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Surface Coal Mining and Reclamation Operations; Permanent Regulatory Program
Hydrology Permitting and Performance Standards; Geology Permitting

September 26, 1983

ACTION: Final rules.

SUMMARY: The Office of Surface Mining Reclamation and Enforcement (OSM) is issuing final rules governing the hydrology and geology permitting requirements and hydrology performance standards under the Surface Mining Control and Reclamation Act of 1977 (the Act). The rules consolidate previously scattered requirements and clarify the hydrologic and geologic requirements stipulated in the Act. The rules focus primarily on premining data collection and analysis, monitoring, reclamation planning to ensure protection of the hydrologic balance, and design of diversion structures. Greater flexibility is provided to both the operator and the regulatory authority to design and implement surface mining and reclamation operations which address site-specific hydrologic and geologic conditions.

EFFECTIVE DATE: This regulation is effective October 26, 1983. The incorporation by reference of the publication listed in the regulations is approved by the Director of the Federal Register as of October 26, 1983.

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I. Introduction

Protection of the integrity of the Nation's surface- and ground-water resources from the potential adverse impacts of coal mining is one of the major objectives of the Surface Mining Control and Reclamation Act of 1977, *30 U.S.C. 1201 et seq.* (the Act). Sections 507 (b)(11), (b)(14) and (b)(15), 508 (a)(5), and (a)(13), 510(b)(3), 515(b)(10), 516 (b)(4), (b)(9) and (b)(12), 517 (b)(2), and 717 of the Act are the primary hydrologic and geologic requirements for permitting, mining, and reclaiming a surface coal mining operation.

Hydrologic and geologic systems are, in most cases, exceedingly complex, and their protection from the adverse impacts of mining activities is often difficult and subject to uncertainty. OSM believes that the best approach to meeting the goals of the Act is through a premining analysis of the potential impacts of mining on the hydrologic balance, application of environmentally protective mining and reclamation practices, and monitoring. To this end, the final rules establish basic permitting and performance standards with nationwide applicability, provide operators the opportunity to apply cost-effective hydrologic and engineering techniques to their particular mining situation, and provide the regulatory authority latitude to prescribe, on a case-by-case basis, additional elements for permit conditions which it deems necessary to protect the hydrologic balance.

The protections prescribed by the Act for surface- and ground-water resources from both surface and underground mining are similar. The final permitting requirements for hydrologic and geologic information for surface mining (Part 780) and underground mining (Part 784) are essentially identical. The hydrologic performance standards for surface mining activities (Part 816) and underground mining activities (Part 817) for the most part are also identical. The primary differences appear in the performance standards for discharges from underground mines and in not requiring the identification and replacement of water supplies that may by impacted by underground mine operations. The following discussion of the rules adopted and the public comments received will reference surface mining requirements unless a specific issue concerning underground mining was raised or is otherwise appropriate. However, the discussion is equally applicable to the requirements for both surface and underground mines.

II. Background

On June 25, 1982 *(47 FR 27712)*, OSM proposed rules for hydrology and geology permitting requirements and hydrology performance standards. This action was taken primarily to clarify the essential hydrologic and geologic concepts contained in the Act, to reorganize the rules so that hydrology and geology requirements would be set in distinct sections rather than being dispersed throughout the permanent program, and to take advantage of the experience gained by OSM over the years by way of updating the rules and providing improved direction to the regulatory authorities and applicants.

The proposed rules were based upon and referenced OSM's Permanent Regulatory Program promulgated on March 13, 1979 *(44 FR 14902, 15311).* Readers should consult the cited Federal Register notices for additional background information regarding hydrologic and geologic requirements and supporting technical references. The reader should also note that, as a result of the district court's decision in *In re: Permanent Surface Mining Regulation Litigation*, C.A. No. 79-1144 (D.D.C. May 16, 1980), certain of the March 13, 1979, permanent program rules for hydrology were amended or suspended. *See 45 FR 51548*, August 4, 1980. Where appropriate these final rules address the court's decision in that case.

Numerous modifications to the rules affecting hydrology were proposed in the June 25 Federal Register notice referenced above. Discussion of the public comments received are addressed in Part III of this preamble.

Public meetings were held in Washington, D.C., on July 1, 20, 23, and 27, 1982 and in Pittsburgh, Pennsylvania, on July 22 and 23, 1982. On July 13, 1982 *(47 FR 30266)*, OSM issued a notice closing the public comment period for the hydrology and geology rules, effective August 25, 1982. During the comment period, OSM received comments from sources representing industry, environmental groups, associations, and Federal and State agencies. The OSM Administrative Record for these rules was reopened to allow insertion of the comments made at the oversight hearings held by the House Interior and Insular Affairs Committee on September 9 and 10, 1982.

III. Discussion of Comments and Rules Adopted

A. Definitions

B. Geologic Information

C. General Comments on Hydrology Rules

D. Hydrology Permitting Rules

E. Hydrologic Balance Protection Performance Standards

F. Diversions

A. Definitions (Section 701.5)

Definitions for the terms "cumulative impact area" and "gravity discharge" were proposed in the June 25, 1982, rulemaking. A third term, "potentially impacted offsite areas," was proposed in an earlier OSM rulemaking *(47 FR 42-43*, January 4, 1982). The phrase "potentially impacted offsite areas" was used throughout the June 25, 1982, proposed rules. However, in response to comments, OSM did not adopt the proposed deinition. Rather, the final rule uses the term "adjacent area," which was defined in a Federal Register notice issued on April 5, 1983. *(48 FR 14814-14822).* The reader is referred to the preamble on that final rule for a discussion of the comments received and the meaning of the term "adjacent area."

1. *Cumulative impact area*. Final § 701.5 defines "cumulative impact area" to mean "the area, including the permit area, within which impacts resulting from the proposed operation may interact with the impacts of all anticipated mining on surface- and ground-water systems." The definition for "cumulative impact area" also contains an explanation of "anticipated mining" as including, at a minimum, the entire projected lives through bond release of the proposed operation; all existing operations; any operation for which a permit application has been submitted to the regulatory authority; and all operations required to meet diligent development requirements for leased Federal coal for which there is actual mine development information available.

Thus, the final definition for "cumulative impact area" consists of two parts: The first sets out the extent of the area which the regulatory authority will evaluate when preparing the required cumulative hydrologic impact assessment (CHIA). This area will include those areas where there would be an interaction between the hydrologic impacts from the proposed operation and the impacts of all other anticipated mining. The second part of the definition clarifies the meaning of the term "anticipated mining" and identifies the minimum extent of mining, both existing and proposed, which must be included in the CHIA evaluation.

The final definition modifies the proposal to clarify the definition and to emphasize the delineation of minimum boundaries for the area to be covered by the CHIA. Included among the changes are the following: The introductory phrase in the proposal referring to "the assessment of probable cumulative hydrologic impacts" has been removed as unnecessary. OSM has chosen the phrase "may interact with" to describe the relationship between the impacts on hydrology which the proposed operation may have with the impacts of all anticipated mining. This addresses criticism that OSM used the same words in the definition that it was attempting to define. The proposed phrase "surface- and ground-water basin(s)" has been replaced with the phrase "on surface- and ground-water systems." The former phrase was inappropriate as it suggested consideration of areas which could be well beyond the reach of any impacts on hydrology that need be studied by the regulatory authority in order for it to fulfill its statutory obligations. The phrase adopted is flexible enough to allow the evaluation of the full reach of impacts on hydrologic systems without suggesting unnecessary analysis.

Several alternatives were included in the preamble to the proposal for the definition of "anticipated mining" as follows:

The proposed language, which included all existing operations, the proposed operation over its entire projected life, and any operations which the regulatory authority reasonably expected to be permitted during the projected life of the proposed operation.

Limiting anticipated mining to the operation covered by the permit and other existing operations.

Including only those operations for which a permit has been issued or for which a permit has been officially applied.

Including the entire life of the proposed mine and other existing operations.

In the West, including any leased Federal coal.

Comments were specifically requested on these and any other alternatives a commenter felt should be considered.

In the final rule, OSM adopts a technically and environmentally sound definition for "anticipated mining" that avoids requiring the regulatory authority to attempt to assess the hydrologic impacts of operations that are merely speculative rather than actually anticipated, while assuring that all operations receive thorough analysis prior to commencement of mining. The definition includes all operations which have a reasonable expectation of receiving regulatory authority approval to mine and for which there is sufficient mine development information available to allow adequate analysis.

OSM recognizes that under the definition adopted some person could submit a permit application to conduct a future mining operation which was not included in an earlier CHIA. However, any such future operation or operations could not be permitted until after the completion of a new CHIA which would have to consider the newly proposed operation and any other "anticipated" mines. "Thus, any cumulative risk to the environment will be identified and could be mitigated." *(47 FR 27714.)* If any material damage would result to the hydrologic balance from the cumulative impacts of a newly proposed operation and any previously permitted operation, the new operation could not be permitted.

Several commenters have confused the relationship between the definition for "cumulative impact area" and the analysis performed by the regulatory authority known as the cumulative hydrologic impacts assessment. As described above, the cumulative impact area refers to the area of concern, that is, the areal extent of cumulative hydrologic impacts. The CHIA refers to the required assessment of cumulative impacts.

The major provisions defining the scope of the required CHIA are contained in sections 507(b)(11) and 510(b)(3) of the Act. These sections require data for the "mine site and surrounding areas" so that the regulatory authority can make the CHIA (section 507(b)(11)); specify that this assessment not be required until the necessary information on the "general area" is available, but that the permit not be approved unless such information is available (section 507(b)(11)); and require the assessment of the cumulative impact of "all anticipated mining in the area" (section 510(b)(3)). These provisions are implemented in § 782.21(g).

The term "cumulative impact area" is not defined in the Act, but, as used in these rules, it is intended to be in accord with the use of the terms "mine site and surrounding area" and "general area" appearing in section 507(b)(11) of the Act. These terms define the areal extent of baseline data requirements for the CHIA.

The term "general area," in previous § 770.5, is being deleted as part of the revised permitting rule which removes 30 CFR Part 770. This rule uses the term "cumulative impact area" to circumscribe the baseline data requirements for the CHIA. The use of the new term in the rules is not intended to change the scope of the Act's requirements. Rather, it is intended to help clarify the extent of the area for which a CHIA must be completed and to reduce some of the confusion resulting from the application of the term "general area" in the previous rules. The nature and scope of cumulative hydrologic impact assessments will be discussed in greater detail later in this preamble.

One commenter viewed the previously used term "general area" as more precise for describing the area of concern for protection of hydrologic resources than the proposed definition of "cumulative impact area." Also, the commenter believed that the proposed definition would not cover area-type operations or account for long-term ground-water impacts.

The final definition for "cumulative impact area" will prove to be workable and can effectively replace the term "general area" in the previous rules. The final definition for "cumulative impact area" allows for the delineation of an area which must be analyzed for cumulative impacts occurring outside the permit area of the proposed operation. Furthermore, because the definition encompasses offsite impacts from all anticipated mining, all hydrologic resources

which may be impacted will be included in the assessment regardless of the type of coal mining operation. Long-term impacts are no different under either the definition for "cumulative impact area" or the previously used term "general area." The definition adopted provides the regulatory with the necessary flexibility and guidance to protect the hydrologic balance of an area. This, coupled with monitoring information and predicitive methodologies, will allow detection of potential problems and suggest remedial or preventive actions.

Several commenters considered the proposed definition of "cumulative impact area," and particularly the explanation of the term "anticipated mining," to be too broad. Most focused on the speculative nature of hydrologic predictions, the scaracity of hydrologic data for many areas of the country, the diffculty in obtaining data considered proprietary, and the ease and benefits associated with basing a cumulative assessment on data available through the permitting process. Some commenters argued that the proposed broad-based assessment would be ambiguous, beyond statutory requirements, unscientific, and open to challenge because it would lack reasonable standards to guide the applicant and the regulatory authority. Others contended that the regulatory authority would have an impossible burden in assessing cumulative impacts, esspecially in situations where rapid development was possible. They believed that without the benefit of permit data, the regulatory authority would be forced to rely on clairvoyance. Also, they viewed the definition as encompassing areas that would make the analysis meaningless.

Suggestions for changing the definition of "cumulative impact area" included limiting "anticipated mining" to existing operations and those for which a permit application had been filed. State commenters who objected to the breadth of the proposed definition, nevertheless wanted the regulatory authority to have the discretion to include additional areas in the assessment. Advocates for limiting the definition believed that since a cumulative hydrologic impact assessment must be completed for each new permit application prior to issuing a permit, remedial and mitigative efforts for new impacts could be addressed at that time. Some commenters thought the definition should not require the assessment to cover the entire life of the proposed mine. Others believed that life-of-the-mine impacts could be reasonably projected.

Some commenters felt the proposed definition was too narrow and suggested other changes. Some viewed the phrase "projected life of the proposed operation" as too restrictive because it did not include postmining operation impacts. Another commenter thought that limiting the scope of "anticipated mining" to the projected life of the mine, as proposed, ran contrary to congressional intent. A State commenter suggested that the definition should establish a uniform national minimum standard but allow the regulatory authority to consider a period of analysis longer than the life of the operation. Another commenter thought that reasonably anticipated mining would include coal areas under diligent development requirements.

OSM has considered all of the comments submitted and has revised the proposal as indicated above. The final rule does not require the regulatory authority to speculate or to use "clairvoyance" to evaluate potential impacts. Rather, it provides a definition which will allow a meaningful technical analysis, while ensuring that mining will not be permitted until the hydrologic impacts of all operations have been assessed.

The definition of "cumulative impact area" is structured to allow the regulatory authority to delineate an area of concern within which impacts from coal mining upon hydrologic systems will be assessed. Consideration of which mining operations must be included in the CHIA can be divided into three parts, as follows:

Pre-existing operations which have completed mining and reclamation;

Existing operations; and

Future operations.

The final does not specifically require that preexisting operations be identified and included in the cumulative impact area. Inclusion of such operations is unnecessary since any preexisting hydrologic impacts would become part of the baseline hydrologic conditions. Data covering such conditions will be provided with the permit application.

Both the proposed and final definitions include all existing operations. No comments were received which suggested that existing operations be excluded. Some difference of opinion among commenters existed with respect to potential future development at existing operations. OSM believes that future activities of existing operations should be included as "anticipated" operations. For such operations a plan for future mining will be available, along with hydrologic data submitted with the permit application for the existing mine. The comments suggesting that postmining operation impacts be considered has also been accepted. The final rule requires consideration of the entire life through bond release of all operations which are considered anticipated mining. Upon bond release all reclamation requirements of the Act must be fully met.

OSM rejects those comments suggesting that the definition be limited to operations already permitted. Moreover, the impacts of unpermitted operations such as operations of less than two acres for which a permit may not be required, must be included in the assessment.

In addition to future stages of existing operations, the definition also includes certain other "anticipated" future operations. Specifically, the definition includes the proposed operation; any other operations for which a permit application has been submitted to the regulatory authority; and any operations required to meet diligent development requirements for leased Federal coal and for which there is actual mine development information available. This definition is not intended to preclude the regulatory authority from including additional areas in the assessment at its discretion.

The basis for including the proposed operation and other operations with a permit application pending over their entire projected lives is the same as the reasoning behind including future stages of existing operations; that is, for such operations a plan for mining will be available as well as data submitted with the permit application and there will be a reasonable "anticipation" that such operations would receive permits and commence mining.

In the case of operations mining leased Federal coal, OSM thought it necessary to modify its proposal *(47 FR 27714)* in order to exclude operations for which data are speculative. Only operations for leased Federal coal which have hydrologic, geologic and mine development information available (for example: planned mining and reclamation techniques, processes, schedules) will allow for accurate hydrologic impact assessments.

The language of the proposed definition could have been read to require consideration of operations for which there was no plan for the mine and for which projected impacts were highly speculative. To focus analysis, instead, on non-speculative operations, OSM has listed operations which reasonably can be evaluated in interaction with the impacts of the proposed operation. The definition for anticipated mining does not, however, include merely possible or speculative operations for which the regulatory authority reasonably has no available information upon which to base its assessment.

One commenter thought that the limited definition of "cumulative impact area" might result in the exclusion from the CHIA of some watersheds which might be mined. Other commenters felt that this definition focused too much on anticipated mining rather than on all areas which might be impacted.

In proposing the definition it was not OSM's intent to exclude the consideration of any hydrologic system that might be impacted. The final rules require that, before approval of any permit for a surface coal mining and reclamation operation, a CHIA must be completed to determine whether the proposed operation has been designed to prevent material damage to the hydrologic balance outside the permit area. No exclusion of areas which may be impacted as stated or implied. The proposed definition was revised to allow consideration of all areas outside the permit area which would likely be impacted.

One commenter suggested that the use of the term "basin(s)" in the definition posed an impractical, if not impossible, task for the regulatory authority. Because of the vast size of some surface- and ground-water basins, the lack of information regarding boundaries and hydrologic properties and the overall complexity of large systems, the commenter thought that asissments of basins would be of little value, extremely costly, and time-consuming. Other commenters suggested that because mining impacts might be localized, the regulatory authorities should have discretion to delineate areas of analysis without set spatial limits and should focus attention on areas with overlapping impacts.

OSM agrees with these comments and has revised the final definition by substituting the more general term "systems" for the word "basin." This substitution conforms with usage in section 507(b)(11) of the Act and signifies that impacts are to be assessed on the hydrologic resources which may be impacted without set spatial limits which may be unmanageable. This change, however, will not restrict the area of analysis. It will allow the regulatory authority flexibility to define a meaningful cumulative impact area.

Other commenters thought the language of the proposed definition was confusing as to whether the CHIA was confined to the permit area. Changes have been made to the definition to clarify that the cumulative hydrologic impacts, both inside and outside of the proposed permit area, must be considered in the CHIA. Probable hydroligic impacts within the permit and adjacent areas which derive solely from the proposed operation will be included in the probable hydrologic consequences (PHC) determination for that mine.

One commenter suggested that the proposed definition was unworkable because it established a "circular test" by defining the cumulative impact area to be the area in which cumulative impacts may occur. Further, the commenter noted that the definition assumed that one might predict what the cumulative impacts would be prior to the analysis.

OSM has made changes in the language of the definition to address the commenter's first criticism. However, OSM disagrees with the commenter's second point.

OSM believes that the commenter has misunderstood the purpose of the "cumulative impact area" definition. Application of the definition will help a regulatory authority to establish the boundaries of the area to be analyzed. In establishing the physical scope of the cumulative impact area, the regulatory authority will look at the likely areas affected by the proposed operation, the likely areas affected by all anticipated mining and the likely areas to be affected by the interaction of impacts among the various operations. At this stage of establishing the area of concern, the regulatory authority need not determine the cumulative impacts on the hydrology of the area. Such analysis will occur during the CHIA process.

This is a workable approach. An educated judgment based upon available hydrologic, geologic and mine development information is the most feasible way to delineate an area in which there may be cumulative impacts. Furthermore, boundaries established for the assessment can later be changed by the regulatory authority if subsequent analyses or data reveal impacts beyond those in the area initially described.

One commenter thought that the cumulative impact area should be defined by the regulatory authority as the area of probable impacts developed through the use of standard hydrologic prediction techniques (modeling).

The cumulative impact area definition must be as specific as possible to reflect the intent of Congress but need not specify analytical techniques to be used in the CHIA. OSM expects that regulatory authorities will use modeling techniques, where appropriate, as tools for assessing cumulative impacts during the CHIA process.

One commenter wanted OSM to make it clear that when a proposed mine would be the first in an area, there would be no cumulative impacts and therefore no need for a CHIA.

While it may be possible that for a single hydrologically isolated mine the probable hydrologic consequences determination made by the operator would be adopted by the regulatory authority as the CHIA, nevertheless such a conclusion must be reached by the regulatory authority on a case-by-case basis.

Several commenters did not think that the proposed definition clarified the responsibility for preparation of the CHIA.

Responsibility for preparation of the CHIA lies with the regulatory authority as provided in § 780.21(h). This requirement does not, however, preclude the applicant from submitting information on the cumulative impact area as part of a permit application (§ 780.21(d)).

2. *Gravity discharge* . The term "gravity discharge" is defined in the final rule as mine drainage in underground mines that flows freely in an open channel downgradient. It does not include mine drainage that occurs as a result of flooding a mine to the level of the discharge.

Several commenters disagreed with the second sentence of the proposed definition which excluded mine drainage occurring solely as a result of hydrostatic pressure from a mine flooded to the level of discharge. Various suggested changes were offered. Some recommended deleting the words "solely" and "flooded to the level of discharge." These commenters felt the proposed language could be misinterpreted in two aspects: First, the words "solely" and "flooded to the level of discharge" could be read to mean that a mine could not be flooded above the level of discharge; and, second, the term "solely" could be interpreted to preclude "elbow" shaped mines where the lowest part of the roof at the elbow was below the level of the discharge. Such mines inhibit the free flow of fresh air into the mine workings, but do not result in all workings being flooded after mining ceases.

OSM agrees with these comments and has revised the final definition of gravity discharge to help eliminate these ambiguities. The word "solely" has not been adopted. OSM does not agree, however, with the commenters' suggestion to delete the words "flooded to the level of discharge." Since all water flows through a mine as a result of hydrostatic pressure, defining gravity discharge in terms of only hydrostatic pressure could result in exactly the form of misinterpretation the commenters sought to avoid. For this reason, the final definition retains these words, but does not include the words "hydrostatic pressure" in the final language.

One commenter stated that sufficient evidence was not available to be sure that acid mine drainage would not occur in flooded mines. According to this reviewer, the second sentence of the proposed definition would allow the development of mines which would discharge and therefore could produce acid mine drainage. Two commenters stated that the

proposed definition would not stop the discharge, but would block air return and restrict channel flow only until section 516(b)(12) of the Act no longer applied. The commenters felt such a result would be contrary to congressional intent.

OSM believes that Congress did not intend to ban all mining of potentially acid- or toxic-forming coal seams or to have all discharges from underground mines considered as gravity discharges. Section 516(b)(12) of the Act is concerned primarily with "up-dip" mining in the Appalachian coal fields that results in an open channel with water flowing downgradient unimpeded to the mine opening. That provision requires mine planning that will result in the creation of barriers to air and water flow through the mine by selective placement of mine openings and sound mine drainage control.

Because the availability of air is a major factor in the production of acid mine drainage, mine flooding is a generally accepted technique to minimize this problem. Congress did not prohibit the use of this control practice. The definition adopted is consistent with this approach. It is not, however, intended to preclude the use of "elbow" mines or the flooding of mines above the level of discharge.

Merely because a mine will discharge water is an insufficient basis to conclude that the mine should not be permitted. Since as a practical matter all mines do discharge water, such a provision would amount to a complete prohibition on underground mining, a result Congress clearly did not intend. As indicated above, mine flooding is a generally accepted technique to minimize acid and toxic discharges from underground mines. The final regulations encourage this technique. As one commenter noted, fresh air is an important ingredient in the formation of acid mine drainage. A principal objective of the second sentence of the definition of "gravity discharge" is to minimize the free flow of oxygen within a mine after closure and thus minimize the amount of oxidation. While it may not be possible, with existing technology, to totally prevent oxidation from occurring, a properly designed mine should be able to minimize the rate of oxidation of acid- or toxic-forming materials within a mine.

The latter commenters apparently felt that the proposed rule would allow a gravity discharge after a mine is closed. This is unfounded. Under section 516(b)(12) of the Act, mine openings for new drift mines in acid-producing or iron-producing seams must be located to prevent gravity discharge. OSM interprets this provision and the final rule to require the mine to be designed to prevent such discharges both during mining operations and after mine closure.

One commenter felt that OSM was expressing a preference for "wet seals." Another commenter felt the proposal would allow discharge past "ineffective seals." These conclusions are incorrect. While OSM is expressing a preference for mine flooding after closure, the final rule is not intended to encourage "wet seals." Rather, mine design that would allow flooding of potentially acid- or toxic-forming material, while allowing dry seals, may in most cases be preferable. The rules for mine seals, either "wet" or "dry," however, are contained in §§ 817.14 and 817.15. These requirements are unaffected by the definition of gravity discharge. Thus, the definition will not restrict the effectiveness of mine seals.

B. Sections 780.22 and 784.22 Geologic information.

The geologic information required by these rules will give the regulatory authority an adequate geologic description of all lands that may be affected throughout a surface coal mining and reclamation operation. They will also assist the regulatory authority in determining whether compliance with a number of performance standards can be achieved, and, after permit issuance, whether the standards are being met. Principal among these performance standards is protection of the hydrologic balance. Others include casing and sealing of drilled holes, coal recovery, backfilling and grading, etc.

Sections 780.22(a) and 784.22(a)

Paragraph (a) establishes the general requirements for submission of geologic information and sets forth the purposes for which the specific information required in paragraph (b) is to be used. The general purposes for the data are: (1) To assist the applicant in the preparation of the probable hydrologic consequences (PHC) determination; (2) to identify locations for surface- and ground-water monitoring and to develop the monitoring and hydrology protection plans required under §§ 780.21 and 784.14; (3) to identify potentially acid- or toxic-forming strata within the permit area down to and including the stratum immediately below the lowest coal seam to be mined; (4) to assist the regulatory authority in its permit review responsibilities under section 510(b) of the Act to determine whether reclamation as required by the permanent regulatory program can be met and whether the proposed operation has been designed to prevent material damage to the hydrologic balance outside the permit area; and (5), in the case of underground mining operations, to assist in determining whether a subsidence control plan under *30 CFR 784.20* is required.

Paragraph (a) differs from proposed paragraph (a) in several ways. First, it contains a more complete list of uses for the geologic information, thus emphasizing the relationship which the data will have with certain responsibilities of the applicant and the regulatory authority. This change was made in response to a commenter suggestion that the rule indicate the contexts in which the geologic data will be used to fulfill statutory requirements.

