**SUPPORTING STATEMENT**

# COALBED METHANE EXTRACTION SECTOR QUESTIONNAIRE

**INFORMATION COLLECTION REQUST SUPPORTING THE**
**U.S. EPA CLEAN WATER ACT SECTION 304(b)**
**EFFLUENT GUIDELINES ANNUAL REVIEWS**

**U.S. ENVIRONMENTAL PROTECTION AGENCY**

**June 2008**

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## PART A OF THE SUPPORTING STATEMENT

## 1. IDENTIFICATION OF THE INFORMATION COLLECTION

### 1(a) Title of the Information Collection

*Coalbed Methane Extraction Sector Questionnaire*

### 1(b) Short Characterization/Abstract

This Information Collection Request (ICR) package requests the Office of Management and Budget (OMB) to review and approve the U.S. Environmental Protection Agency's (EPA's), Office of Water survey titled: "Coalbed Methane Extraction Sector Questionnaire." EPA identified the CBM sector as a candidate for a detailed study in the 2006 Clean Water Act (CWA) Section 304(b) Effluent Guidelines Review (71 FR 76656; December 21, 2006) and also identified that it would develop an industry survey to support this detailed study and would seek OMB approval under the Paperwork Reduction Act (PRA). EPA is conducting this review to determine if it would be appropriate to conduct a rulemaking to revise the effluent guidelines for the Oil and Gas Extraction Point Source Category (40 CFR 435) to control pollutants discharged in coalbed methane (CBM) produced water. EPA also noticed it will conduct an ICR for the CBM extraction sector in its 2007 CWA Section 304(b) Effluent Guidelines Review (72 FR 61343; October 30, 2007).

The CBM extraction sector is an important domestic source of natural gas. In 2006, CBM production accounted for about 9.4 percent of the total U.S. natural gas production and is expanding in many locations across the Nation. The growth in the CBM industrial sector can be explained by the decrease in both drilling and transmission costs, improved clarity of gas ownership, and the increase of long-term natural gas prices.

CBM extraction requires removal of large amounts of water from underground coal seams before CBM can be released. CBM wells have a distinctive production history characterized by an early stage when large amounts of water are produced to reduce reservoir pressure which in turn encourages release of gas; a stable stage when quantities of produced gas increase as the quantities of produced water decrease; and a late stage when the amount of gas produced declines and water production remains low. Pollutants often found in these wastewaters include chloride, sodium, sulfate, bicarbonate, fluoride, iron, barium, magnesium, ammonia, and arsenic. All of these parameters can potentially cause adverse environmental impacts and also affect the potential for beneficial reuse of CBM produced water.

Currently, regulatory controls for CBM produced waters vary from state to state and permit to permit (see EPA– HQ–OW–2004–0032–2782, 2540). Permit information (e.g., effluent limits, restrictions) for this industrial sector is not available in a central database. This information is in state and local offices scattered across the country. Consequently, EPA is gathering additional information from state National Pollutant Discharge Elimination System (NPDES) permit programs and the industry on the current regulatory controls across the different CBM basins.

EPA indicated in the 2006 Effluent Guidelines Review (71 FR 76656) that it will need to gather information about the CBM industry to determine whether it would be appropriate to conduct a rulemaking to potentially revise the effluent guidelines for the Oil and Gas Extraction Point Source Category to include limits for CBM. In particular, EPA will need to collect technical, economic, and environmental data from a wide range of CBM operations. EPA plans to use a questionnaire to survey the CBM industry to collect information about, among other things, geographical differences in the characteristics of CBM-produced waters, current regulatory controls, potential environmental impacts, and availability and affordability of treatment technology options. The CBM detailed questionnaire will collect information on the following:

- General information on the operator and parent company;
- Produced water volumes, water quality, and treatment, reuse, and disposal methods;
- Destination of CBM produced water;
- Produced water treatment methods, including system design, operating, and cost information;
- Environmental impact on receiving waters;
- Pollutant monitoring;
- Firm-level financial information; and
- Project-level financial information.

EPA will distribute the CBM questionnaire to a statistical sample of operators in areas with significant CBM production. Part B of this supporting statement provides additional details on the sampling methodology. EPA estimates the total respondent burden and costs associated with completing the questionnaires are approximately 40,017 hours and $2,141,000. The cost estimate includes operational costs of photocopying and mailing the completed questionnaires to EPA ($28,500). There are no capital costs associated with this survey. Additional details on burden can be found in Section 6. An overview of the survey burden is provided below:

- Estimated total number of potential respondents: 484
- Frequency of response: One-Time
- Estimated total average number of responses for each respondent: One
- Estimated total annual burden hours: 40,017
- Average burden hours per respondent: 83 (~40,017 hours/484 respondents)
- Average cost per respondent: $4,424 (~ $2,141,000/484 respondents).

## 2. NEED FOR AND USE OF THE INFORMATION COLLECTION

### 2(a) Need/Authority for the Information Collection

The 1972 Clean Water Act (CWA) directs EPA to develop and annually review national technology-based regulations, placing limits on the pollutants that are discharged by categories of industry to surface waters (termed "effluent guidelines") or to sewage treatment plants[1] (termed "pretreatment standards"). The Act also directs EPA to develop and annually review national technology-based regulations (termed "new source performance standards") for new industrial facilities that are discharging non-trivial amounts of toxic or non-conventional pollutants. See CWA, 33 U.S.C. 1251, et seq., and in particular sections 301(d), 304(b), 304(g), 304(m), 306, 307(b), and 308, 33 U.S.C. 1311(d), 1314(b), 1314(g), 1314(m), 1316, 1317, and 1318.

Under the authority of Section 308 of the Clean Water Act (33 U.S.C. Section 1318), EPA's Office of Water has begun an effort to determine whether it would be appropriate to conduct a rulemaking to potentially revise the effluent guidelines for the Oil and Gas Extraction Point Source Category to include limits for CBM. Currently, such discharges are not regulated by existing effluent limitations guidelines (ELGs). EPA did not consider CBM production in developing the 1979 national technology-based effluent limitations guidelines for the Onshore and Agricultural and Wildlife Water Use Subcategories of the Oil and Gas Extraction Point Source Category (40 CFR 435, Subparts C and E) because there was no significant CBM production in 1979.[2] Additionally, EPA did not consider CBM production in developing effluent guidelines for the Coal Mining Point Source Category in 1977 and 1985. None of these rulemakings considered CBM extraction in any of the supporting analyses or records. EPA reviewed effluent guidelines for the 56 industrial point source categories and determined that CBM is best reviewed as a potentially new subcategory under the Oil and Gas Extraction Point Source Category (40 CFR 435).

### 2(b) Practical Utility/Users of the Data

#### (i) General Use of the Data

EPA plans to use a survey questionnaire to solicit detailed information specific to individual CBM projects. EPA will use this information, along with other available information, to determine whether it would be appropriate to conduct a rulemaking to potentially revise the effluent guidelines for the Oil and Gas Extraction Point Source Category to include limits for CBM. EPA will use information collected with the detailed questionnaire to quantify pollutants currently discharged by the industry, and to assess CBM production processes, technological and economic achievability of available controls, potential environmental impacts, and produced water disposal practices. EPA is aware that the economics and environmental impacts of CBM production are highly dependent on the location of the CBM development and the surrounding ecosystem; therefore, the CBM detailed questionnaire will be sent to a statistical sample of operators in each basin with CBM production. EPA is distributing a screener questionnaire to

[1] Also referred to as publicly owned treatment works or POTWs.

[2] O'Farrell, Thomas P., EPA's Industrial Technology Division. Letter to Constance B. Harriman, Steptoe & Johnson. June 1, 1989. EPA-HQ-OW-2004-0032-2766.

help select the statistical sample. Part B of the supporting statement contains additional information on the screener questionnaire and the statistical sample.

The CBM detailed questionnaire is designed to collect the following information. Part A of the detailed questionnaire identifies the project selected for the questionnaire. The recipient is directed to provide financial, economic, and technical information for selected CBM projects. Companies operating two or less wells may not have received a screener and will be asked to provide information on the wells they operate. Part B of the detailed questionnaire collects financial and economic information and Part C collects technical CBM produced water management information for the projects listed in Part A.

EPA will use the data collected by the detailed questionnaire to evaluate the discharges from this industrial sector against the four factors (pollutant discharges, available technology, economic achievability, and implementation and efficiency) that EPA uses in its review of discharges from existing industrial point source categories (see 71 FR 76666). EPA will use these four factors to determine whether an effluent guidelines rulemaking is warranted. These factors are derived from sections 301(b)(2) and 304(b) of the CWA, which specify the factors EPA must consider when selecting the best available technology economically achievable for an industrial category. Among others, these factors include:

- Identifying applicable and demonstrated technologies, process changes, or pollution prevention approaches that would substantially reduce pollutant discharges; and

- Determining if the cost of the technologies, process changes, or pollution prevention approaches is likely to be affordable by the industry.

For EPA to determine if an effluent guidelines rulemaking for the CBM extraction sector is appropriate, EPA needs information to confirm the availability of produced water management technologies that can reduce pollutant discharges. EPA also needs to understand how these technologies are limited by the quality and quantity of the produced water and the location in which the water is produced. In addition, EPA needs information to determine if the costs of the produced water management technologies are likely to be affordable by the CBM industry, both for existing projects and projects that will be developed in the future. EPA will use all of information collected by the detailed questionnaire to address these factors and determine if an effluent guidelines rulemaking is appropriate for this industry sector.

Specifically, EPA will use the financial information in Part B of the detailed questionnaire to estimate:

- The baseline financial condition of each CBM operator;

- The baseline financial condition of each project surveyed;

- Financial characteristics that may be unique to CBM operations;

- The impacts of the cost of additional produced water management on existing and new CBM projects; and

- The likelihood of project shut-ins (closings) and loss of productive life due to increased costs of providing improved management, and estimates of associated losses in numbers of firms operating CBM projects, employment, revenues, production, and balance of trade considerations.

The technical information collected in Part C of the detailed questionnaire will allow EPA to:

- Properly characterize, classify, and if necessary subcategorize the CBM industry by basin, pollutants generated, or a combination of these or other factors yet to be determined;

- Establish baseline estimates of CBM produced water pollutant discharges so that the incremental reductions achievable by available produced water management technologies can be estimated;

- Identify best management practices and pollution prevention and source reduction activities that can reduce pollutant discharges;

- Identify best available technologies, which are based on factors such as pollutant removal; and

- Determine potential environmental impacts of CBM produced water.

**(ii) Detailed Economic Analyses Supported by Part B of the Detailed Questionnaire**

EPA will conduct detailed analyses of the economic and financial data collected in Part B of the detailed questionnaire. These analyses will be designed to determine if the costs of produced water management technologies are likely to be affordable by the CBM industry, both for existing projects and projects that will be developed in the future. Specific analyses using the economic and financial data are described below.

(a) *Estimation of Impacts on Projects*

EPA will use the information provided in Part B, Section 3 of the detailed questionnaire to determine the baseline financial conditions of CBM projects throughout the U.S. The overall profitability of the project, accounting for capital costs and earnings, determines whether it makes economic sense to install and operate additional produced water management equipment. EPA engineers will use information from Part C of the detailed questionnaire to develop produced water management and treatment costs for various management options. EPA economists will use historic, current, and projected information on production and costs of production, along with the engineering costs, to calculate baseline and post-option earnings and historic, current, and projected investment costs, including project development costs. These earning estimates will allow EPA to project how additional produced water management costs will impact CBM production decisions by operators.

(b) *Estimation of Impacts on Companies*

EPA will use the information provided in Part B, Section 2 of the detailed questionnaire to determine the baseline financial condition of firms. Part B Section 2 information will also help EPA determine whether firms will be able to afford to invest in the produced water management options considered by EPA. This information will also determine how important the CBM portion of their business is to the financial condition of the firms. EPA will use Part B Section 2 information to evaluate whether firms may face bankruptcy if required to use additional produced water management technologies. For example, some firms may not be able to afford to purchase and install option equipment.

(c) *Estimation of Secondary Impacts*

EPA will use estimated project-level and firm-level impacts to estimate effects on employment in the affected communities. EPA will also use estimated project-level impacts to determine the effects on the production of gas, and thereby effects on royalties for individuals, states, and the federal government, effects on state severance taxes and any possible effects on state and federal income. EPA will use estimates of reductions in gas production to determine any impacts on regional gas markets, the U.S. dependence on foreign sources of energy, and coal miner worker safety.[3] EPA will also use estimates of lost CBM revenues to identify possible employment and economic output effects on communities through direct, indirect, and induced impacts on local and state economies.

(d) *Small Business Regulatory Flexibility Analysis (SBRFA)*

EPA will use information obtained from Part B, Section 2, of the detailed questionnaire to identify which firms are small businesses. Using results of firm failure analyses and revenue test results, EPA will identify the numbers of small businesses that might incur significant impacts to assess whether a SBRFA analysis would be required if EPA initiated an effluent guidelines rulemaking for the CBM extraction sector.

**(iii) Detailed Technical Analyses Supported by Part C of the Detailed Questionnaire**

EPA will conduct detailed analyses of the technical data collected in Part C of the detailed questionnaire to identify applicable and demonstrated technologies, process changes, or pollution prevention approaches (including beneficial reuse) that would substantially reduce pollutant discharges. Specific analyses using the technical data are described below.

(a) *Subcategorization*

To determine whether to initiate an effluent guidelines rulemaking for the CBM extraction sector, EPA will evaluate the basin-specific differences in CBM operations and consider whether it is appropriate to subcategorize the CBM industry based upon such factors as:

- Geographical location;
- Geology;

[3] Some operators extract CBM in advance of underground coal mining operations, which promotes worker safety in underground mines due to the reduction of methane in the mines.

- Operator size as defined by CBM production;
- Maturity of CBM projects as defined by project start;
- Produced water volume;
- Produced water quality;
- Available discharge, disposal, and reuse practices;
- Available treatment technologies; and
- Non-water quality or secondary impacts.

EPA will use the detailed questionnaire data, EPA site visits, and industry submissions to evaluate and consider each of the factors listed above.

(b) *Characterization of CBM Produced Water*

Produced water characteristics (e.g., volumes, pollutant types and concentrations) directly influence the technologies that can be used for treatment and disposal of produced water. For this reason, EPA needs information identifying and quantifying the constituents present in produced water to identify applicable produced water management technologies. EPA will use data collected by the detailed questionnaire to analyze CBM produced water management practices, treatment systems, and discharge, disposal, and reuse options. Specifically, EPA will analyze factors affecting CBM produced water generation (e.g., location, well age); management options (e.g., state regulations, surface rights agreements); and treatment (e.g., water quality and volumes, costs).

CBM produced water characterization data will provide information on the variations in water quality by basin and the effectiveness of treatment. EPA will use any sampling data provided to develop a list of pollutants that are commonly found in CBM produced water and compare the performance of the different treatment technologies to control these pollutants.

(c) *Technology Analysis*

To determine whether to initiate an effluent guidelines rulemaking for the CBM extraction sector, EPA will identify available technologies (including beneficial reuse) for CBM produced water. EPA will also evaluate the feasibility of using these technologies in the different CBM basins. EPA will evaluate the effectiveness of the control technologies at reducing or eliminating discharges of specific pollutants, demonstrated performance, and cost effectiveness.

(d) *Pollutant Loadings and Removals*

EPA will calculate baseline pollutant loadings in discharges of produced water (in pounds/year). EPA will also calculate the amount of pollutant that would be removed if various produced water management technologies were implemented. EPA will use these calculations to evaluate the effectiveness of the control technologies, estimate benefits gained from removing pollutants discharged, estimate the costs to achieve such reductions, and evaluate the cost-effectiveness of the technology in reducing the pollutant loadings. Calculating pollutant discharges and removals includes the following:

- Using estimates of the volume of produced water discharged and pollutant concentrations, calculating the baseline discharges in 2007 (i.e., the pollutant loadings discharged prior to any potential revisions);

- Using estimates of pollutant concentrations and volume of produced water that would be discharged after implementation of management options, calculating loadings after implementation of each produced water management option; and

- Calculating the pollutant reductions (i.e., the difference between the baseline loadings and the post-treatment loadings).

(e) *Assessment of Technology Costs*

EPA will estimate the incremental investment costs and incremental operating and maintenance costs for operators to implement treatment technologies. These compliance costs will be used to determine the potential economic impacts on the industry. In addition, these compliance costs will be weighed against the effluent reductions resulting from each technology option.

To estimate these incremental costs, EPA will use information collected with the CBM detailed questionnaire about treatment system components; capital costs for engineering design, equipment, installation, and utility connections; annual operating and maintenance (O&M) costs for the equipment and equipment operators; and capital amortization. EPA will estimate the direct costs of CBM produced water treatment to determine if any technologies are economically feasible using these data as well as data on CBM produced water volumes and quality.

(f) *Environmental Assessment and Economic Benefits Analysis*

EPA will perform an environmental assessment to identify potentially affected environmental resources and assess the environmental impacts associated with CBM produced water discharges. To do this, EPA will use data collected from the questionnaires on the pollutant concentrations discharged by the facilities and the location of the discharges. EPA will also use information provided by the operators regarding monitoring efforts or other studies to assess the potential impact of discharges to receiving waters.

(g) *Assessment of Non-Water Quality Environmental Impacts*

EPA will also use the survey data to identify the potential non-water quality environmental impacts associated with different technology options. These include any energy requirements, air emissions, and disposal capacity of produced water treatment residuals. To do this, EPA will use data collected from the questionnaires on energy requirements of the various treatment options, transportation and disposal methods for CBM produced water and treatment residuals, and disposal capacities for the different disposal methods.

(h) *Final Decision*

After EPA identifies all subcategories, assesses technologies, calculates pollutant reductions and non-water quality environmental impacts, performs an environmental assessment,

and performs economic analyses, EPA will determine the appropriate action. For example, EPA may:

- Initiate an effluent guidelines rulemaking;
- Develop guidance for permit writers (i.e., a framework for permit writers to use to decide what is best available technology economically achievable (BAT) for each site);
- Develop a resource book for operators and permit writers that describes, but does not recommend, CBM produced water control technologies; or
- Take no action.

## 3. NONDUPLICATION, CONSULTATIONS, AND OTHER COLLECTION EFFORTS

### 3(a) Nonduplication

The Office of Science and Technology of the Agency's Office of Water has made every reasonable attempt to ensure that the CBM questionnaire does not request data and information currently available through less burdensome mechanisms. EPA is working with a range of stakeholders (e.g., industry representatives; Federal, State, and Tribal representatives; public interest groups and landowners; and produced water treatment experts) throughout the CBM Detailed Study to obtain the best available information on the industry and its practices.

To initiate data collection and stakeholder involvement EPA conducted seven teleconferences in June and July 2007 to identify interested parties and provide an overview of the study and data collection needs. EPA also conducted site visits and stakeholder meetings in basins with active CBM development to obtain information about CBM production. In total, EPA conducted 20 sites visits to different locations within six CBM basins:

- Black Warrior Basin (Alabama);
- Upper Appalachian (southwestern Pennsylvania);
- Central Appalachian (southwestern Virginia and southern West Virginia);
- Powder River Basin (Wyoming and Montana);
- San Juan (Colorado and New Mexico); and
- Raton (Colorado and New Mexico).

