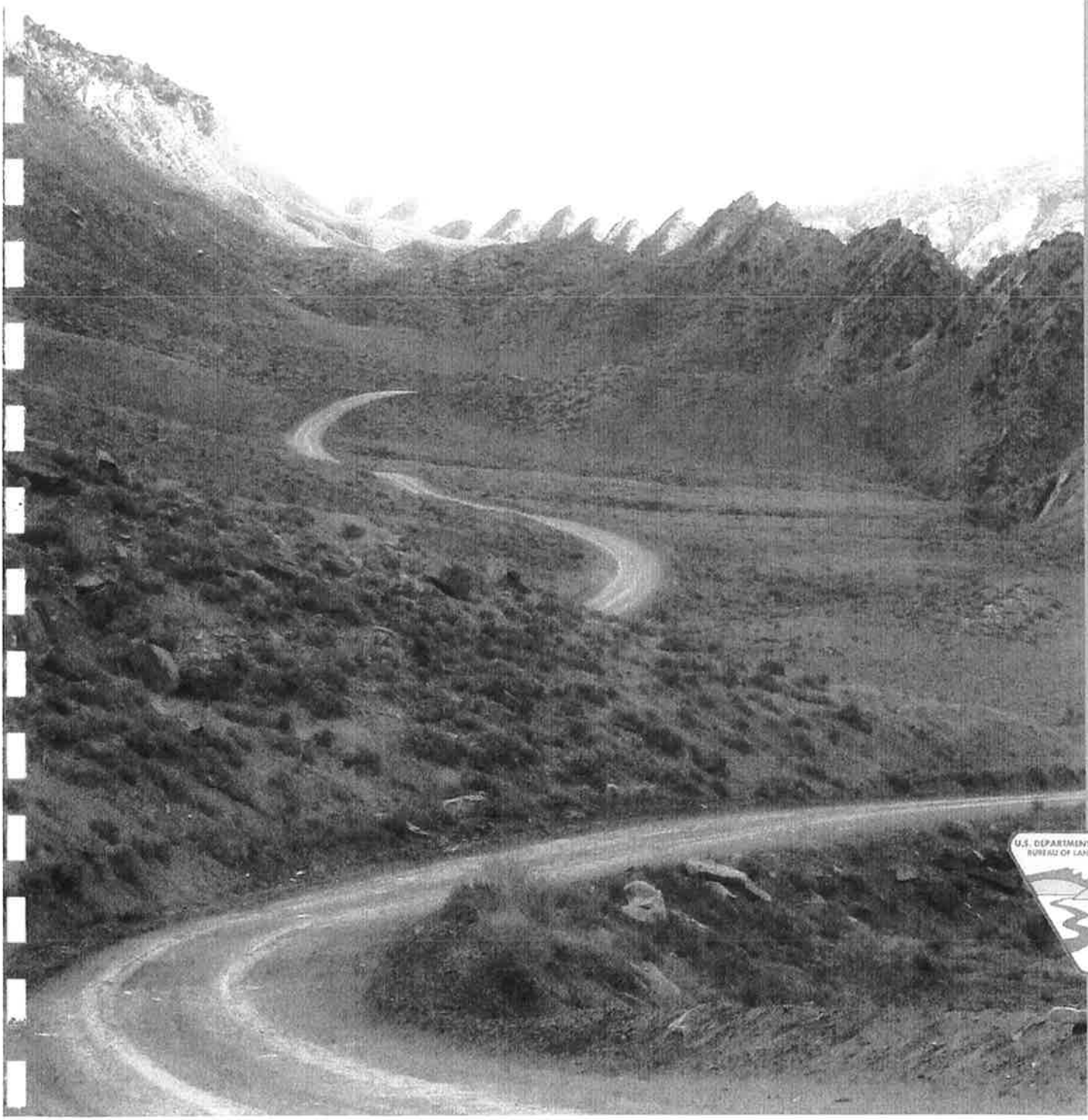
Supplement to Attachment G1

Exhibits to Comment Letter I9: E, G, K, L, N, O, P, Q, T, U, and V

EXHIBIT E

BLM

BLM National Environmental Policy Act Handbook H-1790-1



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BLM/WO

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Cover Photograph – Grand Staircase Escalante National Monument by Peg Sorensen

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FIGURES

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HANDBOOK USER'S GUIDE

The purpose of this Bureau of Land Management (BLM) Manual Handbook (H-1790-1) is to help us comply with the National Environmental Policy Act (NEPA), the Council on Environmental Quality's (CEQ) NEPA regulations (40 CFR Parts 1500–1508) and the Department of the Interior NEPA manual. "We" (BLM) have written it for use by "you," the reader involved in the NEPA process. The "NEPA process" means all measures necessary for compliance with the requirements of the Purpose (section 2 of the Act) and the Congressional Declaration of National Environmental Policy (Title 1 of the Act). Meeting our NEPA compliance responsibilities requires help from all levels of our agency, including decision-makers, program managers, specialists, interdisciplinary team members, and BLM contractors.

The NEPA process is intended to help public officials make decisions that are based on understanding of environmental consequences, and take actions that protect, restore, and enhance the environment (40 CFR 1500.1(c)). Early chapters in this Handbook address the legal requirements and our analytical approach to complying with the NEPA. We then explain content requirements of specific types of NEPA compliance documents.

Following the introductory material in Chapter 1, Chapters 2 through 5 address the procedural determinations of whether a NEPA analysis is necessary and, if so, the degree to which it may be already covered in an existing NEPA document. Chapter 6 identifies the essential analytical elements that are common to NEPA analysis, regardless of whether you are preparing an Environmental Assessment or an Environmental Impact Statement. Chapters 7 through 9 help you identify whether an Environmental Assessment or Environmental Impact Statement is needed, and describe the various sections of these documents. The remaining Chapters 11 through 15 address monitoring, cooperating agencies, working with advisory committees, administrative procedures, and adaptive management.

A requirement to meet NEPA compliance is that we encourage and facilitate public involvement in decisions which affect the quality of the human environment (40 CFR 1500.2(d)). Information relating to public participation in the NEPA process is contained primarily in Chapters 6, 8, 9, and 12.

To assist you in carrying out your NEPA responsibilities, this Handbook includes references to documents contained in the BLM NEPA Handbook Web Guide (Web Guide). The Web Guide includes copies of official guidance, such as CEQ citations, and provides examples for your use in complying with the NEPA. For example, an interdisciplinary team preparing an EIS with tribal or county cooperators can review a number of sample memorandums of understanding (MOUs) written to identify the responsibilities of cooperating agency status. These MOUs serve as models, although they are not official guidance. The Web Guide also contains excerpts of BLM NEPA documents. Other materials include helpful ideas, tools, and techniques for making the NEPA process more efficient and effective and for adding clarity to the NEPA documents. References to the Web Guide are shown in this Handbook in blue text.

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CHAPTER 1—NEPA BASICS

General
1.1 Introduction to the NEPA
1.2 Departmental Guidance and this Handbook
1.3 Documents Used to Meet NEPA Requirements
1.4 The NEPA Approach
1.5 Conformance with the Existing Land Use Plan
1.6 Consistency with Other Authorities

GENERAL

This chapter provides an overview of the National Environmental Policy Act (NEPA) and related direction which is pertinent to the Bureau of Land Management (BLM) planning and decision-making process.

1.1 INTRODUCTION TO THE NEPA

The National Environmental Policy Act was passed by Congress in 1969 and signed into law on January 1, 1970. This legislation established a landmark national environmental policy which, among other things, encourages environmental protection and informed decision-making. It provides the means to carry out these goals by:

- mandating that every Federal agency prepare a detailed statement of the effects of "major Federal actions significantly affecting the quality of the human environment."
- establishing the need for agencies to consider alternatives to those actions.
- requiring the use of an interdisciplinary process in developing alternatives and analyzing environmental effects.
- requiring that each agency consult with and obtain comments of any Federal agency which has jurisdiction by law or special expertise with respect to any environmental impact involved.
- requiring that detailed statements and the comments and views of the appropriate Federal, State, tribal, and local agencies be made available to the public.

The stated purpose of the NEPA and the mission of the BLM are fully compatible. Our mission is to sustain the health, diversity, and productivity of the public lands for the use and enjoyment of present and future generations. This closely mirrors BLM's multiple use and sustained yield mandates under the Federal Land Policy and Management Act. The NEPA declares that the Federal government's continuing policy is to create and maintain conditions under which people and nature can exist in productive harmony and fulfill the social, economic, and other requirements of present and future generations of Americans.

In addition to setting policy goals for environmental planning, the NEPA created the Council on Environmental Quality (CEQ), in the Executive Office of the President, to be the "caretaker" of the NEPA. The CEQ issued final regulations for Implementing the Procedural Provisions of NEPA (40 CFR 1500–1508) in 1978 (revised in 1986), and added to them in 1981 with a guidance document titled "Forty Most Asked Questions Concerning CEQ's NEPA Regulations." The NEPA and the CEQ regulations establish procedures to ensure proper consideration of environmental concerns, but they do not dictate a particular result or decision. The CEQ regulations also require that agencies "make diligent efforts to involve the public in preparing and implementing their NEPA procedures" (40 CFR 1506.6(a)).

1.2 DEPARTMENTAL GUIDANCE AND THIS BLM HANDBOOK

The Department of the Interior's (DOI) NEPA policy is found in the Departmental Manual (DM) Part 516. Chapter 11 of the manual (516 DM 11) is specific to the BLM's management of the NEPA process. The DOI, through the Office of Environmental Policy and Compliance (OEPC), also continuously updates a series of environmental statement, review, and compliance memoranda, which further interpret DM Part 516.

This Handbook contains direction for use by BLM employees from all levels of our organization, including decision-makers, program managers, specialists, interdisciplinary team members, and any BLM contractors involved in the NEPA process. "We" (BLM) believe it will help "you" (the reader) help us in meeting the legal requirements of the NEPA.

For more information see the BLM Planning and NEPA Library Web page.

1.3 DOCUMENTS USED TO MEET NEPA REQUIREMENTS

The BLM uses various types of documents to meet our NEPA requirements. Environmental analysis documents, which must be made available to the public, include environmental impact statements (EISs) and environmental assessments (EAs) (40 CFR 1506.6(b)). If a proposed action will have a significant environmental impact, you must prepare an environmental impact statement (EIS) (40 CFR 1502.1). The EIS process is initiated with publication of a notice of intent (NOI) and requires public scoping. Draft EISs are made available for public review and comment, and final EISs include our responses to comments received. You must document your decision on the action in a record of decision (ROD) (40 CFR 1505.2).

If it is unclear whether the action would have a significant effect, you prepare an environmental assessment (EA) (40 CFR 1508.9(a)). If the analysis in an EA shows the action would not have a significant effect, a "Finding of No Significant Impact" (FONSI) documents that there is no need for an EIS (40 CFR 1508.13).

If the proposed action belongs to a category of actions that have no potential for significant environmental impacts, you may categorically exclude the action from analysis in an EA or EIS before deciding to implement it. To categorically exclude an action, the proposed action must fit within the list of statutory, Departmental, or BLM categorical exclusions (CXs) (516 DM 2.3(A)).

The BLM NEPA procedures also provide for the use of existing NEPA analysis documents. If a proposed action is adequately covered by an existing EIS or EA, then you may document a "Determination of NEPA Adequacy" (DNA) (516 DM 11.6).

> As NEPA analysis documents are not agency decisions, they are not subject to BLM administrative protest or appeal provisions. However, a decision based on a CX, an EA and FONSI, or an EIS is an agency action and may be protested or appealed, regardless of the type of NEPA compliance documentation completed.

1.4 THE NEPA APPROACH

As described by the CEQ regulations, the NEPA "is our basic national charter for protection of the environment" (40 CFR 1500.1). According to the regulations, "The NEPA process is intended to help public officials make decisions that are based on understanding of environmental consequences, and take actions that protect, restore, and enhance the environment" (40 CFR 1500.1(c)). Analysis and disclosure of the effects of a proposed action and its alternatives are the underlying NEPA principles that move agencies toward achieving this goal.

Figure 1.1, "NEPA Screening Process," is a flow chart that shows our NEPA screening process. The NEPA process starts when the BLM has a proposal for action (see section **3.1, *Determining When NEPA Applies***). The CEQ regulations require that the NEPA process begin and be "integrate[d] with other planning at the earliest possible time to ensure that planning and decisions reflect environmental values, to avoid delays later in the process, and to head off potential conflicts" (40 CFR 1501.2).

Several factors guide the timing of NEPA analysis and agency decision-making (40 CFR 1502.5 and 1506.1). For example:

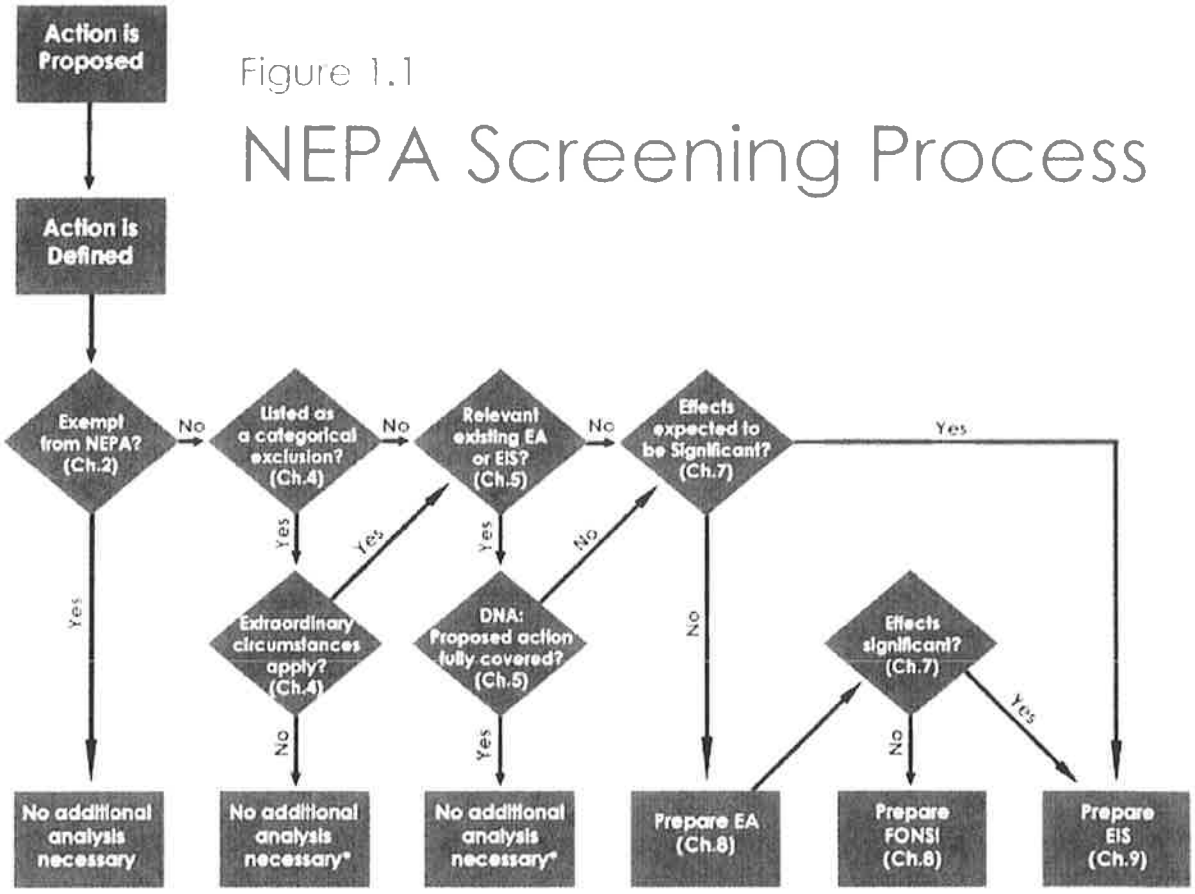
- You must finish all of the steps necessary for completing the NEPA process prior to issuance of a formal decision, to enable you to make a well-informed decision (40 CFR 1505.1(d), 40 CFR 1506.1, 516 DM 1.2(D)).

- You must not authorize any action that would limit the choice of alternatives being analyzed under the NEPA until the NEPA process is complete (40 CFR 1506.1). However, this requirement does not apply to actions previously analyzed in a NEPA document that are proposed for implementation under an existing land use plan. For instance, an existing plan will continue to guide the BLM's processing of site-specific permits on existing oil and gas leases. Drilling permits, sundry notices, and similar authorizations will be allowed as long as the actions do not exceed limits that were delineated in the existing land use plan (LUP) and analyzed in the associated NEPA document.

You must prepare NEPA analyses using an interdisciplinary approach, and the disciplines of the preparers must be appropriate to the scope of the analysis and to the issues identified in the scoping process (40 CFR 1502.6). The requirement for an interdisciplinary approach is met when preparer(s) consult with all appropriate sources for the analysis of affected resources. This may include staff from other BLM offices or other Federal or non-Federal agencies, as needed, to provide a rational basis for decision-making.

The CEQ regulations require NEPA documents to be "concise, clear, and to the point" (40 CFR 1500.2(b), 1502.4). Analyses must "focus on significant environmental issues and alternatives" and be useful to the decision-maker and the public (40 CFR 1500.1). Discussions of impacts are to be proportionate to their significance (40 CFR 1502.2(b)). Similarly, the description of the affected environment is to be no longer than is necessary to understand the effects of the alternatives (40 CFR 1502.15). "Most important, NEPA documents must concentrate on the issues that are truly significant to the action in question, rather than amassing needless detail." (40 CFR 1500.1).

Figure 1.1 NEPA Screening Process



* See Chapters 4 and 5 for documentation requirements

1.5 CONFORMANCE WITH THE EXISTING LAND USE PLAN

All actions approved or authorized by the BLM must conform to the existing land use plan where one exists (43 CFR 1610.5-3, 516 DM 11.5). Although it is not a NEPA requirement, the BLM includes within all its NEPA documents a statement about the conformance of the proposed action and alternatives with the existing land use plan (LUP). The BLM's planning regulations state that the term "conformity" or "conformance" means that "... a resource management action shall be specifically provided for in the plan, or if not specifically mentioned, shall be clearly consistent with the terms, conditions, and decisions of the approved plan or amendment" (43 CFR 1601.0-5(b)).

A proposal for an action that has been clearly identified and provided for in the LUP would be considered to be in conformance with the plan.

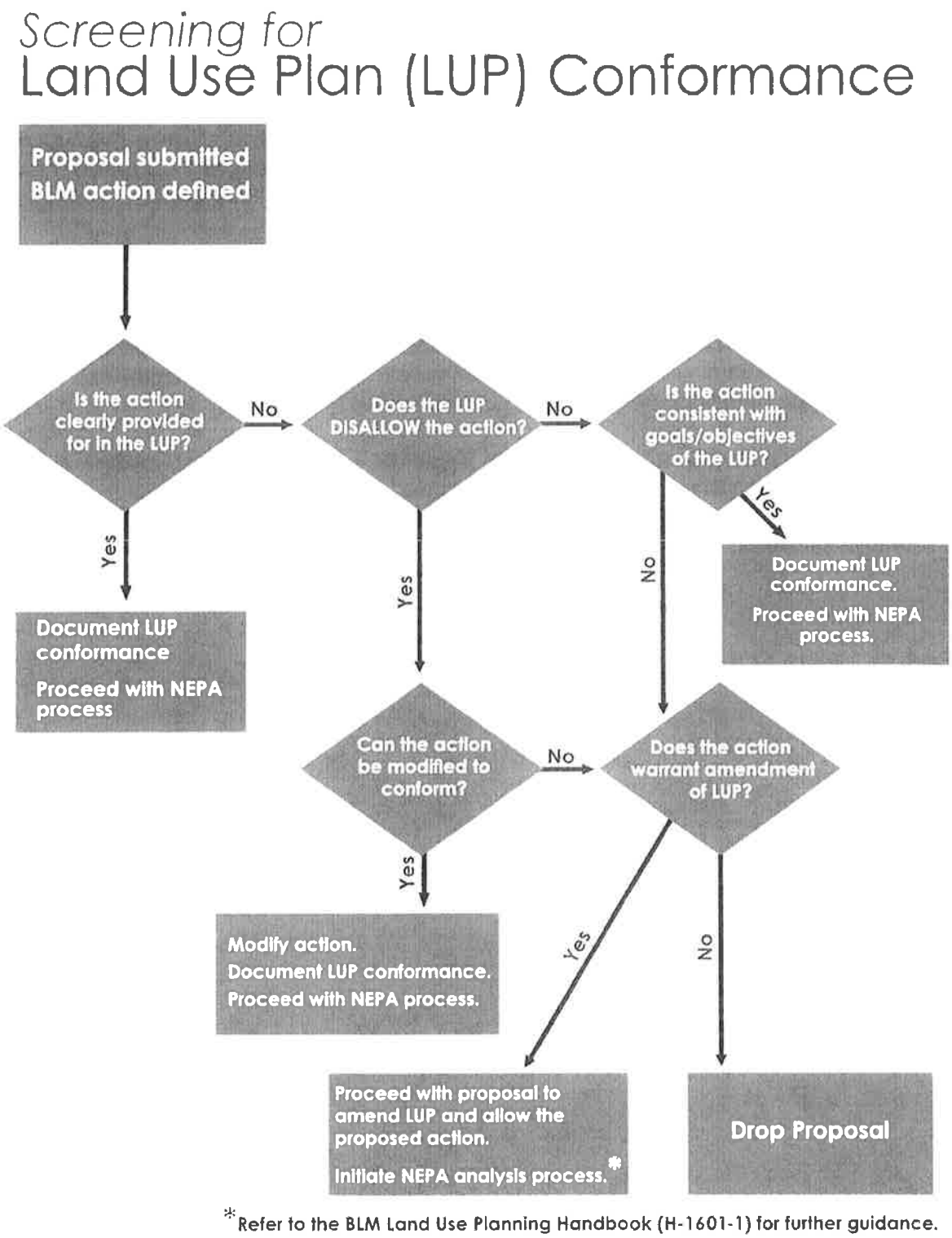
If the LUP is silent about an activity, review the plan direction including the broad and programmatic goals and objectives. In this evaluation, there are four possible conclusions:

1. the activity contributes to meeting plan goals and objectives and is not inconsistent with the plan, and hence it can be considered to be in conformance;
2. the proposal is not in conformance, but the proposal can be modified to be in conformance;
3. the proposal is not in conformance, but amendment of the LUP is warranted to allow the activity; or
4. the proposal is not in conformance, and the proposal does not warrant further consideration through an LUP amendment.

If you determine that the proposed action does not conform to the LUP, you may modify the proposal to conform, or consider a plan amendment to allow the action. In the case of externally-generated proposals, working with the applicant before submission of a proposed action to suggest modifications to their initial proposal may result in conformance with the LUP.

When a proposal cannot be modified and does not warrant amendment of the LUP, drop the proposal. (See **Figure 1.2, *Screening for Land Use Plan Conformance*).**

Figure 1.2 Screening for Land Use Plan Conformance



1.6 CONSISTENCY WITH OTHER AUTHORITIES

In addition to the BLM's planning regulations related to LUP conformance, there are a number of other authorities, such as program-specific guidance and Executive Orders, for you to remember when considering an action.

We recommend that you document your compliance with other authorities at the same time that you document NEPA compliance. These other authorities do not constitute NEPA requirements for analysis, but some contain specific direction about NEPA compliance. More generally, other authorities may be relevant during several steps of the NEPA process. For example, other laws, regulations, and policies may be useful to consider in formulating the purpose and need for action (see section **6.2, *Purpose and Need***), identifying issues for analysis (see section **6.4, *Issues***), formulating alternatives (see section **6.6, *Alternatives Development***), identifying any regulatory thresholds (see section **6.8.3.5, *Analyzing the Cumulative Effects***), and developing the rationale for decision selection (see sections **8.5.1, *Documenting the Decision*** and **9.7.1, *ROD Format***). In addition, other laws and regulations may factor into the determination of whether effects are significant (see section **7.3, *Significance***).

The list of supplemental authorities contained in **Appendix 1, *Supplemental Authorities to be Considered***, is not exhaustive and will change over time. This list is not a checklist for NEPA compliance, but may be consulted when developing NEPA documents. See section **6.4, *Issues*** for additional guidance.

CHAPTER 2—ACTIONS EXEMPT FROM THE NEPA AND EMERGENCY ACTIONS

GENERAL

Some types of actions are or can be exempt from NEPA requirements. However, the NEPA has broad-reaching applicability, and situations where actions are exempt are rare. In an emergency, when action must be taken immediately, there are procedures for complying with the NEPA (see section **2.3, *Emergency Actions***).

Be aware that even if an action is exempt from the NEPA or if alternative arrangement procedures are used, you may need to analyze that action as part of a cumulative effects analysis for a future action (see section **6.8.3, *Cumulative Effects***).

2.1 CONGRESSIONALLY EXEMPT ACTIONS

Some actions are congressionally exempt from NEPA compliance. This is uncommon and is applicable only on a case-by-case basis. Review the relevant statutory language to determine the extent and scope of the action being exempted. Any actions that are outside the scope of a statutory exemption would require appropriate NEPA analysis. *An example of an action that is congressionally exempt from the NEPA is one where a law directs the BLM to take action, such as closing an area to a specific use, and the law states that the provisions of the NEPA do not apply.*

2.1.1 CERCLA

It is the position of the Department of Justice that the NEPA is not applicable to cleanups conducted pursuant to the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. sections 9601 et seq. (CERCLA). Requirements for environmental analysis and public participation during CERCLA cleanups are addressed in the CERCLA Handbook. For further information regarding this issue, or how it may apply at a particular site, contact the Office of the Solicitor.

2.2 ACTIONS MANDATED BY STATUTE

If the BLM is required by law to take an action, the NEPA may not be triggered. *For example, Public Law 105-167 mandates the BLM to exchange certain mineral interests. In this situation, the NEPA would not apply because the law removes the BLM's decision-making discretion.* Also, if there is a clear and unavoidable conflict between NEPA compliance and another statutory authority, NEPA compliance is not required. *For example, if the timing of another statutory authority makes NEPA compliance impossible, the NEPA is not triggered.*

Be aware however, that some statutorily mandated actions do require NEPA analysis. *For example, an Act may direct the BLM to lease a specific parcel of land, as described in the preceding example, yet require the BLM to comply with the provisions of the NEPA.* We recommend that you consult with the Office of the Solicitor if there are potential conflicts between the NEPA and other statutory provisions.

2.3 EMERGENCY ACTIONS

In the event of an emergency situation, immediately take any action necessary to prevent or reduce risk to public health or safety, property, or important resources (516 DM 5.8). Thereafter, other than those actions that can be categorically excluded, the decision-maker must contact the BLM Washington Office, Division of Planning and Science Policy (WO-210) to outline subsequent actions. The CEQ regulations (40 CFR 1506.11) provide that in an emergency "alternative arrangements" may be established to comply with NEPA. Alternative arrangements do not waive the requirement to comply with NEPA, but establish an alternative means for compliance.

The CEQ regulations for alternative arrangements for dealing with such emergencies are limited to the actions necessary to control the immediate effects of the emergency. Other portions of the action, follow-up actions, and related or connected actions remain subject to normal NEPA requirements, so you must complete appropriate NEPA analysis before these actions may be taken (40 CFR 1506.11).

The "alternative arrangements" take the place of an EIS and only apply to Federal actions with significant environmental impacts (see section **7.3, *Significance***). If the proposed action does not have significant environmental effects, then the alternative arrangements at 40 CFR 1506.11 do not apply.

If you anticipate the proposed emergency response activity will have significant environmental effects, we recommend that you assess whether an existing NEPA analysis has been prepared (e.g., implementing preexisting plans) or whether there is an applicable exemption. *For example, certain Federal Emergency Management Agency (FEMA) response actions are exempt from the NEPA (see the NEPA Handbook Web Guide).*

2.3.1 Types of Emergency Actions

The following actions are typically considered emergency actions, provided they must immediately be taken to protect public health and safety or important resources:

- cleanup of a hazardous materials spill.
- wildland fire suppression activities related to ongoing wildland fires.
- emergency stabilization actions following wildland fires or other disasters.

Emergency stabilization actions that are not immediately needed to protect public health and safety or important resources must undergo normal NEPA procedures (40 CFR 1506.11). Generally, follow-up actions such as fire rehabilitation, abandoned mine land reclamation, or flood cleanup are not considered emergency actions.

2.3.2 Procedures for Emergency Actions

2.3.2.1 Wildfire Suppression Actions

You must take immediate action to manage all wildfires consistent with land use and fire management plans. The BLM Washington Office will consult with the OEPC on an annual basis to discuss anticipated fire suppression activities for the upcoming fire season and any changes in fire suppression standards and operating procedures. The OEPC will consult with the CEQ, as appropriate. Prescribed fire projects are not considered wildfire suppression activities, and must undergo normal NEPA procedures (40 CFR 1506.11).

2.3.2.2 Emergency Actions other than Wildfire Suppression

You must take immediate action to prevent or reduce risk to public health or safety or important resources (516 DM 5.8). Thereafter, other than those actions that can be categorically excluded, you must contact the BLM Washington Office (WO-210) to outline subsequent actions. We recommend that you address the following factors when contacting WO-210 in the event of an emergency situation:

- nature and scope of the emergency.
- actions necessary to control the immediate effects of the emergency.
- potential adverse effects of the proposed action.
- components of the NEPA process that can be followed and that provide value to decision-making (e.g., coordination with affected agencies and the public).
- duration of the emergency.
- potential mitigation measures.

The BLM WO-210 will expedite the necessary consultation with the Office of the Solicitor, the OEPC, and the CEQ for those emergency actions anticipated to have significant environmental impacts. Once alternative arrangements have been established, the CEQ will provide documentation describing the alternative arrangements and the considerations on which they are based. During any follow-up activities, the OEPC and the BLM will jointly be responsible for consulting with the CEQ. If the BLM action is not expected to have significant environmental impacts, contact the BLM WO-210. The BLM WO-210 will consult with the OEPC to consider any appropriate action. The Web Guide provides WO-210 contact information, including non-duty hour procedures. Also, see 516 DM 5.8 for guidance on emergencies.

When time permits, actions that are not categorically excluded and that are not expected to have significant environmental effects can be analyzed with an environmental assessment. We recommend that you use the techniques described throughout this handbook to prepare a focused, concise, and timely environmental assessment:

- narrowly focus the purpose and need.
- limit alternatives to those that would achieve the purpose and need.
- if there is consensus about the proposed action, do not analyze in detail the no action or other action alternatives.
- tailor public involvement and use informal scoping (telephone calls, on-site discussions with affected parties) to identify issues of concern.
- limit the analysis to issues of concern.

CHAPTER 3—ACTIONS REQUIRING NEPA COMPLIANCE

GENERAL

The NEPA process is initiated when a proposal for Federal action exists. The sections of this chapter discuss when the NEPA applies for various types of proposals that the BLM considers.

3.1 DETERMINING WHEN THE NEPA APPLIES

A proposal for Federal action triggers the NEPA. The CEQ regulations define major Federal actions to include adoption of official policy (that is, rules and regulations), adoption of formal plans, adoption of programs, and approval of specific projects (40 CFR 1508.18). The NEPA process is initiated when a proposal has been developed by, or submitted to the BLM. Identification of existing conditions and of possible actions does not trigger the NEPA.

> A BLM proposal is a Federal action when: (1) we have a goal and are actively preparing to make a decision on one or more alternative means of accomplishing that goal (40 CFR 1508.23); (2) the proposed action and effects are subject to BLM control and responsibility (40 CFR 1508.18); (3) the action has effects that can be meaningfully evaluated (40 CFR 1508.23); and (4) effects of the proposed action are related to the natural and physical environment, and the relationship of people with that environment (40 CFR 1508.8; 40 CFR 1508.14).

As a Federal agency, the BLM must meet NEPA requirements whenever it is the BLM's decision that would result in an effect on the human environment, even when the effect would be beneficial and regardless of who proposes the action or where it would take place (40 CFR 1508.18).

3.2 PROPOSALS ORIGINATING WITHIN THE BLM

The BLM develops land use plans and proposes or approves actions to implement those plans. The BLM land use plans (LUP) require preparation of an EIS. Amendments of LUPs require an EA or EIS. The BLM's Land Use Planning Handbook (H-1601-1) provides additional guidance for complying with the NEPA for planning actions and implementation actions. Examples of implementation actions are construction of trails; timber sales; fuels reduction projects; and development of camping sites. Implementation actions require preparation of an EA or EIS, unless the action can be categorically excluded (see **section 4.2.1, *Identifying Potential Categorical Exclusions***).

Internal BLM projects are held to the same NEPA analysis requirements as externally-generated projects. It is important not to overlook the analysis requirements of any BLM-initiated projects, including such relatively low-impact actions as approving a buried powerline in a previously disturbed area or installing a wildlife guzzler.

3.2.1 Policies and Rulemaking

Federal actions include "Adoption of official policy, such as rules, regulations, and interpretations …" (40 CFR 1508.18(b)(1)). When we propose a policy, we must evaluate it to determine whether it is a major Federal action significantly affecting the quality of the human environment, and thus triggers the need to prepare an EIS (40 CFR 1502.4(b)). This evaluation involves a three part test to determine whether the following apply: the action must (1) be federally approved or conducted, (2) major, and (3) have a significant environmental impact. However, it is not always as clear whether a proposed policy will affect the human environment. The BLM must evaluate if the proposed action would authorize any activity or commit any resources, thus affecting the human environment (40 CFR 1508.18).

Adoption of official policy of an administrative, financial, legal, technical or procedural nature is often too broad, speculative, or conjectural to allow for a meaningful analysis. Such actions may be categorically excluded (see **Appendix 3, *Departmental Categorical Exclusions*, CX #1.10**). *An example of a categorically excluded procedural action is the BLM's proposed revision of our Departmental NEPA Manual chapter (516 DM chapter 11; Federal Register, January 25, 2006).*

Departmental policy requires that all rulemaking documents be published in the Federal Register for public comment, and that the notice include a Record of Compliance with a statement whether the proposed policy would or would not constitute a major Federal action significantly affecting the quality of the human environment (318 DM 4). This statement may be supported by:

- an EIS;
- an EA and FONSI;
- an explanation that the action is categorically excluded; or
- an explanation that the action does not constitute a major Federal action significantly affecting the quality of the human environment, and a detailed statement under the National Environmental Policy Act of 1969 is not required.

An example of rulemaking that required preparation of an EIS is revision to our grazing regulations is found at 43 CFR part 4100 (Federal Register, December 8, 2003 and July 12, 2006).

3.2.2 Land Use Plan (LUP) Development

Sections 201 and 202 of the Federal Land Policy and Management Act of 1976 (FLPMA, 43 U.S.C. 1711-1712) and regulations in 43 CFR part 1600 establish BLM land use planning requirements. The BLM LUPs are designed to provide guidance for future management actions and the development of subsequent, more detailed and limited-scope plans for resources and uses. The BLM Land Use Planning Handbook (H-1601-1) provides supplemental guidance for preparing, revising, amending and maintaining LUPs. Land use plans include both resource management plans (RMPs) and management framework plans (MFPs).

Development of a new plan (including replacement of a MFP with an RMP) requires preparation of an EIS, as does revision of an existing LUP (43 CFR 1601.0-6). An existing plan may be amended to make changes in the terms, conditions and decision of an approved plan. The amendment process is tailored to the anticipated level of public interest and potential for significant impacts, and requires preparation of an EA or EIS. *An example of an EA-level LUP amendment is to establish or adjust a herd management area on public lands used by wild horses, in accordance with the Wild Free-Roaming Horse and Burro Act of 1971.* Actions to maintain LUPs usually may be categorically excluded (see section **4.2.1, *Identifying Potential Categorical Exclusions***).

3.3 PROPOSALS SUBMITTED TO THE BLM BY OTHER ENTITIES

Other entities who submit proposals include applicants for use or development of resources on lands administered by the BLM. Other entities include non-Federal organizations and individuals, other Federal, State and local agencies, and tribal entities. As part of considering a proposal submitted to the BLM by others, the decision-maker must determine if it is in conformance with the LUP (43 CFR 1610.5-3, 516 DM 11.5) and what level or type of NEPA documentation is required (see section **1.3 *Documents Used to Meet NEPA Requirements***). The following are some examples of proposals from outside the BLM:

- *applications for a permit to drill, a special recreation permit, a right-of-way grant, or a grazing authorization*
- *a proposal by the Animal and Plant Health Inspection Service to control grasshoppers on lands administered by the BLM.*
- *a proposal from a State wildlife agency for the BLM to cooperate in restoring wildlife habitat.*

3.3.1 Proposals for the BLM to Fund Actions

Whenever the BLM receives a proposal to fund projects on public lands that we manage, the NEPA is triggered. Occasionally, the BLM has funds to distribute to non-Federal entities to perform work on lands not administered by the BLM. If the BLM exercises control over the implementation of the action such that the effect can be meaningfully evaluated, NEPA analysis is required. If the BLM distributes the funds according to a predetermined formula or through a State clearing house for subsequent distribution to projects not individually identified, then the NEPA is not triggered.

For example, the BLM has a cooperative agreement with a State agency to fund fuel reduction projects on private or State lands. If the cooperative agreement describes the criteria to select the projects but leaves the specifics of project selection to the State agency, then the NEPA is not triggered. On the other hand, if the BLM is making a decision to fund or not fund a specific project on lands not administered by the BLM, then NEPA is triggered.

3.3.2 Proposals Involving Mineral Estate

Where the BLM manages both surface resources and subsurface resources, any proposal to develop locatable or leaseable mineral resources triggers the NEPA. Where the BLM does not manage both surface and subsurface resources (split estate), whether or not a proposal requires NEPA compliance depends on the specific situation.

– Proposals where the BLM manages the subsurface resources and another Federal agency manages the surface. The NEPA is triggered by a proposal to develop the subsurface resource. The BLM must establish a cooperating agency relationship with the other Federal agency (see section **12.1, *Cooperating Agency Status in Development of NEPA Analysis Documents*)**.

– Proposals where the BLM manages the subsurface resources and the surface is non-Federal. On split estate lands where the reserved Federal minerals are open to leasing or location (location is the act of staking a mining claim under the General Mining Law), the NEPA is triggered by an operator or mining claimant's proposal to explore for or develop the subsurface resource. The BLM is responsible for NEPA compliance, and you must document effects on surface and subsurface resources (40 CFR 1508.8). An exception to this policy refers to Stock Raising Homestead Act lands and applies only when the surface owner and the mining claimant are the same party (IM 2005-114; 43 CFR 3809).

– Proposals where the BLM manages the surface and the subsurface is non-Federal. As with any proposal, the NEPA is triggered by a request for the BLM to authorize surface disturbance. *For example, the BLM is responsible for documenting NEPA compliance for an access road right-of-way application, regardless of the use for which the access is requested.*

CHAPTER 4—CATEGORICAL EXCLUSIONS

GENERAL

Categorical exclusions (CXs) are categories of actions that Federal agencies have determined do not have a significant effect on the quality of the human environment (individually or cumulatively) and for which, therefore, neither an EA nor an EIS is required (40 CFR 1508.4). A CX is a form of NEPA compliance, without the analysis that occurs in an EA or an EIS. It is not an exemption from the NEPA.

When using CXs, other procedural requirements may still apply: for example, tribal consultation, and consultation under the National Historic Preservation Act and the Endangered Species Act.

> You are encouraged to apply categorical exclusions, where appropriate, because they speed NEPA compliance (40 CFR 1500.5(k).

While use of a CX is not subject to protest or appeal, a decision on the action being taken may be subject to protest and appeal. Consult program-specific guidance and include applicable protest and appeal provisions with the documentation of the decision on the action. See the NEPA Handbook Web Guide for program-specific protest and appeal information.

If there is high public interest in an action that will be categorically excluded, you may elect to involve the public (for example, through notification or scoping). Public involvement may be valuable in determining whether extraordinary circumstances apply. There may be program-specific guidance for public notification of the decision. Even if there is no program-specific guidance, you may elect to provide public notification of a decision based on a CX, depending on the public interest in the action.

Though not required, you may elect to prepare an EA for proposed actions otherwise excluded when the decision-maker believes that an EA would be helpful in planning or decision-making (40 CFR 1501.3 and 516 DM 3.2(B)). We recommend that you include in the NEPA document the rationale for completing an EA when a CX could be used.

Guidance for the use of CXs differs for some specific CXs as described below.

4.1 CATEGORICAL EXCLUSIONS ESTABLISHED BY THE ENERGY POLICY ACT

Section 390 of the Energy Policy Act of 2005 established five statutory CXs that apply only to oil and gas exploration and development pursuant to the Mineral Leasing Act. The CXs do not apply to geothermal actions. These CXs are listed in **Appendix 2, *Using Categorical Exclusions Established by the Energy Policy Act of 2005.***

The decision-maker must include in the well file or case file a brief rationale as to why one or more Energy Act CXs apply. No other documentation for application of Energy Act CXs is required. These CXs are different in application from the Departmental CXs and the BLM non-Energy Act CXs. Energy Policy Act CXs do not require review for extraordinary circumstances. This is because these CXs are established by statute, and their application is governed by that statute. However, other procedural requirements still apply, such as consultation under the Endangered Species Act and National Historic Preservation Act.

Issue a decision document for the proposed activity. Apply environmental best management practices (BMPs) and other suitable mitigation measures to permit approvals in accordance with current national policy. Best Management Practices or conditions of approval can be implemented with a CX and do not require additional NEPA documentation.

Detailed guidance for using these statutory CXs is described in **Appendix 2, *Using Categorical Exclusions Established by the Energy Policy Act 2005***.

4.2. CATEGORICAL EXCLUSIONS ESTABLISHED BY THE DEPARTMENT OF THE INTERIOR OR THE BLM

This section outlines procedures for using categorical exclusions established by the Department of the Interior or the BLM in accordance with CEQ regulations (40 CFR 1508.4).

4.2.1 Identifying Potential Categorical Exclusions

Verify that the proposed action fits within one of the Departmental CXs (**Appendix 3, *Departmental Categorical Exclusions***) or a BLM CX (**Appendix 4, *BLM Categorical Exclusions)***. Both the Departmental and BLM lists of CXs need to be reviewed to determine if the proposed action falls into one of the listed categories, as the two lists are not the same.

Some proposed actions may fit within more than one CX. In determining the appropriate CX to use, select the CX that most closely matches the objectives of the proposed action and is the most specific.

Several CXs include acreage limitations (**Appendix 3, *Departmental Categorical Exclusions*** and **Appendix 4, *BLM Categorical Exclusions)***. Where multiple treatments are proposed, for instance, consider the total area treated, rather than adding together overlapping acreage of different treatments. *For example, the BLM CX for vegetation treatment (see **Appendix 4, BLM Categorical Exclusions)** includes an acreage limitation of 1000 acres for vegetation management projects other than prescribed fire. A proposed action of invasive plant removal on 600 acres, followed by mechanical cutting on 500 overlapping acres does not exceed the 1000-acre limitation. If the mechanical cutting were proposed on 500 acres that did not overlap with the 600 acres of invasive plant removal, the proposed action would exceed the 1000-acre limitation.*

4.2.2 Determining if an Extraordinary Circumstance Precludes Use of a Categorical Exclusion

Extraordinary circumstances preclude the use of a Departmental or BLM CX. Extraordinary circumstances are those circumstances for which the Department has determined that further environmental analysis is required for an action, and therefore an EA or EIS must be prepared (516 DM 2.3(A)(3)). All categorically excluded actions must be subjected to sufficient review to determine if any of the extraordinary circumstances apply (see **Appendix 5, *Categorical Exclusions: Extraordinary Circumstances***).

If any extraordinary circumstances apply, an EA or EIS must be prepared (516 DM 2.3(A)(3)). While there is no requirement for an interdisciplinary process or public involvement when reviewing whether extraordinary circumstances apply, the decision-maker may choose to do so.

If any of the extraordinary circumstances apply to the proposed action, determine whether the proposal can be modified to alleviate or resolve the circumstances that are considered extraordinary. If this can be done, and if applicable, the proponent agrees to the change, then the proposed action may be modified and categorically excluded. If the proposed action cannot be modified or the proponent refuses to accept a proposed change, prepare an EA or EIS. If an extraordinary circumstance indicates there are significant effects, then an EIS must be prepared (516 DM 4) (see section **7.2, *Actions Requiring an EIS***).

Some actions may require considerable review to determine whether any extraordinary circumstances apply. *For example, a significant impact on a threatened or endangered species is an extraordinary circumstance* (see **Appendix 5, *Categorical Exclusions: Extraordinary Circumstances***). *It might be readily determined that an action would have some effect on a threatened or endangered species (which would not necessarily constitute an extraordinary circumstance). Determining whether that effect would be significant might require considerable review.* If there is uncertainty about whether one or more of the extraordinary circumstances apply, we recommend that you prepare an EA to determine whether an EIS is required.

If none of the extraordinary circumstances apply to the proposed action (or modified action), then it may be categorically excluded.

4.2.3 Documentation Requirements

4.2.3.1 Documentation Requirements When Using Hazardous Fuels and Post-Fire Rehabilitation CXs

Categorical exclusions for hazardous fuels and post-fire rehabilitation (see **Appendix 3, *Departmental Categorical Exclusions*, #1.12 and #1.13**) have specific documentation requirements. The OEPC requires you to prepare a specific memorandum documenting the use of these two categorical exclusions and documenting the decision to implement the proposed project (DM ESM 03-2). The documentation must follow the template provided in **Appendix 7, *Documentation Requirements for Hazardous Fuels Actions and Post-Fire Rehabilitation Actions***. You must include this document in the case or project file.

4.2.3.2 Documentation Requirements When Using CXs Not Established by Statute

For most actions that are categorically excluded, we recommend that you document which categorical exclusion applies. Documentation would often not be necessary for:

- Actions that have no environmental effect (for example, personnel actions (516 DM 2, Appendix 1 (1.1)) or routine financial transactions (516 DM 2 Appendix 1, (1.3))).
- Actions that have negligible environmental effect (for example, nondestructive data collection (516 DM 2, Appendix 1 (1.6)) or installation of routine signs and markers (516 DM 11.9 (G.2))). The NEPA Handbook Web Guide provides additional examples and discussion.

If you document which categorical exclusion applies, you must use the form provided in **Appendix 6**, ***Categorical Exclusion Documentation Format When Using Categorical Exclusions Not Established by Statute***. This form must be included in the case or project file. This form does not constitute a decision document, and you must issue a decision document that meets program specific guidance.

CHAPTER 5—USING EXISTING ENVIRONMENTAL ANALYSES

GENERAL

You may use existing environmental analyses to analyze effects associated with a proposed action, when doing so would build on work that has already been done, avoid redundancy, and provide a coherent and logical record of the analytical and decision-making process.

Address the following questions before using existing environmental analyses:

- Have any relevant environmental analyses related to the proposed action been prepared (for example, LUP/EIS, programmatic EIS)?
- Who prepared or cooperated in the preparation of the analyses (i.e., the BLM or another agency)?
- Do any of the existing analyses fully analyze the proposed actions, alternatives, and effects?
- Are there new circumstances or information that have arisen since the original analysis was conducted?

The answers to these questions will determine the degree to which you might rely on the existing NEPA analyses. Use of existing analyses may range from considering them as the basis for decision-making (following a Determination of NEPA Adequacy (DNA) or adoption of another agency's NEPA analysis); using components of them (through tiering or incorporation by reference); or supplementing them with new analysis.

5.1 DETERMINATION OF NEPA ADEQUACY

A Determination of NEPA Adequacy confirms that an action is adequately analyzed in existing NEPA document(s) and is in conformance with the land use plan.

Not all new proposed actions will require new environmental analysis. In some instances an existing environmental analysis document may be relied upon in its entirety, and new NEPA analysis will not be necessary (516 DM 11.6). The following are examples of some of the typical situations in which an existing environmental analysis might be relied upon in its entirety.

– *An applicant requests a special recreation permit for a 4-wheel vehicle race on an established route, which is analyzed in an EA, selected in a decision document, and implemented. Later, another applicant requests a special recreation permit for a motorcycle race on the same route. Review the existing EA to determine if it adequately addresses this similar action and if new information and resource concerns have arisen.*

– *A proposed action for a landscape-scale timber harvest project is analyzed in an EIS and selected in a ROD. For implementation of a subsequent individual timber sale developed consistent with the ROD, review the EIS to determine if its analysis adequately addresses the specific effects of the individual timber sale.*

You may also use the DNA to evaluate new circumstances or information prior to issuance of a decision to determine whether you need to prepare a new or supplemental analysis (see section **5.3, *Supplementing an EIS***). For example:

A proposed action to construct a road is analyzed in an EIS, but a decision is delayed for several years until funding becomes available. Before reaching a decision, review the existing EIS to determine if it is still adequate in light of new information and resource concerns that may have arisen in the intervening years.

To determine if existing documents are adequate, identify and review each relevant environmental document, as described below.

5.1.1 Identifying Existing Environmental Documents

A new proposed action may rely on a single or multiple existing NEPA documents. The NEPA documents that may be relevant include:

- EISs associated with BLM Resource Management Plans.
- EISs or EAs associated with Resource Management Plan Amendments.
- EISs or EAs on BLM programmatic actions.
- EISs or EAs associated with BLM activity plans, projects, or permit approval actions.
- EISs or EAs prepared by other agencies, including those on programmatic, land use, and activity or project-specific plans or actions, with the BLM as a cooperating agency.
- EISs or EAs prepared by other agencies without the BLM as a cooperating agency.

If the existing document is an EIS or EA prepared by another agency, the BLM must adopt the EIS or EA in order to use it for NEPA compliance. Follow the procedures for adoption rather than a DNA (see section **5.4, *Adopting Another Agency's NEPA Analyses***).

5.1.2 Reviewing Existing Environmental Documents

Review existing environmental documents and answer the following questions to determine whether they adequately cover a proposed action currently under consideration:

- Is the new proposed action a feature of, or essentially similar to, an alternative analyzed in the existing NEPA document(s)? Is the project within the same analysis area, or if the project location is different, are the geographic and resource conditions sufficiently similar to those analyzed in the existing NEPA document(s)? If there are differences, can you explain why they are not substantial?

- Is the range of alternatives analyzed in the existing NEPA document(s) appropriate with respect to the new proposed action, given current environmental concerns, interests, and resource values?

- Is the existing analysis valid in light of any new information or circumstances (such as rangeland health standard assessments, recent endangered species listings, updated lists of BLM-sensitive species)? Can you reasonably conclude that new information and new circumstances would not substantially change the analysis of the new proposed action?

- Are the direct, indirect, and cumulative effects that would result from implementation of the new proposed action similar (both quantitatively and qualitatively) to those analyzed in the existing NEPA document?

We recommend that your answers be substantive and detailed and contain specific citations to the existing EA or EIS (see section **5.1.3, *Document the Review***). If you answer "yes" to all of the above questions, additional analysis will not be necessary. If you answer "no" to any of the above questions, a new EA or EIS must be prepared (516 DM 11.6). However, it may still be appropriate to tier to or incorporate by reference from the existing EA or EIS or supplement the existing EIS (provided that the Federal action has not yet been implemented).

In addition to answering the above questions, evaluate whether the public involvement and interagency review associated with existing EAs or EISs are adequate for the new proposed action. In general, where the new proposed action has not already been discussed during public involvement for the existing EA or EIS, some additional public involvement for the new proposed action will be necessary. For example,

> *In the example above of a permit for a motorcycle race relying on the existing EA prepared for a 4-wheel vehicle race on the same route, provide some additional public involvement prior a decision on the permit, unless the public involvement for the EA specifically discussed the motorcycle race.*

In the example above of a timber sale relying on the existing EIS for a landscape-scale timber harvest project, provide some additional public involvement prior a decision on the timber sale, unless the public involvement for the EIS specifically described the individual timber sale.

In the example above of a decision on road construction delayed after preparation of an EIS, additional public involvement may or may not be necessary depending on the new information or resource concerns that may have arisen. Evaluate whether additional public involvement would assist in determining whether the existing EIS is still adequate for the action.

If you conclude that additional public involvement is necessary, the type of public involvement is at the discretion of the decision-maker. Public involvement may include any of the following: external scoping, public notification before or during your review of the existing EA or EIS, public meetings, or public notification or review of a completed DNA Worksheet (see section **5.1.3, *Document the Review***).

Some actions may be appropriate to implement with either a DNA or CX. When the new proposed action is clearly a feature of an action analyzed in an existing NEPA document and the existing analysis remains valid, a DNA would generally be preferable to using a CX, because a DNA would rely on a NEPA analysis to support decision making.

5.1.3 Document the Review

The DNA worksheet is not itself a NEPA document. The DNA worksheet documents the review to determine whether the existing NEPA documents can satisfy the NEPA requirements for the proposed action currently under consideration. The DNA worksheet can be found in **Appendix 8, *Worksheet [for] Determination of NEPA Adequacy (DNA)***.

When relying on an existing environmental analysis for a new proposed action, we recommend that you document the review using the DNA worksheet.

When evaluating new circumstances or information prior to issuance of a decision, as described in section **5.1, *Determination of NEPA Adequacy***, you may document your review using the DNA worksheet or in other documents, such as decision documentation or responses to comments. The Web Guide contains examples of completed DNA worksheets.

5.1.4 FONSIs, Decisions, Protests, and Appeals

If the new proposed action is a feature of the selected alternative analyzed in an existing EA, you do not need to prepare a new FONSI because the existing FONSI already made the finding that the selected alternative would have no significant effects. However, you must prepare a new FONSI before reaching a decision if the new proposed action is:

1. essentially similar to, but not specifically a feature of, the selected alternative
2. a feature of, or essentially similar to, an alternative that was analyzed in the EA or EIS, but was not selected.

Be sure to evaluate whether the new FONSI must be made available for public review before reaching a decision (see section **8.4.2, *The Finding of No Significant Impact***).

The DNA worksheet is not a decision document. For a new action for which a DNA has been prepared, you usually must prepare decision documentation consistent with program-specific guidance.

There may be program-specific guidance for public notification of decisions. Even if there is no program-specific guidance, you may elect to provide public notification of a decision based on a DNA, depending on the public interest in the action and the public involvement that was provided for the existing NEPA analysis.

The signed conclusion in the DNA worksheet is an interim step in the BLM's internal review process and does not constitute an appealable decision. The decision on the action being implemented may be subject to protest or appeal under 43 CFR Part 4 and program-specific regulations. See the Web Guide for examples of DNA-level decisions.

