

H-1624-1 - PLANNING FOR FLUID MINERAL RESOURCES
Chapter III

CHAPTER III - CONDUCTING AND DOCUMENTING THE ANALYSES OF FACTORS

A. Introduction.

The BLM's planning regulations (43 CFR 1610.4) describe a nine step process, following preplanning, for preparing resource management plans or plan amendments. These steps are: (1) identify issues; (2) develop planning criteria; (3) collect data; (4) analyze the management situation; (5) formulate alternatives; (6) estimate effects; (7) select the preferred alternative; (8) select the plan; and (9) monitor and evaluate the plan. These steps and the requirements for interagency coordination and consultation and public participation are discussed in detail in BLM Manual Sections 1614 through 1616 (see Illustration 1).

The interdisciplinary planning team, working with line management, goes through each of these steps in every resource management planning effort. Although the planning process is portrayed as a series of sequential and discrete steps, in practice, the process is intended to be iterative and dynamic. If fluid minerals determinations are being made and/or affected by other resource determinations, a fluid minerals specialist should be involved in every step of the process.

The supplemental program guidance for fluid minerals (MS 1624.2) identifies three factors of analysis which should be considered in making fluid minerals determinations in resource management plans or plan amendments: (1) the potential for fluid mineral occurrence and development; (2) the cumulative impacts of reasonably foreseeable development; and (3) the necessity for constraints (BLM MS 1624.22). These analyses are completed during the planning process. This chapter provides guidance on how to analyze and document the analyses of these factors.

B. Procedural Guidance.

1. Assemble Data and Information. The interdisciplinary team begins compiling relevant data and information early in the planning process, preferably during preplanning. The fluid minerals specialist should focus attention on collecting data to assist in conducting the analyses of the factors identified in the supplemental program guidance for fluid minerals. The fluid mineral specialist is expected to review data from available sources (e.g., USGS, DOE, American Petroleum Institute, Potential Gas Committee, State agencies, professional societies, and academic sources) to develop a broad data base. BLM files are also important sources of information; they may consist of oil/gas/geothermal maps, well location file cards, well completion reports, and production reports. Previous mineral assessments, such as KGS/KGRA and prospectively valuable classifications, and other evaluations that may have been done for technical reports, exchanges, withdrawals and other actions, may be used as data sources. In many cases, this information has already been compiled and summarized on maps and data bases. Some of this information can be obtained from commercial computer services, such as Petroleum Information and Dwigths, or may be provided by service companies. Special procedures and restrictions on using proprietary data and information are discussed in BLM MS 1273.3.

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Exclusive of those areas closed to fluid mineral development by law, regulation, Executive Order, and Secretarial decision, fluid minerals data and information for the entire planning area (e.g., resource area) should be assembled regardless of surface or mineral ownership. Data on fluid mineral resources and activities in areas adjacent to the planning area may also be useful and necessary for analyzing the potential for occurrence and development and projecting reasonably foreseeable development. The types of data and information generally useful for analyzing fluid minerals potential and estimating impacts are discussed in greater detail below:

a. Past and present data on leasing and development activities and operations. Data and information on historic trends and patterns of fluid mineral exploration and development activities in the planning area, including both boom and bust periods, as well as industry expressions of interest in future leasing and development should be assembled. Generally this information will include past and present data on:

(1) The number and location of leases, units, communitization agreements, development contracts, areas where bonuses have been paid, and areas with comparatively high percentage of leased land.

(2) The number, location, and types of wells drilled under each lease (e.g., wildcat, development, injection, and disposal); the representative depth of wells drilled; the number and location of dry holes; the success ratio for wells drilled; the location, production history and life expectancy of producing fields.

(3) The nature and size of typical facilities or developments associated with fluid mineral exploration and development, e.g., drillpads, pits, roads, pipelines, transmission lines, production facilities, gas storage projects, enhanced recovery projects, water source wells, routine hydraulic fracturing, tank batteries, and other ancillary facilities.