As part of the site visits, EPA met with industry representatives, local government agencies, and public interest groups to assess publicly-available sources of information relevant to the study and to solicit comments on the topics that will be covered in the CBM questionnaire. This outreach is summarized in the following document, *Coalbed Methane Detailed Study 2007 Data Collection and Outreach* (see EPA-HQ-OW-2006-0771-0977). Additionally, all information collected during these site visits and stakeholder meetings is contained in the record for this project which is available to all interested parties at www.regulations.gov (EPA Docket Number EPA-HQ-OW-2006-0771). EPA will continue to review and assess information collected during the detailed study and include it in the public record. Note that EPA excluded any information claimed as Confidential Business Information (CBI) from the public record.

EPA has determined that existing public data is insufficient to meet its needs (e.g., financial data to determine economic achievability of different technology options) and that more comprehensive information on CBM operators, as described in Section 4 of this supporting statement, is needed to determine whether to initiate an effluent guidelines rulemaking for the CBM extraction sector.

## 3(b) Public Notice Required Prior to ICR Submission to OMB

### (i) Publication of the Federal Register Notice

EPA published two Federal Register notices announcing EPA's intention to develop an industry survey to support this detailed study and to seek OMB approval for this survey under the Paperwork Reduction Act (PRA) (see 71 FR 76656; December 21, 2006; and 72 FR 61343; October 30, 2007). More recently, EPA published another notice in the Federal Register on January 25, 2008 (73 FR 4556), announcing additional details for the Agency's intent to submit a request for a new Information Collection Request (ICR) and to collect comments on the Draft Questionnaire for the Coalbed Methane Extraction Sector. EPA extended the comment period from 60 to 90 days in response to requests from commenters (see 73 FR 14983; March 20, 2008). A copy of this last notice is included on EPA's Effluent Guidelines Biennial Plan Web site (www.epa.gov/guide/304m). EPA published a second notice in the Federal Register on XXX (XXX FR XXX) which discussed comments EPA has received on the initial survey instrument and solicits any remaining comments on EPA's revised Draft Questionnaire for the Coalbed Methane Extraction Sector.

In addition to publishing these Federal Register notices, EPA informed over 700 CBM stakeholders, who participated in EPA's stakeholder meetings and site visits, of the notice publication via phone and e-mail. The January 2008 Federal Register notice included more details on the description of the entities to be affected by the proposed questionnaire, a brief explanation of the need for the questionnaire, identification of the authority under which the questionnaire will be issued, and an estimate of burden to be incurred by questionnaire respondents. In the January 2008 notice, the Agency requested comments and suggestions regarding the questionnaire and the reduction of data collection burden, and asked that the public submit all comments and suggestions within 90 days of the Federal Register notice publication. By means of this last notice, the Agency requested any remaining comments and suggestions regarding the questionnaire, and asked that the public submit all comments and suggestions within 30 days of the Federal Register notice publication

Pursuant to section 3506(c)(2)(A) of the Paperwork Reduction Act, EPA specifically solicited comments and information to enable it to:

1. Evaluate whether the proposed collection of information is necessary for the proper performance of the functions of the Agency, including whether the information will have practical utility.

2. Evaluate the accuracy of the Agency's estimate of burden of the proposed collection of information, including the validity of the methodology and assumptions used.

3. Enhance the quality, unity, and clarity of the information to be collected.

4. Minimize the burden of the collection of information on those who are to respond.

**(ii) Public Response to the Federal Register Notice**

EPA received 35 comments on the January 2008 Federal Register notice regarding the Coalbed Methane detailed survey. This section includes a brief summary of the major comments related to the detailed questionnaire along with EPA's summary responses. The comments are organized below by topic. Section 3(b)(iii) of this document discusses the changes EPA made to the information collection request based on public comment.

(a) *General Comments on the Coalbed Methane Data Collection*

1. Commenters stated that EPA has not demonstrated that there is an environmental problem warranting national regulations; individual states have been issuing permits for existing CBM wells for more than 20 years.

   Response: One of the Clean Water Act's (CWA) major strategies in making reasonable further progress toward the national goal of eliminating the discharge of all pollutants requires effluent limitations, based not on the impact of the discharge on receiving waters, but instead upon the capabilities of the technologies available to control those discharges. Unlike other Clean Water Act tools, effluent guidelines are national in scope and establish pollution control obligations for all facilities within an industrial category or subcategory.

   EPA did conduct an initial review of its record and identified several documents that discuss adverse surface water impacts from CBM produced water discharges. At the Federal level, Bureau of Land Management Environmental Impact Statements have found that produced water discharges will have adverse water resource consequences such as noticeable changes in water quality of main stems of rivers during periods of low flow, that concentrations of suspended sediment in surface waters are likely to rise above present levels as a result of increased flows of produced water and runoff from areas disturbed by coalbed methane production, that increased concentrations of sodium from produced water discharges may inhibit the use of irrigation in some areas, that perennial stream flows are likely to develop in formerly ephemeral channels, and that ground water recharge of rivers may diminish, that wetlands and riparian areas could be damaged by access roads, and that exiting water rights may in impacted. Peer reviewed journal articles in the Agency's record, moreover, present findings that produced water discharges are adversely affecting stream water chemistry with unknown consequences to aquatic life populations. In addition to documentation of adverse impacts from produced water discharges, the current preliminary record also reflects official state-level concern about adverse impacts. The Western Governor's Association, for example, has produced a best management practices handbook to help address adverse environmental impacts from coalbed methane production. The preliminary record also includes documents demonstrating concern by state regulatory agencies in Wyoming and Montana about the potential water quality impacts of produced water discharges.

   EPA requires detailed financial and technical data to perform economic impact analyses for firm-level and well fields / projects to ensure that a rulemaking decision does not have potential for impacts on existing and future CBM production. This detailed information must be collected through an industry survey since it is not publicly

available. Therefore, due to information on existing environmental problems and a lack of detailed data, EPA is moving forward with additional study of this industry to determine if effluent guidelines are needed.

2. Industry expressed concern for the very large amounts of data and information requested for individual wells, and that the burden to provide such data and information for all wells would not be reasonable for industry and would also overwhelm EPA resources and would not be used productively.

   Response: EPA will minimize response burdens by maximizing data gathering from federal government agencies (e.g., EIA, USGS, BLM, MMS, USFS, DOE, etc.), states, commercial databases (e.g., HPDI), and vendors and publicly-available reports. EPA has developed a screener survey which will help EPA identify a statistically-selected subset of projects and associated wells to receive the detailed questionnaire. EPA will not be collecting data on all wells. Also, as shown in Section 3(b)(iii), EPA has eliminated many questions from the detailed questionnaire, made questions optional, established skip patterns that eliminate many questions for some respondents, or allowed estimates to be provided to reduce burden to industry while still allowing EPA to collect the information required for our analyses.

3. CBM representatives asserted that detailed project- and firm-level financial data are extremely sensitive, and most companies would not respond to financial data requests because of concerns for protection of these very sensitive data and the undemonstrated need for the data.

   Response: EPA has a long-standing appreciation for the sensitivity of financial data and a history of very carefully managing and protecting confidential business information (CBI), including financial data from small companies, submitted over more than 30 years by a broad range of industries. These financial data for the CBM industry are not currently available and are necessary to perform critical detailed economic analyses.

4. EPA has underestimated the burden of the questionnaire and/or labor hour costs for completing the questionnaire.

   Response: EPA has modified the detailed questionnaire to help reduce the burden and labor hour costs to industry.

5. EPA should carefully define what a project is; EPA's definition of project may not match how companies define project.

   Response: EPA agrees that the definition of a project is critical and, after receiving this comment, EPA worked with stakeholders to develop a revised definition

6. EPA may end up collecting data only from large operators, which will skew results.

   Response: EPA is planning to stratify the detailed survey questionnaire such that a representative sample of both small and large operators will be selected.

(b) *Comments on Economic Section of Survey (Part B)*

1. Wide variations in natural gas prices, types of surface owner and mineral rights, pipeline availability, and demand issues further confound EPA's ability to perform a realistic economic analysis.

   Response: EPA follows OMB guidance for economic analyses and will use the information collected through the survey to establish a pre-regulatory baseline from which to measure the effects of incremental costs. EPA is planning to undertake the survey using a statistically valid and representative sample of the projects currently operating in the U.S. and gather data which will reflect the necessary array of such variables.

2. EPA should consider the loss of reserves resulting from the adoption of any new ELG.

   Response: A major goal of the detailed questionnaire is to develop sufficient information to model the effects of additional produced water costs on production. The results of such an analysis will be used by EPA in determining whether to go forward with an ELG, and if so, what options might be economically achievable.

3. EPA should consider loss of revenues to federal, state, and local governments as a result of any new effluent guidelines.

   Response: The questionnaire requests data on severance taxes, ad valorum taxes, type of leases (e.g., state or federal), and royalties. These data will be used to determine (based on modeling of production losses) the declines in revenues to governments that might occur if higher cost produced water options are required. Additionally, EPA's CBM project financial model computes the federal and state income tax implications (if applicable) of income tax reductions due to increased production costs.

4. Respondents may not have historic information on economic projects due to the age of the project or acquiring it from another operator.

   Response: EPA has inserted skip patterns in the section requesting historical information. The skip pattern is designed to eliminate all operators from this portion of the questionnaire who manage projects in which the first lease was acquired prior to 2003, or who acquired the project or any portion of the project from another operator (other than acquiring undeveloped leases from that operator in 2003 or later). Therefore, EPA is not collecting historic information for any projects more than five years old or any that were acquired in whole or in part where cost records to develop the project might not be complete.

5. Decision-making criteria such as hurdle rate, cost of capital, etc. are too sensitive and/or are not useful to EPA.

Response: EPA has restructured questions on these topics to allow respondents to accept EPA assumptions or to provide their own. EPA will use the average cost of capital (as estimated by the Office of Management and Budget) and a range of hurdle rates in sensitivity analyses, unless otherwise specified by respondents. EPA agrees that this information might be sensitive and has allowed respondents to easily identify all pieces of sensitive information by checking a CBI box. Cost of capital and hurdle rates are factors that companies do consider when deciding whether to go forward with a project. EPA cannot assess what impact any incremental produced water management requirements might have on those decisions without some assumptions about the magnitude of these factors.

6. EPA should not request financial information regarding non-CBM operations. Revenues, costs, assets, etc., from conventional oil and gas operations are not pertinent (these projects are not used to subsidize CBM operations) and/or cannot be distinguished.

   Response: EPA agrees that conventional oil and gas, or any other revenue-generating business units within the firm, would not be used to subsidize CBM operations. EPA requests this type of information to determine the importance of CBM operations within the firm and to assess the magnitude of impact on a firm if some or all of their CBM operations become unprofitable under alternative produced water management requirements. If CBM operations are a small fraction of oil and gas revenues, or overall revenues, CBM projects that are shut in will have a small impact on the firm; if a large fraction, impacts would be larger. EPA believes that CBM-conventional costs and revenues can be estimated and has provided operators with the opportunity to note that these are estimates within the survey questionnaire. EPA is concerned with the general proportions of such costs and revenues, not the exact amount.

7. Financial questions at the firm level are inappropriate because decisions about whether to produce are made at the project level. EPA should not ask for financial data above the immediate owner/operator; financial data from the division level is what is most relevant.

   Response: EPA agrees that decisions about whether to produce are made at the project level, but does not collect firm level information to judge whether a project would or would not produce. Although the firm will make a decision to produce or not produce based on the financial conditions of the project, a decision to shut in a project could have a major impact on the firm. Additionally, some firms, particularly small firms, might have difficulties attracting capital to purchase and install alternative produced water management equipment due to their current debt structure and/or cash flow situation. This would mean they might be forced to sell their project, incurring other potentially major impacts on the firm.

8. EPA should take into account that non-economic factors play a role in many cases in choice of produced water management. Split estate issues create additional problems; landowners may require the water that is produced.

   Response: EPA agrees that non-economic decisions play a role in what produced water management practices are selected for a site. EPA has added questions about the reason

current practices were selected to understand what non-economic factors might have played a role in the decision.

9. Data requested may be kept over varying groupings of wells and operators may have to estimate data; EPA should allow estimates.

   Response: EPA has clarified the directions to allow estimates, where necessary, and has provided check boxes in some cases to allow respondents to identify which responses are estimates.

10. EPA cannot require operators to furnish information that is not maintained in the ordinary course of business.

    Response: EPA realizes that some information requested may need to be estimated, but believes that such information is important in making the results of analyses as accurate as possible. Respondents are welcome to identify any information they have estimated. Respondents will not be penalized for providing good faith estimates.

11. EPA cannot require reserves information.

    Response: EPA is requesting information only from respondents that routinely calculate reserves for SEC and/or DOE and is not asking anyone to calculate reserves strictly for this survey.

12. EPA may miss secondary impacts on communities, service companies, etc.

    Response: EPA always investigates secondary impacts when estimating impacts from potential new CBM produced water treatment technology options. Both employment and output multiplier effects will be considered, and EPA will identify if regions have substantial increases in unemployment rates as a result of direct impacts on firms or facilities (or in this case, CBM projects).

13. Small businesses might not have the data needed to complete the survey.

    Response: EPA is working closely with trade associations that represent smaller CBM operators to try to understand what data these operators might or might not have. EPA is also stressing that estimates are sufficient for many of the data items requested. Additionally, EPA is offering to complete most of Part B Section 2 for small businesses using their financial reports or corporate income tax forms.

14. Confidentiality may be a problem if a company operates the majority of the wells in a particular basin.

    Response: EPA has handled the analysis and reporting of data where there are an insufficient number of respondents in a particular stratum to ensure data confidentiality in many prior analyses of Section 308 surveys and will do so here in a similar manner. EPA will combine strata in presenting results and provide the detailed results at the component

stratum level *only* in the confidential portion of the record (which is subject to the same access restrictions as the CBI questionnaires themselves). By placing the detailed results of both strata used in the combined stratum into the confidential record, EPA ensures that any results cannot be back calculated in any way.

15. Large CBM operators might be required to respond for thousands of wells.

    Response: EPA plans to cap the number of projects about which an operator will be required to respond.

16. EPA should request a range of costs for handling produced water in the past and the point at which these costs begin to make reserves uneconomic.

    Response: This approach does not give EPA the flexibility to vary a number of key assumptions needed to perform sensitivity analyses. What is uneconomic under one scenario may be economic under another, when production projection assumptions, price of gas, and other factors are varied.

17. The questionnaire is biased towards successful CBM projects.

    Response: EPA has added questions aimed at identifying success rates of exploratory and delineation wells; the costs of basin-wide activities of this nature will be used to determine the additional cost of development in specific basins attributable to failures and to characterize the overall success rates in a basin. These rates will be applied when new projects in a basin are characterized for modeling purposes and will be used to develop ranges for sensitivity analyses in basins that are expected to be developed over the next several years.

18. Small businesses may not follow cost accounting assumed by EPA.

    Response: EPA is offering to complete much of Part B Section 2 for small businesses based on their financial reports and/or corporate income tax forms.

19. Operators should not have to provide information related to projections, or projections should be limited to just a few years.

    Response: EPA is now offering respondents the choice of accepting EPA projection assumptions, providing their own projection assumptions, or providing at least three years of projections (two years beyond 2008 plus 2008).

20. The questionnaire will not provide costs on exploration, identification and evaluation of reserves and production; EPA will not be gathering information on wildcatting or delineation.

    Response: EPA has added questions on which projects are considered wildcats, as well as questions on what it costs to explore and delineate the basins in which the operator's projects are located. Additionally, if the respondent believes that a cost item has not been

captured in the questionnaire, EPA offers numerous places within the questionnaire where other costs can be added in, as long as those costs are clearly identified and are not included in responses to other questions.

(c) *Comments on Produced Water Management Section of Survey (Part C)*

1. CBM well circumstances (e.g., produced water quantity and quality, available and applicable produced waste management and control technologies, etc.) are diverse and complex geographically and geologically, and the draft questionnaire does not address this complexity and variation.

   Response: EPA intends to gather the data on representative well characteristics, produced water quantities and qualities, and attendant differences in wastewater management and disposal technology options and costs to carefully address these diverse circumstances, including geographic and geology differences among regions and basins, and within basins.

2. EPA should collect information about unsuccessful produced water management systems to learn site-specific conditions that may make proposed treatment technologies unsuccessful.

   Response: EPA agrees that understanding treatment technology implementation issues would be valuable and has added questions on this topic in Part C.

3. EPA should not request detailed design and operating data on produced water management systems that do not discharge to surface waters (e.g., injection wells, evaporation ponds).

   Response: EPA has modified Part C to eliminate many of the detailed questions for produced water management systems that do not discharge to surface waters.

4. EPA should request information to account for costs related to residual disposal. This is especially important as EPA considers technologies such as ion exchange and reverse osmosis.

   Response: Residual disposal should be included in the produced water management system operating and maintenance cost question. Information on the amount, frequency, and destination of sludge or solids is also requested in Part C. In addition, EPA requests detailed capital and operating and maintenance costs for individual treatment units which should account for residual disposal.

5. There are instances where produced water management systems manage both CBM and conventional produced water, making proportioning of capital and operating costs attributable solely to CBM produced water difficult.

   Response: EPA is requesting information on the percentage of flow for each produced water management system that is attributable to the economic project listed in Part A

which will allow EPA to link the information obtained in Part B to the information in Part C.

6. The data does not often exist for the level of detail requested for the components of the PWMSs. Several comments suggested that EPA use vendor data instead of requesting the data from the industry.

   Response: EPA will be using vendor data to supplement data collected by the questionnaire. EPA is collecting cost information for the system as a whole and more detailed information only for systems discharging to surface water, a POTW, or third party.

7. Well flow information requested may not be known. Several comments noted that they do not monitor the flow from the individual wells to the produced water management system; they only monitor the total flow from the produced water management system. Also, there was uncertainty about how to record and account for intermittent flows.

   Response: EPA is not collecting information from specific wells. Flow information for the produced water management system is sufficient.

8. Operations at a project(s) may make the requested produced water management system diagrams too complex to produce. For example, when flows from individual wells can be directed to one or more disposal options or produced water management systems.

   Response: EPA is allowing respondents to submit either a diagram or a narrative response. EPA is not requiring detailed diagrams with every well listed. EPA would like a general overview of the produced water management system as shown in the example diagrams provided in Part C of the questionnaire.

9. ELGs may create non-water quality impacts and impacts on beneficial reuse.

   Response: EPA acknowledges that alternative produced water management options can have impacts on non-water quality factors, including the potential loss (or gain) of water to beneficial reuse. EPA will address these factors using engineering knowledge of the various option lifecycle inputs and outputs, including creation of hazardous waste, air pollutants, solid waste, energy use, etc., and whether requirements might, for example, encourage disposal rather than use of water if treatment exceeds disposal costs.

10. EPA should take into account increased prices for raw materials (for example, acid) if certain water treatment options are mandated.

    Response: If EPA determines that certain produced water management options result in a large number of projects considered likely to adopt those options where a raw material may have a limited supply and there are few substitutes, EPA will consider the price effects of that scenario using a sensitivity analysis.

11. Several comments indicated that the water quality data requested in Part C, Section 4, is already available through state agencies (including both direct discharge to surface water,

as well as underground injection) and should not be requested. Other comments also suggested that other requested information (e.g., descriptions of treatment systems) is also available from state agencies.