5.2 INCORPORATION BY REFERENCE AND TIERING

Incorporation by reference and tiering provide opportunities to reduce paperwork and redundant analysis in the NEPA process. When incorporating by reference, you refer to other available documents that cover similar issues, effects and/or resources considered in the NEPA analysis you are currently preparing. Incorporation by reference allows you to briefly summarize the relevant portions of these other documents rather than repeat them.

Tiering is a form of incorporation by reference that refers to previous EAs or EISs. Incorporation by reference is a necessary step in tiering, but tiering is not the same as incorporation by reference. Tiering allows you to narrow the scope of the subsequent analysis, and focus on issues that are ripe for decision-making, while incorporation by reference does not. You may only tier to EAs or EISs, whereas you may incorporate by reference from any type of document.

5.2.1 Incorporation by Reference

The CEQ regulations direct that:

> Agencies shall incorporate material into an environmental impact statement by reference when the effect will be to cut down on bulk without impeding agency and public review of the action. The incorporated material shall be cited in the statement and its content briefly described. No material may be incorporated by reference unless it is reasonably available for inspection by potentially interested parties within the time allowed for comment. Material based on proprietary data which is itself not available for review and comment shall not be incorporated by reference (40 CFR 1502.21).

Incorporation by reference is useful in preparing both EAs and EISs. It involves two steps: citation and summarization.

1. **Cite** the source of the incorporated material. Give the name of the document and page numbers where the incorporated material can be found. Make this citation as specific as possible so there is no ambiguity for the reader about what material is being incorporated. If unpublished, state where cited material is available.

2. **Summarize** the incorporated material. Briefly describe the content of the incorporated material and place it in the context of the NEPA document at hand. For example, if analysis is incorporated by reference from one NEPA document into another, summarize the previous analysis, and explain what you conclude based on that previous analysis and how it relates to the action in question. The summary of the incorporated material must be sufficient to allow the decision-maker and other readers to follow the analysis and arrive at a conclusion.

If a document incorporated by reference is central to the analysis in the EIS, circulate the document for comment as part of the draft. For example, circulate incorporated material with the draft EIS if it provides the bulk of the analysis, or it addresses effects which are highly controversial, or if it is likely to provide a basis for the decision (see section **9.7.1, *ROD Format***). In such instances, it may be more appropriate to attach the material as an appendix rather than incorporate it by reference.

Any material may be incorporated by reference, including non-NEPA documents, as long as the material is reasonably available for public inspection. There are many ways to make incorporated material available for public inspection, such as mailing the material upon request or posting the material on the Internet. At a minimum, incorporated material must be available for inspection in the applicable BLM office. If the material is not or cannot be made reasonably available, it cannot be incorporated by reference. For example, privileged data that are not readily available (such as some seismic data, company financial data, cultural inventories) may be referenced, but not incorporated by reference. Instead, summarize the information as fully as possible with mention that the privileged information is not available for public review.

In addition, other material may be simply referenced in a NEPA document, without being incorporated by reference. Without following the above procedures for incorporation by reference, such material would not be made part of the NEPA document. It may be appropriate to simply reference material when it provides additional information for the reader, but is not essential to the analysis. If such referenced material is otherwise reasonably available (such as published material including books or journal or newspaper articles), you do not need to make it available for inspection at the BLM office. If any such material is essential to the analysis in the NEPA document, incorporate it by reference as described above. See the Web Guide for an example of incorporation by reference.

5.2.2 Tiering

Tiering is using the coverage of general matters in broader NEPA documents in subsequent, narrower NEPA documents (40 CFR 1508.28, 40 CFR 1502.20). This allows the tiered NEPA document to narrow the range of alternatives and concentrate solely on the issues not already addressed. Tiering is appropriate when the analysis for the proposed action will be a more site-specific or project-specific refinement or extension of the existing NEPA document.

Before you tier to a NEPA document, evaluate the broader NEPA document to determine if it sufficiently analyzed site-specific effects and considered the current proposed action. If so, a DNA will be more appropriate than a subsequent, tiered NEPA document (see section **5.1, *Determination of NEPA Adequacy***).

When preparing a tiered NEPA document:

1. state that it is tiered to another NEPA document;
2. describe the NEPA document to which it is tiered; and
3. incorporate by reference the relevant portions of the NEPA document to which it is tiered (cite and summarize, as described in section **5.2.1, *Incorporation by Reference***).

You may tier to a NEPA document for a broader action when the narrower action is clearly consistent with the decision associated with the broader action. In the tiered document, you do not need to reexamine alternatives analyzed in the broader document. Focus the tiered document on those issues and mitigation measures specifically relevant to the narrower action but not analyzed in sufficient detail in the broader document.

Tiering can be particularly useful in the context of the cumulative impact analysis. A programmatic EIS will often analyze the typical effects anticipated as a result of the individual actions that make up a program, as well as the total effects of the overall program. An EA prepared in support of an individual action can be tiered to the programmatic EIS. You may prepare an EA for an action with significant effects, whether direct, indirect or cumulative, if the EA is tiered to a broader EIS which fully analyzed those significant effects. Tiering to the programmatic EIS would allow the preparation of an EA and FONSI for the individual action, so long as the remaining effects of the individual action are not significant. If there are new circumstances or information that would result in significant effects of an individual action not considered in the EIS, tiering to the EIS cannot provide the necessary analysis to support a FONSI for the individual action (see sections **7.1, *Actions Requiring an EA***, and **8.4.2, *The Finding of No Significant Impact (FONSI)***).

Note that in some instances, a broader EIS might fully analyze significant effects on some resources affected by the individual action, but not all resources. The tiered EA for the individual action need not re-analyze the effects on resources fully analyzed in the broader EIS, but may instead focus on the effects of the individual action not analyzed in the broader EIS. The FONSI for such an individual action could rely on the analysis in the broader EIS as well as the tiered EA, and would explain which parts of the EIS it is relying upon. An EIS would need to be prepared for the individual action only if there are significant effects that have not been analyzed in the broader EIS.

For example:

> *If an LUP EIS analyzed the effects of a typical individual juniper control project and the total effects of a juniper control program, an individual juniper control project implemented as part of that overall program would generally be expected to have no significant effects, beyond those already analyzed in the LUP EIS.*

In such instances, focus the EA on determining if, and how, any new circumstances or information would change the effects anticipated by the EIS. The EA in such instances may also consider mitigation of effects analyzed in the EA or already analyzed in the broader EIS, including reducing or avoiding effects that are not significant.

The following are examples of some of the typical situations in which tiering is appropriate.

- *LUP/EIS tiered to a programmatic EIS: tiering the analysis of a proposed grazing program in an LUP to the programmatic EIS for regulations for the fundamentals of rangeland health. Tiering to the programmatic EIS would allow the LUP EIS to exclude alternatives that would establish grazing at levels that would not achieve the fundamentals of rangeland health.*

- *Activity Plan NEPA document tiered to a LUP/EIS: tiering an allotment management plan EA to the analysis in the LUP/EIS that analyzed the effects of the livestock management objectives and management actions for the area. Tiering to the LUP EIS would allow the allotment management plan EA to exclude alternatives that would set grazing levels different than those established in the LUP EIS.*

- *Project-specific NEPA document tiered to Activity Plan NEPA: tiering an EA for building a fence to an allotment management plan EA. (Note that this action may sometimes be appropriate with a DNA, as described in Sec. 5.1.) If the allotment management plan decided to use fencing, as opposed to reducing grazing levels, to exclude cows from riparian areas, tiering to the allotment management plan EA would allow the fence EA to exclude alternatives that would reduce grazing levels to reduce riparian impacts.*

- *Project-specific NEPA document tiered to a LUP/EIS: in the absence of an allotment management plan, tiering an EA for building a fence to the general analysis of fencing in the grazing section of the LUP/EIS. (Note that this action may sometimes be appropriate with a DNA, as described in section **5.1, Determination of NEPA Adequacy**).*

5.3 SUPPLEMENTING AN EIS

"Supplementation" has a particular meaning in the NEPA context. The Supreme Court has explained that supplementation of an EIS is necessary only if there remains major Federal action to occur. (See *Norton v. Southern Utah Wilderness Alliance*, 542 U.S. 55 (2004)). In the case of a land use plan, implementation of the Federal action is the signing of a Record of Decision. You must prepare a supplement to a draft or final EIS if, after circulation of a draft or final EIS but prior to implementation of the Federal action:

- you make substantial changes to the proposed action that are relevant to environmental concerns (40 CFR 1502.9(c)(1)(i));
- you add a new alternative that is outside the spectrum of alternatives already analyzed (see Question 29b,CEQ, *Forty Most Asked Questions Concerning CEQ's NEPA Regulations, March 23, 1981*); or
- there are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its effects (40 CFR 1502.9(c)(1)(ii)).

A supplemental EIS must provide a basis for rational decision-making and give the public and other agencies an opportunity to review and comment on the analysis of the changes or new information (40 CFR 1502.9(c)(4)). Supplementing is used to meet the purposes of the NEPA as efficiently as possible, avoiding redundancy in the process.

Supplementation is a process applied only to draft and final EISs, not EAs. If you make changes to the proposed action; add an alternative outside the spectrum of those already analyzed; or if new circumstances or information arise that alters the validity of an EA analysis prior to the implementation of the Federal action, prepare a new EA.

5.3.1 When Supplementation is Appropriate

"Substantial changes" in the proposed action may include changes in the design, location, or timing of a proposed action that are relevant to environmental concerns (i.e., the changes would result in significant effects outside of the range of effects analyzed in the draft or final EIS).

Adding a new alternative analyzed in detail requires preparation of a supplement if the new alternative is outside the spectrum of alternatives already analyzed and not a variation of an alternative already analyzed. For example:

> *Comments on a draft EIS for a transmission line right-of way suggest an entirely new route for the right-of-way that would be a reasonable alternative. The new route would result in effects outside the range of effects analyzed in the draft. Prepare a supplemental draft EIS to analyze this new route.*

Describing additional alternatives that are considered but eliminated from detailed analysis does not require supplementation.

"New circumstances or information" are "significant" and trigger the need for supplementation if they are relevant to environmental concerns and bearing on the proposed action and its effects (i.e., if the new circumstances or information would result in significant effects outside the range of effects already analyzed). New circumstances or information that trigger the need for supplementation might include the listing under the Endangered Species Act of a species that was not analyzed in the EIS; development of new technology that alters significant effects; or unanticipated actions or events that result in changed circumstances, rendering the cumulative effects analysis inadequate.

5.3.2 When Supplementation is Not Appropriate

Supplementation is not necessary if you make changes in the proposed action that are not substantial (i.e., the effects of the changed proposed action are still within the range of effects analyzed in the draft or final EIS).

If a new alternative is added after the circulation of a draft EIS, supplementation is not necessary if the new alternative lies within the spectrum of alternatives analyzed in the draft EIS or is a minor variation of an alternative analyzed in the draft EIS. In such circumstances, the new alternative may be added in the final EIS. For example:

> *A draft EIS for an oil field development project analyzed the effects of drilling 500, 1,000, and 5,000 wells. The addition of a 3,000-well alternative could be analyzed in the final EIS without a supplemental draft EIS.*

Supplementation is not appropriate when new information or changed circumstances arise after the Federal action has been implemented. If the new information or changed circumstances impedes the use of the EIS for subsequent tiering for future decision-making, prepare a new EIS or EA and incorporate by reference relevant material from the old EIS. For example:

> *An EIS for an oil field development project is prepared and a decision issued. EAs or EISs prepared for subsequent applications of permit to drill (if they cannot be categorically excluded) are tiered to the field development EIS. New drilling technology developed after the preparation of the EIS results in significant impacts not analyzed in the field development EIS. These changed circumstances do not require that the field development EIS be supplemented. However, because the EAs or EISs for applications of permit to drill need the EIS for tiering, you may wish to prepare a new field development EIS.*

When new circumstances or information arise prior to the implementation of the Federal action, but your evaluation concludes that they would not result in significant effects outside the range of effects already analyzed, document your conclusion and the basis for it. If the new circumstances or information arise after publication of a draft EIS, document your conclusion in the final EIS. If the new circumstances or information arise after publication of the final EIS, document your conclusion in the ROD.

5.3.3 The Supplementation Process

Supplemental EISs will vary in scope and complexity depending upon the nature of the proposed changes or new information or circumstances. Supplemental EISs are prepared, circulated, and filed with the same requirements as EISs, except that supplemental EISs do not require scoping (40 CFR 1502.9) (see section **9.5, *Supplements to Draft and Final EISs***). A supplemental EIS may incorporate by reference the relevant portions of the EIS being supplemented or may circulate the entire EIS along with the supplemental EIS.

When a supplement is prepared after circulation of a draft EIS, but before preparation of a final EIS, you must prepare and circulate a draft supplemental EIS and then prepare a final EIS. When a supplement is prepared after circulation of a final EIS, you must prepare and circulate a draft supplemental EIS and then prepare and circulate a final supplemental EIS, unless alternative procedures are approved by the CEQ (40 CFR 1502.9(c)(4)). Consult with the OEPC and the Office of the Solicitor before proposing alternative arrangements to the CEQ.

5.4 ADOPTING ANOTHER AGENCY'S NEPA ANALYSES

If an EIS or EA prepared by another agency is relevant to a BLM proposed action, you may prepare a new EIS or EA and incorporate by reference the applicable portions of the other agency's document (see section **5.2.1, *Incorporation by Reference***). Or you may adopt an EIS or EA prepared by another agency, after following certain steps described below.

5.4.1 Adopting Another Agency's EIS

You may use another agency's EIS for BLM decision-making after adopting the EIS. "An agency may adopt a Federal draft or final [EIS] or portion thereof provided that the statement or portion thereof meets the standards for an adequate statement under these [the CEQ] regulations" (40 CFR 1506.3(a)). Adopting another agency's EIS reduces paperwork, eliminates duplication, and makes the process more efficient. You may adopt an EIS that meets all CEQ, DOI, and BLM requirements for preparation of an EIS. You must prepare your own ROD on adopted EISs (Question 30, CEQ, *Forty Most Asked Questions Concerning CEQ's NEPA Regulations*, *March 23, 1981*).

If the BLM is a cooperating agency in the preparation of an EIS, you may adopt it without recirculating the EIS if you conclude that your comments and suggestions have been satisfied (40 CFR 1506.3(c)). For example:

> *The Forest Service, with the BLM as a cooperator, prepared an EIS for the Biscuit Fire Recovery Project, which addressed actions on both Forest Service and BLM-managed lands in Oregon. The BLM adopted the EIS and prepared a separate ROD for actions on BLM-managed lands.*

If the BLM is not a cooperating agency in the preparation of an EIS, you may adopt it after recirculating the document consistent with the following requirements:

- If the BLM proposed action is substantially the same as the action covered by the other agency's EIS, you can adopt the EIS after recirculating the document as a final EIS. When recirculating the final EIS, you must identify the BLM proposed action (40 CFR 1506.3(b)).

- If the BLM adopts an EIS that is not final within the agency that prepared it, or if the action the EIS assesses is the subject of a referral or if the adequacy of the EIS is the subject of judicial action that is not final, the BLM must indicate its status in the recirculated draft and final EIS (40 CFR 1506.3(c)).

5.4.2 Adopting Another Agency's EA

You may use another agency's EA for a BLM FONSI and BLM decision-making after adopting the EA, consistent with the following requirements (see *CEQ Guidance Regarding NEPA Regulations*, 48 Fed. Reg. 34263 (July 28, 1983)):

- The BLM must independently evaluate the information contained in the EA, and take full responsibility for its scope and content. You must evaluate the information contained in the EA to ensure that it adequately addresses environmental impacts of the BLM's proposed action and ensure that the EA to be adopted satisfies the BLM's own NEPA procedures. If the BLM has acted as a cooperating agency, you must ensure that any concerns which it has raised during the process of preparing the EA have been adequately addressed (*CEQ Guidance Regarding NEPA Regulations*, 48 Fed. Reg. 34263 (July 28, 1983)). An interdisciplinary team may be useful in evaluating another agency's EA for adoption.

- If you conclude that environmental impacts are adequately addressed, you must issue your own FONSI to document your formal adoption of the EA, and your conclusions regarding the adequacy of the EA (*CEQ Guidance Regarding NEPA Regulations*, 48 Fed. Reg. 34263 (July 28, 1983)). In certain limited circumstances, you must publish or otherwise make the FONSI available for public review for thirty days (see section **8.4.2, *The Finding of No Significant Impact***).

- You must prepare your own decision record in accordance with program-specific requirements following adoption of the EA and the issuance of the FONSI (see section **8.5, *The Decision Record***).

CHAPTER 6—NEPA ANALYSIS

GENERAL

There are a variety of ways to comply with the NEPA; the scope of your analysis and documentation will depend on your proposal and its environmental effects. This chapter is broadly focused on NEPA analysis, not on documentation requirements. The CEQ regulations prescribe specific steps for the preparation of an EIS. The process of preparing an EA is more flexible. This chapter describes NEPA concepts and outlines typical steps of NEPA analysis. For detailed documentation and format requirements for EAs and EISs, see **Chapter 8, *Preparing an Environmental Assessment*** and **Chapter 9, *Preparing an Environmental Impact Statement*.**

While the NEPA process is much the same for all BLM actions, some programs have specific requirements for NEPA analysis. Become aware of and consult program-specific guidance when beginning the NEPA process.

6.1 OUTLINE OF ANALYTICAL STEPS

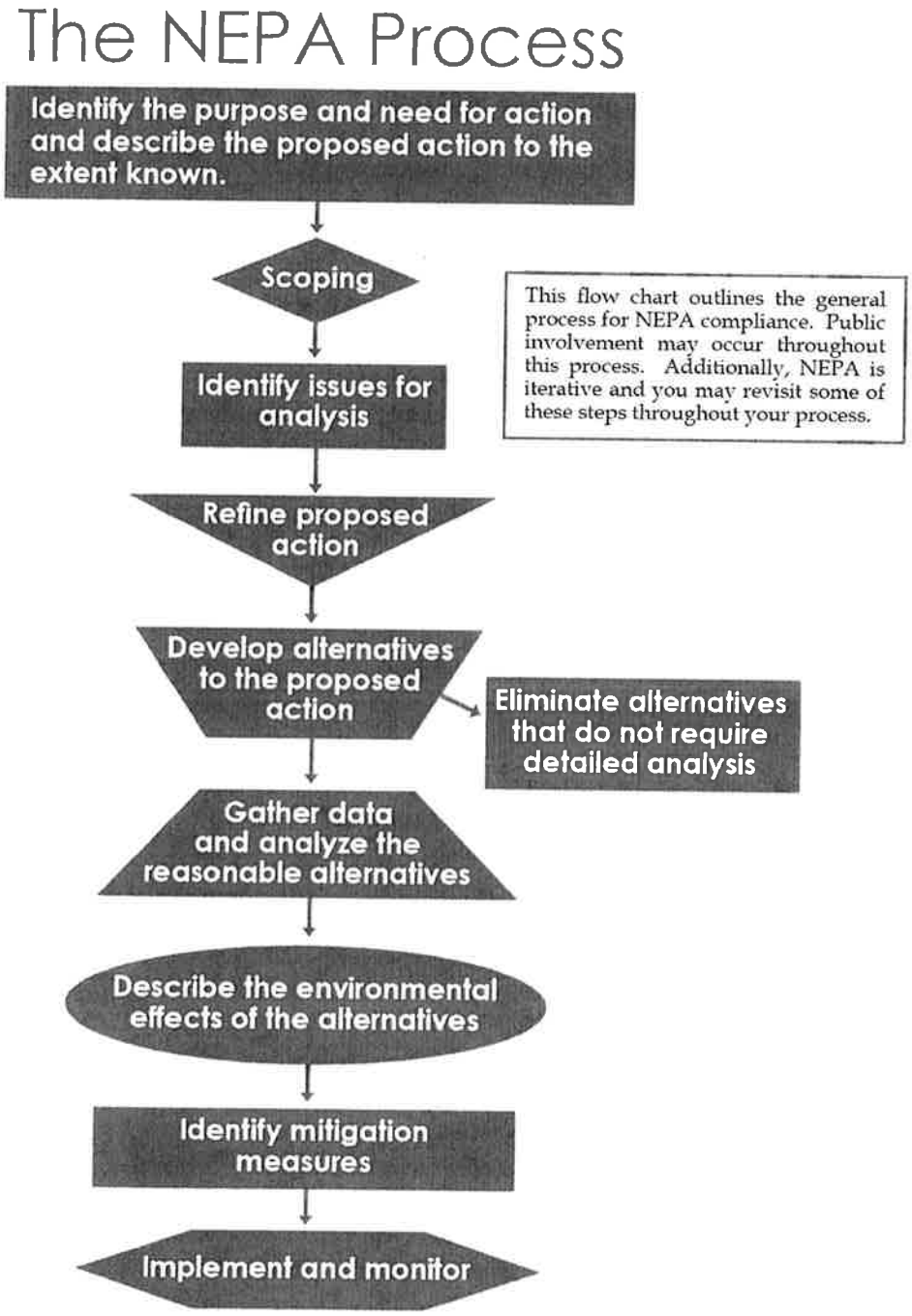
For an internally generated project (one in which the BLM is developing the proposed action), the usual analytical steps for an EA or EIS are as follows:

- Identify the purpose and need for action and describe the proposed action to the extent known.
- Develop a scoping strategy and conduct scoping.
- Identify issues requiring analysis.
- Refine the proposed action.
- Develop reasonable alternatives to the proposed action.
- Identify, gather and synthesize data.
- Analyze and disclose the impacts of each alternative.
- Identify potential mitigation measures to reduce adverse impacts.

Many of these steps are iterative; for example, developing alternatives may lead to the identification of additional issues requiring analysis. At several points in the process, you may loop back to an earlier step to make refinements.

For an externally generated project (one in which a non-BLM party has developed a proposed action), the analysis steps are the same except that the first step in the process is when you accept a proposal regarding an action to be taken, and move forward into NEPA analysis.

Figure 6.1 The NEPA Process



6.2 PURPOSE AND NEED

The CEQ regulations direct that an EIS "…shall briefly specify the underlying purpose and need to which the agency is responding in proposing the alternatives including the proposed action" (40 CFR 1502.13). The CEQ regulations also direct that EAs "…shall include brief discussions of the need for the proposal…" (40 CFR 1508.9(b)).

The CEQ regulations do not differentiate the "purpose" of the action from the "need" for the action. However, distinguishing the "purpose" and the "need" as two separate aspects of the purpose and need statement may help clarify why the BLM is proposing an action. For many types of actions, the "need" for the action can be described as the underlying problem or opportunity to which the BLM is responding with the action. The "purpose" can be described as a goal or objective that we are trying to reach. Often, the "purpose" can be presented as the solution to the problem described in the "need" for the action. *For example, the "need" for a culvert replacement project might describe how the existing culvert blocks fish passage; the "purpose" might be to replace the culvert with one that allows fish passage.*

Regardless of whether the "purpose" and the "need" are treated as distinct or synonymous, the purpose and need statement as a whole describes the problem or opportunity to which the BLM is responding and what the BLM hopes to accomplish by the action.

We recommend that the purpose and need statement be brief, unambiguous, and as specific as possible. Although the purpose and need statement cannot be arbitrarily narrow, you have considerable flexibility in defining the purpose and need for action. To the extent possible, construct the purpose and need statement to conform to existing decisions, policies, regulation, or law. The purpose and need for the action is usually related to achieving goals and objectives of the LUP; reflect this in your purpose and need statement.

The purpose and need statement for an externally generated action must describe the BLM purpose and need, not an applicant's or external proponent's purpose and need (40 CFR 1502.13). The applicant's purpose and need may provide useful background information, but this description must not be confused with the BLM purpose and need for action. The BLM action triggers the NEPA analysis. It is the BLM purpose and need for action that will dictate the range of alternatives and provide a basis for the rationale for eventual selection of an alternative in a decision. See the Web Guide for examples of purpose and need statements.

> The purpose and need statement should explain why the BLM is proposing action. Note that you must describe the purpose and need for the **action**, not the purpose and need for the document.

6.2.1 The Role of the Purpose and Need Statement

We recommend that you draft your purpose and need statement early in the NEPA process. Including a draft purpose and need statement with scoping materials will help focus internal and external scoping comments. Reexamine and update your purpose and need statement as appropriate throughout the NEPA process, especially when refining the proposed action and developing alternatives.

A carefully crafted purpose and need statement can be an effective tool in controlling the scope of the analysis and thereby increasing efficiencies by eliminating unnecessary analysis and reducing delays in the process. The purpose and need statement dictates the range of alternatives, because action alternatives are not "reasonable" if they do not respond to the purpose and need for the action (see section **6.6.1, *Reasonable Alternatives***). The broader the purpose and need statement, the broader the range of alternatives that must be analyzed. The purpose and need statement will provide a framework for issue identification and will form the basis for the eventual rationale for selection of an alternative. Generally, the action alternatives will respond to the problem or opportunity described in the purpose and need statement, providing a basis for eventual selection of an alternative in a decision.

*For example, in the culvert replacement example above (*see section **6.2, *Purpose and Need***), *the scope of the analysis would be narrowed by describing a more specific "purpose" of replacing the existing culvert to allow cutthroat trout fish passage in the spring; reasonable alternatives might include analyzing various culvert sizes, or moving the culvert. Conversely, the scope of the analysis would be broadened by describing a more general "purpose" of improving fish passage; reasonable alternatives might include culvert removal and road decommissioning.*

Examples of purpose and need statements and related decisions are found in the next section, **6.2.2, *The Decision to be Made***, and examples of combined and separated purpose and need statements can be found in the Web Guide.

6.2.2 The Decision to be Made

You may include in the purpose and need statement a description of your decision(s) to be made based on the NEPA analysis. Tying the purpose and need for your proposal to your decision helps establish the scope for the NEPA analysis. A clear explanation of the decision(s) at hand is also helpful in public involvement; it helps to set expectations and explain the focus of the BLM's NEPA analysis. In describing the BLM's decision(s) to be made, you must retain the flexibility to select among alternatives that meet the purpose and need, and are within the BLM's jurisdiction (40 CFR 1506.1(a)(2)). As with the purpose and need, the description of the decision(s) to be made may be broad or narrow.

For externally generated actions, the description of the decision(s) to be made helps differentiate your role in the action from the external proponent's role. For NEPA documents prepared with cooperating agencies with jurisdiction by law, we recommend that you explicitly identify the decisions to be made by each agency (see section **12.1, *Cooperating Agency Status in Development of NEPA Documents***).

Jurisdiction by law means another governmental entity (Tribal, Federal, State, or local agency) has authority to approve, veto, or finance all or part of a proposal (40 CFR 1508.15). The CEQ regulations provide for establishing a cooperating agency relationship with such entities in development of a NEPA analysis document.

Examples:

The following examples are adapted from actual BLM actions. These are not intended to provide a template to be copied, but as examples for general consideration. Because the purpose and need statement controls the scope of the analysis and is directly tied to the eventual rationale for selection, it is important that the purpose and need statement be tailored to the specific action in question.

An externally generated implementation action. *The purpose of the action is to provide the owners of private land located in Township X South, Range X West, Section X, with legal access across public land managed by the BLM. The need for the action is established by the BLM's responsibility under FLPMA to respond to a request for a Right-of-Way Grant for legal access to private land over existing BLM roads and a short segment of new road to be constructed across public land.*
Decision to be made: The BLM will decide whether or not to grant the right of way, and if so, under what terms and conditions.

An internally generated implementation action. *The purpose of the action is to modify current grazing practices on the X Allotment by adjusting timing and levels of livestock use so that progress can be made toward meeting the fundamentals of rangeland health. The need for the action is that fundamentals of rangeland health are not being met for watersheds, riparian areas, and threatened and endangered plants in the X Allotment, based on a current assessment. Active erosion is evident and exotic annual grasses dominate the understory. The assessment found that current livestock grazing management practices do not meet the fundamentals of rangeland health.*
Decision to be made: The BLM will decide whether or not to issue a grazing permit with modifications from the current permit.

A Land Use Plan revision, *(Note: this example is abbreviated from the detail that would customarily be appropriate for revision of an LUP). The purpose of the X Field Office LUP revision is to ensure that public lands are managed according to the principles of multiple use identified in FLPMA while maintaining the valid existing rights and other obligations already established. The need for the action is that changing resource demands and technology have changed the type and level of impacts to various resources, as detailed in the LUP evaluation. Specifically, the emergence of new exploration and extraction technologies in oil and gas*

development may result in impacts not previously analyzed. Alternatives will address the availability of unleased lands for future oil and gas leasing; potential stipulations to be attached to new leases or leases to be reoffered if existing leases are relinquished; and mitigation measures to be considered in reviewing applications for permits to drill. This need is limited, because most oil and gas resources in the planning area have already been leased, and the LUP revision will maintain valid existing rights. The LUP evaluation also noted other changes in resource conditions and uses that could result in impacts not previously analyzed.
Decision to be made: The BLM will revise the LUP and identify areas available for oil and gas leasing, leasing stipulations, and mitigation measures to consider in reviewing applications for permits to drill.

6.3 SCOPING

> "There shall be an early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to a proposed action. This process shall be termed scoping." (40 CFR 1501.7)

Scoping is the process by which the BLM solicits internal and external input on the issues, impacts, and potential alternatives that will be addressed in an EIS or EA as well as the extent to which those issues and impacts will be analyzed in the NEPA document. Although it is not required, you may also elect to scope for issues and impacts associated with actions under CX or DNA review. Begin considering cumulative impacts during the scoping process; use scoping to begin identifying actions by others that may have a cumulative effect with the proposed action, and identifying geographic and temporal boundaries, baselines and thresholds. Scoping also helps to begin identifying incomplete or unavailable information and evaluating whether that information is essential to a reasoned choice among alternatives.

Scoping is one form of public involvement in the NEPA process. Scoping occurs early in the NEPA process and generally extends through the development of alternatives. (The public comment period for a DEIS or public review of an EA are not scoping).

Developing the purpose and need statement will enhance the scoping process, even if you have not yet fully developed a proposed action. A preliminary purpose and need statement will allow BLM staff, other agencies, and the public to give more focused input on issues or the proposal. Additionally, sharing what is known about the No Action alternative and the consequences of not meeting the need for action may facilitate effective scoping comments.

6.3.1 Internal Scoping

Internal scoping is simply the use of BLM and cooperating agency staff to help determine what needs to be analyzed in a NEPA document. Internal scoping is an interdisciplinary process; at a minimum, use scoping to define issues, alternatives, and data needs. Additionally, this is an opportunity to identify other actions that may be analyzed in the same NEPA document. You may use internal scoping to:

- formulate and refine the purpose and need.
- identify any connected, cumulative, or similar actions associated with the proposal.
- start preparation for cumulative effects analysis.
- decide on the appropriate level of documentation.
- develop a public involvement strategy.
- decide other features of the NEPA process.

6.3.2 External Scoping

External scoping involves notification and opportunities for feedback from other agencies, organizations, tribes, local governments, and the public. You do not need to conduct external scoping at the same time as internal scoping; frequently you first conduct some internal scoping to develop a preliminary range of alternatives and issues. These alternatives and issues may then be shared during external scoping, and you will likely build upon these preliminary issues as scoping continues.

External scoping can be used to identify coordination needs with other agencies; refine issues through public, tribal and agency feedback on preliminary issues; and identify new issues and possible alternatives. Tribal consultation centers on established government-to-government relationships, and it is important that you allow sufficient time and use the appropriate means of contacting tribes when conducting scoping. External scoping serves to build agency credibility and promote constructive dialogue and relations with tribes, agencies, local governments and the public.

The CEQ regulations mandate external scoping for EISs, and such scoping has formal requirements (see section **9.1.3, *Scoping***). The time-limited scoping period that follows the publication of a Notice of Intent to prepare an EIS is referred to as formal scoping. However, you should not limit scoping for an EIS to the formal scoping period.

External scoping for EAs is optional. See section **8.3.3, *Scoping and Issues*** for a discussion of when external scoping is appropriate for an EA.

External scoping may help identify alternatives to the proposed action, as well as refine the proposed action. External scoping may result in refinement of issues for analysis. Preliminary issues may be clarified and new issues identified in the external scoping process. You will use external scoping to begin identifying past, present, and reasonably foreseeable actions by others that could have a cumulative effect together with the BLM action (see section **6.8.3.4, *Past, Present, and Reasonably Foreseeable Actions)***. External scoping can be used to identify permits, surveys, or consultations required by other agencies. Scoping may also generate information that may be used during the permitting or consultation process.

External scoping methods include but are not limited to: *Federal Register* notices, public meetings, field trips, direct mailing, media releases, newsletters, NEPA registers, and email notifications. You may also seek help from other agencies, organizations, tribes, local governments, and the public in identifying interested parties that may not yet have been reached by scoping efforts.

6.4 ISSUES

The CEQ regulations provide many references to "issues," though the regulations do not define this term explicitly. At 40 CFR 1501.7(a)(2), 40 CFR 1501.7(a)(3), 40 CFR 1502.1 and 1502.2(b), the CEQ explains that issues may be identified through scoping and that only significant issues must be the focus of the environmental document . Significant issues are those related to significant or potentially significant effects (see section **7.3, *Significance***).

For the purpose of BLM NEPA analysis, an "issue" is a point of disagreement, debate, or dispute with a proposed action based on some anticipated environmental effect. An issue is more than just a position statement, such as disagreement with grazing on public lands. An issue:

- has a cause and effect relationship with the proposed action or alternatives;
- is within the scope of the analysis;
- has not be decided by law, regulation, or previous decision; and
- is amenable to scientific analysis rather than conjecture.

Issues point to environmental effects; as such, issues can help shape the proposal and alternatives. (For externally generated proposals, the proposed action is not developed through scoping, but other action alternatives are). Issues may lead to the identification of design features that are incorporated into the proposed action (see section **6.5.1.1, *Design Features of the Proposed Action***) or mitigation measures (see section **6.8.4, *Mitigation and Residual Effects***).

> "Most important, NEPA documents must concentrate on the issues that are truly significant to the action in question, rather than amassing needless detail." (40 CFR 1500.1(b))

6.4.1 Identifying Issues for Analysis

Preliminary issues are frequently identified during the development of the proposed action through internal and external scoping. Additionally, supplemental authorities that provide procedural or substantive responsibilities relevant to the NEPA process may help identify issues for analysis. See **Appendix 1**, ***Supplemental Authorities to be Considered***, for a list of some common supplemental authorities. There is no need to make negative declarations regarding resources described in supplemental authorities that are not relevant to your proposal at hand.

While many issues may arise during scoping, not all of the issues raised warrant analysis in an EA or EIS. Analyze issues raised through scoping if:

- Analysis of the issue is necessary to make a reasoned choice between alternatives. That is, does it relate to how the proposed action or alternatives respond to the purpose and need? (See section **6.6,** ***Alternatives Development***).

- The issue is significant (an issue associated with a significant direct, indirect, or cumulative impact, or where analysis is necessary to determine the significance of impacts).

When identifying issues to be analyzed, it is helpful to ask, "Is there disagreement about the best way to use a resource, or resolve an unwanted resource condition, or potentially significant effects of a proposed action or alternative?" If the answer is "yes," you may benefit from subjecting the issue to analysis.

Entire resources cannot be issues by themselves, but concerns over how a resource may be affected by the proposal can be issues.

It is useful to phrase issues in the form of questions, as this can help maintain the focus of the analysis, which would need to answer the questions. For example:

The BLM is analyzing the construction and operation of a wind farm on public lands. "Wildlife" is not considered an issue—this is too broad for reasonable analysis, and it is not clearly related to the effects of the action. We suggest, "What would be the effect of the alternatives on sage grouse nesting?" as a more explicit issue statement.

The Web Guide contains examples of issues identified for analysis.

6.4.2 Issues Not Analyzed

You need not analyze issues associated with the proposed action that do not meet the criteria described in section **6.4.1., *Identifying Issues for Analysis.*** We recommend that you document such externally generated issues along with rationale for not analyzing them in the administrative record or in the EA or EIS itself. You have more flexibility in tracking internally generated issues. For example, in a preliminary brainstorming session, it may not be important to record all issues raised. However, if after careful and detailed consideration you determine not to analyze an internally-generated issue, we recommend that you document the reasons in the administrative record, or in the EA or EIS. The detail used to explain why an issue was not analyzed is largely dependent on how the issue was presented and why you are not analyzing it. See the Web Guide for an example of how issues not analyzed can be treated in a NEPA document.

6.5 PROPOSED ACTION

The CEQ regulations state that a "proposal" exists at that stage in the development of an action when an agency subject to the NEPA has a goal and is actively preparing to make a decision on one or more alternative means of accomplishing that goal and the effects can be meaningfully evaluated (40 CFR 1508.23). A "proposed action" may be described as a proposal for the BLM to authorize, recommend, or implement an action to address a clear purpose and need, and may be generated internally or externally.

When developing the proposed action, it is important to understand how it will be used in the environmental analysis. You can use a preliminary description of the proposed action during scoping to focus public involvement. The proposed action is one possible option to meet the purpose and need. Alternatives are developed to consider different reasonable paths to take to accomplish the same purpose and need as the proposed action.

The level of detail used to describe a proposed action will vary by the nature and stage of the project. For example, the level of detail available at the beginning of a project may be very limited, but details will be better defined after scoping. The details and description of a proposed action in a programmatic analysis will be different than one in the analysis of a site-specific implementation action. The level of detail used in describing the proposed action will influence the specificity of the analysis and the assumptions made in analyzing the environmental consequences. The Web Guide contains example descriptions of Proposed Actions.

6.5.1 Description of the Proposed Action

A detailed description of the proposed action at the outset of the analysis process is beneficial for many reasons. Clearly described proposed actions can result in:

- more focused and meaningful public input.
- more focused and meaningful internal (BLM) participation.
- more complete identification of issues.
- development of reasonable alternatives.
- sound analysis and interpretation of effects.
- focused analysis.
- a sound and supportable decision.

Detailed descriptions of proposed actions usually include five elements:

1. Who — "Who" is the Federal agency that is going to guide the analysis and make the decision. Even for externally proposed projects, you will be making the decision to authorize or recommend an action. For externally proposed projects, it is important to identify the external proponent and their role in implementing your decision.

2. What — "What" is the specific activity or activities proposed. You must provide sufficient detail in the description of the activities so that the effects of the proposed action may be compared to the effects of the alternatives, including the No Action alternative (40 CFR 1502.14(b)). That comparison provides the clear basis for choice by the decision-maker.

3. How — "How" relates to the specific means by which the proposal would be implemented. Include project design features, including construction activities, operations, and schedules. It may also be appropriate to include maps, photographs, and figures. Means, measures, or practices to reduce or avoid adverse environmental impacts may be included in the proposed action as design features (see section **6.5.1.1, *Design Features of the Proposed Action***).

4. When — "When" is the timeframe in which the project will be implemented and completed. If the proposed action has identifiable phases, describe the duration of those phases. The timing for monitoring integral to the proposed action should also be described.

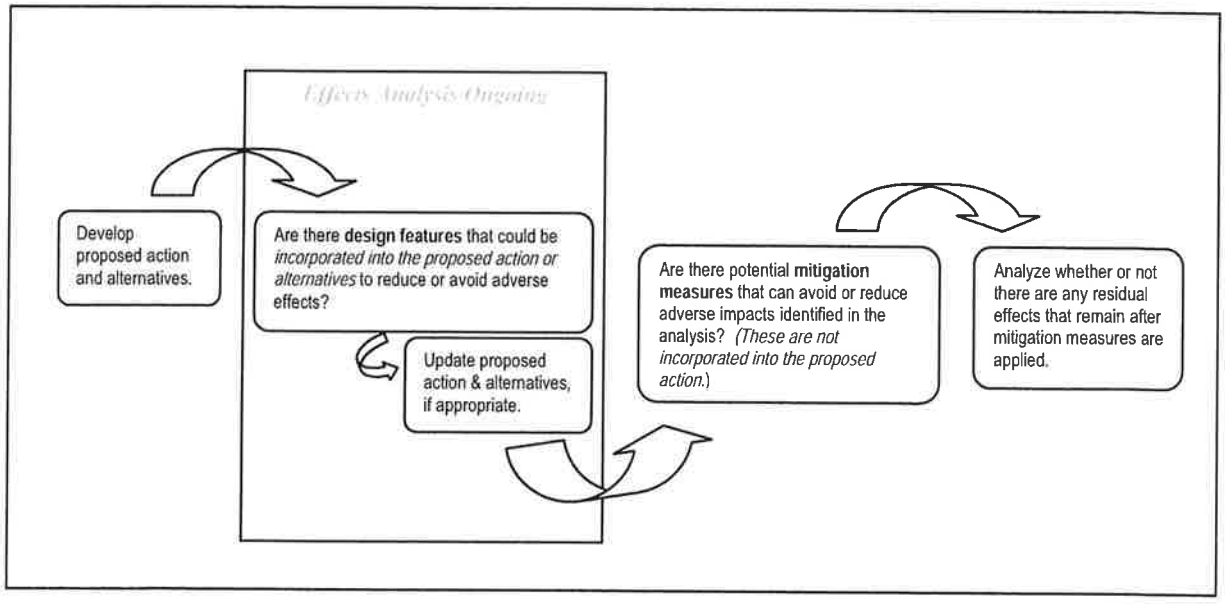
5. Where — "Where" is the location(s) where the proposed action will be implemented and should be described as specifically as possible. Maps at a relevant scale may be provided to support the narrative.

6.5.1.1 Design Features of the Proposed Action

Design features are those specific means, measures or practices that make up the proposed action and alternatives. You may identify design features, especially those that would reduce or eliminate adverse effects after the initial formulation of alternatives, as the impact analysis is being conducted. In this situation, you may add these design features to the proposed action or alternatives. Standard operating procedures, stipulations, and best management practices are usually considered design features. For example, *if the proposed action sites a reserve pit for drilling fluids away from areas of shallow groundwater, this is a design feature, not mitigation.*

Because the formulation of alternatives and the impact analysis is often an iterative process, you might not be able to identify the means, measures or practices until the impact analysis is completed. If any means, measures, or practices are not incorporated into the proposed action or alternatives, they are considered mitigation measures (see section **6.8.4, *Mitigation and Residual Effects***).

Figure 6.2 Design Features and Mitigation Measures



6.5.2 Defining the Scope of Analysis of the Proposed Action

After initial development of the proposed action, evaluate whether there are connected or cumulative actions that you must consider in the same NEPA document (40 CFR 1508.25). In addition, evaluate whether there are similar actions that you wish to discuss in a single NEPA document. The CEQ regulations refer only to an EIS in discussion of including connected, cumulative, and similar actions in a single EIS. For an EA, we recommend that you consider connected or cumulative actions in the same EA, and similar actions may be discussed at your discretion. Considering connected or cumulative actions in a single EA is particularly important in the evaluation of significance (see section **7.3, *Significance***).

6.5.2.1 Connected Actions

Connected actions are those actions that are "closely related" and "should be discussed" in the same NEPA document (40 CFR 1508.25 (a)(1)). Actions are connected if they automatically trigger other actions that may require an EIS; cannot or will not proceed unless other actions are taken previously or simultaneously; or if the actions are interdependent parts of a larger action and depend upon the larger action for their justification (40 CFR 1508.25 (a)(i, ii, iii)). Connected actions are limited to actions that are currently proposed (ripe for decision). Actions that are not yet proposed are not connected actions, but may need to be analyzed in cumulative effects analysis if they are reasonably foreseeable.

If the connected action is also a proposed BLM action, we recommend that you include both actions as aspects of a broader "proposal" (40 CFR 1508.23), analyzed in a single NEPA document. You may either construct an integrated purpose and need statement for both the proposed action and the connected action, or you may present separate purpose and need statements for the proposed action and the connected action. Regardless of the structure of the purpose and need statement(s), you must develop alternatives and mitigation measures for both actions (40 CFR 1508.25(b)), and analyze the direct, indirect, and cumulative effects of both actions (40 CFR 1508.25(c)).

For example,

The BLM proposes prescribed burning to attain desired vegetation characteristics. The BLM also proposes subsequent seeding of the same site to contribute to attaining those same desired vegetation characteristics, which is a connected action. We recommend that you include the prescribed burning and seeding as aspects of a broader proposal, analyzed in a single NEPA document.

If the connected action is an action proposed by another Federal agency, you may include both actions as aspects of a broader proposal analyzed in a single NEPA document, as described above. Evaluate whether a single NEPA document would improve the quality of analysis and efficiency of the NEPA process, and provide a stronger basis for decision-making. Also consider the timing of the other agency action and the capabilities of the other agency to act as a cooperating agency or joint lead agency (see sections **12.1** ***Cooperating Agency Status in Development of NEPA Documents*** and **12.2** ***Joint Lead Agencies in Development of NEPA Documents***).

For example,

The BLM proposes constructing a trail to provide recreation access to BLM-managed lands from a campground the Forest Service proposes to construct on adjacent Forest Service lands. The Forest Service campground construction is a connected action. You and the Forest Service may elect to include the BLM trail construction and the Forest Service campground construction as aspects of a broader proposal, analyzed in a single NEPA document, either as joint lead agencies, or with one agency as lead and the other as cooperating.

If you do not include the connected action with the proposed action as aspects of a broader proposal analyzed in a single NEPA document, you must, at a minimum, demonstrate that you have considered the connected action in the NEPA document for the proposed action (40 CFR 1508.25) (i.e., describe the connected action and its relationship to the proposed action, including the extent to which the connected action and its effects can be prevented or modified by BLM decision-making on the proposed action). In this case, a separate NEPA document would need to be prepared for the connected action. It may be useful to incorporate by reference portions of the NEPA document completed for the connected action, if available, into the NEPA document for the proposed action.

A non-Federal action may be a connected action with a BLM proposed action. The consideration of a non-Federal connected action is limited in your NEPA analysis, because the NEPA process is focused on agency decision making (40 CFR 1500.1(c), 40 CFR 1508.18, 40 CFR 1508.23). Therefore, you are not required to include a non-Federal connected action together with a BLM proposed action as aspects of a broader proposal, analyzed in a single NEPA document. Proposals are limited to Federal actions (40 CFR 1508.23). You would not have to develop or present the purpose and need for the non-Federal action, and you are not required to consider alternatives available to the non-Federal party for its action. If there are effects on BLM managed resources, it may be useful to develop and suggest alternatives or mitigation for those non-Federal connected actions (see **section 6.8.4, *Mitigation and Residual Effects***).

As with a Federal connected action, you must, at a minimum, demonstrate that you have considered the non-Federal connected action in the NEPA document for the proposed action (40 CFR 1508.25) (i.e., describe the connected action and its relationship to the proposed action, including the extent to which the connected action and its effects can be prevented or modified by BLM decision-making on the proposed action).

If the connected non-Federal action and its effects can be prevented by BLM decision-making, then the effects of the non-Federal action are properly considered indirect effects of the BLM action and must be analyzed as effects of the BLM action (40 CFR 1508.7, 40 CFR 1508.25(c)).

For example,

> *You receive a right-of-way request from a private company to build a road across BLM-managed land to provide access to adjacent private land, on which the company plans to create and operate a quarry. The creation and operation of the quarry cannot proceed unless the road is constructed. The road cannot be constructed without the grant by BLM of a right-of-way. The grant of the right-of-way must be analyzed as a BLM action: the BLM can grant or deny the right-of-way request. The construction of the road and the creation and operation of the quarry are connected actions.*
>
> *Alternatives: You must analyze the proposed action of granting the right-of-way, and consider the alternative of denying the right-of-way (the No Action alternative) and any other reasonable alternatives related to the right-of-way request. Because the construction of the road, and the creation and operation of the quarry would not be BLM actions, you do not need to consider alternatives to the road construction and creation and operation of the quarry.*

Direct and Indirect Effects: You must analyze the direct and indirect effects of granting the right-of-way. You must also analyze the direct and indirect effects of constructing the road and creating and operating the quarry, because these effects could be prevented by a BLM decision to deny the right-of-way request, and therefore are properly considered indirect effects of the BLM right-of-way grant.

Cumulative Effects: You must analyze the cumulative impact of the right-of-way grant, the road construction, and quarry creation and operation, taking into account the effects in common with any other past, present, and reasonably foreseeable future actions.

If the connected non-Federal action cannot be prevented by BLM decision-making, but its effects can be modified by BLM-decision-making, then the changes in the effects of the connected non-Federal action must be analyzed as indirect effects of the BLM proposed action. Effects of the non-Federal action that cannot be modified by BLM-decision-making may still need to be analyzed in the cumulative effects analysis for BLM action, if they have a cumulative effect together with the effects of the BLM action (see section **6.8.3 *Cumulative Effects***).

For example,

You receive a right-of-way request from a private company to build a road across BLM-managed land to provide access to adjacent private land, on which the company plans to create and operate a quarry. In contrast to the example above, the creation and operation of the quarry could proceed with other, reasonably foreseeable, road access. However, conditions on the grant by BLM of a right-of-way could modify the effects of the quarry creation and operation (e.g., right-of-way conditions limiting the amount and timing of haul could alter the timing of quarry creation activities and consequent effects). The grant of the right-of-way must be analyzed as a BLM action. The effects of the road construction must be analyzed as indirect effects of the BLM right-of-way grant. The changes in the effects of the quarry creation and operation must be analyzed as indirect effects of the conditions on the BLM right-of-way grant. The unchanged effects of the quarry creation and operation would be analyzed in the cumulative effects analysis for the BLM action to the extent they would have a cumulative effect together with the effects of the BLM action.

If the non-Federal action cannot be prevented by BLM decision-making and its effects cannot be modified by BLM decision-making, the effects of the non-Federal action may still need to be analyzed in the cumulative effects analysis for BLM action, if they have a cumulative effect together with the effects of the BLM action (see section **6.8.3 *Cumulative Effects***). While analysis of the effects of these non-Federal actions provides context for the analysis of the BLM action, their consideration in the determination of the significance of the BLM action is limited (see section **7.3, *Significance***).

For example,

You receive a right-of-way request from a private company to build a road across BLM-managed land to provide access to adjacent private land, on which the company plans to create and operate a quarry. The creation and operation of the quarry could proceed with other, reasonably foreseeable, road access. Conditions on the grant by BLM of a right-of-way would not modify the effects of the quarry creation and operation. The grant of the right-of-way must be analyzed as a BLM action. The road construction is a connected action, and its effects must be analyzed as indirect effects of the BLM right-of-way grant. However, the quarry creation and operation are not connected actions; their effects would be analyzed in the cumulative effects analysis for the BLM action to the extent they would have a cumulative effect together with the effects of the BLM action.

6.5.2.2 Cumulative Actions

Cumulative actions are proposed actions which potentially have a cumulatively significant impact together with other proposed actions and "should be discussed" in the same NEPA document (40 CFR 1508.25(a)(2)).

If the cumulative action is a BLM or other Federal proposed action, you may include both actions as aspects of a broader proposal, analyzed in a single NEPA document, as described above for connected actions.

For example,

The BLM proposes construction of a campground to enhance developed recreation opportunities. The campground construction would contribute sediment to a nearby stream. Separately, the BLM proposes a culvert replacement to remove a fish passage barrier. The culvert replacement would contribute sediment to the same stream. The culvert replacement is a cumulative action to the campground construction campground construction and culvert replacement. You may include the campground construction and culvert replacement as aspects of a broader proposal, analyzed in a single NEPA document. In this case, separate purpose and need statements for the campground construction and culvert replacement would likely be more appropriate than attempting to create a single, integrated purpose and need statement.

If you do not include the cumulative action with the proposed action as aspects of a broader proposal analyzed in a single NEPA document, you must, at a minimum, demonstrate that you have considered the cumulative action in the NEPA document for the proposed action (40 CFR 1508.25):

- describe the cumulative action; and
- include analysis of the effects of the cumulative action in the cumulative effects analysis of the proposed action.

It may be useful to incorporate by reference portions of the NEPA document completed for the cumulative action, if available, into the NEPA document for the proposed action.

Non-Federal actions which potentially have a cumulatively significant impact together with the proposed action must be considered in the same NEPA document (40 CFR 1508.25). Identifying an action as a cumulative non-Federal action is a component of your cumulative effects analysis of the proposed action (see section **6.8.3, *Cumulative Effects***).

6.5.2.3 Similar Actions

Similar actions are proposed or reasonably foreseeable Federal actions that have similarities that provide a basis for evaluating their environmental consequences together with the proposed action (40 CFR 1508.25(a)(3). Similarities are not limited to type of action; such similarities include, for instance, common timing or geography. You may include similar proposed actions as aspects of a broader proposal, analyzed in a single NEPA document, as described above for connected and cumulative actions, when a single NEPA document would improve the quality of analysis and efficiency of the NEPA process, and provide a stronger basis for decision-making

If other Federal actions with a common timing or geography are interdependent with the proposed action, they would be considered as connected actions (see section **6.5.2.1, *Connected Actions***). If other Federal actions with common timing or geography would have a cumulative effect together with the proposed action, they would be considered as cumulative actions (see section **6.5.2.2, *Cumulative Actions***).

If you include similar actions as aspects of a broader proposal, analyzed in a single NEPA document, evaluate the purpose and need and the range of alternatives to ensure that they adequately address the similar actions.

6.6 ALTERNATIVES DEVELOPMENT

6.6.1 Reasonable Alternatives

The NEPA directs the BLM to "study, develop, and describe appropriate alternatives to recommended courses of action in any proposal that involves unresolved conflicts concerning alternative uses of available resources;..." (NEPA Sec102(2)(E)).

The range of alternatives explores alternative means of meeting the purpose and need for the action. As stated in section **6.2.1, *The Role of the Purpose and Need Statement***, the purpose and need statement helps define the range of alternatives. The broader the purpose and need statement, the broader the range of alternatives that must be analyzed. You must analyze those alternatives necessary to permit a reasoned choice (40 CFR 1502.14). For some proposals there may exist a very large or even an infinite number of possible reasonable alternatives. When there are potentially a very large number of alternatives, you must analyze only a reasonable number to cover the full spectrum of alternatives (see Question 1b, CEQ, *Forty Most Asked Questions Concerning CEQ's NEPA Regulations, March 23, 1981*). When working with cooperating agencies, your range of alternatives may need to reflect the decision space and authority of other agencies, if decisions are being made by more than one agency.

In determining the alternatives to be considered, the emphasis is on what is "reasonable" rather than on whether the proponent or applicant likes or is itself capable of implementing an alternative. "Reasonable alternatives include those that are *practical or feasible* from the technical and economic standpoint and using common sense, rather than simply *desirable* from the standpoint of the applicant." (Question 2a, CEQ, *Forty Most Asked Questions Concerning CEQ's NEPA Regulations, March 23, 1981*). You can only define whether an alternative is "reasonable" in reference to the purpose and need for the action. See **Chapter 8, *Preparing an Environmental Assessment*** and **Chapter 9, *Preparing an Environmental Impact Statement*** for discussion of reasonable alternatives for an EA and EIS. For externally generated action, the range of alternatives will typically include at least denying the request (No Action); approving the request as the proponent proposed; or approving the request with changes BLM makes to the proponent's proposal.