Final paragraph (a)(1) differs from proposed paragraph (a)(1) by utilizing the terms "permit and adjacent areas," rather than "potentially impacted offsite area." Several commenters objected to use of the phrase "potentially impacted offsite area" which appeared in the proposed rules for hydrology and geology information. As discussed elsewhere in this preamble, OSM has not adopted the proposed phrase. The areal coverage of the PHC determination is the "permit area" and the "adjacent area", which are terms defined in § 701.5, and the language of the geology rule has been changed to conform to the use of these terms.

Final paragraph (a)(2) is adopted from proposed paragraph (a)(2) and requires the geologic information to be sufficient to determine all potentially acid- or toxic-forming strata down to and including the stratum immediately below the lowest coal seam to be mined. For underground mines, the requirement includes both the permit area and the area covered by underground workings to ensure that all potentially acid-forming or toxic-forming seams that may be mined are identified in the permit application.

Paragraph (a)(3) summarizes how the regulatory authority will use the information being provided. Paragraph (a)(4) of § 784.22 is based on proposed § 784.22(a)(3) and links the collection of the baseline geologic information with the preparation of the subsidence control plan.

Several commenters objected to the adoption of the proposed subsidence information collection requirement. They thought relevant information would be supplied in the subsidence control plan. OSM disagrees. The general geologic information required by § 784.22 is applicable generally to subsidence concerns as well as to hydrology. The subsidence control plan will supplement this information with information more specifically related to subsidence.

One of these commenters thought that the proposed language, "conditions that may influence ground subsidence * * *," was alarmingly open-ended and could result in unwarranted requests for information. OSM disagrees. Paragraph (a) generally outlines the general objectives to be achieved in the submission of geologic information. However, since § 784.20 more precisely describes the subsidence control permitting requirements, the final rule adopts more precise language which focuses attention and limits the scope of the information to be requested to that necessary to prepare the subsidence control plan.

OSM did not adopt the recommendation of several commenters to include language in paragraph (a) authorizing operators to "reference" geologic information in the application. OSM is sympathetic to the concern raised by the commenters about supplying voluminous data already in the possession of the regulatory authority. However, the waiver provided for in paragraph (d) is broad enough to address this situation.

Sections 780.22(b) and 784.22(b).

Except for certain differences in the information collection requirements for underground operations where the strata above the coal seams to be mined will not be removed, the requirements of paragraph (b) for surface and underground mining activities are similar. Paragraph (b) sets forth the minimum requirements for the collection, analysis, and description of geologic information.

Sections 780.22(b)(1) and 784.22(b)(1) require the permit application to include a general description of the geology of the proposed permit area and adjacent areas. Final paragraph (b)(1) combines the requirements of proposed paragraphs (b)(1) and (b)(2) to simplify the wording of the regulation and make the requirements more easily understood. The description must extend to all strata down to and including the deeper of either the stratum immediately below the lowest coal seam to be mined or any aquifer below the lowest coal seam to be mined which may be adversely impacted by mining. The description is to include the areal and structural geology as well as other parameters which influence the required reclamation and the occurrence, availability, movement, quantity, and quality of potentially impacted surface and ground waters. It is to be based upon the cross sections, maps, and plans required by §§ 779.25 and 783.25; drill holes, core samples, and other data required under paragraphs (b)(2), (b)(3) and (c); and geologic literature and practices.

One commenter suggested that surface- and ground-water quantity be added to the list of features that should be considered in describing the geology of the permit and adjacent areas. This comment was accepted and paragraph (b)(1) has been revised accordingly.

Sections 780.22(b)(2) and 784.22(b)(2) deal with the analysis of samples collected from portions of the permit area where the overburden has been or must be removed. In such situations the samples may be collected from test borings; drill cores; or from fresh, unweathered, uncontaminated samples from the rock outcrops. The depth of the samples to be taken must extend to the deeper of either (1) the stratum immediately below the lowest coal seam to be mined or (2) any aquifer below the lowest coal seam to be mined which may be adversely impacted by mining.

Paragraphs (b)(2) (i) to (iii) identify the information which must be provided from the collection and analysis of the various overburden and coal samples and are adopted from proposed paragraph (b)(3). The data to be obtained will show the lithologic characteristics of the strata, including physical properties and thickness. The chemical analyses of each stratum will provide information on the potential presence and content of acid-, toxic- or alkaline-forming materials. The regulatory authority may determine that analysis for the presence and content of alkaline-forming material is unnecessary. The coal seams will be analyzed for the presence of acid- and toxic-forming materials, including total sulfur and pyritic sulfur. In case of pyritic sulfur, the regulatory authority may find that determining its content is unnecessary. Finally, the resulting data will indicate the location of all ground water, including aquifers.

Redundancy as to the location for sample collection has been eliminated. Under paragraph (b)(2), samples are to be obtained from the permit area. In addition to obtaining samples from test borings or drill cores, the rule allows the collection of "fresh, unweathered, uncontaminated samples from rock outcrops * * *." This addition was made in response to the suggestion of two commenters to allow collection by hand from rock outcrops or excavations at or near the faceup areas, especially at existing mines. While authorizing such a practice, OSM considers it important that the samples be fresh or recently collected before analysis. Also, the sample must be taken from rocks that are in place and have not naturally slumped or been weathered. Under such circumstances, the carefully collected samples should be representative of the rock in the overburden.

In keeping with the intent expressed in the June 25, 1982, preamble to the proposed rule *(47 FR 27719)* and with modifications made in the hydrology information rule, OSM has adopted language which describes the depth for sample collection. The prior rule at § 779.14(a) was vague and subject to differing interpretation. The language of the proposed rule did not carry out fully the intentions as expressed in the June 25, 1982, preamble to include in the geologic description and analysis all strata down to the stratum below the lowest coal seam to be mined or a lower aquifer that may be impacted by mining.

Commonly, the stratum immediately below a coal seam consists of very fine grained, sedimentary rock which has a low transmissivity or does not have the hydrologic properties necessary to transmit or yield ground water. This stratum may range in thickness from less that 2 feet to several feet and has been variously referred to locally as "underclay" or "fire clay." Although this "underclay" or "fire clay" stratum is generally not considered an aquifer, the next lower (i.e., underlying) stratum commonly has improved hydraulic capabilities and may be an aquifer. Depending upon site geology and operating procedures, such an aquifer may have the potential of being adversely impacted by surface coal mining activities such as blasting, which may fracture any stratum between this aquifer and the coal seam *(44 FR 15031).* Therefore, the applicant has the responsibilities for determining the presence or absence of such an aquifer below the coal seam "underclay" and for assessing its potential for being adversely inpacted by the mining activity.

The language of the final rule clarifies the applicant's responsibilities. It sets forth the vertical depth for geologic information collection. It requires data from the deeper of either the stratum immediately below the lowest coal seam to be mined or any aquifer below the lowest coal seam to be mined which may be adversely impacted by mining.

In paragraph (b)(2)(i), some commenters objected to combining the collection of geologic and hydrologic data from the same drilling program. As one pointed out, combining the two requirements would require drilling to be halted, the well bore to be cleaned and developed, and the well allowed to stabilize before meaningful data could be obtained. Well stabilization could take a considerable amount of time before drilling for lithologic information could resume. OSM agrees that requiring water quality to be included with the drill hole or core sample logs may not be reasonable. Ground-water quality analysis is covered by a separate section and need not be repeated here. The final rule still requires, however, the drill logs to include identification of the occurrence of ground water. Such identification does not require special preparation of the drill hole and stabilization to collect samples.

One commenter objected to the deletion of the requirement for data on the compaction and erodibility properties of strata within the overburden which appeared in the prior rules at §§ 779.14(b)(1)(iii) and 783.14(a)(1)(iii). The commenter thought this omission would preclude some potential for postmining variations in land use. However, the commenter did not explain how having such information about the overburden would be relevant to variations in the postmining use of the overburden material.

Collecting information on compaction and erodibility of the undisturbed overburden is not precluded by the language of the final rule at paragraph (b)(2)(i), which requires information about the "physical properties* * * of each stratum * * *." However, obtaining such information about every stratum may be unnecessary. Usually obtaining information about the geotechnical engineering properties of overburden is relevant when designing certain engineered structures. The professional engineer who plans the structures must determine if testing overburden materials is needed and the kinds of tests to be performed.

Two commenters proposed deleting entirely the requirement in paragraph (b)(2)(ii) to collect data on alkaline-forming materials because the Act does not specifically call for alkalinity information. This suggestion has been rejected. Knowing the alkaline-forming potential of the overburden and substrata will be helpful when planning revegetation efforts in arid and semi-arid areas of the country and when determining the buffering capacity of the strata to neutralize or mitigate acid drainage. (*See* Chapter 1 of the U.S. Department of Agriculture Handbook No. 60 (1954); and *44 FR 15032-15033,* March 13, 1979).

While the Act does not specifically list potential alkalinity, Section 508(a)(12) does call for "an analysis of chemical properties * * * of the mineral and overburden * * *." OSM views this language, coupled with section 507(d) and 508(a)(14), as sufficient authority for this regulatory requirement. To the extent that information on potential alkalinity may not be relevant in a particular situation, the final rule allows the regulatory authority to waive the requirement.

Proposed paragraph (b)(3)(iii) called for the preliminary analysis of the coal seam for total sulfur content. This analysis would have been followed by analyses for sulfate sulfur, pyritic sulfur, and organic sulfur when the regulatory authority considered such action to be necessary because the total sulfur content was sufficiently high to indicate the likely presence of acid-forming materials *(47 FR 27720).* In response to a comment which pointed out the important relationship between the presence of pyritic materials and the acid-forming potential of coal, OSM has modified the final rule so that final paragraph (b)(2)(iii) requires the chemical analysis of the coal seam for the presence and contents of acid- and toxic-forming materials including total sulfur and pyritic sulfur. As written, the regulation assumes analysis for pyritic material except in those instances when the applicant can demonstrate to the regulatory authority that providing such information is unnecessary.

When analyzing coal for acid- and toxic-forming potential, determining the total sulfur content will include the sulfur chemically combined as part of organic matter and as part of inorganic sulfides (such as pyrite and marcasite) and inorganic sulfates (such as calcium sulfate and iron sulfate). Therefore, analysis for the contents of total sulfur and pyritic sulfur according to established procedures, such as those developed by the American Society for Testing Materials (1981), will provide sufficient baseline information about the acid-producing potential of the coal. If the regulatory authority finds it to be necessary, it can require additional analysis for sulfate sulfur or organic sulfur under paragraph (c).

OSM has not adopted a commenter recommendation to require analysis for the mineral marcasite. Being the less stable orthorhombic form of iron disulfide, marcasite generally changes to the mineral pyrite, the more stable isometric form. The additional procedures that would be needed to determine the separate content of each mineral would involve x-ray and/or optical techniques. Yet, the results would provide no more information on the acid-producing potential of the coal seam than is learned from the combined pyritic sulfur (pyrite and marcasite) content.

Section 784.22(b)(3) in the underground mining regulations takes into account certain differences posed by those operations for areas in which overburden is not removed. It is based on proposed § 784.22(b)(4). In contrast to §§ 780.22(b)(2) and 784.22(b)(2), it requires the collection of samples only from test borings or drill cores taken from strata that may be impacted by the underground mining activities above and below the coal seams to be mined, including impacts to the hydrologic balance. Samples must be taken from the adjacent area as well as the permit area. In addition to providing physical and chemical analyses similar to that required for surface operations, where standard room-and-pillar mining methods will be used, the application must contain information on the thickness and engineering properties of those strata immediately above and below the coal seams to be mined if they contain clays or soft rock such as clay shale. This information is intended to assist in evaluating roof and floor rock characteristics that may affect subsidence.

One commenter recommended deleting the entire proposed § 784.22(b)(4). The commenter argued that the decision in *In re: Permanent Surface Mining Regulation Litigation,* C.A. No. 79-1144 (D.D.C., May 16, 1979) at page 12, ruled against such an information collection requirement because underground mining activity only disturbs the surface with respect to surface facilities and roads.

OSM rejects this limited interpretation for a number of reasons. First, surface impacts from underground mining activities occur from more than roads and support facilities. Section 516 of the Act recognizes this fact. Second, the commenter misstated the effect of the court's decision in *In re: Permanent Surface Mining Regulation Litigation.* The court did not rule on this matter. Rather, in response to the plaintiff's allegation of overbreadth in the regulatory language of 30 CFR 783.14(a) *(44 FR 15363 (1979)),* OSM amended the rule to narrow its application *(45 FR 51550,* August 4, 1980). The language of final § 784.22(b)(3) is consistent with the approach adopted by OSM in 1980 in that it calls for geologic information about particular strata above and below the coal seam to be mined as opposed to all strata, down to the coal seam. And third, § 784.22(b)(3) will assist the underground mining operator and the regulatory authority to meet various other statutorily imposed responsibilities as well.

Proposed § 784.22(b)(4)(iv) generated favorable and unfavorable comments. One commenter applauded the requirement to determine the engineering properties of the clay or soft rock underlying the coal seam. The commenter suggested that the information be collected for the life of the mine. OSM has not adopted this suggestion for the reasons outlined below.

Another commenter objected to the requirement for the engineering properties of materials underlying the coal seam. The commenter thought that this kind of information had in most cases already been obtained. Another commenter believed this information would be addressed in the subsidence control plan. OSM agrees that the requirements of proposed § 784.22(b)(4)(iv) could have been required in the subsidence control plan rather than in the general geology section. However, OSM does not agree that this requirement should be deleted entirely. The engineering properties of materials underlying coal seams vary. The objective of the requirement is to alert the regulatory authority and the operator of possible bearing-capacity failure of the pillars and excessive deformation of the floor beneath the pillars. (See *Cummins* (1973).)

One commenter thought the information requirement should apply to materials *overlying* as well as underlying the coal seam. The final rule adopts this suggestion.

Some commenters believed that the geologic description and information collection requirements should extend to an area covering the life of the mine. These commenters thought that such an extension was necessary for the PHC determination and CHIA which in the commenter's opinion also covered the life of the mine. Another commenter argued that the Act only requires operators to obtain hydrologic information from outside the permit area in relation to issues of hydrology.

OSM has specified that the minimum area from which geologic information must be gathered is the permit area and permit and adjacent areas as appropriate. The language of sections 507(b)(15) and 508(a)(12) of the Act point to the "permit area" as the site for test borings or core samples. To the extent that geologic information collected from off the permit area is needed to fulfill the statutory requirements to protect the hydrologic balance, to minimize or prevent subsidence, or to meet other performance standards which may have offsite effects, this serves as the basis for § 784.22(b)(3) and for the regulatory authority requiring the collection of such additional information under § 780.22(c) and § 784.22(c).

OSM does not accept the argument that the data automatically should be collected from an area covering the life of the mine. As is discussed in Parts C and D of this preamble, the applicant is responsible for collecting information sufficient to make the PHC determination. This determination is required for the permit and adjacent areas. While OSM agrees that geologic information covering the life-of-the-mine area will likely be necessary to complete the CHIA, this information is not specifically required to be submitted by the applicant until it is available from an appropriate Federal or State agency. On the other hand, the permit may not be approved under section 507(b)(11) of the Act until this information is available. Recognizing that the lack of such information may delay permit approval, §§ 780.21 (c) and (g) and 784.21 (c) and (f) provide that this information may be submitted by the applicant with the permit application. The reader is referred to the preamble to those sections for additional discussion of this issue.

Sections 780.22(c) and 784.22(c)

Final paragraph (c) makes clear that the regulatory authority may require supplementation of the baseline geologic information to be collected, analyzed, and described pursuant to paragraph (b). The regulatory language for the surface and underground rules are essentially identical. The final rule establishes the test that the regulatory authority must apply when deciding whether any supplemental information is needed.

Three commenters objected to the latitude in proposed paragraph (c) that would allow the regulatory authority to require the collection of samples outside the permit area. They argued that an operator cannot be required to go on land not covered by the bond or not controlled by the operator. OSM disagrees. The final rule establishes a test which the regulatory authority must apply before requiring the additional information. Because there is considerable potential for impacts to the hydrologic balance and to surface areas outside the permit area resulting from underground mining operations, the regulatory authority must be able to obtain adequate information concerning these areas if it is to perform its permit application review responsibilities effectively.

One commenter was concerned that proposed paragraph (c) would allow the regulatory authority to require the collection of nonessential information from greater depths resulting in loss of time and great expense. OSM rejects the assertion that regulatory authorities will seek nonessential information. Having the flexibility provided in paragraph (c) is important because geologic conditions and the proximity of aquifers to mining operations may lead to serious impacts on water quality and quantity which, in turn, could affect the hydrologic balance. In order to develop meaningful PHC determinations, deeper analyses may be necessary. The final language of paragraph (c) is not expected to result in abuse of that discretion by the regulatory authorities.

Sections 780.22(d) and 784.22(d)

Paragraph (d) allows the regulatory authority to waive, in whole or in part, the requirements of §§ 780.22(b)(2) and 784.22 (b)(2) and (b)(3), upon the request of an applicant, provided the regulatory authority makes a written finding that the information is unnecessary because other equivalent information is available to it in a satisfactory form. When making this request, the applicant should provide appropriate references in the application to identify the sources of the substitute information.

As written, the language of the final rule is more precise than the proposal which would have allowed a waiver if the information was unnecessary. The rule makes clear that the waiver applies only to the collection and analysis requirements for test borings and drill cores. The rule specifies the rationale derived from section 508(a)(12) of the Act which the regulatory authority must apply before approving any waiver. It is retained from previous §§ 779.14(b)(3) and 783.14(b), with editorial changes.

One commenter misunderstood the purpose of the waiver provision. The commenter believed it applied when overburden analysis was unnecessary because of the nature of the surface mining activities (i.e., gob piles, loading facilities, processing plants). However, the geology rule does not require test borings or drill cores of strata that will likely be unaffected by particular mining activities. For example, if the surface mining activity consisted solely of a loading facility, the breadth and depth of the geologic information to be collected would reflect this fact.

One commenter thought that the proposal relaxed the requirement for the regulatory authority to have access to equivalent information. The commenter feared the substitution of irrelevant data. The language of the final rule takes into account the requirements of both sections 507(b)(15) and 508(a)(12) of the Act. OSM does not construe the word "equivalent" which appears in section 508(a)(12) as simply meaning "identical." Rather, the substitute material to be considered by the regulatory authority must be of equal value or effect.

As was pointed out in the June 25, 1982, preamble, regulatory authorities may have access to other kinds of relevant information, such as past mining and reclamation experience with particular areas or strata, which would make part or all of the information collection and analysis unnecessary *(47 FR 27720).* The regulatory authorities should be able to judge whether material to be substituted has the same significance as the material being replaced. This degree of flexibility is consistent with the Act.

Another commenter wanted it made clear that analyses are necessary and must be available in the application. The commenter thought section 507(b)(15) of the Act only authorized waivers from collecting data anew.

OSM disagrees with the commenter's reading of the statutory language. Neither section 507(b)(15) nor the legislative history prohibit waiver of analysis as well as data collection where the regulatory authority finds that it has access to material having a corresponding value. Section 507(b)(15) is quite specific that all the requirements appearing in the

provision are eligible for waiver. This includes data collection and analysis. OSM has not, however, included the general geologic description requirements in the paragraph (d) waiver.

C. General Comments on Hydrology Rules

When referring to the analyses required by the Act, OSM has adopted the nomenclature of the Act. These analyses are now referred to as the "probable hydrologic consequences determination" (PHC) and the "cumulative hydrologic impact assessment" (CHIA).

Many commenters supported the proposed hydrology rules, citing improved clarity and organization, a more logical approach to permit requirements, greater flexibility for the regulatory authority, reduced burdens for operators, and emphasis on performance standards rather than design criteria.

Other commenters had general criticisms for the proposed changes. One disagreed with OSM's determination that the proposed rules would not have a "significant economic impact on a substantial number of small entities." The commenter thought the studies which the operator must perform were unnecessary and unrealistic with no benefit other than to satisfy the regulation.

OSM rejects these assertions. The analysis conducted under the Regulatory Flexibility Act was based upon the proposed changes from the previous rules and was thorough and accurate. Further, the information and analytical requirements included in the rule are based on requirements of the Act and are aimed at protection of hydrologic resources, and therefore cannot be considered unnecessary or unrealistic.

One commenter objected to all of the proposed rules which authorized the regulatory authority to prescribe requirements. This commenter feared that the regulatory authority would have too much latitude and would make "frivolous requests for non-essential information * * *."

OSM disagrees. There is no basis to believe that regulatory authorities will make frivolous requests for information. It is important for the regulatory authority to be able to prescribe the necessary conditions for any coal mining operation. This flexibility allows response to unique or unusual situations without the need for across the board requirements affecting all operators.

One commenter believed that the rules focused on areas of the country where surface water availability was low. The commenter thought that the rules should emphasize local and regional differences as required by the Act. Another commenter wanted the rules to provide the regulatory authority with greater flexibility to prescribe geologic, hydrologic, and monitoring requirements because it would be in the best position to evaluate need.

The final rules call for basic permitting baseline information, specific analyses, and performance standards in accordance with the requirements of the Act. The hydrologic, geologic, and monitoring data required represent a framework of detail needed by the operator and the regulatory authority for the design and evaluation of a mining and reclamation plan. These requirements are consistent with sections 507, 508, 510, 515, 516, and 717 of the Act. At the same time, the rules give the regulatory authority flexibility to fill information gaps in response to site-specific conditions when the national requirements are insufficient.

One commenter asserted that all hydrology information requirements and assessments made should cover the life of the mine and should include offsite areas.

OSM agrees that the CHIA required under sections 507(b)(11) and 510(b)(3) ot the Act should cover the life of the mine and should include offsite areas. Otherwise, hydrologic and geologic permitting data are required, under the rules, for the permit area and any adjacent areas which may be impacted by the proposed mining operation. This is consistent with the ruling of the U.S. District Court for the District of Columbia in *In re: Permanent Surface Mining Regulation Litigation,* No. 79-1144 (D.D.C.), Slip op. at pp. 35-36 (February 26, 1980) and Slip op. at pp. 57-58 (May 16, 1980).

The following provides an outline of the timing and areal extent of required hydrologic information and assessment requirements.

(1) Baseline hydrologic information is collected prior to the mining opration, is included in the permit application, and describes the existing conditions in the proposed permit and adjacent areas (§ 780.21(b)).

(2) The probable hydrologic consequence determination is included in the permit application and covers all mining authorized under the permit until bond release (§ 780.21(f)) and describes any impacts of that mining in the permit area and adjacent areas.

(3) Information for the cumulative hydrologic impact assessment is compiled from existing sources where such information is available. In the event sufficient data are not available, the applicant may provide the necessary supplemental material. The information and assessment, at a minimum, cover the cumulative impact area for the life of the proposed operation and all anticipated mining (§ 780.21 (c) and (g)).

(4) The monitoring plans for surface-and ground-water resources appear in the application. They reflect the PHC determination and the CHIA. They cover impacts both within the permit area as well as outside the permit area (§ 780.21 (i) and (j)).

(5) The plan to protect the hydrologic balance is described in the application. The steps to be taken are based on the PHC determination and CHIA. The goal of the plan is to minimize disturbance to the hydrologic balance in the permit area and adjacent area, and to prevent material damage outside the permit area. The plan remains in effect until bond release (§ 780.21(h)).

One commenter wanted it made clear that the PHC determination and the CHIA were required for each application for a permit or revision.

A PHC determination and CHIA must be made for each new permit application. Under the revised final regulations concerning applications for permit revisions, the regulatory authority will determine whether a new or updated PHC determination and CHIA are necessary.

Several commenters stated that the proposed rules deleted critical data requirements and sufficient detail necessary for reclamation and operating planning. In their opinion, this, coupled with weakened monitoring requirements, would make permit review more difficult and adverse hydrologic impacts more likely.

OSM disagrees with both assertions. While the reorganization of the hydrology rules has resulted in fewer parameters being listed and fewer analyses or plans required across the board, nevertheless all changes are in keeping with provisions of the Act, and sound environmental practices. Furthermore, the rules authorize the regulatory authority to add requirements, as necessary, to assure that each operation is designed, operated, and reclaimed to protect the hydrologic balance. Moveover, as described below, monitoring is not weakened.

One commenter suggested that design criteria developed at a State level might be very useful, especially to small operators, and that OSM should make this point in the preamble to the hydrology rules.

OSM has included some basis design criteria. It has authorized regulatory authorities to provide additional design criteria where such would be appropriate. For further discussion about OSM's position on performance standards and design criteria, the reader is referred to the "Final Environmental Impact Statement OSM-EIS-1: Supplement," Volume 1, pp. IV 5-7.

One commenter believed that the complexity of the information process had been increased by separating the hydrology and geology information requirements from other resource information sections.

To the contrary, the information process has been enhanced by pulling together all hydrologic and geologic information requirements and relating them to each other. However, none of the information collection requirements for the permit application should be treated in a vacuum. Operators and regulatory authorities should rely on all relevant information at their disposal.

The same commenter thought that the concept of creating a body of baseline information on which to evaluate compliance with performance standards had the defect of relying on the regulatory authority's ability to foresee problems in order to frame its response in the application analysis.

The baseline hydrologic and geologic information will be sufficient to provide the regulatory authority with information from which to determine operator compliance with required performance standards. Moreover, the rules allow for the regulatory authority to require additional information should that prove necessary. While it may be difficult at the permit review stage to predict all possible environmental problems that could develop, the regulatory authority will be applying its best judgment that the operation has been designed to prevent material damage to the hydrologic balance

outside the permit area. The ongoing monitoring will provide the regulatory authority with operational data so that adjustments to the hydrologic protection plan or other permit conditions may occur.

Generally, commenters believed that the proposed standards for sampling and analyses would improve the quality of permit applications. However, two commenters suggested, in keeping with the spirit of proposed § 780.21(a), that OSM inspectors, contractors and others be required to follow the prescribed procedures and methodologies as well as to make split samples available to operators and to file them for verification of their quality.