(4) The nature and extent as well as the timing and sequence of typical exploration and development activities and operations, including general information on input requirements and residual outputs or waste products.

(5) Social and economic information related to fluid mineral resources, including employment and income patterns and trends in the affected area.

b. Geological data and estimates of fluid mineral resources. The fluid minerals specialist should review available geologic and fluid mineral resource data and information and consolidate it for the respective planning area. The types of data that will be useful for planning and NEPA compliance purposes include:

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(1) Estimates of recoverable and undiscovered resources, including unconventional fluid mineral resources (i.e., coal bed methane, tar sands, and tight gas sands). The U.S. Geological Survey's oil and gas resource estimates of undiscovered resources are discussed in greater detail in item c. below.

(2) Structural and stratigraphic data and information related to basins, fields and plays (may include regional structure contour and isopach data; this type of information may be obtained from maps showing faults, major folds, volcanic features, and distribution of geologic formations, etc.).

(3) Geophysical (seismic) and geochemical data that pertain to the location and analysis of the fluid mineral resource potential.

(4) Geothermal features and thermal gradient data and information.

c. U.S. Geological Survey Estimates of Oil and Gas Resources.

Available USGS resource estimates are analyzed along with BLM-derived estimates to identify oil and gas activity and discovery trends. The Deputy State Director for Mineral Resources is responsible for ensuring that USGS resource estimates and unpublished reports are available to the BLM fluid minerals specialist. The USGS oil and gas resource assessment for the United States is summarized in the "Estimates of Undiscovered Conventional Oil and Gas Resources in the United States - a Part of the Nation's Energy Endowment" (published jointly by the USGS and MMS). More details regarding USGS oil and gas resource estimates for each province and play are or will be available as a series of open file releases.

The USGS defines more than 200 separate plays in the onshore United States. Each play consists of the area containing geologically related oil and gas accumulations. The boundary of each play depends on the stratigraphy, structure and maturation of the source and reservoir beds. For each play the fields were divided into three groupings: the first third discovered, the second third discovered and the last third discovered. For each third, the sizes of the largest discovery and the average discovery are determined. Further expected field sizes and number of remaining fields are projected from this data. The USGS reports contain three useful pieces of information: the play area and boundary; the estimated total remaining undiscovered oil and gas resources in each play; and the number of fields remaining to be discovered and distribution of field size. Most USGS reports also contain discovery rates in terms of fields discovered per number of wildcat tests.

Three important aspects of the USGS analysis deserve special attention. First, the USGS includes as recoverable resources those resources which cannot currently be drilled because of economic limits. Thus, the largest remaining resources of several plays lie in the undrilled deep part of basins rather than the shallow areas where the present drilling and production are concentrated. Secondly, the USGS estimates the resources of undeveloped areas, mainly in Alaska, which have little or no drilling. Third, the USGS estimates do not include unconventional oil and gas resources, such as tar sands, coal-bed methane, and tight gas sands.

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2. Identify and Describe Existing Management Practices. The interdisciplinary team identifies and describes existing management practices and activities for all of the resources and resource uses in the planning area. This is generally completed prior to or early during the analysis of the management situation (step four of the planning process). The fluid minerals specialist focuses on describing existing management relative to fluid minerals.

a. The description of fluid minerals management practices should be based on existing policies, rules, operating orders, notices, directives and management plans (e.g., an existing MFP or RMP and associated NEPA documentation). The description should reflect how the program operates in the planning area, including permitting and procedural requirements of other agencies or levels of government for leasing, exploration and development.

b. To facilitate preparation of documents that will eventually be published for public review, existing fluid minerals practices should be described, to the extent possible, in terms of the determinations set forth in MS 1624.2. Management areas should be identified, i.e., areas currently open to development under standard terms and conditions, areas currently open with minor constraints, areas currently open with major constraints, and areas closed to leasing. How existing leases are managed, including direction and practices related to lease stipulations, stipulation waivers, geophysical exploration and rehabilitation activities, should also be identified and described.