For example,

> *An EIS for an oil field development project has a purpose and need which (in abbreviated form) is to determine whether to permit oil exploration and development within the project area consistent with existing leases and to develop practices for oil development consistent with the land use plan. The EIS would typically analyze at least the following alternatives:*
> - *No Action, which would entail no new drilling beyond what is currently permitted;*
> - *The proponent's proposal for field development; and*
> - *The proponent's proposal with additional or different design features recommended by the BLM to reduce environmental effects. This alternative would include design features that differ from the proponent's proposal, such as alternative well locations, alternative access routes, additional timing or spacing constraints, offsite mitigation, different methods for treating produced water, horizontal well drilling, or other technologies.*

In some situations it may be appropriate for you to analyze a proposed action or alternative that may be outside the BLM's jurisdiction (Question 2b, CEQ, *Forty Most Asked Questions Concerning CEQ's NEPA Regulations, March 23, 1981*). Such circumstances would be exceptional and probably limited to the broadest, most programmatic EISs that would involve multiple agencies. For most actions, we recommend that the purpose and need statement be constructed to reflect the discretion available to the BLM, consistent with existing decisions and statutory and regulatory requirements; thus, alternatives not within BLM jurisdiction would not be "reasonable."

Note: Though not required, a manager may elect to analyze in detail an alternative that might otherwise be eliminated to assist in planning or decision-making. In such cases, explain in the NEPA document why you are electing to analyze the alternative in detail.

6.6.1.1 Developing Alternatives Under The Healthy Forests Restoration Act

The Healthy Forests Restoration Act of 2003 (HFRA) (P.L. 108-148) contains provisions for expedited environmental analysis of projects implemented under its authority. For authorized projects (see HFRA Section 102 to determine which projects are authorized), HFRA allows fewer alternatives to be analyzed compared with that which CEQ regulations prescribe.

For areas within the wildland–urban interface and within 1.5 miles of the boundary of an at-risk community (as defined in Section 101 of HFRA), you are not required to analyze any alternative to the proposed action, with one exception: if the at-risk community has adopted a Community Wildfire Protection Plan and the proposed action does not implement the recommendations in the plan regarding the general location and basic method of treatments, you are required to analyze the recommendations in the plan as an alternative to the proposed action.
For areas within the wildland–urban interface, but farther than 1.5 miles from the boundary of an at-risk community, you are not required to analyze more than the proposed action and one additional action alternative.

For the two previous scenarios, you are not required to present a separate section called the "No Action alternative." However, you must document the current and future state of the environment in the absence of the proposed action. This constitutes consideration of a No Action Alternative. Document this in your purpose and need section (HFRA 104(d)).

For authorized HFRA projects in all other areas, the analysis must describe the proposed action, a No Action alternative, and an additional action alternative, if one is proposed during the scoping or collaboration process.

Additional information on HFRA can be obtained from the Healthy Forests Initiative and Healthy Forests Restoration Act Interim Field Guide, February 2004 (see the Web Guide).

6.6.2 No Action Alternative

The CEQ regulations direct that EISs describe the No Action alternative (40 CFR 1502.14(d)). HFRA, however, removes this regulatory requirement for actions taken under its authority (see section **6.6.1.1, *Developing Alternatives Under the HFRA***). The No Action alternative is the only alternative that must be analyzed in an EIS that does not respond to the purpose and need for the action.

The No Action alternative provides a useful baseline for comparison of environmental effects (including cumulative effects) and demonstrates the consequences of not meeting the need for the action (see sections **8.3.4.2**, ***Alternatives in an EA,*** and **9.2.7.1**, ***Reasonable Alternatives for an EIS*** for discussion of the No Action alternative for EAs and EISs).

The description of the No Action alternative depends on the type of action proposed:

- **For land use planning actions:** The No Action alternative is to continue to implement the management direction in the land use plan (i.e., the land use plan as written). Any other management approach should be treated as an action alternative. If, for example, plan evaluation identifies that implementation has not been in accordance with the management direction in the land use plan, you may consider continued non-conforming implementation as an action alternative, if it is a reasonable alternative (see section **6.1.1, *Reasonable Alternatives***).
- **For internally generated implementation actions:** the No Action alternative is not to take the action.
- **For externally generated proposals or applications**: the No Action alternative is generally to reject the proposal or deny the application. (The sole exception to this is for renewal of a grazing permit, for which the No Action alternative is to issue a new permit with the same terms and conditions as the expiring permit). The analysis of the No Action alternative must only analyze what is reasonably foreseeable if the application is denied (see Question 3, CEQ, *Forty Most Asked Questions Concerning CEQ's NEPA Regulations, March 23, 1981*).

The No Action alternative may constitute a benchmark at one end of the spectrum of alternatives. Therefore, defining the No Action alternative might require reference to the action alternatives that will be analyzed. A No Action alternative that is outside of BLM jurisdiction or contrary to law or regulation might be useful to consider as a baseline for comparison. *For example, when revising an LUP that has been implemented and subsequently found legally inadequate, analysis of continued management under that existing LUP might provide useful comparison in the analysis of the action alternatives in the revised LUP.* The Web Guide provides some examples of No Action alternatives.

6.6.3 Alternatives Considered but Eliminated From Detailed Analysis

If you consider alternatives during the EIS process but opt not to analyze them in detail, you must identify those alternatives and briefly explain why you eliminated them from detailed analysis (40 CFR 1502.14). Explain why you eliminated an alternative proposed by the public or another agency from detailed analysis. We recommend you do the same in an EA. See the Web Guide for examples of "alternatives considered but eliminated from detailed analysis."

You may eliminate an action alternative from detailed analysis if:

- it is ineffective (it would not respond to the purpose and need).
- it is technically or economically infeasible (consider whether implementation of the alternative is likely given past and current practice and technology; this does not require cost-benefit analysis or speculation about an applicant's costs and profits).
- it is inconsistent with the basic policy objectives for the management of the area (such as, not in conformance with the LUP).
- its implementation is remote or speculative.
- it is substantially similar in design to an alternative that is analyzed.
- it would have substantially similar effects to an alternative that is analyzed.

6.7 AFFECTED ENVIRONMENT AND USE OF RELEVANT DATA

6.7.1 Affected Environment

The affected environment section succinctly describes the existing condition and trend of issue-related elements of the human environment that may be affected by implementing the proposed action or an alternative. The CEQ regulations discuss "human environment" at 40 CFR 1508.14; the term broadly relates to biological, physical, social and economic elements of the environment. We recommend that the descriptions of the specific elements be quantitative wherever possible, and of sufficient detail to serve as a baseline against which to measure the potential effects of implementing an action. The affected environment section of the environmental analysis is defined and limited by the identified issues.

Your description of the affected environment will provide the basis for identifying and interpreting potential impacts in a concise manner. Describe the present condition of the affected resources within the identified geographic scope and provide a baseline for the cumulative effects analysis. Identifying past and ongoing actions that contribute to existing conditions will be helpful for the cumulative effects analysis (see section **6.8.3, *Cumulative Effects***). Additionally, identify any regulatory thresholds and characterize what is known about stresses affecting the resources and biological or physical thresholds. These biological or physical thresholds are often poorly understood; it may be helpful to identify as part of the analysis the threshold conditions of resources beyond which change could cause significant impacts. This may not be possible for many resources because of incomplete or unavailable information (40 CFR 1502.22).

Your descriptions of the affected environment must be no longer than is necessary to understand the effects of the alternatives. Data and analyses in a statement must be commensurate with the importance of the impact; with less important material, you may summarize, consolidate, or simply reference the material (40 CFR 1502.15).

6.7.2 Use of Relevant Data

Data and other information used to describe existing conditions and trends may be obtained from other documents and summarized and incorporated by reference or otherwise appropriately referenced. You may also obtain data and other information from cooperating agency partners or other agencies, organizations, or individuals, as identified during scoping.

The CEQ regulations require the BLM to obtain information if it is "relevant to reasonably foreseeable significant adverse impacts," if it is "essential to a reasoned choice among alternatives," and if "the overall cost of obtaining it is not exorbitant" (40 CFR 1502.22). If information essential to reasoned choice is unavailable or if the costs of obtaining it are exorbitant (excessive or beyond reason), you must make a statement to this effect in the EIS or EA. In this statement, you must discuss what effect the missing information may have on your ability to predict impacts to the particular resource. If the information relevant to reasonably foreseeable significant adverse impacts cannot be obtained because the overall costs of obtaining it are exorbitant or the means to obtain it are not known, you must include within the EIS or EA:

1. a statement that such information is incomplete or unavailable;
2. a statement of the relevance of the incomplete or unavailable information to evaluating reasonably foreseeable significant adverse impacts on the human environment;
3. a summary of existing credible scientific evidence which is relevant to evaluating the reasonably foreseeable significant adverse impacts on the human environment, and
4. the agency's evaluation of such impacts based upon theoretical approaches or research methods generally accepted in the scientific community. For the purposes of this section, "reasonably foreseeable" includes impacts which have catastrophic consequences, even if their probability of occurrence is low, provided that the analysis of the impacts is supported by credible scientific evidence, is not based on pure conjecture, and is within the rule of reason.
(40 CFR 1502.22(b)).

6.8 ENVIRONMENTAL EFFECTS

6.8.1 Effects Analysis

6.8.1.1 Defining Environmental Effects

Your EA or EIS must identify the known and predicted effects that are related to the issues (40 CFR 1500.4 (c), 40 CFR 1500.4(g), 40 CFR 1500.5(d), 40 CFR 1502.16) (*see* ***6.4 Issues***). An issue differs from an effect; an issue describes an environmental problem or relation between a resource and an action, while effects analysis predicts the degree to which the resource would be affected upon implementation of an action.

> The terms "**effects**" and "**impacts**" are synonymous in the CEQ regulations (40 CFR 1508.8) and in this handbook.

Effects can be ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historic, cultural, economic, social, or health. Effects may also include those resulting from actions that may have both beneficial and detrimental effects, even if on balance the agency believes that the effects will be beneficial (40 CFR 1508.8).

Analyze relevant short-term and long-term effects and disclose both beneficial and detrimental effects in the NEPA analysis. We recommend you define the duration of long term and short-term, as it can vary depending on the action and the scope of analysis. You must consider and analyze three categories of effects for any BLM proposal and its alternatives: direct, indirect, and cumulative (40 CFR 1508.25(c)).

To help decision-makers understand how a resource will be affected, focus the discussion of effects on the context, intensity, and duration of these effects (see section ***7.3, Significance***).

Your effects analysis must also identify possible conflicts between the proposed action (and each alternative) and the objectives of Federal, State, regional, local, and tribal land use plans, policies, or controls for the area concerned (40 CFR 1502.16(c)).

6.8.1.2 Analyzing Effects

The effects analysis must demonstrate that the BLM took a "hard look" at the impacts of the action. The level of detail must be sufficient to support reasoned conclusions by comparing the amount and the degree of change (impact) caused by the proposed action and alternatives (40 CFR 1502.1). See the Web Guide for recent examples of how the Interior Board of Land Appeals (IBLA) has dealt with the concept of "hard look."

A "**hard look**" is a reasoned analysis containing quantitative or detailed qualitative information.

Use the best available science to support NEPA analyses, and give greater consideration to peer-reviewed science and methodology over that which is not peer-reviewed.

Analytical documents to support Federal agency decision-making include EISs and EAs, but neither are considered publications of scientific research subject to peer review. You may choose to have your NEPA analysis reviewed by members of the scientific community as part of public review of the document. Such review may be desirable to improve the quality of the analysis or share information; this does not constitute formal peer-review.

Describe the methodology and analytical assumptions for the effects analysis as explained below:

> Methodology: Your NEPA document must describe the analytical methodology sufficiently so that the reader can understand how the analysis was conducted and why the particular methodology was used (40 CFR 1502.24). This explanation must include a description of any limitations inherent in the methodology. If there is substantial dispute over models, methodology, or data, you must recognize the opposing viewpoint(s) and explain the rationale for your choice of analysis. You may place discussions of methodology in the text or in the appendix of the document. To the extent possible, we recommend that the analysis of impacts be quantified.

Assumptions: We recommend that your NEPA document state the analytical assumptions, including the geographic and temporal scope of the analysis (which may vary by issue), the baseline for analysis, as well as the reasonably foreseeable future actions (see section **6.8.3, *Cumulative Effects***). You must also explain any assumptions made when information critical to the analysis was incomplete or unavailable (40 CFR 1502.22). See section **6.7.2, *Use of Relevant Data***, for more discussion of incomplete or unavailable information.

Analytical assumptions may include any reasonably foreseeable development (RFD) scenarios for resources, such as RFDs for oil and gas development. A reasonably foreseeable development scenario is a baseline projection for activity for a defined area and period of time, and though commonly used in minerals development, these scenarios may be used for other resources as well. Examples of reasonably foreseeable development scenarios can be found in the Web Guide.

Clarity of expression, logical thought processes, and rational explanations are more important than length or format in the discussion of impacts. Following these guidelines will help the decision-maker and the public understand your analysis.

- Use objective, professional language without being overly technical.
- Avoid subjective terms such as "good," "bad," "positive," and "negative." The term "significant" has a very specific meaning in the NEPA context (see section **7.3, *Significance***). While it is a common descriptor, do not use it in NEPA documents unless it is intended to take on the NEPA meaning.
- Avoid the use of acronyms.

6.8.2 Direct and Indirect Effects

EAs and EISs must analyze and describe the direct effects and indirect effects of the proposed action and the alternatives on the quality of the human environment (40 CFR 1508.8). The value in requiring analysis of both direct and indirect effects is to make certain that no effects are overlooked. Because it can be difficult to distinguish between direct and indirect effects, you do not have to differentiate between the terms. When you are uncertain which effect is direct and which is indirect, it is helpful to describe the effects together. Effects are weighted the same; you do not consider an indirect effect less important than a direct effect in the analysis. Examples of direct and indirect effects can be found in the Web Guide.

Direct effects are those effects "…which are caused by the action and occur at the same time and place" (40 CFR 1508.8(a)).

Indirect effects are those effects "…which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density, or growth rate, and related effects on water and air and other natural systems, including ecosystems" (40 CFR 1508.8(b)).

6.8.3 Cumulative Effects

The purpose of cumulative effects analysis is to ensure that Federal decision-makers consider the full range of consequences of actions (the proposed action and alternatives, including the No Action alternative). Assessing cumulative effects begins early in the NEPA process, during internal and external scoping.

> The CEQ regulations define **cumulative effects** as "...the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such actions" (40 CFR 1508.7).

"Analyzing cumulative effects is more challenging than analyzing direct or indirect effects, primarily because of the difficulty of defining the geographic (spatial) and time (temporal) boundaries. For example, if the boundaries are defined too broadly, the analysis becomes unwieldy; if they are defined too narrowly, significant issues may be missed, and decision-makers will be incompletely informed about the consequences of their actions" (CEQ, "Considering Cumulative Effects Under the National Environmental Policy Act").

In addition to the direction described below, the Web Guide contains a list of "Principles of cumulative effects analysis" that is useful in guiding effective cumulative effects analysis, as well as examples of cumulative effects. The Web Guide also includes "Steps in cumulative effects analysis to be addressed in each component of environmental impact assessment" from the CEQ's "Considering Cumulative Effects Under the National Environmental Policy Act (Table 1-5)."

The following sections lay out steps in cumulative effects analysis. This is not a required format for documentation but is a useful way to think about the process and ensure an adequate analysis.

6.8.3.1 Cumulative Effects Issues

Determine which of the issues identified for analysis (see section **6.4, *Issues***) may involve a cumulative effect with other past, present, or reasonably foreseeable future actions. If the proposed action and alternatives would have no direct or indirect effects on a resource, you do not need a cumulative effects analysis on that resource. Be aware that minor direct and indirect effects can potentially contribute to synergistic cumulative effects that may require analysis (see section **6.8.3.5 *Analyzing the Cumulative Effects***).

For example, *the BLM proposes to build a campground near private land where a private utility company proposes to build and operate a power generation structure. The NEPA document must analyze the direct, indirect, and cumulative effects of your action of constructing a campground. If the campground construction would affect sage grouse habitat, but have no effect on air quality, and the power generation structure would affect sage grouse habitat and air quality, your NEPA document for the campground construction must describe the cumulative effects on sage grouse habitat, but not on air quality.*

In another example, *the BLM is reviewing a proposal to develop a natural gas field that will affect air quality but not affect any sensitive plants. The State is proposing a large prescribed burn, which will affect air quality and a sensitive plant population. The NEPA document needs to discuss the cumulative effects on air quality, but not on sensitive plants.*

6.8.3.2 Geographic Scope of the Cumulative Effects Analysis

We recommend that you establish and describe the geographic scope for each cumulative effects issue, which will help bound the description of the affected environment (see section **6.7.1, *Affected Environment***). Describe in your EA or EIS the rationale for the geographic scope established. The geographic scope is generally based on the natural boundaries of the resource affected, rather than jurisdictional boundaries. The geographic scope will often be different for each cumulative effects issue. The geographic scope of cumulative effects will often extend beyond the scope of the direct effects, but not beyond the scope of the direct and indirect effects of the proposed action and alternatives. As noted above, if the proposed action and alternatives would have no direct or indirect effects on a resource, you do not need to analyze cumulative effects on that resource.

For example, *if a proposal affects water quality and air quality, the appropriate cumulative effects analysis areas may be the watershed and the airshed.*

6.8.3.3 Timeframe of the Cumulative Effects Analysis

We recommend that you establish and describe the timeframe for each cumulative effects issue—that is, define long-term and short-term, and incorporate the duration of the effects anticipated. Long-term could be as long as the longest lasting effect. Timeframes, like geographic scope, can vary by resource. For example, *the timeframe for economic effects may be much shorter than the timeframe for effects on vegetation structure and composition.* Base these timeframes on the duration of the direct and indirect effects of the proposed action and alternatives, rather than the duration of the action itself. Describe in your EA or EIS the rationale for the timeframe established.

6.8.3.4 Past, Present, and Reasonably Foreseeable Actions

The cumulative effects analysis considers past, present, and reasonably foreseeable future actions that would affect the resource of concern within the geographic scope and the timeframe of the analysis. In your analysis, you must consider other BLM actions, other Federal actions, and non-Federal (including private) actions (40 CFR 1508.7).

You must consider past actions within the geographic scope to provide context for the cumulative effects analysis (40 CFR 1508.7). Past actions can usually be described by their aggregate effect without listing or analyzing the effects of individual past actions (CEQ, *Guidance on the Consideration of Past Actions in Cumulative Effects Analysis*, June 24, 2005). Summarize past actions adequately to describe the present conditions (see section **6.7.1, *Affected Environment***).

In some circumstances, past actions may need to be described in greater detail when they bear some relation to the proposed action. For example, past actions that are similar to the proposed action might have some bearing on what effects might be anticipated from the proposed action or alternatives. You should clearly distinguish analysis of direct and indirect effects based on information about past actions from a cumulative effects analysis of past actions. (CEQ, *Guidance on the Consideration of Past Actions in Cumulative Effects Analysis*, June 24, 2005).

You must consider present actions within the geographic scope (40 CFR 1508.7). Present actions are actions which are ongoing at the time of your analysis.

You must include reasonably foreseeable future actions within the geographic scope and the timeframe of the analysis (40 CFR 1508.7). You cannot limit reasonably foreseeable future actions to those that are approved or funded. On the other hand, you are not required to speculate about future actions. Reasonably foreseeable future actions are those for which there are existing decisions, funding, formal proposals, or which are highly probable, based on known opportunities or trends. Reasonably foreseeable development scenarios may be valuable sources of information to assist in the BLM's cumulative effects analysis. When considering reasonably foreseeable future actions, it may be helpful to ask such questions as:

- Is there an existing proposal, such as the submission of permit applications?
- Is there a commitment of resources, such as funding?
- If it is a Federal action, has the NEPA process begun (for example, publication of an NOI)?

Analyzing future actions, such as speculative developments, is not required but may be useful in some circumstances. Including assumptions about possible future actions may increase the longevity of the document and expand the value for subsequent tiering. For example:

> *The EIS for oil and gas leasing in the Northwest NPR-A Planning Area in Alaska included analysis of permanent road construction, even though it is not feasible at this time. By including assumptions and analysis about such possible future road construction in the EIS, new NEPA analysis might not be required if such permanent roads become feasible in the future.*

6.8.3.5 Analyzing the Cumulative Effects

For each cumulative effect issue, analyze the direct and indirect effects of the proposed action and alternatives together with the effects of the other actions that have a cumulative effect. Cumulative effects analysis will usually need to be addressed separately for each alternative, because each alternative will have different direct and indirect effects.

The following structure is not a required format, but may be useful in constructing the cumulative effects analysis. For each cumulative effect issue:

- Describe the existing condition (see section **6.7, *Affected Environment***). The existing condition is the combination of the natural condition and the effects of past actions. The natural condition is the naturally occurring resource condition without the effects of human actions. Detailed description of the natural condition may not be possible for some resources because of incomplete or unavailable information (40 CFR 1502.22) or may not be applicable for some resources. Describe the effects of past actions, either individually or collectively, to understand how the existing condition has been created.
- Describe the effects of other present actions.
- Describe the effects of reasonably foreseeable actions.
- Describe the effects of the proposed action and each action alternatives.
- Describe the interaction among the above effects.
- Describe the relationship of the cumulative effects to any thresholds.

See the Web Guide for an example of cumulative effects analysis.

Figure 6.3 Cumulative Effects
Bars in this graph represent effects of actions.
This graphic most clearly represents additive cumulative effects.

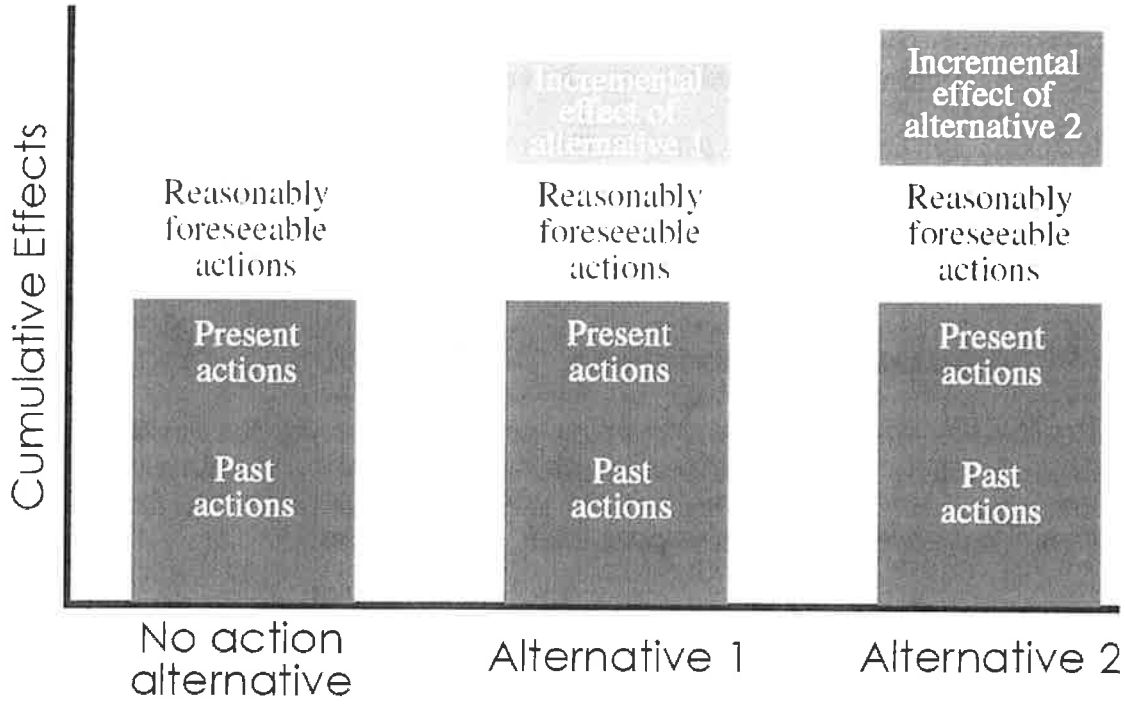


Figure 6.3

The analysis of the No Action alternative describes the cumulative effect of past, other present, and reasonably foreseeable actions, without the effect of the proposed action or action alternatives. The analysis of the proposed action will include those same effects, as well as the effects of the proposed action, and thus will demonstrate the incremental difference resulting from the proposed action. Regardless of how you present the analysis, you must be able to describe the incremental differences in cumulative effects as a result of the effects of the proposed action and alternatives (40 CFR 1508.7).

Describe the interaction among the effects of the proposed action and these various past, present, and reasonably foreseeable actions. This interaction may be:

- additive: the effects of the actions add together to make up the cumulative effect.
- countervailing: the effects of some actions balance or mitigate the effects of other actions.
- synergistic: the effects of the actions together is greater than the sum of their individual effects.

How the different effects interact may help determine how you may best describe and display the cumulative effects analysis. It will often be helpful to describe the cause-and-effect relations for the resources affected to understand if the cumulative effect is additive, countervailing, or synergistic.

The cumulative effects analysis provides a basis for evaluating the cumulative effect relative to any regulatory, biological, socioeconomic, or physical thresholds. Describe how the incremental effect of the proposed action and each alternative relates to any relevant thresholds.

6.8.4 Mitigation and Residual Effects

Mitigation includes specific means, measures or practices that would reduce or eliminate effects of the proposed action or alternatives. Mitigation measures can be applied to reduce or eliminate adverse effects to biological, physical, or socioeconomic resources. Mitigation may be used to reduce or avoid adverse impacts, whether or not they are significant in nature. Measures or practices should only be termed mitigation measures if they have not been incorporated into the proposed action or alternatives. If mitigation measures are incorporated into the proposed action or alternatives, they are called design features, not mitigation measures (see section **6.5.1.1, *Design Features of the Proposed Action***). You must describe the mitigation measures that you are adopting in your decision documentation. Monitoring is required to ensure the implementation of these measures (40 CFR 1505.2(c)) (see section **10.1, *Purposes of and Requirements for Monitoring***).

Mitigation measures are those measures that could reduce or avoid adverse impacts and have not been incorporated into the proposed action or an alternative.

Mitigation can include (40 CFR 1508.20):

- Avoiding the impact altogether by not taking a certain action or parts of an action.
- Minimizing impact by limiting the degree of magnitude of the action and its implementation
- Rectifying the impact by repairing, rehabilitation, or restoring the affected environment.
- Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
- Compensating for the impact by replacing or providing substitute resources or environments."

In an EIS, all "relevant, reasonable mitigation measures that could improve the project are to be identified," even if they are outside the jurisdiction of the agency (see Question 19b, CEQ, *Forty Most Asked Questions Concerning CEQ's NEPA Regulations, March 23, 1981*). When presenting mitigation measures not within the BLM's jurisdiction, it is particularly beneficial to work with other agencies (see **Chapter 12, Cooperating Agencies, Joint Lead Agencies, and Advisory Committees**).

Socioeconomic impacts are usually indirect and largely fall on communities and local government institutions, by definition located outside BLM-managed lands. While some mitigation strategies are within the BLM's control, (such as regulating the pace of mineral exploration and development to minimize rapid, disruptive social change), most mitigation strategies require action by other government entities—typically cities, counties, and State agencies. In supporting local and State efforts to mitigate socioeconomic impacts, you "may provide information and other assistance, sanction local activities, encourage community and project proponent agreements, and cooperate with responsible officials to the fullest extent feasible" (BLM Handbook of Socio-Economic Mitigation, IV-2).

You may need to identify mitigation measures that would reduce or eliminate the effects of a non-Federal action when it is a connected action to the BLM proposed action (see section **6.8.2.1.1, *Connected Non-Federal Actions***). For such non-Federal actions, the relevant, reasonable mitigation measures are likely to include mitigation measures that would be carried out by other Federal, State or local regulatory agencies or tribes. Identifying mitigation outside of BLM jurisdiction serves to alert the other agencies that can implement the mitigation. In describing mitigation under the authority of another government agency, you must discuss the probability of the other agency implementing the mitigation measures (see Question 19b, CEQ, *Forty Most Asked Questions Concerning CEQ's NEPA Regulations, March 23, 1981*).

For an action analyzed in an EA, mitigation can be used to reduce the effects of an action below the threshold of significance, avoiding the need to prepare an EIS (see section **7.1, *Actions Requiring an EA***).

During impact analysis, analyze the impacts of the proposed action (including design features) and with all mitigation measures (if any) applied, as well as any further impacts caused by the mitigation measures themselves. Address the anticipated effectiveness of these mitigation measures in reducing or avoiding adverse impacts in your analysis. Describe the residual effects of any adverse impacts that remain after mitigation measures have been applied.

6.9 PUBLIC INVOLVEMENT AND RESPONDING TO COMMENTS

Public involvement is an important part of the NEPA process. The level of public involvement varies with the different types of NEPA compliance and decision-making. Public involvement begins early in the NEPA process, with scoping, and continues throughout the preparation of the analysis and the decision.

The public must be notified of its privacy rights. See *IM 2007-092, April 4, 2007.* **Include the following statement in all information requesting public comment:** "Before including your address, phone number, e-mail address, or other personal identifying information in your comment, be advised that your entire comment –including your personal identifying information –may be made publicly available at any time. While you can ask us in your comment to withhold from public review your personal identifying information, we cannot guarantee that we will be able to do so."

6.9.1 Involving and Notifying the Public

The CEQ regulations require that agencies "make diligent efforts to involve the public in preparing and implementing their NEPA procedures" (40 CFR 1506.6(a)). There are a wide variety of ways to engage the public in the NEPA process. For EA public involvement, see sections **8.2, *Public Involvement;* 8.3.3, *Scoping and Issues;*** and **8.3.7, *Tribes, Individuals, Organizations, or Agencies Consulted.*** For EIS public involvement, see sections **6.3, *Scoping*** and **9.2.10.1, *Public Involvement and Scoping***.

A primary goal of public involvement is to ensure that all interested and affected parties are aware of your proposed action. Knowing your community well is the first step in determining the interested and affected parties and tribes. You may already have a core list of those interested in and potentially affected by the BLM's proposed actions; this may provide a good starting point. Work with your public affairs officer and other BLM staff, community leaders, and governmental agencies (Federal, State, and local) to help determine interested and affected parties and tribes.

Public meetings or hearings are required when there may be substantial environmental controversy concerning the environmental effects of the proposed action, a substantial interest in holding the meeting, or a request for a meeting by another agency with jurisdiction over the action (40 CFR 1506.6 (c)). You may determine that it is efficient to combine public meetings for the NEPA with hearings required by another law (an example is requirements in the Alaska National Interest Lands Conservation Act that require hearings if certain findings are made regarding the effects of a proposed action on subsistence). There are more stringent requirements for conducting the hearing and recording the proceedings. You must maintain records of public meetings and hearings including a list of attendees (as well as addresses of attendees desiring to be added to the mailing list) and notes or minutes of the proceedings. Consult 455 DM 1 for procedural requirements related to public hearings. Check individual program guidance to determine requirements for public meetings and hearings.

In many cases, people attending field trips and public meetings will be interested and/or affected parties. Make sure that you have attendance sheets that capture contact information at your field trips and meetings; these will provide you with a list of people who may want to be contacted about and involved in the NEPA process. In some cases, those affected by your proposed action may not be actively engaged in the NEPA process. In these cases, it is still important for you to reach out to those individuals, parties, or tribes, and we recommend using a variety of methods to help inform and engage those affected.

Notification methods include, but are not limited to: newsletters, Web sites or online NEPA logs, bulletin boards, newspapers, and *Federal Register* Notices. EISs have very specific notification requirements, detailed in **Chapters 9 and 13**. Also refer to **Chapters 4, 5, and 8** for more discussion of DNAs, CXs, and EAs.

The CEQ regulations explicitly discusses agency responsibility towards interested and affected parties at 40 CFR 1506.6. The CEQ regulations require that agencies shall:

(a) Make diligent efforts to involve the public in preparing and implementing their NEPA procedures

(b) Provide public notice of NEPA-related hearings, public meetings, and the availability of environmental documents so as to inform those persons and agencies who may be interested or affected.

In all cases the agency shall mail notice to those who have requested it on an individual action. In the case of an action with effects of national concern notice shall include publication in the Federal Register and notice by mail to national organizations reasonably expected to be interested in the matter and may include listing in the 102 Monitor. An agency engaged in rulemaking may provide notice by mail to national organizations who have requested that notice regularly be provided. Agencies shall maintain a list of such organizations.

In the case of an action with effects primarily of local concern the notice may include:

(i) Notice to State and areawide clearinghouses pursuant to OMB Circular A- 95 (Revised).
(ii) Notice to Indian tribes when effects may occur on reservations.
(iii) Following the affected State's public notice procedures for comparable actions.
(iv) Publication in local newspapers (in papers of general circulation rather than legal papers).
(v) Notice through other local media.
(vi) Notice to potentially interested community organizations including small business associations.
(vii) Publication in newsletters that may be expected to reach potentially interested persons.
(viii) Direct mailing to owners and occupants of nearby or affected property.
(ix) Posting of notice on and off site in the area where the action is to be located.

(c) Hold or sponsor public hearings or public meetings whenever appropriate or in accordance with statutory requirements applicable to the agency. Criteria shall include whether there is:

(i) Substantial environmental controversy concerning the proposed action or substantial interest in holding the hearing.
(ii) A request for a hearing by another agency with jurisdiction over the action supported by reasons why a hearing will be helpful. If a draft environmental impact statement is to be considered at a public hearing, the agency should make the statement available to the public at least 15 days in advance (unless the purpose of the hearing is to provide information for the draft environmental impact statement).

(d) Solicit appropriate information from the public.

(e) Explain in its procedures where interested persons can get information or status reports on environmental impact statements and other elements of the NEPA process.

(f) Make environmental impact statements, the comments received, and any underlying documents available to the public pursuant to the provisions of the Freedom of Information Act (5 U.S.C. 552), without regard to the exclusion for interagency memoranda where such memoranda transmit comments of Federal agencies on the environmental impact of the proposed action. Materials to be made available to the public shall be provided to the public without charge to the extent practicable, or at a fee which is not more than the actual costs of reproducing copies required to be sent to other Federal agencies, including the Council.

6.9.2 Comments

The BLM has both the duty to comment on other agencies' EISs and to obtain comments on our EISs in cases of jurisdiction by law or special expertise. For more discussion of these requirements, see **Chapter 11, *Agency Review of Environmental Impact Statements***.

Comments on the document and proposed action may be received in response to a scoping notice or in response to public review of an EA and FONSI or draft EIS. Comments received at other times in the process may not need a formal response. However, all substantive comments received before reaching a decision must be considered to the extent feasible (40 CFR 1503.4). Comments must be in writing (including paper or electronic format or a court reporter's transcript taken at a formal hearing), substantive, and timely, in order to merit a written response. You may receive oral comments at public meetings and workshops – it is helpful to write these down to revisit during the NEPA process. To ensure that the true intent of the comment is captured, offer the commenter the opportunity to record his or her comment in writing. The geographic origin of a comment does not alter whether it is substantive.

The requirements for BLM responses to comments differ between EAs and EISs (see section **8.2, *Public Involvement***, and section **9.6.1, *Comments Received Following Issue of the Final EIS***). When an EA and unsigned FONSI are made available for public comment, we recommend that you respond to all substantive and timely comments. You may respond to substantive, timely comments in the EA or in the decision record. If a substantive and timely comment does not lead to changes in the EA or decision, you may reply directly to the commenter, and we recommend that you document the reply in either the EA or the decision record (see section **8.5.1, *Documenting the Decision*).** When preparing a final EIS, you must respond to all substantive written comments submitted during the formal scoping period and public comment period (see section **9.4, *The Final EIS***). You are not required to respond to comments that are not substantive or comments that are received after the close of the comment period, but you may choose to reply (516 DM 4.19(A) and (B)) (see section **6.9.2.2, *Comment Response***). However, be cautious about not responding to untimely comments from agencies with jurisdiction by law or special expertise (see section **11.1 *Obtaining Comments on Your EIS***).

6.9.2.1 Substantive Comments

Substantive comments do one or more of the following:

- question, with reasonable basis, the accuracy of information in the EIS or EA.
- question, with reasonable basis, the adequacy of, methodology for, or assumptions used for the environmental analysis.
- present new information relevant to the analysis.
- present reasonable alternatives other than those analyzed in the EIS or EA.
- cause changes or revisions in one or more of the alternatives.

Comments that are not considered substantive include the following.

- comments in favor of or against the proposed action or alternatives without reasoning that meet the criteria listed above (such as "we disagree with Alternative Two and believe the BLM should select Alternative Three").
- comments that only agree or disagree with BLM policy or resource decisions without justification or supporting data that meet the criteria listed above (such as "more grazing should be permitted").
- comments that don't pertain to the project area or the project (such as "the government should eliminate all dams," when the project is about a grazing permit).
- comments that take the form of vague, open-ended questions.

Examples of substantive comments can be found in the Web Guide.

6.9.2.2 Comment Response

The CEQ regulations at 40 CFR 1503.4 recognize several options for responding to substantive comments, including:

- modifying one or more of the alternatives as requested.
- developing and evaluating suggested alternatives.
- supplementing, improving, or modifying the analysis.
- making factual corrections.
- explaining why the comments do not warrant further agency response, citing cases, authorities, or reasons to support the BLM's position.

Preparing to Respond to Comments
When you anticipate receiving a large number of comments, we recommend that you develop an organized system for receiving and cataloging comments before the comments start arriving. Training (formal or informal) to ensure that staff understand their responsibilities and the system's organization may be valuable. For proposals that may have a large number of comments, we recommend that you develop a systematic way to track substantive comments and the BLM's response, such as in a searchable database. Commenters may wish to know how the BLM responded to their comments; having a well-organized means of determining this will facilitate the process.

Responding to Substantive Comments
You may respond to comments in several ways:

- write a letter to the commenter and record your response in the administrative record.
- present the comment and your response in the NEPA document.
- present the comment and your response in the decision document.

The CEQ recommends that responses to substantive comments should normally result in changes in the text of the NEPA document, rather than as lengthy replies to individual comments in a separate section (see Question 29a, CEQ, *Forty Most Asked Questions Concerning CEQ's NEPA Regulations, March 23, 1981).* If the comments are made with respect to the BLM decision, you may respond to the comments in the decision documentation or Record of Decision rather than in the EIS or EA.
A short response to each substantive comment and a citation to the section or page where the change was made may be appropriate. Similar comments may be summarized and one response given to each group of similar comments; this approach is especially useful when a large number of comments is received.

If public comments on a draft EIS identify impacts, alternatives, or mitigation measures that were not addressed in the draft, the decision-maker responsible for preparing the EIS must determine if they warrant further consideration. If they do, the decision-maker must determine whether the new impacts, new alternatives, or new mitigation measures must be analyzed in either the final EIS or a supplemental draft EIS (see Question 29b, CEQ, *Forty Most Asked Questions Concerning CEQ's NEPA Regulations, March 23, 1981)* (see section **5.3, *Supplementing an EIS***). Similarly, we recommend that the decision-maker responsible for preparing an EA consider whether public comments identify impacts, alternatives or mitigation measures that warrant preparation of a new EA.

Comments that express a professional disagreement with the conclusions of the analysis or assert that the analysis is inadequate may or may not lead to changes in the NEPA document. When there is disagreement within a professional discipline, a careful review of the various interpretations is warranted. In some instances, public comments may necessitate a reevaluation of analytical conclusions. If, after reevaluation, the decision-maker responsible for preparing the EA or EIS does not think that a change is warranted, we recommend that your response provide the rationale for that conclusion. Thorough documentation of methodology and assumptions in the analysis may improve the reader's understanding of the BLM's analytical methods, and may reduce questions (see section **6.8.1.2, *Analyzing Effects***).

Responding to Nonsubstantive Comments
You are not required to respond to nonsubstantive comments such as those comments merely expressing approval or disapproval of a proposal without reason. However, you may wish to acknowledge the comment, and may do so in a variety of methods, including but not limited to sending postcards, letters, or email responses.

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CHAPTER 7—DETERMINING WHETHER AN EA OR EIS IS APPROPRIATE

7.1 ACTIONS REQUIRING AN EA

Actions are analyzed in an EA if the actions are not categorically excluded, not covered in an existing environmental document, and not normally subject to an EIS. Use the EA analysis to determine if the action would have significant effects; if so, you would need to prepare an EIS. If the action would not have significant effects, prepare a Finding of No Significant Impact (FONSI) (see section **8.4.2, *The Finding of No Significant Impact (FONSI)***). If you have already decided to prepare an EIS, you do not need to first prepare an EA (see section **7.2, *Actions Requiring an EIS***).

An EA may demonstrate that a proposed action would have effects that are significant but could be reduced or avoided through mitigation. You may use a mitigated FONSI rather than an EIS if you are able to reasonably conclude, based on the EA analysis, that the mitigation measures would be effective in reducing effects to nonsignificance. The FONSI must clearly identify whether the mitigation measures are needed to reduce effects to nonsignificance. You must describe the mitigation measures you are adopting in the decision documentation, and must provide monitoring to ensure the implementation of these measures (see section **10.2, *Developing a Monitoring Plan or Strategy***).

You may prepare an EA for an action that has some significant impacts if the EA is tiered to a broader EIS which fully analyzed those significant impacts (see section **5.2.2, *Tiering***). For such a tiered EA, you must document in the FONSI a determination that the potentially significant effects have already been analyzed, and no other effects reach significance. Only significant effects that have not been analyzed in an existing EIS will trigger the need for a new EIS.

Note: Though not required, a decision-maker may elect to prepare an EA for an action that is categorically excluded or covered by an existing environmental document to assist in planning or decision-making. In such cases, explain in the EA why you are electing to prepare an EA.

7.2 ACTIONS REQUIRING AN EIS

Actions whose effects are expected to be significant and are not fully covered in an existing EIS must be analyzed in a new or supplemental EIS (516 DM 11.8(A)). You must also prepare an EIS if, after preparation of an EA, you determine that the effects of the proposed action would be significant and cannot be mitigated to a level of nonsignificance (see section **7.1, *Actions Requiring an EA***). If you determine during preparation of an EA that the proposed action would have significant effects and cannot be mitigated to a level of nonsignificance, you do not need to complete preparation of the EA before beginning preparation of an EIS (516 DM 11.7(E)) (See section **8.4.1, *Significant Impacts – Transitioning from an EA to an EIS***).

The following actions normally require preparation of an EIS:

(1) Approval of Resource Management Plans.
(2) Proposals for Wild and Scenic Rivers and National Historic Scenic Trails.
(3) Approval of regional coal lease sales in a coal production region.
(4) Decision to issue a coal preference right lease.
(5) Approval of applications to the BLM for major actions in the following categories:
    (a) Sites for steam-electric power plants, petroleum refineries, synfuel plants, and industrial structures
    (b) Rights-of-way for major reservoirs, canals, pipelines, transmission lines, highways and railroads
(6) Approval of operations that would result in liberation of radioactive tracer materials or nuclear stimulation
(7) Approval of any mining operation where the area to be mined, including any area of disturbance, over the life the mining plan is 640 acres or larger in size.

"If, for any of these actions it is anticipated that an EIS is not needed based on potential impact significance, an environmental assessment will be prepared...." (516 DM 11.8(B) and (C)).

Note: Though not required, a decision-maker may elect to prepare an EIS for an action that does not have significant effects to assist in planning or decision-making. In such cases, explain in the Notice of Intent and the EIS why you are electing to prepare an EIS.

7.3 SIGNIFICANCE

Whether an action must be analyzed in an EA or EIS depends upon a determination of the significance of the effects. "Significance" has specific meaning in the NEPA context and you must use only this meaning in NEPA documents.

Significance is defined as effects of sufficient context and intensity that an environmental impact statement is required. The CEQ regulations refer to both significant effects and significant issues (for example, 40 CFR 1502.2(b)). The meaning of significance should not be interpreted differently for issues than for effects: significant issues are those issues that are related to significant or potentially significant effects.

The CEQ regulations explain in 40 CFR 1508.27:

> "'Significantly' as used in the NEPA requires considerations of both context and intensity:
>
> (a) Context. This means that the significance of an action must be analyzed in several contexts such as society as a whole (human, national), the affected region, the affected interests, and the locality. Significance varies with the setting of the proposed action. For instance, for a site-specific action, significance would usually depend upon the effects in the locale rather than in the world as a whole. Both short-term and long-term effects are relevant.

(b) Intensity. This refers to the severity of effect. Responsible officials must bear in mind that more than one agency may make decisions about partial aspects of a major action…." (40 CFR 1508.27).

Note that to determine the severity of effect, you must look at direct, indirect, and cumulative effects (40 CFR 1508.25(c)).

The CEQ regulations include the following ten considerations for evaluating intensity.

Impacts that may be both beneficial and adverse (40 CFR 1508.27(b)(1)). In analyzing the intensity of effects, you must consider that effects may be both beneficial and adverse. Even if the effect of an action will be beneficial on balance, significant adverse effects may exist. *For example, removal of a dam may have long-term beneficial effects on an endangered fish species. However, the process of removing the dam may have short-term adverse effects on the fish.*

The consideration of intensity must include analysis of both these beneficial and adverse effects, not just a description of the net effects. Only a significant adverse effect triggers the need to prepare an EIS.

Public health and safety (40 CFR 1508.27(b)(2)). You must consider the degree to which the action would affect public health and safety which may require, for example, evaluation of hazardous and solid wastes, air and water quality. In the context of evaluating significance, consideration of these resource effects should describe their relation to public health and safety. Economic or social effects are not intended by themselves to require preparation of an environmental impact statement (40 CFR 1508.14.).

Unique characteristics of the geographic area (40 CFR 1508.27(b)(3). "Unique characteristics" are generally limited to those that have been identified through the land use planning process or other legislative, regulatory, or planning process; for example:

- prime and unique farmlands as defined by 7 CFR 657.5.
- caves designated under 43 CFR 37.
- wild and scenic rivers, both designated and suitable.
- designated wilderness areas and wilderness study areas.
- areas of critical environmental concern designated under 43 CFR 1610.7-2.

Degree to which effects are likely to be highly controversial (40 CFR 1508.27(b)(4)). You must consider the degree to which the effects are likely to be highly controversial. Controversy in this context means disagreement about the nature of the effects, not expressions of opposition to the proposed action or preference among the alternatives. There will always be some disagreement about the nature of the effects for land management actions, and the decision-maker must exercise some judgment in evaluating the degree to which the effects are likely to be highly controversial. Substantial dispute within the scientific community about the effects of the proposed action would indicate that the effects are likely to be highly controversial.

Degree to which effects are highly uncertain or involve unique or unknown risks (40 CFR 1508.27(b)(5)). You must consider the degree to which the effects are likely to be highly uncertain or involve unique or unknown risks. As with controversy, there will always be some uncertainty about the effects of land management actions, and the decision-maker must exercise some judgment in evaluating the degree to which the effects are likely to be highly uncertain. Similarly, there will always be some risk associated with land management actions, but the decision-maker must consider whether the risks are unique or unknown. (Refer to the Web Guide for examples of both risks that are unique or unknown, and risks that are not).

Consideration of whether the action may establish a precedent for future actions with significant impacts (40 CFR 1508.27(b)(6)). You must consider the degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration. You must limit this consideration to future actions that are reasonably foreseeable, not merely possible (see section **6.8.3.4, *Past, Present, and Reasonably Foreseeable Actions***).

Consideration of whether the action is related to other actions with cumulatively significant impacts (40 CFR 1508.27(b)(7)). You must consider whether the action is related to other actions with cumulatively significant effects (40 CFR 1508.27(b)(7). Other actions are "related" to the action if they are connected or cumulative actions (see sections **6.5.2.1, *Connected Actions*** and **6.5.2.2, *Cumulative Actions***). You must analyze the effect of past, present, and reasonably foreseeable future actions, regardless of who undertakes such other actions, in the cumulative effects analysis for the proposed action. This analysis provides the context for understanding the effects of the BLM action (see section **6.8.3, *Cumulative Effects***). In determining the significance of the BLM action, you count only the effects of the BLM action together with the effects of connected and cumulative actions to the extent that the effects can be prevented or modified by BLM decision making (see section **6.5.2.1 *Connected Actions***).

For example:

The BLM proposes to construct a trail to provide recreation access to BLM-managed lands from a campground the Forest Service proposes to construct on adjacent Forest Service lands. The Forest Service campground is a connected action (see section **6.5.2.1, *Connected Actions***). *In this example, you must count the effects of both the BLM trail construction and the Forest Service campground construction in determining significance.*

The BLM proposes to construct a campground, which would contribute sediment to a nearby stream; the BLM proposes to replace a culvert, which would contribute sediment to the same stream. The culvert replacement is a cumulative action (see section **6.5.2.2, *Cumulative Actions***). *In this example, you must count the effects of both the campground construction and the culvert replacement in determining significance.*

*The BLM receives a right-of-way request for access for timber harvest on adjacent private land. The timber harvest on private land would be a connected action, because the timber harvest and the right-of-way request are interdependent parts (*see section **6.5.2.1, *Connected Actions***). *Whether you count the effects of the timber harvest in determining the significance of the right-of-way grant would depend on whether the effects of the timber harvest could be prevented by BLM decision making (*see section **6.5.2.1. *Connected Actions***). *In this example, that determination would likely depend on whether the private party has other reasonable access for timber harvest (*see section **6.6.3, *Alternatives Considered but Eliminated From Detailed Analysis*** *for discussion of "reasonable").*

- *If the private party has no other reasonable access (and therefore the harvest could not proceed without the right-of-way grant), the effects of the timber harvest would count towards the significance of the right-of-way grant. If the private party has no other reasonable access, the No Action alternative (i.e., denying the right-of-way request) would assume that the timber harvest would not occur. In this case, the effects of the timber harvest would be part of the incremental difference in cumulative effects between the No Action alternative (denying the right-of-way request) and the Proposed Action (granting the right-of-way).*
- *If the private party has other reasonable access, the effects of the timber harvest would not count towards the significance of the right-of-way grant. The No Action alternative would assume that the timber harvest would occur using the other reasonable access. In this case, the effects of the timber harvest would not be part of the incremental difference in cumulative effects between the No Action alternative and the Proposed Action (*see section **6.8.3.5, *Analyzing the Cumulative Effects***).

Scientific, cultural, or historical resources, including those listed in or eligible for listing in the National Register of Historic Places (40 CFR 1508.27(b)(8)). This factor represents a specific sub-set of the factor, "unique characteristics of the geographic area." Significance may arise from the loss or destruction of significant scientific, cultural, or historical resources. For resources listed in or eligible for listing in the National Register of Historic Places, significance depends on the degree to which the action would adversely affect these resources.

Threatened or endangered species and their critical habitat (40 CFR 1508.27(b)(9)). Significance depends on the degree to which the action would adversely affect species listed under the Endangered Species Act or their designated critical habitat. A determination under the Endangered Species Act that an action would adversely affect a listed species or critical habitat does not necessarily equate to a significant effect in the NEPA context. The NEPA analysis and ESA effects determinations have different purposes and use slightly different analytical approaches (for example, regarding connected actions, reasonably foreseeable actions, and cumulative effects). Although ESA documents, such as biological assessments and biological opinions, provide useful information, you must base your evaluation of the degree to which the action would adversely affect the species or critical habitat on the analysis in the EA.

Any effects that threaten a violation of Federal, State, or local law or requirements imposed for the protection of the environment (40 CFR 1508.27(b)(10)). This factor will often overlap with other factors: for example, violations of the Clean Water Act or Clean Air Act would usually involve effects that would adversely affect public health and safety.

CHAPTER 8—PREPARING AN ENVIRONMENTAL ASSESSMENT

GENERAL

An **environmental assessment** is a tool for determining the "significance" of environmental impacts; it provides a basis for rational decision making.

The steps for performing an EA-level analysis follow the NEPA analysis steps laid out in **Chapter 6, *NEPA Analysis***. This chapter builds on the foundation laid in Chapter 6 and provides specific direction and guidance for preparing an EA. **Chapter 8, *Preparing an Environmental Assessment*** also addresses the transition steps necessary to shift to preparation of an EIS when an EA process identifies significant effects or the likelihood of significant effects (see section **8.4.1, *Significant Impacts – Transitioning from an EA to an EIS***).

8.1 PREPARING TO WRITE AN ENVIRONMENTAL ASSESSMENT (EA)

An EA is intended to be a concise public document that provides sufficient evidence and analysis for determining the significance of effects from a proposed action (40 CFR 1508.9) and that serves as a basis for reasoned choice. Based upon the EA analysis, either an EIS or a FONSI will be prepared.

The CEQ has advised agencies to keep EAs to no more than approximately 10-15 pages (Question 36a, CEQ, *Forty Most Asked Questions Concerning CEQ's NEPA Regulations, March 23, 1981*). Concise and well-written documents foster effective communications with the public and informed decision-making. This handbook was developed to assist in streamlining NEPA documents while retaining their informative character, and provides suggestions and tools for preparing concise EAs.

You may reduce the length of the EA by thoughtful crafting of the purpose and need for action; developing a proposed action that specifically addresses the purpose and need; and maintaining focus on the relevant issues. Consistent focus on the issues associated with the proposed action will help you identify reasonable alternatives and potential effects. Other streamlining techniques include the use of tiering and incorporation by reference (see section ***5.2, Incorporation by Reference and Tiering***).

A longer EA may be appropriate when a proposal is so complex that a concise document cannot meet the goals of 40 CFR 1508.9 or when it is extremely difficult to determine whether the proposal could have significant environmental effects. Carefully consider complex proposals and the criteria for when an EIS may be appropriate (see **Chapter 7, *Determining Whether an EA or an EIS is Appropriate***), rather than proceeding with a lengthy EA just to avoid the EIS process.