Response: EPA acknowledges that data at the state level exists, and EPA will attempt to use as much as possible for its analyses. EPA will accept water quality data in existing formats so that respondents do not need to complete the table included in Section 4 for the analytical data results. However, it should be acknowledged that data obtained from states may not be sufficient for the types of analyses typically performed for development of effluent guidelines (e.g., verification of treatment system performance). For example, NPDES permit discharge data is reported in summary form (e.g., averaged data) and states typically do not collect treatment system influent and effluent data.

**(iii) EPA Action Resulting from Public Comment**

Major revisions to the CBM detailed questionnaire based on public comment include the development of a screener questionnaire to aid in the development of the statistical sample and revisions and deletions to questions in the detailed questionnaire. The screener will be sent to approximately 300 operators that have three or more wells. For the remaining (approximately) 180 operators with only one or two wells, EPA would attempt to collect the screener using publicly available information and contacts with industry associations. Only as a last resort would EPA contact the operators themselves. EPA expects that any additional information required from the operators could be obtained through a brief telephone call, instead of a written response to the complete screener. The screener collects only information that EPA needs to select a representative sample of the industry for the detailed questionnaire. To ensure that the detailed questionnaire sample:

- Selects CBM operations, the screener would verify that the establishment name is correct and operates CBM wells;
- Includes small businesses, the screener would ask whether the parent company is "small" according to the Small Business Administration;
- Includes projects of various sizes, the screener would ask for total gas production and number of wells;
- Identifies specific projects using names familiar to the operator, the screener would request the operator's name or identifier for the project; and
- Includes projects that discharge into rivers and streams in and near the Powder River Basin in Wyoming and Appalachian Basin, the screener would request information about produced water management practices.

Table 3-1 presents a summary of the significant changes made to the detailed questionnaire since the publication of the January 25, 2008 FR notice. A copy of the January 2008 questionnaire is located on EPA's Web site (http://www.epa.gov/guide/304m/2008/cbm-questionnaire-200801.pdf) and in the docket for EPA's Effluent Guidelines Program Plan on regulations.gov (see EPA– HQ–OW–2006–0771–0960, DCN 05365).

## Table 3-1. Changes to the Detailed Questionnaire

| Detailed Questionnaire Section/Topic | Description of Modification | Question Deleted? |
|---|---|---|
| **Part A** | EPA modified Part A to use the results of information provided in the screener questionnaire. A list of API numbers (or state permit numbers in some states) is requested for each sampled project, which can be submitted either on the table provided, in attached spreadsheets, or electronically. These numbers are needed in order for EPA to use data the Agency has acquired on CBM wells and production for projections and other purposes. | |
| **Part B, Section 1** | No changes | |
| **Part B, Section 2** | EPA clarified instructions, made questions about cost of capital and hurdle rate optional (allowing respondents to concur with EPA assumptions), added a question allowing respondents to skip most of Part B, Section 2 if they injected all produced water from all CBM projects operated in the U.S., and allowed small businesses to opt to have EPA fill out most of Part B, Section 2 from financial report submittals if they choose. | YES—<br><br>Questions related to payback decisions were deleted.<br><br>Small businesses have option for EPA to complete section based on their financial documents.<br><br>Respondents that inject all produced water from all domestic CBM projects skip most questions in Section 2. |
| **Part B, Section 3, Table B-1** | EPA added questions related to whether the project commingles CBM with conventional oil and gas so that conventional and CBM production can be distinguished, and whether the project is considered a wildcat. EPA asks for well counts by whether they are horizontally or vertically drilled wells. ERG clarified that operators of projects begun prior to 2003 or for which any portion of the project was acquired after development had begun should skip Table B-2 and go directly to Table B-3. | YES—<br><br>Question asking for all lease or state permit numbers was deleted. Question on costs of wastewater management deleted. |

## Table 3-1. Changes to the Detailed Questionnaire

| Detailed Questionnaire Section/Topic | Description of Modification | Question Deleted? |
|---|---|---|
| **Part B, Section 3, Table B-2** | EPA clarified instructions and terminology in questions. EPA added questions to address issues about an operator's unsuccessful CBM exploration and costs for exploration in the basin in which a project is located. EPA asks about delineation wells to address comments that EPA needs to know about exploration and delineation. EPA added a question to make sure initial permit costs were specifically called out, and added ongoing permit costs as an example cost to another cost question since commenters indicated there were no questions specific to permitting. EPA changed questions pertaining to project timing to elicit year activities began, rather than asking about numbers of years between activities. EPA changed instructions for responding about activities such as workovers, allowing respondents to report them in O&M costs if they are considered a part of ordinary maintenance (e.g., performed on an annual basis) or as extraordinary expenditures (e.g., not done every year). | |
| **Part B, Section 3, Table B-3** | EPA clarified instructions and terminologies in questions. Permit related costs for monitoring, recordkeeping and reporting were specifically indicated to be included in O&M costs. Major maintenance such as workovers can now be reported under O&M if they are considered ordinary maintenance, or can be reported as extraordinary expenses, if not done every year. Costs for developmental well drilling are now distinguished from costs for delineation wells, if applicable. Reserves questions now instruct respondents that they do not have to create this information for EPA. If they do not report reserves to SEC or DOE, they are instructed to skip questions on economic reserves. If they do not have the information available, operators do not have to provide information on technically recoverable reserves. | |
| **Part B, Section 3, Project Projections** | All projections are now optional. Respondents can provide as much data as they care to share with EPA or they can opt to have EPA make projects for them, or any combination of those options. Assumptions EPA plans to make are spelled out to the extent that EPA can spell out such assumptions ahead of receiving survey data or analyzing data EPA has acquired on CBM well production and other information. | |

## Table 3-1. Changes to the Detailed Questionnaire

| Detailed Questionnaire Section/Topic | Description of Modification | Question Deleted? |
|---|---|---|
| **Part C Section 2** | | |
| C2-1 Request for Diagram | EPA has modified the instructions to allow respondents to submit a narrative description or diagram. EPA provided example diagrams and narratives that describe the level of detail required. EPA is not requesting a diagram showing individual wells. | |
| C2-3 List of Wells | EPA is no longer requesting a list of wells in this section. EPA has included a question on the percent of water from the economic project listed in Part A that contributes to the total flow for the produced water management system which will allow EPA to link the information in Parts B and C. | YES |
| Additional Question – EPA added a request for the land area occupied by the CBM operations. | EPA is requesting information about the footprint of management system and to determine whether there may be room for additional treatment. | |
| Additional Questions – Information on other management scenarios | To respond to comments regarding failures of produced water management systems, EPA has added questions requesting information about other produced water management systems considered and the reasons they were either abandoned or not implemented. | |
| **Part C Section 3** | | |
| General | This section was reorganized such that operators who are not discharging to surface water, POTWs, or third parties do not need to complete detailed information. EPA will ask for detailed treatment information only from operators discharging to surface water, POTWs, or third parties. | |
| C3-1 Surface Water Discharge | EPA has deleted the request for outfall latitude, longitude, and receiving water name and type. EPA also deleted the request for detailed design component information (e.g., pumps, monitoring equipment). | YES – Deleted detailed design questions. |
| C3-2 Land Application/Irrigation | EPA is no longer requesting information on this topic. | YES |
| C3-3 Underground Injection | EPA is no longer requesting information on this topic. | YES |
| C3-4 Surface Impoundments/Sedimentation Ponds | EPA is only requesting information on sedimentation ponds used to remove pollutants prior to discharge to surface water, POTW, or third party. EPA also deleted the request for detailed design component information (e.g., pumps, monitoring equipment). | YES – Deleted detailed design questions. |
| C3-5 Livestock or Wildlife Watering | EPA is no longer requesting information on this topic. | YES |
| C3-6 Ion Exchange | EPA has deleted the request for detailed design component information (e.g., pumps, monitoring equipment). | YES – Deleted detailed design questions. |

**Table 3-1. Changes to the Detailed Questionnaire**

| Detailed Questionnaire Section/Topic | Description of Modification | Question Deleted? |
|---|---|---|
| C3-7 Low Pressure Filtration | EPA has deleted the request for detailed design component information (e.g., pumps, monitoring equipment). | YES – Deleted detailed design questions. |
| C3-8 High Pressure Filtration | EPA has deleted the request for detailed design component information (e.g., pumps, monitoring equipment). | YES – Deleted detailed design questions. |
| C3-9 Treatment Not Specified Elsewhere | EPA has deleted the request for detailed design component information (e.g., pumps, monitoring equipment). | YES – Deleted detailed design questions. |

## 3(c) Consultations

As previously discussed, the Agency organized and conducted numerous meetings and teleconferences with industry trade groups and other stakeholders in the process of obtaining both informal and formal comments on the draft questionnaire. The Agency provided the industry stakeholders an initial list of questionnaire topics during the industry site visits to gauge initial reactions and obtain general comments and suggestions (DCN 05206). EPA conducted industry stakeholder meetings in conjunction with the site visits performed in each of the six CBM basins to solicit industry comments on EPA's CBM detailed study and planned ICR. EPA also conducted teleconferences and meetings with other government agencies and interested parties to solicit input on the CBM detailed study. EPA also conducted three additional meetings after the publication of the first Federal Register notice. Table 3-2 lists the dates for all industry and other stakeholder meetings.

**Table 3-2. List of EPA Outreach Activities**

| No. | Meeting/Teleconference | Location | Date | DCN |
|---|---|---|---|---|
| 1 | Department of Energy's Office of Fossil Energy and Energy Information Administration | Washington, DC | 15-May-07 | 5176 |
| 2 | Stakeholder Teleconference | Washington, DC | 21-Jun-07 | 5177 |
| 3 | Stakeholder Teleconference | Washington, DC | 26-Jun-07 | 5178 |
| 4 | Stakeholder Teleconference | Washington, DC | 27-Jun-07 | 5179 |
| 5 | Stakeholder Teleconference | Washington, DC | 28-Jun-07 | 5180 |
| 6 | Stakeholder Teleconference | Washington, DC | 10-Jul-07 | 5181 |
| 7 | Stakeholder Teleconference | Washington, DC | 24-Jul-07 | 5182 |
| 8 | Stakeholder Teleconference | Washington, DC | 26-Jul-07 | 5184 |
| 9 | Alabama Coalbed Methane Industry Meeting | Tuscaloosa, AL | 07-Aug-07 | 5098 |
| 10 | U.S. Fish and Wildlife, Daphne Field Office and Geological Survey of Alabama Meeting Minutes | Tuscaloosa, AL | 07-Aug-07 | 5100 |
| 11 | Geological Survey of Alabama and State Oil and Gas Board of Alabama Meeting | Tuscaloosa, AL | 08-Aug-07 | 5099 |
| 12 | U.S. Geological Survey | Reston, VA | 09-Aug-07 | 5186 |

## Table 3-2. List of EPA Outreach Activities

| No. | Meeting/Teleconference | Location | Date | DCN |
|---|---|---|---|---|
| 13 | U.S. Forest Service | Arlington, VA | 10-Aug-07 | 5187 |
| 14 | Department of Energy, Energy Information Administration Teleconference | Washington, DC | 17-Aug-07 | 5188 |
| 15 | CBM Trade Associations and Operators | Washington, DC | 30-Aug-07 | 5189 |
| 16 | Bureau of Land Management | Washington, DC | 31-Aug-07 | 5190 |
| 17 | West Virginia Department of Environmental Protection Teleconference | Washington, DC | 21-Sep-07 | 5191 |
| 18 | West Virginia Coalbed Methane Industry Stakeholder Meeting | Beckley, WV | 24-Sep-07 | 5207 |
| 19 | API Clean Water Task Force Meeting | Washington, DC | 03-Oct-07 | 5373 |
| 20 | Public Interest Group Meeting | Melcroft, PA | 11-Oct-07 | 5209 |
| 21 | Pennsylvania Coalbed Methane Industry and Pennsylvania Department of Environmental Protection (PADEP) Meeting | Canonsburg, PA | 11-Oct-07 | 5208 |
| 22 | Public Interest Group Meeting | Broadus, MT | 16-Oct-07 | 5210 |
| 23 | Wyoming Coalbed Methane Industry Stakeholder Meeting | Gillette, WY | 17-Oct-07 | 5212 |
| 24 | Meeting with Federal and State Regulators | Sheridan, WY | 17-Oct-07 | 5213 |
| 25 | Public Interest Group Meeting | Sheridan, WY | 17-Oct-07 | 5214 |
| 26 | Meeting with Federal and State Regulators | Billings, MT | 18-Oct-07 | 5192 |
| 27 | Public Interest Group Meeting | Billings, MT | 18-Oct-07 | 5215 |
| 28 | Northern Cheyenne Meeting | Billings, MT | 19-Oct-07 | 5193 |
| 29 | Colorado Coalbed Methane Industry Stakeholder Meeting | Durango, CO | 22-Oct-07 | 5216 |
| 30 | Meeting with Federal and State Regulators | Farmington, NM | 22-Oct-07 | 5219 |
| 31 | U.S. Forest Service on Northern San Juan FEIS & ROD | Durango, CO | 22-Oct-07 | 5195 |
| 32 | Meeting with Oil and Gas Accountability Project | Durango, CO | 23-Oct-07 | 5220 |
| 33 | Southern Ute Meeting | Igancio, CO | 24-Oct-07 | 5221 |
| 34 | Colorado Coalbed Methane Industry Stakeholder Meeting | Trinidad, CO | 25-Oct-07 | 5222 |
| 35 | Public Interest Group Meeting | Trinidad, CO | 25-Oct-07 | 5223 |
| 36 | Meeting with City of Raton, NM | Raton, NM | 26-Oct-07 | 5196 |
| 37 | Methane Energy (Coos Bay, OR) Teleconference | Washington, DC | 31-Oct-07 | 5246 |
| 38 | Colorado Petroleum Association Meeting Minutes, | Washington, DC | 01-Nov-07 | 5244 |
| 39 | Teleconference with Mary Williams, Minerals Management Service | Denver, CO | 02-Nov-07 | 5224 |
| 40 | 14th International Petroleum Environmental Conference Presentation | Houston, TX | 07-Nov-07 | 5138 |
| 41 | Industry Questionnaire Meeting | Washington, DC | 11-Dec-07 | 5245 |
| 42 | Department of Interior, Bureau of Reclamation Teleconference | Washington, DC | 27-Dec-07 | 5247 |
| 43 | CBM Trade Associations and Operators Questionnaire Meeting | Washington, DC | 15-Jan-08 | 5368 |

**Table 3-2. List of EPA Outreach Activities**

| No. | Meeting/Teleconference | Location | Date | DCN |
|---|---|---|---|---|
| 44 | Oklahoma Independent Petroleum Association (OIPA) | Washington, DC | 17-Apr-08 | 5764 |
| 45 | CBM Trade Associations and Operators Questionnaire Meeting | Denver, CO | 14-May-08 | 5765 |
| 46 | CBM Trade Associations and Operators Questionnaire Meeting | Washington, DC | 26-Jun-08 | 5766 |

### 3(d) Effects of Less Frequent Collection

The CBM ICR is a *one time only* data collection activity for the respondents.

### 3(e) General Guidelines

EPA will conduct data collection activities in accordance with the Paperwork Reduction Act guidelines in 5 CFR 1320.6 and EPA's Quality Assurance Guidance. Information to be disseminated will comply with EPA's Information Quality Guidelines, which were developed for implementing OMB's Guidelines for Ensuring and Maximizing the Quality, Objectivity, Utility, and Integrity of the Information Disseminated by Federal Agencies.

### 3(f) Confidentiality

Both the screener and detailed questionnaires inform respondents of their right to claim information as business confidential in accordance with 40 CFR Part 2, Subpart B, Section 2.203. Both questionnaires provide instructions for claiming confidentiality, and informs respondents of the terms and rules governing the protection of Confidential Business Information (CBI) under the Clean Water Act and 40 CFR 2.203(B). In the detailed questionnaire, each question which requests potentially confidential information is accompanied by a CBI checkbox. Respondents are requested to check the CBI checkboxes which accompany responses they claim as confidential.

EPA and its contractors will follow existing written procedures to protect data labeled as CBI. These procedures include the following:

- Ensure secure handling of completed questionnaires to preclude access by unauthorized personnel.

- Store completed questionnaires and databases in secured areas of offices, and restrict access to authorized EPA and contractor personnel only.

- Restrict any publication or dissemination of confidential study results or findings to aggregate statistics and coded listings. Individual respondents will not be identified in summary reports and EPA contractors will not release respondents' names to unauthorized individuals.

A copy of the written procedures for gathering, safeguarding, and securing CBI is located Office of Water, Office of Science and Technology's "Confidential Business Information Application Security Plan," which EPA included in the record supporting this ICR (see DCN 05359).

Information covered by a claim of confidentiality will be disclosed by EPA only to the extent of, and by means of, the procedures set forth in 40 CFR Part 2, Subpart B. In general, submitted information protected by a business confidentiality claim may be disclosed to other employees, officers, or authorized representatives of the United States concerned with implementing the Clean Water Act. Exemption 4 of the Freedom of Information Act (FOIA) protects from disclosure "trade secrets and commercial or financial information obtained from a person and privileged or confidential." See 5 U.S.C. 552(b)(4).

Information covered by a claim of confidentiality will be made available to EPA contractors under EPA Contract Numbers 68-C02-095, EP-C-07-029, and EP-C-05-030 to enable the contractors to perform the work required by their contracts with EPA. Each EPA contractor that collects, possesses, or stores CBI is responsible for the proper handling of that data. Each contractor will safeguard information as described in Section 2.211(d) of Subpart B and is obligated to use or disclose information only as permitted by the contract under which the information is furnished.

**3(g) Sensitive Questions**

No sensitive questions pertaining to private or personal information, such as sexual behavior or religious beliefs, will be asked in the questionnaire.

## 4. THE RESPONDENTS AND THE INFORMATION REQUESTED

### 4(a) Respondents NAICS Codes

The respondents affected by this information collection request include over 480 companies operating over 45,000 wells that were active CBM producers in the U.S. as of mid-2007. CBM operations are classified under North American Industry Classification System (NAICS) identification number 21111, Oil and Gas Extraction, and Standard Industrial Classification code 1311, Crude Petroleum and Natural Gas.

### 4(b) Information Requested

### (i) Detailed Description of the CBM Detailed Questionnaire

EPA is planning to conduct a survey of CBM operators. The detailed questionnaire is designed to collect comprehensive technical and economic data about CBM produced water characteristics; produced water management and associated costs; and industry financial information. It will provide information to evaluate the need for initiating an effluent guidelines rulemaking for the CBM extraction sector.

The questionnaire consists of three parts. Part A provides information that indicates which CBM projects are being surveyed. Part B requests company- and project-level financial and economic information that will be used to characterize the economic status of the industry and to estimate economic impacts of potential regulations. Part C requests general facility and technical data, which will be used to determine produced water generation rates and water quality, water management techniques including reuse, and treatment and disposal costs and practices.

EPA solicits comment on whether it should develop an electronic version of the questionnaire. For example, EPA developed an electronic questionnaire for the Drinking Water Treatment effluent guidelines rulemaking (see http://www.epa.gov/guide/dw/ and EPA-HQ-OW-2004-0035). If EPA develops the electronic questionnaire it will meet the 1998 Government Paperwork Elimination Act (GPEA). EPA anticipates that most respondents will be familiar and comfortable with electronic submission forms. Additionally, the electronic questionnaire will allow for automatic population of a database with responses—reducing the potential for errors introduced though key-entry of data.