OSM agrees that hydrologic information should be collected and analyzed according to standard procedures by all parties. All OSM inspectors are required to follow prescribed agency procedures; and State regulatory programs are required to be consistent with OSM regulations. In most cases this will result in the use of the methodologies listed in § 780.21(a). Although OSM cannot set requirements for "other" parties, including permit challengers, scientifically sound information is imperative to evaluate compliance with the regulatory standards. However, requiring a regulatory authority to retain samples for every inspection of every operation and to make sample splits available would place an unreasonable burden upon regulatory authorities. If a person has reason to question the validity of an analysis or sample, he or she may request appropriate administrative and judicial review. Additionally, any citizen who believes a violation may continue to exist may request that further inspections be made.

The U.S. Environmental Protection Agency (EPA) has asked OSM to clarify that these rules do not supersede EPA's regulations pertaining to non-coal mine waste under the Resource Conservation and Recovery Act of 1976, as amended (RCRA), *42 U.S.C. 6921 et seq.* Operators are required to comply where applicable. As for coal mine waste, OSM and EPA have undertaken a joint study under Subtitle C of RCRA. Until that study is completed, OSM has no responsibility for regulating coal mine waste under Subtitle C of RCRA.

In a number of instances, activities subject to the hydrology regulations may involve discharges of dredged or fill material into surface waters, including wetlands, subject to section 404 of the Clean Water Act. A question was raised whether, in those instances, OSM would itself determine whether the activity complied with the requirements of section 404 or whether OSM instead expected the applicant to furnish evidence that the Corps of Engineers had made such a determination.

The Corps of Engineers has issued an interim final nationwide permit for certain surface mining activities. OSM is in the process of reviewing the requirements of the Surface Mining Regulatory Program, including permitting requirements and performance standards, to determine if they are sufficient to satisfy the requirements of section 404. OSM expects to work with EPA and the Corps of Engineers to ensure that if the nationwide permit for surface mining activities is retained, OSM's regulations are consistent with such a permit.

D. Hydrology Permitting Rules (Sections 780.21 and 784.14)

Generally, comments addressed both sets of rules for surface and underground mining. Unless otherwise indicated, the following discussion will be deemed applicable to both. The references provided will be made to the rules for surface mining activities.

Section 780.21 has ten paragraphs; § 784.14 has nine. Paragraph (a) prescribes water quality sampling and analysis methodologies. Paragraph (b) prescribes the baseline hydrologic information to accompany each permit application. Paragraph (c) describes the baseline cumulative impact area information. Paragraph (d) allows the use of modeling techniques. Paragraph (e) specifies alternative water source information for surface mining activities only (and is not required in Part 784). Paragraph (f) specifies the requirements for the PHC determination. Paragraph (g) describes the CHIA. Paragraph (h) includes the requirements for the hydrologic reclamation plan. Paragraph (i) specifies the ground water monitoring plan. Paragraph (j) specifies the surface water monitoring plan. Each of these paragraphs is described in detail below.

Sections 780.21(a) and 784.14(a) Sampling and analysis methodology.

Paragraph (a) incorporates by reference the 15th edition of "Standard Methods for the Examination of Water and Wastewater" and references 40 CFR Parts 136 and 434 which rely upon EPA's publication "Methods for Chemical Analysis of Water and Wastes". These water-quality sampling and analysis methodologies are to be used when providing the baseline hydrologic information for the proposed permit and adjacent areas in the application. Either of these methodologies must be used for all required water-quality analyses. These are to be used for required water-quality

sampling when feasible. References to baseline information which appeared in the proposed paragraph have been deleted. The requirements for baseline information are set out in paragraph (b).

One commenter suggested that OSM should not reference "the most current editions" in the rule but should provide the date of publication for each reference.

OSM agrees with the commenter and notes that the Office of the Federal Register requires the current edition be specified. OSM will publish a notice in the Federal Register of any change in these publications (i.e., a new edition of a reference or a new reference).

One commenter objected to OMS's use of the term "feasible" in connection with the collection of water-quality sampling, believing the word could be interpreted as providing a "loophole" for operators from doing water-quality sampling.

OSM disagrees. Paragraph (a) merely provides guidance on methods of data collection and analysis, and does not diminish an applicant's responsibility under the other paragraphs of § 780.21 to submit information and analysis. Sampling methodologies may vary based upon the water source being sampled and other site-specific conditions. The documents referenced on sampling procedures were not developed to provide strict methods for hydrologic data collection. Rather, they establish guidance and general standards for good practice. As these publications become more widely accepted and revised to cover all circumstances, it may be appropriate to make their use mandatory in all cases. However, at this point the rules appropriately acknowledge that the sampling procedures outlined may not be feasible in all circumstances where sample collection may be necessary.

One commenter criticized OSM's use of the phrase "hydrologic data representative of * * *", pointing to the March 13, 1979, preamble to the permanent regulatory program which stated that modeling had not yet reached a state of art to be a universally accepted tool. The commenter viewed the proposed rule as allowing modeling everywhere.

Although the final paragraph describing the baseline information no longer includes this language, paragraph (d) continues the principle of previous § 779.13(c) to allow use of modeling where appropriate. The comment appears to be based on two misconceptions. First, the language cited in the March 1979 preamble was an extraction from commenter ideas regarding modeling techniques. It was not an OSM position. Second, OSM is not promoting the use of modeling techniques in all cases. The application of modeling techniques may be acceptable based on site-specific conditions, the parameter being modeled, and what other data may be available. All techniques used by an applicant will be reviewed by the regulatory authority who has the option to require actual data even when modeling techniques are used.

Another commenter felt that OSM provided no defined procedure for determining what data to include in the baseline information collection effort and that use of the phrase "representative of" in the proposal rendered the rule vague and uncertain.

OSM disagrees with this assertion because guidance is provided regarding hydrologic information requirements in paragraphs (b), (c), (d), and (f). Also, the regulatory authority may set additional site-specific information requirements. Authorizing the use of "representative data" allows for the use of cost effective methods for describing some hydrologic conditions without collecting additional data. The limitations on the use of such data are discussed under paragraphs (d) and (f). However, OSM agrees that the proposed rule caused confusion by including both a general statement on data requirements and specific requirements for collection and analysis methodologies in the same paragraph. For this reason the first sentence of proposed paragraph (a) is not included in the final rule. This sentence was unnecessary since data requirements are set out in subsequent paragraphs.

Sections 780.21(b) and 784.14(b) Baseline ground-water information and baseline surface-water information.

Many commenters addressed both surface- and ground-water baseline information requirements jointly. OSM agrees that there is some redundancy between the requirements for surface- and ground-water baseline hydrologic information requirements.

To simplify the rule and reduce unnecessary wording, the final rule combines proposed paragraphs (b) and (c) in one paragraph (b) dealing with baseline data. No substantive change is intended by this reorganization. However, the initial sentence does specify that the regulatory authority may call for additional information beyond that specified as minimum, because site-specific conditions may necessitate such additional data. This preamble combines the comment responses on the two proposed information collection requirements.

Final paragraph (b) describes the baseline information requirements for ground- and surface-water resources in paragraphs (b)(1) and (b)(2), respectively. Paragraphs (b)(1) and (b)(2) call for certain fundamental information of all applicants. Under paragraph (b)(1), an applicant shall provide information for the proposed permit and adjacent areas about the location and ownership of existing wells, springs and other ground-water resources; water usage; as well as specific descriptive parameters relating to ground-water quantity and quality, including total dissolved solids (TDS) or specific conductance corrected to 25 deg. C, pH, total iron, and total manganese. These requirements differ from the proposal in that ground-water quantity information must include "approximate rates of discharge or usage and depth to the water in each water bearing stratum" rather than "discharge rate and depth to water in each significant water-bearing strata * * *." The first change was made because calculating water usage will generally provide an adequate gauge for determining the status of the resource without the more costly and environmentally disruptive process of always calculating the discharge rates. The second change, i.e., deletion of the word "significant," was made in response to comments and to ensure the collection of all necessary information.

Under paragraph (b)(2) an applicant must provide fundamental information about surface-water location, usage, quality and quantity. The requirement differs from the proposal in that an applicant is asked to provide information about ownership of surface-water bodies, and the location of any discharges into them. Identification of ownership will make paragraph (b)(2) consistent with (b)(1) and meet information requirements of section 507(b) of the Act. Identifying the location of discharges is necessary to fulfill effluent limitation requirements. Surface water quality baseline information must describe total suspended solids (TSS) in addition to the parameters enumerated for ground water. Baseline acidity and alkalinity information must be provided if there is a potential for acid drainage from the proposed mining information. Water quantity description must include, at a minimum, baseline information on seasonal flow rates.

Paragraph (b)(3) calls for certain supplemental information if an operator finds in the probable hydrologic consequences (PHC) determination that adverse impacts on or off the permit area may occur to surface-water resources or to strata that serve as aquifers which significantly ensure the hydrologic balance, or that acid-forming or toxic-forming materials are present that could result in contamination of ground- or surface-water supplies.

The requirements for supplemental information have been revised in response to comments, to specify that any supplemental information which is necessary to complete the PHC determination and evaluate adverse impacts on the hydrologic balance and potential contamination of water supplies must be included in the permit application. The requirement extends to both surface-water and ground-water resources, because both make up the hydrologic balance and because they often interconnect.

One commenter thought that the preamble to the final rule should point out the relationship between the hydrology and geology information requirements and that the permit application should contain appropriate cross-references and maps.

A thorough understanding of the geologic setting is necessary to understand the hydrologic systems encountered. Although OSM has separated these information requirements for clarity in the permitting process, the two are interrelated and have been emphasized throughout the permitting rules. Hydrologic/geologic cross-sections and maps remain part of the application as required by existing §§ 779.24, 780.14, 784.23, and other rules in 30 CFR Chapter VII. No further cross-references are necessary.

One commenter approved of OSM's emphasis in the proposed rules on significant water resources but suggested that it might be more expedient for the operator to collect more data and perform more analyses than the stated minimum to supplement the regulatory authority's cumulative hydrologic impacts assessment.

As was described above, OSM has modified the test for supplemental baseline information to extend to all adverse impacts on the hydrologic balance and not just significant water resources. The more general statement is deemed appropriate since the PHC determination is an analysis of impacts generally. It should be noted, however, that this section merely relates to hydrologic impact analysis and does not set standards for environmental protection of nonsignificant water resources. With respect to the question of an operator providing additional information for purposes of the CHIA process, both paragraphs (c) and (g) authorize this. It is important to point out the differences between baseline imformation collection and cumulative impact area information collection. The first will give the regulatory authority specific data about the proposed permit and adjacent areas so that impacts of the operations proposed to be authorized by the permit can be determined. The second will enable the regulatory authority to evaluate the interaction of the proposed operation with all anticipated mining on the hydrology of the area and to predict cumulative hydrologic impacts.

One commenter questioned the relationship of baseline information to the PHC determination and the completeness of a permit application.

Baseline information on surface- and ground-water resources is intended to provide a description of existing hydrologic conditions at a particular proposed mine site and in the adjacent area. This information in conjunction with the operator's specific mining and reclamation plans will be used to develop the PHC determination by the applicant. Both the baseline information and the PHC determination must be included in the permit application. Although the rules set minimum requirements for baseline hydrologic information, the regulatory authority's familiarity with the hydrologic and geologic conditions of a particular area and the proposed design and operation submitted in the mining and reclamation plans will dictate the type and amount of information necessary for a "complete and accurate permit application" as that term has been defined at *30 CFR 701.5*. The completeness of a permit application is determined by the regulatory authority prior to approval.

Two commenters saw the proposed rules as cutting back too far on initial baseline analyses. One thought proposed paragraphs (b)(1) and (c)(1) omitted information requirements which would be essential for completing the PHC determination and CHIA. By way of example the commenter claimed that surface-water information must be collected showing water quality as related to seasonal, peak, and low-flow conditions in order to relate quality to quantity. The other commenter believed that the regulatory authority would not be able to determine if performance standards were being met.

OSM disagrees with these conclusions. Final paragraph (b) is more complete and flexible than previous baseline information requirements. All essential information requirements from the previous rules have been incorporated in the final rules. Moreover, the regulatory authority has the prerogative to expand information requirements when necessary. Along with basic information and analysis, the final rules also require supplemental information when necessary in the PHC determination process. This approach assures protection of the hydrologic balance without placing unnecessary burdens on all operators. Adjustments in proposed monitoring and hydrologic protection plans may be included if necessary to eliminate any potential material damage outside the permit area based on the regulatory authority's CHIA. Preparation of the CHIA in many cases may involve data beyond that obtained for the PHC determination. However, since preparation of the analysis is the responsibility of the regulatory authority from available information, such cumulative impact area data have not been included as a mandatory permit application requirement.

One commenter interpreted proposed paragraph (b)(2) as creating a mechanism whereby an operator could avoid gathering hydrologic data necessary to determine whether a resource was significant or currently used.

The baseline information called for under paragraph (b)(1) will be collected for each water-bearing stratum. Data obtained under paragraph (b)(3) do not supplant the data collection requirements of paragraph (b)(1). The information collected under paragraphs (b)(1) and (b)(2) will aid the regulatory authority when it evaluates the likely adverse effects of the proposed operation and when it examines the proposed hydrologic protection plan for adequacy.

One commenter wanted the minimum information requirements eliminated because in some cases the commenter thought they would be unnecessary and burdensome.

Although the regulatory authority must have the prerogative to specify information requirements for each proposed permit area. there is a minimum of information which will be necessary for descriptive and monitoring purposes as well as for serving as a basis for the PHC determination. The minimum requirements specified are essential for most operations and they likely will be expanded by the regulatory authority to account for local hydrologic conditions.

Several commenters supported use of the proposed phrase "currently used or significant" to modify ground-water information requirements. Some viewed it as a screening process in the development of sound data bases. Other commenters objected to the application of this test prior to requiring an operator to secure supplemental data. They noted that the term "significant" was not defined, that there was no indication that enough data could be collected to determine significance and that the Act required protection of the hydrologic balance without regard to the significance or use of the water.

OSM has taken all of these comments into account and modified the final rule to eliminate vagueness and yet retain the limited distinction it believes should be made. As revised, baseline information is mandated for all water-bearing strata. The only kind of ground-water resource that may not require the securing of supplemental information is one that does not affect the overall hydrologic balance, for example, a hydrologically isolated water zone.

One commenter feared that failure to obtain relevant data to establish the need for monitoring would be compounded because proposed paragraph (g) allowed the operator in making the PHC determination "to use only data statistically representative of the site or data collected near (but not on) the site."

OSM believes that the relationship between the requirements of final paragraphs (b), (f) and (i) is reasonable. Under final § 780.21(f), the PHC determination must be based on the baseline information collected under paragraph (b). Adequate onsite data will be available for the operator to make the PHC determination. Under § 780.21(i), waivers from the general requirement to monitor will be sufficiently restricted.

Two commenters thought proposed paragraph (b)(2), related to supplemental information requirements, was a problem since the requirement was based on a finding in the PHC determination of likely adverse impacts. However, the commenters were concerned that this finding could not be made without the information required in paragraph (b)(2). Thus, the commenters viewed OSM as putting "the cart before the horse" by requiring the operator to make the PHC determination before deciding whether or not to collect certain data.

This comment reflects an incomplete understanding of the content and purpose of the hydrology permitting rules. The necessary baseline information for all operations is outlined in the final rules and is intended to serve as a reference point of existing conditions. It is entirely appropriate to provide for a relationship between the baseline data requirements and the required analytical evaluation, in this case the PHC determination. Otherwise, the operator would either be required to collect an insufficient or an excessive amount of data to make the necessary determinations. Since no area of the country is totally without some hydrologic and geologic information being available, qualified professionals should be able to determine baseline data needs to complete the PHC determination early in the permit application preparation process. Further, variations in hydrologic and geologic conditions from site to site and in different regions render it virtually impossible to write a rule of nationwide applicability that covers all possible baseline conditions and types of mining. If an applicant is uncertain as to the conditions in a particular locale and the extent of information required, he or she may consult with the regulatory authority to receive additional guidance.

The regulatory authority has the option to expand these basic requirements if necessary to protect the hydrologic balance or otherwise to understand the potential impacts of the operation. Moreover, the preparation of the PHC determination should reflect the input of any other relevant information requirements provided for in the rules.

The information requirements listed in final paragraphs (b)(1), (b)(2), and (e), in combination with the geologic information required by § 780.22, are sufficient to prepare the initial PHC determination. Moreover, throughout the application stage the regulatory authority may require additional information necessary to assure that the proposed operation will protect the hydrologic balance. All hydrologic information and evaluations by the operator in the PHC determination are subject to review and approval by the regulatory authority (*30 CFR 773.15(c)(1)*). If deemed warranted, additional information requirements or conditions to the mining and reclamation plans may be established.

Commenters thought that since iron and manganese did not usually represent a health hazard and, that since these elements in a dissolved state might be carried away from the mine site, analysis should focus on dissolved rather than total concentrations.

Total concentrations serve as an appropriate nationwide requirement because they can indicate potential problems with both dissolved and suspended constituents. As a practical consideration, both manganese and iron tend to precipitate out of solution upon storage so that dissolved concentrations are more difficult to determine than total levels.

In a related vein, another commenter stated that the combination of total plus dissolved iron provided information previously determined by OSM to be necessary *(43 FR 41695, 41839*, September 18, 1978). The commenter viewed the reasoning in the preamble to the proposed rule for requiring only total concentrations as insufficient in comparison to the earlier analysis.

The individual and relative merits of the various iron analyses are not specifically discussed in the earlier preamble. While analysis for both total and dissolved iron may be appropriate in some situations, the objective of the requirements of paragraphs (b)(1) and (b)(2) is to alert the regulatory authority and the operator to problems that may be encountered at the site. Since the total analyses include both suspended and dissolved constituents, adequate information will be provided for this purpose. If additional analysis is necessary to complete the PHC, it will be furnished under paragraph (b)(3). No adverse consequences are expected as a result of this change, especially since the regulatory authority can obtain additional analytical information if total levels appear high.

One commenter offered two suggestions. First, the term "ground water" should not include mere infiltration or percolation of rainfall but only permanent bodies of underground water. Second, ground water should be evaluated for quality in comparison to the quality of its source.

No changes have been made based on these comments. First, the definition of ground water found in the existing rules at § 701.5 is environmentally sound and workable in the context of surface mining activities. This definition includes all saturated rock or soil materials but does not include percolating water in the zone of aeration. Second, quality comparisons between a gound-water resource and its origins may be appropriate in some circumstances but in most cases would likely be irrelevant to the goal of predicting impacts on the hydrologic balance from a proposed mining operation. If adverse impacts are possible, monitoring of changes from baseline conditions will usually be a better measure of the impacts from mining than comparisons of baseline conditions with water origins.

Two commenters were concerned that the requirement for "discharge rates" as part of the ground-water baseline information might result in unproductive expense and significant environmental disturbance.

OSM agrees and has reworded the final rule to require "approximate rates of discharge or usage." This modification will give the regulatory authority an idea of the quantity of water in each water-bearing stratum and the importance of this quantity to various users without adversely affecting the environment or placing an undue burden on the applicant where there is an existing water usage.

One commenter suggested that the minimum requirements for ground-water information be expanded to include temperature and direction of ground-water movement. The commenter gave no reason for the suggested change.

OSM disagrees with the commenter's suggestions. Its intent in listing required parameters is to provide a basic understanding of hydrologic conditions and to alert the operator and regulatory authority to potential problems and impacts on the hydrologic balance that may occur due to mining. Temperature changes do not generally result from coal mining and, therefore, no general requirement relating to temperature has been included in the final rule. On the other hand, analysis for specific conductance levels does require consideration of temperature. Therefore, in accordance with the references cited in paragraph (a), paragraphs (b)(1) and (b)(2) have been revised to clarify that specific conductance levels are to be corrected to 25 deg. C. This will necessitate a temperature reading of the sample to determine any necessary correction. If additional temperature data are appropriate in a particular situation, these may be required by the regulatory authority. Further, while flow direction is possible to estimate through water-level fluctuations and knowledge of geologic formations, it is a most difficult parameter to measure accurately. Also, determining flow patterns in complex geologic settings would be costly and would likely produce inexact data of questionable value to the operator or regulatory authority. Since flow direction can generally be determined from information otherwise required, no change has been made to the final rule based on this comment.

Two commenters suggested modifying the requirements for seasonal ground-water quantity and quality information with the phrase "when obtainable." They thought that this information might be difficult to determine and verify because of well construction and filters.

OSM understands that certain wells may pose problems for sampling. However, seasonal variation is essential to an understanding of the dynamic nature of the hydrologic regime. And seasonal variation data are required by sections 507(b) and 508(a) of the Act.

One commenter believed that drawdown effects resulting from mining and ground-water development associated with mining should not be considered adverse impacts unless protected by State law.

Water-rights issues, especially in the Western States, may complcate surface mining activities. In some instances, State requirements pertaining to such issues have been incorporated into State regulatory programs. Nevertheless, the Act prescribes protection of the hydrologic balance. Since water-level drawdown may affect both onsite and offsite areas, the impacts of ground-water development or dewatering will have to be considered in the PHC determination and may result in supplemental information requirements as noted in paragraph (b)(3). These steps are necessary so that the design and conduct of mining activities will protect the hydrologic balance.

Two commenters suggested substituting the word "or" for the word "and" with respect to additional information requirements specified by the regulatory authority in proposed paragraph (b)(2). The commenters noted that all of the listed information may not be necessary in every case.

OSM agrees with this comment and has rephrased paragraph (b)(3).

Two commenters suggested that OSM emphasize the use of extrapolation and interpolation techniques especially with respect to seasonal variation and clarify that permit approvals were not precluded in areas where actual low-flow and seasonal-variation information was unavailable.

Flow and seasonal variation information is required for all permit applications as prescribed in the Act. If this information is unavailable, the applicant must obtain it. OSM agrees that the use of modeling and other techniques are useful to the applicant for predictive and descriptive purposes. Their use is authorized in paragraphs (d) and (f), but use of modeling is at the discretion of the regulatory authority.

One commenter suggested that the reference to impoundments in proposed paragraph (c)(1) be qualified by the phrase "important or significant."

The intent of the Act is to protect and understand the nature of all surface-water resources. The final rule calls for basic information regarding these resources. This does not impose undue hardships on the applicant and has been retained in the final rule.

Sections 780.21(c) and 784.14(c) Cumulative impact area information.

Paragraph (c) describes the kind of hydrologic and geologic information that the regulatory authority must consider when preparing the cumulative hydrologic impacts assessment (CHIA) required by paragraph (g). The provision has been modified to reflect changes made to the final definition for "cumulative impact area." References to geologic information have been included in response to commenter requests for integration of the two kinds of data requirements. As with the proposed rule, the regulatory authority may obtain the information from appropriate State or Federal agencies. In order to help expedite the permitting process, the operator may gather and submit the necessary information as part of the permit application. As required by section 507(b)(11) of the Act, a permit cannot be approved until the necessary information is available to the regulatory authority.

Several commenters thought the proposed provision allowing an applicant to gather and submit data on the cumulative assessment could be construed as being mandatory. Also, they thought the assessment was not cost-effective and of questionable value.

Paragraphs (c) and (g) make it clear that preparation of the CHIA is the responsibility of the regulatory authority. Under paragraph (c)(1), however, the operator is required to identify and provide to the regulatory authority data available from appropriate Federal or State agencies on the cumulative impact area. Submission of these data is mandatory and will be used by the regulatory authority in preparing the CHIA. Paragraph (c)(2) gives operators the *option* to collect and submit the cumulative impact area information with the permit application where the information is not available from such agencies. Generally, it is to the applicant's advantage, particularly with respect to timing, to assist the regulatory authority by providing the necessary hydrologic and geologic information when possible. Preparation of a CHIA prior to approval of a permit is mandated by the Act.

One commenter suggested rephrasing proposed paragraph (d) pertaining to cumulative impact area information to specify that the applicant would be responsible only for information regarding the potential consequences of his operation and that the CHIA would be limited to existing mines and potential aggravation of existing or predicted impacts resulting from those mines.

OSM disagrees. Sections 507(b) and 510(b) of the Act require a cumulative impact assessment (CHIA) for "all anticipated mining." As discussed above, the "anticipated mining" is defined to include more than just existing mines. Therefore, the CHIA cannot be limited to only existing mines. (See discussions for definition of "cumulative impact area" and paragraph (f). The final rule reflects this conclusion, but allows the operator to assist the regulatory authority in securing needed cumulative impact area information.

Sections 780.21(d) and 784.14(d) Modeling.

Paragraph (d) allows an operator to use modeling techniques, interpolation, or statistical techniques when developing material for the permit application. However, the provision does not eliminate the possibility that actual surface- and ground-water information also may be required. Minor editorial changes have been made in the final rule from proposed paragraph (e).

One commenter thought that proposed paragraph (e) took no notice of the complexities associated with the modeling of hydrologic systems. The commenter viewed this coupled with the allowance for "representative data" in proposed § 780.21(a) as adversely affecting the level of environmental protection.

OSM disagrees with this conclusion. The language of final paragraph (d) is basically the same as previous § 779.13(c). OSM disagrees with the commenter's assessment that the new rule ignores the complexities of modeling or that OSM's allowance of modeling will have an adverse environmental effect. OSM recognizes the complexities associated with modeling and statistical analysis. However, the application of modeling may be acceptable based on site-specific conditions, the parameter being modeled, and what other data may be available. Techniques used by the applicant will be reviewed by the regulatory authority, who may require collection of actual data even when models are used. Under paragraph (f) statistically representative data may form the basis of the PHC determination only when used in conjunction with baseline hydrologic, geologic and other information collected for the permit application.

Section 780.21(e) Alternative water-source information.