8.2 PUBLIC INVOLVEMENT

You must have some form of public involvement in the preparation of all EAs. The CEQ regulations do not require agencies to make EAs available for public comment and review. In certain limited circumstances, agencies are required to make FONSIs available for public review (40 CFR 1501.4(e)(2) (see section **8.4.2, *The Finding of No Significant Impact (FONSI)***). The CEQ regulations direct agencies to encourage and facilitate public involvement in the NEPA process to the fullest extent possible (40 CFR 1500.2(d), 40 CFR 1506.6). This means that while some public involvement is required in the preparation of an EA, you have the discretion to determine how much, and what kind of involvement works best for each individual EA. For preparation of an EA, public involvement may include any of the following: external scoping, public notification before or during preparation of an EA, public meetings, or public review and comment of the completed EA and unsigned FONSI. The type of public involvement is at the discretion of the decision-maker. When you need to prepare many EAs for similar projects in a short timeframe, it may be helpful to prepare a programmatic EA to cover those projects and to facilitate focused public involvement

Before and during the preparation of the EA, be very thoughtful about the level of public involvement that may be necessary with respect both to the decision to be made and the analysis of the environmental consequences of that decision. As discussed in section **6.9, *Public Involvement and Responding to Comments***, consider providing for public involvement very early in the process. It is helpful to prepare a public involvement strategy that allows you to adjust the amount and nature of public participation throughout the analysis process. In the strategy, identify the objectives for public involvement to assist in determining the need for, level and nature of that involvement.

Internal scoping, while not considered public involvement, is used to set the stage for external scoping if the decision-maker determines that it is necessary. Internal and external scoping are introduced in section **6.3, *Scoping*** and discussed in more detail in section **8.3.3, *Scoping and Issues***. Internal scoping is integral to the preparation of all environmental assessments.

In addition to public involvement in the preparation of EAs, you must notify the public of the availability of a completed EA and FONSI (40 CFR 1506.6(b)). In addition, some FONSIs must be made available for a 30-day public review, as described in section **8.4.2, *The Finding of No Significant Impact (FONSI)***. In situations that do not require public review of the FONSI, the unsigned FONSI and completed EA may be released for public review at the decision-maker's discretion. Section **8.4.2, *The Finding of No Significant Impact (FONSI)*** discusses the preparation of FONSIs and provides information regarding their release for public review.

8.3 EA FORMAT

The CEQ regulations state that an EA must contain brief discussions of the need for the proposal, the alternatives considered, the environmental effects of the proposed action and alternatives, and a listing of agencies and persons consulted (40 CFR 1508.9 (b)). Also, the BLM requires certain information in the EA, and there may be particular program-specific requirements for an EA. Refer to the Web Guide for a current description of program-specific requirements related to EAs. Content and format requirements for EA-level LUP amendments can be found in the BLM's Land Use Planning Handbook H-1601-1.

We recommend that you organize an EA so that the flow of information is logical and easy to follow. The following recommended EA format is intended to present the analytical information in a manner that both informs decision-making and enhances general reader understanding of the proposal, the analysis process, and the results. This recommended format is provided in outline form in **Appendix 9, *Recommended EA Format.***

8.3.1 Introduction

Provide the following identifying information at the beginning of an EA, or in the introduction:

- **Title, EA number, and type of project.** Consult the appropriate State, District, or Field Office guidance regarding the assignment of EA numbers.
- **Location of proposal.** Identify the general location of the proposed action (details of the location are in the proposed action). Use maps where appropriate to assist in identifying the specific location of the proposed action.
- **Name and location of preparing office.**
- **Identify the subject function code, lease, serial, or case file number** (where applicable). Identify, for example, the right-of way case file number, the application for a permit to drill identifier, etc.
- **Applicant name** (where applicable). The applicant's address may also be included. (Note: Applicant name and address may be protected under the *Privacy Act*: refer to program-specific guidance and the exemptions under the *Freedom of Information Act*, which is referenced in the Web Guide).

The EA introduction also typically includes background information that provides context for the purpose and need statement.

8.3.2 Purpose and Need for Action and Decision to be Made

As discussed in section **6.2.1, *The Role of the Purpose and Need Statement,*** the purpose and need statement frames the range of alternatives. We recommend that you develop the purpose and need statement very early in the NEPA process and include it in scoping.

We recommend including a section in the EA that describes the "Decision to be Made." Describing the decision to be made clearly spells out the BLM's decision space and the focus of the NEPA analysis; in addition, it may serve as a vehicle for describing the nature of other decisions that will be made by other entities in order to implement the proposed action and any alternatives. Refer to the discussion and examples in section **6.2.1, *The Decision to be Made***.

8.3.3 Scoping and Issues

The topics of internal and external scoping are introduced in section **6.3, *Scoping***. Internal scoping, as discussed, is used to formulate the purpose and need; identify connected, similar and cumulative actions associated with the proposal; begin preparations for the cumulative effects analysis; determine the appropriate level of documentation; and prepare a public participation strategy. While external scoping for EAs is optional (40 CFR 1501.7), the benefits of external scoping for an EA are essentially the same as for an EIS, as discussed in section **6.3.2, *External Scoping***.

When evaluating the need for scoping, consider factors such as: the size or scale of the proposed action; whether the proposal is routine or unique; who might be interested or affected; and whether or not external scoping has been conducted for similar projects and what the results have been. It is up to the decision-maker to determine the need for and level of scoping to be conducted. We recommend that you document in the EA your rationale for determining whether or not to conduct external scoping. If you conduct external scoping, document the scoping process, the comments received, and the issues identified and how they were addressed in the EA. If you receive numerous comments, a summary of the comments may suffice for the EA; however, be sure to retain the comments and to document their disposition in the administrative record. See sections **8.3.7, *Tribes, Individuals, Organizations, or Agencies Consulted***, and **8.5.1, *Documenting the Decision,*** for additional discussions regarding public involvement and managing comments.

Regardless of the level of scoping conducted, we recommend that you identify and document issues associated with the proposed action (see sections **6.3, *Scoping*** and **6.4, *Issues***). As discussed in section **6.4.1, *Identifying Issues for Analysis***, you do not need to analyze all issues identified in the scoping process. Analyze an issue if its analysis will help in making a reasoned choice among alternatives, or if it is, or may be, related to a potentially significant effect. In addition, the decision-maker may elect to analyze other issues to assist in planning or decision-making. In such cases explain in the EA why you are electing to identify the issue for analysis.

8.3.4 Proposed Action and Alternatives

You must describe the proposed action and alternatives considered, if any (40 CFR 1508.9(b)) (see sections **6.5, *Proposed Action*** and **6.6, *Alternative Development***). Illustrations and maps can be used to help describe the proposed action and alternatives. The sub-sections below provide detailed guidance for how to describe the proposed action and how to develop and describe appropriate alternatives.

8.3.4.1 Description of the Proposed Action

Provide a description of the proposed action (see section **6.5, *Proposed Action*** for guidance). Generally describe the relationship between the purpose and need and the proposed action. To identify potential connected and cumulative actions that may need to be included with the proposed action, refer to sections ***6.5.2.1, Connected Actions and 6.5.2.2, Cumulative Actions***. Be sure to include design features specific to the proposed action (see section **6.5.1.1, *Design Features of the Proposed Action***).

8.3.4.2 Alternatives in an EA

EAs shall "...include brief discussions...of alternatives as required by section 102(2)(E),..." (40 CFR 1508.9(b)). Section 102(2)(E) of the NEPA provides that agencies of the Federal Government shall "study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources."

Although the regulation at 40 CFR 1508.9(b) makes no specific mention of the No Action alternative with respect to EAs, the CEQ has interpreted the regulations generally to require some consideration of a No Action alternative in an EA. The CEQ has issued guidance stating: "you may contrast the impacts of the proposed action and alternatives with the current condition and expected future condition in the absence of the project. This constitutes consideration of a no-action alternative as well as demonstrating the need for the project." (CEQ Memorandum to Federal NEPA Contacts: Emergency Actions and NEPA (September 8, 2005), CEQ Memorandum to Secretary of Agriculture and Secretary of Interior: Guidance for Environmental Assessments of Forest Health Projects (December 9, 2002)). Therefore, at a minimum, your EA must include documentation of the current and future state of the environment in the absence of the proposed action. This discussion does not need to be a separate section called "No Action Alternative," but can be part of the environmental effects section of the EA to show the change in effects brought about by the proposed action or alternatives. Examples of how to do this can be found on the web guide.

You may analyze the No Action alternative with the same level of treatment as the proposed action and any action alternatives, if this will assist in your decision-making. In such cases, it may be clearer to provide this analysis in a separate analysis of the No Action alternative in an environmental effects section. Including such a separate analysis may provide a useful context for comparing environmental effects of the various alternatives, and demonstrates the consequences of not meeting the need for the action.

You must consider alternatives if there are unresolved conflicts concerning alternative uses of available resources (40 CFR 1508.9(b)). There are no unresolved conflicts concerning alternative uses of available resources if consensus has been established about the proposed action based on input from interested parties, or there are no reasonable alternatives to the proposed action that would be substantially different in design or effects. (However, the analysis of effects may result in new issues that require development and consideration of another alternative).

Consensus about the proposed action may be established by conducting scoping for the proposed action, but it may also be possible to establish consensus through other means of public involvement. For example, scoping and/or public comments on a programmatic NEPA document may provide a basis for concluding that there is consensus about a subsequent specific action that is tiered to the programmatic document. Document the basis for concluding that there is consensus about a proposed action and identify the interested parties that participated in the consensus-building process.

Many conflicts concerning alternative uses of available resources are resolved in existing land use plan (LUP) and other programmatic decisions. Such programmatic decisions often establish "basic policy objectives for management of the area," which may ultimately limit the "reasonable" alternatives to a proposed action to implement an LUP or programmatic decision (see section **6.6.1, *Reasonable Alternatives***). The purpose and need statement for implementation actions may be constructed in the context of the existing LUP or programmatic decisions; thus, alternatives that are not in conformance typically will not be "reasonable." However, some proposed actions and alternatives will intentionally not be in conformance with the LUP because the intent is to amend or revise LUP direction; hence the alternatives are reasonable to analyze.

If alternatives relevant to the proposed action have been described and analyzed in a previous environmental document, it may be sufficient to incorporate by reference the description and analysis from the previous document (see section **5.2, *Incorporation by Reference and Tiering***). In addition, you may use tiering to reduce the range of alternatives (see section **5.2, *Incorporation by Reference and Tiering***, for further discussion of tiering).

In addition, for EAs, you need only analyze alternatives that would have a lesser effect than the proposed action. However, be cautious in dismissing an alternative from analysis in an EA because it would have a "greater effect." For many management actions, characterizing the overall effects of alternatives as "lesser" or "greater" will be difficult, because alternatives will often have lesser effects on some resources and greater effects on other resources when compared to the proposed action.

For projects proposed under the Healthy Forests Restoration Act of 2003 (HFRA) (P.L. 108-148), refer to specific guidance regarding analysis of alternatives in section **6.6.1, *Reasonable Alternatives,*** as it provides guidance different from that included in this section.

While analysis of alternatives is not always required in EAs, a decision-maker may choose to analyze alternatives in detail to assist in identifying trade-offs or in decision-making and planning. In such cases, explain in the EA why you are electing to analyze the alternative in detail.

8.3.4.2.1 Alternatives Considered but Eliminated from Detailed Analysis

We recommend that the EA contain a description of alternatives to the proposed action that were considered but not analyzed in detail. Include alternatives that were recommended by members of the public or agencies but dismissed from detailed analysis after preliminary investigation. Document the reasons for dismissing an alternative in the EA (see section **6.6.3, *Alternatives Considered but Eliminated from Detailed Analysis*** for additional discussion).

8.3.4.3 Conformance

In this section, discuss whether or not the proposed action is in conformance with the land use plan; identify directly relevant laws, regulations, policies, program guidance, and local permitting requirements that are germane to the proposed action. An exhaustive list or discussion of all applicable laws or regulations is not appropriate.

We recommend that you also evaluate and disclose whether or not any alternatives considered are in conformance with the land use plan and as described above. Determining "conformance" early in the process will indicate if a plan amendment is necessary to implement an alternative.

8.3.5 Affected Environment

We recommend that the EA contain a brief description of the environment likely to be affected by the proposed action or alternatives. Limit the description of the affected environment to that information relevant to understanding the effect(s) of the proposed action or alternative (see sections **6.7.1, *Affected Environment*** and **6.7.2, *Use of Relevant Data***). You may present the affected environment description as its own section, or combined with environmental effects.

8.3.6 Environmental Effects

The EA must describe and provide the analysis of environmental effects of the proposed action and each alternative analyzed in detail (40 CFR 1508.9(b)). An issue identified through internal or external scoping must be analyzed if analysis is necessary to :

- make a reasoned choice among alternatives (if any), or
- determine the significance of effects (see section **6.8, *Environmental Effects***).

The effects analysis must address direct, indirect and cumulative effects related to each issue (see section **6.8, *Environmental Effects***). Tiering to a broader NEPA analysis may limit the need for analysis, especially cumulative effects analysis (see section **6.8.3, *Cumulative Effects***).

Discussion of impacts may either be organized by alternative with impact topics as subheadings or by impact topic with alternatives as subheadings. Generally, if impacts to a particular resource for one alternative are the same as another alternative, make reference to that section in the EA rather than repeating the information.

The EA must also identify and analyze mitigation measures, if any, which may be taken to avoid or reduce potentially significant effects (see Question 39, CEQ, *Forty Most Asked Questions Concerning CEQ's NEPA Regulations, March 23, 1981*). You must describe and analyze the anticipated effectiveness of mitigation measures and any direct, indirect, and cumulative effects that remain after the application of all mitigation measures—that is, residual effects. Although described and analyzed in the body of the EA, the mitigation measures that will be implemented are explicitly adopted in the decision record. Refer to section **6.8.4, *Mitigation and Residual Effects*** for additional information regarding mitigation measures.

8.3.7 Tribes, Individuals, Organizations, or Agencies Consulted

The EA must list tribes, individuals, organizations, and agencies consulted (40 CFR 1508.9(b)). Long contact lists may be referenced or provided in an appendix to the EA. It may be appropriate to provide brief statements regarding the purpose for the contacts and the results. You may include comments received from tribes and the public in this section, though you may also include them in the discussion of scoping and issues earlier in the EA, or describe them in the decision record (see sections **8.3.3, *Scoping and Issues*** and **8.5.1, *Documenting the Decision***). If large numbers of substantive comments are received, you may summarize them in the EA or decision record, but you must retain the comment letters in the administrative record. It is important that you not only evaluate and summarize the substantive comments, but be able to demonstrate that you considered them.

8.3.8 List of Preparers

We recommend that you provide a list of the specialists who prepared the EA and their area of expertise.

8.4 DETERMINATION OF SIGNIFICANCE

Based upon the analysis, provide a determination as to whether or not the selected alternative will have significant environmental effects (see section **7.3, *Significance***). This determination yields different results, as outlined below.

8.4.1 Significant Impacts -Transitioning from an EA to an EIS

If you determine that the effects of the alternative you wish to select are significant, you cannot approve the action unless it is either analyzed in an EIS or modified to avoid significant effects.

In the event that you determine an EIS is necessary, draw the EA preparations to a close (retain all documents). You must publish in the *Federal Register* a Notice of Intent (NOI) to prepare an EIS (refer to section **13.1, *Publishing Notices in the Federal Register***). You may integrate the information assembled and analysis completed for the EA into the EIS and use it for scoping for the EIS. Information related to how and when scoping was conducted for the EA, the results, and any comments received can still be very helpful. However, the scoping for the EA does not take the place of the scoping required after publication of the NOI for the EIS unless a public notice for scoping for the EA said that preparation of an EIS was a possibility and that comments would still be considered (see Question 13, CEQ, *Forty Most Asked Questions Concerning CEQ's NEPA Regulations, March 23, 1981*).

When transitioning to an EIS, organize materials used for the EA so that pertinent portions may be integrated into the EIS. As discussed above, information about the scoping process and issues, contact lists used for scoping, and comments received may be especially helpful. Discussions from the EA of the purpose and need, proposed action and alternatives may streamline the initiation of the EIS process. Descriptions of the affected environment and the analyses of effects, including assumptions and methodologies, may also be directly incorporated into the EIS.

8.4.2 The Finding of No Significant Impact (FONSI)

The FONSI is a document that explains the reasons why an action will not have a significant effect on the human environment and, why, therefore, an EIS will not be required (40 CFR 1508.13). The FONSI must succinctly state the reasons for deciding that the action will have no significant environmental effects (40 CFR 1508.13, Questions 37a, CEQ, *Forty Most Asked Questions Concerning CEQ's NEPA Regulations, March 23, 1981*). The FONSI need only provide a basis for the conclusion that the selected alternative(s) will have no significant effect. Alternatives that are not selected but may have significant effects do not trigger the preparation of an EIS nor do they have to be described in the FONSI. We recommend that the FONSI address the relevant context and intensity factors described in section **7.3, *Significance***.

There are two situations when a FONSI is prepared:

- EA analysis shows that the action would have no significant effects.
- EA analysis shows that the action would have no significant effects beyond those already analyzed in an EIS to which the EA is tiered (see section **5.2.2, *Tiering***). You may find that your action has significant effects and still reach a FONSI, provided that those significant effects were fully analyzed in the EIS to which your EA tiered (see section **5.2.2, *Tiering***). In this case, we recommend that you state in the FONSI that there are no significant impacts beyond those analyzed in the EIS to which this EA is tiered.

The EA must be attached to the FONSI or incorporated by reference into the FONSI (40 CFR 1508.13, Question 37a, CEQ, *Forty Most Asked Questions Concerning CEQ's NEPA Regulations, March 23, 1981*). The FONSI must note any other relevant environmental documents related to the findings, and must be signed and dated by the decision-maker (40 CFR 1501.7(a)(5), 40 CFR 1508.13). The FONSI is not the authorizing document for the action: the decision record is the authorizing document.

Some FONSIs must be made available for a 30-day public review before the determination of whether to prepare an EIS (40 CFR 1501.4 (e)(2); also see 40 CFR 1501.4 (e)(1)). Public review is necessary if or when:

- the proposal is a borderline case, (such as when there is a reasonable argument for preparation of an EIS)
- it is an unusual case, a new kind of action, or a precedent-setting case, such as a first intrusion of even a minor development into a pristine area
- there is either scientific or public controversy over the effects of the proposal
- it involves a proposal that is similar to one that normally requires preparation of an EIS

You must also allow a period of public review of the FONSI if the proposed action is construction in a wetland or would be located in a floodplain. (Question 37b, CEQ, *Forty Most Asked Questions Concerning CEQ's NEPA Regulations, March 23, 1981*, citing E.O. 11990, sec. 2(b) and E.O. 11988, sec. 2(a)(4)).

In addition, the decision-maker may decide to release the unsigned FONSI and EA for public review and comment even if the proposal does not meet the criteria described above. Consider the complexity of the project and issues, as well as the level of public interest, in determining the length of review and comment period. Releasing the documents for public review and comment is typically done to allow the public, agencies and tribes the opportunity to respond to the analysis of impacts and to further long-term collaborative efforts.

If you release the EA and FONSI for public review, we recommend that you not sign the FONSI until the public review is completed and any necessary changes made to the EA. Include a discussion of comments received on the EA and FONSI and their disposition in the decision record (see **8.5.1, *Documenting the Decision***).

The FONSI is signed before issuance of the decision record. The FONSI must not be combined with the EA or decision record, although these may be attached to each other (516 DM 2.3(C)).

No format requirement exists for a FONSI; however, a suggested format and examples are provided in the Web Guide.

8.5 THE DECISION RECORD

Neither the EA nor the FONSI is a decision-making document. Decisions regarding proposed actions analyzed in an EA are documented in accordance with program-specific requirements. While the NEPA does not require a specific decision document regarding actions for which an EA has been completed, the BLM has chosen to use the "decision record" (DR) to document the decision regarding the action for which the EA was completed. The decision cannot be implemented until the DR is signed. Refer to section **8.3.6, *Environmental Effects*** and **Chapter 10, *Monitoring***, for discussion of mitigation and monitoring to be included in the DR. Check for and follow program-specific requirements on the content and format of a DR. If there are no program-specific requirements for the DR or if they are only general, use the guidance in section **8.5.1, *Documenting the Decision*** to organize the content and format of the DR.

8.5.1 Documenting the Decision

Organize the DR using the content outline below:

1. Identify compliance with major laws pertinent to the decision, such as the Endangered Species Act, National Historic Preservation Act, and the Clean Water Act. Also describe conformance with the LUP, and other applicable laws, regulations, and policies.

2. Identify the selected alternative. Describe as precisely as possible specific features of the decision, or incorporate by reference the description of the selected action in the EA. Identify mitigation and monitoring measures that have been selected to be implemented. While incorporating by reference to describe the alternative and mitigation measures is encouraged, the specifics of what is being approved must be made clear. The DR must also identify any limitations on when the decision may be implemented.

3. Reference the FONSI indicating that the action has been analyzed in an EA and found to have no significant impacts, thus an EIS is not required.

4. Summarize the public involvement undertaken and comments received and describe how substantive comments were considered in making the decision (see also sections **6.9.2, *Comments,*** and **8.3.7, *Tribes, Individuals, Organizations, or Agencies Consulted***).

   Note: We recommend that you address timely comments received on the EA or FONSI during review, and that you document your responses, as described below:

   a. Integrate comments that provide substantive new information relevant to the analysis, FONSI or decision be integrated into the EA (which becomes a "new" EA), with any changes to the FONSI reflected in a new FONSI, and the comment and its import acknowledged in the DR. If the EA and FONSI are substantively changed, the new EA and FONSI may need to be circulated for public review and comment. It is within the decision-makers' discretion to determine whether or not to circulate the new EA and FONSI for public review and comment.

   b. Substantive comments that provide minor corrections or updates to the EA may be simply integrated into the EA and acknowledged in the DR. There typically will be no need to re-circulate the EA and FONSI for public review and comment; however, that determination is left to the discretion of the decision-maker.

   c. If a substantive comment does not lead to changes in the EA, FONSI or DR, you may reply directly to the commenter. For this situation, we recommend that you document your reply in the administrative record.

   d. While you are not required to respond to non-substantive comments, you may wish to acknowledge them. See section **6.9.2.2, *Comment Response*** for methods to acknowledge comments.

5. Explain the rationale for the decision, explaining how the selected alternative addresses the purpose and need for action and why it was selected over other alternatives. Include all program-specific requirements.

6. Describe protest and appeal opportunities.

7. The decision-maker must sign and date the DR.

8. You must provide notice of the signed DR, FONSI, and EA (40 CFR 1506.6(b), Question 38, CEQ, *Forty Most Asked Questions Concerning CEQ's NEPA Regulations, March 23, 1981*) (see section **6.9.1, *Involving and Notifying the Public***).

The Web Guide provides several examples of Decision Records and an optional format.

8.5.2 Terminating the EA Process

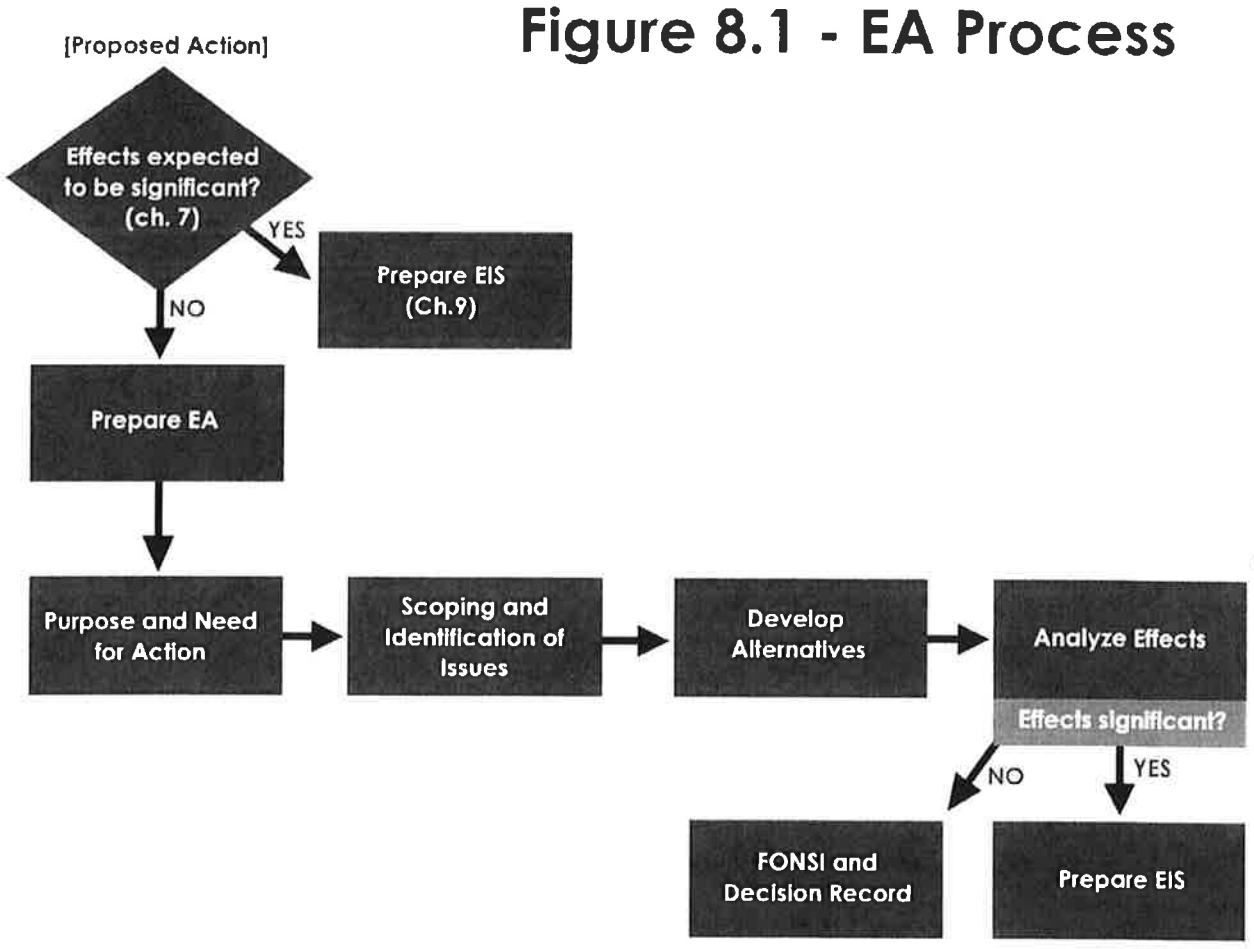
When you terminate the EA process prior to completion, complete your administrative record, documenting the reason or reasons for aborting the process. If you have given public notice of the EA process, inform interested persons and parties that you are terminating the EA process.

8.6 IMPLEMENTATION

A decision may not be implemented until the FONSI and DR have been signed and all other program-specific procedural requirements have been met (such as applicable protest and appeals procedures).

Implementation of the action, including any mitigation and monitoring measures adopted in the decision record, must be in accordance with the decision described in the DR. Program-specific guidance regarding protest and appeal provisions and timing of implementation relative to public notification can be found in the Web Guide.

Figure 8.1 EA Process



CHAPTER 9—PREPARING AN ENVIRONMENTAL IMPACT STATEMENT

GENERAL

The steps for performing an EIS-level analysis follow the NEPA analysis steps laid out in **Chapter 6, *NEPA Analysis***. This chapter should be consulted as the BLM begins and works through the analytical process.

9.1 PREPARING TO WRITE AN EIS

9.1.1 Develop Preparation Plan

You must develop a preparation plan (also referred to as "prep plan") before initiating an EIS for land use plans (*BLM Land Use Planning Handbook H-1610-1*, pages 17–18, March 11, 2005). We recommend that you develop a preparation plan for other EISs. The preparation plan facilitates coordination between participants involved in the preparation of the EIS and those with approval and oversight responsibility. A properly prepared preparation plan provides the foundation for the entire planning process by identifying the issues to be addressed; the skills needed to address the issues; a preliminary budget that can be used for cost estimates; important legal, regulatory and policy guidance; and available and needed data and metadata.

Appendix F-1 in the *BLM Land Use Planning Handbook H-1601-1* describes in detail what goes into a preparation plan for an LUP; the contents may be tailored to fit any action effort involving an EIS. We recommend that preparation plans contain the following information and discrete sections:

- Introduction and Background
- Anticipated Issues and Management Concerns
- Important Legal, Regulatory and Policy Guidance
- Data and GIS Needs, Including Data Inventory
- Participants in the Process
- Process for EIS Development
- Schedule
- Communications Strategy
- Budget

Links to examples of a non-LUP prep plan and an LUP or EIS prep plan can be found in the Web Guide.

9.1.1.1 Develop Strategy for Public Involvement and Interagency/Intergovernmental Coordination and Consultation

The public involvement and interagency or intergovernmental coordination and consultation strategy is an integral part of the EIS process. We recommend that it be described in the preparation plan and that it remain flexible.

We recommend that the public involvement strategy: identify tribes, individuals, organizations and other agencies known to be interested or affected by the proposed action; identify agencies with special expertise or jurisdiction by law; identify possible cooperating agencies (see **Chapter 12, *Cooperating Agencies, Joint Lead Agencies, and Advisory Committees***); identify the role, if any, of the BLM Resource Advisory Council; identify schedules for scoping, including public meetings, and timing for electronic and postal mail notifications; identify the process for tracking and recording public involvement and include lists of contacts. The public involvement strategy will likely be updated during the EIS process.

Public notice (see section **6.9.1, *Involving and Notifying the Public*** for a discussion on the various ways the public can be notified) must be provided for any EIS-related meetings or hearings (40 CFR 1506(b) (see sections **9.3.2, *Notify the Public and Government Agencies of the Availability of the Draft EIS for Review and Comment;* 9.4.2, *Full Text Final EIS*; 9.7, *Issuing the Record of Decision;*** and **13.1, *Publishing Notices in the Federal Register*** for additional guidance). The BLM must also provide public notice of the availability of the draft and final EIS documents, as well as the Record of Decision (40 CFR 1506(b), Question 34a, CEQ, *Forty Most Asked Questions Concerning CEQ's NEPA Regulations, March 23, 1981*)).

Ensure the public involvement strategy is sensitive to language or cultural barriers. Hold meetings in ways that accommodate cultural traditions, values and methods of communication. Follow the requirements of the Federal Advisory Committee Act of 1972 (FACA). See **Chapter 12, *Cooperating Agencies, Joint Lead Agencies, and Advisory Committees*** for additional information on the FACA.

9.1.2 Publish the Notice of Intent

Publishing the Notice of Intent (NOI) in the *Federal Register* begins the formal scoping process and serves as the official legal notice that the BLM, or when the BLM is the lead agency, the BLM and its cooperators, are commencing an EIS. The NOI must include:

- A description of the purpose & need, the draft proposed action, & possible alternatives, if available. For some BLM-initiated actions, where the proposed action has not yet been developed in detail, the reason for initiating the EIS must be clearly stated.
- A description of the agency's proposed scoping process; this should include whether, when, and where any scoping meetings will be held. If the time and place of scoping meetings is not known, the NOI must state how the time and place will be announced.
- The name and address of the BLM contact for the proposed action and EIS (40 CFR 1508.22).
- For planning documents, also identify preliminary planning issues and planning criteria. (See the *BLM Land Use Planning Handbook, H-1601-1*, pages 18–19, March 11, 2005).

The BLM requires that the NOI be formatted in accordance with *Federal Register* guidance on notices (see section **13.1, *Publishing Notices in the Federal Register***). An example of an NOI can be found in the Web Guide. Check program guidance for any additional information that must be included in the NOI. For example, there is a specific format for a call for nominations for oil and gas leasing. See the Web Guide for an example of an NOI that also includes a call for nominations for oil and gas.

A revised NOI may be required if there are any substantial changes to the proposed action or if substantial new circumstances or information arise that relate to the proposal or its impacts, such that the BLM would essentially be starting over with the NEPA process. Minor changes may be addressed in the Notice of Availability (NOA) for the draft EIS.

Additional guidance on publishing notices in the *Federal Register* for EISs can be found in **Chapter 13, *Administrative Procedures***. Contact your State office for current briefing and approval procedures for NOIs and NOAs.

9.1.3 Scoping

Scoping is the process required by the CEQ for EISs by which the BLM solicits input on the issues and impacts that will be addressed in a NEPA document as well as the degree to which those issues and impacts will be analyzed. The intent of scoping is to focus the analysis on significant issues and reasonable alternatives, to eliminate extraneous discussion, and to reduce the length of the EIS. No guidance is provided by the CEQ for the length of scoping periods. Check individual program guidance for any prescribed minimum periods.

Scoping must be conducted both internally with appropriate BLM staff, and externally with interested and affected public, agencies, tribes, and organizations (40 CFR 1501.7) (see section **6.3, *Scoping*** for more discussion of scoping).

Formal public scoping begins following publication of an NOI. Informal internal and external scoping may occur before the formal scoping period begins. Scoping can provide valuable information in identifying issues related to cumulative effects.

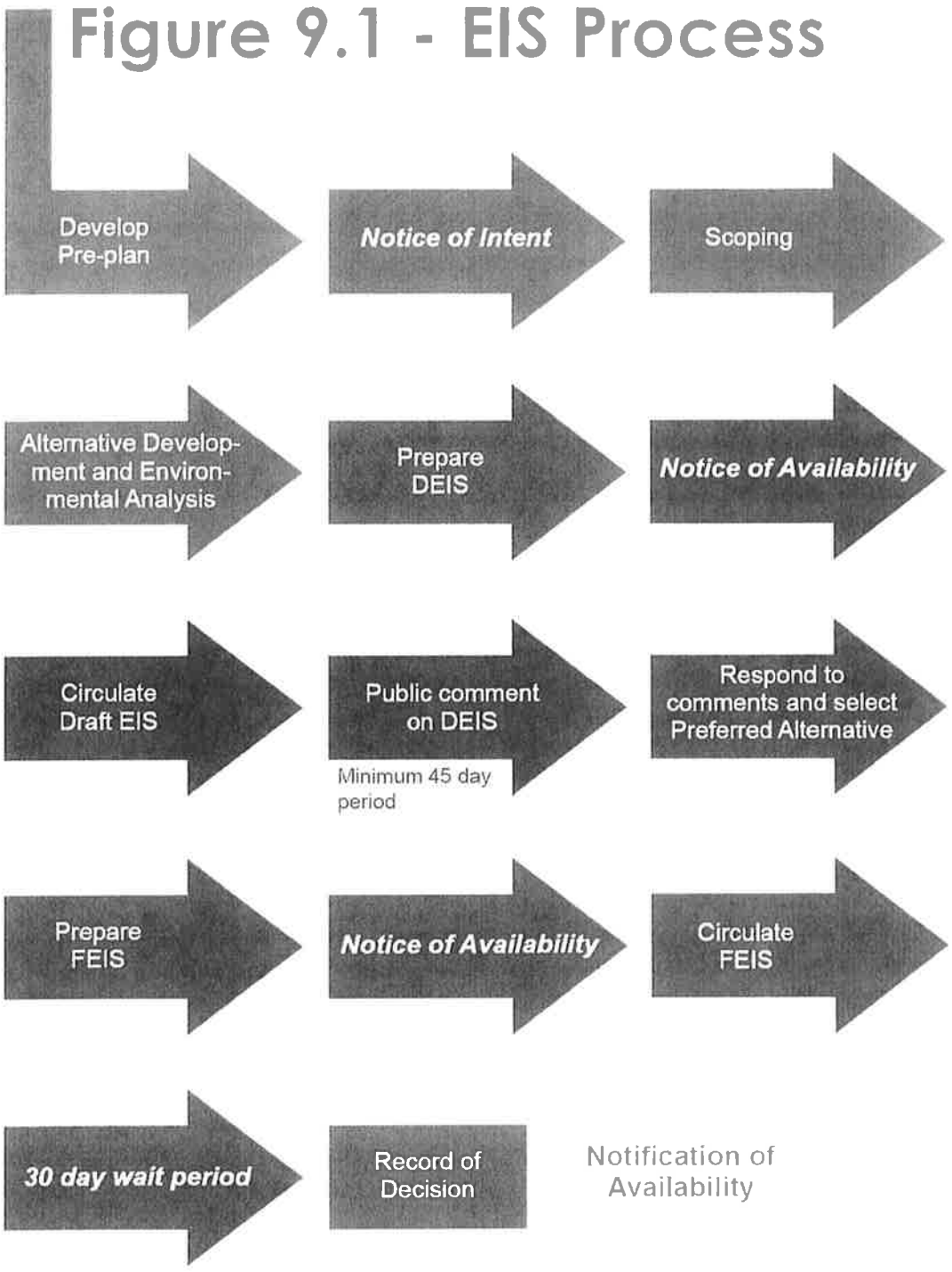
The CEQ regulations at 40 CFR 1501.7 require the following in an agency's scoping process:

- Invite participation from affected Federal, State, local, and tribal organizations and interested persons.
- Determine the scope or extent of the EIS and the significant issues to be analyzed. Scoping is valuable in identifying connected, cumlative, and similar actions.
- Eliminate those issues raised that are not related to potentially significant impacts or those that have been covered in other environmental documents. Make assignments for preparation of the EIS between the lead and cooperating agencies.
- Identify any environmental documents being prepared that have relevance to, but are not part of, the scope of this EIS.
- Identify other environmental review and consultation requirements.
- Discuss the relationship between the timing of the preparation of the EIS and the agency's tentative planning and decision-making schedule.

In addition to publishing the NOI in the *Federal Register*, we recommend a notice announcing the beginning of the formal scoping process be published in local newspapers and be sent to interested agencies, organizations, and other stakeholders.

Prepare a scoping report that discusses the issues raised during the scoping process, the issues to be addressed in the EIS, the issues that will not be addressed in the EIS and why (see section **6.4, *Issues***), a list of participants in the scoping process, and the views of those participants. See the Web Guide for an example of a scoping report.

Figure 9.1 The EIS Process



9.2 EIS FORMAT

This section outlines a suggested format for an EIS, although the specific elements and their order should remain flexible. For example, in some instances it may be desirable to combine chapters three and four in this outline into one chapter. The BLM Land Use Planning Handbook provides a recommended format for planning-related EISs.

9.2.1 Cover Sheet

The cover sheet must not exceed one page and must include:

- a list of responsible agencies including the lead agency and any cooperating agencies.
- the title and location of the proposed action that is the subject of the statement.
- the name, address, and telephone number of the BLM contact person.
- designation of the statement as a draft, final, or supplemental.
- a one-paragraph abstract of the statement that identifies significant impacts and alternatives to the proposed action or proposal.
- the date by which comments must be received. (40 CFR 1502.11)

It is optional to include the name and title of the person responsible for preparing the EIS and the decision-maker for the action.

9.2.2 "Dear Reader" Letter

You may use a letter signed by the decision-maker responsible for preparing the EIS to request review and comment on the draft. You may use this letter to inform the reader of other details pertinent to the review. For example, if you anticipate an abbreviated final EIS, the letter may suggest that the reader retain the draft for reference. Make sure you include the privacy language discussed in section **6.9, *Public Involvement and Responding to Comments***. Be specific about what you want the reader to focus on, but remember that the reader can decide which areas to address. See the Web Guide for an example of a Dear Reader letter.

9.2.3 Summary

The EIS must contain a summary identifying the areas of controversy (including issues raised by agencies and the public), the issues to be resolved (including the choice among alternatives), and the major conclusions of the analysis. The summary normally must not exceed 15 pages, and must focus on the key points of each section (40 CFR 1502.12).

9.2.4 Table of Contents

Ensure that the table of contents is sufficiently detailed to allow the reader to quickly locate major subject matter in the EIS, particularly specific impact topics and alternatives analyzed in the document.

9.2.5 Chapter 1—Introduction

This chapter includes the following:

- purpose and need; and we recommend you include decisions to be made (see section **6.2, *Purpose and Need***);
- the general location, including maps when appropriate;
- major authorizing laws and regulations;
- an explanation of the relationship of the proposed action to BLM policies, plans, and programs;
- the relationship to non-BLM policies, plans, and programs—including discussions of any land use planning or zoning statutes or requirements that may affect or limit the proposal. You must identify or reference any germane land use planning or zoning statutes or requirements (40 CFR 1502.16(c), 40 CFR 1506.2(d)). An exhaustive list of all applicable laws and regulations is not appropriate; and
- a list of all Federal permits, licenses, and other entitlements that must be obtained in implementing the proposal (40 CFR 1502.25(b)). It is optional to list authorizing actions by State and local entities. To the fullest extent possible, the environmental analyses for these related permits, licenses, and approvals must be integrated and performed concurrently (40 CFR 1502.25, 40 CFR 1506.2(b).

9.2.6 Issues

Issues may be raised by the public, other agencies, or the BLM throughout the NEPA analysis process. See section **6.4, *Issues***, for a complete discussion of issues. Include in the administrative record or the EIS supporting documentation indicating why an identified issue was not analyzed.

The section of the EIS describing the issues for analysis (and issues identified, but not analyzed) may be organized into its own chapter, as an appendix, or may be presented within other chapters of the EIS.

9.2.7 Chapter 2—Proposed Action and Alternatives

The EIS must describe the proposed action and alternatives (40 CFR 1502.14) (see sections **6.5, *Proposed Action*** and **6.6, *Alternatives Development***). The EIS must consider a range of reasonable alternatives, including the Proposed Action and No Action alternative, and provide a description of alternatives eliminated from further analysis (if any exist) with the rationale for elimination (40 CFR 1502.14(a)). The CEQ regulations direct that an EIS include a description of the No Action alternative (40 CFR 1502.14(d)) (see section **6.6.2, *No Action Alternative***). The No Action alternative is the only alternative that must be analyzed in an EIS that does not respond to the purpose and need for the action.

This chapter must also document:

- design features that would minimize potentially significant impacts (40 CFR 1502.14(f));
- LUP conformance (except for EISs prepared for approval, amendment, or revision of LUPs) (516 DM 11.5);
- the BLM's preferred alternative(s), if one or more exists (40 CFR 1502.14(e); and
- summary of effects (usually in a table) (40 CFR 1502.14) (see section **9.2.9, *Environmental Effects***)

9.2.7.1 Reasonable Alternatives for an EIS

The CEQ regulations direct that an EIS "rigorously explore and objectively evaluate all reasonable alternatives, and for alternatives that were eliminated from detailed study, briefly discuss the reasons for their having been eliminated" (40 CFR 1502.14(a): see also NEPA Sec. 102(2)(C)(iii)).

For projects proposed under the Healthy Forests Restoration Act of 2003 (P.L. 108–148) refer to specific guidance regarding analysis of alternatives in section **6.6.1, *Reasonable Alternatives***.

The CEQ regulations also direct that an EIS "…include reasonable alternatives not within the jurisdiction of the lead agency" (40 CFR 1502.14(c)) (see section **6.6.1, *Reasonable Alternatives***). When there are multiple agencies cooperating to develop one EIS for several agency-specific decisions, the alternatives should be developed to ensure that each agency will be able to develop its ROD from the FEIS.

9.2.7.2 Features Common to All Alternatives

Describe features that are common to all alternatives. These features need only be described in detail once. For example, identify common features in the description of the proposed action and cross-reference to that description in the discussion of each alternative to which they apply. Another option is to describe common features under a separate heading.

Common features typically include standard operating procedures and other BLM requirements prescribed by law, regulation or policy. This may also include a description of relevant laws, regulations, required permits, licenses, or approvals.

For a land use plan amendment or revision we recommend that you include management direction carried forward from the existing plan.

9.2.7.3 Agency Preferred Alternative

> Note that BLM planning regulations at 43 CFR 1610.4–7 require identification of the preferred alternative in a draft EIS for a resource management plan.

The CEQ regulations at 40 CFR 1502.14(e) direct that an EIS "...identify the agency's preferred alternative or alternatives, if one or more exists, in the draft statement and identify such alternative in the final statement unless another law prohibits the expression of such a preference." The preferred alternative may be identified in an explanatory cover letter to the draft EIS or within the text. The final EIS must identify the preferred alternative unless another law prohibits the expression of such a preference. Publication of an EIS without identifying the preferred alternative must be approved by the OEPC and the Office of the Solicitor (516 DM 4.10(b)(3)).

The identification of a preferred alternative does not constitute a commitment or decision in principle, and there is no requirement to select the preferred alternative in the ROD. The identification of the preferred alternative may change between a draft EIS and final EIS. Various parts of separate alternatives that are analyzed in the draft can also be "mixed and matched" to develop a complete alternative in the final as long as the reasons for doing so are explained. Selection in the ROD of an alternative other than the preferred alternative does not require preparation of a supplemental EIS if the selected alternative was analyzed in the EIS. In any case, you must provide the rationale for selection in the ROD (40 CFR 1502(b)).

When an EIS is prepared jointly, the lead agency with responsibility for preparing the EIS and ensuring its adequacy is responsible for identifying the agency's preferred alternative (see Question 4c, CEQ, *Forty Most Asked Questions Concerning CEQ's NEPA Regulations, March 23, 1981*). Whereas the BLM must work with cooperators and other interested parties to encourage consensus on a preferred alternative, the preferred alternative in the EIS represents the preference of the lead agency. Cooperators and other interested parties can express their preferences through scoping and comments on the draft EIS. The BLM will occasionally prepare an EIS with another Federal agency as "joint lead" agencies (40 CFR 1506.2(b)). In such circumstances, the joint lead agencies must work towards reaching consensus about the preferred alternative. If consensus cannot be reached, we recommend that each joint lead agency clearly identify their preferred alternative and explain the basis for their preference and why consensus could not be reached. (See section **12.2, *Joint Lead Agencies in Development of NEPA Documents*).**

The proposed action may be, but is not necessarily, the BLM's preferred alternative. For internally proposed actions implementing the LUP, the proposed action will often end up as the BLM's preferred alternative. For external proposals or applications, the proposed action may not turn out to be the BLM's preferred alternative, because the BLM will often present an alternative that would incorporate specific terms and conditions on the applicant.

9.2.8 Chapter 3—Affected Environment

You must provide brief description of the environment likely to be affected by the proposed action or alternatives. Limit the description of the affected environment to that information relevant to understanding the effect(s) of the proposed action or alternative (see sections **6.7.1, *Affected Environment*** and **6.7.2, *Use of Relevant Data***). You may present the affected environment description as its own section, or combined with environmental effects.
If the EIS will be used to document compliance with any supplemental authorities, some of which are listed in **Appendix 1, *Supplemental Authorities to be Considered***, it may be necessary to provide a description of the resources of concern.

9.2.9 Chapter 4—Environmental Effects

The EIS must describe and provide the analysis of environmental effects of the proposed action and each alternative analyzed in detail (40 CFR 1502.16). Describe the assumptions and assessment criteria used in analyzing impacts. Identify any time-frames, rates of change, and other common data applied to the analysis. Explain assumptions used when information critical to the analysis was incomplete or unavailable. Include relevant reasonably foreseeable development scenarios for certain programmatic EISs and for cumulative effects analysis. See section **6.8.1.2, *Analyzing Effects*** for a discussion of when methodologies must be discussed in the main text and when they may be placed in an appendix. See section **6.7.2, *Use of Relevant Data***, for a discussion of incomplete or unavailable information.

> "The discussion will include the environmental impacts of the alternatives including the proposed action, any adverse environmental effects which cannot be avoided should the proposal be implemented, the relationship between short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and any irreversible or irretrievable commitments of resources which would be involved in the proposal should it be implemented" (40 CFR 1502.16).

Discussion of impacts may either be organized by alternative with impact topics as subheadings or by impact topic with alternatives as subheadings. Generally, if impacts to a particular resource for one alternative are the same as another alternative, make reference to that section in the EIS rather than repeating the information.

Based on the effects analysis in this chapter, develop a summary comparison of effects by alternative and include the summary in the section that describes the alternatives in Chapter 2. You must describe direct, indirect, and cumulative impacts of each alternative (40 CFR 1508.25(c)). We recommend that you quantify the effects analysis as much as possible and describe effects in terms of their context, duration, and intensity. Base the analysis of impacts on the assumption that all standard operating procedures and other standard BLM-wide requirements will be followed in implementing the proposed action and alternatives unless changes in such practices are specifically being addressed in the analysis or considered in an alternative.

You must consider long-term impacts and the effect of foreclosing future options. Describe the relation between short-term uses of the environment and the maintenance and enhancement of long-term productivity, and any irreversible or irretrievable commitments of resources that would be involved in the proposal if it is implemented (40 CFR 1502.16).

All "relevant, reasonable mitigation measures that could improve the project are to be identified," even if they are outside the jurisdiction of the agency (See Question 19b, CEQ, *Forty Most Asked Questions Concerning CEQ's NEPA Regulations, March 23, 1981*). See section **6.8.4, *Mitigation and Residual Effects***, for more discussion of mitigation measures including the difference between these measures and design features of the alternatives. If mitigation measures are identified, those measures must be analyzed "even for impacts that by themselves would not be considered significant" (See Question 19a, CEQ, *Forty Most Asked Questions Concerning CEQ's NEPA Regulations, March 23, 1981*). Analyze and compare the effectiveness of mitigation measures proposed and the effects if the project were to proceed without mitigation. Include an assessment of any residual direct, indirect, or cumulative effects that will remain after application of the mitigation measures.

Question 5b, CEQ, *Forty Most Asked Questions Concerning CEQ's NEPA Regulations, March 23, 1981.*

5b. Is the analysis of the "**proposed action**" in an EIS to be treated differently from the analysis of alternatives?

A. The degree of analysis devoted to each alternative in the EIS is to be substantially similar to that devoted to the "proposed action." Section 1502.14 is titled "Alternatives including the proposed action" to reflect such comparable treatment. Section 1502.14(b) specifically requires "substantial treatment" in the EIS of each alternative including the proposed action. This regulation does not dictate an amount of information to be provided, but rather, prescribes a level of treatment, which may in turn require varying amounts of information, to enable a reviewer to evaluate and compare alternatives.

9.2.10 Chapter 5 - Consultation and Coordination

Include a brief history of the public involvement (including scoping) undertaken, a list of agencies (including cooperating agencies) and organizations consulted, a list of preparers and their expertise, and a list of recipients of the EIS. In the final EIS, include a response to comments section.

9.2.10.1 Public Involvement and Scoping

- Summarize the scoping process, including efforts to involve the public in preparation of the EIS. Briefly describe the scoping meetings (when, where, how many, topics), the major issues that arose during scoping if they have not been discussed in Chapter 1, and the comments received.
- Include names of any Federal, State, or local agencies, major organizations or individuals consulted.
- Identify any unresolved environmental issues or conflicts discussed during scoping.
- Include a list of all agencies, organizations, and people to whom you will send copies. This list may be organized alphabetically under "Federal agencies," "State and local agencies," "Indian tribes," "organizations," and "individuals." If this list of individuals is excessively long, you may place it in the administrative record instead of the EIS, but note in the EIS that a complete list is found in the administrative record. In the final EIS, provide an updated list of recipients, as necessary, to indicate who will be receiving the final EIS.

Although not required, you may find it to be useful to provide a discussion of the government-to-government consultation process that was followed during the EIS process. The BLM Handbook H-8120-1 contains examples of program guidance for Native American consultation, and the BLM Manual 8120, *Tribal Consultation Under Cultural Resources*, provides detailed guidance for this consultation. See the Web Guide for a copy of H-8120-1.

9.2.10.2 List of Preparers

The EIS must include a list of individuals, including names and qualifications, primarily responsible for preparing the document or significant supporting reports (40 CFR 1502.10(h) and 40 CFR 1502.17).

9.2.11 Other Material

- The last section of the EIS may include a bibliography, glossary, index of key words, and appendices.
- The bibliography includes a list of references cited in the EIS, including written material and personal communications.
- Define in a glossary, using plain language, any technical or other terms not understandable to an average lay reader. Either in the glossary or in a separate list define any acronyms used in the EIS.
- You must include an alphabetically ordered index that contains enough key words from the EIS to allow the reader to find the information (see Questions 26a and 26b, CEQ, *Forty Most Asked Questions Concerning CEQ's NEPA Regulations*, *March 23, 1981*).
- Appendices are for support of critical analyses in the EIS. An appendix is not a data bank or library for total reference support, but contains only major substantiating data, essential relevant descriptions of environmental components, or other information necessary for complete use of the EIS for analytical or decision-making purposes. You

may keep other supporting material in the administrative record and make it available if requested, instead of including it as an appendix.

9.3 ISSUING THE DRAFT EIS

Once approved, print the draft EIS, file it with the Environmental Protection Agency (EPA), and issue it for public review and comment. See **Chapter 13, *Administrative Procedures***, for information on printing the draft EIS.

9.3.1 File with the EPA

File the draft EIS with the EPA in accordance with procedures identified in Chapter 13. The EPA will then publish notice of the filing in the *Federal Register*. The date the EPA notice appears in the *Federal Register* initiates the public review period. Consult program-specific guidance for additional requirements regarding filing procedures.

9.3.2 Notify the Public and Government Agencies of the Availability of the Draft EIS for Review and Comment

You must provide public notification of the availability of the draft EIS, and that notification must include publication of a notice of availability (NOA) in the *Federal Register* for actions with effects of national concern (40 CFR 1506.6(b)). You must publish an NOA in the *Federal Register* for a draft EIS prepared for a LUP or LUP amendment (*BLM Land Use Planning Handbook H-1601-1*). The CEQ regulations at 40 CFR 1503.1 require that the BLM obtain comments from Federal agencies with jurisdiction by law or special expertise; and that we request comments from appropriate State and local agencies, tribes, and any agency that requests a copy of the EIS). There are no content or format requirements for an NOA other than those associated with the preparation of notices for publication in the *Federal Register* (see section **13.1, *Publishing Notices in the* Federal Register**). In addition to announcing the availability of a document and the public review period, where applicable, the NOA will generally identify the purpose and need of the action, describe the proposed action and alternatives, and indicate the dates and location of public meetings on the document. Consult program-specific guidance for any other content requirements. A sample notice is shown in **Appendix 11, *Federal Register Illustrations***. Sample NOAs for draft and final EISs are available in the Web Guide. Check with your State NEPA coordinator and Public Affairs Chief for information about the appropriate documentation to include with your NOA. Public affairs will also assist with procedures for notifying appropriate members of the Congressional Delegation from your State.

The public comment period for all draft EISs must last at least 45 days (516 DM 4.26), but some programs require longer comment periods. For example, a draft EIS for a LUP or LUP amendment must be available for a 90-day comment period (*BLM Land Use Planning Handbook H-1601-1,* page 23). Check program guidance requirements.

A press release is usually prepared for national media, local media, or both to announce the availability of the draft and to announce any public meetings or hearings.

9.3.3 Distribute the Draft EIS

> "Agencies shall circulate the entire draft and final environmental impact statements except for certain appendices as provided in Sec. 1502.18(d) and unchanged statements as provided in Sec. 1503.4(c). However, if the statement is unusually long, the agency may circulate the summary instead, except that the entire statement shall be furnished to:
>
> (a) Any Federal agency which has jurisdiction by law or special expertise with respect to any environmental impact involved and any appropriate Federal, State or local agency authorized to develop and enforce environmental standards.
> (b) The applicant, if any.
> (c) Any person, organization, or agency requesting the entire environmental impact statement.
> (d) In the case of a final environmental impact statement any person, organization, or agency which submitted substantive comments on the draft.
>
> If the agency circulates the summary and thereafter receives a timely request for the entire statement and for additional time to comment, the time for that requestor only shall be extended by at least 15 days beyond the minimum period" (40 CFR 1502.19).