EPA designed the questionnaire to include many burden-reducing features. For example, it contains questions on type of current produced water management practice that direct respondents to skip detailed questions that may not pertain to their company or CBM operations or that may not be critical for analysis.

The questionnaire was designed in modular fashion to reduce burden on management in delegating questionnaire sections to respondents. The hardcopy questionnaire can be separated, copies of selected sections can be made when needed, and portions distributed to the appropriate staff. The electronic questionnaire format may further simplify this task by allowing facilities to electronically generate the required number of copies of each section.

Some sections will not be applicable to all facilities. General instructions to the questionnaire describe allowable responses for cases in which a facility will be unable to respond to a question. A response of "NA" corresponds to questions that are *not applicable*. EPA notes for many questions that estimates are acceptable, acknowledging that there is a wide variation in how operators record their cost and other information, particularly on a project basis.

(a) *Part A: Selection of Projects for the Detailed Questionnaire*

Part A will list projects EPA selected to be surveyed for each operator, based either on (1) responses to EPA's screener questionnaire or (2) a listing of projects provided by operators with a very small number of CBM wells in EPA's database; these latter operators will not be sent a screener survey. The detailed questionnaire first asks if the operator received the screener questionnaire. Those that did will be directed to provide a listing of wells (by API number or state permit number) associated with a list of projects that have been selected for the survey. They will be able to choose to fill out a table provided in the detailed questionnaire or provide a hard copy or electronic printout of the wells in each of their projects.

Those that did not receive the screener questionnaire will be directed to provide a project ID of their choosing for each project they operated in 2007, along with a list of the wells associated with each project (with API number or state permit number) using the table provided in the detailed questionnaire. These operators are generally expected to have operated only one or two wells in 2007. If a respondent did not operate any CBM wells in 2007, EPA instructs them to call the help line for further instructions on returning the questionnaire, since they will not have to complete the survey.

These lists of wells by project are critical for linking EPA's CBM universe database, acquired from HPDI, Inc., and augmented with state data for some states, to the survey data. EPA will used the data in the CBM universe database to provide data that might be needed for projecting production from projects.

Part A also provides a certification statement. The certification attests to the truth and accuracy of the responses provided.

(b) *Part B: CBM Economic Information*

(i) <u>Section 1 General Operator Information</u>

Section 1 of Part B collects contact information to ensure EPA can contact the appropriate persons to clarify responses to the financial and economic questions. Table 4-1 provides a detailed description of this section.

**Table 4-1. Detailed Description of Part B, Section 1**

| Question Number | Question Description | Purpose of Question |
|---|---|---|
| **B1-1 through B1-4.** | Requests names, titles, telephone and facsimile numbers, and e-mail addresses of primary and secondary contacts for the owner/ operator regarding information supplied in Part B, Sections 2 and 3 of the survey. | EPA needs to know who should be contacted to verify or clarify the economic questionnaire information. The contacts may be different from the technical contacts requested in Part A. Furthermore, the contacts for the firm financial information in Part B, Section 2, may be different from those for the project-specific information in Part B, Section 3. |
| **B1-5.** | Requests respondent to indicate if another survey ID will be submitting Part B, Section 2 information (firm-level financial information). | This question allows a firm to coordinate one response for firm financial information if multiple surveys have been sent to the same firm. EPA cannot necessarily know in advance if the same or similar firm name in more than one basin indicates the same firm will be submitting Part B. Section 2 or whether each name indicates a separate division or profit center that will each provide different information in response to Part B. Section 2. |

(ii) Section 2 Firm-Level Financial Questions

Section 2 of Part B will gather information necessary to complete a firm-level economic impact analysis of produced water management options for the CBM industry. The questions collect ownership information, including information about any intermediate owner firms and corporate parents. Section 2 also collects profile information on employment and NAICS classification. It also requests detailed information about the first level of corporate hierarchy at which financial information is kept, such as income statement and balance sheet information. To minimize burden, the only information requested at the ultimate parent company level, if different from the level at which detailed financial information is provided, is the name of the entity, which will be used to determine if publicly available data on the parent are available.

To further minimize the burden of responding to the questionnaire, the questions are phrased with commonly used terminology. Tables are organized with formats familiar to financial officers in the respondents' industry. Questions requesting similar types of information are arranged together to facilitate review of pertinent records and completion of the questionnaire.

For some questions, three years of data are needed to provide information to identify industry trends, to resolve data anomalies, and to identify potential irregularities caused by events outside of the CBM industry's control. In particular, given the volatility of natural gas prices, relying on one year's income statement data could overstate or understate longer-term trends in firm revenues in the industry. EPA requests income statement financial information for the fiscal years ending 2005, 2006, and 2007—the most recent years for which data are available. Because balance sheet information tends to be less volatile, only one year's data (2007) are requested to minimize burden to respondent.

Respondents will be able to choose to answer certain questions pertaining to how they analyze potential projects in decisions to go forward with an investment, or they may choose to

accept EPA assumptions for key decisionmaking factors (such as cost of capital and hurdle rates). Table 4-2 provides a detailed description of this section.

**Table 4-2. Detailed Description of Part B, Section 2**

| Question Number | Question Description | Purpose of Question |
|---|---|---|
| **B2-1.** | Asks about the structure of any corporate hierarchy above the level of the immediate owner operator. | EPA will use this information on the ownership structure of the immediate owner/operator to understand the structure in which it operates. This question also helps set up which questions should be answered, depending on this structure. |
| **B2-2.** | Asks for the name of the ultimate parent company, where relevant. | EPA will use this information to link to other survey information if affiliated firms have been surveyed. EPA will also use the information to identify possible publicly available information on parent firms. |
| **B2-3.** | Asks for the name or names of owner firms. | EPA will use this information to link to other survey information if affiliated firms have been surveyed. EPA will also use the information to identify possible publicly available information on owner firms. |
| **B2-4.** | Asks if the immediate owner/operator qualifies as a small business under Small Business Administration definitions. | Allows EPA to identify any small businesses not identified in the screener survey for use in a small business analysis. Small business designation is also used to identify those firms for which EPA will provide assistance on Part B Section 2. EPA is offering to fill out most of the remainder of the section based on financial submissions by small businesses. |
| **B2-5.** | Requests six-digit NAICS at the immediate owner/operator level. | EPA needs this information to profile the types of industries that own or operate CBM wells. |
| **B2-6.** | Asks if the operator acts strictly as a contract operator in all their U.S. CBM well operations. | Alerts EPA to the need to analyze the operator differently in the firm-level analysis. A contract operator will not be affected directly by option costs, but will be affected if projects shut-in. |
| **B2-7.** | Asks respondents to identify from a checklist the corporation type that best describes the immediate owner/operator. | EPA needs this information to determine a company's tax status for the economic analysis, which estimates firm tax burdens and computes post-tax impacts. |
| **B2-8.** | Asks if the respondent is required to use the cost depletion method in computing depletion allowances. | The answer to this question will tell EPA how to calculate depletion in the CBM model. Using the model, EPA will select the depletion calculation method based on the response to this question. The answer also helps EPA categorize respondents into majors (vertically integrated firms with downstream and upstream oil and gas activities) and independents for profiling purposes. |

## Table 4-2. Detailed Description of Part B, Section 2

| Question Number | Question Description | Purpose of Question |
|---|---|---|
| **B2-9.** | Asks for 2007 employment, both total and attributable to CBM operations. | EPA needs employment information to determine impacts if projects are projected to shut-in or if firms are estimated to fail. EPA will use the CBM portion of employment to estimate what employment effects might be associated with project shut-ins. |
| **B2-10.** | Asks if all water from all CBM projects operated in the U.S. by the respondent used injection for produced water disposal. | Allows operators who exclusively inject produced water from all of their CBM projects to opt out of the remaining, detailed financial questions in Part B Section 2 (firm level information). |
| **B2-11.** | Asks for the corporate level at which data for questions B2-11 to B2-16 are provided. | EPA needs this information to link the entities described in Questions B2-1 through B2-10 to the responses to Questions B2-11 through B2-16 These subsequent questions lay out important assumptions (either EPA's or the respondent's) that EPA will need to use to determine whether a project should be undertaken. Some immediate owner/operators may engage in project decision making, whereas others will not. For these latter entities, the decision to go forward with a project is made at a higher level in the corporate hierarchy. |
| **B2-12.** | Asks if a net present analysis or some alternative analysis (to be provided by the respondent) should be used to analyze investment decisions. | Offers respondents a choice to provide specific information on what approaches they use to make decisions or to rely on EPA assumptions. EPA needs to use some form of project analysis to determine if projects will be undertaken under various produced water management options. |
| **B2-13.** | Asks for cost of capital given the typical mix of equity and debt or allows respondents to accept a standard cost of capital assumption. | EPA will use the cost of capital as a discount rate to annualize the cost of future produced water management investments. Requesting only the overall cost of capital simplifies the response, allowing respondents to calculate and report one number rather than report interest rates, equity rates, and the mix. Alternatively, if respondents choose, they can accept EPA's standard cost of capital assumption. |
| **B2-14.** | Asks respondents for their hurdle rate (minimum desired investment return) or allows respondents to accept a range of values that EPA will use to bracket a sensitivity analysis. | With this information, EPA will be able to use both a hurdle rate and cost of capital in assessing investment decisions and to separate the risk component in the investment decision. A hurdle rate is needed to provide a realistic analysis of new projects. |
| **B2-15.** | Asks respondents if they identified themselves as a small business in Question B2-4 and offers them the option of having EPA fill out most of the remaining Part B Section 2 based on financial submissions provided by the respondent. | Reduces burden on small businesses, which might otherwise have to hire a consultant to help with this task, while still providing EPA with the information needed to analyze firm-level impacts. |

## Table 4-2. Detailed Description of Part B, Section 2

| Question Number | Question Description | Purpose of Question |
|---|---|---|
| **B2-16.** | Requests corporate level at which income statement information is being provided. | To put the data into perspective and to link the information to that information collected in Questions B2-1 through B2-9, the corporate level is requested. Questions B2-17 through B2-19 allow the respondent to provide information at a level where the information is commonly kept, to provide estimates at the lower level, or to use "NA" for certain items not often recorded at a division level, whichever the respondent chooses. The respondent can also indicate if a line item was estimated, if they choose. |
| **B2-17.** | Asks respondents to report revenue information for the lowest corporate level that keeps such information for fiscal years 2005 through 2007. Information requested includes total revenue, as well as a breakout of revenues associated with CBM. | EPA is requesting 3 years of revenue, cost, and income data for several reasons. First, three consecutive years of data will provide a much more accurate picture of the financial condition of the firm. Second, 3 years of data provides EPA with an estimate of the year-to-year variation in income and costs. The firm-level analysis will not hinge on a single, possibly atypical, year. Third, EPA can identify possible trends in the data over various groups of respondents. EPA will use identified trends to provide additional information when selecting the best method for projecting future financial conditions.<br><br>EPA will use the responses to Questions B2-17 through B2-19 as the basis for developing forecasted earnings (discounted cash flow) for a firm failure analysis. For example, EPA's earnings projections might indicate sharply declining and/or negative earnings when produced water management option costs are incurred, and EPA may assess a probable firm failure associated with that option.<br><br>Using this information, EPA will calculate the present value of earnings (as cash flow) and the present value of incremental produced water management costs for each firm using the cost of capital information collected in Question B2-13. EPA will adjust the present value of cash flow by the estimated aggregate present value costs of upgrading all the respondent's CBM projects. EPA will use this change in present value of cash flow as one component of the firm failure analysis. EPA will use taxes and net income information to select the appropriate marginal tax rate for the firm in order to calculate post-tax impacts at the project and firm level.<br><br>In these questions, EPA also asks for costs and revenues associated with the CBM portion of the business. EPA will use this information to evaluate the relative importance of CBM operations to the company. If CBM operations are a small part of a company's earnings, any impacts on the firm might be less in this case than if CBM operations are a large part of a company's earnings. EPA understands that this information is not usually broken out in most accounting reports, but must be estimated. The information is critical, |
| **B2-18.** | Asks respondents to report costs and expenses for the lowest corporate level that keeps such information for fiscal years 2005 through 2007. Information requested includes operating costs, depletion, royalties, and other cost items. Information requested includes total operating costs, as well as a breakout of operating costs associated with CBM. | |
| **B2-19.** | Asks respondents to report earnings and net income for the lowest corporate level that keeps such information for fiscal years 2005 through 2007. Information requested includes earnings before interest and taxes (EBIT), interest, taxes, and net income. | |

## Table 4-2. Detailed Description of Part B, Section 2

| Question Number | Question Description | Purpose of Question |
|---|---|---|
| | | however, to EPA's understanding of how the firm or division might behave when faced with produced water management option investment costs and the extent to which the firm may be affected by all costs of an option. |
| **B2-20.** | Requests corporate level at which balance sheet information is provided. | EPA will use the responses to this question to put the data into perspective and to link to information requested in Questions B2-1 through B2-9. Questions B2-21 through B2-25 allow the respondent to provide information at a level where the information is commonly kept or to make an estimate of the line item, whichever the respondent chooses. |
| **B2-21.** | Asks for current assets, property, plant, and equipment, other assets, cumulative depreciation and total assets. | EPA will use the balance sheet data to calculate financial ratios that indicate financial health (e.g., current ratio, working capital-to-debt, and other debt-to-asset ratios). Because balance sheet data tend to be less volatile than income statement data, only one year of data is requested to reduce respondent burden. |
| **B2-22.** | Asks for liabilities and equity, including current liabilities, long-term debt, retained earnings, other owner equity and sum of liabilities and owner equity. | |
| **B2-23.** | Asks for payments to principal for fiscal years 2005, 2006, and 2007. | EPA will use this information in evaluating firm-level discounted cash flow. At a minimum, discounted cash flow must be positive for a firm to continue as a viable entity. However, an evaluation method that uses a discounted cash flow greater than zero to indicate good financial health may not be appropriate, since a certain amount of cash is necessary for ongoing operations. EPA will use payments to principal to estimate future cash needs for investment to maintain an ongoing business. EPA attempted to solicit information on costs of capital replacement in another survey (considered potentially a more accurate estimator of cash needs for ongoing business operations); however, respondents found this computation difficult, and many did not attempt to provide information. Payments to principal are cash needs that are easier to calculate. |
| **B2-24.** | Asks for the month the company's fiscal year starts. | EPA will use this information to determine how to interpret the actual reporting year. A fiscal year starting January will need a different inflator/deflator than one starting in September to put the financial information on a same dollar basis. |

**Table 4-2. Detailed Description of Part B, Section 2**

| Question Number | Question Description | Purpose of Question |
|---|---|---|
| **B2-25.** | Requests 2005-2007 financial statements used to compile answers to questions in Part B, Section 2. | EPA will use the additional information that may be contained in notes or additional line items, if necessary, which can help avoid calls to the respondent for clarifications. EPA does not use these financial statements in lieu of requesting that respondents complete Part B, Section 2 questions for large firms. EPA does this because there are often variations and extenuating circumstances indicated in numerous notes to the financial statements that need to be considered when the financial tables in this questionnaire are completed. EPA believes the larger businesses are well equipped to understand their particular circumstances and can provide the information in the tables with these circumstances taken into account. |

(iii) Section 3 Project-Level Financial Questions

Section 3 of Part B of the questionnaire will gather information necessary to complete a project-level analysis of the economic impact of produced water management options. The questions collect project-specific information in three major time periods: 1) historic information on initial investments in developing the project through 2006 (Questions B3-18 through Questions B3-42), 2), current year information on investments and operating information (Questions B3-43 through B3-72), and 3) an additional projection of that same type of information (Questions B3-73 through B3-96). Respondents have a choice of providing 3 to 5 years of projections (or more), accepting EPA assumptions for projections, or providing alternative data and/or assumptions that EPA can use in making 10-year projections. EPA will use current year (2007) and 10-year projections as inputs to model existing projects. EPA adds historic data prior to 2007 to current year and 10-year projections to model new CBM projects.

The CBM model is a cash flow model that arrays operating revenues and expenditures over at least 10 years, allowing a project to shut-in when operating costs exceed operating revenues. The model also accepts various additional costs (such as drilling costs and other capital infusions into years in which they occur or are expected to incur) and takes all of the year-by-year cash flow into account up to the year of shut-in to calculate the net present value of the entire project. EPA will use the model outputs to compute reductions in project life, reductions in production, reductions in net present value of the project, etc. These results can then be used to determine if the project is no longer economically viable or would not be undertaken (if a new project) when produced water option costs are considered.

To minimize the burden of responding to questionnaire Part B Section 3, the questions are phrased with commonly used terminology. Historic questions are asked only of respondents most likely to have the information easily accessible (those whose projects are fairly new and who have owned/operated the project continuously since initiated). Questions requesting similar types of information are arranged together to facilitate review of pertinent records and completion of the questionnaire. Table 4-3 provides a detailed description of this section.