Paragraph (e) of the final rule applies only to surface mining activities and aids in fulfilling the requirements of sections 508(a)(13)(C) and 717(b) of the Act. It requires the operator to provide information on water availability and alternative water sources if the PHC determination under paragraph (f) indicates that the proposed operation may proximately result in contamination, diminution, or interruption of water used for domestic, agricultural, industrial, or other legitimate use within the proposed permit or adjacent areas. Except for minor editorial changes, the paragraph for surface mining is adopted essentially as proposed.

The final rule requires alternative water-source information only for surface mining activities, since application of section 717(b) of the Act to underground mining was ruled improper in *In re; Permanent Surface Mining Regulation Litigation*, No. 79-1144 (May 16, 1989). The related performance standard at § 817.54 of the March 1979 rules was suspended by OSM on August 4, 1980 *(45 FR 51547).*

Section 508(a)(13)(C) of the Act is one permitting standard which implements section 717(b) of the Act. Because section 717(b) applies only to surface mining activities, information on alternative water sources for underground mining activities, which would otherwise be required under section 508(a)(13(C) of the Act, is not needed and has not been provided for. This difference between Parts 780 and 784 is authorized by section 516(d) of the Act.

One commenter wanted proposed paragraph (e) to require information on the legal and physical availability of alternative water sources and assurance that water uses during mining would be recognized and protected.

The language of the paragraph is broad enough to cover adequately all legal and physical concerns which the regulatory authorities may have. Protection of water uses during mining operations is addressed by this and other provisions in the permitting and performance standard sections for surface coal mining operations.

Sections 780.21(f) and 784.14(e) Probable hydrologic consequences determination.

Final paragraph (f) requires the operator to make a determination of the probable hydrologic consequences (PHC) of the proposed operation upon the quantity and quality of ground water and surface water under seasonal flow in the proposed permit and adjacent areas. This determination is a predictive estimate of potential impacts on the hydrologic balance. It serves as one source of basic information for the regulatory authority when preparing the CHIA. It will be used by the regulatory authority to evaluate whether the operation has been designed to minimize disturbances to the hydrologic balance both within and outside the permit area and to prevent material damage to the hydrologic balance outside the permit area. The paragraph specifies minimum analytical findings and estimates and allows the regulatory authority to expand the findings to be made. The findings which go into the PHC determination have a direct bearing on remedial measures, monitoring requirements, and supplemental baseline information requirements that will be set for an applicant.

A number of changes were made from the proposed rule. The areal coverage of this provision is specified in the first sentence, that is, the proposed permit and adjacent areas. Other references to spatial extent have been deleted as redundant. As mentioned earlier, the proposed phrase "potentially impacted offsite areas" has been replaced with the term "adjacent area." Under § 780.21(f)(2) the PHC determination must rely upon the baseline hydrologic, geologic, and other information collected for the application. Statistically representative data may be used to supplement other baseline data collected for the permit application.

Specific findings to be included in the PHC determination and alluded to in other paragraphs of § 780.21 have been summarized in §§ 780.21(f)(3) and 784.14(f)(3). The first two findings are required for both surface and underground mining. These are: (1) Whether adverse impacts may occur to the hydrologic balance, and (2) whether acid-forming or toxic-forming materials are present that could result in the contamination of surface- or ground-water supplies. The third finding requires a determination of whether the proposed operation may proximately result in contamination, diminution, or interruption of certain water uses. This finding is included only in § 780.21, for surface mining activities since, as discussed earlier, the requirements of section 717 of the Act for replacement of such water uses is applicable only to surface mines and not to underground mines. The fourth finding under § 780.21(f)(3) requires determination of impacts on sediment yield, total suspended and dissolved solids, flooding or streamflow alteration, ground-water and surface-water availability and other characteristics required by the regulatory authority. The finding related to ground-water and surface-water availability should pertain to impacts on future uses, where known, as well as to impacts on existing uses.

As noted above, paragraph (f)(3) includes a requirement that the PHC include a determination of the probable impacts of the mining operation on total dissolved solids. Salinity (total dissolved solids) predictions can be extremely useful as an indicator of potential problems for which remedial measures can be prescribed. Also, along with total suspended solids, it is one of the parameters specifically required by section 507(b)(11) of the Act. In order to clarify the actual analysis desired, OSM has modified the final rule to add a requirement for suspended solids and to replace the requirement for salinity with one of total suspended and dissolved solids. Other changes made between the proposed and final language are of an editorial nature.

To ensure that the probable hydrologic impacts of any changes to the original plan for mining are evaluated throughout the life of the mining and reclamation operation, paragraph (f)(4) clarifies that the regulatory authority must review applications for permit revisions to determine whether a new or updated PHC determination is necessary. This is consistent with the revised application review procedures of § 774.13.

One commenter suggested that because the determination of probable hydrologic consequences (PHC) by the operator is limited to a 5-year period and because the CHIA is made for the life of the mine, a major data gap was created which made it difficult to assess individual impacts for the life of the mine. Another commenter thought that limiting the PHC determination to the 5-year term of the permit was contrary to congressional intent.

The commenter's interpretation of OSM's intent regarding the time frame of the PHC determination is incorrect. Section 507(b)(11) of the Act calls for a determination of probable hydrologic consequences both "on and off the mine site." OSM interprets this phrase as including the permit and adjacent areas. This is consistent with the previous rules (*30 CFR 780.21(c)*). The activities whose impacts are examined in the PHC determination include the mining and reclamation activities proposed under the permit. However, the impacts resulting from such activities may extend beyond the time required to complete actual mining and reclamation. The predictive analysis in the PHC determination must cover the full extent of such impacts. The time frame for other areas and activities for the cumulative impacts of all anticipated mining will be covered by the CHIA.

Under the final rules, the regulatory authority is required to obtain the necessary information so that, through its CHIA process, it can determine whether the proposed operation has been designed to prevent material damage to the hydrologic balance outside the permit area. The CHIA must include consideration of all "anticipated mining"; as discussed above, the definition of anticipated mining includes the entire projected life of the proposed operation through bond release.

Possible gaps in data between those which may be required for the PHC and those which may be required for the CHIA, under section 507(b)(11) of the Act, cannot be required from the applicant until they are made available from an appropriate Federal or State agency. Nevertheless, the permit may not be approved until such information is available and incorporated in the application. If necessary information on likely impacts within the cumulative impact area is not available to the regulatory authority from State or Federal sources, then the applicant may gather and submit the data.

One commenter wanted it made clear that both the PHC determination and the CHIA were means to decide whether an operation was designed to prevent material damage to the hydrologic balance as required by section 507(b)(11) of the Act.

The PHC determination and CHIA are pre-mining analyses which allow the operator and regulatory authority to design an operation to minimize hydrologic impacts in the permit and adjacent areas and to prevent material damage to the hydrologic balance outside the permit areas. Their relationship to each other is covered in § 780.21 (f), (g), and (h)

of the final rules. Section 507 (b)(11) of the Act describes the relationship between the PHC determination and CHIA and requires this analysis to take place prior to application approval.

One commenter thought that proposed paragraph (g) did not require sufficient information to ensure that all performance standards would be met.

OSM disagrees. Final paragraph (f) is written broadly to cover all probable hydrologic impacts. This would cover the relevant performance standards of sections 515 and 516 of the Act. Also, additional information may be required by the regulatory authority.

One commenter considered the term "statistically representative" ambiguous in a regulatory sense because data from any coal field could be considered statistically representative and because such data could not be used responsibly as a substitute for actual analyses. This reviewer also commented that natural systems data were often statistically independent and that the proposed rule did not consider this fact or the needed precision when using these terms in a regulatory context.

In conjuction with the collection of actual baseline data, an applicant may use representative data from sites in close proximity to the proposed operation which have similar hydrologic and geologic conditions. While natural systems can vary from place to place, when sound statistical procedures are employed in conjunction with data from hydrologically and geologically similar sites and the baseline data for the proposed site, this variability can be recognized and accounted for so that accurate projections can be made and verified. Furthermore, the accuracy and usefulness of the PHC determination will be assured because the regulatory authority must review the use of the statistical and modeling methods and may require collection of actual information in addition.

Two commenters wanted OSM to provide a clearly stated methodology for conducting PHC determinations.

In the preamble to the proposed rule, OSM expressed general guidance regarding PHC analysis. Because OSM believes that analyses must be based on local hydrologic conditions, inclusion of PHC methodologies in a regulation of nationwide application would be inappropriate. The combination of the permit information requirements, knowledge of local conditions and typical surface mining impacts, and guidance from the regulatory authority can be used to prepare the PHC determination and to develop an environmentally sound mining and reclamation plan.

One commenter suggested that the PHC determination should be a "description" rather than an estimate of potential impacts.

OSM agrees that descriptions as well as numerical estimates can be used in the PHC determination depending upon the factor being considered and local conditions. Section 507(b)(11) of the Act gives guidance regarding the scope of the PHC determination. It is to be used as a tool for structuring a sound plan for mining and reclamation and must include a determination of probable impacts. The final rule has been revised to require such a determination. Some discretion is necessarily left to the regulatory authority regarding its precise content. However, OSM expects that the PHC determination will include numerical estimates of most impacts.

One commenter proposed the use of data from "more distant locations" if the data reflected regional trends or was otherwise useful in the PHC determination.

Data collected at a distance from a proposed operation may well be useful as an indicator of regional trends and could be used as part of the information used in the PHC determination or the CHIA conducted by the regulatory authority. However, the further one moves from the proposed permit site, the more difficult it is to correlate the data obtained to the proposed site or to estimate impacts from the proposed operation. In most cases, the utility of data used in the PHC determination will be inversely proportional to the distance from the proposed permit area. OSM believes that allowing the use of data "statistically representative of the site" is sufficiently flexible and workable.

One commenter concluded, after reading the preamble to the proposed rules, that OSM did not view the PHC determination as contributing to environmental protection. Instead it was treated as an exercise between the operator and the agency. However, the commenter believed that the PHC determination was intended for the benefit of the public's review.

OSM did not intend to give such an impression in the preamble to the proposed rules. The preamble to the proposal stressed the importance of baseline data and its relationship to an accurate and useful PHC determination. The specific requirements of final paragraph (f) and its direct links with othre permitting and performance standard requirements clearly illustrate OSM's belief in the importance of the PHC determination. The main function of the PHC determination

is to describe potential hydrologic impacts which can then be dealt with in the various plans prepared for the mining and reclamation operation and to serve as a basis for the broader cumulative hydrologic impacts assessment. OSM agrees with the commenter that it can serve as a useful document for public information and participation as well and must be included in the permit application which is available for public review.

Sections 780.21(g) and 784.14(f) Cumulative hydrologic impact assessment.

Final paragraph (g) requires the regulatory authority to prepare an assessment of the probable cumulative hydrologic impacts of the proposed operation and all anticipated mining upon the surface- and ground-water systems within the cumulative impact area. The assessment must be sufficient to determine, for purposes of permit approval, whether the proposed operation has been designed to prevent material damage to the hydrologic balance outside the permit area.

Changes were made in the regulatory language of proposed Paragraph (h) to make the final rule consistent with, and to emphasize its relationship to, the definition for "cumulative impact area" (§ 701.5) and to the requirements of paragraph (c) for "baseline cumulative impact area information."

As with the requirements for the probable hydrologic consequences determination, a provision has been included in paragraph (g) to assure that the CHIA will be updated, if necessary, whenever there are changes to the approved permit. Thus, an application for permit revision must be reviewed by the regulatory authority to determine whether a new or updated CHIA is required. This is consistent with the revised application review procedures of § 774.13.

OSM is aware of the complexities associated with the evaluation of existing and anticipated mining operations and the preparation of cumulative hydrologic impact assessments (CHIA). OSM's experience with cumulative assessments on Federal lands over the years has shown that sound hydrologic assessments can be made for potential mining impacts on both surface- and ground-water resources. Further, methodologies for making cumulative hydrologic impact assessments are steadily developing and improving as data bases expand. While OSM believes that the CHIA can be accomplished in an environmentally and scientifically sound fashion, the CHIA process cannot reasonably be extended to include remote and speculative impacts. Rather it should be based upon those impacts that have a reasonable likelihood of occurring and which are sufficiently defined to enable the regulatory authority to reach a decision for permit approval.

OSM agrees with some commenters that the Act envisions a portion of the process to be sequential rather than collective because an assessment is required for each application for a permit or permit revision. The cumulative hydrologic impact assessment for any given area will most likely be redefined with each new permit application because the scope of all anticipated mining will be changing.

Under the final rules, the cumulative hydrologic impact assessment need not be a land use planning tool nor result in judgments balancing current coal development and possible future development. The final rule allows a "first come first served" analysis with each subsequent operation being based upon its potential for material damage with respect to any preceding operations. This approach is not inconsistent with the Act's intent to protect the environment, because no later or revised operations can be approved until a cumulative hydrologic impact assessment is completed indicating that there will be no material damage to the hydrologic balance outside the permit area.

OSM is aware that some States may wish to use the CHIA process as a land use planning tool by accounting for impacts from possible future mining development in their permit reviews. The language of the final definition for cumulative impact area and the final rules for the CHIAs do not preclude regulatory authorities from establishing such a procedure.

One commenter wanted proposed paragraph (h) to allow the regulatory authority to establish criteria to measure "material damage." Others urged OSM to define the term or establish guidelines to evaluate whether material damage would occur from the proposed operation.

Evaluating the probable consequences of the proposed operation upon the hydrologic balance outside the permit area is a very important step in the review of a permit application by the regulatory authority. OSM agrees that the regulatory authorities should establish criteria to measure material damage for purposes of the CHIAs.

However, because the gauges for measuring material damage may very from area to area and from operation to operation, OSM has not established fixed criteria, except for those established under §§ 816.42 and 817.42 related to compliance with water-quality standards and effluent limitations.

Several commenters opposed the proposal to allow the applicant to submit a draft CHIA with the permit application. For some, the proposal was unclear as to who was responsible to collect data and to prepare the assessment. For others the proposal had the potential for conflict between applicants and regulatory authorities regarding the validity of the draft document, variation in assessment approach, availability of data, and expertise. Suggestions were made to delete the provision and to allow the applicant to submit relevant data.

In response to the comments, the final rule has been revised to allow submittal of data and relevant analysis. However, even where an applicant does submit analysis with the permit application, final responsibility for the CHIA rests with the regulatory authority.

One commenter thought that the preamble to the proposed rule pointed out difficulties with attempting to make cumulative impact assessments of future operations. The commenter believed that the proposed rules did not address the difficulties.

While projections of probable cumulative hydrologic impacts may be difficult, the Act requires the regulatory authority to make this effort. OSM has tried to address some of the problems of projection by developing the concept of the cumulative impact area which defines "anticipated mining" to include only non-speculative coal mining operations.

Two commenters thought that there were dissimilarities in intent between proposed paragraph (h) and previous 30 CFR 786.19(c) and that because the proposed section was not one of findings relevant to the basic tenets of the Act, it violated the spirit and intent of the Act.

OSM has included final paragraph (g) in § 780.21 because the section allows the operator to collect information which can be useful to the regulatory authority in its CHIA process. The concept of "findings" by the regulatory authority regarding compliance with the Act, especially with respect to the question of material damage, has been preserved in the revised general permitting procedure rules at § 773.15(e)(5) as well as in § 780.21(g).

Some reviewers suggested adding the phrase "outside the permit area" to the end of the second sentence to make the paragraph consistent with section 510(b)(3) of the Act. OSM has adopted this suggestion.

One commenter thought that this rulemaking provided an opportunity for delineating a methodology for preparing a CHIA and offered seven steps for OSM's consideration.

It is inappropriate to dictate methodologies of CHIA analysis in a regulation of nationwide application. Although some CHIA criteria will be generally applicable, others will be of local value. Therefore, each regulatory authority must adopt a CHIA methodology when reviewing a permit application which will reflect the particular hydrologic and geologic conditions in their area of concern.

Sections 780.21(h) and 784.14(g) Hydrology reclamation plan.

Paragraph (h) sets out the elements to appear in the hydrology reclamation plan which must be submitted with the permit application. This plan must contain maps and descriptions indicating the steps to be taken during mining and reclamation through bond release to meet the requirements of Part 816, including §§ 816.41 to 816.43; to minimize disturbance to the hydrologic balance within the permit and adjacent areas; to prevent material damage to the hydrologic balance outside the permit area; to meet applicable Federal and State water quality laws and regulations; and, for surface mining activities, to protect the rights of present water users. Measures to be included among the steps to be outlined in the plan are those that will be implemented to: Avoid acid or toxic drainage; prevent, to the extent possible using the best technology currently available, additional contributions of suspended solids to streamflow; provide water-treatment facilities when needed; control drainage; restore approximate premining recharge capacity; and, for surface mining activities, protect or replace rights of present users. Also, the plan must specifically address any potential adverse hydrologic consequences identified in the PHC determination by including preventive and remedial measures.

The final rule reflects a number of editorial changes. The list of particular measures which must be addressed in the plan are based on the requirements of section 508(a)(13) of the Act and the performance standards outlined in section 515(b)(10) of the Act. The relationship between the findings in the PHC determination and the coverage of the protection plan for the hydrologic balance has been made more specific.

A commenter recommended changing the language in proposed paragraph (i) from "onsite and offsite areas" to "mine site and associated offsite areas," in order to make the provision more consistent with sections 507(b)(14), 515(b)(10), 516(b)(9), and 701(28)(B) of the Act. The same commenter thought that the water systems mentioned in

section 508(a)(13) referred to water delivery systems and, therefore, did not apply to most coal mining operations. The commenter considered OSM's reliance on this section to support offsite reclamation planning as inappropriate.

OSM agrees that the wording of proposed paragraph (i) should be clarified. However, rather than accepting the commenter's suggestion, the final rule is revised in accordance with terms defined elsewhere in the rules. Thus, the language used in final paragraph (h) revises the proposal to reflect the operator's responsibility to protect the hydrologic balance by minimizing disturbances within the permit and adjacent areas and by preventing material damage outside the permit area. This language is consistent with the intent of the Act in the sections cited by the commenter. OSM disagrees, however, with the commenter's interpretation of section 508(1)(13) of the Act. While this section does address the rights of water users and alternative water sources, OSM does not interpret the language "surface and ground water systems" to apply to "developed and operating surface and groundwater delivery systems for water uses." Rather, OSM interprets this language to refer to surface- or ground-water hydrologic units, such as a drainage basin, aquifer, soil zone, lake, or reservoir. The hydrologic balance is the relationship between the quality and quantity of water inflow to, water outflow from, and water storage in such systems. Thus, section 508(a)(13) requires the reclamation plan to include a description of the measures to be taken to assure the protection of such systems both within the permit area and the adjacent area. Neither the Act nor legislative history suggests a narrower interpretation for reclamation plan requirements.

One commenter thought that OSM was incorrect in requiring the PHC determination to occur prior to completion of the reclamation plan.

OSM disagrees. The order of the requirements for PHC determination and the reclamation plan in the regulation is inconsequential. The two requirements are naturally interrelated. An operator must determine what adverse impacts to the hydrologic balance are likely to occur from a planned operation and include protective steps to prevent or minimize such impacts.

Monitoring plans

The following discussion covers the rules which prescribe how monitoring plans for surface and ground water must be developed and implemented so that adverse mining impacts can be minimized and so that those impacts due to mining will be distinguishable from those due to other causes.

Sections 780.21(i) and 784.14(h) Ground-water monitoring plan.

Final paragraph (i)(1) requires the operator to develop a ground-water monitoring plan based upon the PHC determination and relevant information appearing in the permit application. It must provide for the monitoring of parameters that relate to the suitability of the ground-water for current and approved postmining uses and to the objectives set forth in the hydrology reclamation plan. The monitoring plan must identify the quantity and quality parameters, sampling frequency, and site locations. It must describe how the data may be used to determine the impacts of the operation upon the hydrologic balance. Minimum parameters are: total dissolved solids or specific conductance corrected to 25 deg.C, pH, total iron, total manganese and water levels. Reports for each monitoring location must be submitted every 3 months. The regulatory authority may require additional monitoring and may adjust monitoring frequency on a case-by-case basis. Specific conductance has been included as an alternative to TDS because it is a measurable parameter indicating the same constituents and may be correlated to TDS.

In certain limited circumstances monitoring may be unnecessary. Such cases may occur in an area having limited perched ground-water zones or where the resource is of marginal quality or quantity and where other ground-water resources are available for current and future uses. Under paragraph (i)(2), if an operator can demonstrate to the regulatory authority, using the PHC determination and other available data, that a particular ground-water resource fits into this narrow exception, then the regulatory authority may waive monitoring of that particular water. All such decisions must be carefully evaluated by the regulatory authority in view of the statutory requirements to maintain the hydrologic balance, to protect water rights, and to replace water supplies.

Numerous commenters criticized the proposed rule for vagueness as to which ground-water resources need not be monitored. Section 517(b)(2) of the Act describes the characteristics of ground-water resources that must be monitored. They are all strata "that serve as aquifers which significantly insure the hydrologic balance * * *."

This statutory phrase, which has been included in § 780.21(i)(2), properly directs the attention of the operator and the regulatory authority to the relationship of the ground-water resource to the hydrologic balance.

Several commenters criticized the proposed rule pertaining to ground-water monitoring for a number of other reasons. Some thought the reference to "significant ground-water resource" was vague. Others believed that the proposed rule would illegally limit the monitoring requirement. OSM has made adjustments in the language of the final rule to address these concerns.

Under the proposed rule, if the PHC determination indicated that adverse onsite or offsite impacts might occur to a significant ground-water resource or if required by the regulatory authority, then the application would include a ground-water monitoring plan. The preamble made clear that it was OSM's intent that such action would be approved by the regulatory authority only after careful evaluation and that the foregoing of monitoring would apply only to water supplies of "marginal use or when no appreciable adverse impacts are anticipated." *[47 FR 27718]*.

The final rule more clearly provides for OSM's expressed intention for a limited monitoring exemption with close review by the regulatory authority as to whether the particular resource at issue will not serve "as an aquifer which significantly insures the hydrologic balance within the cumulative impact area * * *." As an added protection, the regulatory authority has the discretion to deny a request for a waiver for a particular resource if it determines that the resource has significance for the hydrologic balance.

One commenter objected to eliminating the requirements for monitoring such parameters as ground-water levels, infiltration rates, subsurface flow, and storage characteristics. The reviewer thought that OSM was letting the post-mining land use be the controlling factor for monitoring. The commenter urged consideration of ground water in the support of fish and wildlife and other resources.

The final rules do not require analysis or monitoring of all the parameters specified by the commenter in every case. Rather, depending upon the results of the PHC determination, part or all of this kind of supplemental information may be necessary at the discretion of the regulatory authority as provided for in § 780.21(b). As for the commenter's second point, the postmining land use is only one of several factors governing actions to protect ground water.

One commenter thought that adverse effects to "currently used" ground-water resources as well as "significant" resources should be included so that even lower yielding and/or quality aquifers would be protected, an important consideration in the western States.

OSM agrees with this reasoning. The final rule is broad enough to allow for such consideration.

Several commenters supported the proposed ground-water monitoring exclusion believing that it would result in a more realistic and workable monitoring program.

OSM believes that monitoring will be the general rule. It has defined the very limited circumstances when monitoring of a ground-water resource may not be required.

One commenter objected to deleting the general requirement for monitoring all water resources in order to determine the effects of surface mining activities, which appeared in previous § 816.52(a)

Generally the final rules require the monitoring of ground-water resources. The exemption which OSM has provided has been narrowly drawn and requires the operator seeking the exemption to demonstrate to the regulatory authority that a particular resource has a limited effect, if any, on the hydrologic balance. In any event, baseline information will be available for all ground-water resources.

Numerous commenters suggested that although a ground-water resource may be determined not to be "significant" in its own right, nevertheless it may supply water to other ground-or surface-water resources that are significant. Commenters feared that relaxation of monitoring requirements might allow contamination of significant resources by the acidic, toxic, or other poor qualities of non-significant ground water. Commenters especially feared that these marginal resources might be the only supplies available for fish and wildlife.

As was discussed above, OSM has modified the final rule to focus on the relationship the ground-water resource has to the hydrologic balance. Issues of the interconnected nature of the water bodies and use by wildlife have to be resolved to the satisfaction of the regulatory authority. The number of ground-water resources eligible for the waiver will be limited. No lowering of environmental protection or loss of resources which will be useful in the future is expected. Finally, regardless of the site specific conditions which might appear to allow a ground-water monitoring ex-

emption, the regulatory authority has the responsibility to require monitoring if it determines that such action is necessary to protect the hydrologic balance of the area.

Similarly, several commenters suggested that the ground-water monitoring exclusion should include consideration of surface-water resources as well as ground-water resources. They argued that this inclusion would help minimize potential for ground-water contamination through interconnected and contaminated surface waters.

OSM agrees with this reasoning. The final rule takes into account adverse effects to surface-water resources because they are part of the total hydrologic balance.

Several reviewers wanted OSM to provide guidance regarding the terms "significant" and "marginal" as used in the proposed rule and the preamble. Suggestions included using the term "ecologically significant" and taking into account both present and future uses of ground-water resources.

OSM has modified the rule so that the focus is on adverse effects to the hydrologic balance rather than the significance or marginality of an individual resource. Current and potential uses of the ground-water resource would be relevant to any decision for waiver of monitoring.

A number of commenters suggested that OSM replace the proposed quarterly monitoring requirements with a more flexible schedule. Reasons offered in support of this position included: the burden and expense of monitoring, the slowness of detectable changes in ground-water quality, the lack of quality changes following the first year of operation, variability of local hydrologic and seasonal conditions which affect monitoring such as ice and snow cover, and the regulatory authority's knowledge of local conditions.