Distribute the draft EIS before or on the same day copies are transmitted to the EPA for filing (see section **13.3.2, *Procedures for Filing with the EPA*** for more discussion). Provide two copies to the BLM Library at the National Science and Technology Center in Denver and two copies to the BLM Planning Office in Washington, D.C. (WO-210). The standard distribution of EISs to other Interior and Federal agencies is described in the Web Guide. You must make copies available to any requesting party (40 CFR 1505.5(f)). Make sufficient copies available for review in appropriate BLM offices, including the State Office, and for distribution to those who request a copy during the review period. The use of Web sites to distribute draft and final EISs and RODs is encouraged, as is the use of compact disks or other electronic media. However, do not underestimate the number of paper copies that will be needed; there are still many people who will want a paper copy. The State NEPA coordinator can provide guidance on this process. The BLM may charge requesting parties the cost of production for a document copy in a particular format or in multiple copies.

9.3.4 Public Meetings and Hearings

You may hold public meetings or hearings to receive comments on the draft EIS. (See section **6.9.1, *Involving and Notifying the Public***). You must maintain records of public meetings and hearings including a list of attendees (as well as addresses of attendees desiring to be added to the mailing list) and notes or minutes of the proceedings. Consult 455 DM 1 for procedural requirements related to public hearings. Check individual program guidance to determine requirements for public meetings and hearings. See section **6.9.2, *Comments***, for a discussion of how to manage and process comments on the draft.

9.4 THE FINAL EIS

Following public review of the draft EIS, the lead agency prepares a final EIS (unless a decision is made to terminate the EIS).

9.4.1 Abbreviated Final EIS

In deciding whether an abbreviated EIS is appropriate, consider the extent of the changes made to the EIS as a result of comments on the draft. If you make only minor changes to the draft EIS in response to comments, then you may prepare an abbreviated final EIS. An abbreviated final EIS only contains a cover sheet, an explanation of the abbreviated EIS, copies of substantive comments received on the draft, responses to those comments, and an *errata* section with specific modifications and corrections to the draft EIS made in response to comments (40 CFR 1503.4). Abbreviated EISs require that the reader have access to both the draft and the final EIS. Because a draft EIS is usually required to understand changes in an abbreviated EIS, send the appropriate number of draft EISs with the abbreviated final EIS to the EPA when filing the final. See the Web Guide for examples of abbreviated EISs.

9.4.2 Full Text Final EIS

If you make major changes to the draft EIS, the final EIS should be a complete full text document. The content of a full text document is substantially the same as the corresponding draft EIS except that it includes copies of substantive comments on the draft EIS, responses to those comments and changes in or additions to the text of the EIS in response to comments (40 CFR 1503.4). A full text final EIS may incorporate by reference some of the text or appendices of the draft EIS (see section **5.2.1, *Incorporation by Reference***).

9.5 SUPPLEMENTS TO DRAFT AND FINAL EISs

See section **5.3, *Supplementing an EIS***, for a discussion of when to supplement a draft or final EIS. The standard procedural and documentation requirements for preparing an EIS described in this chapter also apply to supplementing an EIS, with the following exceptions:

- Additional scoping is optional (40 CFR 1502.9 (c)).
- We recommend that the supplemental EIS identify the EIS being supplemented on the cover page, and explain the relationship of the supplement to the prior analysis early in the text.
- We recommend that the supplemental EIS identify the changes in the proposed action or the new information or changed circumstances that require the BLM to prepare the supplement.

- The OEPC and the Office of the Solicitor must be consulted before proposing to the CEQ to prepare a final supplement without preparing an intervening draft (516 DM 4.5(B)).

You must circulate a supplement in the same manner as a draft or final EIS (40 CFR 1502.9(c)). If there is good reason to believe the interested and affected public will have a copy of the draft or final EIS, you only need to circulate the supplement. If you do not circulate the EIS being supplemented with the supplement, it must be reasonably available for public inspection (40 CFR 1506.6(f)).

9.6 ISSUING THE FINAL EIS

Once the final EIS is prepared, print it, file it with the EPA, and distribute it to the public. (See **Chapter 13, *Administrative Procedures*** for guidance on printing, filing, and distributing the EIS.) You must provide public notification of the availability of the final EIS, and that notification must include publication of a notice of availability (NOA) in the *Federal Register* for actions with effects of national concern (40 CFR 1506.6(b)). You must publish an NOA in the *Federal Register* for a final EIS prepared for a LUP or LUP amendment (*BLM Land Use Planning Handbook H-1601-1*). (See section **13.1, *Publishing Notices in the Federal Register*** for guidance on publishing notices). The State NEPA coordinator and Public Affairs Chief can provide information about the appropriate documentation to include with an NOA. The date the EPA notice appears in the *Federal Register* initiates the required minimal 30-day availability period. Although this is not a formal public comment period, you may receive comments. Also note that while you may have requested comment from agencies with jurisdiction by law or special expertise, you do not need to delay preparation and issuance of the final EIS when such agencies do not comment within the prescribed timeframe (516 DM 4.19(A)).

9.6.1 Comments Received Following Issue of the Final EIS

Any comments received may be addressed in the ROD. However, review any comments on the final EIS, to determine if they have merit; for example, if they identify significant new circumstances or information relevant to environmental concerns and bear upon the proposed action. If so, the decision-maker preparing the EIS must determine whether to supplement the draft or the final EIS or if minor changes can be made to the existing EIS. Refer to section **9.5, *Supplements to Draft and Final EISs***, when supplementing a draft or final EIS. Check program guidance for additional review requirements. For example, there is a 60-day Governor's consistency review requirement for LUPs (*BLM Land Use Planning Handbook H-1601-01,* pages 24-25).

9.7 ISSUING THE RECORD OF DECISION

A ROD is prepared to document the selected alternative and any accompanying mitigation measures. The ROD is must be signed by the decision-maker. The ROD may be integrated with any other record prepared by the BLM (40 CFR 1505.2). Examples would be findings for floodplains required by E.O.11988 and for wetlands required by E.O. 11990. No action concerning a proposal may be taken until the ROD has been issued, except under conditions specified in 40 CFR 1506.1 (see section **1.4, *The NEPA Approach***).

Except as described below, the ROD cannot be issued until the later of the following dates:

- 90 days after the publication of the EPA's notice of filing of the draft EIS.
- 30 days after publication of the EPA's notice of filing of the final EIS (40 CFR 1506.10(b)).

You must provide public notification of the availability of the ROD, and that notification must include publication of a notice of availability (NOA) in the *Federal Register* for actions with effects of national concern (40 CFR 1506.6(b), Question 34a, CEQ, *Forty Most Asked Questions Concerning CEQ's NEPA Regulations, March 23, 1981*). You must provide a copy of the ROD to those who have requested it (40 CFR 1506.6(b), Question 34a, CEQ, *Forty Most Asked Questions Concerning CEQ's NEPA Regulations, March 23, 1981*). We recommend that you provide a copy of the ROD to substantive commenters on the draft or final EIS and to others known to have a strong interest in the proposal(s). Generally, the funding office in Washington will specify WO or other distribution requirements. For example, a copy of the decision documents for LUPs or plan amendments must be provided to WO-210 (Planning and Science Policy). Consult program-specific guidance for additional requirements on the distribution of RODs or records which incorporate RODs.

If the decision is subject to 30-day appeal to the Interior Board of Land Appeals (IBLA), then the ROD may be issued at the same time the final EIS is filed (40 CFR 1506.10(b)). This allows both 30-day periods to run concurrently. If the ROD is issued at the same time the final EIS is filed, the EIS must identify and explain the appeal provisions. If the ROD is issued in full force and effect, then it cannot be issued until 30 days after publication of the EPA's notice of filing the final EIS (40 CFR 1506.10(b)(2)).

Consult program specific guidance for any additional requirements regarding protest and appeal procedures and preparation of RODs.

9.7.1 ROD Format

A suggested format which satisfies the ROD content requirements specified in 40 CFR 1505.2, is provided below. The Land Use Planning Handbook provides a recommended format for planning-related RODs. There is also an example of a ROD in the Web Guide.

Introductory Material. A cover sheet that provides introductory material may be prepared. This includes the title, project or case file identification number, preparing office and office location, cooperating agencies, signatures, date of signatures, and titles of the responsible and concurring officials.

Summary. A summary is needed only if the ROD exceeds 10 pages.

Decision. Include a concise description of the approved action. Identify all important aspects of details of the decision. Provide a clear description of what is and what is not being approved. Attach to the ROD stipulations and other design features that are part of the decision or incorporated by reference. Present any committed mitigation measures and related monitoring and enforcement activities, if any, for the selected alternative (see **Chapter 10, *Monitoring***). Indicate whether all practicable mitigation measures have been adopted. You must identify any mitigation measures which were not selected with a brief explanation of why such measures were not adopted (40 CFR 1505.2(a)).

Alternatives. Identify all of the alternatives considered. When it is necessary to summarize the alternatives, thematic descriptions including major aspects may be helpful. You must identify the the environmentally preferable alternative in this section (40 CFR 1505.2 (b)). The environmentally preferred alternative best promotes the national environmental policy in Section 101 of the NEPA. This is ordinarily the alternative that causes the least damage to the biological and physical environment and best protects, preserves and enhances the resources that are present. (See Question 6a, CEQ, *Forty Most Asked Questions Concerning CEQ's NEPA Regulations*, *March 23, 1981*).

Management Considerations. Provide the rationale for the decision. Discuss factors which were important and relevant to the decision (40 CFR 1505.2 (b)). Explain how the alternatives respond to the purpose and need for the action.

Public Involvement. Briefly describe efforts to seek public views throughout the EIS process.

9.8 Terminating the EIS Process

When you terminate the EIS process without completing a Record of Decision, complete your administrative record, documenting the reason or reasons for aborting the process. Publish a notice in the *Federal Register*, referencing the relevant Notice of Intent to prepare the EIS and stating that you are terminating the EIS short of completion. If you have already published a draft EIS, we recommend that you inform all who commented on the draft that you are ending the process and briefly explain why.

CHAPTER 10—MONITORING

GENERAL

Monitoring can provide important information, including whether decisions were implemented as designed, their effectiveness in achieving desired outcomes and the effectiveness of mitigation measures. Monitoring can also determine whether the impact analysis was accurate. In certain instances, as described below, monitoring is required.

10.1 PURPOSES OF AND REQUIREMENTS FOR MONITORING

The level and intensity of monitoring varies according to the purpose being served. In developing a NEPA-related monitoring program, carefully consider the following purposes of monitoring.

To Ensure Compliance with Decisions

We recommend monitoring to ensure that actions taken comply with the terms, conditions, and mitigation measures identified in the decision. This monitoring may identify underlying reasons for non-compliance. You must provide compliance monitoring where mitigation measures are required to reach a FONSI.

To Measure the Effectiveness or Success of Decisions and the Accuracy of Analysis

While not required by the NEPA, monitoring can be implemented to determine if the decisions are achieving intended environmental objectives, and whether predicted environmental effects were accurate. This could include the validation of conceptual models and assumptions used in the analysis.

To Determine How to Modify Decisions if the Purpose and Need or Desired Outcomes Are Not Being Achieved.

If decisions are not meeting the purpose and need or achieving desired outcomes, monitoring may be used to identify necessary changes.

In a record of decision (ROD), a monitoring and enforcement program shall be adopted and summarized where applicable for any mitigation (40 CFR 1505.2(c)). The ROD must identify the monitoring and enforcement programs that have been selected and plainly indicate that they were adopted as part of the agency's decision (see Question 34c, CEQ, *Forty Most Asked Questions Concerning CEQ's NEPA Regulations, March 23, 1981*). The ROD must delineate the monitoring measures in sufficient detail to constitute an enforceable commitment, or incorporate by reference the portions of the EIS that do so (see Question 34c, CEQ, *Forty Most Asked Questions Concerning CEQ's NEPA Regulations, March 23, 1981*).

The decision record on an EA may also impose requirements for mitigation and related monitoring and enforcement activities. Monitoring activities which are adopted in a decision record must be implemented as specified.

In situations where there is incomplete or unavailable information relevant to reasonably foreseeable significant adverse impacts essential to a reasoned choice among alternatives, and it is not feasible to obtain that information prior to making a decision, we recommend that you establish a monitoring program to assess resources or values that may be impacted in order to determine if subsequent action needs to be taken.

We recommend that you coordinate monitoring that stems from the NEPA analysis process with other BLM monitoring activities. The BLM Manual 1734 - Inventory and Monitoring Coordination, provides additional guidance on the BLM's inventory and monitoring programs.

10.2 DEVELOPING A MONITORING PLAN OR STRATEGY

Except for monitoring activities specifically addressed in the decision document, the responsible manager has discretion in scheduling monitoring activities, determining monitoring approaches or methodologies, and establishing monitoring standards. We recommend a written monitoring plan that incorporates monitoring schedules, approaches, and standards. Consider Bureau-wide and program specific monitoring policies and strategies in developing a monitoring plan (see BLM Manual 1734, Inventory and Monitoring Coordination).

We recommend that you consider the following factors when developing a monitoring plan.

Coverage – We recommend that you tailor the scope of monitoring activities to meet the intended purpose of monitoring. *For example, monitoring activities may be limited to determining if the action is implemented as planned (compliance monitoring), or they may be designed to also include determination of whether the action is meeting goals and objectives (effectiveness monitoring).*

Frequency – The establishment of specific time frames are recommended for each monitoring activity.

Intensity/Complexity – The intensity and complexity of monitoring activities will vary according to the issues at hand and with the purpose of the monitoring. *For example, compliance monitoring to determine if an action is being implemented as described in the decision document may be relatively simple. However, determining whether implementation of an action is achieving complex ecological objectives, would involve more complex monitoring techniques and analysis.*

10.3 IMPLEMENTING MONITORING

It is important that managers establish priorities for implementing monitoring activities. The following are situations or circumstances that warrant high priority for monitoring and that should be considered in determining important cases:

- A ROD adopts mitigation measures to reduce environmental impacts (monitoring required).
- Decisions authorize actions involving new or untested procedures or methods, or involve a high degree of uncertainty regarding the effects of the procedure or method.
- Effects are based on incomplete or unavailable information.
- Uncertainty exists about the interactive effects of multiple resources or uses.
- The decision may affect highly sensitive or important resource values.

> Agencies may provide for monitoring to assure that their decisions are carried out and should do so in important cases (40 CFR 1505.3).

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CHAPTER 11—AGENCY REVIEW OF ENVIRONMENTAL IMPACT STATEMENTS

11.1 OBTAINING COMMENTS ON YOUR EIS

When preparing an EIS, you must obtain the comments of any Federal agency which has jurisdiction by law or special expertise with respect to any environmental impact involved (40 CFR 1503.1(a)(1)). We recommend responding to comments from these agencies, even if the comments are untimely. However, you do not need to delay the preparation and issuance of a final EIS when such agencies do not comment within the prescribed timeframe (516 DM 4.19(A)).

11.2 COMMENTING ON ANOTHER FEDERAL AGENCY'S EIS

When the BLM has jurisdiction by law or special expertise with respect to a project's environmental impacts, the BLM must comment on the EISs of other Federal agencies (40 CFR1503.2). The BLM may be asked to review or provide comment on other environmental documents as well. If the BLM does not have comments on an EIS where it has jurisdiction by law or special expertise, it must reply to that effect. (Generally, if the BLM has jurisdiction by law or special expertise, the BLM will be a cooperating agency in the NEPA process. See **Chapter 12, *Cooperating Agencies, Joint Lead Agencies, and Advisory Committees.***)

The OEPC coordinates review of other agencies' EISs and assigns agency responsibilities for review. This includes setting the schedule for review and requesting extensions.

When a cooperating agency comments on a BLM document, or when the BLM is a cooperating agency, the comment must (40 CFR 1503.3):

- describe alternative methods for analyzing impacts if it criticizes methodology in the EIS.
- specify mitigation measures it finds acceptable if it criticizes the level of impact.

Guidance for reviewing and commenting on NEPA documents that are prepared by other agencies but that may affect BLM-managed resources is provided in 516 DM 7. This chapter of the manual describes the roles and responsibilities of the Department and agencies, how different reviews are handled, and the content and process for performing such reviews.

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CHAPTER 12—COOPERATING AGENCIES, JOINT LEAD AGENCIES, AND ADVISORY COMMITTEES

GENERAL

This chapter discusses means for consulting with and obtaining the views of appropriate entities as part of the NEPA process.

12.1 COOPERATING AGENCY STATUS IN DEVELOPMENT OF NEPA DOCUMENTS

The CEQ regulations (40 CFR 1501.6) provide for and describe both lead and cooperating agency status, and emphasize agency cooperation early in the NEPA process. Upon request of the lead agency, any other Federal agency which has "jurisdiction by law" shall be a cooperating agency. Jurisdiction by law means the other agency has authority to approve, veto, or finance all or part of the proposal (40 CFR 1508.15). *For example, the Federal Communication Commission approves applications for BLM communication facilities and has NEPA procedures (47 CFR 1.1301 to 1.1319) for the preparation of environmental documents associated with such applications. The BLM or FCC may participate as either lead or cooperating agency in the preparation of these documents. You must contact FCC and agree on appropriate lead and cooperating agency status.*

In addition, any other Federal agency which has "special expertise" with respect to any environmental issue which will be addressed by the NEPA analysis may participate as a cooperating agency. Special expertise means "...statutory responsibility, agency mission, or related program experience" (40 CFR 1508.26). When the BLM is a lead agency, another agency may request that we designate it a cooperating or joint lead agency. Any State, tribal, or local agency with jurisdiction by law or special expertise may by agreement be a cooperating agency (40 CFR 1508.5; 516 DM 2.5c). Cooperating agency status is most commonly applied to preparation of an EIS, but may also be applied to an EA (DM ESM02-2).

> The BLM publication "A Desk Guide to Cooperating Agency Relationships" (2005) defines the lead agency–cooperating agency relationship and explores ways to create more effective government partnerships in the preparation of NEPA documents and land use plans.

Requirements for working with cooperating agencies were added to the BLM's planning regulations in 2005 (43 CFR 1601.0-5, 1610.3-1, and 1610.4). Our Land Use Planning Handbook (H-1601-1) provides additional guidance for collaborative planning and preparation of an EIS or EA for approval, amendment, or revision of an LUP.

12.1.1 When Another Agency is Cooperating in Preparation of a NEPA Analysis Document with the BLM as a Lead

You must invite eligible governmental entities (Federal, State, local, and tribal) to participate as cooperating agencies when preparing an EIS (516 DM 2.5(e)). You must also consider any requests by eligible governmental entities to participate as a cooperating agency with respect to a particular EIS, and will either accept or deny such requests. If such a request is denied, the BLM will inform the other agency and state in writing, within the EIS, the reasons for such denial. Throughout the preparation of an EIS, you must collaborate, to the fullest extent practicable, with all cooperating agencies, concerning those issues relating to their jurisdiction or special expertise (516 DM 2.5(f)). Prepare a Memorandum of Understanding (MOU) with any cooperating agency, clearly defining the roles and responsibilities of each agency.

12.1.2 When the BLM is Cooperating in Preparation of a NEPA Analysis Document With Another Agency as Lead

Functioning as a cooperating agency in preparation of an EIS or EA provides you several advantages:

- You may adopt the EIS without recirculating it when, after an independent review of the analysis, you conclude that your comments and suggestions have been satisfied (40 CFR 1506.3(c)).
- You, and the lead agency, may save staff time and dollars when compared to each agency preparing its own document.
- You can ensure that the NEPA analysis document meets all Departmental and BLM requirements or standards.
- Expanding the scope of a NEPA analysis to consider connected and cumulative actions of all cooperating agencies into a single document improves overall interagency coordination.
- Agencies working cooperatively help the public to participate effectively and efficiently. The public involvement in the NEPA process takes place in the larger context of multiple agencies. Thus, the public can better understand the entire scope of a proposal, rather than being presented with a piece of it now and another piece later. The public can participate effectively with fewer meetings to attend and letters to write.
- You can ensure that the NEPA analysis specifically addresses the action that you must consider before making your decision. This avoids the struggle to adapt another agency's documentation to fit our proposed action.

12.1.3 Deciding Whether to be a Cooperating Agency

When another Federal agency intends to prepare a NEPA analysis document, and you have a related decision to make, formally ask to be a cooperating agency as early as possible. You must notify the OEPC of either the acceptance or rejection of a cooperating agency request (516 DM 2.5(B)).

If another agency asks you to be a cooperating agency in preparation of a NEPA document for an action in which the BLM has *jurisdiction by law*, you must be a cooperating agency (40 CFR 1501.6).

If another agency asks you to be a cooperating agency in preparation of a NEPA analysis document in which the BLM has *special expertise*, you may elect to be a cooperating agency. In deciding, consider what resources you have to commit to the document preparation.

12.1.4 Procedures for Working as a Cooperating Agency

An interagency memorandum of understanding (MOU) between the BLM and the lead agency must be prepared (516 DM 2.5(G)). It must identify a BLM contact and specify any special resource needs, data requirements, and issues that need to be addressed in the analysis. The MOU must also identify the responsibilities of the lead and cooperating agencies (a sample MOU is in the Web Guide).

We recommend that the BLM be identified as a cooperating agency in the notice of intent (NOI) published in the *Federal Register*, and that the BLM be identified as a cooperating agency in the NEPA analysis document, preferably on the cover sheet.

After adopting the NEPA document, the BLM must issue its own decision (and FONSI for an EA) (Questions 30, CEQ, *Forty Most Asked Questions Concerning CEQ's NEPA Regulations, March 23, 1981*), *CEQ Guidance Regarding NEPA Regulations*, 48 Fed. Reg. 34263 (July 28, 1983)) (see section **5.4, *Adopting Another Agency's NEPA Analysis***). This may be done in an individual decision document or in a decision document signed by more than one agency, as long as it is clear that only the BLM decision-maker is making a decision regarding resources under BLM authority.

12.2 JOINT LEAD AGENCIES IN DEVELOPMENT OF NEPA DOCUMENTS

In order to eliminate duplication while satisfying NEPA and comparable State and local requirements, the CEQ regulations (40 CFR 1506.2(b)) encourage Federal agencies to be joint leads with State and local agencies. When two agencies have approximately equal pieces of a proposal being considered and want to make this situation clear to their respective partners, they may agree to be joint lead agencies.

A Memorandum of Understanding (MOU) must be signed by both agencies, clearly defining the roles and responsibilities of each (516 DM 2.5(G)). Only one agency must be identified as the agency responsible for filing the EIS with the EPA.

We recommend that the agencies be identified as joint lead agencies in the NOI and in the NEPA documents. We recommend that the cover sheet clearly identify the joint leads, and the logos of both agencies be displayed on the cover of the NEPA documents.

We recommend that an EIS preparation plan be developed and signed by both agencies, and identify such things as: the decisions to be made by each agency, the make up of the core team and ID team and their responsibilities, estimated budget and financial obligations of each agency, review responsibilities, and tentative schedules.

You must issue your own ROD for an EIS, and your own FONSI and decision record for an EA. (Questions 30, CEQ, *Forty Most Asked Questions Concerning CEQ's NEPA Regulations, March 23, 1981*), *CEQ Guidance Regarding NEPA Regulations, 48 Fed. Reg. 34263 (July 28, 1983)*) This applies to any Federal lead or cooperating agency, and all other cooperating agency procedures apply as well. This may be done in an individual decision document or in a decision document signed by more than one agency, as long as it is clear that only the BLM decision-maker is making a decision regarding resources under BLM authority.

12.3 WORKING WITH ADVISORY COMMITTEES AND THE FEDERAL ADVISORY COMMITTEE ACT

The Federal Advisory Committee Act (FACA) was enacted to reduce narrow special-interest group influence on decision-makers, to foster equal access to the decision-making process for the general public, and to control costs by preventing the establishment of unnecessary advisory committees. The FACA applies whenever a statute or an agency official establishes or uses a committee, board, commission or similar group for the purpose of obtaining advice or recommendations on issues or policies within the agency official's responsibility.

See H-1601-1, Appendix B for determining when the FACA applies, FACA requirements, and avoiding violations of the FACA. More in-depth information can also be found in the BLM FACA Guidebook, available from the BLM ADR (Alternative Dispute Resolution) and Conflict Prevention Program, in hard copy and online at www.blm.gov/adr.

12.3.1 Guidance for Meeting With Groups

If participants with the BLM in a collaborative group are solely Federal, State, tribal, or local government employees operating in their official capacities, the group is exempt from the administrative requirements of the FACA.

If participants include nongovernmental members and they will meet regularly or formally, there are a number of circumstances that will require a FACA charter.

The BLM's managers and staff must understand the provisions of the FACA both when they are gathering public input for decision-making processes and when they are working in collaborative efforts. In essence, any time a group will be consulted or will be providing recommendations to a BLM official, the BLM should verify whether the FACA applies and, if so, ensure that the FACA requirements are followed.

- The BLM establishes, manages, or controls the group. A FACA charter is usually necessary if the BLM will be making decisions on or otherwise controlling group membership, sending out meeting invitations, or hosting the meeting.

- The BLM also manages or controls the group's agenda, takes a leadership role in the group, and facilitates the meetings. Funding the group or holding a disproportionate number of the group's meetings on BLM property may also be seen as indicators of management or control.

- A FACA charter may be necessary if the BLM is seeking group advice or specific group recommendations to the agency from a nongovernmental group.

If the BLM wishes to have a central role in the formation and agenda of the group, consider pursuing a charter for a FACA committee. Refer to the Office of the Solicitor for additional information.

To avoid the need for a FACA charter, publicize the meetings of the group, and open group membership to all.

Meetings of collaborative community working groups should adhere to general open government criteria. For example: *invite the public to meetings; publish timely notice in local forums; accept public comments; and keep records of group meeting minutes, attendance, and other documents used by the group.* Even when meetings with other governmental agencies are exempt from the FACA, BLM employees should be aware of State "open meetings" laws or similar County ordinances. For example, *an LUP strategy session attended by BLM representatives and a quorum of County Commissioners may need to be open to the public.*

12.3.2 Alternatives to Chartered Groups

- The BLM can establish a working group with solely governmental entities—other Federal, State, tribal, and local government employees working in their official capacities.

- One of the non-Federal entities involved can take the lead in organizing and setting up the group. The FACA only applies to Federal agencies, so if a tribal, State, county, or local agency or public interest group is willing to put the collaborative group together, control membership, and set up meetings, the BLM can participate without violating the FACA.

- In some situations, the BLM can form a working group as a subcommittee of a preexisting Resource Advisory Committee (RAC) or other FACA-chartered advisory committee. Make sure the working group always reports to the RAC or chartered committee and not directly to the BLM.

- Sometimes group advice is not the desired outcome— the BLM only needs input from a variety of public stakeholders. Or sometimes the BLM needs to educate the community about its programs and decisions. Here, the best approach may be to hold town hall-style meetings with open public participation. Such meetings will not violate the FACA as long as the BLM is not seeking group advice, but rather is sharing information or seeking a range of advice from individuals.

CHAPTER 13—ADMINISTRATIVE PROCEDURES

GENERAL

There are a number of administrative requirements associated with NEPA analysis. This chapter discusses how to publish the required *Federal Register* notices, print EISs, prepare the administrative record, and store environmental records. Additionally, this chapter provides guidance on using contractors to assist with NEPA analysis or documentation.

13.1 PUBLISHING NOTICES IN THE *FEDERAL REGISTER*

You must publish various notices in the *Federal Register* during the course of the NEPA process:

- a notice of intent (NOI) to prepare an EIS in the *Federal Register* (40 CFR 1501.7).
- a notice of availability (NOA) for draft, final, and supplemental EISs for land use plans and land use plan amendments, and for actions with effects of national concern (*BLM Land Use Planning Handbook H-1601-1*, 40 CFR 1506.6(b)(2)). You must file EISs with the Environmental Protection Agency (EPA), who publishes its own *Federal Register* notice (see section **9.3.1, *File with the EPA***).
- an NOA for RODs for actions with effects of national concern (40 CFR 1506.6(b)(2)).
- notices announcing NEPA-related hearings, public meetings, or the availability of EAs and FONSIs on issues of national concern (40 CFR 1506.6(b)(2)).

Offices should follow the most current guidance on review and submission of *Federal Register* notices.

13.1.1 Procedures for Publishing Notices in the *Federal Register*

The Office of the Federal Register (OFR) has established procedures and formats to be used when preparing a notice for publication. Individuals should consult the latest version of the *Document Drafting Handbook* prepared by the OFR for detailed guidance on the preparation of notices for publication in the *Federal Register*. The handbook can be found online at: http://www.archives.gov/federal-register/write/handbook/.

13.1.1.1 Publication Requirements

A *Federal Register* notice should include the following items:

1. The billing code. The billing code is assigned by the Government Printing Office and can be obtained from the BLM's printing officer. It must appear on each document submitted for publication.

2. Headings. Each notice should begin with headings that identify the BLM and the subject matter of the notice. Headings for a notice should be in this format:

    - Department Name (DEPARTMENT OF THE INTERIOR).
    - Subagency Name (Bureau of Land Management).
    - Agency Docket Number (optional).
    - Subject Heading.

3. Authority citations. You must cite the authority that authorizes you to issue your notice; you are encouraged to use the shortest form possible. This may appear in narrative form within the text or in parentheses on a separate line following the text.

4. Text. The text of the notice may be organized in any logical format, but the OFR recommends the preamble format, shown below:

    - AGENCY:
    - ACTION:
    - SUMMARY:
    - DATES:
    - ADDRESSES:
    - FOR FURTHER INFORMATION:
    - SUPPLEMENTARY INFORMATION:

5. Signature. Notices must be signed by an authorized official. There must be three copies, each with original signatures, preferably in blue ink (this helps OFR determine that the signatures are original and not photocopies). The signature block should not be on a page by itself.

See the illustrations provided by the *Federal Register* in **Appendix 11, *Federal Register* Illustrations**.

13.1.1.2 Typing and Format Requirements

(Refer to **Appendix 11, *Federal Register* Illustrations**)

- Documents must be prepared on 8 ½″ × 11″ bond paper or photocopy.

- Documents must be typed on one side of the paper and double-spaced. Any quoted material, footnotes, and notes to tables may be single-spaced.

- Documents must have one-inch margins on the top, bottom, and right side of the page. On the left side, the margin will be one and one-half inches wide.

  All headings must be typed flush with the left margin. Section headings must be typed out in full on a line separate from the text and underlined. Pages of the document must be numbered consecutively, starting with the second page.

  The following items must be typed in all capital letters (see illustrations):

  (a) FEDERAL REGISTER
  (b) Name of Agency (but not the name of the subagency. i.e., DEPARTMENT OF THE INTERIOR, Bureau of Land Management)
  (c) Preamble captions

- The use of abbreviations, symbols, and style must be in accordance with guidance in the *Document Drafting Handbook* prepared by the OFR.

- All signatures must be original and appear on a page with text. The name and title of the individual who signs the notice must by typed directly below the signature line. No second-party signatures will be accepted.

13.1.1.3 Submission Requirements

- The *Federal Register* notice may or may not need to be submitted and reviewed by the Washington Office or the Department. Review current policy before submitting the notices to the OFR, to ensure compliance with requirements.

- The notice must be submitted in triplicate to the OFR. Duplicate originals are recommended (each original is signed in ink, preferably blue, by the issuing official). It is permissible to submit one original and two copies (each with an original signature), or it is also acceptable to submit one original and two certified copies. Certified copies must include the name and title of the issuing official typed or stamped on the copy, a statement that reads "Certified to be a true copy of the original document," and the signature of the certifying official.

- See the Web Guide for the current mailing addresses of the OFR.

13.1.1.4 Publication Date

Notices are published in the *Federal Register* on the third business day after they are received by the OFR (for example, if the notice is received and accepted on a Monday, the notice will be published on Thursday).

13.2 PRINTING EISs

Prepare all EISs for printing in accordance with the BLM Manual Section 1551. Work closely with your external affairs staff and your state printing specialist when preparing to print an EIS.

Send two hard copies of the final EIS and the ROD to the BLM Library at the National Science and Technology Center in Denver.

13.3 FILING EISs WITH THE EPA

You must file all draft, final, and supplemental EISs with the EPA (40 CFR 1506.9). The *Federal Register* publishes a notice prepared by the EPA every Friday. The notice lists all draft, final, and supplemental EISs received and filed with the EPA during the previous week.

Whereas the EPA only publishes notices for EISs on Fridays, the *Federal Register* publishes daily. The BLM strives to publish the BLM notice for an EIS on the same Friday as the EPA notice publishes. The BLM notice should not be published before the EPA notice. For further discussion on publishing notices in the *Federal Register*, see section **13.1, *Publishing Notices in the Federal Register***.

The filing procedures for delegated EISs are slightly different from the filing procedures for nondelegated EISs, as discussed in section **13.3.2, *Procedures for Filing with the EPA***.

- A delegated EIS is one for which the decision authority on the proposed action rests by delegation with a single Assistant Secretary or subordinate officer.

- A nondelegated EIS is one for which the decision authority on the proposed action requires the approval of more than one Assistant Secretary (or bureaus under more than one Assistant Secretary), OR is an EIS reserved or elevated to the Secretary (or Office of the Secretary) by expressed interest of the Secretary, Deputy Secretary, the Chief of Staff, the Solicitor, or the Assistant Secretary for Policy, Management, and Budget, OR is of a highly controversial nature or one in which the Secretary has taken a prominent public position in a highly controversial issue, OR faces a high probability of judicial challenge to the Secretary.

The Web Guide contains a general schedule for the filing and publishing of *Federal Register* notices.

13.3.1 Significance of EPA Publication Dates

The date that the EPA notice appears in the *Federal Register* also serves as the official date for announcing the availability of a draft, final, or supplemental EIS, and starting the required comment and protest periods.

- For draft EISs, this starts the public review period.
- For final EISs, this notice initiates the 30-day period during which implementation cannot occur (see section.**9.3.1, *File with the EPA***).
- For land use planning actions, the EPA notice starts the 30-day protest period (40 CFR 1506.10).

13.3.2 Procedures for Filing with the EPA

The following procedures will ensure timely publication of the EPA notice for both delegated and nondelegated EISs. For a nondelegated EIS, however, the OEPC approves and files the EIS with the EPA. When you are working on a nondelegated EIS, consult with the OEPC early regarding the schedule and preparation of the EIS.

1. Prepare a transmittal letter to the EPA. For a draft EIS, indicate the length of the public review period. The BLM may request a specific date for the EIS to be listed in the EPA's *Federal Register* notice (Friday publication dates only). (For nondelegated EISs, the transmittal letter is signed by the OEPC. Before the EIS is sent to the EPA, it must be approved and cleared to print by the OEPC).
2. Mail or deliver to the EPA the transmittal letter and five copies of the EIS (draft, final, or supplemental) with a complete distribution list of individuals and organizations to whom the EIS is being distributed. (Arrangements may be made with the EPA and the printer for direct distribution of the EIS to the EPA to save time).

   The distribution list does not need to include addresses, and may be either printed in the EIS or inserted in the EIS. Send the letter, EISs, and distribution lists to the current addresses listed in the Web Guide.

   The EPA maintains a Web site with information and addresses associated with submitting EISs, see the Web Guide for this information.
3. Ensure that the transmittal letter and required attachments are sent to the EPA in sufficient time to guarantee that *Federal Register* publication occurs on the intended date and that public review requirements are satisfied (section **9.3.2, *Notify the Public and Government Agencies of the Availability of the Draft EIS for Review and Comment***). The documents must be received by the EPA at least five business days before the date the notice will appear in the *Federal Register*. Documents must also be received in the Office of Federal Activities before 2:30 pm to be logged as received for that business day. (The Office of Federal Activities coordinates the EPA's review of all Federal EISs).

4. Concurrent with the transmittal to the EPA, provide a copy of the transmittal letter, including the distribution list, and three copies of the EIS to the Office of Environmental Policy and Compliance (OEPC), 1849 C Street NW (2342-MIB), Washington, DC 20240. Contact the OEPC at 202-208-3891 to obtain the Environmental Statement control number. Immediately provide the Environmental Statement control number to the EPA. The EPA will not prepare a notice to publish in the *Federal Register* without the Environmental Statement control number.

5. Before or on the same day copies are transmitted to the EPA, distribute copies of the EIS to individuals or organizations included on the distribution list. If the printer is mailing the EISs, arrange the shipping dates with the printer.

13.4 RECORDKEEPING PROCEDURES

13.4.1 Environmental Documents and Supporting Records—The Administrative Record

The administrative record is the paper trail that documents the BLM's decision-making process and the basis for the BLM's decision. The administrative record establishes that you complied with relevant statutory, regulatory, and agency requirements, demonstrating that you followed a reasoned decision-making process. It is imperative that the BLM maintain complete and well-organized files (indexed or searchable) of environmental documents and supporting records in its administrative record. Such documents and records may be either hard copy or electronic. Begin compiling and organizing the administrative record as early in the NEPA process as possible. Official file copies of BLM environmental documents and supporting records must be maintained by the originating office. Environmental documents include:

- environmental assessments (EAs)
- findings of no significant impact (FONSIs)
- environmental impact statements (EISs)
- notices of intent (NOIs)
- Records of decision (RODs)
-

(40 CFR 1508.10, Question 34a, CEQ, *Forty Most Asked Questions Concerning CEQ's NEPA Regulations, March 23, 1981*).

Supporting records consist of material generated or used in the preparation of environmental documents. As a guiding principle, these records must demonstrate both the process and information used to reach the final decision. Such records include, but are not limited to:

- mailing lists
- summaries of public meetings (including attendance lists)
- records pertaining to consultations
- documents or studies incorporated by reference
- technical reports prepared by staff
- materials submitted by applicants
- records of contractual work related to the project
- cost recovery forms and records

A more complete list of potential supporting records can be found in **Appendix 10, *Items to Include in the Administrative Record***. The Web Guide includes a PowerPoint presentation on developing an administrative record.

Not all information in the administrative record is necessarily available to the public; information that is confidential must be marked as such.

We recommend you keep administrative records as long as you plan to rely upon that NEPA analysis. The originating offices are to retain the official file copies of the NEPA document and its supporting record. These documents are not to be stored indeterminately; the documents may be destroyed when superseded, obsolete, or no longer needed for administrative or reference purposes (BLM Manual 1220, Appendix 2). At least one copy of draft, final, and supplemental EISs and RODs must be available in the lead State Office or Washington program office, as appropriate.

The lead State Office (or Washington program office, for programmatic or legislative environmental analyses) must determine where and for how long copies of environmental documents and documents incorporated by reference must be maintained. In accordance with the National Archives Records Administration, the BLM follows a General Records Schedule for management of its records, including NEPA records. This schedule is found in the BLM Manual 1220, Records and Information Management, Appendix 2—GRS/BLM Combined Records Schedules, which is available in the Web Guide.

In some instances, program-specific guidance identifies distribution and availability requirements. For example, grazing operator case files are permanent records, and have their own schedule for storage in the field before being moved to the Federal Records Center, and on to the National Archives Records Administration. The BLM records that may contain Indian fiduciary trust records are to be treated as permanent records, and you must coordinate these through BLM records administrators.

13.4.2 Other Environmental Records

Your office may have environmental records that do not fall under the scope of environmental documents as defined above (for example, categorical exclusion review records, or reviews done to determine adequacy of an existing NEPA document). The originating office must also keep these environmental records in an official file, as discussed in section **13.4.1**, ***Environmental Documents and Supporting Records—The Administrative Record***.

For records relating to the review of other agency environmental documents, the BLM office that actually assembles comments and prepares the response should maintain official files. Thus, when the BLM is assigned as a lead agency for the Department in responding to other Federal agency's EISs, the State Office or Washington program office assigned to prepare the response maintains the official files (including all support material) for both the BLM and the Department. The cutoff for these files is the end of the fiscal year in which the review was completed. The documents may be destroyed two years after this cutoff date, as long as they are not needed for any purposes (BLM Manual 1220, Appendix 2).

13.5 CONTRACTING NEPA WORK

Contracting may be used for the preparation of a NEPA document or for certain portions of the analyses. Contracting an environmental document does not eliminate the BLM's active role in the NEPA process; you must still put forth substantial efforts to develop the contract, meet frequently with the contractor, review all products, and develop necessary partnerships with counties, the state, Tribes, other Federal agencies, and other BLM offices. The contractor-developed work becomes your work: you are responsible for all content within NEPA document and the supporting materials, which must be included in the administrative record. Additionally, decisions and findings are those of the BLM, not of the contractor, and these must reflect a review of underlying NEPA document. As such, we recommend that you prepare the findings and decision records, not the contractor.

The CEQ provides guidance for contracting EAs and EISs at 40 CFR 1506.5(b) and (c). The BLM may permit an applicant to prepare the EA. An applicant may also pay a contractor to prepare an EA (this is called third-party contracting). When an applicant or contractor prepares an EA, the BLM must independently evaluate the information submitted and its accuracy, and the environmental issues. Though the applicant or contractor prepares the EA, the BLM is responsible for the scope and content of the EA.

The CEQ provides more specific guidance for contracting an EIS. The BLM remains responsible for all of the content within the EIS. Additionally, the BLM or a cooperating agency (ies) must select the cooperator, and a conflict of interest disclaimer must be included in the EIS. The CEQ speaks directly to this requirement at 40 CFR 1506.5(c):

> It is the intent of these regulations that the contractor be chosen solely by the lead agency, or by the lead agency in cooperation with cooperating agencies, or where appropriate by a cooperating agency to avoid any conflict of interest. Contractors shall execute a disclosure statement prepared by the lead agency, or where appropriate the cooperating agency, specifying that they have no financial or other interest in the outcome of the project. If the document is prepared by contract, the responsible Federal official shall furnish guidance and participate in the preparation and shall independently evaluate the statement prior to its approval and take responsibility for its scope and contents. Nothing in this section is intended to prohibit any agency from requesting any person to submit information to it or to prohibit any person from submitting information to any agency.

While the CEQ only requires this disclaimer for EISs, we recommend including such statements in your contractor-prepared EAs as well. Additionally, when using third-party contracting, we recommend an MOU between the BLM and the applicant. This MOU must:

- establish the roles and responsibilities of each party; and
- specify that all costs of using a contractor in the preparation of the NEPA document will be borne by the applicant.

There are two principle approaches for contracting environmental documents: standard federal contracting procedures (competitive procurement), and third party contracting. Procurement of contracts is subject to the Federal Acquisition Regulation (48 CFR 1.6). Third party contracting may be used most effectively for non-Bureau energy initiatives (for example, power plants and certain rights-of-way). The key element in both approaches is the BLM control of analytical standards used, of the products produced, and of the schedule. Work with your procurement personnel early in the process when considering contracting. See the NEPA Web guide for more information and suggestions on contracting.

The BLM Washington Office or your State Office may establish policy related to contracting NEPA work. We recommend working with your State NEPA coordinators to ensure that any applicable guidance is used in this process.

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CHAPTER 14—ADAPTIVE MANAGEMENT

[Chapter Reserved for Adaptive Management]

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Glossary

affect—to bring about a change. As a verb, affect is most commonly used in the sense "to influence" or "impact." The adjective "affected" means acted upon or influenced.

alternatives—other options to the proposed action by which the BLM can meet its purpose and need. The BLM is directed by the NEPA to "study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources...." (NEPA Sec 102(2)E)

alternative arrangements—where emergency circumstances make it necessary to take an action with significant environmental impact, the Federal agency taking the action may consult with Council on Environmental Quality about alternative arrangements to observing the provisions of their regulations to implement the NEPA. Such arrangements must be limited to actions necessary to control the immediate impacts of the emergency. Other actions remain subject to NEPA review (40 CFR 1506.11).

appeal—an opportunity, provided by the Secretary of the Interior, for a qualified person to obtain a formal review, by an independent board, of the procedures and authority followed by an Interior agency in making a decision.

at-risk community—In summary, a group of homes or structures for which a significant threat to human life or property exists as a result of a wildland fire. When using the NEPA provisions of the Healthy Forests Restoration Act, the definition of "at-risk community" in the Act must be used. See Title 1, Healthy Forests Restoration Act of 2003 (P.L. 108-148), or The Healthy Forests Initiative and Healthy Forests Restoration Act Interim Field Guide, February 2004 (available online at www.healthyforests.gov).

categorical exclusion—a category of actions (identified in agency guidance) that do not individually or cumulatively have a significant effect on the human environment, and for which neither an environmental assessment nor an EIS is required (40 CFR 1508.4).

community wildfire protection plan—In summary, a collaborative plan developed by State and local governments and communities, in conjunction with adjacent Federal land-management agencies, which identifies areas and priorities for hazardous fuels reduction treatments on Federal and non-Federal lands. When using the NEPA provisions of the Healthy Forests Restoration Act, the definition of "community wildfire protection plan" in the act must be used. See Title 1, Healthy Forests Restoration Act of 2003 (P.L. 108-148), or The Healthy Forests Initiative and Healthy Forests Restoration Act Interim Field Guide, February 2004 (available online at www.healthyforests.gov).

conformance—means that a proposed action shall be specifically provided for in a land use plan or, if not specifically mentioned, shall be clearly consistent with the terms, conditions, and decisions of the approved plan or amendment. The BLM policy requires that a statement of land use plan conformance be included in a NEPA compliance document.

connected action—those actions that are "closely related" and "should be discussed" in the same NEPA document (40 CFR 1508.25 (a)(1)). Actions are connected if they automatically trigger other actions that may require an EIS; cannot or will not proceed unless other actions are taken previously or simultaneously; or if the actions are interdependent parts of a larger action and depend upon the larger action for their justification (40 CFR 1508.25 (a)(1)). Connected actions are limited to actions that are currently proposed (ripe for decision). Actions that are not yet proposed are not connected actions, but may need to be analyzed in cumulative effects analysis if they are reasonably foreseeable.

cooperating agency—assists the lead Federal agency in developing an EA or an EIS. A cooperating agency may be any agency that has special jurisdiction by law or special expertise for proposals covered by the NEPA (40 CFR 1501.6). Any Federal, State, tribal, or local government jurisdiction with such qualifications may become a cooperating agency by agreement with the lead agency.

cumulative action—proposed actions, which, when viewed with the proposed action, potentially have cumulatively significant impacts related to one or more identified issues. Cumulative actions "should be discussed" in the same NEPA document (40 CFR 1508.25(a)(2)).

cumulative effect—"...the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such actions" (40 CFR 1508.7 and 1508.25).

decision-maker—the BLM official who has been delegated authority to approve an action and is responsible for issuing a decision to implement a proposed action. Synonyms include authorized official, authorized officer, responsible official, and responsible manager.

decision record (DR)—the BLM document associated with an EA that describes the action to be taken when the analysis supports a finding of no significant impact.

delegated EIS—an EIS for which the decision authority for the proposed action rests by delegation with a single Assistant Secretary or a subordinate officer.

departmental policy—a policy established by the U.S. Department of the Interior

design features—measures or procedures incorporated into the proposed action or an alternative, including measures or procedures which could reduce or avoid adverse impacts. Because these features are built into the proposed action or an alternative, design features are not considered mitigation.

Determination of NEPA Adequacy (DNA)—an interim step in the BLM's internal analysis process that concludes that a proposed action is adequately analyzed in an existing NEPA document (an EIS or EA). Where applicable, the determination also addresses conformance with an approved land use plan.

direct effect—". . . those effects which are caused by the action and occur at the same time and place" (40 CFR 1508.8(a).

effect—impact to the human environment brought about by an agent of change, or action. Effects analysis predicts the degree to which the environment will be affected by an action. The CEQ uses both the terms "effect" and "impact" in the NEPA regulations; these terms are synonymous in the NEPA context. As a noun, other synonyms include consequence, result and outcome. Effects can be both beneficial and detrimental, and may be direct, indirect, or cumulative.

emergency action—immediate steps or response taken by the BLM to prevent or reduce risk to public health or safety or important resources.

externally generated proposal—a proposal that has been developed by an individual or group external to the BLM.

extraordinary circumstances—those circumstances for which the Department has determined that further environmental analysis is required for an action, and therefore an EA or EIS must be prepared.

Federal action—a BLM proposal is a Federal action when: (1) the proposal is at a stage in development where we have a goal and are actively preparing to make a decision on one or more alternative means of accomplishing that goal (40 CFR 1508.23); (2) the proposed action and effects are subject to BLM control and responsibility (40 CFR 1508.18); (3) the action has effects that can be meaningfully evaluated (40 CFR 1508.23); and (4) effects of the proposed action are related to the natural and physical environment, and the relationship of people with that environment (40 CFR 1508.8; 40 CFR 1508.14).

Federal Register—the official daily publication for rules, proposed rules, and notices of Federal agencies and organizations, as well as executive orders and other presidential documents. The *Federal Register* is published by the Office of the Federal Register, National Archives and Records Administration (NARA).

Finding of No Significant Impact (FONSI)—a finding that explains that an action will not have a significant effect on the environment and, therefore, an EIS will not be required (40 CFR 1508.13).

hard look—a reasoned analysis containing quantitative or detailed qualitative information.

human environment—includes the natural and physical environment and the relationship of people with that environment. When economic or social effects and natural or physical environmental effects are interrelated, then the analysis must discuss all of these effects on the human environment (40 CFR 1508.14).

implementation action—an action that implements land use plan decisions.

incorporation by reference—citation and summarization in a NEPA document of material from another reasonably available document that covers similar actions, issues, effects, or resources.

indirect effect—effects that "…are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density, or growth rate, and related effects on water and air and other natural systems, including ecosystems" (40 CFR 1508.8(b)).

internally generated proposal—a proposal developed by the BLM.

impact—see "effect"

issue—a point or matter of discussion, debate, or dispute about the potential environmental effects or impacts, of an action. Issues point to environmental effects and may drive the development of alternatives to the proposed action.

jurisdiction by law—means another governmental entity (Federal, State, tribal, or local agency) has authority to approve, veto, or finance all or part of a proposal (40 CFR 1508.15). The CEQ guidance provides for establishing a cooperating agency relationship with such entities in development of a NEPA analysis document.

land use plan—a set of decisions that establish management direction for land within an administrative area, as prescribed under the planning provisions of the Federal Land Policy and Management Act; an assimilation of land-use-plan level decisions developed through the planning process outlined in 43 CFR part 1600, regardless of the scale at which the decisions were developed. The term includes both Resource Management Plans and Management Framework Plans (H-1601-1, Glossary, page 4).

legislation—includes a bill or legislative proposal to Congress developed by or with the significant cooperation and support of a Federal agency, but does not include requests for appropriations (40 CFR 1508.17).

Legislative EIS—an environmental impact statement prepared on proposals made by Federal agencies for legislation that significantly affects the quality of the human environment. The term "legislation" in this context does not include proposed legislation initiated *by* Congress or Federal agency requests *to* Congress for appropriations. Rather, it includes any bill or legislative proposal submitted *to* Congress that is developed by or has the significant cooperation and support of a Federal agency (i.e., the Federal agency is the primary proponent of the legislation). Special rules apply to the preparation and review of legislative EISs. (40 CFR 1506.8)

may—you are free to decide whether or not to follow the guidance described.