c. The description should cover the entire planning area, regardless of surface or mineral ownership. In other words, it should cover leasing, exploration, and development activities and practices in the planning area, as well as adjacent areas that logically should be included because of common resources or shared ecosystems, regardless of whether or not the BLM administers the surface and/or subsurface. Information on terms and conditions should be based on existing management or land use plans and programs of surface management agencies and other agencies external to the BLM (e.g., USFS, NPS, Bureau of Reclamation, Military, State, Tribal and local agencies).

3. Analyze Resource Capability and Potential. Based on available data, the interdisciplinary team analyzes the capability or potential of the resources as necessary to identify management opportunities and limitations. The analysis must be completed prior to or as part of step four of the planning process when the planning team analyzes the management situation. The fluid minerals specialist focuses on analyzing fluid mineral occurrence and development potential.

a. Oil and Gas Resources. With respect to oil and gas resources, the fluid minerals specialist should consider the USGS resource estimates. These estimates may not cover all the oil and gas resources in a BLM planning unit. The specialist will need to independently estimate all other oil and gas resources in the planning unit and integrate them into the planning document.

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Other oil and gas resources include additional play resources based on new data available after the USGS study, resources of small fields which were not dealt with by the USGS, resources of frontier plays disregarded by USGS, and resources contained in unconventional reservoirs (e.g., tight sands, coal bed methane, and tar sands). The fluid minerals specialist will need to analyze and discuss unconventional oil and gas resources not covered by the USGS estimates in the same manner as conventional resources are treated.

The USGS resource estimates are based on oil and gas plays which, in many instances, are larger than a planning unit. Therefore, a portion of the total oil and gas estimate in a play must be allocated to the individual planning unit. The resource occurrence potential within a play is assumed to be constant within a play, but the resource estimate does not imply a uniform distribution of the oil and gas resources nor of development potential within the play. Oil and gas recoverable resources are locally dependent upon factors such as porosity, permeability, depth, trap size, and surface locality. Most of the USGS assessment techniques do not address the parameters on a local level.

All USGS and BLM generated plays must be treated similarly. The general procedure is as follows: determine the percentage of the plays encompassed by the planning unit; identify the limiting reservoir and geologic parameters attributable to the planning unit for each play (e.g., porosity, pinchouts, structure, and thermal maturation); determine a projected field size distribution for each play; identify those areas within each play which have the potential for discovery of commercial fields during the life of the plan; and allocate resource estimates by play to the planning unit. The fluid mineral resources that are identified should be expressed as a range. Note that the estimated total remaining fluid mineral resources in the study area will not be discovered during the life of the plan. The analysis should be coordinated with all other planning units within each play.

b. Geothermal Resources. With respect to geothermal resources, the fluid minerals specialist will need to compile available geothermal resource data and structural geologic information to make a determination regarding the location and extent of geothermal resources potentially available for electrical generation or direct use applications. The geothermal resources that should be analyzed include hydrothermal convection (i.e., vapor- and hot water-dominated) systems, hot igneous (i.e., molten or hot dry rock) systems, and conduction-dominated areas (i.e., high heat flow provinces).

c. Rating and Mapping Potential. As a part of this analysis, a resource potential map should be produced which shows: major geologic trends; USGS or other published play boundaries or KGRA boundaries; play boundaries for conventional and unconventional oil and gas resources developed by BLM; and areas of high, medium, low or no potential for occurrence and development as outlined below. In rating and mapping potential, include a description of the level of confidence which indicates the approximate accuracy of any boundaries identified (i.e., using standard cartographic techniques).