## Table 4-3. Detailed Description of Part B, Section 3

| Question Number | Question Description | Purpose of Question |
|---|---|---|
| **Table B-1 General Project Information** | | |
| Project Identifier Information (Questions B3-1 to B3-10) | | EPA will use responses to these questions to locate additional information associated with a project in publicly available records and to identify any unusual characteristics of the project. |
| **B3-1.** | Requests name or identifier of project. | For respondents that did not receive the screener survey, this question ensures that well identification data provided in Table A-1 links to Part B Section 2 and to information provided in Part C. For respondents that received a screener survey, this information will be prepopulated. |
| **B3-2.** | Requests name of field. | EPA will use this information to profile basins and to help link projects to EPA's CBM Universe database. |
| **B3-3.** | Asks if project is a wildcat. | EPA will use this information to determine characteristics of wildcat operations that are different from those for development projects. Wildcat projects may be much more costly to develop and changes to produced water management practices may be more difficult to implement. |
| **B3-4.** | Asks if project commingles CBM with conventional production. | EPA will use this information to identify projects that might be subject to the onshore oil and gas ELG for a portion of the produced water stream. This question also sets up a skip pattern so that respondents with a CBM-only project do not need to provide information relating to conventional oil and gas production. |
| **B3-5.** | Asks for the percentage of gas and water that was produced from coalbeds in 2007. | Ensures that the CBM portion of gas and water produced can be calculated in production-related questions. EPA acknowledges that estimates may be necessary. |
| **B3-6.** | Asks for oil production in 2007. | Oil production revenues will be estimated and added to gas production revenues (wellhead oil price will be estimated by EPA, not requested, since numbers of projects with any oil production are expected to be small). |
| **B3-7.** | Asks for oil royalty rate if different from that for gas. | Royalties for oil will be used to estimate net revenues (severance will be estimated, not requested). |
| **B3-8.** | Asks for year conventional oil or gas production began. | Provides information on whether CBM started earlier, later or at roughly the same time as conventional production; provides EPA with information that may be useful to EPA in determining how to handle overlapping regulations at such operations should an ELG for CBM be considered. |
| **B3-9.** | Requests unit number or other group identifier. | EPA will use this information to determine if the project is a recognized unit. EPA can also link to other surveys using unit numbers, if a project is a part of a multi-operator unit and other projects in the unit are surveyed. Additionally, EPA can link to data in some states where unit information can be accessed by unit number. Sets up a skip pattern to allow respondents to skip question pertaining to formal units. |

## Table 4-3. Detailed Description of Part B, Section 3

| Question Number | Question Description | Purpose of Question |
|---|---|---|
| **B3-10.** | Requests percentage of total unit production if the project is part of a multi-operator project. | Based on publicly available data found in EPA's CBM universe database, EPA may be able to link the respondent's project with other operators and identify the unit in question. This question may allow EPA to extend an analysis to the overall unit for greater predictive results in the analysis, especially if other portions of the unit are sampled. |
| Numbers of Wells in Project (Questions B3-11 to B3-15) | | |
| **B3-11.** | Asks for the number of exploratory or delineation wells drilled to date associated with the project and whether they were drilled vertically or horizontally. | These types of wells are generally associated with projects that are costlier to develop and for which project risks are greater. Provides EPA with profile information in basins about proportions of projects that might have been riskier to develop. |
| **B3-12.** | Requests number of horizontal and vertical wells actively producing gas or water. | EPA needs information on the current numbers of wells and their status in 2007. The detailed survey requests the information broken out by whether the wells are horizontal or vertical to understand differences in costs and production volumes among projects where many wells are drilled horizontally. Numbers of non-producing or inactive wells are also requested to understand the drilling costs incurred. |
| **B3-13.** | Requests number of planned wells with active permits. | |
| **B3-14.** | Requests numbers of spudded, drilling or completed (production pending) wells. | |
| **B3-15.** | Requests number of inactive wells. | |
| Basic Historic Information (Questions B3-16 to B3-17) | | |
| **B3-16.** | Requests year project development began or year project was acquired. | EPA will use this question to ensure those who should or should not fill out the next section are properly identified. (The next section should only be filled out by those who began project development after 2003 and who are the original owners of the entire project; this was done to reduce the burden on operators who might not have easy access to such data). |
| **B3-17.** | Instructs respondents that began projects later than 2003 or that acquired the project (or any portion of the project from another operator) to skip the entire Table B-2 (historical information) | EPA is using this question to further clarify to operators that they might not need to fill out Table B-2, sparing them the task of locating difficult to access information. |

## Table 4-3. Detailed Description of Part B, Section 3

| Question Number | Question Description | Purpose of Question |
|---|---|---|
| **Table B-2 Project History** | | EPA will use the information provided in this table (Questions B3-18 to B3-42) to construct new source models of CBM projects. In new source models, the cash flow and net present value of projects are calculated from project inception. Therefore, data on all costs from project inception to current year are required here; data for 2008 and projections are requested in Questions B3-43 onward. Respondents are requested to provide information only on recently developed projects owned continuously since inception to minimize burden. Additionally, EPA must make a number of assumptions about inflation if cost data from many years ago are to be converted to current year dollars. These assumptions may not be sufficiently accurate to produce realistic current year cost estimates. |
| General Questions (Questions B3-18 to B3-20) | | |
| **B3-18.** | Asks if respondent had drilled any exploratory wells in this basin other than for this project. | Questions B3-18 to B3-20 will allow EPA to collect data on exploration costs and failure rates, which will allow EPA to understand relative risks among basins and to allow modeling and results to distinguish between high-risk projects undertaken far from existing infrastructure from lower-risk projects where existing infrastructure is available. |
| **B3-19.** | Asks for average exploratory well costs in the basin. | |
| **B3-20.** | Requests failure rates for exploratory well drilling. | |
| Lease Acquisition Costs (Questions B3-21 to B3-23) | | |
| **B3-21.** | Requests original lease acquisition costs. | EPA uses this information as one of the cost inputs to the CBM model for new projects. |
| **B3-22.** | Requests year or years of lease acquisition. | EPA uses this information to input into the CBM model with the costs of lease acquisitions in the year or years over which these costs were incurred for new projects. |
| **B3-23.** | Requests payment to surface owner(s) if lump sum. | EPA will include this cost, if relevant, in the lease acquisition cost that is input to the CBM model (Ongoing rent payments are captured in Table B-3, Current Operations). |
| Lease Development Costs (Questions B3-24 to B3-27) | | |
| **B3-24.** | Requests total capital costs of project development through 2006 minus drilling costs and produced water management costs. | EPA will use the capital costs of gas production other than drilling and produced water management for input to the CBM model. Capital costs are requested separately so that drilling costs, which might occur much later in project life can be separated from costs that occur only in the early years of project development. Produced water management capital costs need to be excluded, because these costs are captured in Part C. |
| **B3-25.** | Requests total cost of all developmental well drilling through year end 2006. | EPA will use this information to develop an average cost per developmental and delineation well drilled in the project |

## Table 4-3. Detailed Description of Part B, Section 3

| Question Number | Question Description | Purpose of Question |
|---|---|---|
| **B3-26.** | Requests total cost of all delineation well drilling through year end 2006. | using information in Table B-1 on total numbers of wells drilled to date (regardless of status). EPA will use average well drilling costs (along with best professional judgment and engineering cost adjustments) to estimate CBM well drilling costs in basins that are not being surveyed because development is just starting or not yet underway. EPA will also use these costs to develop projections of drilling costs where respondents have not provided year-by-year estimates in Table B-4. |
| **B3-27.** | Requests all costs of permit application fees and costs to prepare permits not related to produced water management (one-time costs; does not include ongoing monitoring, recordkeeping, and reporting costs). | EPA will use this information to ensure these costs are input in the project models. Recurring permit costs are requested in Question B3-41). |
| Project Development Schedule (Questions B3-28 to B3-35) | | |
| **B3-28.** | Requests the year site development began. | EPA will use this information to determine when project development costs begin to enter the year-by-year CBM cash flow model. |
| **B3-29.** | Requests year drilling began. | EPA will use this information to determine when drilling costs begin to be incurred. |
| **B3-30.** | Requests year water production began. | In some cases, CBM wells must produce water for an extended period of time before gas production can begin. If water production begins in an earlier year than gas production, EPA will use this information to input produced water management costs in a year or years before revenues enter the model. |
| **B3-31.** | Requests year CBM gas production began. | |
| **B3-32.** | Requests year of peak water production. | EPA will use this information to model the project's water production volumes between first production and current production (reported in Table B-3, Current Operations). |
| **B3-33.** | Requests amount of water produced in peak year. | |
| **B3-34.** | Requests year of peak gas production. | EPA will use this information to model the project's gas production volumes between first production and current production (reported in Table B-3, Current Operations). |
| **B3-35.** | Requests amount of gas produced in peak year. | |
| Other Major Expenditures (Questions B3-36 to B3-41) | | |
| **B3-36.** | Requests O&M costs by year through year end 2006. | These costs will be input to the model in the year in which they were incurred. Information will also be used to assist with projections. |
| **B3-37.** | Requests costs of workovers, stimulations and recompletions to year end 2006, if not included as O&M costs. | EPA will use these major intermittent cash outlays as inputs to the model in the years they were incurred. EPA will also use this information to create averages for use in projections. EPA is not requesting years in which for workovers, stimulations, and recompletions occurred. EPA will make assumptions about how to distribute these costs |
| **B3-38.** | Requests total numbers of workovers, stimulations, and recompletions, if not included as O&M costs. | |

## Table 4-3. Detailed Description of Part B, Section 3

| Question Number | Question Description | Purpose of Question |
|---|---|---|
| **B3-39.** | Requests major intermittent capital outlays that have been undertaken if not included in Questions B3-37 and B3-38 (if respondent did not incur any major capital outlays they are instructed to skip to Question B3-42). | over time to reduce respondent burden. Major capital outlays are more variable and sporadic, so EPA will not attempt to make assumptions about the timing of these expenditures. |
| **B3-40.** | Requests when the capital outlays were incurred. | |
| **B3-41.** | Requests how much they cost. | |
| **Table B-3 Current (2007) Operations at Your Projects** | | |
| General Information | | |
| **B3-42.** | Requests information on type of lease if single lease project. | EPA will use this information to allocate royalty impacts to individuals, states, federal government, or tribes. The type of lease indicates the type of royalty recipient. EPA will estimate total impacts on royalties using the CBM model. |
| **B3-43.** | Requests numbers of leases by type of lease if multi-lease project. | |
| 2007 Operating and Maintenance Costs (Questions B3-44 to B3-46) | | EPA will use operation and maintenance (O&M) costs as one input for calculating 2007 operating earnings of the project. EPA will use the operating earnings for 2007 to provide a starting point for projections in cases where respondents ask EPA to do the projections (see Questions B3-73 to B3-83). Operating earnings are the key factor in ongoing production decisions. Projects will operate as long as operating earnings are positive. |
| **B3-44.** | Requests total 2007 operating and maintenance cost of gas production excluding produced water management costs after final separation (including permits). | EPA will use the information in these questions to model year-by-year earnings for 2007 and beyond (combined with the answers to Questions B3-73 through B3-83). EPA needs fixed and variable costs to be reported separately (thus requiring an estimate; operators commented they might not be able to distinguish these types of costs in their records). CBM production declines over time, as do variable costs. Without a fixed cost component, operating costs would be understated near the end of the productive life of a project. |
| **B3-45.** | Requests an estimated percentage of O&M costs that would have been incurred had the project been shut in, or offers an assumption of 5 percent of O&M, if preferred. | |
| **B3-46.** | Requests any other recurring costs. | This question ensures that all possible annually recurring costs are captured. |
| Extraordinary and Other Expenditures (Questions B3-47 to B3-55) | | This section allows for large, intermittent costs to be accounted for. |
| **B3-47.** | Requests the total cost of developmental well drilling in 2007. | EPA will use costs reported in these major expenditure categories as a cash outflow in the model. EPA will also use the reported costs to project similar costs over the remaining life of the project (combined with the answers to Questions B3-73 through B3-83). |
| **B3-48.** | Requests number of developmental wells drilled in 2007. | |
| **B3-49.** | Requests the total cost of delineation well drilling in 2007. | |
| **B3-50.** | Requests number of delineation wells drilled in 2007. | |

## Table 4-3. Detailed Description of Part B, Section 3

| Question Number | Question Description | Purpose of Question |
|---|---|---|
| **B3-51.** | Requests total cost of all infrastructure additions in 2007. | Questions B3-51 to B3-56 allow respondents who do not feel the cost categories provided in Questions B3-42 to B3-46 adequately describe a particular set of expenditures that are not incurred regularly to provide a description of any such items and their costs. EPA will assess what type of cost it is and how it should be treated in the CBM model for tax deduction purposes (i.e., expensed in one year or capitalized and spread over several years). |
| **B3-52.** | Requests respondents to identify the types of infrastructure additions. | |
| **B3-53.** | Requests the total cost of any workovers, stimulations, and recompletions for the project in 2007, if considered extraordinary and not included as O&M or other recurring costs.. | |
| **B3-54.** | Requests a description of other major expenditures (including capital expenditures or new lease acquisitions for the project) in 2007. | |
| **B3-55.** | Requests the total cost of any other unusual capital expenses for this project in 2007. | |
| 2007 Production, Royalties, and Taxes (Questions B3-56 through B3-64) | | EPA will use the responses to these questions to compute net revenues. Net revenues are compared to operating costs when making production decisions (projects shut-in if operating costs exceed net revenues). EPA will also use the information (combined with the answers to Questions B3-73 through B3-83) for projections over the remaining life of the project. |
| **B3-56.** | Requests the total gas production from this project in 2007. | EPA has collected data on gas production from virtually all CBM wells in the U.S. but has obtained only a partial 2007 production year in most states, and no production figures from some states. EPA will use these 2007 data so that 2007 can be used consistently as the base year for analytical purposes. |
| **B3-57.** | Requests the total gas sold from this project in 2007. | EPA will use this information to compute net revenues. Total gas minus gas sold is a component of net revenues. |
| **B3-58.** | Requests total gas used by the project in 2007. | EPA will use this information to compute net revenues. Total production minus total gas sold that is not used is lost production or shrinkage and is a part of net revenues |
| **B3-59.** | Requests the minimum, maximum and average wellhead price received for sold gas in 2007. | EPA will use this information with volumes of gas sold in computing net revenues as well as to determine variability of wellhead price among fields and basins. Ranges will be used for sensitivity analysis purposes. |
| **B3-60.** | Requests produced water volumes (estimates, if not measured). | Produced water volumes will be used with costs estimated using Part C and engineering judgments for alternative produced water management options to estimate existing and alternative produced water management costs for the project. |
| **B3-61.** | Requests average working interest share in this project. | EPA will prorate project produced water management option costs for the project to the firm on the basis of working interest share. EPA will also use this question to identify contract operators, since their share of a project would be 0%. |

## Table 4-3. Detailed Description of Part B, Section 3

| Question Number | Question Description | Purpose of Question |
|---|---|---|
| **B3-62.** | Requests the average royalty rate for this project. | EPA will use the average royalty rate with total production to calculate another factor that must be netted out of project revenues to compute net revenues. |
| **B3-63.** | Requests the total severance taxes from this project in 2007. | EPA will use severance taxes with other net revenue factors in calculating net revenues. EPA needs to ask this question because the severance tax factors can vary by production volumes or other considerations by state. EPA might need to create state-specific questions and ask several additional questions for operations in some states to obtain the same information represented by this one question. EPA believes this question may reduce the burden for some respondents. |
| **B3-64.** | Requests any other taxes, such as ad valorem. | EPA will use this information in the net revenue calculation. These taxes can also vary considerably by a variety of factors. Respondents have a choice of providing a production share or a total dollar amount, whichever is easiest to report. |
| Reserves Information (Questions B3-65 to B3-71) | | |
| **B3-65.** | Asks if respondent prepares proved reserves estimates for DOE or SEC. | Sets up skip pattern, routing respondents over questions pertaining to proved reserves. |
| **B3-66.** | Requests the most recent remaining proved reserves estimate prepared either for DOE or SEC, specifying units of numbers provided and the estimation method used. | EPA will use this information to estimate the life of the project and to assist in making projections (combined with the answers to Questions B3-73 through B3-83). Operators may have information on proved reserves at a project as part of their calculations of proved reserves for submission to DOE in their annual survey (Form EIA-23L). EPA will use this information directly in modeling the project if: 1) a project conforms to the field in which it operates or 2) the respondent pro-rates field-level information to the project. |
| **B3-67.** | Requests the discount rate and wellhead price used for proved reserve estimate. | Proved reserves are those that are believed by the operator to be technically and economically recoverable. To determine if the reserves are economically recoverable, the operator must assume a price of gas (typically and, most likely, a discount rate). EPA will use the responses to these questions to determine alternative proved reserves using other prices and discount rates. EPA can also compare these results with the CBM model results to ensure the model is well calibrated. |
| **B3-68.** | Requests the remaining technically recoverable reserves, if available. | EPA will use this information, if available, to restrict the model so that no production is assumed beyond this amount, regardless of economics. EPA is not requesting respondents to estimate these reserves, if not already computed. |
| **B3-69.** | Requests the projected remaining life of the project, if available. | EPA will compare this information to the CBM model estimates to calibrate the model for that project. EPA is not requesting respondents to estimate remaining life, if not already computed. |

## Table 4-3. Detailed Description of Part B, Section 3

| Question Number | Question Description | Purpose of Question |
|---|---|---|
| **B3-70.** | Requests cumulative gas production at 2007 year end. | EPA will use this information in estimating year-by-year production projections (combined with the answers to Questions B3-73 through B3-83) to help with production projections. |
| **B3-71.** | Requests cumulative produced water production at 2007 year end (estimate if not measured). | EPA will use this information in estimating year-by-year production projections (combined with the answers to Questions B3-73 through B3-83) to help with production projections. |
| Future Costs and Revenues—Project-Specific (Questions B3-73 to B3-95) | | |
| **B3-72.** | Asks respondent to check off which method they prefer to use for answering questions about projections of costs and production. | EPA will use this information to check that the respondent skipped appropriate questions. |
| **B3-73.** | Requests numbers of wells planned to be drilled through 2012 or through end of planning horizon. | EPA will use the responses to Questions B3-73 through B3-83 to perform projections similar to those requested in Table B-4, if the operator chooses not to make those projections. Because the CBM model is a year-by-year cash flow model, projected revenues and costs are required for every year in which the project is estimated to operate. Assumptions about production decline rates, cost trends, etc. are more accurate when the operators have input to these assumptions. All of the information requested in Questions B3-73 through B3-83 are key inputs for calculating operating earnings. EPA will use these projected operating earnings to determine likely to shut-in decisions and for calculating overall net present value of projects. If respondents accept EPA assumptions or do not provide any alternative assumptions, EPA will make those projections for the respondents. |
| **B3-74.** | Requests year drilling will be completed for project based on current plans. | |
| **B3-75.** | Requests average drilling costs expected and/or factor incremental to inflation to apply to drilling costs, or requests respondents to allow EPA to project drilling costs based on publicly available data and professional judgments. | |
| **B3-76.** | Requests range of years of expected remaining project life. | |
| **B3-77.** | Requests respondents to choose to allow EPA to use state production data to project gas production at the project or to provide alternative data or assumptions. | |
| **B3-78.** | Requests respondents to choose to allow EPA to use state production data to project water production at the project or to provide alternative data or assumptions | |
| **B3-79.** | Requests respondents to choose to allow EPA to use survey and other data to project frequencies of workovers, stimulations, and recompletions for the project or to provide alternative data or assumptions. | |
| **B3-80.** | Requests respondents to choose to allow EPA to use survey and other data to project costs of workovers, stimulations, and recompletions for the project or to provide alternative data or assumptions. | |

## Table 4-3. Detailed Description of Part B, Section 3

| Question Number | Question Description | Purpose of Question |
|---|---|---|
| **B3-81.** | Requests respondents to choose to allow EPA to use survey and other data to project costs of wellhead prices for the project or to provide alternative data or assumptions. | |
| **B3-82.** | Requests respondents to choose to allow EPA to use survey or other data to project fixed and variable O&M costs (excluding produced water management costs) for the project. The split between fixed and variable costs will be estimated using the percentage provided in Question B3-45. Alternatively, respondents can choose to provide alternative data or assumptions. | |
| **B3-83.** | Requests any additional comments on issues that could affect costs over the next several years. | Provides respondents with an opportunity to add any conditions that EPA may need to consider in making projections or running sensitivity analyses, e.g., potential changes to state regulations, competition for drilling rigs, etc. |
| **Table B-4 Projections of Costs and Production over 5 Years (Questions B3-84 to B3-95)** | | EPA will use the responses to these questions to model the costs, revenues and production of gas and produced water over the analytical time frame. The use of respondent-generated responses is expected to be the most accurate means of projecting costs and production, since the respondent considers each year separately and can assign any unusual expenses to the year in which the respondent believes they are likelier to be incurred. The more years of data the respondent can provide, the more consistently EPA's projections might reflect decisions the respondent might make when faced with increased costs of production. |
| Operating Cost Schedule | | |
| **B3-84.** | Requests total O&M costs (including monitoring, recordkeeping, and reporting costs for non-water permits and excludes produced water management costs). | EPA will use the information in the responses to these questions to model the year-by-year operating cost streams over the life of the project. These questions allow respondents to report changes in costs year by year. These changes can include increased costs when new wells are added to production, or declines in costs as production declines in older wells. EPA will also use the information to construct projections for new projects and to help with making projections for projects for which Table B-4 is not completed. |
| Drilling and Major Expenditure Schedule (Questions B3-85 to B3-90) | | |
| **B3-85.** | Requests estimated number of wells drilled in the year they are expected to be drilled. | EPA will use the responses to these questions to model cash outflows that are not a part of operating and maintenance costs in the year in which they are expected to be incurred. This approach will lead to a more accurate earnings projection. EPA will also use the information to construct |
| **B3-86.** | Requests estimated drilling costs in year they are expected to be incurred. | |