OSM agrees that a variety of factors can affect schedules for monitoring. However, the quarterly monitoring requirement does not impose an undue burden on operators and it will help identify any hydrologic problems that may develop during mining. the final rule allows the regulatory authority to require more frequent monitoring on a case-by-case basis. Such decisions should rely on baseline hydrologic and geologic information, PHC findings and the CHIA. If during mining and reclamation the monitoring has demonstrated that the hydrologic protection requirements are met or that monitoring is no longer necessary to achieve its purposes, the monitoring frequency may be adjusted in accordance with § 816.41(c)(3).

Three commenters wanted to see all ground-water resources monitored. They thought that the protection requirements of the Act could not be met without monitoring and that early-warning capabilities would be lost.

OSM disagrees with the commenter's characterization of Congress' intent with respect to the amount of required monitoring. Throughout the legislation, the focus is on the protection of the hydrologic balance as a whole. Therefore, attention to and individual water resource relates to its connection with this larger issue of protection of the hydrologic balance.

The narrow exception to monitoring, which the final rules provide, requires careful scrutiny of the effects such action may have on the hydrologic balance. The regulatory authority will be able to take into account a broad range of considerations before authorizing a particular waiver. Commenters have raised numerous areas of concern, for example, potential use, current use, wildlife, interconnectedness of resources, and early-warning factors. OSM views these as relevant to the regulatory authority's decision.

One commenter wanted to see the reporting requirements contained in previous § 816.52(a)(3) added to the final rule.

The final rule includes provisions requiring operators to report both surface- and ground-water monitoring information to the regulatory authority.

Several commenters wanted OSM to delete the list of parameters to be monitored. Others thought the measurement for total manganese was inappropriate under alkaline conditions. They also suggested using "settleable solids" instead of suspended solids.

As was discussed previously, the monitoring required under the final rule is not considered to be excessive and will serve the operator and regulatory authority as a standard against which impacts can be measured. With respect to the analysis of manganese, the predictability of the occurrence of manganese does not directly correlate with typically "alkaline conditions." Although in many cases alkaline conditions make manganese less important, no clear line of ap-

plicability can be drawn. This, coupled with the relatively low cost of the analysis, lends support for the adoption of this test.

The suggestion to require monitoring of settleable solids has not been accepted where ground water is concerned. Settleable and suspended solids are associated almost exclusively with surface waters, but not ground water since they become naturally filtered by subsurface ground-water movement. Thus, the analysis of total dissolved solids is most applicable for routine ground-water evaluation. Analysis of total dissolved constituents along with other baseline information will serve as indicators of potential problems and may point to the need for additional or more specific analysis, which can be done at a relatively low cost. For surface waters, monitoring requirements for settleable solids will be established by the NPDES permitting authority.

Two commenters proposed deleting provisions allowing the regulatory authority to add monitoring requirements and instead only authorize considering "significant" impacts to water resources. The commenters thought that section 517(b)(2) of the Act specified when ground water must be monitored and that since the regulatory authority approved monitoring plans the provision regarding additional requirements was redundant.

The commenters have misunderstood the meaning of section 517(b)(2) of the Act. It does not limit monitoring to situations where there are significant impacts to water resources. Instead it calls for monitoring when an operation will remove or disturb strata which serve as aquifers which have significance for the hydrologic balance. Given OSM's recognition of the importance of considering specific conditions, it is necessary for the regulatory authority to have the flexibility to require the appropriate level of monitoring.

Sections 780.21(j) and 784.14(i) Surface-water monitoring plan.

Final paragraph (j) requires the application to contain a surface-water monitoring plan. This plan will be based upon the findings of the PHC determination and analysis of the baseline hydrologic, geologic, and other relevant information included in the application.

The plan must relate to the suitability of the surface water for current and approved postmining land uses, to the objectives set forth in the hydrologic protection plan under paragraph (h), and to U.S. Environmental Protection Agency (EPA) effluent limitations found at 40 CFR Part 434. The application must identify the surface-water quality and quantity parameters to be monitored, sampling frequency, and monitoring site locations and must describe how the data collected will be used to determine the impacts of the operation upon the hydrologic balance.

At all monitoring locations in surface-water bodies which may be potentially affected by the impacts of the operation or into which water is to be discharged and at upstream monitoring locations, the following parameters must be monitored: total dissolved solids or specific conductance corrected to 25 deg.C, pH, total suspended solids, total iron, total manganese, and flow. Additionally, in the case of all point source discharges, monitoring must be conducted in accordance with EPA permitting and monitoring requirements (40 CFR Parts 122, 123 and 434) and as required by the National Pollutant Discharge Elimination System permitting authority.

These data must be reported to the regulatory authority every 3 months. The regulatory authority may require additional monitoring on a case-by-case basis.

Some changes were made to the language of the paragraph to clarify the interrelationship between the surface-water monitoring plan and certain other findings and data included in the permit application. In response to comment from the U.S. Environmental Protection Agency (EPA), monitoring of point source discharges must be conducted to accord with the requirements of 40 CFR Parts 122, 123, and 434 and as otherwise required by the National Pollutant Discharge Elimination System permitting authority.

One commenter thought that proposed paragraph (k) did not recognize the need, as stated in prior § 816.52, for monitoring to be adequate to measure and record the quality and quantity of discharges from the permit area. The commenter feared that restricting required accuracy to that sufficient to meet postmining land uses would not recognize the continuing need to analyze changes in numerous parameters so as to anticipate and prevent unforeseen changes. The commenter also objected to an alleged deletion of a requirement for joint NPDES/OSM permits, contending that this flew in the face of regulatory reform.

The final rule for the surface-water monitoring plan does not inappropriately limit the degree of accuracy required for monitoring. Monitoring is to be based on the PHC determination and must be sufficient to measure the suitability of

the surface water for current and approved postmining land uses, to meet the objectives for protecting the hydrologic balance as set forth in the plan required by paragraph (h), as well as to meet EPA effluent limitations. Monitoring for these objectives should result in the data necessary to indicate any unforeseen changes. In turn, this paragraph, coupled with the requirements of § 816.41(e), will allow for prompt response to indications of changes in the form of noncompliance with permit conditions. Finally, previous § 816.52 did not involve the issuance of joint permits between EPA and OSM. OSM has advanced the goal of regulatory reform by clarifying the monitoring procedures it will expect from an operator.

One commenter proposed deleting the monitoring locations for impoundments "into which water will be discharged." The commenter thought that potential impacts would have been brought out in the PHC determination and that impoundments would be monitored as point source discharges under the EPA rules adopted by OSM at § 816.42.

The commenter misunderstands the intent of the referenced language. Whether or not monitoring is conducted of all impoundments into which water is discharged will be determined by the regulatory authority based upon the PHC and the need to protect the hydrologic balance. If monitoring of such bodies of water is appropriate, paragraph (j)(2) indicates the minimum parameters to be reported. Additionally, receiving waters may not always involve a point source discharge covered by an NPDES permit, and monitoring of discharges only may not indicate possible problems with meeting the water-quality standards of the receiving stream. Therefore, monitoring at such sites is included in the final rule.

E. Hydrologic Balance Protection Performance Standards (§ 816.41 and 817.41)

Sections 816.41(a) and 817.41(a) General.

Paragraph (a) outlines the general goals for the hydrologic balance section which are to minimize disturbance to the hydrologic balance within the permit and adjacent areas, to prevent material damage to the hydrologic balance outside the permit area, and to support approved postmining land uses in accordance with the terms and conditions of the approved permit and other relevant performance standards in Parts 816 and 817. In the case of surface mining activities, the conduct of the operation must also assure the protection or replacement of water rights. (This distinction comports with the decision *in re: Permanent Surface Mining Regulation Litigation,* C.A. No. 79-1144 (D.D.C. May 16, 1979)). Also under paragraph (a), the regulatory authority may impose additional preventive, remedial, and monitoring measures to ensure that material damage outside the permit area is prevented. Finally, the rule indicates that mining and reclamation practices that minimize water pollution and changes in flow are preferable to water treatment.

The final rule highlights the distinction which the Act draws between minimizing disturbance to the hydrologic balance in the permit and adjacent areas and preventing material damage to the hydrologic balance outside the permit area. (See sections 510(b)(3) and 515(b)(10) of the Act.)

Two commenters raised an issue specific to the underground mining performance standard (§ 817.41(a)). They recommended that the phrase "to assure protection of water rights" be deleted because section 516(b)(9) of the Act did not mention protection of water rights. The commenters referred to Judge Flannery's decision, *In re: Permanent Surface Mining Regulation Litigation,* C.A. No. 79-1144 (D.D.C. May 16, 1979), which ruled that operators of underground mines were not required to replace water if it were lost. A similar argument was raised for § 817.41(c). These comments have been accepted and the appropriate deletions have been made.

Sections 816.41(b) and 817.41(b) Ground-water protection.

Paragraph (b) begins by stating the goals of this performance standard, namely to protect the hydrologic balance by following the plan approved under § 780.21(h) or 784.14(g).

Ground-water quality must be protected by handling earth materials and runoff so as to minimize acidic, toxic or other harmful infiltration into the ground-water systems. Excavations and other disturbances must be managed to prevent or control the discharge of pollutants into such systems. Ground-water quantity must be protected by handling earth materials and runoff in order to restore the approximate premining recharge capacity of the reclaimed area, excluding coal mine waste disposal areas and fills, so as to allow for the movement of water to the ground-water system.

Changes have been made from the proposed rule to specifically include reference in the final rule to the hydrology protection plan required by §§ 780.21(h) and 784.14(g) and to simplify the language of paragraph (b)(2) by simply referencing restoration of the recharge capacity of the reclaimed area as required by the Act and as was provided in previous § 816.51.

The proposed reference to "coal-processing wastes" has been replaced by the more general phrase "coal mine waste." This accords with OSM's revised rules dealing with disposal of coal mine waste.

Two commenters stated that the new provision which emphasized water availability rather than recharge capacity would have the potential to add significant new responsibilities for operators in restoring subsurface storage and flow capability. The commenters contended that OSM had not provided a justification in law or fact for the change. The commenters believed that restoration of recharge capacity was sufficient to assure that ground-water supplies would continue to be adequate for meeting postmining land use needs.

Another commenter stated that OSM had not defined or explained the use of the term "water availability" in the proposed rules and questioned its use as a substitute for the term "recharge capacity."

The final rule has been revised to specify restoration of recharge capacity rather than water availability. This change is in accord with section 515(b)(10)(D) of the Act. OSM disagrees, however, with the commenter's reasoning on water availability. OSM's emphasis in the proposed rule on water availability rather than recharge capacity accords with Congress' intent for water availability in ground-water systems after mining and reclamation to be similar to that which existed prior to mining. This comports with the requirement of section 507(b)(11) of the Act that the regulatory authority assess "the probable cumulative impacts of all anticipated mining in the area upon the hydrology of the area and *particularly* upon water availability" prior to issuing a mining and reclamation permit. [Emphasis added] However, OSM has redrafted parargraph (b)(2) to specifically reference recharge capacity as was set forth in the previous rules and has included an introductory paragraph in final § 816.41(b) referencing required compliance with the hydrology protection plan of §§ 780.21(h) and 784.14(g). Although recharge capacity is only one characteristic of the reclaimed area's ability to transmit water to ground-water systems, if this characteristic is assured, the availability of water in most cases will likewise be assured. Additional measures necessary to protect ground-water quantity beyond re-establishing premining recharge capacity will be identified in the PHC and CHIA for the mine and included in the hydrology protection plan.

One commenter suggested that the language in proposed paragraph (b)(2) should be rephrased to allow the regulatory authority to take into consideration the feasibility of restoring subsurface storage and flow capability of the reclaimed area.

Reclamation considerations are basic to the issue of whether a proposed operation can be permitted. Although requirements for restoration of subsurface storage and flow capability have not been included in the final rule, restoration of approximate recharge capacity is required. The requirement comports with the environmental protection performance standards of the Act, particularly section 515(b)(10)(D). Any additional requirements necessary to protect ground-water quantity will be included in the hydrology protection plan under §§ 780.21(h) and 784.14(g).

One commenter recommended that the proposed requirement to restore approximate premining water availability be modified to account for water level drawdown induced by ground-water development by other industrial, commercial, and residential users which occurred during the period of the mining operation.

Reference to "water availability" has been deleted from the final rule as explained above. However, if the situation described by the commenter were to occur, then the regulatory authority would take the baseline data on water availability and withdrawals by the mine operator into account at the time of reclamation. Obviously, the mine operator cannot be held responsible for water that has been withdrawn by other industrial, commercial, and residential users.

Two commenters recommended substituting the words "water resources" for "water availability" in proposed paragraph (b)(2). The commenters thought that this would clarify that the water resource must be protected. They contended that OSM did not have the authority to require restoration of private water supplies.

As indicated, the final rule deletes the use of the term "water availability." Replacement of private water supplies is, however, required under § 816.41(h) and section 717 of the Act for surface mining activities.

One commenter suggested replacing the phrase "storage and flow capability" with the phrase "flow system" in proposed paragraph (b)(2). According to the commenter, since the overburden which is backfilled in place of the removed resource has different physical and chemical properties, its storage and flow capabilities would differ.

OSM agrees with the commenter's view regarding the character of backfilled materials. Under the final rule, these changes can be considered in completing the required PHC and CHIA for the mine.

Sections 816.41(c) and 817.41(c) Ground-water monitoring.

Paragraph (c) requires that ground-water monitoring be conducted according to the approved monitoring plan. The regulatory authority may require additional monitoring. The monitoring data must be submitted on a quarterly basis or more frequently as prescribed by the regulatory authority. When the analysis indicates noncompliance with permit conditions, then the operator must promptly notify the regulatory authority and take the actions prescribed under revised §§ 773.17(e) and 780.21(h) or 784.14(g).

The ground-water monitoring must continue until bond release. Consistent with the permit revision rule (§ 774.13), the regulatory authority may modify the requirements if the operator demonstrates, using the already collected monitoring data, that: (1) The operation has minimized disturbances to the hydrologic balance in the permit and adjacent areas and prevented material damage outside the permit area; the water quantity and quality are suitable for supporting approved postmining land uses; and the water rights of others have been protected or replaced (in the case of surface mining operations); or (2) monitoring is no longer necessary to achieve the purposes which were set out in the approved monitoring plan. Paragraph (c) also requires the proper installation, operation, maintenance, and removal of monitoring equipment or structures so that the landowners do not have to assume such costs.

The final rule is substantially similar to the proposed rule. Paragraph (c)(2) elucidates what the monitoring reports must contain. The language adopted appeared in proposed paragraph (e)(2) for surface-water monitoring. Paragraph (c)(2) also identifies what actions must be taken when the analysis from monitoring indicates noncompliance with permit conditions. This addition was prompted by a comment from the EPA. Such actions are spelled out generally in the permitting requirements at § 773.17(e) and more particularly for hydrologic concerns in the hydrology protection plan under § 780.21(h) (784.14(g)). The conditions to be met prior to regulatory authority approval for modification of monitoring requirements have been clarified. A reference to the permit revision requirements has been added to illustrate that modifications to the monitoring plan must be considered to be a permit revision.

One commenter suggested that the word "availability" in proposed paragraph (c)(3)(i) be replaced by "quantity." OSM has accepted this suggestion.

One commenter thought that OSM did not present any evidence to support the decision to allow the regulatory authority, in the absence of monitoring, to decide on bond release. The commenter observed that monitoring is conducted not only to meet the requirements of the monitoring plan but also to check on the mining and post-mining conditions on and off the site.

Section 816.41 does not establish standards for bond release. However, under paragraph (c)(3) monitoring is required to continue until bond release unless the operator demonstrates that monitoring is no longer needed for its intended purpose or to demonstrate compliance. Such a change may only be made in accordance with the requirements for permit revisions. If there are conditions or events on a specific site that require monitoring for longer periods of time, then continued monitoring would be required by the regulatory authority.

Standards for bond release are contained in section 519 of the Act and are implemented in *30 CFR 800.40 (48 FR 32962*, July 19, 1983). While monitoring is not specifically required to allow bond release, the regulatory authority must evaluate the completed reclamation operations, including considering whether pollution of surface or ground water is occurring and the probability of continuance of such pollution before releasing the bond. Section 816.41(c) provides the regulatory authority sufficient flexibility to require monitoring in support of this evaluation when necessary. Under § 800.40(c)(3) no bond shall be fully released until reclamation requirements of the Act and permit are fully met.

Sections 816.41(d) and 817.41(d) Surface-water protection.

The reorganization of paragraph (d) parallels that of the ground-water protection paragraph. The general goal and requirement to comply with the hydrology protection plan of §§ 780.21(h) and 784.14(g) are summarized at the beginning because they apply to surface-water quality and quantity protection. Some of the language of paragraph (d)(1) has been changed to follow the statutory language found at section 515(b)(10) of the Act. Also certain redundant language has been removed. Actions to protect surface-water quantity will be identified in the surface-water protection plan. The connection between this plan and the performance standard are made more clear.

Paragraph (d)(1) requires operators to protect surface-water quality by minimizing the formation of acidic or toxic drainage and by preventing, to the extent possible using the best technology currently available, the contributions of suspended solids to streamflow outside the permit area and by otherwise preventing water pollution. If reclamation and remedial practices are not adequate to meet the requirements of §§ 816.41 and 816.42, then water-treatment facilities or water-quality controls must be used. Surface-water quantity and flow rates must be protected by following the steps outlined in the approved surface-water protection plan.

One commenter thought that Congress intended to control erosion and suspended solids only during active mining. The commenter questioned why OSM was requiring perpetual sediment and erosion control after reclamation had been completed.

The commenter has misunderstood the intent of the Act and the rules. Section 701(27) of the Act coupled with section 515(b)(10)(B) make it clear that the responsibility of the operator to prevent additional contributions of suspended solids to streams continues through reclamation until bond release.

Sections 816.41(e) and 817.41(e) Surface-water monitoring.

Paragraph (e) requires that surface-water monitoring be conducted according to the approved monitoring plan. The regulatory authority has flexibility to require additional monitoring. The monitoring data must be submitted on a quarterly basis to the regulatory authority, or more frequently as prescribed by the regulatory authority. It must include analytical results from each sample taken during the reporting period. In the case of a permit violation, sampling results must be submitted promptly to the regulatory authority and the protective steps taken as set forth in §§ 773.17(e) and 780.21(h). The reporting requirements of paragraph (e) in no way exempt an operator from complying with NPDES reporting requirements.

Monitoring must proceed through bond release. However, if certain conditions are met, the regulatory authority may modify monitoring requirements, except those required by the NPDES permitting authority. To allow a modification, the conditions which must be demonstrated by the operator using the monitoring data are: (1) That the operation has minimized disturbance to the hydrologic balance in the permit and adjacent areas and prevented material damage outside the permit area; that the quality and quantity of the water are suitable for approved postmining land uses; and that, in the case of surface coal mining activities, the water rights of other users have been protected or replaced; or (2) monitoring is no longer necessary to achieve the purposes which were set out in the approved monitoring plan (§ 780.21(j)). Finally, monitoring equipment and structures must be properly installed, operated, and maintained and must be removed by the operator when no longer needed.

Some commenters thought that in contrast to the prior rule, § 816.52(b), the proposed rule lowered the standards for monitoring and thereby limited the ability of the regulatory authority to assess the impact of mining upon the hydrologic balance and to notice sub-critical changes in water quality and quantity that might be indicators of damage to other resources.

OSM disagrees. Monitoring must be conducted in accordance with the approved monitoring plan under which key parameters must be monitored to protect the hydrologic balance and which has to be based upon the PHC determination and other baseline information. The final rule gives more discretionary power to the regulatory authority to adjust monitoring requirements to match the conditions that may occur at an individual mine site. This flexibility will result in better protection of the environment because it allows site specific adjustments. Such action fully complies with the Act.

Two commenters opposed the proposed 3-month reporting requirement. One of these also suggested substituting the phrase "any surface-water sample" which appeared in proposed paragraph (e)(2) with the phrase "point source discharges."

These comments are rejected. First, it is reasonable to require monitoring on a quarterly basis to identify hydrologic impacts that may occur during mining and provide the operator with an opportunity to institute remedial measures if necessary. (Quarterly reporting was also required under previous § 816.52(b)(1)(iii).) The final rule also gives the regulatory authority the discretion to require submission of monitoring data at a more frequent interval when appropriate. Second, use of the phrase "point source discharges" in this paragraph would not be sufficiently inclusive. OSM's intent is to have monitoring for point source discharges as well as other surface-water bodies.

Another commenter believed that the deletion of the requirement to report NPDES noncompliance would complicate both the applicant's and the regulatory authority's part in coal resource development.

The commenter has misinterpreted the intent of the proposed rules. Compliance with NPDES standards is part of the terms and conditions of a SMCRA permit. Noncompliance with any term or condition of a permit requires prompt notification of the regulatory authority.

One commenter questioned allowing the discontinuance of monitoring at bond release even when the disturbance to the hydrologic balance had been minimized, the post-mining land uses had been supported, and water rights were protected. The commenter feared that some areas could still show contamination of effluent quality that might be injurious to other resources or indicative of problems that were still unsolved.

Under the final rules for bond release, the regulatory authority must determine that disturbance to the hydrologic balance has been minimized in the permit and adjacent areas and that material damage has been prevented outside the permit area. While the performance standards for surface- and ground-water monitoring allow a regulatory authority to modify monitoring requirements based on certain showings, nevertheless it retains the responsibility to determine that the regulatory requirements have been met prior to bond release.

Sections 816.41(f) and 817.41(f) Drainage from acid- and toxic-forming materials.

Paragraph (f) appeared as § 816.41(g) in the proposed rules.

The final rule requires that the drainage from acid- and toxic-forming material be avoided by identifying, treating or burying, and, when necessary, burying and treating such materials in order to prevent adverse effects to water quality, to vegetation, or to public health. Section 817.41(f) also applies to underground development waste. Storage of such materials must be limited to the period until burial and/or treatment first become feasible and so long as storage will not result in any risk of water pollution or other environmental damage. Storage or treatment must be conducted in a manner that will protect the surface water and ground water by preventing erosion and polluted runoff. The practices used for storage, burial, or treatment must be consistent with other material handling and disposal provisions of 30 CFR Chapter VII.

Paragraph (f) has been adopted substantially as proposed. By including the word "and" in the last sentence of paragraph (f)(1)(ii), OSM is emphasizing that in no case will storage be permissible if to do so will result in water pollution or other environmental damage. Paragraph (f)(2) points out that practices for dealing with acid- or toxic-forming materials must be consistent with other material handling and disposal provisions in the final rules.

Two commenters supported not setting the 30-day storage limitation which appeared in the previous rules at § 816.48. They considered such a requirement as frequently impractical.

One of these also endorsed the concept that both treatment and burial of acid- and toxic-forming materials may not be required.

Under the previous rules, treatment and burial were not required in all cases. And temporary storage of spoil was permissible under § 816.48 if approved by the regulatory authority upon a finding that such action would not result in any material risk of water pollution or other environmental damage. Although OSM has deleted the 30-day limit on storage, the final rule continues to require that water quality and the environment must be protected.

Noting the proposed elimination in the backfilling and grading rule of the requirement to cover toxic- and acid-forming materials with 4 feet of soil (§ 816.103(a)), one commenter thought it would be difficult for the applicant to decipher what the regulatory authority would accept with regard to protection of the hydrologic balance from the adverse effects of offensive spoil. The commenter believed that the modifications proposed for § 816.41(g), together with the elimination of the 4-foot cover requirement in § 816.103(a) would have the cumulative effect of lowering the protection afforded the environment.

OSM disagrees with this conclusion. The final rule requires burial and/or treatment of acid- and toxic-forming materials so that no pollution of surface or ground water occurs, and so that no harm comes to the environment or public health and safety. Paragraph (f)(2) requires the management practices to be consistent with povisions that direct the handling and disposal of materials.

OSM is aware of the many potential problems that attend the proper disposal of toxic materials. However, a national standard for cover thickness is not the solution or solutions to these problems. Instead the regulatory authority should set whatever standards, specific or otherwise, provide the best solution or solutions within the State. In some instances, 4 feet of cover may be inadequate to provide the requisite protection. The difficulties operators may have in under-

standing the requirements can be avoided by allowing the State regulatory authorities to set, and encouraging them to explain, standards designed for local conditions.

The same commenter opposed deleting the requirement that acid- or toxic-forming materials be stored on impermeable material (previous § 816.48(c)), fearing that with proposed changes in the monitoring provisions the detection of environmental damage would be difficult.

This comment was rejected. The final rule requires storage of potentially acid- or toxic-forming material in a manner that will protect surface and ground water. While this may require impermeable liners in some cases, such a general requirement is overbroad and would impose undue expense and potential disturbance of otherwise undisturbed areas in order to obtain the impermeable material. Under the final rule, the regulatory authority can require impermeable liners where necessary. Additionally, the final rules require sufficient monitoring to ensure that the hydrologic balance is protected.

One commenter suggested including "treatment" along with storage as a method for dealing with the problem of drainage from acid or toxic materials.

OSM has accepted this suggestion because if storage of toxic- and acid-forming material is expected to cause water pollution or other environmental damage prior to its safe burial, then treatment of such material may be necessary.

Section 816.41(g) and 817.41(g) Transfer of wells

Paragraph (g) appeared as § 816.41 (h) in the proposed rule. The final rule provides that exploratory or monitoring wells must either be sealed in accordance with §§ 816.13 to 816.15, or, with the prior approval of the regulatory authority, be transferred to another party for further use. The conditions of the transfer must comply with State and local law. The permittee will remain responsible for the proper management of the transferred well until bond release in accordance with the requirements of §§ 816.13 to 816.15.

One commenter observed that unlike the prior rule the proposed rule did not address the question of liability. The commenter argued that under the proposal, determinations of liability based on local and State laws would be difficult because of confusion or deliberate maneuverings.