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(1) Oil and Gas. Due to the nearly ubiquitous presence of hydrocarbons in sedimentary rock, use the following for classifying oil and gas potential:

HIGH. Inclusion in an oil and gas play as defined by the USGS national assessment, or, in the absence of a play designation by USGS, the demonstrated existence of: source rock, thermal maturation, and reservoir strata possessing permeability and/or porosity, and traps. Demonstrated existence is defined by physical evidence or documentation in the literature. (Note that reasonable adjustments to any USGS play areas and boundaries may be made if it is apparent that a particular boundary was set up based on administrative convenience rather than a definable change in geological character.)

MEDIUM. Geophysical or geological indications that the following may be present: source rock, thermal maturation, and reservoir strata possessing permeability and/or porosity and traps. Geologic indication is defined by geological inference based on indirect evidence.

LOW. Specific indications that one or more of the following may not be present: source rock, thermal maturation, or reservoir strata possessing permeability and/or porosity, and traps.

NONE. Demonstrated absence of (1) source rock, (2) thermal maturation, or (3) reservoir rock that precludes the occurrence of oil and/or gas. Demonstrated absence is defined by physical evidence or documentation in the literature.

(2) Geothermal. Use the following for classifying geothermal potential:

HIGH. Inclusion in a KGRA; or the existence of a hydrothermal convection system demonstrated by geological evidence of: a structural fault/fracture system and related thermal spring activity or other thermal features (i.e., geysers, fumaroles, mud volcanoes, vents, etc.); and high subsurface temperatures measured in wells and/or estimated from geochemical temperature indicators. Demonstrated existence is defined by physical evidence or documentation in the literature.

MEDIUM. Existence of a hot igneous system demonstrated by geologic evidence of Late Tertiary or Quaternary volcanism and higher than normal geothermal gradient as documented in existing literature.

LOW. Existence of a conduction-dominated area demonstrated by geologic evidence of radiogenic heat production or geopressured environment and higher than normal geothermal gradient as documented in existing literature.

NONE. Demonstrated absence of evidence indicating the existence of hydrothermal convection systems, hot igneous systems, and higher than normal geothermal gradient. Demonstrated absence is defined by physical evidence or documentation in the literature.

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4. Project Reasonably Foreseeable Development (RFD) Under Existing Management. The next step is for the interdisciplinary team to project management activities and actions, including developments, which are likely to occur in the planning area over the life of the plan (i.e., generally 15 to 20 years or whatever has been determined to be the planning horizon or timeframe for the RMP) assuming continuation of existing management. The fluid minerals specialist focuses attention on projecting fluid minerals leasing, exploration, development, production and abandonment activities. The description of existing fluid minerals practices and information on existing leases and related exploration and development activities as well as the potential for development in the planning area provides the basis for projecting the RFD under existing management. The level of detail necessary for describing the reasonably foreseeable development scenario is basically a function of: the amount of geologic data available regarding fluid mineral potential; and the nature or level of resource conflicts or controversies, i.e., planning issues or management concerns involving fluid mineral leasing and development. The RFD scenario for fluid minerals should address the following:

a. The delineation of areas with similar (e.g., high, medium, low or none) exploration and development potential; the number, density and type of wells likely to be drilled within these areas (e.g., wildcat, development, deep, shallow, or other); and the estimated cumulative production by type of product (e.g., oil, gas, geothermal or by-products). The projection should reflect, as necessary, the estimated percent of the activity that is likely to occur on land managed by the BLM and other Federal surface management agencies.

(1) In areas where previous development has occurred, the projections should be based on past and present leasing, exploration, and development activity as well as professional judgement on geological and related technological and economic factors. Extrapolations of historical drilling and/or production activity may be used as the basis for projections. The location of proven reserves, including reserves in existing fields/pools that may be developed by secondary or other enhanced recovery methods, should also be taken into consideration. The historical drilling record should be reviewed for wells that were completed as producers and dry holes. This information may then be analyzed by the specialist to determine success rates and/or discovery rates in areas with similar development potential. Historical cumulative production may also be compared to the number of wells it took to produce the reserves in order to estimate the number of wells it may take to produce a comparable field/pool.