Mitigated FONSI—a finding that explains that an action will not have significant effects because of the adoption of mitigation measures and, therefore, an EIS would not be required.

mitigation—measures or procedures which could reduce or avoid adverse impacts and have not been incorporated into the proposed action or an alternative. Mitigation can be applied to reduce or avoid adverse effects to biological, physical, or socioeconomic resources.

must—you are required to follow the guidance described.

nondelegated EIS—an EIS for which the decision authority on the proposed action requires the approval of more than one Assistant Secretary (or bureaus under more than one Assistant Secretary); OR an EIS reserved or elevated to the Secretary (or Office of the Secretary) by expressed interest of the Secretary, Deputy Secretary, the Chief of Staff, the Solicitor, or the Assistant Secretary for Policy, Management, and Budget; OR an EIS of a highly controversial nature or one in which the Secretary has taken a prominent public position in a highly controversial issue; OR an EIS that faces a high probability of judicial challenge to the Secretary.

notice of availability (NOA)—the *Federal Register* notice that an EIS (draft or final) or record of decision is available. Publication of a notice of filing of an EIS by the Environmental Protection Agency formally begins the public comment period. A NOA may also be published for an EA.

notice of intent (NOI)—this *Federal Register* notice announces that an environmental impact statement or an EA-level land use plan amendment will be prepared. Publication of this notice formally starts the scoping process.

preferred alternative—the alternative the BLM believes would reasonably accomplish the purpose and need for the proposed action while fulfilling its statutory mission and responsibilities, giving consideration to economic, environmental, technical and other factors. This alternative may or may not be the same as the BLM's or the proponent's proposed action.

proposal—the stage in the development of an action when a Federal agency has a goal and is actively preparing to make a decision on one or more alternative means of accomplishing that goal, and the effects can be meaningfully evaluated (40 CFR 1508.23). When the BLM receives or makes a proposal, the NEPA process begins.

proposed action—a proposal for the BLM to authorize, recommend, or implement an action to address a clear purpose and need. A proposal may be generated internally or externally.

protest—an opportunity for a qualified party to seek an administrative review of a proposed decision in accordance with program-specific regulations. For example, a protest may be filed with the Director of the BLM for review of a proposed resource management plan or plan amendment (43 CFR 1610.5-2),or a proposed grazing decision may be protested for review by the authorized officer (43 CFR 4160.2).

reasonably foreseeable action—actions for which there are existing decisions, funding, formal proposals, or which are highly probable, based on known opportunities or trends.

reasoned choice – a choice based on a hard look at how the proposed action or alternatives respond to the purpose and need.

recommend— unless you have a good rationale for not doing so, you must follow the guidance described.

record of decision (ROD)—the decision document associated with an EIS (40 CFR 1505.2).

regulation—an official rule. Within the Federal government, certain administrative agencies (such as the BLM) have a narrow authority to control conduct within their areas of responsibility. A rule (also called a regulation or rulemaking) is a statement you publish in the Federal Register to implement or interpret law or policy (see Administrative Procedure Act, 5 U.S.C. 551(4) ("'rule' means the whole or a part of an agency statement of general or particular applicability and future effect designed to implement, interpret, or prescribe law or policy or describing the organization, procedure, or practice requirements of an agency…")). A rule is generally published as a proposed rule and then as a final rule. Once a rule is published in final, it is codified in the Code of Federal Regulations and remains in effect until it is modified by publication of another rule. (318 DM 1).

residual effects—those effects remaining after mitigation has been applied to the proposed action or an alternative.

resource management plan—(also known as Land Use Plan or Management Framework Plan). A set of decisions that establish management direction for land within an administrative area, as prescribed under the planning provisions of the Federal Land Policy and Management Act of 1976, as amended, P.L. 94-579, 90 Stat. 2743; an assimilation of land use plan-level decisions developed through the planning process outlined in 43 CFR 1600, regardless of the scale at which the decisions were developed.

ripe for decision—the circumstance existing when a contemplated action has reached the time when the facts have developed sufficiently to permit an intelligent and useful decision to be made. A Federal action is "ripe for decision" as soon as the agency receives or makes a proposal (40 CFR 1502.5).

scope—the extent of the analysis in a NEPA document.

scoping (internal and external)—the process by which the BLM solicits internal and external input on the issues and effects that will be addressed, as well as the degree to which those issues and effects will be analyzed in the NEPA document. Scoping is one form of public involvement in the NEPA process. Scoping occurs early in the NEPA process and generally extends through the development of alternatives (the public comment periods for EIS review are not scoping). Internal scoping is simply the use of BLM staff to decide what needs to be analyzed in a NEPA document. External scoping, also known as formal scoping, involves notification and opportunities for feedback from other agencies, organizations and the public.

significance—see "significant impact."

significant impact—effects of sufficient context and intensity that an environmental impact statement is required. The CEQ regulations at 40 CFR 1508.27(b) include ten considerations for evaluating intensity.

similar action—BLM actions which, when viewed with other reasonably foreseeable or proposed Federal actions, have similarities that provide a basis for evaluating their environmental consequences together, such as common timing or geography. When it stands to improve the quality of analysis and efficiency of the NEPA process, similar actions may be analyzed in a single NEPA document. (40 CFR 1508.25)

special expertise—means another governmental (Federal, State, tribal, or local) agency who has statutory responsibility, agency mission, or related program experience (40 CFR 1508.26). The CEQ guidance provides for establishing a cooperating agency relationship with such entities in development of a NEPA analysis document.

substantive comment—a comment that does one or more of the following:
questions, with reasonable basis, the accuracy of information in the EIS or EA; questions, with reasonable basis or facts, the adequacy of, methodology for, or assumptions used for the environmental analysis; presents reasonable alternatives other than those presented in the EIS or EA; or prompts the BLM to consider changes or revisions in one or more of the alternatives.

supplementation— the process of updating or modifying a draft or final EIS if, after circulation of a draft or final EIS but prior to implementation of the Federal action:

- you make substantial changes to the proposed action that are relevant to environmental concerns (40 CFR 1502.9(c)(1)(i));
- you add a new alternative that is outside the spectrum of alternatives already analyzed (see Question 29b, CEQ, *Forty Most Asked Questions Concerning CEQ's NEPA Regulations, March 23, 1981)*; or
- there are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its effects (40 CFR 1502.9(c)(1)(ii)).

third-party contracting—contracting for the preparation of NEPA documents that is funded by the non-BLM proponent of an action. The BLM must still approve this analysis.

tiering—using the coverage of general matters in broader NEPA documents in subsequent, narrower NEPA documents, allowing the tiered NEPA document to narrow the range of alternatives and concentrate solely on the issues not already addressed.

we—as used in this Handbook, refers to the BLM.

wildland–urban interface—In summary, the area where structures and other human development meet or intermingle with undeveloped wildland. When using the NEPA provisions of the Healthy Forests Restoration Act, the definition of "wildland urban interface" in the Act must be used. See Title 1, Healthy Forests Restoration Act of 2003 (P.L. 108-148), or The Healthy Forests Initiative and Healthy Forests Restoration Act Interim Field Guide, February 2004 (available online at www.healthyforests.gov).

you—when used in the Handbook, refers to BLM staff and contractors responsible for NEPA compliance.

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Acronyms

APD—application for permit to drill
BLM—U.S. Department of the Interior, Bureau of Land Management
BMP—best management practices
CEQ—Council on Environmental Quality
CFR—Code of Federal Regulations
CX—categorical exclusion
DM—Departmental Manual
DNA—Determination of NEPA Adequacy
DR—decision record (for an EA)
EA—environmental assessment
EIS—environmental impact statement
E.O.—executive order
EPA—Environmental Protection Agency
ESA—Endangered Species Act of 1973, as amended
ESM—Environmental Statement Memoranda
FACA—Federal Advisory Committee Act
FONSI—finding of no significant impact
GIS—geographic information system
HFRA—Healthy Forests Restoration Act of 2003
IBLA—Interior Board of Land Appeals
IM—Instruction Memorandums [or memoranda]
MOU—memorandum of understanding
NEPA—National Environmental Policy Act of 1969, as amended
NOA—notice of availability
NOI—notice of intent
OEPC—U.S. Department of the Interior, Office of Environmental Policy and Compliance
P.L.—public law
RAC—Resource Advisory Committee
RFD—reasonably foreseeable development
RMP—resource management plan
ROD—record of decision (for an EIS)
WO—BLM Washington Office

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APPENDIX 1
Supplemental Authorities To Be Considered

The NEPA is only one of many authorities that contain procedural requirements that pertain to treatment of elements of the environment when the BLM is considering a Federal action. The following list includes some of the other authorities that may apply to BLM actions.

Element	Authority	Manual Section
Air Quality	The Clean Air Act as amended (42 USC 7401 et seq.)	7300
Cultural Resources	National Historic Preservation Act, as amended (16 USC 470)	8100
Fish Habitat	Magnuson-Stevens Act Provision: Essential Fish Habitat (EFH): Final Rule (50 CFR Part 600; 67 FR 2376, January 17, 2002).	NA
Forests and Rangelands	Healthy Forests Restoration Act of 2003 (P.L. 108-148)	NA
Migratory Birds	Migratory Bird Treaty Act of 1918, as amended (16 USC 703 et seq.)	NA
Native American Religious Concerns	American Indian Religious Freedom Act of 1978 (42 USC 1996)	8100
Threatened or Endangered Species	Endangered Species Act of 1983, as amended (16 USC 1531)	6840
Wastes, Hazardous or Solid	Resource Conservation and Recovery Act of 1976 (43 USC 6901 et seq.) Comprehensive Environmental Repose Compensation, and Liability Act of 1980, as amended (43 USC 9615)	9180 9183
Water Quality Drinking–Ground	Safe Drinking Water Act, as amended (43 USC 300f et seq.)	7240
	Clean Water Act of 1977 (33 USC 1251 et seq.)	9184
Wild and Scenic Rivers	Wild and Scenic Rivers Act, as amended (16 USC 1271)	8014
Wilderness	Federal Land Policy and Management Act of 1976 (43 USC 1701 et seq.); Wilderness Act of 1964 (16 USC 1131 et seq.)	8500
Environmental	E.O. 12898, "Environmental Justice" February 11, 1994	NA

Element	Authority	Manual Section
Justice		
Floodplains	E.O. 11988, as amended, Floodplain Management, 5/24/77	7260
Migratory Birds	E.O. 131186, "Responsibilities of Federal Agencies to Protect Migratory Birds" January 10, 2001	NA
Wetlands-Riparian Zones	E.O. 11990 Protection of Wetlands 5/24/77	6740

APPENDIX 2
Using Categorical Exclusions Established by the Energy Policy Act of 2005

The Energy Policy Act (P.L. 109-58) prescribes the following five categorical exclusions (CX) for activities whose purpose is for exploration or development of oil or gas:

1. *Individual surface disturbances of less than five acres so long as the total surface disturbance on the lease is not greater than 150 acres and site-specific analysis in a document prepared pursuant to the NEPA has been previously completed.*

2. *Drilling an oil and gas well at a location or well pad site at which drilling has occurred within five years prior to the date of spudding the well.*

3. *Drilling an oil or gas well within a developed field for which an approved land use plan or any environmental document prepared pursuant to NEPA analyzed drilling as a reasonably foreseeable activity, so long as such plan or document was approved within five years prior to the date of spudding the well.*

4. *Placement of a pipeline in an approved right-of-way corridor, so long as the corridor was approved within five years prior to the date of placement of the pipeline.*

5. *Maintenance of a minor activity, other than any construction or major renovation of a building or facility.*

Specific instructions for using these five CXs are identified below.

1. *Individual surface disturbances of less than five acres so long as the total surface disturbance on the lease is not greater than 150 acres and site-specific analysis in a document prepared pursuant to the NEPA has been previously completed.*

Use of this CX requires the decision-maker to do three things before applying this exclusion to any authorization. First, the decision-maker must determine that the action under consideration will disturb less than five acres on the site. If more than one action is proposed for a lease (for example, two or more wells), each activity is counted separately and each may disturb up to five acres. Similarly, the five-acre limit must be applied separately to each action requiring discrete BLM action, such as each APD, even though for processing efficiency purposes the operator submits for BLM review a large Master Development Plan addressing many wells.

Second, the decision-maker must determine that the current unreclaimed surface disturbance readily visible on the entire leasehold is not greater than 150 acres, including the proposed action. This would include disturbance from previous rights-of-way issued in support of lease development. If one or more Federal leases are committed to a BLM-approved unit or communitization agreement, the 150-acre threshold applies separately to each lease. For larger

leases, the requirement for adequate documentation would be satisfied with a copy of the most recent aerial photograph in the file with an explanation of recent disturbance that may not be shown on the aerial photos. Maps, tally sheets, or other visual aids may be substituted for aerial photographs.

Finally, this CX includes the requirement of a site-specific NEPA document. For the purposes of this CX, a site-specific NEPA analysis can be either an exploration and/or development EA/EIS, an EA/EIS for a specific Master Development Plan, a multi-well EA/EIS, or an individual permit approval EA/EIS. The NEPA document must have analyzed the exploration and/or development of oil and gas (not just leasing) and the action/activity being considered must be within the boundaries of the area analyzed in the EA or EIS. The NEPA document need not have addressed the specific permit or application being considered.

This CX may also be applied to geophysical exploration activities provided the above requirements have been met. For example, if an oil and gas exploration and development EIS analyzes the site-specific impacts of 3D geophysical exploration within the oil and gas field, this CX may apply to subsequent 3D geophysical activities conducted within the field.

The above requirements, that is, the five acre threshold, 150 acre unreclaimed disturbance limit, and a site-specific NEPA document that addressed oil and gas development, are the only applicable factors for review pursuant to this statute, but all must be satisfied in order to use this CX.

2. *Drilling an oil and gas well at a location or well pad site at which drilling has occurred within five years prior to the date of spudding the well.*

The well file narrative to support use of this CX must state the date when the previous well was completed or the date the site had workover operations involving a drilling rig of any type or capability; this also includes completion of any plugging operations. A "location or well pad" is defined as a previously disturbed or constructed well pad used in support of drilling a well. "Drilling" in the context of, "Drilling has occurred within five years" refers to any drilled well including injection, water source, or any other service well. Additional disturbance or expansion of the existing well pad is not restricted as long as it is tied to the original location or well pad. This exclusion does not extend to new well sites merely in the general vicinity of the original location or well pad.

If the operator delays in spudding the new well and the time period between the previous well completion and spudding exceed five years, the operator must suspend preparation for drilling operations until the BLM completes NEPA compliance for the proposed well and issues a new decision on the APD. Therefore, the APD must contain a condition of approval (COA) stating that "If the well has not been spudded by *(the date the CX is no longer applicable)*, this APD will expire and the operator is to cease all operations related to preparing to drill the well."

The above requirements, that is, the drilling of a well at an existing location or well pad and the five year limitation are the only two applicable factors for review pursuant to this statute, but must both be satisfied in order to use this CX.

3. *Drilling an oil or gas well within a developed field for which an approved land use plan or any environmental document prepared pursuant to NEPA analyzed drilling as a reasonably foreseeable activity, so long as such plan or document was approved within five years prior to the date of spudding the well.*

The proposed well must be within a developed oil and gas field. A developed field is any field in which a "confirmation well" has been completed. Normally, this is after the third well in a field. The pending APD must also be within the reasonably foreseeable development scenario (RFD) used in either a land use plan EIS or subsequent developmental EA or EIS. Finally, the new well must be spudded within five years of that previous NEPA document. This provision applies to "any environmental document" that analyzed drilling, meaning any document adopted by any Federal agency pursuant to the NEPA, regardless of whether it was adopted by the BLM. Because the 5-year period is again tied to the spudding of the pending well, the APD must contain a COA that if no well is spudded by the date the CX is no longer applicable, the APD will expire, thus requiring the operator to obtain a new APD. For example, "If the well has not been spudded by *(the date the categorical exclusion is no longer applicable)*, this APD will expire and the operator is to cease all operations related to preparing to drill the well."

Full field development EISs do not need to be prepared where the development envisioned was analyzed in the land use plan EIS. As long as the development foreseen does not exceed the number of wells and/or surface disturbance analyzed in the prior NEPA document, no additional NEPA documentation is required because of changes in the density of development.

All of the following requirements must be met to use this CX.

(1) The proposed APD is within a developed oil or gas field. A developed field is defined as any field in which a confirmation well has been completed.

(2) There is an existing NEPA document (including that supporting a land use plan) that contains a reasonably foreseeable development scenario encompassing this action.

(3) The NEPA document was finalized or supplemented within five years of spudding the well.

4. *Placement of a pipeline in an approved right-of-way corridor, so long as the corridor was approved within five years prior to the date of placement of the pipeline.*

The 5-year time period is to be calculated from the date the decision was made approving the corridor, including any amendments to the corridor. The time period extends to the date placement of any portion of the new pipeline is concluded, provided that placement activities began within the 5-year period. If the operator delays in beginning to place the pipeline, and the time period between the approval of the corridor and placement exceeds five years, the authorized officer must suspend the right-of-way authorization until the BLM completes NEPA compliance for the proposed right-of-way and issues a decision. To avoid problems, the right-of-way must contain a term or condition that provides for the suspension of the authorization if placement does not begin before the last date that the CX is available, thus requiring the operator to obtain a new right-of-way.

Existing right-of-way corridors of any type can be used for new pipeline placement, such as the burial of a pipeline or pipeline conduit in an existing roadbed or along a power line right-of-way, could qualify for the exclusion. The term "right-of-way corridor" in Section 390 is not limited to those authorized under 43 CFR 2800, but is a more generalized term that applies to any type of corridor or right-or-way (whether on or off lease) approved under any authority or vehicle of the BLM, including Sundry Notices. Additional disturbance or width needed to properly or safely install the new pipeline may be authorized under this exclusion if it is within the approved right-of-way corridor. Creation of a new right-of-way completely outside and not overlapping into a portion of the existing corridor is not authorized.

The above requirements, that is, the placement of a pipeline in an existing corridor of any type and placement of the pipe within five years of approval (or amendment), are the only two applicable factors for review pursuant to this statute and both must be satisfied to use this CX.

Other types of new right-of-way applications cannot be excluded from NEPA analysis under this exclusion, for example, above ground power lines, or new roads; however, existing right-of-way corridors, such as roads, may be used for new pipeline or pipeline conduit in an existing roadbed.

5. *Maintenance of a minor activity, other than any construction or major renovation of a building or facility.*

This CX applies to maintenance of minor activities, such as maintenance of the well or wellbore, a road, wellpad, or production facility. The exclusion does not cover construction or major renovation of a building or facility. The addition of a compressor or a gas processing plant would therefore not be eligible for this CX.

Note: CX numbers one through four reference prior approvals made following NEPA analysis. Field Offices must apply the same or more effective mitigating measures considered in the parent NEPA documents to all actions approved under any CX. Additionally, BMPs are to be applied as necessary to reduce impacts to any authorization issued, regardless of the NEPA analysis or exclusion used.

APPENDIX 3
Departmental Categorical Exclusions

The following actions are categorical exclusions (CXs) pursuant to 516 DM 2, Appendix 1. However, individual actions must be subjected to sufficient review to determine if any of the extraordinary circumstances listed in **Appendix 5, *Categorical Exclusions: Extraordinary Circumstances*** apply. If any of the extraordinary circumstances apply, an EA or an EIS must be prepared. In addition, see **Appendix 4, *BLM Categorical Exclusions*** for a list of BLM excludable activities.

1.1 Personnel actions and investigations and personnel services contracts.

1.2 Internal organizational changes and facility and office reductions and closings.

1.3 Routine financial transactions including such things as salaries and expenses, procurement contracts (in accordance with applicable procedures and Executive Orders for sustainable or green procurement), guarantees, financial assistance, income transfers, audits, fees, bonds, and royalties.

1.4 Departmental legal activities including, but not limited to, such things as arrests, investigations, patents, claims, and legal opinions. This does not include bringing judicial or administrative civil or criminal enforcement actions which are outside the scope of NEPA in accordance with 40 CFR 1508.18(a).

1.5 Reserved.

1.6 Nondestructive data collection, inventory (including field, aerial, and satellite surveying and mapping), study, research, and monitoring activities.

1.7 Routine and continuing government business, including such things as supervision, administration, operations, maintenance, renovations, and replacement activities having limited context and intensity (e.g., limited size and magnitude or short-term effects).

1.8 Management, formulation, allocation, transfer, and reprogramming of the Department's budget at all levels. (This does not exclude the preparation of environmental documents for proposals included in the budget when otherwise required.)

1.9 Legislative proposals of an administrative or technical nature (including such things as changes in authorizations for appropriations and minor boundary changes and land title transactions) or having primarily economic, social, individual, or institutional effects; and comments and reports on referrals of legislative proposals.

1.10 Policies, directives, regulations, and guidelines that are of an administrative, financial, legal, technical, or procedural nature and whose environmental effects are too broad, speculative, or conjectural to lend themselves to meaningful analysis and will later be subject to the NEPA process, either collectively or case-by-case.

1.11 Activities which are educational, informational, advisory, or consultative to other agencies, public and private entities, visitors, individuals, or the general public.

1.12 Hazardous fuels reduction activities using prescribed fire not to exceed 4,500 acres, and mechanical methods for crushing, piling, thinning, pruning, cutting, chipping, mulching, and mowing, not to exceed 1,000 acres. Such activities: Shall be limited to areas (1) in wildland–urban interface and (2) Condition Classes 2 or 3 in Fire Regime Groups I, II, or III, outside the wildland–urban interface; Shall be identified through a collaborative framework as described in "A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment 10-Year Comprehensive Strategy Implementation Plan;" Shall be conducted consistent with agency and Departmental procedures and applicable land and resource management plans; Shall not be conducted in wilderness areas or impair the suitability of wilderness study areas for preservation as wilderness; Shall not include the use of herbicides or pesticides or the construction of new permanent roads or other new permanent infrastructure; and may include the sale of vegetative material if the primary purpose of the activity is hazardous fuels reduction.

1.13 Post-fire rehabilitation activities not to exceed 4,200 acres (such as tree planting, fence replacement, habitat restoration, heritage site restoration, repair of roads and trails, and repair of damage to minor facilities such as campgrounds) to repair or improve lands unlikely to recover to a management approved condition from wildland fire damage, or to repair or replace minor facilities damaged by fire. Such activities: Shall be conducted consistent with agency and Departmental procedures and applicable land and resource management plans; Shall not include the use of herbicides or pesticides or the construction of new permanent roads or other new permanent infrastructure; and Shall be completed within three years following a wildland fire.

APPENDIX 4
BLM Categorical Exclusions

The following actions are designated as categorical exclusions (CXs) pursuant to 516 DM 11.9.

Before any action described in the following list is used, the list of "extraordinary circumstances" described in **Appendix 5, Categorical Exclusions: *Extraordinary Circumstances*** must be reviewed for applicability. If any of the extraordinary circumstances are applicable to the action being considered, either an EA or an EIS must be prepared for the action. When no "extraordinary circumstances" apply, the following activities do not require the preparation of an EA or EIS. In addition, see **Appendix 3, *Departmental Categorical Exclusions*** for a list of DOI-wide CXs.

The following actions are designated as categorical exclusions. The subject headings are for organizational purposes only - any program may use any of the CXs.

A. Fish and Wildlife

1. Modification of existing fences to provide improved wildlife ingress and egress.
2. Minor modification of water developments to improve or facilitate wildlife use (e.g., modify enclosure fence, install flood valve, or reduce ramp access angle).
3. Construction of perches, nesting platforms, islands, and similar structures for wildlife use.
4. Temporary emergency feeding of wildlife during periods of extreme adverse weather conditions.
5. Routine augmentations, such as fish stocking, providing no new species are introduced.
6. Relocation of nuisance or depredating wildlife, providing the relocation does not introduce new species into the ecosystem.
7. Installation of devices on existing facilities to protect animal life, such as raptor electrocution prevention devices.

B. Oil, Gas, and Geothermal Energy

1. Issuance of future interest leases under the Mineral Leasing Act for Acquired Lands, where the subject lands are already in production.
2. Approval of mineral lease adjustments and transfers, including assignments and subleases.
3. Approval of unitization agreements, communitization agreements, drainage agreements, underground storage agreements, development contracts, or geothermal unit or participating area agreements.
4. Approval of suspensions of operations, force majeure suspensions, and suspensions of operations and production.
5. Approval of royalty determinations, such as royalty rate reductions.
6. Approval of Notices of Intent to conduct geophysical exploration of oil, gas, or geothermal, pursuant to 43 CFR 3150 or 3250, when no temporary or new road construction is proposed.

C. Forestry

1. Land cultivation and silvicultural activities (excluding herbicide application) in forest tree nurseries, seed orchards, and progeny test sites.
2. Sale and removal of individual trees or small groups of trees which are dead, diseased, injured, or which constitute a safety hazard, and where access for the removal requires no more than maintenance to existing roads.
3. Seeding or reforestation of timber sales or burn areas where no chaining is done, no pesticides are used, and there is no conversion of timber type or conversion of non-forest to forest land. Specific reforestation activities covered include: seeding and seedling plantings, shading, tubing (browse protection), paper mulching, bud caps, ravel protection, application of non-toxic big game repellant, spot scalping, rodent trapping, fertilization of seed trees, fence construction around out-planting sites, and collection of pollen, scions and cones.
4. Pre-commercial thinning and brush control using small mechanical devices.
5. Disposal of small amounts of miscellaneous vegetation products outside established harvest areas, such as Christmas trees, wildings, floral products (ferns, boughs, etc.), cones, seeds, and personal use firewood.
6. Felling, bucking, and scaling sample trees to ensure accuracy of timber cruises. Such activities:
    a. Shall be limited to an average of one tree per acre or less,
    b. Shall be limited to gas-powered chainsaws or hand tools,
    c. Shall not involve any road or trail construction,
    d. Shall not include the use of ground based equipment or other manner of timber yarding, and
    e. Shall be limited to the Coos Bay, Eugene, Medford, Roseburg, and Salem Districts and Lakeview District - Klamath Falls Resource Area in Oregon.
7. Harvesting live trees not to exceed 70 acres, requiring no more than 0.5 mile of temporary road construction. Such activities:
    a. Shall not include even-aged regeneration harvests or vegetation type conversions.
    b. May include incidental removal of trees for landings, skid trails, and road clearing.
    c. May include temporary roads which are defined as roads authorized by contract, permit, lease, other written authorization, or emergency operation not intended to be part of the BLM transportation system and not necessary for long-term resource management. Temporary roads shall be designed to standards appropriate for the intended uses, considering safety, cost of transportation, and impacts on land and resources; and
    d. Shall require the treatment of temporary roads constructed or used so as to permit the reestablishment by artificial or natural means, or vegetative cover on the roadway and areas where the vegetative cover was disturbed by the construction or use of the road, as necessary to minimize erosion from the disturbed area. Such treatment shall be designed to reestablish vegetative cover as soon as practicable, but at least within 10 years after the termination of the contract.

    Examples include, but are not limited to:
    a. Removing individual trees for sawlogs, specialty products, or fuelwood.

b. Commercial thinning of overstocked stands to achieve the desired stocking level to increase health and vigor.

8. Salvaging dead or dying trees not to exceed 250 acres, requiring no more than 0.5 mile of temporary road construction. Such activities:
   a. May include incidental removal of live or dead trees for landings, skid trails, and road clearing.
   b. May include temporary roads which are defined as roads authorized by contract, permit, lease, other written authorization, or emergency operation not intended to be part of the BLM transportation system and not necessary for long-term resource management. Temporary roads shall be designed to standards appropriate for the intended uses, considering safety, cost of transportation, and impacts on land and resources; and
   c. Shall require the treatment of temporary roads constructed or used so as to permit the reestablishment, by artificial or natural means, of vegetative cover on the roadway and areas where the vegetative cover was disturbed by the construction or use of the road, as necessary to minimize erosion from the disturbed area. Such treatment shall be designed to reestablish vegetative cover as soon as practicable, but at least within 10 years after the termination of the contract.
   d. For this CX, a dying tree is defined as a standing tree that has been severely damaged by forces such as fire, wind, ice, insects, or disease, and that in the judgment of an experienced forest professional or someone technically trained for the work, is likely to die within a few years. Examples include, but are not limited to:
      (i) Harvesting a portion of a stand damaged by a wind or ice event.
      (ii) Harvesting fire damaged trees.
9. Commercial and non-commercial sanitation harvest of trees to control insects or disease not to exceed 250 acres, requiring no more than 0.5 miles of temporary road construction. Such activities:
   a. May include removal of infested/infected trees and adjacent live uninfested/uninfected trees as determined necessary to control the spread of insects or disease; and
   b. May include incidental removal of live or dead trees for landings, skid trails, and road clearing.
   c. May include temporary roads which are defined as roads authorized by contract, permit, lease, other written authorization, or emergency operation not intended to be part of the BLM transportation system and not necessary for long-term resource management. Temporary roads shall be designed to standards appropriate for the intended uses, considering safety, cost of transportation, and impacts on land and resources; and
   d. Shall require the treatment of temporary roads constructed or used so as to permit the reestablishment, by artificial or natural means, of vegetative cover on the roadway and areas where the vegetative cover was disturbed by the construction or use of the road, as necessary to minimize erosion from the disturbed area. Such treatment shall be designed to reestablish vegetative cover as soon as practicable, but at least within 10 years after the termination of the contract. Examples include, but are not limited to:

(i) Felling and harvesting trees infested with mountain pine beetles and immediately adjacent uninfested trees to control expanding spot infestations; and

(ii) Removing or destroying trees infested or infected with a new exotic insect or disease, such as emerald ash borer, Asian longhorned beetle, or sudden oak death pathogen.

D. Rangeland Management

1. Approval of transfers of grazing preference.
2. Placement and use of temporary (not to exceed one month) portable corrals and water troughs, providing no new road construction is needed.
3. Temporary emergency feeding of livestock or wild horses and burros during periods of extreme adverse weather conditions.
4. Removal of wild horses or burros from private lands at the request of the landowner.
5. Processing (transporting, sorting, providing veterinary care, vaccinating, testing for communicable diseases, training, gelding, marketing, maintaining, feeding, and trimming of hooves of) excess wild horses and burros.
6. Approval of the adoption of healthy, excess wild horses and burros.
7. Actions required to ensure compliance with the terms of Private Maintenance and Care agreements.
8. Issuance of title to adopted wild horses and burros.
9. Destroying old, sick, and lame wild horses and burros as an act of mercy.
10. Vegetation management activities, such as seeding, planting, invasive plant removal, installation of erosion control devices (e.g., mats/straw/chips), and mechanical treatments, such as crushing, piling, thinning, pruning, cutting, chipping, mulching, mowing, and prescribed fire when the activity is necessary for the management of vegetation on public lands. Such activities:
    a. Shall not exceed 4,500 acres per prescribed fire project and 1,000 acres for other vegetation management projects;
    b. Shall not be conducted in Wilderness areas or Wilderness Study Areas;
    c. Shall not include the use of herbicides, pesticides, biological treatments or the construction of new permanent roads or other new permanent infrastructure;
    d. May include temporary roads which are defined as roads authorized by contract, permit, lease, other written authorization, or emergency operation not intended to be part of the BLM transportation system and not necessary for long-term resource management. Temporary roads shall be designed to standards appropriate for the intended uses, considering safety, cost of transportation, and impacts on land and resources; and
    e. Shall require the treatment of temporary roads constructed or used so as to permit the reestablishment, by artificial or natural means, of vegetative cover on the roadway and areas where the vegetative cover was disturbed by the construction or use of the road, as necessary to minimize erosion from the disturbed area. Such treatment shall be designed to reestablish vegetative cover as soon as practicable, but at least within 10 years after the termination of the contract.

11. Issuance of livestock grazing permits/leases where:
    a. The new grazing permit/lease is consistent with the use specified on the previous permit/lease, such that
        (i) the same kind of livestock is grazed,
        (ii) the active use previously authorized is not exceeded, and
        (iii) grazing does not occur more than 14 days earlier or later than as specified on the previous permit/lease, and
    b. The grazing allotment(s) has been assessed and evaluated and the Responsible Official has documented in a determination that the allotment(s) is
        (i) meeting land health standards, or
        (ii) not meeting land health standards due to factors that do not include existing livestock grazing.

E. Realty

1. Withdrawal extensions or modifications, which only establish a new time period and entail no changes in segregative effect or use.
2. Withdrawal revocations, terminations, extensions, or modifications; and classification terminations or modifications which do not result in lands being opened or closed to the general land laws or to the mining or mineral leasing laws.
3. Withdrawal revocations, terminations, extensions, or modifications; classification terminations or modifications; or opening actions where the land would be opened only to discretionary land laws and where subsequent discretionary actions (prior to implementation) are in conformance with and are covered by a Resource Management Plan/EIS (or plan amendment and EA or EIS).
4. Administrative conveyances from the Federal Aviation Administration (FAA) to the State of Alaska to accommodate airports on lands appropriated by the FAA prior to the enactment of the Alaska Statehood Act.
5. Actions taken in conveying mineral interest where there are no known mineral values in the land under Section 209(b) of the Federal Land Policy and Management Act of 1976 (FLPMA).
6. Resolution of class one color-of-title cases.
7. Issuance of recordable disclaimers of interest under Section 315 of FLPMA.
8. Corrections of patents and other conveyance documents under Section 316 of FLPMA and other applicable statutes.
9. Renewals and assignments of leases, permits, or rights-of-way where no additional rights are conveyed beyond those granted by the original authorizations.
10. Transfer or conversion of leases, permits, or rights-of-way from one agency to another (e.g., conversion of Forest Service permits to a BLM Title V Right-of-way).
11. Conversion of existing right-of-way grants to Title V grants or existing leases to FLPMA Section 302(b) leases where no new facilities or other changes are needed.
12. Grants of right-of-way wholly within the boundaries of other compatibly developed rights-of-way.
13. Amendments to existing rights-of-way, such as the upgrading of existing facilities, which entail no additional disturbances outside the right-of-way boundary.
14. Grants of rights-of-way for an overhead line (no pole or tower on BLM land) crossing over a corner of public land.

15. Transfers of land or interest in land to or from other bureaus or federal agencies where current management will continue and future changes in management will be subject to the NEPA process.
16. Acquisition of easements for an existing road or issuance of leases, permits, or rights-of-way for the use of existing facilities, improvements, or sites for the same or similar purposes.
17. Grant of a short rights-of-way for utility service or terminal access roads to an individual residence, outbuilding, or water well.
18. Temporary placement of a pipeline above ground.
19. Issuance of short-term (3 years or less) rights-of-way or land use authorizations for such uses as storage sites, apiary sites, and construction sites where the proposal includes rehabilitation to restore the land to its natural or original condition.
20. One-time issuance of short-term (3 years or less) rights-of-way or land use authorizations which authorize trespass action where no new use or construction is allowed, and where the proposal includes rehabilitation to restore the land to its natural or original condition.

F. Solid Minerals

1. Issuance of future interest leases under the Mineral Leasing Act for Acquired Lands where the subject lands are already in production.
2. Approval of mineral lease readjustments, renewals, and transfers including assignments and subleases.
3. Approval of suspensions of operations, force majeure suspensions, and suspensions of operations and production.
4. Approval of royalty determinations, such as royalty rate reductions and operations reporting procedures.
5. Determination and designation of logical mining units.
6. Findings of completeness furnished to the Office of Surface Mining Reclamation and Enforcement for Resource Recovery and Protection Plans.
7. Approval of minor modifications to or minor variances from activities described in an approved exploration plan for leasable, salable, and locatable minerals (e.g., the approved plan identifies no new surface disturbance outside the areas already identified to be disturbed).
8. Approval of minor modifications to or minor variances from activities described in an approved underground or surface mine plan for leasable minerals (e.g., change in mining sequence or timing).
9. Digging of exploratory trenches for mineral materials, except in riparian areas.
10. Disposal of mineral materials, such as sand, stone, gravel, pumice, pumicite, cinders, and clay, in amounts not exceeding 50,000 cubic yards or disturbing more than 5 acres, except in riparian areas.

G. Transportation

1. Incorporation of eligible roads and trails in any transportation plan when no new construction or upgrading is needed.
2. Installation of routine signs, markers, culverts, ditches, waterbars, gates, or cattleguards on/or adjacent to roads and trails identified in any land use or transportation plan, or eligible for incorporation in such plan.
3. Temporary closure of roads and trails.
4. Placement of recreational, special designation, or information signs, visitor registers, kiosks, and portable sanitation devices.

H. Recreation Management

1. Issuance of Special Recreation Permits for day use or overnight use up to 14 consecutive nights; that impacts no more than 3 staging area acres; and/or for recreational travel along roads, trails, or in areas authorized in a land use plan. This CX cannot be used for commercial boating permits along Wild and Scenic Rivers. This CX cannot be used for the establishment or issuance of Special Recreation Permits for "Special Area" management (43 CFR 2932.5).

I. Emergency Stabilization

1. Planned actions in response to wildfires, floods, weather events, earthquakes, or landslips that threaten public health or safety, property, and/or natural and cultural resources, and that are necessary to repair or improve lands unlikely to recover to a management-approved condition as a result of the event. Such activities shall be limited to: repair and installation of essential erosion control structures; replacement or repair of existing culverts, roads, trails, fences, and minor facilities; construction of protection fences; planting, seeding, and mulching; and removal of hazard trees, rocks, soil, and other mobile debris from, on, or along roads, trails, campgrounds, and watercourses. These activities:
    a. Shall be completed within one year following the event;
    b. Shall not include the use of herbicides or pesticides;
    c. Shall not include the construction of new roads or other new permanent infrastructure;
    d. Shall not exceed 4,200 acres; and
    e. May include temporary roads which are defined as roads authorized by contract, permit, lease, other written authorization, or emergency operation not intended to be part of the BLM transportation system and not necessary for long-term resource management. Temporary roads shall be designed to standards appropriate for the intended uses, considering safety, cost of transportation, and impacts on land and resources; and
    f. Shall require the treatment of temporary roads constructed or used so as to permit the reestablishment by artificial or natural means, or vegetative cover on the roadway and areas where the vegetative cover was disturbed by the construction or use of the road, as necessary to minimize erosion from the disturbed area. Such treatment shall be designed to reestablish vegetative cover as soon as practicable, but at least within 10 years after the termination of the contract

J. Other

1. Maintaining land use plans in accordance with 43 CFR 1610.5-4.
2. Acquisition of existing water developments (e.g., wells and springs) on public land.
3. Conducting preliminary hazardous materials assessments and site investigations, site characterization studies and environmental monitoring. Included are siting, construction, installation and/or operation of small monitoring devices such as wells, particulate dust counters and automatic air or water samples.
4. Use of small sites for temporary field work camps where the sites will be restored to their natural or original condition within the same work season.
5. Reserved.
6. A single trip in a one month period for data collection or observation sites.
7. Construction of snow fences for safety purposes or to accumulate snow for small water facilities.
8. Installation of minor devices to protect human life (e.g., grates across mines).
9. Construction of small protective enclosures, including those to protect reservoirs and springs and those to protect small study areas.
10. Removal of structures and materials of no historical value, such as abandoned automobiles, fences, and buildings, including those built in trespass and reclamation of the site when little or no surface disturbance is involved.
11. Actions where the BLM has concurrence or co-approval with another DOI agency and the action is categorically excluded for that DOI agency.
12. Rendering formal classification of lands as to their mineral character, waterpower, and water storage values.

APPENDIX 5
Categorical Exclusions: Extraordinary Circumstances

Before any non-Energy Act CX is used, you must conduct sufficient review to determine if any of the following extraordinary circumstances apply (516 DM 2, Appendix 2). If any of the extraordinary circumstances are applicable to the action being considered, either an EA or an EIS must be prepared for the action. Part 516 of the Departmental Manual (516 DM 2, Appendix 2) states that extraordinary circumstances exist for individual actions within CXs which may:

2.1 Have significant impacts on public health or safety.

2.2 Have significant impacts on such natural resources and unique geographic characteristics as historic or cultural resources; park, recreation or refuge lands; wilderness areas; wild or scenic rivers; national natural landmarks; sole or principal drinking water aquifers; prime farmlands; wetlands (Executive Order 11990); floodplains (Executive Order 11988); national monuments; migratory birds; and other ecologically significant or critical areas.

2.3 Have highly controversial environmental effects or involve unresolved conflicts concerning alternative uses of available resources [NEPA Section 102(2)(E)].

2.4 Have highly uncertain and potentially significant environmental effects or involve unique or unknown environmental risks.

2.5 Establish a precedent for future action or represent a decision in principle about future actions with potentially significant environmental effects.

2.6 Have a direct relationship to other actions with individually insignificant but cumulatively significant environmental effects.

2.7 Have significant impacts on properties listed, or eligible for listing, on the National Register of Historic Places as determined by either the bureau or office.

2.8 Have significant impacts on species listed, or proposed to be listed, on the List of Endangered or Threatened Species, or have significant impacts on designated Critical Habitat for these species.

2.9 Violate a Federal law, or a State, local, or tribal law or requirement imposed for the protection of the environment.

2.10 Have a disproportionately high and adverse effect on low income or minority populations (Executive Order 12898).

2.11 Limit access to and ceremonial use of Indian sacred sites on Federal lands by Indian religious practitioners or significantly adversely affect the physical integrity of such sacred sites (Executive Order 13007).

2.12 Contribute to the introduction, continued existence, or spread of noxious weeds or non-native invasive species known to occur in the area or actions that may promote the introduction, growth, or expansion of the range of such species (Federal Noxious Weed Control Act and Executive Order 13112).

APPENDIX 6
Categorical Exclusion Documentation Format When Using Categorical Exclusions Not Established by Statute

A. Backgound
BLM Office: _____ Lease/Serial/Case File No.: _____

Proposed Action Title/Type: _____
Location of Proposed Action: _____
Description of Proposed Action: _____
_____
_____
_____
_____

B. Land Use Plan Conformance
Land Use Plan Name: _____ Date Approved/Amended: _____
The proposed action is in conformance with the applicable LUP because it is specifically provided for in the following LUP decision(s): _____
_____
_____
_____

_____ The proposed action is in conformance with the LUP, even though it is not specifically provided for, because it is clearly consistent with the following LUP decision(s) (objectives, terms, and conditions): _____
_____
_____
_____

C: Compliance with NEPA:
The Proposed Action is categorically excluded from further documentation under the National Environmental Policy Act (NEPA) in accordance with 516 DM 2, Appendix 1, _____ [Insert appropriate CX number and text, or a paraphrase of the text] or 516 DM 11.9, _____ [Insert appropriate CX number and text, or a paraphrase of the text].

This categorical exclusion is appropriate in this situation because there are no extraordinary circumstances potentially having effects that may significantly affect the environment. The proposed action has been reviewed, and none of the extraordinary circumstances described in 516 DM2 apply.

I considered _____
_____ [Insert any pertinent design features incorporated into the project design, or relevant situations discussed during project design, and explain why there is no potential for significant impacts].

D: Signature

Authorizing Official: _____ Date: _____
(Signature)

Name: _____
Title: _____

Contact Person

For additional information concerning this CX review, contact [Insert contact name, title, office name, mailing address, and telephone number].

Note: A separate decision document must be prepared for the action covered by the CX.

APPENDIX 7
Documentation Requirements for Hazardous Fuels Actions and Post-Fire Rehabilitation Actions

Decision Memorandum on Action and for Application of:
Departmental Categorical Exclusion 1.12 (or 1.13 or both)
Project Name

U.S. Department of the Interior

Bureau Name

Bureau Field Station (State Office, Regional Office, etc.)

County, State

Description of the Proposed Action and the Purpose and Need for the Action

[*Provide a description of the proposed action and the purpose and need for the action. Provide any pertinent facts such as: applicable legal land description, statutory citations, and other agency involvements.*]

Plan Conformance

[*State that the Proposed Action is consistent with any land and resource management plans as required by appropriate Federal, State, or local statutes having a bearing on the decision.*]
[*State that the Proposed Action was designed in conformance with all bureau standards and incorporates appropriate guidelines for specific required and desired conditions relevant to project activities.] [insert findings for other applicable laws.*]

Compliance with the National Environmental Policy Act

[*State that the Proposed Action is categorically excluded from further documentation under the National Environmental Policy Act (NEPA) in accordance with 516 DM 2, Appendix 1, 1.12 (or 1.13 or both).*] [*insert reasons.*]

[*State that the application of this categorical exclusion is appropriate in this situation because there are no extraordinary circumstances potentially having effects which may significantly affect the environment.] [Clearly state that none of the exceptions apply. If any apply, then the categorical exclusions cannot be utilized.] [State that these extraordinary circumstances are contained in 516 DM 2, Appendix 2.*]

I considered [*insert any pertinent situations that were brought up during the design of the activities and explain why there is no potential for significant effects*].

Persons and Agencies Consulted

[*Explain how the public was made aware of this proposed activity. Describe people and agencies consulted regarding the development of the action and steps taken based on this consultation.*]

Decision and Rationale on Action

I have decided to implement [*insert description of actions, including mitigation measures and reference any maps and drawings*]. These actions meet the need for action. In addition, I have reviewed the plan conformance statement and have determined that the proposed action is in conformance with the approved land use plan and that no further environmental analysis is required.

Implementation Date

This project will be implemented on or after [*insert implementation date and identify any conditions related to implementation*].

_____ _____

[*Insert deciding official's name*] Date
[*Insert deciding official's title*]

Administrative Review or Appeal Opportunities

[*State whether the decision is or is not subject to administrative appeal. If it is subject to appeal, provide the citation of the appeal rules and provide appeal information.*]

Contact Person

For additional information concerning this decision, contact [Insert contact name, title, office name, mailing address, and telephone number].

APPENDIX 8
Worksheet
Determination of NEPA Adequacy (DNA)
U.S. Department of the Interior
Bureau of Land Management

OFFICE:

TRACKING NUMBER:

CASEFILE/PROJECT NUMBER:

PROPOSED ACTION TITLE/TYPE:

LOCATION/LEGAL DESCRIPTION:

APPLICANT (if any):

A. Description of the Proposed Action and any applicable mitigation measures

B. Land Use Plan (LUP) Conformance

LUP Name*_____ Date Approved _____

Other document _____ Date Approved _____

Other document _____ Date Approved _____

** List applicable LUPs (for example, resource management plans; activity, project, management, or program plans; or applicable amendments thereto)*

The proposed action is in conformance with the applicable LUP because it is specifically provided for in the following LUP decisions:

The proposed action is in conformance with the LUP, even though it is not specifically provided for, because it is clearly consistent with the following LUP decisions (objectives, terms, and conditions):

C. Identify applicable National Environmental Policy Act (NEPA) documents and other related documents that cover the proposed action.

List by name and date all applicable NEPA documents that cover the proposed action.

List by name and date other documentation relevant to the proposed action (e.g., biological assessment, biological opinion, watershed assessment, allotment evaluation, and monitoring report).

D. NEPA Adequacy Criteria

1. Is the new proposed action a feature of, or essentially similar to, an alternative analyzed in the existing NEPA document(s)? Is the project within the same analysis area, or if the project location is different, are the geographic and resource conditions sufficiently similar to those analyzed in the existing NEPA document(s)? If there are differences, can you explain why they are not substantial?

Documentation of answer and explanation:

2. Is the range of alternatives analyzed in the existing NEPA document(s) appropriate with respect to the new proposed action, given current environmental concerns, interests, and resource values?

Documentation of answer and explanation:

3. Is the existing analysis valid in light of any new information or circumstances (such as, rangeland health standard assessment, recent endangered species listings, updated lists of BLM-sensitive species)? Can you reasonably conclude that new information and new circumstances would not substantially change the analysis of the new proposed action?

Documentation of answer and explanation:

4. Are the direct, indirect, and cumulative effects that would result from implementation of the new proposed action similar (both quantitatively and qualitatively) to those analyzed in the existing NEPA document?

Documentation of answer and explanation:

5. Are the public involvement and interagency review associated with existing NEPA document(s) adequate for the current proposed action?

Documentation of answer and explanation:

E. Persons/Agencies /BLM Staff Consulted

Name	Title	Resource/Agency Represented

Note: Refer to the EA/EIS for a complete list of the team members participating in the preparation of the original environmental analysis or planning documents.

Conclusion (*If you found that one or more of these criteria is not met, you will not be able to check this box.)*

Based on the review documented above, I conclude that this proposal conforms to the applicable land use plan and that the NEPA documentation fully covers the proposed action and constitutes BLM's compliance with the requirements of the NEPA.

_____
Signature of Project Lead

_____
Signature of NEPA Coordinator

_____ _____
Signature of the Responsible Official: Date

Note: The signed Conclusion on this Worksheet is part of an interim step in the BLM's internal decision process and does not constitute an appealable decision. However, the lease, permit, or other authorization based on this DNA is subject to protest or appeal under 43 CFR Part 4 and the program-specific regulations.

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APPENDIX 9
Recommended EA Format

Following is a suggested, but optional, outline for an EA. Refer to **Chapter 8, *Preparing an Environmental Assessment*** for descriptions of the content for these EA sections or chapters.

1. Introduction

- Identifying Information
- Purpose and Need for Action
- Scoping and Public Involvement and Issues

2. Proposed Action and Alternatives

- Description of Proposed Action
- Description of Alternatives Analyzed in Detail
- Alternatives Considered but not Analyzed in Detail

3. Affected Environment

4. Environmental Effects

- Direct and Indirect Effects
- Cumulative Effects
- Residual Effects

5. Tribes, Individuals, Organizations, or Agencies Consulted

6. List of Preparers

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APPENDIX 10
Items to Include in the Administrative Record

The administrative record needs to demonstrate all of the factors considered and the process used in reaching a decision. The record must also document public involvement in the process. Be aware that some documents in the Administrative Record are subject to the Freedom of Information Act and Privacy Act (consult your FOIA Officer). Note this on the document itself, and indicate it in the database. (If the administrative record is used in lawsuits, protests, and so forth, and if information is not filed in the administrative record, the courts or the IBLA may consider that it did not happen.)

Administrative records may include (but are not limited to) these documents:

General Information

- *Federal Register* Notices
- Interdisciplinary Team or Project Team Membership
- Preparation Plans
- Contract Information (if the project is contracted)

Public Information

- Public Involvement Plans
- Public Information Documents (letters, notices)
- News Reports and Clippings
- General Correspondence
- Meeting and Workshop Records (attendance lists, announcements)
- Scoping Report
- BLM Responses to Comments (if not included in the environmental document)
- Protests or appeals and the BLM's responses
- Mailing Lists
- Public Comments (from all phases of the project)

External Communications

- Other Federal Agencies
- Cooperating Agencies
- Tribes
- State Agencies
- Local Agencies
- Elected Officials (Governor, County commissioners, city officials, and so forth)
- Organizations
- Individuals
- Freedom of Information Act (FOIA) Requests and Responses (maintained by the FOIA Officer)

Internal Communications

- Project Management Correspondence
- Interdisciplinary Team–Project Team Correspondence (meeting notes, agendas)
- FOIA exempt documents
- Quality Assurance Determination

Background Material/Supporting Information

- Data
- Data Standards
- Metadata
- References
- Analyses (of alternatives, environmental consequences)
- Appendixes
- Special Reports (ACEC Report, Reasonably Foreseeable Development Scenarios, Mineral Assessments, Wild and Scenic River Suitability Assessments)
- Biological Assessments or Opinions
- Section 106 Consultation

Environmental Documents

- Draft EIS
- Final EIS
- Record of Decision or Decision Record

APPENDIX 11
Federal Register Illustrations

These illustrations were adopted from the Office of the Federal Register's *Federal Register Document Drafting Handbook*, October 1998 Revision.

Illustration 1: *Federal Register* Format Requirements

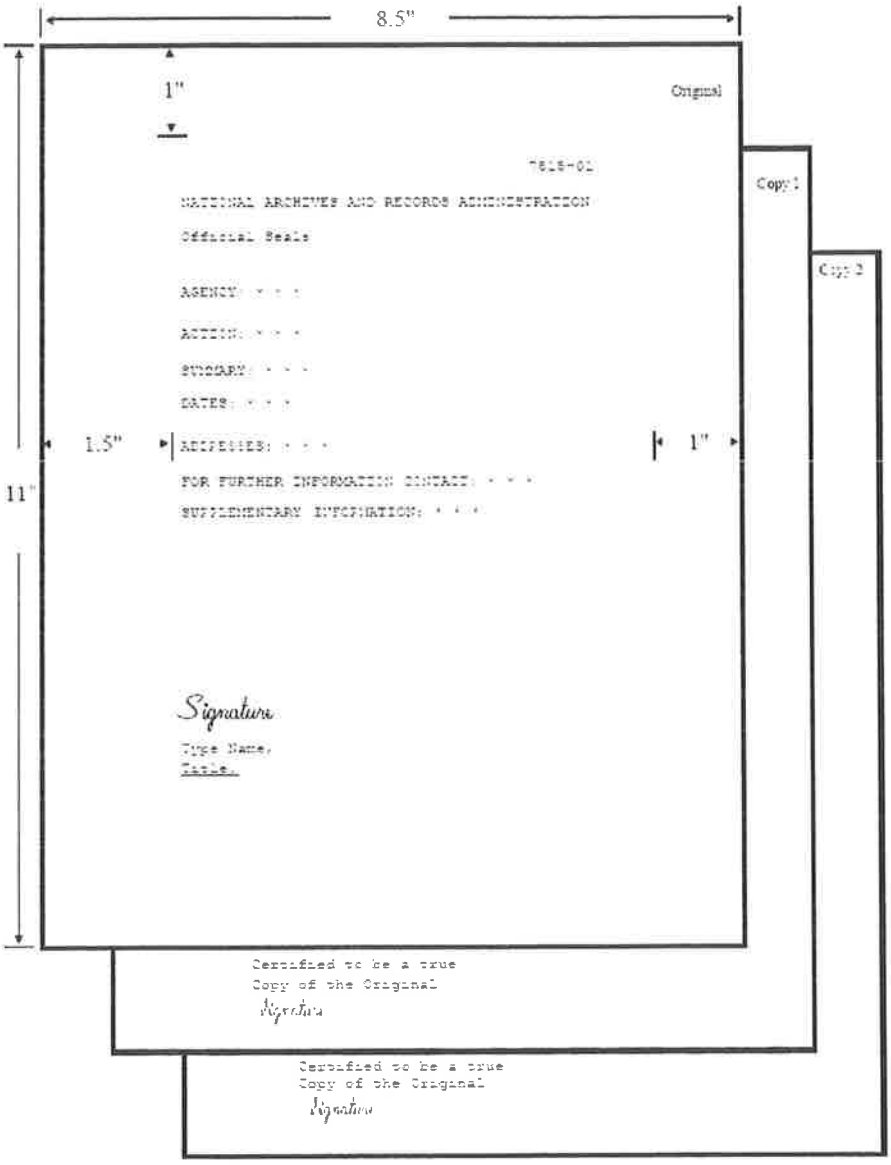

Illustration 2: Sample Notice

7515-01

NATIONAL ARCHIVES AND RECORDS ADMINISTRATION

Public Meeting With Interested Vendors for Ordering Reproductions of Still Photographs, Aerial Film, Maps, and Drawings

AGENCY: National Archives and Records Administration.

ACTION: Notice of meeting.

SUMMARY: The National Archives and Records Administration (NARA) will hold a meeting to discuss the continued privatization of reproduction services for still pictures, aerial film, maps, and drawings. On March 6, 198x, NARA began a test phase of new procedures for the delivery of reproduction services for records which NARA customers request from the Still Picture Branch, the Cartographic and Architectural Branch, and the Nixon Presidential Materials Staff. The National Archives and Records Administration permitted vendors to set up work stations in College Park, MD, where the still photographs, cartographic, and architectural records are housed and made available. The three units referred customer requests for reproduction of these media to the vendors, who determined fees, collected payments, performed the copying work, and mailed the reproductions to the customers. The purpose of this one-year

1

Illustration 2: Sample Notice (Continued)

trial program was to: verify the degree to which the privatization of the reproduction order fulfillments could improve customer service; and ascertain the extent to which digital scanning can satisfy requirements from NARA's customers. The program is extended for one more year, with some changes. All vendors interested in the program, including vendors already participating, are invited to attend the next scheduled meeting. A follow-up meeting has also been scheduled to answer any remaining questions from possible vendors, and to distribute copies of the memorandum of agreement.

DATES: The meeting will be held on Wednesday, January 24, 199x, at 2 p.m. The follow-up meeting will be held on Thursday, February 15, 199x, at 2 p.m.

ADDRESSES: The meetings will be held in Archives II, Lecture Rooms D and E, located at 8601 Adelphi Road, College Park, MD.

FOR FURTHER INFORMATION CONTACT: Michael Meetings, 301-903-3030.

Dated: January 2, 199x.

Signature

Type name,

Title.

2

Illustration 3: Guidance on Writing a *Federal Register* Notice

Capitals. Type in all capital letters:

- The name of the agency or cabinet-level department (but not the name of the subagency) in the heading of a document.
- "FEDERAL REGISTER" in the parenthetical for dates that we are to compute.
- Preamble captions.

Example 27.

```
AGENCY:
ACTION:
SUMMARY:
DATES:
ADDRESSES:
FOR FURTHER INFORMATION CONTACT:
SUPPLEMENTARY INFORMATION:
```

Copies. Provide legible copies.

Correction or adhesive tape. Do not use correction or adhesive tape.

Double-spacing. Type the text of your document double-spaced.

Headings. Type document headings centered or flush with the left margin.

Margins

- One inch at the top, bottom, and right side.
- One and one-half inches on the left side.

Page numbers. Number the pages consecutively in one of the following places:

- Centered top.
- Centered bottom.
- Upper right-hand corner.

Paper. You must prepare your documents on 8½" × 11" white paper.

Quotation marks. Use quotation marks for names of books, journals, articles, and similar items.

Quoted material. Type quoted material:

- Single-spaced.
- Centered-block style.
- Without quotation marks.