Based on the language of section 515(b)(10)(A)(iii) of the Act, the permittee retains responsibility for the proper casing, sealing, and managing of wells during all surface coal mining and reclamation operations. So long as the permittee remains responsible, there is no need for the rule to address the responsibility of the transferee or to establish categories of primary and secondary liability. The final rule does not preclude the permittee and the transferee from entering into private arrangements whereby the transferee could assume contractual obligations regarding the well. Similarly the final rule does not prevent a State from imposing additional obligations on a transferee. The final rule clarifies the operator's responsibility by specifying that the permittee remains responsible under the Act for proper management of the well until bond release.

Sections 816.41(h) Water rights and replacement

Final § 816.41(h) appeared as proposed § 816.41(i) and requires any person who conducts surface mining activities to replace the water supply of an owner of interest in real property who obtains all or part of his supply for domestic, agricultural, or other legitimate use from an underground or surface source which has been adversely impacted by contamination, diminution, or interruption proximately resulting in from the surface mining activity. The impact of the mining operation on the water resource must be determined by using the baseline information developed during the permitting process.

One commenter recommended deleting the proposed word "suitable" because it was a subjective term. The commenter suggested that the second sentence read "The water supplies shall be replaced with an alternative source of equal of better quality and quantity to the per-impacted supply." Another commenter suggested modifying the language in the second sentence of proposed paragraph (i), so that the operator need supply water of a suitable quality or quantity only if the water supply in question previously could have met the requirements of the postmining land use.

OSM has responded to these comments by deleting the second sentence of the proposed rule which contained the language objected to by the commenters. This sentence is unnecessary since it is implicit in the requirements of section 717(b) of the Act, which are repeated in the first sentence of paragraph (h), that the alternative water supply must be

capable of restoring the water user's supply which was lost due to surface mining impacts. The requirements of paragraph (h) to replace water supplies are thus tied to pre-existing uses and not the postmining land use.

One commenter believed that the issue of water rights operated strictly in accordance with State water law and suggested language changes to emphasize the point.

OSM agrees that water rights operate in accordance with State water law and that the requirements under the Act do not change these rights except for requiring operators of surface coal mines to replace affected water supplies. First, section 717(a) of the Act makes this clear by providing that the Act does not affect the right of any person to enforce or protect, under applicable law, his or her interest in water resources. Second, section 717(b) of the Act and paragraph (h) require that a use be a "legitimate" use before it can qualify for replacement. Any use that would be in violation of State water rights would not be a "legitimate" use. Thus, no change is required in the final rule to accommodate the commenter's concern.

Sections 816.41(i) and 817.41(h) Discharge of water into an underground mine.

Final §§ 816.41(i) and 817.41(h) appeared as §§ 816.41(j) and 817.41(i) in the proposed rules. The final rules provide that the discharge of water into an underground mine is prohibited, unless it can be demonstrated to the statisfaction of the regulatory authority that the discharge will minimize disturbance to the hydrologic balance on the permit area, prevent material damage outside the permit area, meet with the approval of the Mine Safety and Health Administration, not violate applicable water-quality standards and effluent limitations, and be of known quality and quantity to meet the effluent limitation in §§ 816.42 and 817.42 for pH and total suspended solids. The pH and TSS standards may be exceeded if they are approved by the regulatory authority. Permissible discharge materials are limited to the six kinds of material listed in the previous rules, with the addition of a seventh, water. The final rule is substantially similar to the previous rule, which was codified at §§ 816.55 and 817.55.

OSM has moved language appearing in proposed § 817.41(j)(1) to final § 817.41(h)(3). The rule allows water from an underground mine to be diverted into other underground workings provided the requirements of the section are met. The transfer of the language from paragraph (j) to (h) was made for organizational purposes and has no substantive effect.

One commenter suggested that trash and garbage be added to the list of wastes that could be discharged into an underground mine. The commenter asserted that this method of disposal might in many cases be more environmentally sound than disposal by incineration or burial in a surface landfill.

OSM rejects this suggestion because of the potential of degrading the quality of ground water. Revised §§ 816.89 and 817.89 govern the disposal of non-coal mine waste. Also, the disposal of such materials is regulated by other laws.

The U.S. Environmental Protection Agency asked OSM to note in this rule that discharges into underground mine workings must be in compliance with any applicable requirements of the Underground Injection Control Program promulgated under Part C of the Safe Drinking Water Act (Pub. L. 93-523, as amended, *42 U.S.C. 300f et. seq* .). The list of Class V wells in 40 CFR 146.05(e) includes sand backfill and other backfill wells used to inject a mixture of water and sand, mill tailings or other solids into mined out portions of subsurface mines whether what is injected is a radioactive waste or not. This provision may apply to the underground disposal method described in § 816.81(f). At this time, the only requirements that apply to Class V wells are: (1) The inventory reporting requirement in *40 CFR 122.37(c)(1)*; and (2) the general prohibition against contamination of underground sources of drinking water in *40 CFR 144.12*.

Section 817.41(i) Discharge of water from underground mines.

Section 817.41(i) for underground mines was proposed as § 817.41(j) and replaces previous § 817.50. The essential requirements of the previous rule have been retained. The final rule requires that surface entries and accesses to underground workings be managed to prevent or control gravity discharges of water from the mine. Except for drift mines, the gravity discharge of water from an underground mine may be approved by the regulatory authority upon the demonstration that the untreated or treated discharge complies with the performance standards of Part 817 and any additional NPDES permit requirements.

Section 817.41(i) also provides that surface entries and accesses to drift mines which are used after the implementation of State, Federal, or Federal lands programs and which are located in acid- or iron-producing coal seams must be located in such a manner as to prevent any gravity discharges from such mines.

One environmental group thought that rewording the proposed rule by deleting the requirement of previous § 817.50 for untreated discharges to meet effluent limitations could result in the need for perpetual treatment at mines, a requirement the commenters felt was not practicable under any circumstances.

OSM disagrees with this interpretation of the meaning of § 817.41(i). This rule requires the untreated or treated gravity discharge from an underground mine to comply with the requirements of Part 817 performance standards and NPDES permit requirements. Under the requirements of §§ 817.41(a) and 817.42, point source discharges from underground mines must meet applicable effluent limitations and water-quality standards; minimize disturbances to the hydrologic balance; and support the approved postmining land use. Treated discharges must meet similar applicable requirements. The final rule merely combines the requirements for untreated and treated discharges into one sentence. It does not impose a requirement for perpetual treatment at mines.

The same commenter thought that the proposed definition of gravity discharge, when coupled with the provisions of proposed § 817.41(i)(2) for drift mines, would defeat the intent of the Act to protect against discharges from iron- or acid-bearing seams.

OSM does not agree with the conclusion reached by this commenter with respect to drift mines. Section 516(b)(12) of the Act requires that openings for all new drift mines be located to prevent a gravity discharge of water if the mine is located on an acid- or iron-producing seam. The definition for "gravity discharge" is in accord with the requirements of section 516(b)(12). This definition is discussed earlier in this preamble and, together with the requirements of this section, will provide the protection intended by Congress.

Two commenters recommended deleting proposed paragraph (i)(1) because in their opinion section 516(b)(12) of the Act did not authorize such regulation.

OSM disagrees with this assessment of its statutory authority. Section 516(b)(9) of the Act outlines what steps mine operators must take to minimize disturbance to the hydrologic balance including avoiding acid or other toxic mine drainage. Regulating all gravity discharges from underground mines comes within the scope of this statutory directive.

F. Diversions (Sections 816.43 and 817.43)

The material covered in final §§ 816.43 and 817.43 for diversions appeared as §§ 816.41(f) and 817.41(f) in the proposed rules. The final rules for diversions have been adopted basically as proposed except as discussed below. Because the performance standards for diversion of intermittent and perennial streams and miscellaneous flows are identical except for two requirements, the rule has been restructured to reflect the similarities and to eliminate redundancy. Other minor language changes were also made for purposes of clarity.

In accord with the combination of previous §§ 816.43 and 816.44 and 817.43 and 817.44 into final §§ 816.43 and 817.43, respectively, the final rule also corrects the citations to these sections in §§ 780.29 and 784.22 of the permitting rules. § 784.22 is also renumbered as § 784.29. No substantive change is intended by these revisions.

Sections 816.43(a) and 817.43(a) General requirements.

Under paragraph (a)(1) a regulatory authority may approve the diversion from disturbed areas, by means of temporary or permanent diversion, of any flow from a mined area abandoned prior to May 3, 1978, and any flow from undisturbed or reclaimed areas after meeting the criteria of § 616.46 for siltation-structure removal. To grant approval, a regulatory authority must find that the diversion is designed to minimize adverse impacts to the hydrologic balance within the permit area, to prevent material damage to the hydrologic balance outside the permit area, and to assure the safety of the public. Diversions may not be used to divert water into underground mines unless the regulatory authority approves such action in accordance with § 816.41(i).

The final rule revises the proposal to be in accord with the final definitions of permit area and adjacent area and the rule establishing requirements for sedimentation ponds.

Paragraph (a)(2) requires that the design, location, construction, maintenance, and use of the diversion and its appurtenant structures will ensure stability; provide protection against flooding and resultant damage to life and property; prevent additional contributions of suspended solids to streamflow outside the permit area; and comply with applicable Federal, State, and local regulations.

Final § 816.43(a)(3) provides that when no longer needed, temporary diversions must be removed and the disturbed land restored in accordance with the requirements of Part 816. Prior to removing a temporary diversion, the operator must remove or modify, as necessary, downstream water-treatment facilities that would be adversly affected. This requirement will not alter the operator's responsibility to maintain required water-treatment facilities.

The design and construction of a permanent diversion and the reclamation of a stream after removal of a temporary diversion must restore or approximate the premining characteristics of the original stream and the natural riparian vegetation so as to promote the recovery and enhancement of the aquatic habitat.

The regulatory authority may specify additional design criteria for diversions.

Two commenters noted that unlike the prior rules at § 816.44(d)(1), proposed paragraph (f)(1)(iv) did not call for the consideration of restoring riparian habitat during construction of permanent diversions and stream channels following removal of temporary diversions. They feared that this would lead to potentially significant impacts on riparian ecosystems and the esthetic quality of natural streams. OSM accepts this comment and has revised the rule accordingly.

Several commenters expressed concern with how the proposed rules dealt with assurances for the recovery of aquatic habitat. One thought that simply to augment the recovery and enhancement of aquatic habitat would result in significant environmental damage. Another thought the aquatic habitat requirements should not be applied to ephemeral streams as it was doubtful that such habitat existed on ephemeral streams in arid or semi-arid regions. Other commenters thought the recovery standard should be to minimize disturbance of the hydrologic balance and enhance the aquatic habitat where practical. They thought that such a standard would be more in line with section 515(b)(24) of the Act.

OSM's objective in paragraph (a)(3) is to achieve a condition after mining at least as good as the original condition. The requirements adopted will achieve this objective and at the same time will provide the operator with sufficient flexibility. Additionally, OSM disagrees with the commenters' characterization of the intent of section 515(b)(24) of the Act. That section calls for minimizing adverse impacts of fish, wildlife, and related environmental values to the extent possible using the best technology currently available and "enhancement of such resources where practicable." The language in the final rule allows operators to make technical innovations and improvements to achieve these goals without specifying all aspects of stream channel reconstruction.

One commenter argued that in the semi-arid West, restoring the erosional balance of the reconstructed stream was more important to successful reclamation than restoring aquatic habitat. He suggested including the requirement to restore or augment the natural erosional balance of the original stream channel.

Although OSM agrees that erosional balance is an important aspect of stream channel reconstruction, it is not of nationwide applicability. Moreover, because the erosional balance is not usually known and because land disturbances during the operations alter the characteristics of the materials used in reclamation, restoring the original erosional balance may be unwise or impossible. Section 816.95(a) of the final rules calls for stabilization of all surface areas to control erosion. This requirement would apply in the situation described by the commenter.

One commenter suggested deleting the provision authorizing the regulatory authority to specify design criteria. The commenter thought that the statement was unnecessary as the regulatory authority could reject any design not conforming to established criteria.

OSM rejects this comment. The final rules generally do not specify design criteria. They authorize the regulatory authority to prescribe criteria if requested to do so or if it considers such action necessary. For a further discussion related to design criteria, the reader is referred to OSM's "Final Environmental Impact Statement OSM-EIS-1: Supplement."

Two commenters objected to the language of the proposal giving regulatory authorities discretion to set design criteria. One of them seemed to suggest that the authority to specify design criteria be limited to case-by-case situations at the request of operators.

This approach would be impractical. The rules provide that the regulatory authority may, if it chooses, specify and publish design criteria for diversions. Such criteria would be available to all mine operators within the jurisdiction of the regulatory authority, and each mine operator would have to comply.

One commenter viewed OSM's decision not to include restrictions on locations, sediment control measures, and design of the diversion as being unhelpful to first-time applicants when they prepared a permit application and to regulatory authorities when they reviewed and approved such applications.

Setting nationwide design criteria with respect to location, sediment control measures, etc., is unnecessary. These criteria should be known by qualified registered professional engineers who specialize in mining and reclamation operations. The final rules provide for professional engineers to certify the design and construction of the stream channel diversions and provide regulatory authorities the discretion to develop detailed design, construction, and maintenance standards for diversion structures.

Sections 816.43(b) and 817.43(b) Diversion of perennial and intermittent streams.

In addition to the general requirements of paragraph (a), paragraph (b) sets the performance standards for the diversion of perennial and intermittent streams within the permit area. Diversions may be approved by the regulatory authority after finding that they will comply with findings in *30 CFR 816.57* related to stream buffer zones that there will be no adverse effect on water quantity and quality and related environmental resources of the stream.

The design capacity of channels for temporary and permanent diversions of perennial and intermittent streams must be at least equal to the capacity of the unmodified stream channel immediately upstream and downstream from the diversion. The requirement for a diversion to provide protection against flooding, as set forth at § 816.43(a)(2)(ii), will be met if the diversion is designed so that the combination of channel, bank, and flood-plain configuration is adequate to pass safely the peak runoff of a 10-year, 6-hour precipitation event for a temporary diversion and a 100-year, 6-hour precipitation event for a permanent diversion.

OSM modified the proposed design criteria by substituting a 6-hour precipitation event for a 24-hour storm event. This change makes the diversion rules consistent with the rules for sedimentation ponds, § 816.46(b), and permanent and temporary impoundments, § 816.49. The rationale for the change in the design criteria is based on the following analysis.

The storm design event being adopted is consistent with the criteria of the Mine Safety and Health Administration (MSHA) published as "Design Guidelines for Coal Refuse Piles and Water, Sediment, or Slurry Impoundments and Impoundment Structures" (IR 1109). OSM recognizes that for some basins, depending on location, the 24-hour duration storm may result in a runoff volume somewhat higher than the 6-hour storm for the same area (See *44 FR 15207).* However, for most mining situations, a 6-hour event is more likely to result in a higher peak flow. For a given storm frequency, the time of concentration and watershed shape can be more influential in determining the peak flow than the storm duration. Therefore, in most cases the differences in any increased volume of peak flows will be minor from a practical design and construction standpoint. Any computed increase in peak flow volume would most likely not result in any significant change in flow depth or flow velocities and, correspondingly, any alteration in drainage channel design.

A qualified registered professional must certify stream channel diversion design, construction, and maintenance of diversions and their appurtenant structures as conforming to the performance standards of Part 816 and any design criteria set by the regulatory authority.

Two commenters endorsed proposed paragraph (f)(1)(ii), which keyed the capacity of the diversion to the capacity of the natural stream rather than national design standards.

Based on field experience, OSM believes that it is technically sound and environmentally safe to require that the flow carrying capacity of a stream channel diversion be equal to that of the undiverted channel. Therefore, OSM has given more discretion to the regulatory authority to prescribe requirements suited to local geographical and meteorological conditions.

One commenter took issue with OSM's reasons as expressed in the preamble to the proposed rule *(47 FR 27723)* for not establishing national standards for diversion capacity. The commenter asserted that a diversion with a larger ca-

pacity than that of the natural stream channel would prevent some overtopping and would help to prevent sediment contributions downstream during non-flood periods.

While diversion capacities larger than the natural stream's capacity may prevent some overtopping, nevertheless, size alone does not provide any guarantees for meeting these problems. Moreover, the land disturbance associated with construction and removal of larger diversions could very well nullify any benefits from their greater capacities. The rules fully meet the environmental protection provisions of the Act in a feasible and cost effective manner.

Some commenters objected to requiring the supervision of a registered professional engineer over the design, construction, and maintenance of diversions. The commenter thought that the requirement did not contribute to environmental protection or coal development in any significant manner. Also because little guidance in selecting the appropriate design was provided, the requirement would result in delay and costly design changes at the time of permit review.

Section 102(a) of the Act declares that one of its purposes is "* * * to protect society and the environment from the adverse effects of surface coal mining operations." The requirement for the certification of the design and construction of stream channel diversions by a registered professional engineer is in accord with section 515(a) of the Act and will help achieve this goal. However, OSM agrees that requiring engineer certification of routine maintenance of stream channels and designs of diversions of miscellaneous flows may not be necessary. The final rule is thus changed accordingly so that the certification requirement applies only to the design and construction of perennial or intermittent streams.

Sections 816.43(c) and 817.43(c) Diversions of miscellaneous flows.

Paragraph (c) provides standards for the diversion of miscellaneous flows. The final rule is based on the language appearing in proposed § 816.41(f)(2). Paragraph (c)(1) clarifies what OSM means by the term "miscellaneous flows."

The performance standards of paragraph (c)(2), for diversions of miscellaneous flows, are the same as those for perennial and intermittent streams with certain exceptions. When reviewing the proposed diversion, the regulatory authority need not make the finding concerning stream buffer zones since these are not applicable to miscellaneous flows. In addition, the design storm events for temporary and permanent diversions of miscellaneous flows are a 2-year, 6-hour precipitation event, and a 10-year, 6-hour precipitation event, respectively, rather than 10- and 100-year events. Further, as stated above, there is no requirements for professional engineer certification of the design and construction for diversion of miscellaneous flows.

One commenter thought that the proposed rule for miscellaneous flow concerning the application of the best technology currently available to prevent additional contributions of suspended solids to streamflows outside the permit area should be revised to take into account the water quality of the ultimate receiving stream.

OSM rejects this suggestion. The requirement is derived from section 515(b)(10) of the Act and the statutory language is included verbatim in § 816.43.

One commenter thought that a mine operator should be able to divert any flow if it came from upstream areas that he or she had not disturbed. The commenter objected to the requirement to obtain the prior approval of the regulatory authority.

OSM considers that prior regulatory authority approval of diversions of flow is appropriate because unregulated diversions could lead to environmental damage, unsafe conditions, and disruption of the hydrologic balance. This approval may be granted as part of the permitting process.

Another commenter objected to OSM not providing specific reasons for allowing diversions of overland flows as was the case in the previous rule (§ 816.43). The commenter believed that by allowing diversion of all flows, without the limitations listed at that section, the task of the regulatory authority would be more difficult.

OSM discussed the reason for allowing diversions of any flow, including those from abandoned or undisturbed areas or reclaimed areas, in the preamble to the proposed rules. *(47 FR 27723,* June 25, 1982). The language of previous §§ 816.43 and 816.44 led to confusion as to when diversions would be approved or required and what elements of the performance standards applied to miscellaneous flows as opposed to perennial and intermittent flows. The final rule adopts the provision that the regulatory authority may require, as well as approve, diversions of miscellaneous flows. This authorization was inadvertently left out of the proposed rule. Changes made between the previous and final rules are intended to provide additional flexibility in allowing diversion of miscellaneous flows.

It is not possible to categorically list all situations where it may be environmentally desirable to divert such flows. For instance, it may be necessary to divert miscellaneous flows to prevent infiltration into spoils and protect the stability of fills or backfilled areas. The previous rule could have prohibited such diversions. The final rules provide the regulatory authority with sufficient authority to address environmental concerns with respect to miscellaneous flows without necessitating the listing of limitations as previously was the case.

One commenter was concerned that an operator could be released from the requirement to make miscellaneous diversions at least as large as the natural stream channel, should design values for handling flood flows of proposed paragraph (f)(2)(iii) prove to be smaller. The commenter thought that diversions of miscellaneous flows should have the capacity of the stream channel in all cases. Two other commenters suggested adding language regarding the proper sizing of channels for temporary and permanent diversion of miscellaneous flows, when no defined stream channel existed. Under such conditions, they thought that the rule should provide: "The diversion shall be capable of conveying the flow from the design precipitation event."

OSM agrees that for intermittent and perennial streams, keying the size of the diversion channel to the natural stream channel is appropriate. Such a requirement is included in final paragraph (b)(2). However, for miscellaneous flows, natural stream channels are often non-existent or irrelevant to the purposes of the diversion or to the size requirements for diversion safety. Safety is provided by specifying the design precipitation event for the combination of the channel, bank, and flood plain configuration. The final rule leaves flexibility to the operator and regulatory authority with respect to the precise channel size requirements for miscellaneous flow diversions provided the general requirements of paragraph (a) are met.

Cross-referencing

In a number of places in the final rule and preamble, OSM has cross-referenced other OSM rules, some of which have been proposed for revision and may not yet be finalized. If such rules are not finalized or are revised from those versions expected to be issued in the near future, conforming technical amendments may be necessary.

IV. Procedural Matters

Executive Order 12291

The Department of the Interior (DOI) has examined these proposed rules according to the criteria of Executive Order 12291 (February 17, 1981). OSM has determined that these are not major rules and do not require a regulatory impact analysis because they will impose only minor costs on the coal industry, coal consumers, and the public. In addition, the proposed rules emphasize the use of performance standards instead of design criteria, which will allow operators to utilize the most cost-effective means of achieving the performance standards.

Agency Approval

Section 516(a) of the Act requires that, with regard to rules directed toward the surface effects of underground mining, OSM must obtain written concurrence from the head of the department which administers the Federal Mine Safety and Health Act of 1977. OSM has obtained the written concurrence of the Assistant Secretary for Mine Safety and Health, U.S. Department of Labor.

Under section 501(a)(B) of the Act the Secretary may not promulgate and publish regulations relating to water quality standards promulgated under the authority of the Federal Water Pollution Control Act, as amended *33 U.S.C. 1151*-1175, until he has obtained the written concurrence of the Administrator of the Environmental Protection Agency (EPA). The written concurrence has been received with respect to these rules.

Regulatory Flexibility Act

The DOI has also determined, pursuant to the Regulatory Flexibility Act, *5 U.S.C. 601 et seq.,* that these rules will not have significant economic impact on a substantial number of small entities. The proposed rules will allow small coal operators increased flexibility in meeting performance standards and should especially ease the regulatory burden on small coal operators in Appalachia.

Federal Paperwork Reduction Act

In accordance with the Federal Paperwork Reduction Act of 1980 (Pub. L. 96-511; *44 U.S.C. 3507)*, the information requirements in Parts 780, 784, 816, and 817 were approved by the Office of Management and Budget (OMB) and assigned clearance numbers 1029-0036, 1029-0039, 1029-0047, and 1029-0048, respectively. These approvals were codified under new sections in each of those parts that contain information collection requirements. The information required in these sections will be used by the regulatory authority to assess the impact of the proposed mining operation on the hydrologic balance of the permit and adjacent areas and cumulative impacts in the cumulative impact area. Submission of such information is mandatory.

National Environmental Policy Act

OSM has analyzed the impacts of these final rules in the "Final Environmental Impact Statement OSM EIS-1: Supplement" (FEIS) according to Section 102(2)(C) of the National Environmental Policy Act of 1969 (NEPA) *(42 U.S.C. 4332*(2)(C)). The FEIS is available in OSM's Administrative Record in Room 5315, 1100 L Street, NW., Washington, D.C., or by mail request to Mark Boster, Chief, Branch of Environmental Analysis, Room 134, Interior South Building, U.S. Department of the Interior, Washington, DC 20240. This preamble serves as the record of decision under NEPA. The following substantive differences are noted between these final rules and the preferred alternative set forth in Volume III of the FEIS. Unless otherwise indicated the changes or additions have resulted in a rule that is the same as or more environmentally protective than the FEIS preferred alternative.

1. The final definition for "cumulative impact area," appearing at § 701.5, differs from the preferred alternative primarily in its listing of activities that, at a minimum, constitute "anticipated mining." The list is more extensive than the preferred alternative.

2. Final §§ 780.21(a) and 784.14(a) deal only with sampling and analysis techniques. References to use of the data to be collected have been moved to later paragraphs.

3. Final §§ 780.21(b) and 784.14(b) require more baseline information for surface- and ground-water resources than the preferred alternative.

4. Final §§ 780.21(f) and 784.14(e) specifically list required minimum findings and note that applications for a revision will be reviewed by the regulatory authority to decide whether a new or updated PHC determination will be required.

5. Final §§ 780.21(g) and 784.14(f) note that an application for a permit revision will be reviewed by the regulatory authority to decide whether a new or updated CHIA will be required.

6. Final §§ 780.21(h) and 784.14(g) have more extensive requirements for the reclamation plan to protect the hydrologic balance than the preferred alternative.

7. Final §§ 780.21(i) and 784.14(h) narrow the scope of the possible exemption to the monitoring of ground water which would have been available under the preferred alternative.

8. Final §§ 780.22(a) and 784.22(a) provide a more extensive and clearer list of the uses for which the geologic data is to be collected than the preferred alternative.

9. Final §§ 780.22(b) and 784.22(b) require the collection, analysis and description of more geologic information and more clearly state the depth of the data collection than the preferred alternative.

10. Final §§ 780.22(c) and 784.22(c) specify the bases for the regulatory authority to require the collection, analysis and description of geologic information in addition to that required by paragraph (b). While the language of the preferred alternative was more open-ended, the bases listed in the final rules cover the principal environmental concerns for which the additional data would be needed.

11. Final §§ 816.41(a) and 817.41(a) are broader in their statement of how surface mining activities are to be conducted to protect the hydrologic balance.

12. Final §§ 816.41(b)(2) and 817.41(b)(2) require the handling of earth materials and runoff in a manner to restore the approximate premining recharge capacity rather than premining water availability. This was part of the no action/minimum action alternative in the FEIS.