(2) In frontier areas and areas of low development potential, these analyses may not be possible due to lack of drilling or production data. In such areas, geologic, leasing, and existing exploration information (e.g., wildcat tests, geophysical exploration) may be the only sources of information available. For these areas, an assumption shall be made that a baseline discovery will involve certain exploration activity leading up to a discovery and subsequent baseline development activity. To ensure NEPA compliance, a minimum level of exploration and development activities should be projected over the life of the RMP.

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(3) Assumptions used in projecting exploration and development activities (e.g., regarding prospect size, well spacing, technological changes or applications, economic conditions, product prices, etc.) should be explicitly documented in the analysis.

(4) An example of how the projected level of oil and gas activity may be documented is shown below. Always assume at least one boom and bust cycle over the life of the plan.

It is expected that 70 to 80 wildcat wells will be drilled in the next 10 years with a discovery rate of 1 in 7. The 10 fields discovered are expected to range in size from half a million barrels to 5 million barrels according to USGS estimates (See Appendix A for a list of the field sizes). Normal spacing for fields in the play is 40 acres and the average recovery is a half million barrels per well. The total number of new producing wells expected (including approximately 10 successful wildcat wells) is 25 to 30. It is also expected that 20 to 25 additional wells will be drilled in existing fields. About 200 presently producing wells will be abandoned and the production sites reclaimed.

b. Typical surface and subsurface developments and activities that are likely if these types of wells are drilled (e.g., drillpads, pits, roads, pipelines, transmission lines, production facilities, gas storage projects, enhanced recovery projects, water source wells, routine hydraulic fracturing, tank batteries, and other ancillary facilities, whether direct or in association with exploration and development). Historical and current fluid minerals operations information should be reviewed to determine what these developments and activities might be. Standard and directional drilling activities and potential secondary or other enhanced recovery activities should be considered. Other activities that should be reviewed and considered are seismic operations, and subsequent well operations that may result in additional surface disturbance. To facilitate post lease NEPA compliance, particular attention should be given to describing those activities that are not categorically excluded from NEPA documentation.

c. Land use requirements that would be associated with these exploration, development and utilization activities (e.g., surface use requirements in acres or linear miles of access and pipelines), sequence, timing and duration requirements (e.g., field life), waste disposal needs (e.g., produced water, H₂S, CO₂ venting, and flaring), and special requirements or surface use needs associated with disposal activities. The specialist should review fluid minerals information (e.g., APD's, plans of operation and utilization, well records, etc.) and analyze available data to project average surface land use needs for these activities. Also the specialist should analyze available data to estimate the duration of the various phases, e.g., exploration, drilling, and production phases.

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5. Analyze the Impacts Resulting From the Continuation of Existing Management. Upon completion of a reasonably foreseeable scenario for all resources and resource uses, the interdisciplinary team is in a position to analyze the potential direct, indirect and cumulative impacts assuming continuation of existing management practices.

Impacts are the ecological, aesthetic, historic, cultural, economic, social, or health effects caused by an action. Direct impacts are those which occur at the same time and place as the action. Indirect impacts are those which occur later in time or farther removed in distance from the action but are still reasonably foreseeable (e.g., growth inducing effects, effects on population size or density and related effects on natural systems, etc.). Cumulative impacts are those which result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions.