Single-sided copy. You must type your document on one side only

Illustration 3: Guidance on Writing a *Federal Register* Notice (Continued)

§ Symbol.

Use the § symbol only for a CFR section and §§ symbol only for multiple sections. However, do not use a § symbol to begin a sentence; instead, spell out the word. Do not use the § symbol or the word "section" when the reference follows a title number and CFR as in 36 CFR 1200.1.

Style.

Use the "U.S. Government Printing Office Style Manual" as a guide for punctuation, capitalization, spelling, compounding, and other style matters. You may obtain the GPO Style Manual from the Superintendent of Documents, Government Printing Office.

References.

If your document relates to a previously published *Federal Register* document, you must cite the earlier document. A reference in a notice document to a previously published *Federal Register* document must identify the volume number, page number, and date of the issue in which the document appeared. (See example 28.)

Example 28. Reference to a previously published *Federal Register* document.

```
6x FR 12345, Jul. 23, 199x
```

A reference in a notice document to material contained in the CFR should identify the CFR title and part or section number. (See example 29.)

Example 29. Reference to material contained in the CFR

```
36 CFR part 1210
36 CFR 1210.1
```

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EXHIBIT G

TABLE OF CONTENTS

I. INTRODUCTION

Mono County's Conservation/Open Space Element is a combination of mandatory General Plan elements: the Conservation Element and the Open Space Element.

State law (Government Code § 65302 (d)) requires the Conservation Element to include policies for the conservation, development, and utilization of natural resources including water, forests, soils, rivers, lakes, fisheries, wildlife, minerals, and other natural resources. The Conservation Element may also address:

- The reclamation of land and water;
- Prevention and control of the pollution of streams and other waters;
- Regulation of the use of land in stream channels and other areas required for the accomplishment of the conservation plan;
- Prevention, control, and correction of the erosion of soils, beaches, and shores;
- Protection of watersheds;
- The location, quantity and quality of the rock, sand and gravel resources; and
- Flood control.

The Open Space Element is the county's Open Space Plan. Open space is defined in Government Code § 65560 as any parcel or area of land or water essentially unimproved and devoted to an open space use and designated in an open space plan for one or more of the following reasons, to:

provide outdoor recreation;

preserve natural resources;

manage production of resources; and

provide for public health and safety.

This element serves as the county's Open Space Plan and contains policies to designate lands for open space uses.

An inventory of the county's resources (the Master Environmental Assessment or MEA) is the foundation of the Conservation/Open Space Element. The goals, objectives, policies, and actions in this element are based upon information in the MEA. The Conservation/Open Space Element opens with an overall Open Space Goal followed by goals, objectives, policies, and actions for the following nine resource areas:

Biological Resources;
Water Resources and Water Quality;
Agriculture, Grazing, Timber;
Mineral Resources;
Energy Resources;
Visual Resources;
Outdoor Recreation;
Cultural Resources; and
Public Health and Safety.

II. ISSUES/OPPORTUNITIES/CONSTRAINTS

OPEN SPACE

1. Approximately 94% of the land in Mono County is publicly owned; approximately 88% of the public land is federally owned. Public lands in the county are managed by the U.S. Forest Service (USFS), the Bureau of Land Management (BLM), the California Department of Fish and Game (CDFG), the State Lands Commission, and the Los Angeles Department of Water and Power (LADWP). Much of the federal land is managed as open space by the Humboldt-Toiyabe and Inyo national forests and the BLM in order to provide outdoor recreation opportunities, grazing opportunities, and timber production areas, and to protect the natural resources. The County has no planning authority on those lands. Much of the land owned by the LADWP also remains open space in order to protect watershed values. LADWP lands are used for grazing and outdoor recreation. The County does have planning authority on those lands.

2. Since such a great percentage of the land in the county remains open space and since the County has no direct authority over much of that land, one of Mono County's main concerns about open space is coordinating county policies with the land use policies of the agencies managing the public lands. The County is also concerned about the impacts of federal open space policies on county resources.

3. The open space value of lands owned by the LADWP and the Walker River Irrigation District (WRID) is a major concern. Much of that land was acquired for watershed protection and remains essentially open space. It includes wetlands, riparian habitat, and land adjacent to and visible from scenic highways.

4. Open space within community areas for parks and recreational use is a concern. All of the communities in the county have existing park sites, but the extent and type of facilities at those sites vary. The Long Valley area also has a regional park facility at Whitmore that is shared with the town of Mammoth Lakes. Existing facilities in some communities need to be expanded and/or improved to serve the existing population. Increased population throughout the county will require increased community recreational facilities. One facility that is not available in most communities is a trail system for walking, biking, equestrian, and cross-country ski use. Most communities in the county are interested in developing local trail systems.

5. Various areas in Mono County are subject to a variety of natural hazards, including floods, fire, avalanches, and geologic hazards. The protection of those areas as open space is a valuable method of protecting people and property from the potential impacts of those hazards.

BIOLOGICAL RESOURCES

1. Mono County's fish and wildlife populations and plant communities contribute substantially to the tourist-based economy, to recreation, and to aesthetic enjoyment of the county's resources. These resources are important not only for their direct and indirect benefits to residents and visitors but also for their inherent ecological value.

2. The biological resources in the county contribute to the local economy in several ways. Fishing, hunting, sightseeing, numerous recreational activities, timber

production, agriculture and grazing are all directly dependent on the natural resources in the county, including flora and fauna and water.

3. The protection and enhancement of natural habitats is a critical element in preserving and restoring the long-term existence of local wildlife. Riparian woodlands, wetlands, migration corridors, and wintering and summering grounds are recognized as critical, highly localized wildlife habitat. Increased recreational use in the county and increased development, particularly in areas outside existing community areas, creates potential impacts to the long-term sustainability of fish and wildlife populations and plant communities through degradation of resources and increased conflicts between wildlife and humans.

4. The cumulative impacts of increased development and recreational usage on natural habitats and local wildlife are a major concern. The U.S. Forest Service (USFS) is in the process of conducting a cumulative impact study in the area between Mammoth Lakes and June Lake to assess the potential impacts of future development in that area. The cumulative impacts of development on deer herds are a concern throughout the county.

5. Resource management agencies have given special status to a number of plant and animal species that are known or expected to occur in the county. In addition, a number of locally significant species have been identified. The protection of these species is a concern.

6. A number of agencies are involved in wildlife resource management in the county, including the USFS, the BLM, the CDFG, and the U.S. Fish and Wildlife Service. Each of these agencies has jurisdiction over certain aspects of the protection and enhancement of wildlife habitat and local wildlife populations. The County must work with these agencies and other agencies that are responsible for other areas of resource management, such as the Soil Conservation Service and the U.S. Army Corps of Engineers.

WATER RESOURCES AND WATER QUALITY

1. Water is a highly valued resource in Mono County. Rivers, streams, lakes, and aquifers supply water for domestic, agricultural and recreational uses, support abundant wildlife and fisheries, and are an important aesthetic component of the local landscape. As an example, Crowley Lake serves as a reservoir for the city of Los Angeles, provides habitat for fish and wildlife, and provides a variety of recreational opportunities. Water resources in Mono County have been heavily impacted over the years by the export of large volumes of water for use outside the county, a practice that has been detrimental to local water users and the natural environment within the county. The potential for future export, particularly of groundwater, is a continuing concern.

2. Water for future development is a concern. Four communities have community water systems – Bridgeport, Mono City, Lee Vining, and June Lake. Other areas in the county are served by a variety of mutual water companies, small private systems, and wells. Existing water rights are in some cases inadequate for future expansion and additional surface water is becoming impossible to obtain due to concerns about in-stream and water-dependent resources. Inadequate and insufficient data about many groundwater resources hinders projections on meeting future demand from those sources. Potential off-site impacts on natural resources as a result of groundwater extraction are also a concern. In addition, wells for

existing development are running dry in some areas; pumping new and deeper wells is expensive.

3. The availability of water for future development is also affected by new requirements concerning water quality. Existing community water systems that do not meet the standards set by the Lahontan Regional Water Quality Control Board will have to update their systems. The cost of doing so may inhibit the ability of those systems to provide additional water for future development. In areas that do not currently have community systems, the Lahontan RWQCB will require a community system when a certain level of development is reached. The cost of installing and maintaining a system may preclude additional development in areas currently served by wells or small private systems.

4. Four communities have community sewer systems – Bridgeport, Lee Vining, June Lake, and Hilton Creek. Other areas are served by septic systems. Septic disposal requirements imposed by the Lahontan RWQCB affect the development potential in some areas. In areas that do not currently have sewer systems, the Lahontan RWQCB will require a community sewer system when a certain level of development is reached. The cost of installing and maintaining a system may preclude additional development in areas currently served by septic systems.

5. The county's current good water quality may be affected by land management practices, sewage disposal, construction practices, solid waste disposal, and road maintenance techniques. There is a concern in some areas about the potential impacts of increased storm-water runoff resulting from increased development. Potential impacts include increased stream flows, siltation, erosion, loss of aquatic habitat, and impacts to roads.

AGRICULTURE, GRAZING, AND TIMBER

1. Livestock grazing (cattle and sheep) is a historic use in the county and one that contributes to the rural character of the area and to the area's scenic appeal. Much of the land used for grazing is federally owned. LADWP lands are also leased for grazing. In July 1992, approximately 500 acres on lower McGee and Convict creeks were involved in a range and riparian fencing project aimed at enhancing and monitoring range and riparian habitat improvement.

2. Agricultural land contributes to the area's scenic appeal as well as to the county's economy. Preservation of agricultural and grazing land can provide important open space, especially where there are pressures to develop intensively. Agricultural uses in the county include alfalfa production in Antelope Valley and Tri-Valley (mostly in Hammil Valley), a seed potato operation in Benton, and a virus-free strain of garlic. Land throughout the county is used for pastureland, including land in Antelope Valley, Bridgeport Valley, Long Valley, and Tri-Valley. Some areas, such as the Hammil Valley, are experiencing conflicts between agricultural uses and non-agricultural uses, primarily residential development. The desire for increased residential development and smaller lot sizes in those areas conflicts with the need to maintain larger lot sizes for viable agricultural operations. The continued viability of agricultural uses in the county is also endangered by the rising cost of pumping groundwater for irrigation.

3. The County has participated in the Williamson Act, providing tax relief to agriculture landowners who agree to keep their lands in production. This program helps maintain the economic viability of agriculture in Mono County. A portion of the lost

tax revenue is reimbursed through subvention payments from the State, which in recent years have been inconsistent. Whether or not the County will subsidize this program for the long term is a decision that will be made by the Board of Supervisors.

4. Except for fuelwood cutting, timber is rarely harvested commercially on private lands in the county and is a minor economic resource. Timber is harvested commercially on federal lands; that harvest is regulated by federal timber policies. Timber harvesting on private lands is regulated by Cal Fire, formerly the California Department of Forestry (CDF).

MINERAL RESOURCES

1. Mono County has significant mineral resources within its boundaries. While the extraction of mineral resources is essential to the needs of society and contributes to the economy of Mono County, there is continuing concern over whether mineral resources should be developed, and, if development does occur, how to ensure that it will not cause significant adverse environmental impacts. Mono County may be preempted from imposing land use regulations on state or federal lands, however mining activities on state or federal lands must comply with County environmental regulations.

2. The Surface Mining and Reclamation Act of 1975 (SMARA) stipulates that local governments must plan for the conservation and development of identified significant mineral resource deposits and provide for the reclamation of mined lands. The intent of SMARA is to assure that "the production and conservation of minerals are encouraged, while giving consideration to values relating to recreation, watershed, wildlife, range and forage, and aesthetic enjoyment" (SMARA, Section 2712 (b)). While local jurisdictions are required to address the conservation and development of mineral resources as one factor in their land use planning, SMARA does not dictate land use policy. SMARA also requires the adoption of reclamation plans for active mining operations.

ENERGY RESOURCES

Mono County has significant renewable energy resources within its boundaries. These include geothermal, hydro power, solar and wind energy. Issues have arisen and will continue to arise as to whether these resources should be developed, and, if development does occur, how assurances can be made that it will not cause significant adverse effects on the environment.

GEOTHERMAL RESOURCES

The principal issues faced by Mono County regulatory authorities during the administrative proceedings accompanying the applications for existing geothermal permits involved the question of whether geothermal operations would affect the fumaroles and geothermally influenced pools, streams and springs in the Casa Diablo area, including Hot Creek Fish Hatchery and Hot Creek Gorge. These geothermal features are significant resources in their own right, independent of any economic value they may have. The thermally influenced springs are also factors in the productivity of the Hot Creek Fish Hatchery. Considerations of air quality impacts and public health and safety are extremely important for the use of these resources, as well as potential impacts to visual, biologic, and water resources.

HYDROELECTRIC RESOURCES

Surface waters in Mono County provide valuable habitat for aquatic, terrestrial and insect species as well as enhancing the visual quality of the surrounding landscape. The protection of these waters is of paramount importance, both for the sustenance of the biota directly or indirectly dependent on such resources, and for the support of the recreational economy based on those resources. Certain streams in Mono County flowing east from the Sierra Nevada are already extensively diverted for hydroelectric power or to supply water for export. The environmental damage done by water diversions to riparian plant communities, wildlife, fisheries, and recreational and visual resources can be severe. County policies are directed toward restoring damage that has already occurred, preventing additional damage from occurring, and minimizing unacceptable change to stream environments.

SOLAR AND WIND ENERGY RESOURCES

Structures necessary to capture sufficient amounts of solar radiation or wind energy usually cover large areas. Windmills and wind turbines must be relatively tall to function properly. Therefore, the major impacts of using solar and wind energy resources include visual resource degradation and the potential for increased soil erosion and sediment transport form those solar energy sites that require extensive grading and the removal of trees and other mature vegetation that results in habitat destruction for wildlife. Power generation facilities using wind energy can be very noisy as well.

OTHER ENERGY SOURCES

There are a variety of other energy sources used to generate electricity that could be proposed for development in Mono County. Although it is unlikely that such projects would be economically feasible, other energy sources used for power generation could include waste, nuclear energy, and fossil fuels such as coal and natural gas. Considerations of air quality impacts and public health and safety are extremely important for the use of these resources, as well as potential impacts to visual, biologic, and water resources.

ELECTRICAL TRANSMISSION AND FLUID CONVEYANCE PIPELINES

Electrical transmission lines and fluid conveyance pipelines (including gas pipelines) can be highly visible elements in the landscape if they are not routed and constructed carefully. Because of their linear nature and the need for access, not only for construction but for routine maintenance, the placement of transmission lines and pipelines often is not only conspicuous, but can contribute to erosion, water quality degradation, and loss of wildlife habitat.

ENERGY CONSERVATION

Energy conservation can save consumers money, reduce air pollution from fossil fuel generation and fuel burning, improve the use of resources, and reduce the need for energy production and transmission facilities. It is to the benefit of Mono County and its residents to pursue energy conservation and to use readily available alternative energy resources when such use is environmentally acceptable.

VISUAL RESOURCES

1. Outstanding scenery is one of Mono County's significant attributes. The county's scenic beauty and dramatic vistas, relatively untouched by civilization, attract tourists and recreationists, and are valued by residents.

2. Mono County's landscape is highly sensitive to man-made changes. Major issues to be addressed in protecting and enhancing visual resources in Mono County are protecting views from major travel routes and recreation destinations; improving the opportunity for visitors to view spectacular scenery (e.g., by providing additional turnouts and scenic vista points); designing community and manmade structures to blend in and be compatible with the surrounding environment; and coordinating scenic policies of local and federal agencies so that they complement each other.

3. Mono County participates in the State Scenic Highways Program. Two areas in the county are state designated scenic highways and there are numerous roads designated as county scenic highways. The BLM and the USFS participate in the National Scenic Byways Program. State Route 120 West, Lee Vining Canyon, and Forest Road 4S01 to the Patriarch Grove of ancient bristlecone pines have both been designated as National Scenic Byways.

4. The visual impacts of utility corridors and overhead utility lines have become an issue both in community areas and undeveloped areas. The Public Utilities Commission (PUC) regulates transmission lines; the County has authority over some distribution lines. The Mono County General Plan currently requires underground utility lines unless certain findings can be made and a use permit is approved for overhead lines.

5. The Mono County General Plan provides for design review in community areas through the implementation of a Design Review District. Currently, there is one Design Review District in the county in the Wheeler Crest Planning Area. The intent of this district is to maintain and enhance the aesthetic qualities of community areas. Similarly, the Scenic Combining District is intended to minimize the visual impacts of development in scenic areas outside communities, especially in areas adjacent to and visible from designated scenic highways and other important scenic areas.

OUTDOOR RECREATION

1. Natural resource-based outdoor recreation is and will continue to be the foundation of Mono County's economy. Maintaining the high quality of local recreation facilities and opportunities is a major goal requiring the preservation and enhancement of high-quality natural resources. Recreation issues involve providing community recreation facilities for residents; providing sufficient recreation facilities outside community areas for both residents and visitors; providing connections and trail links between communities and various recreation areas; using existing recreation areas and facilities more efficiently; and ensuring that the type of recreation use, where it is located, and when it is developed corresponds to the County's ability to support it with visitor accommodations and services.

2. Since much of the recreation in the county takes place on federal lands, it is the federal land management agencies (USFS and BLM) that develop policies and facilities for the recreational use of that land. The County needs to coordinate with federal recreational policies in order to avoid duplication of services and to maximize

recreational opportunities in the county. Participation in CURES, the Coalition for Unified Recreation in the Eastern Sierra, offers an opportunity for coordination in providing recreational opportunities while protecting the environment.

CULTURAL RESOURCES

1. Mono County's cultural heritage is a rich and valuable resource. Excellent examples of Native American, mining, ranching, and recreational settlements exist in the county and several sites are nationally known. In Mono County, cultural resources include buildings, sites, structures, objects and districts of interest to Mono County, the region, California and the nation. The term "cultural resources" includes both archaeological and historical resources.

2. Despite cultural resource planning efforts at the federal, state and local levels, a large number of cultural resources outside settled communities remain uninventoried and without any type of preservation or protection. The chance that these resources will remain intact is diminishing rapidly. Ignorance, economic pressures, and increased development and recreational use contribute to the ongoing damage sustained by the county's cultural resources.

3. As is true for all of the county's resources, most of the cultural resources in the county are found on public lands. There are extensive federal and state laws governing the protection of cultural resources, both archaeological and historical. The USFS and the BLM have policies governing their implementation of these laws. The federal land management agencies also have inventories of cultural resources on their property.

4. There are several museums in the county, numerous historic sites, and numerous archaeological sites. The Native American groups in the area are active in cultural resource preservation, as are the museums, the USFS, and the BLM. There is an opportunity to coordinate these efforts.

PUBLIC HEALTH AND SAFETY

A. Public Health and Safety issues in Mono County focus on air quality, water quality, noise levels, protection from hazardous materials and waste, and protection from natural hazards. Air quality is addressed in this section of the Conservation/Open Space element; water quality is addressed in the Water Resources section of the Conservation/Open Space element; noise is addressed in the Noise Element; hazardous materials and waste are addressed in the Hazardous Waste Management Element; and protection from natural hazards is addressed in the Safety Element.

B. One of the county's most valuable resources is its good air quality. With the exception of suspended particulate (PM_{10}), ambient air quality standards established to protect the public from health effects are rarely exceeded. High ambient levels of PM_{10} are the most severe air quality problem in the county; ambient standards are exceeded relatively frequently. While excesses of ambient ozone (O_3) standards are still infrequent, ambient O_3 levels appear to be increasing, which raises the possibility of a greater number of excesses in the future. Geothermal resource development generates hydrogen sulfide (H_2S) and reactive organic compounds (ROC) emissions. The H_2S can cause local health and odor problems while the ROC can contribute to regional O_3 levels.

C. The Great Basin Unified Air Pollution Control District (GBUAPCD) regulates air quality in the area and establishes standards for the area. Currently, the GBUAPCD is focusing its efforts in Mono County on Mammoth and the Mono Basin. Mammoth has established regulation to control wood-burning emissions as part of its plan to meet the agency's standards. Similar regulations may be applicable in other areas of the county, such as June Lake. There is also the potential in some areas such as June Lake for increased transit services to reduce emissions in order to meet the agency's standards.

III. POLICIES

OPEN SPACE

GOAL: Preserve natural open space resources which contribute to the general welfare and quality of life for residents and visitors in Mono County and to the maintenance of the county's tourism economy.

Objective A
Preserve existing open space.

Policy 1: Concentrate development in existing communities in order to preserve large expanses of open space.

Action 1.1: Implement policies in the Land Use Element that promote development in existing communities.

Policy 2: Outside existing communities, cluster development in order to maximize open space.

Action 2.1: Implement policies in the Land Use Element that limit development outside existing communities.

Policy 3: Maintain large lot sizes in agricultural areas in order to protect agricultural uses.

Action 3.1: Avoid conversion of lands currently used for agricultural production to non-agricultural use, unless such a conversion could enhance other critical resource values.

Policy 4: Designate undeveloped lands owned by out of county agencies such as the Los Angeles Department of Water and Power (LADWP), and the Walker River Irrigation District (WRID), or by utility entities such as Sierra Pacific Power Company, and Southern California Edison (SCE) as "Open Space" ("OS") or "Agriculture" ("A") in the Land Use Element. Exceptions to this policy may include lands adjacent to community areas needed for community uses, or lands outside community areas needed for public purposes.

Policy 5: Restrict development in areas constrained by natural hazards, including but not limited to, flood, geologic hazards and avalanche hazards.

Action 5.1: Implement policies contained in the Safety Element.

Policy 6: Coordinate policies in the county General Plan with policies in the USFS's Land and Resource Management Plans for the Inyo and Humboldt-Toiyabe national forests and the BLM's Resource Management Plan in order to coordinate open space programs.

Policy 7: Implement policies in other sections of the general plan relating to preservation of open space.

Objective B
Investigate methods of preserving additional open space.

Policy 1: Work with appropriate agencies, organizations, and individuals to preserve additional open space permanently.

Action 1.1: Keep current on land acquisition and disposal plans and activities of federal and state land management agencies and the LADWP in order to achieve a coordinated effort to preserve and maintain open space.

Action 1.2: During the Specific Plan and subdivision processes, consider conditions of approval such as the use of open space, conservation, and scenic easements; the dedication of open space by project sponsors; the use of deed restrictions that require setbacks and the preservation of natural vegetation and wildlife habitat, cultural resources and recreational values; or other provisions that preserve the open space values of an area.

Action 1.3: Investigate the use or expansion of the Land Conservation Act of 1965 (the Williamson Act) to preserve open space and agricultural uses of land.

Action 1.4: Investigate the use of the County's power of eminent domain where appropriate for health and safety reasons.

Action 1.5: Consider full fee acquisition by the County through purchase at fair market value.

Action 1.6: Evaluate the use of taxes, including user fees and taxes, transient occupancy taxes, real estate transfer tax, and gasoline tax, for open space acquisition.

Action 1.7: Pursue state and federal funding, including funding available under the state Wildlife Protection Act of 1990, HUD open space grants, the Land and Water Conservation Fund, Wildlife Restoration Funds, and other sources.

Action 1.8: Consider the use of Transfer of Development Rights (TDR) or Purchase of Development Rights (PDR) to preserve additional open space.

Action 1.9: Investigate private funding, including conservation groups such as the Nature Conservancy or Trust for Public Lands.

Action 1.10: Promote the establishment of local land conservation organizations.

Action 1.11: Outside community areas, consider land trades involving private lands in Mono County and federal lands elsewhere.

Action 1.12: Work with the county Assessor to encourage gifts of open space through tax-incentive programs.

Action 1.13: Work with the county Assessor to preserve open space through the use of tax foreclosures where appropriate.

BIOLOGICAL RESOURCES

GOAL: Maintain an abundance and variety of vegetation, aquatic and wildlife types in Mono County for recreational use, natural diversity, scenic value, and economic benefits.

Objective A
Maintain and restore botanical, aquatic and wildlife habitats in Mono County.

Policy 1: Future development projects shall avoid potential significant impacts to animal or plant habitats or mitigate impacts to a level of non-significance, unless a statement of overriding considerations is made through the EIR process.

Action 1.1: Future development projects with the potential to significantly impact animal or plant habitats shall assess site-specific resource values and potential impacts prior to project approval. Examples of potential significant impacts include:

a. substantially affecting a rare or endangered species of animal or plant or the habitat of the species; and/or
b. interfering substantially with the movement of any resident or migratory fish or wildlife species; and/or
c. substantially diminishing habitat for fish, wildlife, or plants.

The analysis shall:

a. be funded by the applicant;

b. be prepared by a qualified person under the direction of Mono County and in consultation with the California Department of Fish and Game (CDFG);

c. assess existing conditions in the general project vicinity, including the identification of any listed or candidate threatened or endangered species or habitats of special concern;

d. describe the impacts of the proposed development upon animal or plant habitat within the project site and on surrounding areas; and

e. recommend project alternatives or measures to avoid or mitigate impacts to animal or plant habitat.

Mitigation measures and associated monitoring programs shall be included in the project plans and specifications, and shall be made a condition of approval for the project. The project sponsor shall fund the monitoring and shall be responsible for remedying deficiencies.

Action 1.2: Examples of potential appropriate mitigation measures for projects identified by Action 1.1 as having significant impacts to animal and plant habitats include:

a. requiring cluster development and/or large acre minimum parcel sizes (e.g., in key deer habitat, at least 20 acres for winter range and migration corridors, and at least 40 acres for critical winter range and critical corridors);

b. encouraging future development to locate in less-sensitive areas or on sites adjacent to previously developed areas;

c. encouraging fence designs that allow for the movement of wildlife;

d. where necessary, requiring leash laws as a condition of project approval, in order to control domestic animals in developments in key wildlife habitat. Encourage monitoring and reporting of dog/wildlife problems in developments in deer habitat;

e. requiring project designs to: a) protect important habitat features that are difficult or impossible to replace such as springs and seeps, large trees, old growth, relatively undisturbed caves, wetlands, water courses or water bodies; and b) protect or replace valuable habitat features such as snags, downed logs, manmade water sources, salt licks, spawning grounds, thermal cover, and other features where feasible;

f. requiring project designs to protect important cultural features that also function as wildlife habitat, such as, but not limited to, abandoned mine workings that function as habitat for bat species and small mammals, and as shelter for a variety of avian species; and

g. maintaining and enhancing cover to provide visual barriers to help maintain habitat use. For example, terrain features and vegetation can be utilized to reduce or avoid visual disturbance impacts in major deer use areas.

Action 1.3: If a project outside existing communities proposes to introduce non-native vegetation for landscaping, erosion control, or other purposes, an assessment of the effects of the introduced species shall be included in the project analysis.

Action 1.4: Projects outside community areas within identified deer habitat areas, including migration corridors or winter range (see the Biological Resources Section of the Master Environmental Assessment), which may have a significant effect on deer resources shall submit a site-specific deer study performed by a recognized and experienced deer biologist in accordance with Action 1.1.

Action 1.5: Projects with features that have the potential to be attractive nuisances to wildlife shall include an assessment of the potential impacts from those features in the project analysis and proposed mitigation measures.

Action 1.6: Mining development projects shall be required to submit a Reclamation Plan with the project application. Other types of projects (e.g., geothermal development) may be required to submit a Reclamation Plan with the project application. The Reclamation Plan must comply with the standards in the county's Reclamation Ordinance.

Action 1.7: Monitor the success and failure of adopted mitigation measures in order to refine future efforts.

Action 1.8: The County may initiate cumulative impact assessments for selected wildlife resources if it appears that the combined effects of multiple projects may be significant. Such assessments shall be funded from appropriate development fees.

Action 1.9: Limit road development in valuable habitat areas to the minimum required to achieve necessary access.

Action 1.10: Projects within the Hot Creek deer migration zone (see Figure 1) shall not be permitted unless a finding is made that potential impacts to deer have been avoided or mitigated to a level of non-significance.

Action 1.11: Projects within the Hot Creek deer migration zone may be prevented upon a finding that they will interfere with adopted regulations or herd plan goals of the CDFG.

Action 1.12: Where other mitigation measures cannot reduce impacts to a level of non-significance, a mitigation fee levied on proposed development may be used to enhance habitat elsewhere. In some crucial, non-replaceable habitats, this may not be a viable option.

Action 1.13: In coordination with the CDFG and other appropriate agencies, provide information and educational programs to landowners and developers on how to improve wildlife habitat on their property.

Action 1.14: Work with the CDFG, Caltrans, and other appropriate agencies to develop and implement a program to minimize deer road kill.

Action 1.15: Coordinate policies in the General Plan with policies and goals of CDFG deer herd management plans.

Policy 2: Protect and restore threatened and endangered plant and animal species and their habitats.

Action 2.1: If a project is likely to have significant impacts on any state or federally listed threatened or endangered species, the County will consult fully with appropriate agencies and organizations, such as the CDFG, the USFWS, and the CNPS, concerning project alternatives and mitigation measures.

Action 2.2: Support the acquisition of areas with threatened or endangered species by federal or state land management agencies or land conservation organizations.

Action 2.3: Work with appropriate agencies and organizations to investigate the feasibility of establishing preservation areas to protect and restore threatened and endangered species.

Hot Creek Deer Migration Zone

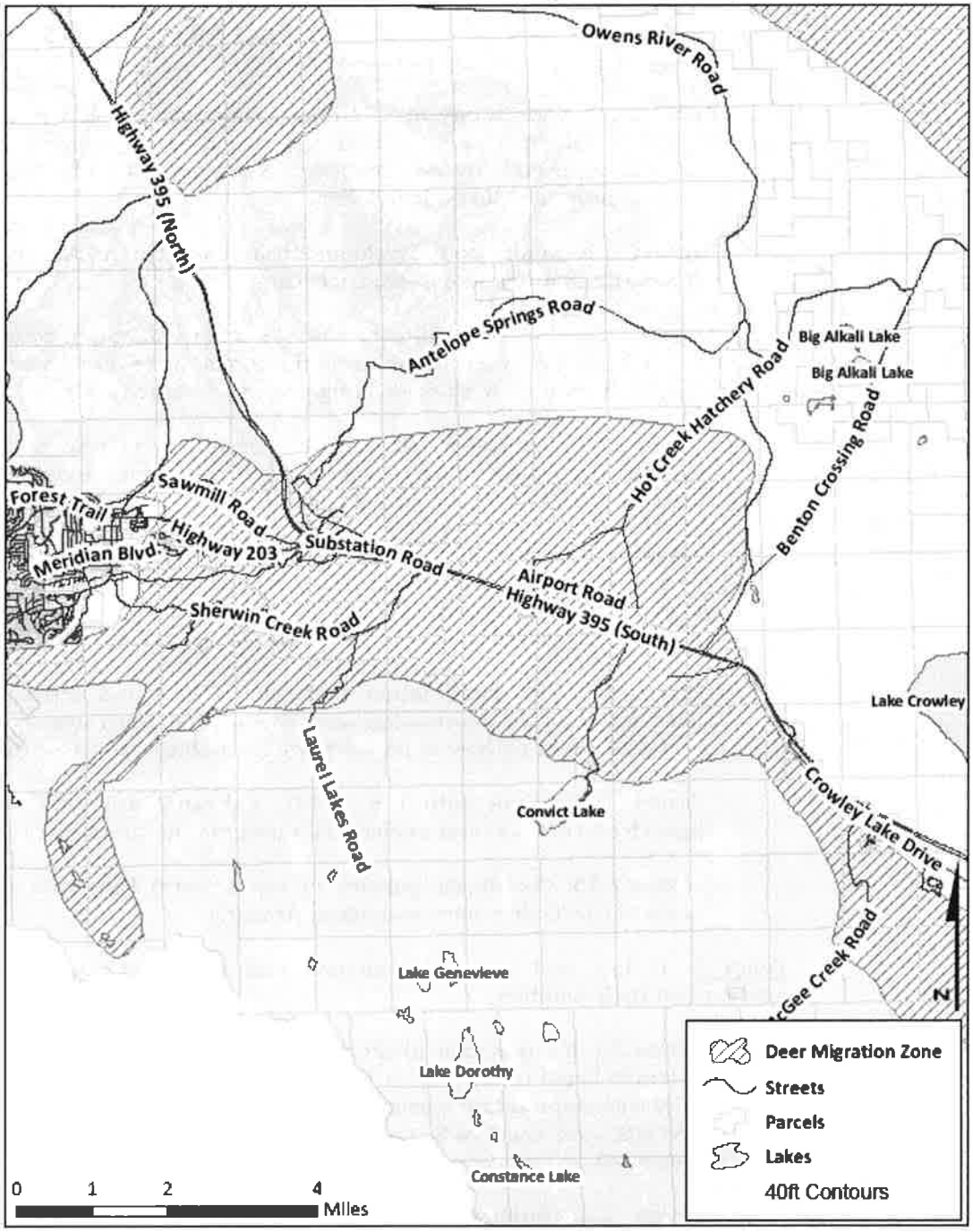

Figure 1

Policy 3: Protect and restore sensitive plants, native plants, and those species of exceptional scientific, ecological, or scenic value.

Action 3.1: Amend the Mono County General Plan to include maximum site disturbance standards in appropriate land use designations.

Action 3.2: Require landscape plans to incorporate the use of native vegetation when feasible. The transplanting of existing vegetation may be required in the landscape plan.

Action 3.3: In order to protect their special value to plant diversity and wildlife habitat, limit development in edge zones.

Action 3.4: Actions 3.2 and 3.3 above shall also apply to sensitive and native plants and those species of exceptional scientific, ecological, or scenic value.

Action 3.5: Limit development affecting riparian areas and wetland zones to protect the special values of those ecosystems.

Policy 4: Prohibit construction activities such as grading in sensitive habitats prior to environmental review in compliance with CEQA and the Mono County Grading Ordinance.

Policy 5: During construction, utilize soil conservation practices and management techniques to conserve naturally occurring soils.

Action 5.1: Projects requiring a Grading Permit shall prepare a plan for the protection, conservation, and future use of naturally occurring soils that are suitable as a plant growth medium. The plan shall ensure that stockpiled soils and graded materials are protected from contamination, chemical and physical degradation, and erosion throughout all stages of the project life.

Policy 6: Support the acquisition of valuable wildlife habitat by federal or state land management agencies or land conservation organizations.

Action 6.1: Support acquisition of important wildlife areas through outright purchase, land donations, trades, purchase of easements, and related options.

Action 6.2: In coordination with the county Assessor's office, seek reductions of property taxes for areas preserved for wildlife.

Action 6.3: Work with appropriate agencies and organizations to investigate the feasibility of establishing habitat preservation areas to protect and improve significant habitat areas.

Action 6.4: Consider appointing a Fish and Wildlife Technical Advisory Committee to advise the County on fish and wildlife planning and mitigation measures and to seek funding for fish and wildlife protection and habitat acquisition.

Policy 7: Restrict OHV use in valuable habitat areas in order to protect those resources.

Policy 8: Maintain water quality for fishery habitat by enforcing the policies contained in the Water Quality and Agriculture / Grazing/ Timber sections of the Conservation/Open Space Element.

Policy 9: Support efforts to regulate in-stream flows and lake levels to maintain fishery and other wildlife values, including riparian habitat.

Action 9.1: Cooperate with the CDFG to obtain adequate habitat protection in connection with Stream or Lake Alteration Agreements and in-stream flow agreements when required for developments.

Action 9.2: Study the feasibility of enlarging the Bridgeport Reservoir, or implementing other alternatives in order to enhance fishery and wildlife resources. Various alternatives include improving water quality and water-bird nesting, and establishing minimum pools.

Action 9.3: Encourage restoration of fishery and riparian habitat that has been degraded or lost.

Action 9.4: Work with the CDFG and other appropriate agencies to prevent and remove unnatural blockages and other impediments to fish movement wherever appropriate.

Policy 10: In order to provide richer angling diversity, and to increase the wild trout population and stimulate tourism, support efforts to manage fisheries in accordance with their biological capabilities.

Action 10.1: Support the development and implementation of the Mono County Trout Enhancement Plan.

Action 10.2: Work with the CDFG and other appropriate entities to enhance fishery resources. Potential projects include improving spawning areas, providing additional angler education and interpretive programs and facilities.

Action 10.3: Pursue grant funding for fisheries enhancement.

Policy 11: Promote the non-consumptive use of existing fisheries, where appropriate.

Action 11.1: Work with the CDFG and other appropriate entities to identify appropriate areas for catch-and-release programs or other appropriate restrictions, and to implement such programs or restrictions.

Action 11.2: Work with the CDFG and other appropriate entities to provide educational material on the non-consumptive use of fisheries; e.g., information on the proper technique for catch-and-release fishing.

Policy 12: Support state and federal efforts to reintroduce trout in appropriate remote locations.

Action 12.1: Provide recommendations to the CDFG and USFWS regarding types of fish and appropriate locations for reintroduction.

Policy 13: When feasible, supplement CDFG fish stocking efforts with a county-supported stocking program.

Action 13.1: As funding permits, continue the county's current fish stocking program.

Policy 14: Develop and implement programs to use county Fish and Game fine revenues to meet the objective of maintaining and restoring botanical, aquatic and wildlife habitats in the county. Possible programs could include measures to improve fish and wildlife habitat (e.g., placement of cattle fencing and fish screens), implementation of measures to reduce deer road kill, etc.

WATER RESOURCES AND WATER QUALITY

GOAL 1: Ensure the availability of adequate surface and groundwater resources to meet existing and future domestic, agricultural, recreational, and natural resource needs in Mono County.

Objective A
Develop a comprehensive countywide water resource database.

Policy 1: Compile baseline data on the basic components of hydrologic units within the county.

Action 1.1: Cooperate with relevant agencies and organizations to develop and maintain a comprehensive hydrologic record of local hydrologic units.

Action 1.2: Study the feasibility of utilizing the existing permitting system for new wells in Mono County as a method to gather information on the depth of the local water table and water use.

Action 1.3: Work with local water providers, LADWP, the Tri-Valley Groundwater Management District, and resource agencies to calculate water budgets[1] for each hydrologic unit in the county.

Action 1.4: Work with local water providers, LADWP, the Tri-Valley Groundwater Management District, and resource agencies to develop water management plans for hydrologic units in the county.

Objective B
Identify and secure adequate water for future local domestic needs while maintaining natural resources.

[1]A water budget is a model of the relationship between the inputs and outputs of a particular hydrologic unit.

Policy 1: Assist and encourage the developed and developing areas of Mono County and local special districts to secure additional water rights within local water basins as necessary for the orderly growth of local communities.
Policy 2: Encourage the preparation of water management plans by local water providers.

Action 2.1: Assist special districts in securing available grant monies for water management planning.

Policy 3: Encourage the USFS and the BLM to assist local communities in securing the water resources necessary to accommodate community demands, particularly those demands that directly and indirectly result from increased activities on adjacent federal lands.

Action 3.1: Review and comment on development proposals on federal lands and require full environmental review on out-of-drainage transfers.

Policy 4: Encourage the consolidation of small water providers to increase operational and service efficiency.

Action 4.1: Require new developments to be served by existing water providers, where feasible, rather than creating new service entities.

Policy 5: Future development projects shall avoid potential significant impacts to local surface and groundwater resources or mitigate impacts to a level of non-significance, unless a statement of overriding considerations is made through the EIR process.

Action 5.1: Future development projects with the potential to significantly impact surface or groundwater resources shall assess any potential impacts prior to project approval. Examples of potential significant impacts include:

a. substantially degrading or depleting surface or groundwater resources; and/or
b. interfering substantially with groundwater recharge.

The analysis shall:

a. be funded by the applicant;

b. be prepared by a qualified person under the direction of Mono County;

c. assess existing conditions in the general project vicinity;

d. identify the quantity of water to be used by the project. Quantities shall be estimated for annual totals, monthly averages, and peak day/peak month usage;

e. identify the source(s) of water for the project and provide proof of entitlement to that water. If the proposed source is to be a special district or mutual water system, a "will-serve" letter shall be required. If the proposed source is ground or surface water, the application

shall indicate that the proponent has entitlement to the source and the quantity of water required;

f. describe the impacts of the proposed development upon water resources within the project site and on surrounding areas; and

g. recommend project alternatives or measures to avoid or mitigate impacts to water resources.

Mitigation measures and associated monitoring programs shall be included in the project plans and specifications and shall be made a condition of approval for the project.

Policy 6: Limit development to a level that can be reasonably supported by available local water resources.

Action 6.1: Require development projects to obtain "will serve" letters from applicable service agencies.

Action 6.2: For areas not served by an existing water system, require future development projects to demonstrate, prior to permit issuance, that sufficient water exists to serve both domestic and fire flow needs of the development and that use of that water will not deplete or degrade water supplies in the area, or adversely impact natural resources.

Action 6.3: Deny development projects that have not demonstrated the availability or entitlement to a supply of water adequate to meet the needs of the proposed project.

Objective C

Promote water conservation programs for Mono County's water resources.

Policy 1: Develop and implement water conservation programs for Mono County government operations.

Policy 2: Water intensive development proposals shall include water conservation measures as a condition of approval of the project.

Policy 3: Work with local water providers to implement water conservation programs in local communities.

Policy 4: Encourage effective water conservation programs for communities outside Mono County that benefit from water resources originating in the county.

Policy 5: Support efforts by affected parties in the Mono Lake litigation to secure monies made available through AB 444 to provide replacement water supplies for Los Angeles and to permanently protect Mono Lake.

Objective D
Protect the Public Trust values[2] of the water resources of Mono County.

Policy 1: Encourage and support agencies responsible for reviewing water rights applications to consider the effects of existing and proposed water diversions upon interests protected by the Public Trust.

Action 1.1: If necessary, file formal protests with the State Water Resources Control Board when the County determines that granting a water rights application would be harmful to Public Trust values.

Action 1.2: Require water projects that may impact Public Trust values to avoid or mitigate those potential adverse impacts.

Policy 2: Oppose any legislative or regulatory efforts to undermine or weaken protection afforded to county water resources by the Public Trust.

Objective E
Protect local water users and biological resources from the adverse effects of out-of-basin water transfers.

Policy 1: Regulate out-of-basin water transfers from private lands in the unincorporated area of the county, in accordance with the following actions.

Action 1.1: Where not preempted by state law, require a water transfer permit from the Mono County Planning Commission for out-of-basin water transfers.

Action 1.2: Applications for permits for out-of-basin water transfers shall be submitted to the county Planning Division and shall include the following information:

a. point of extraction;

b. amount of extraction;

c. nature and location of conveyance facilities.

Applications for water transfer permits shall include a processing fee, together with applicable environmental fees.

Action 1.3: Applications for groundwater export projects shall obtain a Groundwater Transfer permit, which requires the assessment of the potential impacts of the project prior to project approval in accordance with CEQA. The analysis shall:

a. be funded by the applicant;

b. be prepared by a qualified person under the direction of Mono County;

[2]The Public Trust recognizes that some types of natural resources are held in trust by government for the benefit of the public. Water resources have been recognized historically as a resource subject to the public trust.

c. delineate and define the nature of the aquifer;

d. define the safe yield of the aquifer;

e. identify potential impacts to the aquifer that may result from the project; and

f. propose project alternatives and mitigation measures.

Mitigation measures and associated monitoring programs shall be included in the project plans and specifications and shall be made a condition of approval for the project. Adverse impacts associated with water transfer proposals shall be mitigated to a level of non-significance, unless a statement of overriding considerations is made through the EIR process.

Action 1.4: In issuing a water transfer permit, the Planning Commission shall make the following findings:

a. That the proposed project meets all reasonable beneficial water needs, including in-stream uses, within the basin of origin; and

b. That the proposed project adequately protects water quality, in-stream flows, lake levels, and related resources. Projects that do not adequately protect these resources shall be denied.

Action 1.5: The Planning Commission shall review all water export projects in the unincorporated area for consistency with the county General Plan and any applicable Area Plans.

Policy 2: Implement the Groundwater Transfer Ordinance, and consider other local mechanisms to regulate groundwater exports.

Action 2.1: Initiate the process, via state legislation, to establish additional local Groundwater Management Districts (GWMDs) or to expand the existing GWMD to regulate out-of-basin groundwater transfers in appropriate areas of the county.

Policy 3: Oppose federal and state legislation and regulations that provide preferential status to out-of-county water appropriators or that allow for increased water diversions from Mono County.

Objective F

Promote the restoration and maintenance of Mono Lake, tributary streams, and downstream areas of the aqueduct system in Mono County, including Grant Lake, the Upper Owens River, Crowley Lake, and the Owens River Gorge.

Policy 1: Work with the appropriate agencies to develop and implement a comprehensive water management plan for Mono Basin and the downstream areas of the aqueduct system. The water management plan should ensure that Mono Lake and the local aqueduct system are managed in a manner that protects the ecological and fisheries values of the Mono Basin and downstream areas of the aqueduct system.

Action 1.1: Support the State Water Resources Control Board Decision 1631 requiring minimum flows to Mono Lake to raise the lake level over 6,391 feet above mean sea level by 2014.

Action 1.2: Support management of the aqueduct system that avoids drastic fluctuations in stream flows.

Action 1.3: Ensure that any comprehensive water management plan developed as per Policy 1, above, is consistent with the USFS's existing Comprehensive Management Plan for the Mono Basin National Forest Scenic Area.

Action 1.4: Manage Crowley Reservoir to protect the fishery and recreational opportunities at the reservoir.

Action 1.5: Manage the Upper Owens River to protect the quality of the fishery.

Objective G
Reestablish streams impacted by diversions in the Mono Basin and Long Valley hydrologic units with flows adequate to support fish populations, riparian habitat, and associated recreational and scenic values.

Policy 1: Support efforts to establish minimum flows in all streams impacted by water diversions. In establishing minimum stream flows, allow for appropriate flushing flows as needed.

Action 1.1: Review technical documents prepared for the Mono Basin, Upper Owens, and Crowley Lake areas in order to provide input to the LADWP's water management plan on an annual basis.

Policy 2: Provide land use controls that facilitate the restoration of impacted stream channels and adjacent areas.

GOAL 2: Protect the quality of surface and groundwater resources to meet existing and future domestic, agricultural, recreational, and natural resource needs in Mono County.

Objective A
Preserve, maintain, and enhance surface and groundwater resources to protect Mono County's water quality and water dependent resources from the adverse effects of development or degradation water dependent resources.

Policy 1: Future development projects shall avoid potential significant impacts to water quality in Mono County, or mitigate impacts to a level of non-significance unless a statement of overriding considerations is made through the EIR process.

Action 1.1: Future development projects with the potential to impact water quality significantly shall assess the potential impact(s) prior to project approval. Examples of potential significant impacts include:

a. substantially degrading water quality; and/or

b. contaminating a public water supply; and/or

c. causing substantial flooding, erosion or siltation.

In areas determined by the County to be of special significance, such an analysis and associated mitigation measures may be required even if the proposed project conforms to water quality standards established by the Lahontan Regional Water Quality Control Board for the project area.

The analysis shall:

a. be funded by the applicant;

b. be prepared by a qualified person under the direction of Mono County;

c. assess current water quality in the general project vicinity;

d. describe the impacts of the proposed development upon water quality within the project site and on surrounding areas, including a quantification of potential runoff and sedimentation from erosion, contamination that could enter the surface or groundwater system, calculations or mapping related to flooding, and potential cumulative onsite and offsite hydrologic effects on water quality;

e. for projects with the potential to significantly affect groundwater resources, the analysis may be required to include hydrologic mapping, studies of water flows, groundwater resources, aquifer properties, and baseline quality data; and

f. recommend project alternatives or measures to avoid or mitigate impacts to water quality, including a plan for long-term monitoring of water quality.

Mitigation measures and associated monitoring programs shall be included in the project plans and specifications and shall be made a condition of approval for the project.

Policy 2: Control erosion at construction projects.

Action 2.1: Ensure that Lahontan Regional Water Quality Control Board regulations for erosion control are met as a condition for County permit approvals.

Action 2.2: Work with Lahontan to develop standards and regulations for specific areas of the unincorporated area. Reflect these standards in applicable county regulations, such as the Grading Ordinance (Chapter 13.08).

Action 2.3: Work with Lahontan to enforce erosion control standards for development on private land.

Action 2.4: Require posting of a performance bond in compliance with the county Grading Ordinance.

Action 2.5: Work with Lahontan in the development and revision of erosion control standards.

Policy 3: Adjust current practices that cause excessive erosion in order to avoid or mitigate such erosion.

Action 3.1: County staff and contractors shall follow County grading standards when maintaining County roads, rights of way, and property.

Action 3.2: Request that state and federal agencies enforce requirements to minimize erosion.

Action 3.3: Promote the use of cattle fences and fish screens in range areas next to streams and lakes where scientific data and management policies indicate the practice to be beneficial to wildlife and livestock.

Action 3.4: Consider amending the county Grading Ordinance to address water quality concerns.

Policy 4: Establish buffer zones where recharge occurs, including adjacent to surface waters and riparian areas.

Action 4.1: Amend the General Plan to specify uses and setback requirements from recharge, riparian, and wetland areas. Continue to enforce setback requirements from surface waters.

Action 4.2: Establish policies for the management of wetlands in Mono County.

Action 4.3: Develop Special Area Management Plans[3] in cooperation with the U.S. Army Corps of Engineers for the Bridgeport Valley and Long Valley, as well as other wetland regions of the county.

Policy 5: Control the release of storm water so that runoff from sites in recharge zones does not increase in volume or leave the site more rapidly than it would under natural conditions.

Action 5.1: Update the county Grading Ordinance to specify that as part of the grading permit process, developers may be required to provide hydrologic studies assessing pre-development runoff and calculating project runoff.

Policy 6: Drill holes, such as those that are used for mining, geothermal development, and water development, shall be abandoned and plugged in conformity to state requirements for the protection of groundwater resources and public health and safety.

[3]A Special Area Management Plan is a set of policies developed cooperatively with the U.S. Corps of Engineers to address local wetland development issues.

Objective B
Protect water from chemical or bacterial contamination.

Policy 1: Sewage treatment facilities shall be adequate to protect beneficial uses of surface and groundwater.

Action 1.1: Cooperate with Lahontan to monitor water quality.
Action 1.2: Encourage federal, state, and local agencies to maintain adequate sanitary treatment capacity at their facilities.

Policy 2: Degradation of water quality from livestock shall be minimized.

Action 2.1: As necessary, investigate the use of fencing, alternate grazing patterns, and/or reduction in the number of animals grazed, or other measures to protect stream water quality.

Action 2.2: Recommend that salt blocks, supplemental food supplies, or chemicals used in treating animals be located sufficiently far from surface water and used in such a manner as to protect water quality.

Policy 3: Chemicals used for road maintenance should be applied in a manner that does not cause degradation of water quality.

Action 3.1: County staff and contractors shall not use environmentally damaging methods for de-icing roads.

Action 3.2: Work cooperatively with other agencies such as Caltrans and the Town of Mammoth Lakes to achieve the most environmentally sound methods of de-icing roads.

Action 3.3: Request further study of proposed de-icing methods before their widespread use.

Action 3.4: Enforce Lahontan's standards for road maintenance and weed control; work with other agencies to do the same.

Policy 4: Use of fertilizer, pesticide, and other chemicals on vegetation or soil in recharge zones should be minimized.

Action 4.1: Work with the county Agricultural Commissioner and the Soil Conservation Service to institute controls to protect water quality.

Action 4.2: Work with the county Agricultural Commissioner and the Soil Conservation Service to promote effective and minimal use of chemicals in landscaping and agriculture.

Policy 5: Assist in the management and control of toxic chemicals or other substances from extractive, industrial, manufacturing, household or commercial uses.

Action 5.1: Assist appropriate agencies, such as Lahontan Regional Water Quality Control Board and EPA, in enforcing regulations pertaining to hazardous waste management.

Action 5.2: Implement policies in the Hazardous Waste Management Element of the county's General Plan.

AGRICULTURE, GRAZING, AND TIMBER

GOAL 1: Preserve and protect agricultural and grazing lands in order to promote both the economic and open space values of those lands.

Objective A

Encourage the retention of agricultural and grazing lands.

Policy 1: Discourage the conversion of agricultural lands to non-agricultural uses.

Action 1.1: Future development projects with the potential to convert prime agricultural land to non-agricultural use or to impair the productivity of prime agricultural land (as defined in Government Code Section 56064) shall assess the potential impact(s) prior to project approval. The analysis shall:

a. be funded by the applicant;

b. be prepared by a qualified person under the direction of Mono County;

c. assess existing conditions in the general project vicinity;

d. describe the impacts of the proposed development upon prime agricultural lands within the project site and on surrounding areas; and

e. recommend project alternatives or measures to avoid or mitigate impacts to prime agricultural land to a level of non-significance, unless a statement of overriding considerations is made through the EIR process.

Mitigation measures and associated monitoring programs shall be included in the project plans and specifications and shall be made a condition of approval for the project.

Action 1.2: Establish adequate minimum parcel sizes for viable agricultural lands and encourage consolidation of undersized parcels. Consider amending the General Plan to address minimum parcel sizes in appropriate land use designations. An exception to this policy may occur when it is proposed to parcel a farmhouse from the remaining agricultural lands.

Action 1.3: Limit extension of urban services, such as sewer, beyond existing Special District sphere of influence boundaries.

Action 1.4: Consider the availability and financing of public services and utilities in any decision to convert an area from agricultural to non-agricultural uses. Applicants for projects that have the potential to convert prime agricultural land to a non-agricultural use shall, as part of

the required impact analysis, provide a fiscal impact section that documents anticipated service and fiscal impacts on Mono County and other local agencies.

Action 1.5: Require the preparation of a specific plan for proposed subdivisions in agricultural areas, as determined by Planning Staff. A specific plan may be required if any of the following conditions applies:

a. The proposed subdivision would substantially change the use in the area;

b. The proposed subdivision would be growth-inducing;

c. The proposed subdivision would result in a mix of uses in the area; or

d. The proposed subdivision would affect prime agricultural land.

Policy 2: Develop adequate amounts of farm worker and farm family housing in agricultural areas in order to support the efficient management of local agricultural production activities.

Action 2.1: Encourage farm operators to provide sufficient housing for permanent and seasonal agricultural employees and family members in addition to the housing permitted by the applicable density.

Action 2.2: Locate agricultural employee housing where it promotes efficiency of the farming operation and has minimal impact on productive farmland.

Action 2.3: Allow clustering of employee housing.

Policy 3: Encourage the development of programs that offer financial incentives to farm owners to reduce reliance on subdivision and sale of land to raise operating capital.

Action 3.1: Use voluntary purchase or transfer of development rights programs to limit intrusion of residential development in agricultural lands. If TDR or PDR is used, amendments of the land use map or redesignations shall not be used to lower density in anticipation of conferring transfer or purchase rights.