## Table 4-3. Detailed Description of Part B, Section 3

| Question Number | Question Description | Purpose of Question |
|---|---|---|
| **B3-87.** | Requests estimated number of workovers, stimulations, recompletions, or other major maintenance activities in the year they are expected to be done, if considered extraordinary expenses in those years. | projections for new projects and to help with making projections for projects for which Table 4 is not completed. |
| **B3-88.** | Requests estimated workover, stimulation, recompletion or other major maintenance costs (if extraordinary) in year they are expected to be incurred. | |
| **B3-89.** | Requests estimated capital expenditures in year they are expected to be incurred. | |
| **B3-90.** | Requests any other expenditures not captured in Questions B3-86 to B3-89, including one-time non-water permit costs and excluding O&M costs and all monitoring, recordkeeping and reporting costs. | |
| Production Schedule (Questions B3-91 to B3-95) | | |
| **B3-91.** | Requests year-by-year gas production projections. | EPA will use the information in the responses to these questions to model the year-by-year revenue streams over the life of the project. These questions allow respondents to provide changes in production year by year. These changes can include gas and water increases that might occur in years in which new wells are added. They can also include gas and water production declines in older wells. EPA will also use the information to construct projections for new projects and to help with making projections for projects for which Table B-4 is not completed. |
| **B3-92.** | Requests year-by-year produced water production projections. | |
| **B3-93.** | Requests expected average wellhead price by year (used in projections). | EPA will use this information to project wellhead prices for the project over the time frame of the analysis. EPA will also use the information to construct projections for new projects and to help with making projections for projects for which Table B-4 is not completed. |
| **B3-94.** | Requests year-by-year severance and other production taxes. | EPA will use this information to project net revenues for the project over the time frame of the analysis. EPA is requesting this information because these taxes can vary according to production volumes or other considerations. EPA will also use the information to construct projections for new projects and to help with making projections for projects for which Table B-4 is not completed. |
| **B3-95.** | Requests the inflation rate used in projecting wellhead prices in Questions B3-93 and costs reported in Table B-4. | EPA uses real dollars in the CBM model and, therefore, must adjust wellhead prices and costs if the respondent used an inflation rate to create the projections of wellhead prices and expenditures. |
| **B3-96.** | Comments section. | Space is provided for additional explanations of any response in Part B and/or descriptions of estimation methods. |

(c) *Part C: CBM Produced Water Management Information*

Part C collects detailed technical data and is divided into four sections:

- Section 1 requests general information about the operator;
- Section 2 requests general information on produced water generation, management, and treatment;
- Section 3 requests detailed information on the individual components of the produced water management system; and
- Section 4 requests information on produced water quality.

(i) Section 1: General Operator Information

Section 1 requests contact information for the technical portion of the questionnaire. EPA needs contact information to know who should be contacted to verify or clarify the technical questionnaire information. This contact may be different from the contact specified in the economic and financial portions of the questionnaire. Respondents will complete Part C only for the projects listed in Part A.

(ii) Section 2: Produced Water Management System General Questions

Table 4-4 provides a summary of the questions in this section and the purpose of each question.

**Table 4-4. Detailed Description of Part C, Section 2**

| Question Number | Question Description | Purpose of Question |
|---|---|---|
| **C2-1.** | Requests a general block diagram or a narrative description of the produced water management system. The diagram should show the path of produced water from the wells to the final destination (discharge, disposal, or reuse). Example diagrams and an example narrative are provided to illustrate the level of detail required. A checklist is provided to ensure all requested items are included in the diagram. The respondents are not required to develop a new diagram if an existing diagram has all required information. The respondents can also hand mark an existing diagram or submit a hand-drawn diagram. | EPA needs a block diagram or narrative to understand how the operator manages the produced water. The diagram will be used in later questions to help the operator understand how to complete the questionnaire. The diagram will also aid EPA questionnaire reviewers in understanding the questionnaire responses and verifying that the questionnaire has been completed properly. |

## Table 4-4. Detailed Description of Part C, Section 2

| Question Number | Question Description | Purpose of Question |
|---|---|---|
| **C2-2.** | Requests the year the produced water management system began operating and the number of days per year the system operates. | EPA needs this information to help evaluate costs for the industry for a consistent year and operating schedule. EPA will use cost indices to update costs to a base year of 2007. |
| **C2-3.** | Requests the average annual flowrate or total volume of water treated by the produced water management system. | EPA needs this information to assess the size of the produced water management system. |
| **C2-4.** | Requests the percentage of the produced water flow to the management system that is from the economic project listed in Part A of the questionnaire. | This question allows EPA to link the economic information in Part B to the produced water management information in Part C. |
| **C2-5.** | Requests information on how the management option was selected, who is responsible for the management of the produced water, and any costs associated with the management of produced water by a third-party or contractor. | This question will help EPA determine the factors that affect the method in which produced water is managed and the party responsible for the produced water management. If the operator uses a third-party or contractor to manage the produced water, EPA is requesting cost information to understand the costs associated with produced water management and the parties that could incur incremental costs for various control options. |
| **C2-6.** | Requests the total capital cost for the produced water management system. A checkbox is provided for cases where an operator may have purchased an existing management or treatment system and therefore does not have the cost information. This question also requests the year the capital cost was incurrent and an indication of the components of the capital cost. | This question provides EPA the overall capital cost which will be used to estimate baseline and incremental costs. EPA will use these costs to evaluate the economic achievability of various produced water management options. |
| **C2-7.** | Requests the total operating and maintenance costs for 2007 for the produced water management system and the components of the operating and maintenance costs. The question also asks for any revenue received from operating the produced water management system. | This question provides EPA the overall operating and maintenance costs which will be used to estimate baseline and incremental costs. EPA will use these costs to evaluate the economic achievability of various produced water management options. |
| **C2-8.** | Requests the land area occupied by your project, produced water management system, and unoccupied area. | This question provides information about the footprint of your management system and whether there may be room for additional treatment. |
| **C2-9.**<br>**C2-10.**<br>**C2-11.** | This series of questions request information for other produced water management systems that may have been considered and the reasons the systems were not operated. | This question provides EPA information about other management systems that may not be appropriate for use at a particular project. |
| **C2-12.** | Yes/No question asking whether any monitoring or other studies have been performed to assess the environmental impacts of produced water for this produced water management system. | These questions will be used by EPA environmental assessment staff to identify available information that may be used to review potential environmental impacts of CBM produced water. |

**Table 4-4. Detailed Description of Part C, Section 2**

| Question Number | Question Description | Purpose of Question |
|---|---|---|
| **C2-13.** | Requests title and date of any studies performed. | |

(iii) Section 3: Detailed Produced Water Management and Treatment Questions

This series of questions requests information on the final destination of the produced water management system and then asks detailed design and cost questions for any discharges to surface water, POTWs, or third parties. These questions will help EPA determine which management options are currently being used in each CBM basin. This section requests information on treatment prior to discharge and the design components in each system. EPA will use this information along with the total capital and operating and maintenance costs provided in Part C Section 2 to develop baseline costs for managing produced water, determine the affordability of any alternative management options, and evaluate produced water management costs for new sources. Table 4-5 provides a summary of the questions in this section and the purpose of each question.

If EPA does not receive the level of detail required to develop baseline costs, determine the affordability of management options, and evaluate costs for new sources in the detailed questionnaire, EPA may supplement the data with information from treatment vendors or by requesting follow-up information from questionnaire respondents with treatment technologies of interest (see DCN 5767 for an example request letter). For example, the detailed questionnaires may contain summary information about a potential treatment technology for which EPA may require additional design and cost information for the costing analyses. EPA may then need to request more detailed information about this specific technology. EPA has accounted for this burden in its burden estimate.

To select respondents to receive the supplemental cost request, EPA would first review responses to Part C Section 3 of the detailed questionnaire to identify any technologies for the treatment of produced water and then evaluate the feasibility of using these technologies in the different CBM basins. EPA's record indicates that a number of produced water treatment technologies and beneficial use options are in use today by CBM operators (see DCN 05138). EPA would then determine if the information provided in Part C Section 3 sufficiently matches the different produced water treatment technologies and beneficial use options identified in EPA's record for EPA to use in evaluating the affordability of the different produced water management options. If the information is not sufficient, EPA would solicit additional information from the operator of the technology (see DCN 5767 for an example request letter). EPA estimates that the additional cost request would be sent to 30 or fewer respondents.

## Table 4-5. Detailed Description of Part C, Section 3

| Detailed Produced Water Management and Treatment Questions | | |
|---|---|---|
| **C3-1.** | Requests the final destination of the produced water and provides additional instructions on questions to complete based on the response. The question also request information on the volume of water to the final destination and the maximum capacity of that destination. | This question provides information on the destination of produced water and acts as a screener question to guide the respondent through the rest of the questionnaire. Only respondents discharging to surface water, POTWs, or a third party need to complete additional questions in Part C Section 3. All other operators can skip to the request for water quality data in Part C Section 4. |
| **C3-2.** | Surface Water Discharge | |
| a. | General Information on Surface Water Discharge Permit – Requests NPDES permit number, permit type, expiration date, and monitoring information. | EPA will use this information to locate additional information from states and Regions and develop a profile of how existing surface discharges are permitted. |
| b. | General Information on Outfalls Included in Permit – Requests information about each outfall including outfall number, treatment, flowrate, and frequency of discharge. | EPA will use this information to develop a profile of existing discharges. |
| c. | Permit and Discharge Monitoring Reports (DMR) | EPA will use these data to identify pollutants of concern by state and basin; calculate current discharge loads in pounds per year using flow information provided; and calculate pollutant reductions for the alternate management options. |
| **C3-3.** | **Discharge to POTW or third party** | |
| a. | Requests information on the POTW, PrOTW, or third party. | EPA will use this information to locate additional information or ask additional questions on this discharge. |
| b. | Requests a copy of the current permit of discharge agreement. | EPA will review the permit or discharge agreement to obtain additional information about this discharge. |
| **C3-4.** | Requests a yes/no indication of whether the operator performs any treatment prior to discharge. | This question acts as a screener question allowing operators that do not have treatment to skip to the request for water quality data in Part C Section 4. |
| **C3-5.** | Requests information on sludge or solids disposal. | This question provides EPA information on disposal costs. |
| **C3-6.** | Requests information on transporting the produced water from the well to the final destination including engineering methods used for transportation (e.g., piping, pumps, trucking) and capital and operating and maintenance costs. | Transporting produced water may be a significant portion of an operator's produced water management costs. EPA needs this information to estimate baseline transportation costs and to understand how various management and treatment options will change transportation costs. This question requests information for all methods and equipment used to transport produced water (e.g., piping, pumps, trucking). |
| **C3-7.** | Requests information on type of treatment performed. | This question acts as a screener question to guide respondents to the detailed questions associated with their treatment system. This question requests that respondents check a yes/no box indicating if they have water quality data for this system. Water quality data should be included in Part C Section 4. |

**Table 4-5. Detailed Description of Part C, Section 3**

| Detailed Produced Water Management and Treatment Questions | | |
|---|---|---|
| **C3-8.** | Sedimentation Ponds – Requests information on the pond including volumes of produced water, surface areas, costs, and targeted pollutants. | EPA will use this information to develop a profile of produced water management techniques, evaluate the pollutants removed in these systems, estimate the costs of produced water management options, and account for current treatment-in-place. |
| **C3-9.** | Ion Exchange – Requests information on the treatment unit including volumes of produced water, design capacity, costs, and targeted pollutants. | |
| **C3-10.** | Low-Pressure Filtration – Requests information on the treatment unit including volumes of produced water, design capacity, costs, and targeted pollutants. | |
| **C3-11.** | High-Pressure Filtration – Requests information on the treatment unit including volumes of produced water, design capacity, costs, and targeted pollutants. | |
| **C3-12.** | Land Application or Treatment Not Specified Elsewhere – Requests information on the land application or treatment unit including volumes of produced water, design capacity, costs, and targeted pollutants. | |

(iv) Section 4: Produced Water Quality Data

Section 4 requests existing CBM produced water quality data at gathering locations such as treatment units or discharge locations. All information collected will aid EPA in determining CBM produced water characteristics by basin; identifying pollutants; calculating baseline pollutant loadings; and estimating the effectiveness of treatment technologies in removing pollutants of concern. The question asks respondents to complete a table with analytical data for 2007 for any monitoring performed in their produced water management system. The monitoring locations should be shown on the diagram in Question C2-1 which will help EPA link the data to a specific location. Note that respondents may provide this data electronically or can attach existing hardcopy reports.

Section 4 also requests information on whole effluent toxicity (WET) testing performed by the operator which will be used to identify any environmental impacts of CBM produced water.

Question C4-3 provides space for additional explanations of any response in Part C and/or descriptions of estimation methods.

### (ii) Respondents Activities

Operators selected to receive the detailed questionnaire will receive a transmittal letter with attachments citing EPA's authority under Section 308 of the Clean Water Act to collect this information, the ability of the respondent to make a claim of business confidentiality, and EPA's process for gathering, safeguarding, and securing confidential business information (CBI). Each respondent will also receive Parts A, B, and C of the detailed questionnaire. Respondents must read the General Instructions section in the beginning of the questionnaire and the instructions preceding Parts A, B, and C. The General Instructions describes the purpose and use of the questionnaire, help-line information, how to return the questionnaire, and provisions regarding data confidentiality. The separate sets of instructions preceding Parts B and C of the questionnaire give the respondents guidance on completing the responses in each part.

The questionnaire respondents must read and understand the questionnaire, plan response activities, gather information, compile and review information, and complete the questionnaire form. The respondents should retain the completed questionnaire for up to one year in the event that EPA has to contact the facility for clarification of any response. There will be no need for the respondents to maintain any new records because this is a one-time information collection effort.

## 5. THE INFORMATION COLLECTED - AGENCY ACTIVITIES, COLLECTION METHODOLOGY, AND INFORMATION

### 5(a) Agency Activities

The Agency has conducted, is conducting, or will conduct the following activities to administer the CBM questionnaire:

- Develop the questionnaire;
- Provide the questionnaire for review by trade associations, industry representatives, public interest groups, state regulating agencies, EPA workgroup, OMB, and other stakeholders;
- Develop the ICR;
- Revise the questionnaire based on comments from trade associations, industry representatives, public interest groups, state regulating agencies, EPA workgroup members, OMB, and other stakeholders;
- Work with state data and industry to identify appropriate contacts and develop a mailing list database and mailing labels;
- Develop a tracking system for questionnaire mail-out, receipt, and return activities;
- Distribute questionnaires;
- Develop and maintain help lines for respondents who require assistance in completing their questionnaire;
- Conduct meeting and teleconferences with questionnaire respondents to assist in the completion of the survey;
- Develop an electronic questionnaire and supporting database for questionnaire responses;
- Receive and review questionnaire responses;
- Summarize and analyze questionnaire responses; and
- Conduct economic and technical analyses to identify available and affordable technology options for CBM produced water.

The Agency will transfer data received from the questionnaire forms to a master database for future use if the Agency decides to initiate an effluent guidelines rulemaking.

## 5(b) Collection Methodology and Management

Each selected operator will receive a questionnaire with an assigned operator identification number. Each operator can complete the questionnaire by legibly handwriting or typing the responses in the spaces provided, or they may use the electronic version. The questionnaire will be sent via Federal Express or comparable carrier to ensure that a point of contact (the facility contact person) receives and signs for the questionnaire package. Each facility will be allowed 60 calendar days to return the completed questionnaire.

EPA will include an e-mail address and phone number in the instructions that respondents can use to request assistance in completing the questionnaire. Using these assistance methods enables the respondents to receive a timely response to any inquiries that they may have. E-mail and telephone communication will also reduce any misinterpretations of the questionnaire and thus decrease the burden of follow-up phone calls and letters to the respondents. Finally, EPA will conduct a series of teleconferences and interactive forums (e.g., meetings, webcasts) to help respondents complete the questionnaire.

Each page of the questionnaire will have a unique operator identification number for ease of tracking. The operator identification number will be used to track the mailing date of the questionnaire, questionnaire receipt date, follow-up letters and telephone calls to respondents, and EPA's receipt of the completed questionnaire. EPA will also use the identification number as an identification code in the questionnaire database. The Agency will make follow-up calls as needed to clarify inconsistencies in operator responses, and to remind non-respondents of their requirement to complete and return the questionnaire.

Upon receipt of completed questionnaires, EPA will review the questionnaires for completeness and internal consistency and enter the responses into a database. This database will then be used to perform data analysis.

## 5(c) Small Entity Flexibility

Preliminary investigations indicate that up to 37 percent of the CBM operators in some basins either meet the Small Business Administration's (SBA's) definition of a small business or cannot be identified as large because their employment or revenue figures are not known. EPA has taken several steps to minimize the burden of responding to the questionnaire for all respondents, including small businesses. The questions are phrased with commonly used terminology. Tables are organized with formats familiar to financial officers in the respondents' industry. Questions requesting similar types of information are arranged together to facilitate review of pertinent records and completion of the questionnaire. EPA will be providing a helpline to answer questions respondents might have when completing the questionnaire. Finally, EPA is offering to complete large portions of the firm financial questions for small businesses based on their financial reports or corporate income taxes.

## 5(d) Collection Schedule

Based on a maximum of 30 days for OMB review, the schedule for the questionnaire distribution, response receipt, and data collection activities following OMB approval is as follows:

| Action | Approximate Number of Calendar Days After OMB Approval |
|---|---|
| Prepare screener questionnaire mailing and send to respondents | 30 |
| Receive screener questionnaire responses | 60 |
| Screener questionnaire data processing | 90 |
| Screener questionnaire data review/sample draw | 120 |
| Conduct meetings and teleconferences for detailed survey respondents | 135 |
| Prepare detailed questionnaire mailing and send to respondents | 150 |
| Receive detailed questionnaire responses | 210 |
| Detailed questionnaire data processing | 270 |
| Detailed questionnaire data review | 315 |
| Evaluation of technology options | 360 |
| Evaluation of economic achievability | 405 |

## 6. ESTIMATING THE BURDEN AND COST OF THE COLLECTION

### 6(a) Estimating Respondent Burden

The EPA burden estimate is based on the number of entities receiving the questionnaire. To reduce the burden, EPA intends to select a statistical random sample of entities within the CBM industry. The resulting sample will minimize both the burden to respondents in completing the questionnaire and to the Agency in managing and effectively utilizing the data and information supplied by respondents.

In estimating the burden, EPA has included the time required to complete the initial screener questionnaire as well as the detailed questionnaire. EPA will use the results of the screener to select a statistical sample of operators to receive the detailed questionnaire. The use of the screener questionnaire will reduce the total burden to operators. The screener will ask operators to define their economic projects which will simplify the detailed questionnaire.