Based on the projection of RFD, the interdisciplinary team analyzes the potential impacts resulting from exploration activities, producing wells, facilities, roads, pipelines, abandonments, and reclamation. With respect to fluid minerals, the analysis of impacts should address the following:

- a. The site specific direct and indirect impacts normally associated with the type of exploration, development, production and abandonment activities likely to occur in the planning area, i.e., impacts of the typical exploration and development activities.
- b. The direct, indirect and cumulative impacts of the exploration, development, production and abandonment activities projected to occur over the life of the plan i.e., total impacts including the cumulative impacts resulting from all the activities projected in the RFD. Impacts on all resources, regardless of who owns or manages the resources, must be identified and analyzed. Impacts caused by activities of other surface management agencies and agencies or persons external to the BLM must also be addressed in this analysis.
- c. The mitigation, including rehabilitation and abandonment, measures that would be employed to avoid or reduce adverse impacts based on existing management practices, i.e., terms and conditions on exploration and development activities. Mitigation measures include constraints, requirements or conditions which are imposed on fluid mineral lessees to avoid or reduce adverse impacts on the environment, including resources owned or managed by other public agencies or private parties.
- d. The residual impacts that would remain following the application of the mitigation measures identified above, i.e., effectiveness of mitigation measures in ameliorating potential impacts.
- e. The impacts of existing management of other resources and uses on fluid minerals leasing, exploration, development, production and abandonment activities, including production opportunities foregone.

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f. The extent to which there is incomplete or unavailable information which is relevant to the analysis of adverse impacts and essential to a reasoned choice among alternatives. If such information cannot be obtained because the overall costs of obtaining it are exorbitant or the means to obtain it are not known, the fluid minerals specialist must identify the existing credible scientific evidence which is relevant to the analysis of adverse impacts and analyze the impacts based upon theoretical approaches or research methods generally accepted in the scientific community. For purposes of this analysis, impacts which have catastrophic consequences, even if their probability of occurrence is low, should be addressed provided that the analysis is supported by credible scientific evidence, is not based on pure conjecture, and is within the rule of reason. A worst case analysis is not required. (See 40 CFR 1502.22.)

6. Identify Problems and Opportunities Associated with Existing Management. The interdisciplinary team uses the results of the preceding impact analysis to identify potential opportunities and/or problems associated with continuation of existing management. Problems may involve unacceptable or controversial impacts on other resource values or uses, including those resources owned or managed by other public agencies or private parties.

7. Formulate Alternatives to Existing Management. Based on the analysis of the management situation, the interdisciplinary team formulates a reasonable range of alternatives to existing management. Alternatives are directed towards responding to identified issues and concerns, resolving the problems with existing management, and exploring opportunities for enhancing or expanding resources or resource uses. The fluid mineral specialist generally focuses on opportunities or problems related to or dealing with fluid mineral development. However, the analysis and formulation of alternatives requires involvement of all resource specialists.

a. If no opportunities or problems related to or dealing with fluid minerals management are identified, then the manner in which fluid minerals are managed will be, generally speaking, the same across all alternatives. Keep in mind that NEPA requires consideration of alternatives if the proposal involves unresolved conflicts concerning alternative uses of available resources (Section 102(e) of NEPA).

b. In many resource areas, existing management guidance covers some, but not all, of the determinations called for in the SPG for fluid minerals. For example, there may be existing management direction concerning areas open and closed to leasing but none concerning geophysical exploration. If this is the case, at least one alternative to existing management must be formulated and analyzed in the RMP or plan amendment, namely, an alternative that includes all of the required determinations.

c. If opportunities and problems or unresolved conflicts are identified, the interdisciplinary team will formulate one or more alternatives to address them. With respect to fluid minerals, alternatives formulated will vary in terms of where, when, and how fluid minerals exploration and development will be authorized.

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d. Generally, based on the team's review of opportunities and problems, they will identify any surface or subsurface management constraints or mitigating measures that are required to take advantage of opportunities and to resolve any problems. These mitigating measures or constraints, if greater than those that could be imposed under the standard terms and conditions of a fluid mineral lease, are then translated into lease stipulations. In identifying constraints on fluid minerals activities, the team should consider the following:

(1) The least restrictive stipulation that effectively accomplishes the resource objectives or uses for a given alternative should be used.