13. Final §§ 816.41 (c) and (e) and 817.41 (c) and (e) specify what the operator must do if ground-water monitoring indicates noncompliance with permit conditions. Modifications of monitoring requirements shall be treated like permit revisions. The demonstration which an operator must make to obtain a modification in the monitoring requirements has been slightly broadened from that in the FEIS.

14. Final §§ 816.41(d) and 817.41(d) have increased the surface-water protection efforts an operator shall take when conducting surface mining activities.

15. Final §§ 816.41(g) and 817.41(g) require that a permittee shall remain responsible for the proper management of wells until bond release even though the ownership of the well has been transferred to another party.

16. Final § 816.41(h) does not specify, as does the preferred alternative, that the water being replaced shall be of equal or better quality and quantity than the pre-affected supply. Instead, the final rule requires replacement of the water supply adversely affected by the surface mining activity. This is equally as environmentally protective as the preferred alternative because, as described earlier in this preamble, the concept of replacement includes restoration of both quality and quantity.

17. Final §§ 816.41(i) and 817.41(h) add that discharges into an underground mine must prevent material damage outside the permit area.

18. Final §§ 816.43 and 817.43 add that diversions must be designed to prevent material damage to the hydrologic balance. Diversions of miscellaneous flows need not be designed, constructed or maintained under the direction of a registered professional engineer. This is consistent with Alternative B in the FEIS.

List of Subjects

30 CFR Part 701

Coal mining, Law enforcement, Surface mining, Underground mining.

30 CFR Parts 779 and 816

Coal mining, Environmental protection, Reporting and recordkeeping requirements, Surface mining.

30 CFR Part 780

Coal mining, Incorporation by reference, Reporting and recordkeeping requirements, Surface mining.

30 CFR Parts 783 and 817

Coal mining, Environmental protection, Reporting and recordkeeping requirements, Underground mining.

30 CFR Part 784

Coal mining, Incorporation by reference, Reporting and recordkeeping requirements, Underground mining.

Accordingly, 30 CFR Parts 701, 779, 780, 783, 784, 816, and 817 are amended as set forth herein.

Dated: September 15, 1983.

Joy R. Gwaltney,

Acting Deputy Assistant Secretary, Energy and Minerals.

PART 701 -- PERMANENT REGULATORY PROGRAM

1. Section 701.5 is amended by adding the following definitions in alphabetical order:

§ 701.5 Definitions.

* * * * *

Cumulative impact area means the area, including the permit area, within which impacts resulting from the proposed operation may interact with the impacts of all anticipated mining on surface- and ground-water systems. Anticipated mining shall include, at a minimum, the entire projected lives through bond release of: (a) The proposed operation, (b) all existing operations, (c) any operation for which a permit application has been submitted to the regulatory authority, and (d) all operations required to meet diligent development requirements for leased Federal coal for which there is actual mine development information available.

* * * * *

Gravity discharge means, with respect to underground mining activities, mine drainage that flows freely in an open channel downgradient. Mine drainage that occurs as a result of flooding a mine to the level of the discharge is not gravity discharge.

* * * * *

PART 779 -- SURFACE MINING PERMIT APPLICATIONS -- MINIMUM REQUIREMENTS FOR INFORMATION ON ENVIRONMENTAL RESOURCES

§§ 779.13, 779.14, 779.15, 779.16 and 779.17 [Removed]

2. Sections 779.13, 779.14, 779.15, 779.16 and 779.17 are removed.

PART 780 -- SURFACE MINING PERMIT APPLICATIONS -- MINIMUM REQUIREMENTS FOR RECLAMATION AND OPERATION PLAN

3. Section § 780.21 is revised to read as follows:

§ 780.21 Hydrologic information.

(a) *Sampling and analysis methodology.* All water-quality analyses performed to meet the requirements of this section shall be conducted according to the methodology in the 15th edition of "Standard Methods for the Examination of Water and Wastewater," which is incorporated by reference, or the methodology in 40 CFR Parts 136 and 434. Water quality sampling performed to meet the requirements of this section shall be conducted according to either methodology listed above when feasible. "Standard Methods for the Examination of Water and Wastewater," is a joint publication of the American Public Health Association, the American Water Works Association, and the Water Pollution Control Federation and is available from the American Public Health Association, 1015 15th Street, NW., Washington, DC 20036. This document is also available for inspection at the Office of the Federal Register Information Center, Room 8301, 1100 L Street, NW., Washington, D.C.; at the Office of the OSM Administrative Record, U.S. Department of the Interior, Room 5315, 1100 L Street, NW., Washington, D.C.; at the OSM Eastern Technical Service Center, U.S. Department of the Interior, Building 10, Parkway Center, Pittsburgh, Pa.; and at the OSM Western Technical Service Center, U.S. Department of the Interior, Brooks Tower, 1020 15th Street, Denver, Colo. This incorporation by reference was approved by the Director of the Federal Register on October 26, 1983. This document is incorporated as it exists on the date of the approval, and a notice of any change in it will be published in the Federal Register.

(b) *Baseline information.* The application shall include the following baseline hydrologic information, and any additional information required by the regulatory authority.

(1) *Ground-water information.* The location and ownership for the permit and adjacent areas of existing wells, springs, and other ground-water resources, seasonal quality and quantity of ground water, and usage. Water quality descriptions shall include, at a minimum, total dissolved solids or specific conductance corrected to 25 deg.C, pH, total iron, and total manganese. Ground-water quantity descriptions shall include, at a minimum, approximate rates of discharge or usage and depth to the water in the coal seam, and each water-bearing stratum above and potentially impacted stratum below the coal seam.

(2) *Surface-water information.* The name, location, ownership, and description of all surface-water bodies such as streams, lakes, and impoundments, the location of any discharge into any surface-water body in the proposed permit and adjacent areas, and information on surface-water quality and quantity sufficient to demonstrate seasonal variation and water usage. Water quality descriptions shall include, at a minimum, baseline information on total suspended solids, total dissolved solids or specific conductance corrected to 25 deg.C, pH, total iron, and total manganese. Baseline acidity and alkalinity information shall be provided if there is a potential for acid drainage from the proposed mining operation. Water quantity descriptions shall include, at a minimum, baseline information on seasonal flow rates.

(3) *Supplemental information.* If the determination of the probable hydrologic consequences (PHC) required by paragraph (f) of this section indicates that adverse impacts on or off the proposed permit area may occur to the hydrologic balance, or that acid-forming or toxic-forming material is present that may result in the contamination of ground-water or surface-water supplies, then information supplemental to that required under paragraphs (b)(1) and (b)(2) of this section shall be provided to evaluate such probable hydrologic consequences and to plan remedial and reclamation activities. Such supplemental information may be based upon drilling, aquifer tests, hydrogeologic analysis of the water-bearing strata, flood flows, or analysis of other water quality or quantity characteristics.

(c) *Baseline cumulative impact area information.* (1) Hydrologic and geologic information for the cumulative impact area necessary to assess the probable cumulative hydrologic impacts of the proposed operation and all anticipated mining on surface- and ground-water systems as required by paragraph (g) of this section shall be provided to the regulatory authority if available from appropriate Federal or State agencies.

(2) If the information is not available from such agencies, then the applicant may gather and submit this information to the regulatory authority as part of the permit application.

(3) The permit shall not be approved until the necessary hydrologic and geologic information is available to the regulatory authority.

(d) *Modeling.* The use of modeling techniques, interpolation or statistical techniques may be included as part of the permit application, but actual surface- and ground-water information may be required by the regulatory authority for each site even when such techniques are used.

(e) *Alternative water source information.* If the PHC determination required by paragraph (f) of this section indicates that the proposed mining operation may proximately result in contamination, diminution, or interruption of an underground or surface source of water within the proposed permit or adjacent areas which is used for domestic, agricultural, industrial or other legitimate purpose, then the application shall contain information on water availability and alternative water sources, including the suitability of alternative water sources for existing permining uses and approved postmining land uses.

(f) *Probable hydrologic consequences determination.* (1) The application shall contain a determination of the probable hydrologic consequences (PHC) of the proposed operation upon the quality and quantity of surface and ground water under seasonal flow conditions for the proposed permit and adjacent areas.

(2) The PHC determination shall be based on baseline hydrologic, geologic and other information collected for the permit application and may include data statistically representative of the site;

(3) The PHC determination shall include findings on:

(i) Whether adverse impacts may occur to the hydrologic balance;

(ii) Whether acid-forming or toxic-forming materials are present that could result in the contamination of surface or ground-water supplies;

(iii) Whether the proposed operation may proximately result in contamination, diminution or interruption of an underground or surface source of water within the proposed permit or adjacent areas which is used for domestic, agricultural, industrial, or other legitimate purpose; and

(iv) What impact the proposed operation will have on:

(A) Sediment yield from the disturbed area (B) acidity, total suspended and dissolved solids, and other important water quality parameters of local impact; (C) flooding or streamflow alteration; (D) ground-water and surface-water availability and, (E) other characteristics as required by the regulatory authority.

(4) An application for a permit revision shall be reviewed by the regulatory authority to determine whether a new or updated PHC determination shall be required.

(g) *Cumulative hydrologic impact assessment.* (1) The regulatory authority shall provide an assessment of the probable cumulative hydrologic impacts (CHIA) of the proposed operation and all anticipated mining upon surface- and ground-water systems in the cumulative impact area. The CHIA shall be sufficient to determine, for purposes of permit approval, whether the proposed operation has been designed to prevent material damage to the hydrologic balance outside the permit area. The regulatory authority may allow the applicant to submit data and analyses relevant to the CHIA with the permit application.

(2) An application for a permit revision shall be reviewed by the regulatory authority to determine whether a new or updated CHIA shall be required.

(h) *Hydrologic reclamation plan.* The application shall include a plan, with maps and descriptions, indicating how the relevant requirements of Part 816, including §§ 816.41 to 816.43, will be met. The plan shall be specific to the local hydrologic conditions. It shall contain the steps to be taken during mining and reclamation through bond release to minimize disturbances to the hydrologic balance within the permit and adjacent areas; to prevent material damage outside the permit area; to meet applicable Federal and State water quality laws and regulations; and to protect the rights of present water users. The plan shall include the measures to be taken to: Avoid acid or toxic drainage; prevent, to the extent possible using the best technology currently available, additional contributions of suspended solids to streamflow; provide water-treatment facilities when needed; control drainage; restore approximate premining recharge capacity and protect or replace rights of present water users. The plan shall specifically address and potential adverse hydrologic consequences identified in the PHC determination prepared under paragraph (f) of this section and shall include preventive and remedial measures.

(i) *Ground-water monitoring plan.* (1) The application shall include a ground-water monitoring plan based upon the PHC determination required under paragraph (f) of this section and the analysis of all baseline hydrologic, geologic and other information in the permit application. The plan shall provide for the monitoring of parameters that relate to the suitability of the ground water for current and approved postmining land uses and to the objectives for protection of the hydrologic balance set forth in paragraph (h) of this section. It shall identify the quantity and quality parameters to be monitored, sampling frequency, and site locations. It shall describe how the data may be used to determine the impacts of the operation upon the hydrologic balance. At a minimum, total dissolved solids or specific conductance corrected to 25 deg.C, pH, total iron, total manganese, and water levels shall be monitored and data submitted to the regulatory authority at least every 3 months for each monitoring location. The regulatory authority may require additional monitoring.

(2) If an applicant can demonstrate by the use of the PHC determination and other available information that a particular water-bearing stratum in the proposed permit and adjacent areas is not one which serves as an aquifer which significantly ensures the hydrologic balance within the cumulative impact area, then monitoring of that stratum may be waived by the regulatory authority.

(j) *Surface-water monitoring plan.* (1) The application shall include a surface-water monitoring plan based upon the PHC determination required under paragraph (f) of this section and the analysis of all baseline hydrologic, geologic, and other information in the permit application. The plan shall provide for the monitoring of parameters that relate to the suitability of the surface water for current and approved postmined land uses and to the objectives for protection of the hydrologic balance as set forth in paragraph (h) of this section as well as the effluent limitations found at 40 CFR Part 434.

(2) The plan shall identify the surface-water quantity and quality parameters to be monitored, sampling frequency and site locations. It shall describe how the data may be used to determine the impacts of the operation upon the hydrologic balance.

(i) At all monitoring locations in the surface-water bodies such as streams, lakes, and impoundments, that are potentially impacted or into which water will be discharged and at upstream monitoring locations the total dissolved solids or specific conductance corrected to 25 deg.C, total suspended solids, pH, total iron, total manganese, and flow shall be monitored.

(ii) For point-source discharges, monitoring shall be conducted in accordance with 40 CFR Parts 122, 123 and 434 and as required by the National Pollutant Discharge Elimination System permitting authority.

(3) The monitoring reports shall be submitted to the regulatory authority every 3 months. The regulatory authority may require additional monitoring.

4. Section 780.22 is added to read as follow:

§ 780.22 Geologic information.

(a) *General.* Each application shall include geologic information in sufficient detail to assist in determining --

(1) The probable hydrologic consequences of the operation upon the quality and quantity of surface and ground water in the permit and adjacent areas, including the extent to which surface- and ground-water monitoring is necessary;

(2) All potentially acid- or toxic-forming strata down to and including the stratum immediately below the lowest coal seam to be mined; and

(3) Whether reclamation as required by this chapter can be accomplished and whether the proposed operation has been designed to prevent material damage to the hydrologic balance outside the permit area.

(b) Geologic information shall include, at a minimum the following:

(1) A description of the geology of the proposed permit and adjacent areas down to and including the deeper of either the stratum immediately below the lowest coal seam to be mined or any aquifer below the lowest coal seam to be mined which may be adversely impacted by mining. The description shall include the areal and structural geology of the permit and adjacent areas, and other parameters which influence the required reclamation and the occurrence, availability, movement, quantity, and quality of potentially impacted surface and ground waters. It shall be based on --

(i) The cross sections, maps and plans required by § 779.25 of this chapter;

(ii) The information obtained under paragraphs (b)(2) and (c) of this section; and

(iii) Geologic literature and practices.

(2) Analyses of samples collected from test borings; drill cores; or fresh, unweathered, uncontaminated samples from rock outcrops from the permit area, down to and including the deeper of either the stratum immediately below the lowest coal seam to be mined or any aquifer below the lowest seam to be mined which may be adversely impacted by mining. The analyses shall result in the following:

(i) Logs showing the lithologic characteristics including physical properties and thickness of each stratum and location of ground water where occurring;

(ii) Chemical analyses identifying those strata that may contain acid- or toxic-forming or alkalinity-producing materials and to determine their content except that the regulatory authority may find that the analysis for alkalinity-producing materials is unnecessary; and

(iii) Chemical analyses of the coal seam for acid- or toxic-forming materials, including the total sulfur and pyritic sulfur, except that the regulatory authority may find that the analysis of pyritic sulfur content is unnecessary.

(c) If determined to be necessary to protect the hydrologic balance or to meet the performance standards of this chapter, the regulatory authority may require the collection, analysis, and description of geologic information in addition to that required by paragraph (b) of this section.

(d) An applicant may request the regulatory authority to waive in whole or in part the requirements of paragraph (b)(2) of this section. The waiver may be granted only if the regulatory authority finds in writing that the collection and analysis of such data is unnecessary because other equivalent information is available to the regulatory authority in a satisfactory form.

§ 780.29 [Amended]

5. Section 780.29 is amended by replacing the reference "*30 CFR 816.43*-816.44" with the reference " § 816.43 of this chapter."

PART 783 -- UNDERGROUND MINING PERMIT APPLICATIONS -- MINIMUM REQUIREMENTS FOR INFORMATION ON ENVIRONMENTAL RESOURCES

§§ 783.13, 783.14, 783.15, 783.16 and 783.17 [Removed]

6. Sections 783.13, 783.14, 783.15, 783.16 and 783.17 are removed.

PART 784 -- UNDERGROUND MINING PERMIT APPLICATIONS -- MINIMUM REQUIREMENTS FOR RECLAMATION AND OPERATION PLAN

7. Section 784.14 is revised to read as follows:

§ 784.14 Hydrologic information.

(a) *Sampling and analysis.* All water quality analyses performed to meet the requirements of this section shall be conducted according to the methodology in the 15th edition of "Standard Methods for the Examination of Water and Wastewater," which is incorporated by reference, or the methodology in 40 CFR Parts 136 and 434. Water quality sampling performed to meet the requirements of this section shall be conducted according to either methodology listed above when feasible. "Standard Methods for the Examination of Water and Wastewater," is a joint publication of the American Public Health Association, the American Water Works Association, and the Water Pollution Control Federation and is available from the American Public Health Association, 1015 Fifteenth Street, NW., Washington, DC 20036. This document is also available for inspection at the Office of the Federal Register Information Center, Room 8301, 1100 L Street, NW., Washington, D.C.; at the Office of the OSM Administrative Record, U.S. Department of the Interior, Room 5315, 1100 L Street, NW., Washington, D.C.; at the OSM Eastern Technical Service Center, U.S. Department of the Interior, Building 10, Parkway Center, Pittsburgh, Pa.; and at the OSM Western Technical Service Center, U.S. Department of the Interior, Brooks Tower, 1020 15th Street, Denver, Colo. This incorporation by reference was approved by the Director of the Federal Register on October 26, 1983. This document is incorporated as it exists on the date of the approval, and a notice of any change in it will be published in the Federal Register.

(b) *Baseline information.* The application shall include the following baseline hydrologic information, and any additional information required by the regulatory authority.

(1) *Ground-Water information.* The location and ownership for the permit and adjacent areas of existing wells, springs, and other ground-water resources, seasonal quality and quantity of ground water, and usage. Water quality descriptions shall include, at a minimum, total dissolved solids or specific conductance corrected to 25 deg.C, pH, total iron, and total manganese. Ground-water quantity descriptions shall include, at a minimum, approximate rates of discharge or usage and depth to the water in the coal seam, and each water-bearing stratum above and potentially impacted stratum below the coal seam.

(2) *Surface-water information.* The name, location, ownership and description of all surface-water bodies such as streams, lakes, and impoundments, the location of any discharge into any surface-water body in the proposed permit and adjacent areas, and information on surface-water quality and quantity sufficient to demonstrate seasonal variation and water usage. Water quality descriptions shall include, at a minimum, baseline information on total suspended solids, total dissolved solids or specific conductance corrected to 25 deg.C, pH, total iron, and total manganese. Baseline acidity and alkalinity information shall be provided if there is a potential for acid drainage from the proposed mining operation. Water quantity descriptions shall include, at a minimum, baseline information on seasonal flow rates.

(3) *Supplemental information.* If the determination of the probable hydrologic consequences (PHC) required by paragraph (e) of this section indicates that adverse impacts on or off the proposed permit area may occur to the hydrologic balance, or that acid-forming or toxic-forming material is present that may result in the contamination of ground-water or surface-water supplies, then information supplemental to that required under paragraphs (b)(1) and (b)(2) of this section shall be provided to evaluate such probable hydrologic consequences and to plan remedial and reclamation activities. Such supplemental information may be based upon drilling, aquifer tests, hydrogeologic analysis of the water-bearing strata, flood flows, or analysis of other water quality or quantity characteristics.

(c) *Baseline cumulative impact area information.* (1) Hydrologic and geologic information for the cumulative impact area necessary to assess the probable cumulative hydrologic impacts of the proposed operation and all anticipated mining on surface- and ground-water systems as required by paragraph (f) of this section shall be provided to the regulatory authority if available from appropriate Federal or State agencies.

(2) If this information is not available from such agencies, then the applicant may gather and submit this information to the regulatory authority as part of the permit application.

(3) The permit shall not be approved until the necessary hydrologic and geologic information is available to the regulatory authority.

(d) *Modeling.* The use of modeling techniques, interpolation or statistical techniques may be included as part of the permit application, but actual surface- and ground-water information may be required by the regulatory authority for each site even when such techniques are used.

(e) *Probable hydrologic consequences determination.* (1) The application shall contain a determination of the probable hydrologic consequences (PHC) of the proposed operation upon the quality and quantity of surface and ground water under seasonal flow conditions for the proposed permit and adjacent areas.

(2) The PHC determination shall be based on baseline hydrologic, geologic and other information collected for the permit application and may include data statistically representative of the site.

(3) The PHC determination shall include findings on:

(i) Whether adverse impacts may occur to the hydrologic balance;

(ii) Whether acid-forming or toxic-forming materials are present that could result in the contamination of surface- or ground-water supplies; and

(iii) What impact the proposed operation will have on:

(A) Sediment yield from the disturbed area; (B) acidity, total suspended and dissolved solids, and other important water quality parameters of local impact; (C) flooding or streamflow alteration; (D) ground-water and surface-water availability; and, (E) other characteristics as required by the regulatory authority.

(4) An application for a permit revision shall be reviewed by the regulatory authority to determine whether a new or updated PHC determination shall be required.

(f) *Cumulative hydrologic impact assessment.* (1) The regulatory authority shall provide an assessment of the probable cumulative hydrologic impacts (CHIA) of the proposed operation and all anticipated mining upon surface- and ground-water systems in the cumulative impact area. The CHIA shall be sufficient to determine, for purposes of permit approval, whether the proposed operation has been designed to prevent material damage to the hydrologic balance outside the permit area. The regulatory authority may allow the applicant to submit data and analyses relevant to the CHIA with the permit application.

(2) An application for a permit revision shall be reviewed by the regulatory authority to determine whether a new or updated CHIA shall be required.

(g) *Hydrologic reclamation plan.* The application shall include a plan, with maps and descriptions, indicating how the relevant requirements of Part 817, including §§ 817.41 to 817.43, will be met. The plan shall be specific to the local hydrologic conditions. It shall contain the steps to be taken during mining and reclamation through bond release to minimize disturbance to the hydrologic balance within the permit and adjacent areas; to prevent material damage outside the permit area; and to meet applicable Federal and State water quality laws and regulations. The plan shall include the measures to be taken to: avoid acid or toxic drainage; prevent to the extent possible using the best technology currently available, additional contributions of suspended solids to streamflow; provide water-treatment facilities when needed; control drainage; and restore approximate premining recharge capacity. The plan shall specifically address any potential adverse hydrologic consequences identified in the PHC determination prepared under paragraph (e) of this section and shall include preventive and remedial measures.

(h) *Ground-water monitoring plan.* (1) The application shall include a ground-water monitoring plan based upon the PHC determination required under paragraph (e) of this section and the analysis of all baseline hydrologic, geologic and other information in the permit application. The plan shall provide for the monitoring of parameters that relate to the suitability of the ground water for current and approved postmining land uses and to the objectives for protection of the hydrologic balance set forth in paragraph (g) of this section. It shall identify the quantity and quality parameters to be monitored, sampling frequency and site locations. It shall describe how the data may be used to determine the impacts of the operation upon the hydrologic balance. At a minimum, total dissolved solids or specific conductance corrected to 25 deg.C, pH, total iron, total manganese, and water levels shall be monitored and data submitted to the regulatory authority at least every 3 months for each monitoring location. The regulatory authority may require additional monitoring.

(2) If an applicant can demonstrate by the use of the PHC determination and other available information that a particular water-bearing stratum in the proposed permit and adjacent areas is not one which serves as an aquifer which sig-

nificantly ensures the hydrologic balance within the cumulative impact area, then monitoring of that stratum may be waived by the regulatory authority.

(i) *Surface-water monitoring plan.* (1) The application shall include a surface-water monitoring plan based upon the PHC determination required under paragraph (e) of this section and the analysis of all baseline hydrologic, geologic and other information in the permit application. The plan shall provide for the monitoring of parameters that relate to the suitability of the surface water for current and approved postmining land uses and to the objectives for protection of the hydrologic balance as set forth in paragraph (g) of this section as well as the effluent limitations found at 40 CFR Part 434.

(2) The plan shall identify the surface-water quantity and quality parameters to be monitored, sampling frequency and site locations. It shall describe how the data may be used to determine the impacts of the operation upon the hydrologic balance.

(i) At all monitoring locations in streams, lakes, and impoundments, that are potentially impacted or into which water will be discharged and at upstream monitoring locations, the total dissolved solids or specific conductance corrected at 25 deg.C, total suspended solids, pH, total iron, total manganese, and flow shall be monitored.

(ii) For point-source discharges, monitoring shall be conducted in accordance with 40 CFR Parts 122, 123 and 434 and as required by the National Pollutant Discharge Elimination System permitting authority.

(3) The monitoring reports shall be submitted to the regulatory authority every 3 months. The regulatory authority may require additional monitoring.

§ 784.22 [Redesignated as § 784.29 and amended].

8. Section 784.22 is redesignated as § 784.29 and amended by replacing the reference " §§ 817.43-817.44" with the reference " § 817.43 of this chapter."

9. A new § 784.22 is added to read as follows:

§ 784.22 Geologic information.

(a) *General.* Each application shall include geologic information in sufficient detail to assist in --

(1) Determining the probable hydrologic consequences of the operation upon the quality and quantity of surface and ground water in the permit and adjacent areas, including the extent to which surface- and ground-water monitoring is necessary;

(2) Determining all potentially acid- or toxic-forming strata down to and including the stratum immediately below the coal seam to be mined;

(3) Determining whether reclamation as required by this chapter can be accomplished and whether the proposed operation has been designed to prevent material damage to the hydrologic balance outside the permit area; and

(4) Preparing the subsidence control plan under § 784.20.

(b) Geologic information shall include, at a minimum, the following:

(1) A description of the geology of the proposed permit and adjacent areas down to and including the deeper of either the stratum immediately below the lowest coal seam to be mined or any aquifer below the lowest coal seam to be mined which may be adversely impacted by mining. This description shall include the areal and structural geology of the permit and adjacent areas, and other parameters which influence the required reclamation and it shall also show how the areal and structural geology may affect the occurrence, availability, movement, quantity and quality of potentially impacted surface and ground water. It shall be based on --

(i) The cross sections, maps, and plans required by § 783.25 of this chapter;

(ii) The information obtained under paragraphs (b)(2), (b)(3), and (c) of this section; and

(iii) Geologic literature and practices.