For the detailed questionnaire, EPA divided the respondents into small and non-small operators in computing the burden. Small operators will not receive the screener survey. Note that the small operators EPA used to compute the burden may not be small businesses as defined by SBA. EPA assumed small operators would only complete the detailed questionnaire for one project and that the non-small operators may complete the questionnaire for up to three projects. EPA's burden estimate assumes that the statistical selection of the wells will result in approximately 484 operators to be selected for the detailed questionnaire. EPA further estimates that the operators will be required to provide information for approximately 650 projects.

### (i) Respondent Burden

EPA assigned burden estimates for all sections of the questionnaire, as shown in Table 6-1 below. EPA identified labor categories associated with all respondent activities necessary to complete the questionnaire: operator/environmental engineer, junior accountant, clerical support, engineering manager, financial manager, and legal. The Agency estimated the required response time for each labor category per section.

**Table 6-1. Respondent Hours Burden per Section of Questionnaire**

| Respondent Activity | Hours by Job Category | | | | | | |
|---|---|---|---|---|---|---|---|
| | Engineer | Accountant | Clerical Support | Engineering Manager | Financial Manager | Legal | Total Burden per Activity (Hours) |
| **Screener** | | | | | | | |
| Read instructions and complete screener | 3 | 0 | 1 | 1 | 0 | 0 | 5 |
| **Detailed Questionnaire** | | | | | | | |
| **Introduction (time per operator)** | | | | | | | |
| Read Instructions | 1 | 1 | 0 | 1 | 1 | 1 | 5 |

## Table 6-1. Respondent Hours Burden per Section of Questionnaire

| Respondent Activity | Hours by Job Category | | | | | | |
|---|---|---|---|---|---|---|---|
| | Engineer | Accountant | Clerical Support | Engineering Manager | Financial Manager | Legal | Total Burden per Activity (Hours) |
| **Part A (time per operator)** | | | | | | | |
| Read Instructions | 0.25 | 0 | 0 | 0.25 | 0.25 | 0.25 | 1 |
| Complete questions and sign certification | 4 | 0 | 1 | 1 | 0 | 0.25 | 6.25 |
| Total for Part A | 4.25 | 0 | 1 | 1.25 | 0.25 | 0.5 | 7.25 |
| **Part B, Section 1 (time per operator)** | | | | | | | |
| Read instructions | 0 | 0 | 0 | 0.25 | 0.25 | 0 | 0.5 |
| Complete questions | 0 | 0 | 0.5 | 0.25 | 0.25 | 0 | 1 |
| Total for Section Part B, Section 1 | 0 | 0 | 0.5 | 0.5 | 0.5 | 1 | 1.5 |
| **Part B, Section 2 (time per operator)** | | | | | | | |
| Read instructions | 0 | 0.5 | 0 | 0.25 | 0.5 | 0.5 | 1.75 |
| Complete questions | 0 | 4 | 0 | 0.25 | 0.2 | 3 | 9.25 |
| Total for Part B, Section 2 | 0 | 4.5 | 0 | 0.5 | 2.5 | 3.5 | 11 |
| **Part B Section 3 (time per operator)** | | | | | | | |
| Read instructions | 0.5 | 0 | 0 | 0.5 | 0 | 0 | 1 |
| **Part B, Section 3 (time per economic project)** | | | | | | | |
| Complete general project questions | 3 | 0 | 0.5 | 0 | 0 | 0.25 | 3.75 |
| Complete project history questions | 3 | 0 | 0.5 | 0.5 | 0 | 0.5 | 4.5 |
| Complete 2007 operations questions | 8 | 0 | 0.5 | 0.5 | 0 | 0.5 | 9.5 |
| Complete future cost questions | 1 | 0 | 0.5 | 1 | 0 | 0.5 | 3 |
| Total for Part B, Section 3 (not including instructions) | 15 | 0 | 2 | 2 | 0 | 1.75 | 20.75 |
| **Part C (time per operator)** | | | | | | | |
| Read instructions | 1 | 0 | 0 | 1 | 0 | 1 | 3 |
| **Part C (time per produced water management system)** | | | | | | | |
| Provide contact information | 0 | 0 | 0 | 0.25 | 0 | 0 | 0.25 |
| Generate/reproduce block diagram | 2 | 0 | 0.5 | 0.25 | 0 | 0.5 | 3.25 |
| Complete general produced water management system questions | 2 | 0 | 0.5 | 1 | 0 | 0.5 | 4 |
| Complete detailed questions | 2 | 0 | 0.5 | 1 | 0 | 0.5 | 4 |
| Provide produced water quality data | 2 | 0 | 1 | 1 | 0 | 0.5 | 4.5 |
| Total for Part C (not including instructions) | 8 | 0 | 2.5 | 3.5 | 0 | 3 | 16 |

**Table 6-1. Respondent Hours Burden per Section of Questionnaire**

| Respondent Activity | Hours by Job Category | | | | | | |
|---|---|---|---|---|---|---|---|
| | Engineer | Accountant | Clerical Support | Engineering Manager | Financial Manager | Legal | Total Burden per Activity (Hours) |
| **Additional Costing Request (time per respondent)** | | | | | | | |
| Complete Request | 8 | 0 | 0 | 2 | 0 | 0 | 10 |

Because operators may have multiple economic projects or produced water management systems which will require separate responses in the detailed questionnaire, EPA estimated the burden for two groups of operators. Table 6-2 shows the operator groupings and EPA's assumptions for how many economic projects and produced water management systems they operate.

**Table 6-2. Questionnaire Types**

| Operator Group | Number of Operators | Estimated Total Number of Economic Projects (Copies of Part B, Section 3) | Estimated Total Number of Produced Water Management Systems (Copies of Part C) |
|---|---|---|---|
| Small | 178 | 154 | 154 |
| Non-Small | 306 | 496 | 496 |

### (ii) Total Estimated Respondent Burden

EPA calculated the total estimated respondent burden using the estimated response time per section shown in Table 6-1 and the operating groupings shown in Table 6-2. EPA estimated that up to 30 operators may receive the additional costing request. EPA calculated a total respondent burden of 40,017 hours.

## 6(b) Estimating Respondent Costs

### (i) Estimating Labor Costs

The direct labor cost to respondents to complete the questionnaire equals the time required to read and understand the questionnaire, gather the information, compile and review the information, and complete the questionnaire form. The non-labor costs each respondent will incur include photocopying and postage and are discussed in Section 6(b)(iii). Labor costs will comprise the majority of the financial burden imposed on the industry.

Table 6-3 presents earnings data from the Bureau of Labor Statistics, National Occupational Employment and Wage Estimates for the oil and gas extraction industry for 2007 (latest year for which data are available).

**Table 6-3. 2006 Labor Rate Data**

| Job Category | Engineer | Junior Accountant | Clerical Support | Engineering Manager | Financial Manager | Legal |
|---|---|---|---|---|---|---|
| Median Hourly Earnings (base year 2007) | $55.98 | $28.95 | $15.94 | $62.57 | $53.73 | $72.58 |

Source: BLS. 2007d. Bureau of Labor Statistics. May 2007 National Industry-Specific Occupational Employment and Wage Estimates NAICS 211100 - Oil and Gas Extraction.

EPA calculated the estimated respondent burden using the estimated response time per section shown in Table 6-1, the operating groupings shown in Table 6-2, and the labor rates shown in Table 6-3 to calculate a total cost of $2,112,400.

### (ii) Estimating Capital and Operations and Maintenance (O&M) Costs

Because EPA will not require questionnaire respondents to purchase any goods, including equipment or machinery, to respond to the questionnaire, the Agency does not expect capital costs to result from the administration of this data collection questionnaire. Operation and maintenance costs include only photocopying and postage for the completed questionnaires.

### (iii) Capital/Start-up Operating and Maintenance Costs

EPA estimates there will be no capital or start up costs associated with responding to the questionnaire. Operating and maintenance costs include only photocopying and postage. EPA assumes the respondents will incur a photocopying rate of $0.10 per page and that they will return the completed questionnaire via Federal Express or a comparable delivery carrier that requires a signature to acknowledge receipt. EPA estimates a total copying and Federal Express cost of $28,500 which includes copying and sending both the screener and the detailed questionnaire.

### (iv) Annualizing Capital Costs

EPA estimates that there will be no capital costs associated with responding to the questionnaire.

## 6(c) Estimating Agency Burden and Costs

Table 6-4 presents an estimate of the burden and labor costs that EPA will incur to administer the questionnaire. The table identifies the collection administration tasks to be performed by Agency employees and contractors, with the associated hours required for each grouping of related tasks. EPA determined Agency labor costs by multiplying Agency burden figures by the hourly Agency labor rate of $80. EPA determined contractor labor costs by multiplying contractor burden figures by an average contract labor rate of $80 per hour. This rate is consistent with current Agency contracts.

**Table 6-4. Estimated Agency Burden and Labor Costs**

| Activities | Burden (hours) | | | Labor Cost | | |
|---|---|---|---|---|---|---|
| | Agency | Contractor | Total Hours | Agency | Contractor | Total Cost |
| Develop the questionnaire instrument; meet with trade association representatives; publish notice of anticipated ICR in Federal Register. | 1,000 | 1,500 | 2,500 | $80,000 | $120,000 | $200,000 |
| Respond to all comments received. | 200 | 0 | 200 | $16,000 | 0 | $16,000 |
| Revise questionnaire instrument based on comments. | 50 | 400 | 450 | $4,000 | $32,000 | $36,000 |
| Design electronic distribution method, including associated database development. | 100 | 400 | 500 | $8,000 | $32,000 | $40,000 |
| Design and develop a mailing list database; develop a system to track mailing and receipt activities; mail questionnaire instruments. | 0 | 100 | 100 | 0 | $8,000 | $8,000 |
| Develop and maintain helpline. | 0 | 200 | 200 | 0 | $16,000 | $16,000 |
| **Totals** | **1,350** | **2,600** | **3,950** | **$108,000** | **$208,000** | **$316,000** |

## 6(d) Estimating the Respondents Universe and Total Burden Costs

EPA expects to receive information on 650 projects for up to 484 operators. EPA estimates a total burden of 40,017 hours and a total labor and O&M cost of $2,141,000 for all respondents.

## 6(e) Bottom Line Burden Hours and Costs

Tables 6-5 and 6-6 summarize the total costs that the CBM industry and the Agency will incur as a result of the information collection.

**Table 6-5. Total Estimated Respondent Burden and Cost Summary**

| Number of Respondents | Total Burden (Hours) | Total Labor Cost | Total O&M Cost | Total Cost |
|---|---|---|---|---|
| 484 | 40,017 | $2,112,400 | $28,500 | $2,141,000 |

**Table 6-6. Total Estimated Agency Burden and Cost Summary**

| Total Burden (Hours) | Total Labor Cost | Total O&M Cost | Total Cost |
|---|---|---|---|
| 1,350 | $316,000 | - | $316,000 |

## 6(f) Burden Statement

EPA estimates that the total burden to the 484 CBM operators for responding to the questionnaire will be approximately 40,177 hours, or $2,141,000 (including labor and O&M costs). EPA estimates that there will be no start-up or capital costs associated with completing and returning the questionnaire.

Burden means the total time, effort, or financial resources expended by persons to generate, maintain, retain, or disclose or provide information to or for a federal agency. This includes the time needed to review instructions; develop, acquire, install, and utilize technology and systems to collect, validate, and verify information, process and maintain information, and disclose and provide information; adjust the existing ways to comply with any previously applicable instructions and requirements; train personnel to respond to a collection of information; search data sources; complete and review the collection of information; and transmit or otherwise disclose the information. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. The OMB control numbers for EPA's regulations are listed in 40 CFR part 9 and 48 CFR chapter 15.

To comment on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondents burden, including the use of automated collection techniques, EPA has established a public docket for this ICR under Docket ID No. OW-HQ-OW-2006-0771, which is available for public viewing at the Water Docket in the EPA Docket Center (EPA/DC), EPA West, Room 3334, 1301 Constitution Ave., NW, Washington, DC. The EPA Docket Center Public Reading Room is open from 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding legal holidays. The telephone number for the Reading Room is (202) 566-1744, and the telephone number for the Water Docket is (202) 566-2426. An electronic version of the public docket is available through the Federal Data Management System (FDMS) at http://www.regulations.gov. Use FDMS to view and submit public comments, access the index listing of the contents of the public docket, and to access those documents in the public docket that are available electronically. Once in the system, select “Advanced Search,” then key in the Docket ID number identified above. Also, you can send comments to the Office of Information and Regulatory Affairs, Office of Management and Budget, 725 17th Street, NW, Washington, D.C. 20503, Attention: Desk Officer for EPA. Please include the EPA Docket ID No. (OW-HQ-OW-2006-0771) and OMB control number (2040-NEW) in any correspondence.

## 7. References

BLS. 2007d. Bureau of Labor Statistics. May 2007 National Industry-Specific Occupational Employment and Wage Estimates NAICS 211100 - Oil and Gas Extraction. *http://www.bls.gov/oes/current/naics4_211100.htm#b17-0000.* Accessed June 2008.

**PART B OF THE SUPPORTING STATEMENT**

## 1. QUESTIONNAIRE OBJECTIVES, KEY VARIABLES, AND OTHER PRELIMINARIES

## 1(a) Questionnaire Objectives

The primary objectives of the survey are to gather and update information about coalbed methane (CBM) extraction facilities to determine if an effluent guidelines rulemaking is required to control the discharge of pollutants into surface waters of the United States and to publicly owned treatment works (POTWs). More specifically, the survey will provide EPA with preliminary economic, technical, and environmental data needed to quantify any adverse environmental impacts of the discharges of produced waters from coalbed methane extraction facilities, evaluate the effectiveness of treatment technologies, determine the incremental pollutant removals, and develop compliance costs and economic impacts for a range of possible wastewater management options.

## 1(b) Key Variables

EPA is focusing on the availability and affordability of CBM produced water treatment technology options in advance of a decision on whether to initiate an effluent guidelines rulemaking. EPA plans to use the survey to collect information specific to individual CBM projects as the economics and environmental impacts of CBM production are dependent on the location of the CBM development and the surrounding ecosystem. EPA will use this information to assess the statutory factors, particularly technological and economic achievability of available controls, production processes, potential environmental impacts, and wastewater treatment residuals disposal practices. EPA is using the following key variables as they relate to the potential technology options and beneficial use practices for this industrial sector.

- Produced Water Management Practices and Pollutant Discharges;
- Capital and Operating and Maintenance Costs for Produced Water Management Practices;
- Economic Size of CBM Operators and Projects;
- CBM Reserves Estimates and Production by Basin and Future Timing of New CBM Production; and
- Potential Economic Impacts of Different Produced Water Management Practices on CBM Operators and CBM Exploration and Production.

Please see Part A, Section 4(b)(i) of this Information Collection Request for detailed information on the data items for the survey.

## 1 (c) Terminology

For purposes of this data collection, EPA has defined two terms: operator and project. This section describes both in more detail because they are key concepts in the sample design.

An *operator* is the firm or division (if a profit center) that is responsible for management and the day-to-day operation of a project. This operator is generally a working-interest owner or a company under contract to the working interest owner(s). The working-interest owner bears the costs of exploration, development, and operation of the property and, in return, is entitled to a share of the mineral production from the property or to a share of the proceeds there from. The sample design assumes that an operator is located in only one basin. For example, if an operator has projects in three basins, EPA has counted it three times: once in each basin.

A *project* is defined to be comprised of a well, group of wells, lease, group of leases, or recognized unit operated as an economic unit when making production decisions. (EPA recognizes that industry has multiple definitions for the term "project.") One reason that EPA is interested in project-level information is because many projects handle the produced water in a single water management system. For purposes of estimating sample sizes for the information collection request (ICR), EPA has assumed that a project consists of three or fewer wells.

As described in the next section, operators would identify their projects and the number of wells in each in their responses to a screener questionnaire. EPA would then use this information to refine the sample design.

# 2. STATISTICAL APPROACH FOR THE SURVEY

The statistical approach considers the target population, the available information in the sample frame, the sample design, and sources of error. The following sections describe each component in more detail.

## 2(a) Target Population

The principal task in the development of a sample survey design is establishing a clear, concise description of the target population. The definition should clearly identify every element of the target population so that all non-population elements can be excluded. For the screener, EPA would define the target population to be all operators in the U.S. The screener then would collect information from the operators about each project, because the target population for the detailed questionnaire would be all projects producing CBM in 2007.

## 2(b) Sample Frame

A sample frame is a list or set of procedures for identifying all elements of a target population. In addition to listing population elements, sample frames also contain additional information, such as addresses and key characteristics of the population that will be used to draw samples. Sample frames are essential to the quality of surveys because sample elements are drawn from them.

### (i) Screener

For the *screener*, the target population is all operators in the U.S. that produced CBM in 2007. EPA has created a sample frame of operators in the U.S. using licensed database information on historic well production from HPDI, Inc. HPDI, Inc. compiles information from nearly all of the oil and gas producing states and provides detailed data in a consistent format to clients accessed through a web-based query system. This information includes well identification information (such as API number, lease name and number, well name and number, operator name, location, basin designation, field, and reservoir/producing formation), historic production information (including summary information on first production, last production, cumulative production, and last 12 months production as well as detailed information on year-by-year production), status information (active/inactive), and operator contact information (where available). EPA has supplemented the sample frame with information publicly available from States. As a result, EPA considers that it has created a relatively complete sample frame of operators in the U.S. It identifies 484 operators maintaining 45,369 wells that were active CBM producers in the U.S. as of mid-2007.

### (ii) Detailed Questionnaire

For the *detailed questionnaire*, EPA would use the information that it had gathered from the screener to create a sample frame identifying the projects. As explained in Section 2(c), EPA estimates, at most, 15,251 projects would be identified from the screener.

## 2(c) Sample Design

EPA would collect information from the industry using a two-phase sample design. In the first phase, EPA would collect information about the projects from all operators. In the second phase, EPA would select a subset of projects for the detailed questionnaire. Based upon worse case assumptions, EPA estimates that the sample would consist of 650 projects, which would then represent an estimated 15,251 projects in the total population. This section describes the sample design and selection for the screener and detailed questionnaire.

### (i) Screener

The screener would be sent to all operators with more than two wells. To minimize burden for the screener, EPA has taken three approaches. First, for operators with one or two wells, EPA would attempt to complete the screener using publicly available information and contacts with industry associations. Only as a last resort would EPA contact the operators themselves. EPA expects that any additional information required from the operators could be obtained through a brief telephone call, instead of a written response to the complete screener. Second, EPA has only requested information necessary to statistically select the projects for the detailed questionnaire. Third, by applying recent questionnaire formatting research, EPA has designed and formatted the questions and response categories to be easy to read and interpret.

**(ii) Detailed Questionnaire**

The detailed questionnaire would be sent to a sample (subset) of projects identified from the screener responses. By requiring only a subset to respond to the detailed questionnaire, the survey burden would be greatly reduced. EPA would select projects in a manner that would be statistically representative of all projects in the target population. EPA would supplement the statistical sample with a small judgment sample of hand-picked projects that would be used for qualitative review. In an effort to reduce burden EPA may supplement the data with information from treatment vendors or by requesting follow-up information from questionnaire respondents with treatment technologies of interest (see DCN 5767 for an example request letter). For example, the detailed questionnaires may contain summary information about a potential treatment technology for which EPA may require additional design and cost information for the costing analyses. EPA may then need to request more detailed information about this specific technology.