(2) If multiple stipulations are proposed for the same area, the potential effects of overlaps should be considered. For example, if overlapping seasonal restrictions effectively preclude any surface disturbing activity year round, modifying those stipulations should be considered; or if other resource values are of high enough value and the protections are justified in the public interest, a no-surface-occupancy (NSO) stipulation should be employed in lieu of the seasonal restrictions.

e. Several alternatives will generally be developed to address opportunities and problems identified. For example, there may be an opportunity or need to establish a resource condition objective related to a desired plant community in a given area. The same area may be identified as having the potential as a special recreation management area. If the area is already an active fluid minerals area with high or medium potential for further development, the team will need to determine what, if any, problems or conflicts may arise as a result of these multiple resource objectives and uses. Several alternatives may be developed to address these problems or conflicts and to allow for multiple uses in the area. In one alternative, the team may identify any changes (from existing management) in surface and/or subsurface management constraints for fluid minerals activities that would be required to meet the resource condition objective and manage the area as a special recreation management area. Such constraints, if greater than those that could be imposed under the terms and conditions of the standard lease form, would be translated into lease stipulations for that alternative. In another alternative, more constraints on recreation use may be imposed to resolve conflicts with relatively fewer constraints on fluid minerals activities as a result. In yet another alternative, the area may be closed to additional leasing.

f. Each alternative is formulated and described to the same level of detail and in the same manner as was done for describing the existing management. To facilitate preparation of documents that will eventually be published, the constraints associated with fluid minerals aspects of each alternative should be described in terms of the SPG determinations.

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8. Develop RFD Scenarios and Analyze Impacts for Each Alternative. If the proposed alternatives to existing management vary significantly in terms of the manner in which fluid minerals are managed, the fluid minerals specialist, working with or through the interdisciplinary team, will have to generate a separate RFD scenario for each alternative to the same level of detail as was done for the RFD assuming continuation of existing management (see B.4. above). The team will then use these scenarios to help analyze the potential direct, indirect, and cumulative impacts of each alternative (see B.5. above). The analysis of impacts is generally used as the basis for comparing and evaluating the alternatives. Management then selects one of the alternatives as the preferred alternative or develops another alternative (e.g., using a combination of existing alternatives) as the preferred. This may involve additional analysis of the "new" alternative to ensure that impacts have been adequately addressed.

C. Documentation Guidance.

1. In the Unpublished Planning Records. Most of the information and data assembled and used in analyzing the factors will be maintained in the unpublished planning records, generally as part of the analysis of the management situation. The management situation analysis is a working "document" or set of records used by the interdisciplinary planning team to describe existing management, help identify problems and opportunities and formulate plan alternatives.

a. The analysis of the potential for development may be documented in a minerals report in accordance with BLM MS 3060. A format for the mineral assessment report is outlined in BLM MS 3031.

b. The description of existing management and the analysis of opportunities and problems associated with such management is documented in the management situation analysis.

c. Working documents associated with the formulation of alternatives and any technical reports or computations used to analyze environmental impacts are also maintained in the unpublished records.

2. In the RMP/EIS. Generally, the information presented in the published draft RMP/draft EIS and proposed RMP/final EIS is limited to that which will assist the public and other reviewers in understanding and evaluating the alternatives and their impacts. The results of the analysis of factors considered in making fluid minerals determinations, however, are summarized and incorporated into the RMP/EIS. Illustration 2 identifies appropriate places within the established format standards for draft, proposed and approved RMP's or plan amendments and associated EIS's for documenting fluid minerals information (also see BLM Manual Section 1602, Plan Documentation and Records). Additional guidance on presenting fluid minerals data and information in the RMP/EIS is provided below. The planning team, however, must use their best judgement regarding the extent of coverage.