(2) For any portion of a permit area in which the strata down to the coal seam to be mined will be removed or are already exposed, samples shall be collected and analyzed from test borings; drill cores; or fresh, unweathered, uncontaminated samples from rock outcrops down to and including the deeper of either the stratum immediately below the

lowest coal seam to be mined or any aquifer below the lowest coal seam to be mined which may be adversely impacted by mining. The analyses shall result in the following:

(i) Logs showing the lithologic characteristics including physical properties and thickness of each stratum and location of ground water where occurring;

(ii) Chemical analyses identifying those strata that may contain acid- or toxic-forming, or alkalinity-producing materials and to determine their content except that the regulatory authority may find that the analysis for alkalinity-producing material is unnecessary; and

(iii) Chemical analysis of the coal seam for acid- or toxic-forming materials, including the total sulfur and pyritic sulfur, except that the regulatory authority may find that the analysis of pyritic sulfur content is unnecessary.

(3) For lands within the permit and adjacent areas where the strata above the coal seam to be mined will not be removed, samples shall be collected and analyzed from test borings or drill cores to provide the following data:

(i) Logs of drill holes showing the lithologic characteristics, including physical properties and thickness of each stratum that may be impacted, and location of ground water where occuring;

(ii) Chemical analyses for acid- or toxic-forming or alkalinity-producing materials and their content in the strata immediately above and below the coal seam to be mined;

(iii) Chemical analyses of the coal seam for acid- or toxic-forming materials, including the total sulfur and pyritic sulfur, except that the regulatory authority may find that the analysis of pyrite sulfur content is unnecessary; and

(iv) For standard room and pillar mining operations, the thickness and engineering properties of clays or soft rock such as clay shale, if any, in the stratum immediately above and below each coal seam to be mined.

(c) If determined to be necessary to protect the hydrologic balance, to minimize or prevent subsidence, or to meet the performance standards of this chapter, the regulatory authority may require the collection, analysis and description of geologic information in addition to that required by paragraph (b) of this section.

(d) An applicant may request the regulatory authority to waive in whole or in part the requirements of paragraphs (b)(2) and (b)(3) of this section. The waiver may be granted only if the regulatory authority finds in writing that the collection and analysis of such data is unnecessary because other information having equal value or effect is available to the regulatory authority in a satisfactory form.

PART 816 -- PERMANENT PROGRAM PERFORMANCE STANDARDS -- SURFACE MINING ACTIVITIES

§§ 816.13 and 816.15 [Amended]

10. Sections 816.13 and 816.15 are amended by replacing the reference " § 816.53" in each section with the reference " § 816.41."

11. Section 816.41 is revised to read as follows:

§ 816.41 Hydrologic-balance protection.

(a) *General.* All surface mining and reclamation activities shall be conducted to minimize disturbance of the hydrologic balance within the permit and adjacent areas, to prevent material damage to the hydrologic balance outside the permit area, to assure the protection or replacement of water rights, and to support approved postmining land uses in accordance with the terms and conditions of the approved permit and the performance standards of this part. The regulatory authority may require additional preventative, remedial, or monitoring measures to assure that material damage to the hydrologic balance outside the permit area is prevented. Mining and reclamation practices that minimize water pollution and changes in flow shall be used in preference to water treatment.

(b) *Ground-water protection.* In order to protect the hydrologic balance, surface mining activities shall be conducted according to the plan approved under § 780.21(h) of this chapter and the following:

(1) Ground-water quality shall be protected by handling earth materials and runoff in a manner that minimizes acidic, toxic, or other harmful infiltration to ground-water systems and by managing excavations and other disturbances to prevent or control the discharge of pollutants into the ground water.

(2) Ground-water quantity shall be protected by handling earth materials and runoff in a manner that will restore the approximate premining recharge capacity of the reclaimed area as a whole, excluding coal mine waste disposal areas and fills, so as to allow the movement of water to the ground-water system.

(c) *Ground-water monitoring.* (1) Ground-water monitoring shall be conducted according to the ground-water monitoring plan approved under § 780.21(i) of this chapter. The regulatory authority may require additional monitoring when necessary.

(2) Ground-water monitoring data shall be submitted every 3 months to the regulatory authority or more frequently as prescribed by the regulatory authority. Monitoring reports shall include analytical results from each sample taken during the reporting period. When the analysis of any ground-water sample indicates noncompliance with the permit conditions, then the operator shall promptly notify the regulatory authority and immediately take the actions provided for in §§ 773.17(e) and 780.21(h) of this chapter.

(3) Ground-water monitoring shall proceed through mining and continue during reclamation until bond release. Consistent with the procedures of § 774.13 of this chapter, the regulatory authority may modify the monitoring requirements, including the parameters covered and the sampling frequency, if the operator demonstrates, using the monitoring data obtained under this paragraph, that --

(i) The operation has minimized disturbance to the hydrologic balance in the permit and adjacent areas and prevented material damage to the hydrologic balance outside the permit area; water quantity and quality are suitable to support approved postmining land uses; and the water rights of other users have been protected or replaced; or

(ii) Monitoring is no longer necessary to achieve the purposes set forth in the monitoring plan approved under § 780.21(i) of this chapter.

(4) Equipment, structures, and other devices used in conjuction with monitoring the quality and quantity of ground water onsite and offsite shall be properly installed, maintained, and operated and shall be removed by the operator when no longer needed.

(d) *Surface-water protection.* In order to protect the hydrologic balance, surface mining activities shall be conducted according to the plan approved under § 780.21(h) of this chapter, and the following:

(1) Surface-water quality shall be protected by handling earth materials, ground-water discharges, and runoff in a manner that minimizes the formation of acidic or toxic drainage; prevents, to the extent possible using the best technology currently available, additional contribution of suspended solids to streamflow outside the permit area; and otherwise prevents water pollution. If drainage control, restabilization and revegetation of disturbed areas, diversion of runoff, mulching, or other reclamation and remedial practices are not adequate to meet the requirements of this section and § 816.42, the operator shall use and maintain the necessary water-treatment facilities or water quality controls.

(2) Surface-water quality and flow rates shall be protected by handling earth materials and runoff in accordance with the steps outlined in the plan approved under § 780.21(h) of this chapter.

(e) *Surface-water monitoring.* (1) Surface-water monitoring shall be conducted according to the surface-water monitoring plan approved under § 780.21(j) of this chapter. The regulatory authority may require additional monitoring when necessary.

(2) Surface-water monitoring data shall be submitted every 3 months to the regulatory authority or more frequently as prescribed by the regulatory authority. Monitoring reports shall include analytical results from each sample taken during the reporting period. When the analysis of any surface-water sample indicates noncompliance with the permit conditions, the operator shall promptly notify the regulatory authority and immediately take the actions provided for in §§ 773.17(e) and 780.21(h) of this chapter. The reporting requirements of this paragraph do not exempt the operator from meeting any National Pollutant Discharge Elimination System (NPDES) reporting requirements.

(3) Surface-water monitoring shall proceed through mining and continue during reclamation until bond release. Consistent with § 774.13 of this chapter, the regulatory authority may modify the monitoring requirements, except those required by the NPDES permitting authority, including the parameters covered and sampling frequency if the operator demonstrates, using the monitoring data obtained under this paragraph, that --

(i) The operation has minimized disturbance to the hydrologic balance in the permit and adjacent areas and prevented material damage to the hydrologic balance outside the permit area; water quantity and quality are suitable to support approved postmining land uses; and the water rights of other users have been protected or replaced; or

(ii) Monitoring is no longer necessary to achieve the purposes set forth in the monitoring plan approved under § 780.21(j) of this chapter.

(4) Equipment, structures, and other devices used in conjunction with monitoring the quality and quantity of surface water onsite and offsite shall be properly installed, maintained, and operated and shall be removed by the operator when no longer needed.

(f) *Acid- and toxic-forming materials.* (1) Drainage from acid- and toxic-forming materials into surface water and ground water shall be avoided by --

(i) Identifying and burying and/or treating, when necessary, materials which may adversely affect water quality, or be detrimental to vegetation or to public health and safety if not buried and/or treated, and

(ii) Storing materials in a manner that will protect surface water and ground water by preventing erosion, the formation of polluted runoff, and the infiltration of polluted water. Storage shall be limited to the period until burial and/or treatment first become feasible, and so long as storage will not result in any risk of water pollution or other environmental damage.

(2) Storage, burial or treatment practices shall be consistent with other material handling and disposal provisions of this chapter.

(g) *Transfer of wells.* Before final release of bond, exploratory or monitoring wells shall be sealed in a safe and environmentally sound manner in accordance with §§ 816.13 to 816.15. With the prior approval of the regulatory authority, wells may be transferred to another party for further use. At a minimum, the conditions of such transfer shall comply with State and local law and the permittee shall remain responsible for the proper management of the well until bond release in accordance with §§ 816.13 to 816.15.

(h) *Water rights and replacement.* Any person who conducts surface mining activities shall replace the water supply of an owner of interest in real property who obtains all or part of his or her supply of water for domestic, agricultural, industrial, or other legitimate use from an underground or surface source, where the water supply has been adversely impacted by contamination, diminution, or interruption proximately resulting from the surface mining activities. Baseline hydrologic information required in §§ 780.21 and 780.22 of this chapter shall be used to determine the extent of the impact of mining upon ground water and surface water.

(i) *Discharges into an underground mine.* (1) Discharges into an underground mine are prohibited, unless specifically approved by the regulatory authority after a demonstration that the discharge will --

(i) Minimize disturbance to the hydrologic balance on the permit area, prevent material damage outside the permit area and otherwise eliminate public hazards resulting from surface mining activities;

(ii) Not result in a violation of applicable water quality standards or effluent limitations;

(iii) Be at a known rate and quality which shall meet the effluent limitations of § 816.42 for pH and total suspended solids, except that the pH and total suspended-solids limitations may be exceeded, if approved by the regulatory authority; and

(iv) Meet with the approval of the Mine Safety and Health Administration.

(2) Discharges shall be limited to the following:

(i) Water;

(ii) Coal processing waste;

(iii) Fly ash from a coal-fired facility;

(iv) Sludge from an acid-mine-drainage treatment facility;

(v) Flue-gas desulfurization sludge;

(vi) Inert materials used for stabilizing underground mines; and

(vii) Underground mine development wastes.

12. Section 816.43 is revised to read as follows:

§ 816.43 Diversions.

(a) *General requirements.* (1) With the approval of the regulatory authority, any flow from mined areas abandoned before May 3, 1978, and any flow from undisturbed areas or reclaimed areas, after meeting the criteria of § 816.46 for siltation structure removal, may be diverted from disturbed areas by means of temporary or permanent diversions. All diversions shall be designed to minimize adverse impacts to the hydrologic balance within the permit and adjacent areas, to prevent material damage outside the permit area and to assure the safety of the public. Diversions shall not be used to divert water into underground mines without approval of the regulatory authority under § 816.41(i).

(2) The diversion and its appurtenant structures shall be designed, located, constructed, maintained and used to --

(i) Be stable;

(ii) Provide protection against flooding and resultant damage to life and property;

(iii) Prevent, to the extent possible using the best technology currently available, additional contributions of suspended solids to streamflow outside the permit area; and

(iv) Comply with all applicable local, State, and Federal laws and regulations.

(3) Temporary diversions shall be removed promptly when no longer needed to achieve the purpose for which they were authorized. The land disturbed by the removal process shall be restored in accordance with this part. Before diversions are removed, downstream water-treatment facilities previously protected by the diversion shall be modified or removed, as necessary, to prevent overtopping or failure of the facilities. This requirement shall not relieve the operator from maintaining water-treatment facilities as otherwise required. A permanent diversion or a stream channel reclaimed after the removal of a temporary diversion shall be designed and constructed so as to restore or approximate the premining characteristics of the original stream channel including the natural riparian vegetation to promote the recovery and the enhancement of the aquatic habitat.

(4) The regulatory authority may specify design criteria for diversions to meet the requirements of this section.

(b) *Diversion of perennial and intermittent streams* . (1) Diversion of perennial and intermittent streams within the permit area may be approved by the regulatory authority after making the finding relating to stream buffer zones that the diversion will not adversely affect the water quantity and quality and related environmental resources of the stream.

(2) The design capacity of channels for temporary and permanent stream channel diversions shall be at least equal to the capacity of the unmodified stream channel immediately upstream and downstream from the diversion.

(3) The requirements of paragraph (a)(2)(ii) of this section shall be met when the temporary and permanent diversions for perennial and intermittent streams are designed so that the combination of channel, bank and flood-plain configuration is adequate to pass safely the peak runoff of a 10-year, 6-hour precipitation event for a temporary diversion and a 100-year, 6-hour precipitation event for a permanent diversion.

(4) The design and construction of all stream channel diversions of perennial and intermittent streams shall be certified by a qualified registered professional engineer as meeting the performance standards of this part and any design criteria set by the regulatory authority.

(c) *Diversion of miscellaneous flows* . (1) Miscellaneous flows, which consist of all flows except for perennial and intermittent streams, may be diverted away from disturbed areas if required or approved by the regulatory authority. Miscellaneous flows shall include ground-water discharges and ephemeral streams.

(2) The design, location, construction, maintenance, and removal of diversions of miscellaneous flows shall meet all of the performance standards set forth in paragraph (a) of this section:

(3) The requirements of paragraph (a)(2)(ii) of this section shall be met when the temporary and permanent diversions for miscellaneous flows are designed so that the combination of channel, bank and flood-plain configuration is adequate to pass safely the peak runoff of a 2-year, 6-hour precipitation event for a temporary diversion and a 10-year, 6-hour precipitation event for a permanent diversion.

§§ 816.44, 816.48, 816.50, 816.51, 816.52, 816.53, 816.54 and 816.55 [Removed]

13. Sections 816.44, 816.48, 816.50, 816.51, 816.52, 816.53, 816.54 and 816.55 are removed.

PART 817 -- PERMANENT PROGRAM PERFORMANCE STANDARDS -- UNDERGROUND MINING ACTIVITIES

§§ 817.13 and 817.15 [Amended]

14. Sections 817.13 and 817.15 are amended by replacing the reference " § 817.53" in each section with the reference " § 817.41."

15. Section 817.15 is also amended by replacing the reference " §§ 817.13 and 817.50" with the reference " § 817.13."

16. Section 817.41 is revised to read as follows:

817.41 Hydrologic-balance protection.

(a) *General.* All underground mining and reclamation activities shall be conducted to minimize disturbance of the hydrologic balance within the permit and adjacent areas, to prevent material damage to the hydrologic balance outside the permit area, and to support approved postmining land uses in accordance with the terms and conditions of the approved permit and the performance standards of this part. The regulatory authority may require additional preventative, remedial, or monitoring measures to assure that material damage to the hydrologic balance outside the permit area is prevented. Mining and reclamation practices that minimize water pollution and changes in flow shall be used in preference to water treatment.

(b) *Ground-water protection.* In order to protect the hydrologic balance underground mining activities shall be conducted according to the plan approved under § 784.14(g) of this chapter and the following.

(1) Ground-water quality shall be protected by handling earth materials and runoff in a manner that minimizes acidic, toxic, or other harmful infiltration to ground-water systems and by managing excavations and other disturbances to prevent or control the discharge of pollutants into the ground water.

(2) Ground-water quantity shall be protected by handling earth materials and runoff in a manner that will restore approximate premining recharge capacity of the reclaimed area as a whole, excluding coal mine waste disposal areas and fills, so as to allow the movement of water to the ground-water system.

(c) *Ground-water monitoring.* (1) Ground-water monitoring shall be conducted according to the ground-water monitoring plan approved under § 784.14(h) of this chapter. The regulatory authority may require additional monitoring when necessary.

(2) Ground-water monitoring data shall be submitted every 3 months to the regulatory authority or more frequently as prescribed by the regulatory authority. Monitoring reports shall include analytical results from each sample taken during the reporting period. When the analysis of any ground-water sample indicates noncompliance with the permit conditions, then the operator shall promptly notify the regulatory authority and immediately take the actions provided for in §§ 773.17(e) and 784.14(g) of this chapter.

(3) Ground-water monitoring shall proceed through mining and continue during reclamation until bond release. Consistent with the procedures of § 774.13 of this chapter, the regulatory authority may modify the monitoring requirements including the parameters covered and the sampling frequency if the operator demonstrates, using the monitoring data obtained under this paragraph, that --

(i) The operation has minimized disturbance to the prevailing hydrologic balance in the permit and adjacent areas and prevented material damage to the hydrologic balance outside the permit area; water quantity and quality are suitable to support approved postmining land uses; or

(ii) Monitoring is no longer necessary to achieve the purposes set forth in the monitoring plan approved under § 784.14(h) of this chapter.

(4) Equipment, structures, and other devices used in conjunction with monitoring the quality and quantity of ground water onsite and offsite shall be properly installed, maintained, and operated and shall be removed by the operator when no longer needed.

(d) *Surface-water protection.* In order to protect the hydrologic balance, underground mining activities shall be conducted according to the plan approved under § 784.14(g) of this chapter, and the following:

(1) Surface-water quality shall be protected by handling earth materials, ground-water discharges, and runoff in a manner that minimizes the formation of acidic or toxic drainage; prevents, to the extent possible using the best technology currently available, additional contribution of suspended solids to streamflow outside the permit area; and otherwise prevent water pollution. If drainage control, restabilization and revegetation of disturbed areas, diversion of runoff, mulching, or other reclamation and remedial practices are not adequate to meet the requirements of this section and § 817.42, the operator shall use and maintain the necessary water-treatment facilities or water quality controls.

(2) Surface-water quantity and flow rates shall be protected by handling earth materials and runoff in accordance with the steps outlined in the plan approved under § 784.14(g) of this chapter.

(e) *Surface-water monitoring.* (1) Surface-water monitoring shall be conducted according to the surface-water monitoring plan approved under § 784.14(i) of this chapter. The regulatory authority may require additional monitoring when necessary.

(2) Surface-water monitoring data shall be submitted every 3 months to the regulatory authority or more frequently as prescribed by the regulatory authority. Monitoring reports shall include analytical results from each sample taken during the reporting period. When the analysis of any surface-water sample indicates noncompliance with the permit conditions, the operator shall promptly notify the regulatory authority and immediately take the actions provided for in §§ 773.17(e) and 784.14(g) of this chapter. The reporting requirements of this paragraph do not exempt the operator from meeting any National Pollutant Discharge Elimination System (NPDES) reporting requirements.

(3) Surface-water monitoring shall proceed through mining and continue during reclamation until bond release. Consistent with § 774.13 of this chapter, the regulatory authority may modify the monitoring requirements, except those required by the NPDES permitting authority, including the parameters covered and sampling frequency if the operator demonstrates, using the monitoring data obtained under this paragraph, that --

(i) The operation has minimized disturbance to the hydrologic balance in the permit and adjacent areas and prevented material damage to the hydrologic balance outside the permit area; water quantity and quality are suitable to support approved postmining land uses; and

(ii) Monitoring is no longer necessary to achieve the purposes set forth in the monitoring plan approved under § 784.14(i) of this chapter.

(4) Equipment, structures, and other devices used in conjunction with monitoring the quality and quantity of surface water onsite and offsite shall be properly installed, maintained, and operated and shall be removed by the operator when no longer needed.

(f) *Acid- and toxic-forming materials.* (1) Drainage from acid- and toxic-forming materials and underground development waste into surface water and ground water shall be avoided by --

(i) Identifying and burying and/or treating, when necessary, materials which may adversely affect water quality, or be detrimental to vegetation or to public health and safety if not buried and/or treated, and

(ii) Storing materials in a manner that will protect surface water and ground water by preventing erosion, the formation of polluted runoff, and the infiltration of polluted water. Storage shall be limited to the period until burial and/or treatment first become feasible, and so long as storage will not result in any risk of water pollution or other environmental damage.

(2) Storage, burial or treatment practices shall be consistent with other material handling and disposal provisions of this chapter.

(g) *Transfer of wells.* Before final release of bond, exploratory or monitoring wells shall be sealed in a safe and environmentally sound manner in accordance with §§ 817.13 and 817.15. With the prior approval of the regulatory authority, wells may be transferred to another party for further use. However, at a minimum, the conditions of such transfer shall comply with State and local laws and the permittee shall remain responsible for the proper management of the well until bond release in accordance with §§ 817.13 to 817.15.

(h) *Discharges into an underground mine.* (1) Discharges into an underground mine are prohibited, unless specifically approved by the regulatory authority after a demonstration that the discharge will --

(i) Minimize disturbance to the hydrologic balance on the permit area, prevent material damage outside the permit area and otherwise eliminate public hazards resulting from underground mining activities;

(ii) Not result in a violation of applicable water quality standards or effluent limitations;

(iii) Be at a known rate and quality which shall meet the effluent limitations of § 817.42 for pH and total suspended solids, except that the pH and total suspended solids limitations may be exceeded, if approved by the regulatory authority; and

(iv) Meet with the approval of the Mine Safety and Health Administration.

(2) Discharges shall be limited to the following:

(i) water;

(ii) Coal-processing waste;

(iii) Fly ash from a coal-fired facility;

(iv) Sludge from an acid-mine-drainage treatment facility;

(v) Flue-gas desulfurization sludge;

(vi) Inert materials used for stabilizing underground mines; and

(vii) Underground mine development wastes.

(3) Water from one underground mine may be diverted into other underground workings according to the requirements of this section.

(i) *Gravity discharges from underground mines.* (1) Surface entries and accesses to underground workings shall be located and managed to prevent or control gravity discharge of water from the mine. Gravity discharges of water from an underground mine, other than a drift mine subject to paragraph (i)(2) of this section, may be allowed by the regulatory authority if it is demonstrated that the untreated or treated discharge complies with the performance standards of this part and any additional NPDES permit requirements.

(2) Notwithstanding anything to the contrary in paragraph (i)(1) of this section, the surface entries and accesses of drift mines first used after the implementation of a State, Federal, or Federal Lands Program and located in acid-producing or iron-producing coal seams shall be located in such a manner as to prevent any gravity discharge from the mine.

17. Section 817.43 is revised to read as follows:

§ 817.43 Diversions.

(a) *General requirements.* (1) With the approval of the regulatory authority, any flow from mined areas abandoned before May 3, 1978, and any flow from undisturbed areas or reclaimed areas, after meeting the criteria of § 817.46 for siltation structure removal, may be diverted from disturbed areas by means of temporary or permanent diversions. All diversions shall be designed to minimize adverse impacts to the hydrologic balance within the permit and adjacent areas, to prevent material damage outside the permit area and to assure the safety of the public. Diversions shall not be used to divert water into underground mines without approval of the regulatory authority in accordance with § 817.41(h).

(2) The diversion and its appurtenant structures shall be designed, located, constructed, and maintained to --

(i) Be stable;

(ii) Provide protection against flooding and resultant damage to life and property;

(iii) Prevent, to the extent possible using the best technology currently available, additional contributions of suspended solids to streamflow outside the permit area; and

(iv) Comply with all applicable local, State, and Federal laws and regulations.

(3) Temporary diversions shall be removed when no longer needed to achieve the purpose for which they were authorized. The land disturbed by the removal process shall be restored in accordance with this part. Before diversions are

removed, downstream water-treatment facilities previously protected by the diversion shall be modified or removed, as necessary, to prevent overtopping or failure of the facilities. This requirement shall not relieve the operator from maintaining water-treatment facilities as otherwise required. A permanent diversion or a stream channel reclaimed after the removal of a temorary diversion shall be designed and constructed so as to restore or approximate the premining characteristics of the original stream channel including the natural riparian vegetation to promote the recovery and the enhancement of the aquatic habitat.

(4) The regulatory authority may specify additional design criteria for diversions to meet the requirements of this section.

(b) *Diversion of perennial and intermittent streams.*

(1) Diversion of perennial and intermittent streams within the permit area may be approved by the regulatory authority after making the finding relating to stream buffer zones called for in *30 CFR 817.57* that the diversions will not adversely affect the water quantity and quality and related environmental resources of the stream.

(2) The design capacity of channels for temporary and permanent stream channel diversions shall be at least equal to the capacity of the unmodified stream channel immediately upstream and downstream from the diversion.

(3) The requirements of paragraph (a)(2)(ii) of this section shall be met when the temporary and permanent diversions for perennial and intermittent streams are designed so that the combination of channel, bank and flood-plain configuration is adequate to pass safely the peak runoff of a 10-year, 6-hour precipitation event for a temporary diversion and a 100-year, 6-hour precipitation event for a permanent diversion.

(4) The design and construction of all stream channel diversions of perennial and intermittent streams shall be certified by a qualified registered professional engineer as meeting the performance standards of this part and any design criteria set by the regulatory authority.

(c) *Diversion of miscellaneous flows.* (1) Miscellaneous flows, which consist of all flows except for perennial and intermittent streams, may be diverted away from disturbed areas if required or approved by the regulatory authority. Miscellaneous flows shall include ground-water discharges and ephemeral streams.

(2) The design, location, construction, maintenance, and removal of diversions of miscellaneous flows shall meet all of the performance standards set forth in paragraph (a) of this section.

(3) The requirements of paragraph (a)(2)(ii) of this section shall be met when the temporary and permanent diversions for miscellaneous flows are designed so that the combination of channel, bank and flood-plain configuration is adequate to pass safely the peak runoff of a 2-year, 6-hour precipitation event for a temporary diversion and a 10-year, 6-hour precipitation event for a permanent diversion.

§§ 817.44, 817.48, 817.50, 817.52, 817.53, 817.54 and 817.55 [Removed]

18. Sections 817.44, 817.48, 817.50, 817.52, 817.53, 817.54 and 817.55 are removed.

Authority: Pub. L. 95-87, *30 U.S.C. 1201 et seq.*

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