Stratification

For the statistical sample, EPA would *stratify* the projects, primarily, by basin and business size. Stratification is performed by selecting one or more characteristics of interest and dividing the members of the population into the strata based on those characteristics. The sample frame created from the screener responses would identify these characteristics or provide a basis to reasonably assign characteristics to each population member (i.e., project). Stratified sampling consists of selecting a sample from within each stratum, then combining them to constitute the total sample. There are several benefits that result from stratifying the population, including:

- Ensuring that the sample contains representatives from every stratum;
- Improving the precision of parameter estimates;
- Allowing important parameters to be estimated at the stratum level; and
- Allowing certain subpopulations of particular interest to be sampled at a greater rate than others.

To select systems to receive questionnaires, EPA intends to use the following stratification variables:

- *Basin.* EPA's screener sample frame identifies the basin for each operator. EPA intends to stratify by basin to capture geological and regional differences in the industry. Because strata with small sample sizes can lead to inefficient sample designs, EPA has combined a few small basins within the same state. The following sample design estimates and descriptions refer to the combined basins as if they were a single basin. EPA has combined basins within the following three states:
  - *Alabama*: Alabama/Florida/Mississippi Salt Dome (two operators with a total of six wells) has been combined with Cahaba (two operators with 313 wells).
  - *Texas*: Fort Worth (one operator with one well) has been combined with Permian (one operator with six wells) and Texas Gulf Coast (one operator with two wells).

- *Wyoming*: Big Horn (one operator with one well) has been combined with Wind River (six operators with 20 wells).

- *Business size (Small or Non-Small)*. The screener would collect this information by asking if the parent company qualifies as a small business under the Small Business Administration definitions. By stratifying by business size, EPA would collect information that would allow for national estimates about specific impacts to small businesses.

In addition, EPA would further stratify certain basins by:

- *State* for the Powder River Basin (PRB). This basin has the largest number of wells for any basin over a wide geographical area, and thus, EPA considers a subdivision by state (Montana and Wyoming) would be appropriate. This subdivision could easily be incorporated into the sample design because the state location is available in the screener sample frame for each operator and well. The following sample design estimates and descriptions incorporate PRB/MT and PRB/WY as if they were separate basins.

- *Discharge Category* for two basins: PRB/WY and Appalachian. The screener would collect information about discharge practices that EPA would combine into two categories: *zero* and *other*:
  - The *zero* category would include any project that specified *only* these practices: re-injection hauled or trucked off-site, land applied such as irrigation and dust suppression. (In the screener, EPA has chosen to specify the practices separately to lessen any confusion.) Operators that only practice land application for a project where there is a discharge to a surface water would select the fourth check box ("Disposed or discharged by some other method") which would put this project in the other category.
  - The *other* category would include any project that disposes or discharges by some other method, possibly in combination with zero discharge practices.
  - For completeness, the screener includes a third possibility: no water produced by the project. For any such responses, EPA would contact the operator for more information.

Population Estimates for Each Stratum

Table B-1 shows the number of operators, wells, and estimated projects within each basin. EPA estimated the number of operators, wells, projects, small businesses, and discharge status as follows:

- *Operator*. EPA identified 484 operators in its screener sample frame. The screener would ask that the respondent correct the operator name, if appropriate.

- *Wells*. EPA identified 45,369 wells in its screener sample frame. The screener would ask for the number of wells in each project for two reasons. First, to assess

completeness of the responses and the quality of the screener sample frame, EPA intends to compare the number of wells reported by each operator to the number in the screener sample frame. EPA would contact an operator if there was a substantial difference between EPA's previously compiled information compared to the operator's response. Second, to create a more efficient sample design, EPA would statistically select the project with probability proportional to size. Size would be determined by number of wells and volume of gas production.

- *Projects*. EPA estimates that the industry has 15,251 projects. EPA derived this estimate as follows. For each operator with one, two, or three wells, EPA assumed that the operator had one project (i.e., 202 operators have an estimated 202 projects). For each operator with four or five wells, EPA assumed that the operator had two projects (i.e., 32 operators have an estimated 64 projects). For remaining operators (i.e., those with six or more wells), EPA estimated the number of their projects in each basin by dividing by three and rounding upwards to the nearest integer. For example, EPA identified four operators in the Arkla basin. One operator has one well, which EPA assumed is a single project. Three other operators have 26 wells that EPA combined into an estimated 9 projects (i.e., 26/3=8.67 rounded to 9). In total, Arkla has an estimated 10 (i.e., 1+9) projects. EPA used this calculation procedure for all basins to obtain the estimated number of 15,251 projects. EPA expects that this is an overestimate because it has visited projects with many more than three wells. However, the assumption provides a reasonable upper bound (i.e., worse case) on the sample sizes used to estimate the burden of the survey.

- *Small Businesses*. EPA estimated that 178 operators are small businesses. For purposes of developing estimates for the sample design, EPA assumed that operators with only one or two wells are small businesses. EPA recognizes that some operators in this category are large companies (e.g., one is a large Canadian company), and operators with more than two wells might be a small business. Consequently, EPA intends to use the screener responses to revise its small business classifications.

- *Discharge Status*. (Not shown in table because it applies only to two basins). For purposes of the burden estimates for the ICR, EPA estimated the discharge status using its professional judgment based upon its site visits. For the Appalachian basin, EPA estimated that 60 percent (i.e., 892 projects) would have some form of zero discharge, and the remainder would have other types of discharge. For the Power River Basin in Wyoming, EPA assumed that 50 percent (3219 projects) would have zero discharge. EPA would use the screener responses to revise its allocations to the two discharge categories before selecting the sample for the detailed questionnaire.

Table B-1 Numbers of Operators, Wells, Projects, and Small Businesses

| Basin(s) | Number of Operators | Number of Wells | Estimated Number of Projects | Estimated Number of Small Businesses |
|---|---|---|---|---|
| Alabama/Florida/Mississippi Salt Dome & Cahaba | 4 | 319 | 108 | 1 |
| Anadarko | 68 | 1,214 | 433 | 44 |
| Appalachian | 47 | 4,421 | 1,487 | 20 |
| Arkla | 4 | 27 | 10 | 1 |
| Arkoma | 55 | 1,420 | 492 | 23 |
| Big Horn & Wind River | 7 | 21 | 10 | 5 |
| Black Warrior | 13 | 4,771 | 1,593 | 4 |
| Cherokee/Forest City | 49 | 2,311 | 786 | 22 |
| Ft. Worth, Permian, & Texas Gulf Coast | 3 | 9 | 4 | 2 |
| Green River | 20 | 287 | 103 | 10 |
| Illinois | 21 | 141 | 54 | 8 |
| Powder River, MT | 3 | 877 | 293 | 1 |
| Powder River, WY | 79 | 19,295 | 6,440 | 11 |
| Raton | 10 | 2,736 | 914 | 1 |
| Salina | 3 | 3 | 3 | 3 |
| San Juan | 76 | 6,546 | 2,191 | 13 |
| Sweetgrass Arch | 1 | 1 | 1 | 1 |
| Uinta-Piceance | 21 | 970 | 329 | 8 |
| **Total** | **484** | **45,369** | **15,251** | **178** |

Precision Estimates Used to Derive the Estimated Sample Size

The precision of the detailed questionnaire estimates depends on both the sample design and the sample size, that is, the number of projects that would be selected. One measure of precision is the width of the confidence interval for the estimate. Confidence intervals provide a range of values for a particular estimate that would be likely if the study were repeated an infinite number of times. Thus, when using 95 percent confidence intervals, 95 percent of such intervals would include the true value, if we could take an infinite number of samples.

The binomial distribution is often used as the basis of sample designs, and can be used to estimate precision. The binomial distribution applies to situations where there are only two outcomes (yes or no) to a dichotomous question such as “Does the project have zero discharge?” The presence or absence of the attribute for a particular project is a dichotomous, or binary, variable. The binomial distribution models these data, based on the notion of obtaining national estimates of the percentage or proportion of projects in the target population (or a subset of the target population) that have a particular attribute. The binomial distribution also provides

estimates of the variance that is used to calculate the confidence intervals. Because a proportion of 0.5 (or 50 percent) results in the largest possible variance for the binomial distribution, EPA assumed that the probability of one outcome would be 0.5 (e.g., zero discharge occurs at 50 percent of the plants). In other words, if the population value is any value other than 50 percent, the survey estimate will be more precise – in statistical expectation – than it would be if the population value is 50 percent.

Because EPA is developing a national rule, it is primarily concerned with the precision of the overall estimates. Consequently, in estimating the overall sample size, EPA assumed more stringent requirements for overall estimates than basin estimates. First, EPA assumed that the sample (unadjusted for non-response) would be expected, with 95 percent confidence, to yield sufficient data to estimate the value of an unknown proportion to within ±0.05 of its true value for the target population (i.e., projects). This precision target will hold when the proportion's true (unknown) value is equal to 0.5, and even greater precision is expected when the true value of the proportion is not equal to 0.5. EPA then allocated the sample among the different strata. For strata with five or fewer projects, EPA assumed that the sample would include all of them. For the remaining strata with more than five projects, EPA applied another precision target for purposes of estimating the sample size. EPA assumed that the sample (unadjusted for non-response) would be expected, with 90 percent confidence, to yield sufficient data to estimate the value of an unknown proportion to within ±0.15 of its true value for the target population of all projects. EPA then adjusted the stratum estimates upwards by 10 percent for potential non-response. (This assumption of a 10 percent non-response rate is based upon a typical effluent guidelines questionnaire.) As a result of these calculations, EPA estimated that a statistical sample size of 610 projects would be appropriate. In addition, EPA intends to further adjust the sample to include 40 additional projects for a judgment sample. Typically, in EPA's experience with surveys for effluent guidelines, we identify facilities for which additional information would be useful, but were not captured into the statistical sample. For example, industry may identify a project with a unique treatment system for which we need data to evaluate its performance for the CBM Study. For this reason, we are including a judgment sample. We will develop our national estimates based upon the statistical sample with the non-response adjustment, and will use the data from the judgment sample separately in a qualitative manner. Table B-2 summarizes the steps that EPA used to estimate the sample size.

Table B-2 Steps In Sample Size Estimation

| Estimated Number for: | Sample Size |
|---|---|
| National Estimates | 375 |
| After Allocation to Strata | 556 |
| After Strata Adjusted for 10% Non-response | 610 |
| With addition of Judgment Sample | 650 |

Actual Sample Design

The previous section described EPA's procedure for estimating the sample size used to calculate the burden estimates for the ICR. However, if EPA were to use that procedure in actually selecting the sample, it would result in statistically inefficient estimates. In order to reduce the variability associated with the estimates, EPA intends to use the information from the

screener responses to create a more efficient sample design. In this improved design, EPA still intends to maintain at least an overall precision target that would be expected, with 95 percent confidence, to yield sufficient data to estimate the value of an unknown proportion to within ±0.05 of its true value for the target population (i.e., projects). Within this precision target, the sample design would select projects with probability proportional to size (PPS) within each stratum. The size of the project would be determined from the screener responses for the number of wells and the total gas production. Because strata with small population sizes are statistically inefficient, EPA also intends to evaluate whether collapsing any strata would improve the estimates while ensuring that sufficient information would be collected within the basins, small businesses, and the other strata.

## 2(d) Sources of Error

In developing the sample design, as described previously, EPA considered the estimated precision targets for data collected from the target population. EPA also considered potential error that could be associated with estimates calculated from the collected data, due to sources associated with sampling, such as response rates, as well as non-sampling sources of error, such as processing error.

### (i) Response Rates

In developing the sample design, EPA considered both unit (questionnaire) and item (question) non-response. EPA expects that the response rate would be relatively high for this mandatory survey effort. The survey would be conducted under the authority of Section 308 of the Clean Water Act. The cover letters and instructions for the screener and detailed questionnaire would explain the legal authority, responsibility to respond, reasons for the questionnaire, and penalty for non-response. EPA would use reminder letters and/or telephone calls to remind respondents of the duty to respond under Section 308 of the Clean Water Act. If possible, EPA would seek the endorsement of the major trade associations, which would be expected to increase the response rate from its members. EPA recognizes that some non-response is unavoidable, and in past survey efforts, EPA has waived the duty to respond in extreme and rare cases (e.g., natural disasters) which also might occur for this survey effort. However, for the screener, timely and complete responses would be particularly important because it would be used to create the sample frame for the detailed questionnaire. If an operator is unable (or unwilling) to respond within the short timeframe, EPA might estimate the responses from publicly available information so that it would have a complete list of projects to draw the sample for the detailed questionnaire.

Prior to distributing the detailed questionnaires (units), EPA would adjust the initial sample sizes to help ensure that the effective sample sizes (i.e., respondents) would be sufficient for precision requirements. EPA would adjust the statistical sample size for an estimated non-response rate of 10 percent. (This assumption of a 10 percent non-response rate is based upon a typical effluent guidelines questionnaire.) In addition to increasing the initial sample size, EPA would strive to improve the response rate by reminder letters and/or telephone calls. Furthermore, after receiving the responses, EPA intends to adjust the detailed questionnaire weights for any non-response and to review publicly available information (e.g., State databases) in order to determine if non-respondents appear to have different characteristics than

respondents. EPA would examine these characteristics both for the entire industry and for subgroups in the analyses. For any differences, EPA intends to determine the major causes, and to incorporate appropriate adjustments for bias. (Bias is the difference between the expected value of an estimate and the true value of a parameter or quantity being estimated. If the data collection process generates estimates that are consistently (or on average) above or consistently below the true value, the data collection process is biased.)

To minimize item non-response, EPA's subject matter experts have worked closely with industry to develop questions that would be easy to understand with clearly defined and familiar terms; are formatted in a logical sequence; and would request data that are readily available within the industry. In this manner, EPA expects to minimize inaccurate or incomplete response of the questions that can occur due to misunderstanding or misinterpretation of questions and the unintentional skipping of questions by respondents. Additionally, EPA would operate an e-mail helpline and website to assist respondents with the screener and detailed questionnaire. After receipt of the completed detailed questionnaires, EPA intends to conduct extensive follow-up with respondents for any item non-response. If necessary, EPA would impute responses to key questions in our analyses.

### (ii) Processing Errors

Processing errors can occur when questionnaire responses are coded, edited, and entered into the database. The design and implementation of the questionnaire database would employ a number of quality assurance techniques to reduce the frequency of such errors. These techniques would include the following:

- Double-entry keypunch verification on critical questions;
- Computerized comparison of selected responses to detect inconsistencies and illogical responses;
- Computerized analyses to screen for out-of-range and inconsistent numerical values; and
- Computerized analyses to detect missing numerical data and missing units.

## 3. PRETESTS AND PILOT TESTS

EPA does not intend to pre-test the questionnaire. For more than 30 years, EPA's Engineering and Analysis Division has conducted surveys of numerous industrial sectors to collect information to support regulation development activities in the effluent guidelines program. While EPA develops different questionnaires for each industry, there are common elements for all industries. The questionnaires collect the same basic data such as information about processes, treatment, and financial status. Thus, when EPA develops a questionnaire for a particular industry, it generally tailors the questions for specific terms and processes used by that industry. In past years, EPA has relied predominantly on active participation by trade groups in

reviewing the questionnaires. In EPA's experience, such collaboration generally tends to better reflect the industry at large than pre-tests. For this reason, EPA considers additional review through the pre-test process to be unnecessary for this industry.

## 4. COLLECTION METHODS AND FOLLOW-UP

*Please See Part A, Section 5(b) of this ICR for this information.*

## 5. DATA PREPARATION AND ANALYSIS

## 5(a) Data Preparation

Upon receipt of completed questionnaires, EPA and its contractors would review the questionnaires for completeness and accuracy and enter data codes to prepare the questionnaires for data entry. Follow-up calls would be performed as needed to clarify inconsistencies in responses. The coded questionnaire responses would be entered into a database, with double key-entry of critical questions. Once the data are entered into a database, numerous manual and electronic QA activities would be performed and the results would be provided to engineering and economic staff for further resolution and documentation. This database would then be used to perform data analyses.

## 5(b) Analysis

The questionnaire objectives include identifying available and affordable CBM produced water treatment technology options in advance of a decision on whether to initiate a an effluent guidelines rulemaking. Before deciding to initiate a rulemaking EPA will use the survey responses to help answer the following questions:

- What are the observed and potential impacts of CBM produced water discharges on aquatic environments and communities, riparian zones, and other wetlands?
- What is the range of pollutant concentrations and CBM produced water flow rate for the major CBM basins?
- What are the current and potential industry treatment technologies and beneficial use options for CBM produced water?
- How effectively do these treatment technologies and beneficial use practices reduce the discharge of pollutants?
- What is the range of incremental annualized compliance costs associated with these technologies and practices? How do these costs differ between existing and new sources?
- What is the demonstrated use and economic affordability (*e.g.*, production losses, firm failures, employment impacts resulting from production losses and firm failures, impacts on small businesses) of these technologies across the different CBM basins?

- What are the types of non-water quality environmental impacts (including energy impacts) associated with the current industry treatment technologies and beneficial use practices for CBM produced water?

The objectives of the information collection would be achieved by the statistically-designed sample survey because the resulting inferences and analyses would be as statistically unbiased and as precise as is practicable. EPA would apply sample weights derived from the statistical sample design and adjust for non-response to the data during statistical analysis. Weighting the data would allow inferences to be made about all eligible projects, including those that did not respond to the questionnaires. Another advantage is that weighted estimates would have smaller variances than unweighted estimates. EPA also would evaluate whether estimates could be improved by post-stratifying the detailed questionnaire data using the gas production data collected from the screener. EPA would use accepted statistical methods for survey statistics, such as those described in *Sampling Techniques* (Cochran, 1977) and *Survey Sampling* (Kish, 1965). EPA would use the data from the judgment sample separately in a qualitative manner.

See Part A, Section 2(b) of this Information Collection Request for a detailed discussion of the technical and economic analyses.

EPA intends to use the following contractors to assist in conducting this survey:

Sample Frame Preparation and Analysis:
PG Environmental, LLC
447B Carlisle Drive
Herndon, VA 20170

Statistical Design and Analysis:
Battelle
505 King Avenue
Columbus, OH 43201

Economic Impact Analysis:
Eastern Research Group
14555 Avion Parkway
Suite 200
Chantilly, VA 20151

Advanced Resources International, Inc.
4501 Fairfax Drive, Suite 910
Arlington, VA 22203

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Dillman, D. (2000). *Mail and Internet Surveys: The Tailored Design Method*. New York: Wiley.

Israel, G. (1992) "Sampling Issues: Nonresponse," University of Florida, IFAS Extension Electronic Document. Available at: http://edis.ifas.ufl.edu/PD006.

Kish, L. (1965). *Survey Sampling*. New York: Wiley.

Morrison, R. (2007). "Towards the Development of Establishment Survey Questionnaire Design Guidelines at the U.S. Census Bureau." *Proceedings of the Third International Conference on Establishment Surveys (ICES-III), Montreal, Quebec, Canada, June 18-21, 2007* (pp. 662-673). Alexandria, Virginia: American Statistical Association.