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a. Existing fluid minerals management, including constraints, is summarized and presented in the RMP/EIS as the "no action" alternative. This alternative serves as the baseline for discussing the other alternatives and for comparing the effects of choosing one alternative over another.

b. Each alternative to existing management is described to the same level of detail as the "no action" alternative. Alternative fluid minerals determinations and management constraints are summarized and incorporated, as appropriate, into one or more of the alternatives presented. Illustration 3 provides an example of how constraints can be summarized for alternatives using narrative, maps, and tables. If a closure or operating constraint is discretionary with the BLM, evidence that a less restrictive mitigation measure was considered should be reflected in the range of alternatives analyzed in detail.

c. The potential for occurrence and development is often useful in describing features of alternatives. Illustration 3, referenced above, exhibits how one can superimpose the potential for development on the map of areas open and closed to leasing. A table summarizing the availability of land for leasing and development relative to resource potential is prepared for at least the preferred alternative (see MS 1624, Appendix 1). The acreage estimates shown in the table should be rounded to reflect the accuracy of the data (see discussion in Chapter II.D.).

d. Fluid minerals management actions or features which are common to all alternatives are generally only documented once in the plan to minimize redundancy in the text. They may be documented separately or incorporated in the description of one alternative and cross-referenced in the description of the other alternatives.

e. A brief description of the geologic environment and the social and economic conditions related to fluid mineral activities which have occurred or are occurring in the planning area are summarized in RMP/EIS. The discussion should focus on those aspects of the existing environment that would be affected by the alternatives being considered. The extent of the discussion of fluid minerals resources will vary across plans based on the extent of past and present as well as projected fluid minerals activity and its actual or potential influence and importance in the human environment. Information for this description is drawn from the material prepared for the analysis of the management situation. An example of a description of fluid minerals related aspects of the affected environment along with maps, tables, and other figures to support the text are shown in Illustration 4.

f. The assumptions on which the impact analysis is based are discussed in the RMP/EIS. At a minimum, a description of typical exploration and development activities and a description of the reasonably foreseeable development (RFD) over the life of the plan are presented in the RMP/EIS. Any variations in the RFD across alternatives should be clearly described. An example of the RFD scenario and assumptions used in projecting impacts in an area of moderate and low fluid mineral potential is shown in Illustration 5.

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g. The direct and indirect impacts as well as the cumulative impacts of reasonably foreseeable development must be described in the RMP/EIS for each alternative, including the no action alternative. The impacts discussion may be presented by resource or by alternative. Impacts which are common to all alternatives, e.g., impacts related to a typical operation, only need to be summarized once in the document and cross referenced in the discussion of impacts for each alternative. An example of an RFD scenario and the cumulative impacts of development for an area of high potential is shown in Illustration 6. A matrix or table summarizing the alternatives and the impacts of alternatives is prepared and displayed in the RMP/EIS. This summary table may portray the differences, if any, in the RFD associated with each alternative as well as the differences in direct, indirect, and cumulative impacts on the human environment. Documentation requirements associated with incomplete or unavailable data, if any, should be followed in discussing impacts. (See 40 CFR 1502.22.)

h. Mitigation measures and the effectiveness of such measures are described in the RMP/EIS. For the preferred alternative the RMP/EIS should provide evidence that less restrictive measures were considered but found inadequate to provide effective protection for other land uses or resource values determined through the planning process to be deserving of protection.

i. Any detailed technical or programmatic material which supports the main body of the RMP/EIS text and is helpful to understanding that text are included in appendices. The following may be included in an appendix:

(1) Detailed information regarding past and present fluid minerals activity or geological features in the planning area which supports the projections of RFD. Such information may be placed in an appendix if the planning team determines that this information is sufficiently important for reviewers to understand the RMP/EIS.

(2) Additional details on the impacts of the RFD scenario. Such a description may serve to facilitate any subsequent NEPA review if sufficient details are provided on how projected exploration and development activities will be managed and on the nature of the typical site specific impacts normally associated with such activities.

(3) A detailed description of how the fluid minerals program operates in the State. A detailed description of Federal, State or local permitting requirements and other operational requirements that are common to all fluid minerals activities statewide is often useful to reviewers but not essential in the main body of the text.