Action 3.2: Support property and estate tax relief measures that assess long-term agriculture at farm use value.

Action 3.3: Support the use and expansion of Williamson Act contracts over County-designated agricultural lands.

Policy 4: Provide for the raising, harvesting and production of fish in the same manner as the harvesting and production of agricultural products.

Action 4.1: Allow aquaculture and its related facilities and activities in all agricultural areas.

Policy 5: Establish a countywide standing agricultural committee to address issues affecting agricultural landowners in the county. The committee shall be integrated with the county's existing regional and community planning advisory committees.

Objective B

Mitigate conflicts between agricultural and non-agricultural uses in designated agricultural areas.

Policy 1: Limit land uses within viable agricultural areas to those which are compatible with agricultural uses.

Action 1.1: Maintain, in those agricultural land use categories where small parcels may be permitted, the largest land area for agricultural use. Limit the number of clustered lots in any one area to avoid the potential conflicts associated with residential intrusion.

Action 1.2: Where clustered subdivision is permitted, separate clusters on one site from those on another site unless it is clearly demonstrated that the resulting lots will not create the appearance of, or conflicts associated with, residential intrusion. Any subdivision that proposes to cluster parcels of 10 acres or less, shall locate those lots around existing residences on the parcel being subdivided. The intent of this policy is to minimize the impact of residential parcels on adjacent agricultural operations.

Action 1.3: Wherever practical, where clustered subdivision is permitted, use natural features such as ridge tops, creeks, and substantial tree stands to separate the small parcels from the farming areas.

Action 1.4: Where clustered subdivision is permitted, to the extent allowed by law, place an agricultural easement in perpetuity, or other appropriate mechanism, on the residual farming parcel(s) at the time that the subdivision occurs. The easement shall be conveyed to the County or other appropriate nonprofit organizations.

Policy 2: The primary use of any parcel within an agricultural land use category shall be agricultural production and related processing, support services and visitor serving services. Residential uses in these areas shall recognize that the primary use of the land may create agricultural "nuisance" situations such as flies, noise, odors, and spraying of chemicals.

Action 2.1: Facilitate agricultural production by permitting limited agricultural support service uses that support local agricultural activities and are not harmful to the long-term agricultural use in the area.

Policy 3: Ensure access to irrigation facilities.

Action 3.1: As a condition of approval for subdivisions and other applicable development projects, require easements or other appropriate mechanisms to ensure access to irrigation facilities.
Action 3.2: Amend the subdivision ordinance to include measures for the protection of access to irrigation facilities by applicable entities.

Objective C

Promote sound grazing management practices to preserve and enhance the economic and open space values of the land, as well as natural resources, water resources and other public trust values.

Policy 1: Determine the environmental impacts associated with grazing activities in the Long Valley Caldera and on other private lands and LADWP lands in the county.

Action 1.1: Provide input to the Lahontan Regional Water Quality Control Board's investigation of grazing impacts on Crowley Lake.

Action 1.2: Consider designating sensitive portions of the Long Valley Caldera and other appropriate areas in Mono County for Natural Habitat Protection; restrict or prohibit grazing in areas so designated.

Action 1.3: Promote the restoration of private lands degraded by grazing.

Action 1.4: Encourage use of federal land management agency procedures for grazing management practices on private and LADWP lands; e.g., Humboldt-Toiyabe National Forest grazing standards.

Action 1.5: Consider cooperative management, monetary assistance by the county and/or public purchase in areas where it is determined that grazing conflicts with fishery uses.

Action 1.6: Adopt Range Management Advisory Committee and/or Lahontan Regional Water Quality Control Board guidelines for grazing management as they evolve.

GOAL 2: Allow timber harvesting and fuelwood cutting on private lands consistent with the maintenance of recreational, scenic, and natural resource values.

Objective A
Regulate timber harvesting and fuelwood cutting on private and LADWP lands.

Policy 1: During the permit review process, require compliance with Cal Fire's, formerly the California Department of Forestry (CDF), timber harvesting regulations for private lands.

Objective B
Ensure a healthy forest resource.

Policy 1: Work with Cal Fire and federal land management agencies to minimize the impacts of new development on forest resources.

Action 1.1: Limit the size of new forest openings, including roadways.

Action 1.2: Discourage disturbance or removal of forest litter, to maintain the natural catchment and cycling of nutrients.

MINERAL RESOURCES

GOAL: Provide for the conservation and development of mineral resources in a manner that minimizes land use conflicts and maintains a quality environment.

Objective A
Locate and identify significant mineral resource deposits.

Policy 1: Pursue methods that will elevate Mono County's status from a "Low" priority to a "Very High" or "High" priority with respect to the California Department of Conservation, Division of Mines and Geology, priority schedule for *Mineral Land Classification Studies*.

Policy 2: The *State Mineral Land Classification Reports*, as completed and transmitted to Mono County by the State Geologist, shall be utilized to locate and identify:

A. Areas containing little or no mineral deposits.

B. Areas containing significant mineral deposits.

C. Areas containing mineral deposits, the significance of which requires further evaluation.

Action 2.1: The detailed maps and text associated with *State Mineral Land Classification Reports* and/or *State Board of Mines and Geology Designations* shall be kept on file with the Planning Division and made available for public review upon request (see Table 2).

Policy 3: Until the State Geologist finalizes and transmits *State Mineral Land Classification Reports* for all areas of Mono County, pursue other methods and funding sources that could be utilized to identify where locally important and/or potentially significant mineral resource deposits may exist.

Action 3.1: In cases where conflicts may arise between *State Mineral Land Classification Reports* and Mineral Resource Mapping in the **MEA**, the *State Mineral Land Classification Reports* shall take precedence or, if necessary, cases shall be decided on a case-by-case basis in consultation with representatives from the state Division of Mines and Geology.

Action 3.2: The **MEA** Mineral Resource Mapping is intended to be utilized as resource material only and should not be construed, in and of itself, as dictating land use policy. The accuracy of the **MEA** Mineral Resource Mapping is not sanctioned by the County.

Action 3.3: The Planning Division shall update and incorporate changes to the **MEA** Mineral Resource Mapping as new information becomes available.

Action 3.4: **MEA** Mineral Resource Mapping and all reference materials associated with the development and/or modification thereof shall be kept on file with the Planning Division and made available for public review upon request.

Objective B
Conserve and protect areas containing significant mineral deposits in a manner that avoids or minimizes land use conflicts.

Policy 1: Significant mineral resource deposits identified in *State Mineral Land Classification Reports* shall be assigned to a "DMG" classification on the **MEA** Mineral Resource Maps. The purpose of this assignment shall be to:

A. Recognize mineral information classified by the State Geologist and transmitted by the State Mining and Geology Board.

B. Assist in the management of land uses that may affect areas of statewide and regional significance.

C. Emphasize the conservation and potential for development of the identified mineral deposit.

Action 1.1: Prior to permitting a use that would threaten the potential to extract minerals in an area classified by the State Geologist as an "area containing significant mineral deposits," the applicant shall provide a report in conformity to applicable provisions of SMARA. The report shall be funded by the applicant and at a minimum shall:

a. be prepared by a qualified professional under the direction of Mono County;

b. assess the significance of the mineral resource and describe the impacts of the proposed development upon future mineral resource development;

c. specify the reasons why the proposed use should be permitted; and

d. propose project alternatives and/or mitigation measures to avoid or reduce potential project impacts with respect to the resource.

Action 1.2: Land use decisions involving areas designated by the state Mining and Geology Board as "areas of regional and/or statewide significance" shall also consider the importance of the minerals to their market region, the state, and the nation as a whole and not just the importance to the County's area of jurisdiction.

Action 1.3: Prior to permitting a use that would threaten the potential to extract minerals in an area classified by the State Geologist as an "area containing mineral deposits the significance of which requires further evaluation," the County may require the applicant to provide a report prepared in conformity to the specifications in Action 1.1 above. The report shall be submitted to the State Geologist for review and comment.

Action 1.4: State Mineral Land Classification Reports shall be reviewed by the Planning Division. Areas designated by the State Geologist as "areas containing significant mineral resource deposits" shall be assigned to an

appropriate land use designation that shall emphasize the conservation and potential for development of the resource.

Action 1.5: Prior to permitting a use that would threaten the potential to extract "locally important and/or potentially significant mineral resource deposits," the County may require the applicant to provide a report prepared in conformity to the specifications in Action 1.1 above. The report shall be submitted to the State Geologist for review and comment.

Policy 2: The possible existence of a mineral deposit should not preclude use of land for a higher and better use.

Objective C

Manage all mineral resource development activities in a manner that adequately protects the public health, safety, and welfare as well as environmental and socio-economic values.

Policy 1: Mineral resource development projects shall meet or exceed applicable provisions of CEQA, NEPA, SMARA, and the Mono County Environmental Handbook.

Action 1.1: Mineral resource development projects shall strive to avoid or mitigate potentially significant adverse environmental impacts. Significant adverse impacts that cannot be mitigated to a level of non-significance shall require findings of overriding consideration in conformity to CEQA.

Action 1.2: Require an Environmental Impact Report (EIR), with appropriate mitigation, for all open pit mining operations that are subject to permit requirements as specified in SMARA and that propose to utilize a cyanide heap leaching process.

Action 1.3: Encourage project proponents to meet with County personnel and responsible/trustee agencies as early as possible, prior to submitting an application, in order to identify the scope and magnitude of issues that may be considered environmentally significant.

Action 1.4: Encourage the public, through appropriate public notice, to participate in the scoping process for all mineral resource development projects.

Policy 2: Mineral resource development projects shall comply with all applicable provisions of the county's General and Area Plans, along with requirements set forth in the California Surface Mining and Reclamation Act (SMARA); the California Code of Regulations, Title 14, "Mining and Geology"; and County ordinances.

Action 2.1: Amend the county General Plan to provide for a Resource Extraction (RE) District. The Resource Extraction District shall provide appropriate regulations with respect to mineral resource development.

Action 2.2: Mineral resource development activities may be permitted only in those areas designated for Resource Management and Resource Extraction. Extraction of saleable materials/aggregates (e.g., sand or

gravel) may also be permitted in areas designated Agriculture and Resource Extraction.

Action 2.3: Recreational mining[4] shall be permitted in all districts.

Action 2.4: Surface and subsurface mining operations shall obtain a mining use permit, including approval of a reclamation plan, prior to commencing surface disturbance activities.

Action 2.5: Develop appropriate application forms to expedite the application and processing of mineral resource exploration, development, and reclamation projects. Update these forms as necessary to reflect applicable federal, state, and county regulatory changes.

Policy 3: Surface mining operations located on federal lands shall conform to applicable provisions of SMARA.

Action 3.1: Administration and coordination of surface mining activities on lands administered through the BLM shall be in conformity to the Memorandum of Understanding (MOU) between the BLM and the County.

Action 3.2: Pursue methods, such as a MOU or Joint Powers Agreement, to address the administration and coordination of surface mining activities on lands administered through the USFS.

Policy 4: Explore methods to implement a countywide mineral extraction fee or tax. The purpose of this fee or tax shall be to compensate the County for the depletion of its non-renewable mineral resources.

Policy 5: Periodically review filing, processing, and inspection procedures to ensure that staff time allocated to mineral resource development is adequately reimbursed through the assessment of appropriate fees.

Policy 6: Periodically review and where necessary propose amendments to the Mineral Resource Management Policies. All such amendments shall be submitted to the State Board of Mines and Geology for review and comment prior to adoption.

[4]"Recreational mining" means the extraction of minerals that does not require a County, State, or Federal permit of any type, and does not utilize mechanized earth-moving equipment.

TABLE 1: MONO COUNTY MINERAL RESOURCE CLASSIFICATIONS

Mineral Resource Area 1 (MRA-1): Areas where adequate information indicates that no significant mineral deposits are present, or where it can be judged that there is little likelihood for their presence. This area shall be applied where well developed lines of reasoning, based upon economic geologic principles and adequate data, demonstrate that the likelihood for occurrence of significant mineral deposits is nil or slight.

Mineral Resource Area 2 (MRA-2): Areas where adequate information indicates that mineral deposits are present or where it is judged that there is a high likelihood for their presence. This area shall be applied to known mineral deposits or where well developed lines of reasoning based upon economic geologic principles and adequate data demonstrate that the likelihood for occurrence of significant mineral deposits is high.

Mineral Resource Area 3 (MRA-3): Areas containing mineral deposits the significance of which can not be evaluated from available data.

Mineral Resource Area 4 (MRA-4): Areas where available information is inadequate for assignment to any other Mineral Resource Area classification.

Scientific Resource Area (SRA): Areas containing unique or rare occurrences of rocks, minerals, or fossils that are of outstanding scientific significance shall be classified in this zone.

Department of Mines and Geology (DMG): Areas that have been classified by the State Geologist and/or designated by the state Board of Mines and Geology.

CONSERVATION OPEN SPACE ELEMENT

TABLE 2

MINERAL LAND CLASSIFICATION OF THE EUREKA, SALINE VALLEY AREA, INYO AND MONO COUNTIES. Sacramento: California Department of Conservation, Division of Mines and Geology, Special Report 166 (1993).

MONO COUNTY MINING DATABASE AND RELATED NARRATIVE. Susan K. Flynn, Editor. Sutter Creek, California: Geotechnical Research and Development, May 1990. The data contained in this document provided the basis from which the (MEA) mineral resource maps were prepared, in addition to compiling a comprehensive bibliography of geologic and mineral resource documents about the county.

ENERGY RESOURCES

GOAL 1: Establish a regulatory process with respect to both geothermal exploration and development that ensures that permitted projects are carried out with minimal or no adverse environmental impacts.

Objective A
Establish separate permit processes for geothermal exploration and for geothermal development.

Policy 1: Mono County ordinances, rules and regulations shall establish a phased permit process for geothermal development in accordance with the provisions of this element.

Action 1.1: The permit for the first phase (exploration) shall regulate geothermal exploration and reservoir characterization activities. It shall be called the "geothermal exploration permit." The primary purpose of this exploratory phase is to determine hydrologic, geologic and other relevant physical characteristics of the geothermal resource that might be developed.

Action 1.2: During the exploratory phase, the permittee shall develop sufficient data to determine whether there is a geothermal resource adequate to sustain the proposed development project.

Action 1.3: The permit for the second phase (development) shall regulate geothermal development and operations. It shall be called the "geothermal development permit." The purpose of the development phase is to regulate all geothermal development, including the siting and construction of facilities, conditions of operation, and the maintenance of roads and equipment, and to assure the protection of the environment. This phase also includes the termination of operations and reclamation of the site.

Action 1.4: The implementing ordinances, rules and regulations shall provide for the use of common environmental documentation for both

permit stages when consistent with the California Environmental Quality Act (CEQA).

Action 1.5: Whether an activity is exploratory or developmental shall be determined by reference to regulations of the California Division of Oil and Gas.

Objective B
Establish procedures for project review that comply with, and, where determined to be necessary by the Board of Supervisors, exceed existing environmental protection laws.

Policy 1: Mono County, through its permitting process, shall assure compliance with existing law and the carrying out of policies relating to restricted development zones.

Action 1.1: Permits for both geothermal exploration and development shall contain conditions that assure compliance with CEQA and with applicable laws and regulations of Mono County and other agencies with jurisdiction.

Action 1.2: Except for projects in the vicinity of Casa Diablo and associated monitoring or mitigation wells or other facilities, a proposed geothermal project within the Hot Creek Buffer Zone (see Figure 2) and the Deer Migration Zones (see Figure 1), or either of them, identified in this element shall not be permitted, notwithstanding the provisions of CEQA or the County guidelines, unless a finding is made that all the identified environmental impacts of the proposed project are reduced to less-than-significant levels by the permit conditions.

Objective C
Establish procedures that assure that the cumulative impacts of geothermal and other projects on hydrologic and biologic resources are mitigated to less-than-significant levels.

Hot Creek Buffer Zone

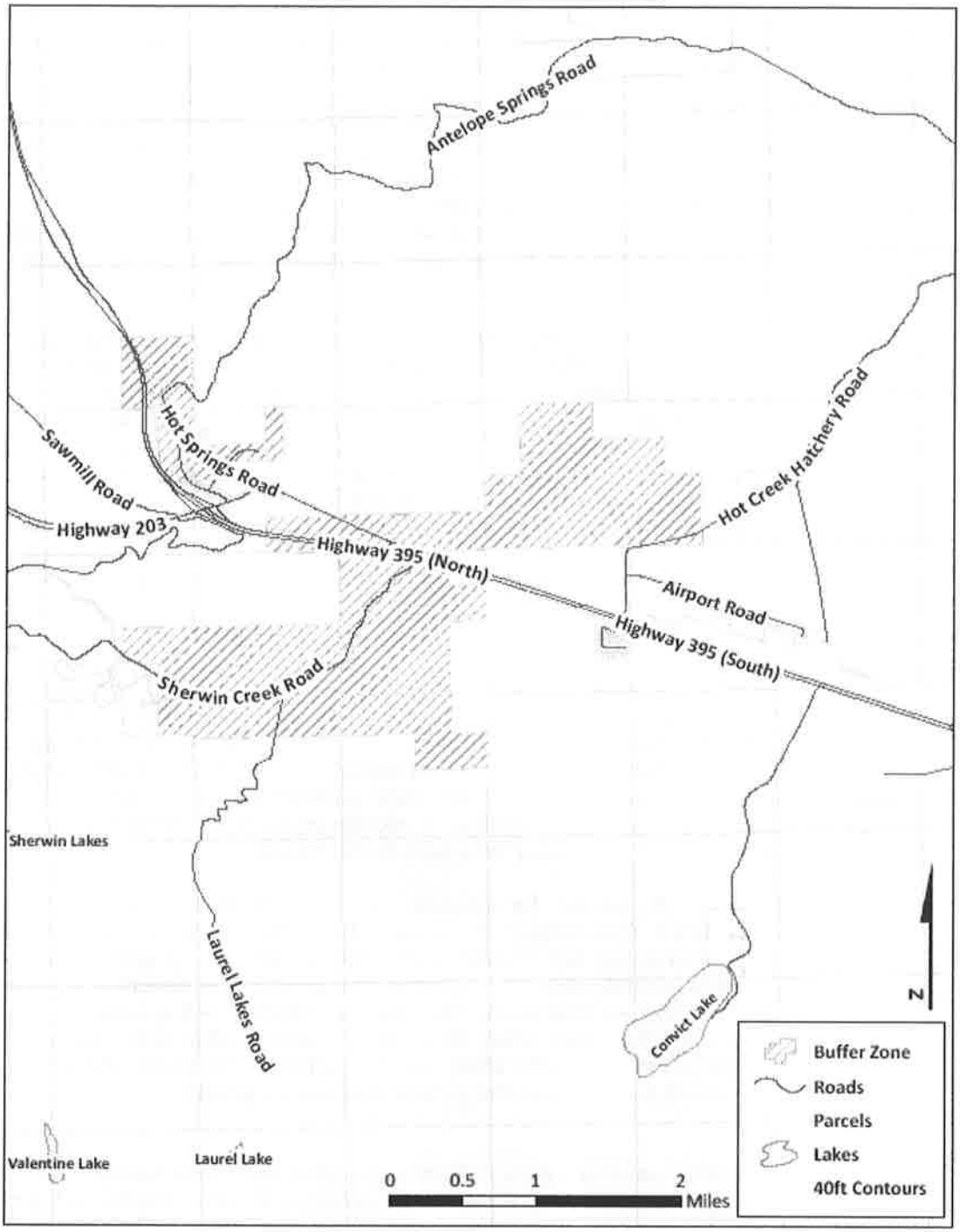

Figure 2

Policy 1: Geothermal development projects shall be phased so that the operational impacts of a permitted project can be assessed before a subsequent project is permitted within an area that may be affected by the permitted project.

Action 1.1: After a permit for geothermal development has been issued by Mono County, no subsequent application for a permit for geothermal development within an area that may be affected by the permitted project shall be accepted until hydrologic and biologic monitoring data relating to the permitted development has been collected for a period of not less than two years. If an area in which a new permit for geothermal development is sought has been previously developed and hydrologic and biologic monitoring data has been collected in the area for in excess of two years, it shall be not less than six months before the new application is accepted.

Action 1.2: Geothermal exploration and development operations shall be monitored, and the monitoring data shall be evaluated by the Mono County Economic Development Department (MCEDD) and the Long Valley Hydrologic Advisory Committee (LVHAC), or other appropriate regional hydrologic committees, and CDFG. The purpose of the monitoring is to determine whether there are or may be adverse hydrologic or biologic impacts. The data and evaluations, to the extent they are not proprietary, shall become a part of the record of any proceeding to consider subsequent geothermal exploration or development permit applications within the Hot Creek Buffer Zone, the deer migration zones, or any other regions that may be affected by the existing projects.

Action 1.3: Prior to the issuance of any permit for either geothermal exploration or development within the Hot Creek Buffer Zone, the MCEDD shall prepare a written analysis of the cumulative hydrologic and biologic impacts of the proposed project and other development projects of any kind or nature that may individually or cumulatively affect springs, streams, fumaroles, or significant biologic resources within the zone. The analysis shall be a part of the record.

Action 1.4: Except for projects in the vicinity of Casa Diablo and associated monitoring or mitigation wells or other facilities, and notwithstanding the provisions of CEQA or the County guidelines, where there is credible scientific evidence contained in the foregoing cumulative impact analysis that shows that the project for which a permit is sought, taken together with other development and development projects, may substantially adversely affect springs, streams, or fumaroles within the Hot Creek Buffer Zone, the permit shall not be granted.

Objective D

The permit holder shall establish data collection for hydrologic and biologic mitigation and monitoring programs to serve as the basis for assuring protection of hydrologic and biologic resources and water quality and quantity. These programs shall be approved by the MCEDD, after consultation with the LVHAC or another appropriate regional hydrologic advisory committee, and the CDFG, prior to implementation.

Policy 1: Geothermal exploration and development projects shall be sited, carried out and maintained by the permit holder in a manner that best protects hydrologic resources and water quality and quantity.

Action 1.1: During the permit processing period, the applicant for a geothermal development permit shall submit draft hydrologic and biologic monitoring plans to the MCEDD. The plans and proposed mitigation measures, as modified and as accepted by the County or its officers, boards and commissions, shall be approved as part of the initial use permit conditions, if a permit is granted.

The operator under a geothermal development permit shall implement the hydrologic resource monitoring plan to monitor baseline conditions and detect changes in the existing hydrothermal reservoir pressures and shallow aquifer water levels, as well as the discharge (flow) rate and temperatures of selected thermal springs in the project area, if any exist.

Action 1.2: The monitoring plans shall include a formula to calculate the appropriate portion of costs to be repaid to the County by the permit holder in the event that the County expends monies to collect baseline data for the plans.

Action 1.3: Upon the basis of relevant scientific evidence and the recommendation of the LVHAC or another appropriate hydrologic review committee, the monitoring plans may be amended during operations upon prior written approval of the MCEDD or the Planning Commission.

Action 1.4: The hydrologic and biologic resource monitoring plans shall include:

a. A schedule for periodically collecting and submitting data to the MCEDD;

b. A schedule for preparing a periodic monitoring report to the MCEDD; and

c. Provisions for periodic review and assessment of the monitoring data by qualified consultants.

Action 1.5: The applicant for a geothermal development permit shall prepare a baseline data report to be included as part of the hydrologic and biologic resource monitoring plans that identifies all significant hydrologic and biologic baseline information available for the project area. Permit conditions shall require that the permit holder or operator continually collect and submit production data to the MCEDD. The frequency and manner of data collection must be approved by the MCEDD, after consultation with the LVHAC or another appropriate hydrologic advisory committee, and the California Department of Fish and Game.

Action 1.6: If scientific evidence indicates that geothermal exploration or development is significantly threatening, or causing, pressure or temperature changes to springs, streams or fumaroles within the areas of the Hot Creek Gorge or Hot Creek Hatchery that are beyond the natural variations determined through baseline data collection, the permit holder

shall implement such mitigation measures as are required by the MCEDD, including, but not limited to, the following:

a. Drilling and monitoring new observation wells, or otherwise amending the hydrologic resource monitoring plan;

b. Reorienting existing exploration, production or injection operations, or any of them, to increase or decrease hydrologic reservoir temperatures or pressures at the appropriate locations;

c. Injecting hot geothermal fluid from the production area directly into injection wells at the appropriate locations to compensate for pressure or temperature changes in the direction of Hot Creek Gorge springs and Hot Creek Hatchery springs, if either group of springs has been shown to be adversely affected by the permit holder's operations;

d. Drilling new injection wells in the vicinity of the project area and injecting hot geothermal fluid from the production area to compensate for temperature and pressure decreases in the direction of Hot Creek Gorge springs and Hot Creek Hatchery springs, if either group of springs has been shown to be adversely affected by project operations; and

e. Curtailing or entirely discontinuing geothermal operations.

Action 1.7: In order to minimize hydrothermal reservoir pressure declines, and provided the conditions do not conflict with regulations of the California Division of Oil and Gas, development permit conditions shall require the reinjection of substantially all extracted geothermal fluids. Incidental uses of the produced geothermal fluids (i.e., well drilling, well testing, emergency fire water makeup) are exempted from this injection requirement.

Action 1.8: The permit holder shall prepare and submit to the MCEDD, prior to commencement of construction, a detailed blowout contingency plan, which includes a description of blowout prevention equipment required during drilling. Sufficient cold water shall be stored by the permit holder at each well site to quench the well should a blowout occur during drilling.

Water used for this purpose shall not be extracted from surface water sources in a manner that would harm aquatic vertebrate species dependent upon the surface water source. The plan shall provide for regular maintenance and testing of equipment. It shall be approved by the MCEDD prior to operations as condition of the permit.

Action 1.9: If biologic monitoring indicates that permitted geothermal exploration, development and operations, or any of them, have significant adverse effects, then the County shall take such action as is necessary to reduce the effects to less-than-significant levels, including curtailing or entirely discontinuing geothermal operations.

Action 1.10: Binary working fluids shall be air cooled.

Action 1.11: The consumptive use of surface water and groundwater, consistent with the reasonable needs (as determined by the MCEDD) of project operations and personnel, shall not decrease the natural flow of surface waters or the perennial yield of groundwater.

Action 1.12: Appropriate measures shall be taken to confine fluid spills. The capacity of the containment facilities shall be equal to at least twice the volume of the entire fluid contents of the facility, including pipeline capacity and the amount that would flow until automatic shutdown devices would stop the flow.

Action 1.13: No geothermal development located within the Hot Creek Buffer Zone shall occur within 500 feet on either side of a surface watercourse (as indicated by a solid or broken blue line on U.S. Geological Survey 7.5- or 15-minute series topographic maps).

Action 1.14: Permit conditions for both geothermal exploration and development shall assure that required reclamation is completed within one year after a project is completed. Reclamation plans shall contain provisions that assure the protection of springs, streams, and fumaroles from erosion, sediment transport, and similar adverse effects. Plan provisions shall also assure that project sites are restored as closely as reasonably possible to natural conditions, as determined by the MCEDD, in consultation with the Visual Review Committee.

Action 1.15: All geothermal permit applications, environmental documentation and proposed project conditions shall be referred to the appropriate hydrologic advisory committee and the California Department of Fish and Game (CDFG) prior to final action on the permit applications.

Action 1.16: The County shall cooperate with the CDFG in promptly referring documentation on proposed geothermal projects to it.

Action 1.17: Permits for both geothermal exploration and development shall incorporate by reference and require compliance with all applicable rules and regulations of other governmental agencies meant to protect the environment, including the CDFG, the California Division of Oil and Gas, the Lahontan Regional Water Quality Control Board, and the Great Basin Unified Air Pollution Control Board.

Action 1.18: All geothermal pipelines potentially visible in scenic highway corridors or important visual areas shall be obscured from view by fences, natural terrain, vegetation, or constructed berms, or they shall be placed in stabilized or lined trenches.

Objective E

Permit conditions for geothermal exploration or development projects shall minimize impacts on deer migration within the deer migration zones identified in this element.

Policy 1: Deer are an important natural, biological, and recreational resource. Geothermal exploration, development and operations shall be undertaken in a manner that minimizes or prevents adverse effects on deer population and migration within the deer migration zones.

Action 1.1: All policies and actions applicable to geothermal development generally that do not conflict with policies specifically applicable to deer migration zones shall be enforced by appropriate permit conditions.

Action 1.2: Development may be prevented in any part of a deer migration zone upon a finding that it will interfere with adopted regulations of the California Department of Fish and Game and the goals of the CDFG deer herd management plans.

Action 1.3: The County shall cooperate with the CDFG in devising conditions meant to carry out this policy.

Objective F
Geothermal exploration and development projects shall be carried out with the fewest visual intrusions reasonably possible.

Policy 1: Permit conditions shall require compliance with all applicable policies and actions of the Conservation/Open Space Element.

Objective G
The permit holder shall establish procedures that ensure that neither geothermal exploration nor development will cause violations of state or federal ambient air quality standards or the rules and regulations of the Great Basin Unified Air Pollution Control District (GBUAPCD).

Policy 1: Permit conditions shall require compliance with all requirements of the regional air pollution control district, and with all other applicable provisions of the Conservation/Open Space Element.

Action 1.1: Air quality shall be monitored by a representative of the MCEDD, or the regional air pollution control district with jurisdiction. The costs of such monitoring shall be funded by the permit holder or project operator.

Objective H
Mono County shall establish procedures that assure that neither geothermal exploration nor development creates unacceptable noise.

Policy 1: Project conditions shall require compliance with all applicable provisions of the Noise Element and the County Noise Ordinance.

GOAL 2: Permit the productive and beneficial development of alternative energy sources, including geothermal resources, consistent with the objectives of Goal I and national and local interests.

Objective A
Provided that the environment is protected in the manner required by the policies and actions of Goal I of this section of the Conservation/Open Space Element, County policy shall ensure the orderly and sound economic development of geothermal resources under the appropriate circumstances.

Policy 1: Decisions on applications for geothermal development permits may take into account evidence of national needs for alternative energy development.

Policy 2: Decisions on applications for geothermal development permits should be relatively more favorable during times of scarcities of other energy sources.

Action 2.1: Applicants for permits for geothermal exploration and development may be required to submit information showing the benefits of geothermal energy during the proposed period of geothermal operations. Benefit may be established by showing a contract for the sale of geothermal power to a utility engaged in the business of providing electrical power to the general public.

Policy 3: Mono County's geothermal resources shall be managed in a manner that assures reasonable economic benefits to the citizens and businesses of the county.

Action 3.1: Applicants for permits for geothermal development shall be required to submit information showing the economic benefits or detriments of the proposed development during the proposed period of operation.

Action 3.2: Decisions on applications for development permits should not be made in the absence of information showing the economic benefit or detriment of such development to the citizens and businesses of Mono County, including impacts on natural resources.

Action 3.3: Geothermal development permits should not be granted in the absence of a reasonable showing of economic benefit to the community, unless findings are made that there are overriding state or national energy needs.

GOAL 3: Protect the natural resources of Mono County from the potentially damaging effects of water storage and diversions for hydroelectric power generation.

Objective A
To prevent conflict between the environment and hydroelectric power generation uses.

Policy 1: All hydroelectric power generation projects located on land under Mono County jurisdiction shall require a use permit.[5]

Objective B
Water diversions for hydroelectric power generation shall not occur on any stream that already has more than 20% of its length that is not contained in a wilderness area

[5]Only those retrofit projects that entail major revisions to or replacement of the primary components of the system (i.e. penstock, generator, diversion structure, etc.) shall require a use permit.

affected by water diversions or in a watershed that already has more than 25% of its average annual inflow diverted.

Policy 1: Mono County shall cooperate with the CDFG, State Water Resources Control Board, the BLM, the USFS, and the Federal Energy Regulatory Commission, in assessing impacts to streams from existing and proposed hydroelectric power generation, diversion for consumptive use, or other uses.

Action 1.1: Mono County shall develop, as part of its hydrologic database, information on water diversions (see the Water Resources Section of this Element).

Policy 2: The County shall consult with those federal and state decision-making bodies having the authority to grant permits for hydroelectric plants.

Objective C

Water diversions for hydroelectric power generation shall not be permitted to occur on any stream that provides habitat for listed or candidate threatened or endangered species, is an important spawning stream or other fishery resource, is used extensively as a recreational resource, or is used extensively for stream research purposes.

Policy 1: Mono County shall cooperate with the CDFG, U.S. Fish and Wildlife Service, the BLM, and the USFS in assessing potentially sensitive surface water resources.

Action 1.1: Mono County shall develop, as part of its hydrologic database, information on water resources and areas that should be protected (see the Water Resources Section of this Element).

Policy 2: The County shall provide input to those federal and state decision-making bodies having the authority to grant permits for hydroelectric plants regarding criteria to be evaluated prior to issuing or denying permission to develop further the hydroelectric potential of already impacted streams and watersheds.

Objective D

Hydroelectric facilities shall be sited so that they are not easily visible from scenic highways or important visual areas.

Policy 1: Project conditions shall require compliance with all applicable provisions of the Conservation/Open Space Element.

GOAL 4: Permit development of wind and solar energy resources where the resource is adequate and visual impacts and impacts to fish and wildlife resources are minimal.

Objective A

The environmental feasibility of large-scale solar and wind energy facilities shall be evaluated before a use permit is granted.

Policy 1: The Mono County Economic Development Department shall solicit assistance from the California Energy Commission for purposes of reviewing the adequacy of the resource from wind and solar power generation projects.

GOAL 5: Permit development of wind and solar energy resources if environmental impacts are minimal and where it is compatible with existing and planned land uses.

Objective A
Large-scale solar and wind energy facilities shall not adversely impact the visual, recreational, and wildlife habitat resources, and noise environment in Mono County.

Policy 1: Project conditions shall require compliance with all applicable provisions of the Conservation/Open Space Element and the Noise Element.

Policy 2: Wind energy facilities shall not adversely affect wildlife.

Action 2.1: Wind energy facilities shall be sited so as to avoid flight paths of migratory birds.

GOAL 6: Permit use of other energy resources for power generation if environmental impacts and impacts to public health and safety are minimal.

Objective A
During the course of evaluating any power generation project under the jurisdiction of Mono County, the California Energy Commission shall be consulted.

Policy 1: Mono County Economic Development Department shall solicit assistance from the CEC for the purposes of reviewing proposed power generation facilities.

Objective B
Power generation facilities shall not adversely impact the visual resources, recreational resources, and noise environment in Mono County.

Policy 1: Project conditions shall require compliance with all applicable provisions of the Conservation/Open Space Element and the Noise Element.

Objective C
Emissions from the operation of power plants shall not adversely impact wildlife habitat, residents, or visitors and shall not constitute a hazard to public health and safety.

Policy 1: Project conditions shall require compliance with all applicable provisions of the Conservation/Open Space Element and the Safety Element.

GOAL 7: Minimize the visual and environmental impacts of electrical transmission lines and fluid conveyance pipelines.

Objective A
Electrical transmission and distribution lines and fluid conveyance pipelines shall meet the utility needs of the public and be designed to minimize disruption of aesthetic quality.

Policy 1: New major steel-tower electrical transmission facilities shall be consolidated with existing steel-tower transmission facilities except where there are technical or overload constraints or where there are social, aesthetic, significant economic, or other overriding concerns.

Action 1.1: Require selection of rights of way to preserve the natural landscape and minimize conflict with present and planned uses of land on which they are to be located.

Action 1.2: Encourage the joint use of transmission and pipeline corridors to reduce the total number of corridors and service and access roads required.

Action 1.3: Require the coordination of siting efforts so that other comparable utility uses can share rights of way in a common corridor where feasible.

Action 1.4: The County shall adopt a proactive position in the future siting of transmission and pipeline corridors by working with utilities and project proponents to specify those locations where transmission corridors are acceptable.

Action 1.5: Cooperate with the USFS and BLM in planning the use of utility corridors.

Policy 2: At the expense of the project proponent, comprehensive and detailed planning studies, including review of all feasible alternatives, shall demonstrate a clear need for new transmission lines or fluid conveyance pipelines, prior to the siting of these facilities.

Policy 3: New transmission or distribution lines or fluid pipelines shall be buried when such burial does not create unacceptable environmental impacts or the potential to contaminate shallow groundwater resources.

Policy 4: Where burial is not possible, transmission facilities and fluid pipelines shall be located in relation to existing slopes such that topography and/or natural cover provide a background where possible.

Policy 5: Transmission line rights of way shall avoid crossing hills or other high points at the crests. To avoid placing a transmission tower at the crest of a ridge or hill, space towers below the crest or in a saddle to carry the line over the ridge or hill. The profiles of facilities should not be silhouetted against the sky.

Policy 6: Where transmission line rights of way cross major highways or rivers, the transmission line towers shall be carefully placed for minimum visibility.

Policy 7: Avoid diagonal alignments of transmission lines through agricultural fields to minimize their visibility.

Policy 8: Require location of access and construction roads so that natural features are preserved and erosion is minimized. Use existing roads to the extent possible.

Policy 9: Require that materials used to construct transmission towers harmonize with the natural surroundings. Self-protecting bare steel and other types of non-reflective surfaces are appropriate in many areas. Towers constructed of material other than steel, such as concrete, aluminum, or wood should be considered. Coloring of transmission line towers to blend with the landscape should be considered.

Policy 10: Above-ground transmission lines shall be non-specular wire construction.

Objective B
Transmission and distribution lines shall not adversely impact wildlife or fisheries.

Policy 1: New transmission or distribution lines shall avoid open expanses of water and wetland, particularly those heavily used by birds. They shall also avoid nesting and rearing areas.

Policy 2: Avoid the placement of transmission or distribution lines through crucial wildlife habitats, such as deer fawning and migration areas.

Policy 3: Design transmission lines to minimize hazards to raptors and other large birds.

GOAL 8: Encourage the prudent use of energy and to allow substitution of alternative energy sources for conventional energy when such substitution would result in minimal environmental impacts.

Objective A
Allow the direct use of geothermal heat provided that such use does not conflict with recreational uses and does not create unmitigatible environmental impacts.

Policy 1: Support the use of direct heat from geothermal fluids in Mammoth Lakes, Bridgeport, and other communities where a geothermal resource may be utilized.

Action 1.1: Identify applications for the direct use of geothermal heat, in addition to space heating, that could support environmentally compatible light industry (such as greenhouses, aquaculture, vegetable dehydration, etc.).

Action 1.2: Cooperate with the Town of Mammoth Lakes/CEC Project on direct use of geothermal heat.

Policy 2: Through participation in the LVHAC Hydrologic Monitoring Program, ensure the implementation of adequate geothermal reservoir monitoring for those direct use projects that have the potential to affect Hot Creek Hatchery springs or Hot Creek Gorge springs.

Objective B
Allow the use of alternative energy sources, such as waste-to-energy or solar in the new construction of residential and commercial buildings.

Policy 1: Encourage the implementation of solar water and space heating systems.

Action 1.1: Provide for density bonuses for residential and commercial projects using passive or active solar heating. A 10% density bonus may be allowed for each 25% reduction in space and water heating demand.

Action 1.2: Enact a solar access ordinance requiring that structures be located and sized so as not to obstruct the solar access of adjoining existing structures unless owners of the affected structures are equitably compensated by the project proponent for the loss of solar access.

Policy 2: Encourage the implementation of alternative forms of space heating when a nearby geothermal source is not available.

Action 2.1: Require that large-scale housing, commercial, and industrial development projects evaluate the potential for using waste-to-energy trash incineration systems and passive solar space heating.

Objective C

Encourage energy conservation.

Policy 1: Promote energy conservation within the community.

Action 1.1: Encourage that an energy audit be conducted of new and existing structures prior to sale or resale. All cost-effective energy conservation measures identified in the audit should be completed prior to close of sale.

Action 1.2: Discourage the use of wood burning for space heating in areas where air quality is adversely affected by wood smoke.

Action 1.3: Require the use of EPA-certified, low-emission wood-burning stoves and fireplace inserts in new construction.

Action 1.4: Discourage the installation of wood-burning fireplaces by allowing a density bonus for the use of gas-fired decorative fireplaces.

Policy 2: Develop land use policies and development standards that foster energy conservation.

Action 2.1: Develop and encourage the use of a voluntary energy efficiency rating system in residential real estate transactions. Implement an ordinance requiring such energy efficiency disclosures in all residential transactions.

Action 2.2: Encourage that all existing residential buildings and motels/hotels be equipped with the following energy conservation measures at the time of sale: weather stripping at all doors, windows, and utility outlets; water heater insulation wrap; insulation of all exposed water pipes and heating ducts; double/triple-pane windows; and automatic thermostat setback control devices.

Action 2.3: Encourage that all built-in heating systems and electrical appliances sold in conjunction with new residential and commercial buildings be evaluated and rated for energy efficiency.

Action 2.4: Enforce the energy conservation provisions of the Uniform, Plumbing, and Mechanical Codes, as well as those in the California Code of Regulations, Title 22, Part 6.

Action 2.5: Ensure that future applicable codes and ordinances reflect energy efficiency in land use matters.

VISUAL RESOURCES

GOAL: Protect and enhance the visual resources and landscapes of Mono County.

Objective A
Maintain and enhance visual resources in the county.

Policy 1: In order to protect and enhance important scenic resources and scenic highway corridors as identified in the **MEA**, designate such areas throughout the county for Open Space, Agriculture, Resource Management, or similar low intensity uses.

Action 1.1: Identify important scenic resources, including scenic highway corridors, in the **MEA**.

Policy 2: Coordinate county visual resource policies with federal and state visual policies and objectives.

Action 2.1: Work with federal, state, local, and other appropriate organizations to review and coordinate the protection and enhancement of the county's scenic resources.

Policy 3: Preserve the visual identity of areas outside communities.

Action 3.1: Concentrate future development in or adjacent to existing communities.

Action 3.2: Retain the rural character of areas outside existing communities by restricting development to low intensity uses; high intensity uses outside communities may be permitted only through the Specific Plan or PUD process.

Action 3.3: Avoid the inclusion of scenic areas within spheres of influence for urban service providers.

Action 3.4: Provide opportunities for consideration of additional development in scenic areas in exchange for permanent open space preservation.

Policy 4: Protect significant scenic areas by maintaining land in those areas in public ownership.

Action 4.1: Encourage the use of federal and state designations that recognize significant scenic areas.

Action 4.2: Encourage the transfer of ownership of visually significant private land to public land management agencies or land conservation organizations for the purpose of preserving scenic resources.

Action 4.3: Encourage private landowners with visually significant property to grant or sell a conservation easement to a land conservation organization to protect the land as open space.

Action 4.4: Continue to use land use regulations and subdivision regulations to preserve open space for scenic purposes.

Action 4.5: Conserve scenic highway corridors by maintaining and expanding large lot land use designations in areas within view of scenic highways.

Policy 5: Restore visually degraded areas when possible.

Action 5.1: Promote reclamation of existing quarry sites to natural conditions following exhaustion of the mineral resource.

Action 5.2: Work with existing uses to mitigate the adverse visual impacts of those uses; e.g., by painting, landscaping, or otherwise screening the use.

Action 5.3: Encourage private restoration of disturbed sites.

Action 5.4: Consider visual impacts during the Grading Permit Process.

Action 5.5: Require the restoration of disturbed sites following construction, but prior to issuance of a Certificate of Occupancy.

Policy 6: Restore abandoned scenic highways.

Action 6.1: Require the governmental entity responsible for the scenic highway abandonment to restore the roadway and adjacent area to a condition comparable to surrounding lands.

Objective B
Maintain a countywide system of state and county designated scenic highways[6].

Policy 1: Maintain existing state designated scenic highways.

Action 1.1: Enforce required regulations for protection of roadways designated as state scenic highways.

Action 1.2: Work with appropriate agencies to protect visual resources within existing designated scenic highway corridors[7].

[6]**Scenic Highway** - Any freeway, highway, road, street, boulevard, or other public right of way that traverses an area of unusual scenic quality and has been designated as a Scenic Highway by the county Board of Supervisors and/or the State of California.

Action 1.3: Work with Caltrans to ensure that state scenic highways are properly signed.

Policy 2: Seek state scenic highways designation for additional mileage in Mono County.

Action 2.1: Apply to Caltrans for designation of additional Mono County roadways as state scenic highways.

Policy 3: Maintain existing county adopted scenic highways.

Action 3.1: Study the feasibility and desirability of a county signing program for county adopted scenic highways.

Policy 4: Designate additional mileage for the county adopted scenic highway system.

Action 4.1: Designate Rock Creek Road as a county scenic highway.

Policy 5: Seek state designation of county adopted scenic highways as official county scenic highways.

Action 5.1: Apply to Caltrans for designation of county adopted scenic highways as official county scenic highways.

Policy 6: Support designation of appropriate highways as National Scenic Byways.

Objective C
Ensure that development is visually compatible with the surrounding community, adjacent cultural resources, and/or natural environment.

Policy 1: Future development projects shall avoid potential significant visual impacts or mitigate impacts to a level of non-significance, unless a statement of overriding considerations is made through the EIR process.

Action 1.1: Future development projects with the potential to have a substantial, demonstrable negative aesthetic effect shall provide a visual impact analysis prior to project approval. Examples of a substantial, demonstrable negative aesthetic effect include:

a. Reflective materials;

b. Excessive height and/or bulk;

c. Standardized designs that are utilized to promote specific commercial activities and that are not in harmony with the community atmosphere;

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[7]**Scenic Highway Corridor** - The area of land generally adjacent to (within 1,000 feet) and visible from the highway, which requires protective measures to ensure perpetuation of its scenic qualities. Scenic Highway Routes consist of both the public right of way and the scenic corridor.

d. Architectural designs and features that are incongruous to the community or area and/or that significantly detract from the natural attractiveness of the community or its surroundings;

e. Dust or steam plumes; and

f. Excessive night lighting.

The analysis shall:

a. be funded by the applicant;

b. be prepared by a qualified person under the direction of Mono County;

c. assess the visual environment in the general project vicinity;

d. describe the impacts of the proposed development upon views and scenic qualities within the project site and on surrounding areas; and

e. recommend project alternatives or measures to avoid or mitigate visual impacts.

Mitigation measures shall be included in the project plans and specifications and shall be made a condition of approval for the project.

Policy 2: Future development shall be sited and designed to be in scale and compatible with the surrounding community and/or natural environment,

Action 2.1: Develop design guidelines for residential, commercial, and industrial development projects. At a minimum, the following development standards shall apply:

a. Projects should not dominate the natural environment, and should complement existing community character; the scale, design, and siting of a project should be appropriate for the setting;

b. Building mass should be varied and should be appropriate for the surrounding community or area. Facades in commercial districts should be varied;

c. Project siting and structural design should be sensitive to the climate, topography, and lighting of the surrounding environment;

d. The design, color, and building materials for structures, fences, and signs shall be compatible with the natural environment and/or surrounding community;

e. Visually offensive land uses shall be adequately screened through the use of landscaping, fencing, contour grading, or other appropriate measures;

f. The visual impacts of parking areas shall be minimized through the use of landscaping, covered parking, siting that screens the parking from view, or other appropriate measures.

g. Signs shall comply with the county's Sign Ordinance;

h. Standardized commercial structures, design, and materials shall not be allowed (e.g., a "McDonald's" shall be designed with materials and finishes that harmonize with the surrounding area);

i. Industrial areas shall be as compact as possible.

j. Exterior lighting shall be shielded and indirect and shall be minimized to that necessary for security and safety;

k. All new utilities shall be installed underground, in conformity to applicable provisions of the Mono County General Plan;

l. Existing roads shall be utilized whenever possible. Construction of new roads should be avoided except where essential for health and safety;

m. Earthwork, grading, and vegetative removals shall be minimized;

n. All site disturbances shall be revegetated with a mix of indigenous species native to the site (based upon a pre-project species survey). A landscaping plan shall be submitted and approved for all projects.

Action 2.2: County staff may require project modifications as necessary to implement Policy 2 and Action 2.1 above.

Action 2.3: Encourage the establishment of Design Review Districts within community areas, in order to provide design guidelines that are more specific to each community.

Action 2.4: Encourage the use of the Scenic Combining District, in order to minimize the impacts of development in scenic areas outside communities, including in scenic highway corridors.

Action 2.5: Require the establishment of building envelopes during the subdivision process, where appropriate, to mitigate visual impacts.

Action 2.6: Work with federal and state agencies on development projects on their lands to ensure that potential adverse visual impacts are fully mitigated.

Action 2.7: Existing visually offensive land uses located within scenic highway corridors should be adequately landscaped or otherwise screened.

Action 2.8: Require any expansion of existing visually offensive land uses within scenic highway corridors to be adequately landscaped or otherwise screened.

Action 2.9: Require naturalistic drainage improvements where modifications to the natural stream way are required in scenic highway corridors. When feasible, do not place streams in underground drainage structures.

Policy 3: Proposed transmission and distribution lines shall be designed and sited to minimize impacts to natural and visual resources.

Action 3.1: Install utilities underground in conformity to the Mono County Code.

Action 3.2: Require that utilities for all new subdivisions be installed underground, unless specific hardships can be demonstrated in conformity to the Mono County Code.

Action 3.3: Install new utility lines underground within scenic highway corridors, unless a variance is granted for overhead installation.

Action 3.4: Pursue the establishment of underground utility districts within scenic highway corridors as a mechanism to place existing overhead lines underground.

Action 3.5: Apply to SCE for financial support to convert eligible overhead lines to underground utilities.

Action 3.6: Require that overhead utility lines proposed within a scenic highway corridor be located in the least conspicuous manner possible.

Action 3.7: Use existing utility corridors and common poles wherever possible.

Action 3.8: Enforce the policies in the Energy section of the Conservation/Open Space Element pertaining to the siting and design of transmission lines and fluid conveyance pipelines.

Policy 4: Promote revegetation and reforestation programs along county roads, including designated scenic highways.

Action 4.1: Seek funding and work with appropriate agencies to develop and implement revegetation and reforestation programs along county roads, including scenic highways.

Policy 5: Minimize the visual impact of signs within designated scenic highway corridors.

Action 5.1: Prohibit billboards and off-premises advertising signs within scenic highway corridors.

Action 5.2: Amend the Sign Ordinance to regulate the number, type, size, height, design, materials, color and texture of on-premise attached signs within scenic highway corridors.

Action 5.3: Require a use permit for all on-premise freestanding signs in scenic highways corridor.

Action 5.4: Amend the Sign Ordinance to clarify the amortization procedures for non-conforming signs.

Policy 6: Establish and implement roadway improvement standards for designated scenic highways.

Action 6.1: Make every effort to work within existing rights of way rather than constructing new roads through scenic areas.

Action 6.2: Ensure that aesthetics is a major consideration in the design of any new roads through scenic areas.

Action 6.3: In order to minimize the disruption that can result from the construction of a new road through a scenic area, clear cutting and hillside cuts should be avoided whenever possible.

Objective D

Heighten awareness of Mono County's unique visual environment.

Policy 1: Tourist facilities should be located to take advantage of scenic views.

Action 1.1: Work with federal, state, and local agencies to construct roadside turnouts with interpretive information for scenic vistas.

Action 1.2: Work with federal, state, and local agencies to develop a scenic vista signing program that marks scenic viewpoints from roadways.

Policy 2: Provide roadside improvements for designated county and state scenic highways.

Action 2.1: Work with appropriate agencies and individuals to develop scenic view areas and roadside stops whenever feasible within scenic highway corridors.

Action 2.2: Install bicycle lanes, equestrian trails and foot trails where appropriate along scenic highways.

Action 2.3: Protect and enhance all historical structures and points of interest and the visual state of their surroundings whenever possible within and adjacent to scenic highway corridors.

Action 2.4: Encourage the USFS, the BLM, and Caltrans to provide funding for roadside improvements.

Policy 3: Continue to conduct an anti-litter campaign along county roadways.

Action 3.1: Continue to provide pull-outs with garbage cans where appropriate along county roadways.

Action 3.2: Encourage participation in Caltrans' Adopt-A-Highway Program.

Action 3.3: Continue to enforce litter abatement laws, including fines.

OUTDOOR RECREATION

GOAL: Provide opportunities for outdoor recreation to meet the needs of residents and visitors in a manner that conserves natural and cultural resources.

Objective A
Provide sufficient recreational facilities and opportunities for residents.

Policy 1: Each community should have a community center and a full range of community recreation facilities.

Action 1.1: Improve and expand existing community recreation facilities.

Action 1.2: Work with communities and other groups as feasible to operate and maintain parks.

Action 1.3: Study the feasibility of providing a community center for Lee Vining.

Policy 2: Plan, design, and construct parks and recreation facilities to coincide with projected growth.

Action 2.1: Provide new park facilities to accommodate growing populations in accordance with the following parkland standards:

a. Neighborhood parks: a minimum of one acre per 1,000 population.

Neighborhood parks should be centrally located to serve areas within a one-half mile radius and should be easily accessible by foot, bicycle, or automobile. Typical facilities include children's play areas, picnic facilities, sitting areas, open turf, and if space permits, paved areas for games such as basketball or tennis.

b. Community parks: a minimum of three acres per 1,000 population.

Community parks should be centrally located to serve areas within a two mile radius and should be easily accessible by foot, bicycle, or automobile. Typical facilities include softball fields, large turf areas for soccer or football, on-site restrooms, paved areas for basketball, and walking paths/fitness trails, and if space permits, children's play areas and picnic facilities.

c. Regional parks: a minimum of 10 acres per 1,000 population.

Regional parks should be located to serve areas within a 10- to 15-mile radius and should be easily accessible by automobile. Typical facilities include ballfields, on-site restrooms, picnic facilities, and specialized facilities such as motocross tracks, pools, shooting ranges.

Action 2.2: County park facilities should be accessible to all segments of the population, including handicapped, young, and elderly, where feasible.

Action 2.3: Encourage the formation of a self-supporting park system by employing user fees (where appropriate), concessionaire revenues, soliciting grants and private contributions, requesting volunteer help, and by other means that further cost-effective park operations.

Action 2.4: Where appropriate, work with incorporated areas to provide joint use park and recreation facilities. Ensure that incorporated development pays its fair share toward provision of these services.

Policy 3: Identify, designate and acquire sites for parks and other recreation facilities of sufficient size and location for future development.

Action 3.1: Prioritize site acquisitions.

Action 3.2: Where feasible, acquire public lands for parks and ballfields through land exchanges and special use permits.

Action 3.3: Develop and adopt a funding plan to acquire sites and/or conservation easements and to fund needed recreation facilities.

Action 3.4: Continue pursuing state and federal grant monies and monies available from nonprofit corporations for the acquisition, construction, and maintenance of parks and other recreation facilities.

Action 3.5: Promote the development and enactment of an ordinance implementing the Quimby Act's parkland dedication provisions (Government Code § 66477b) that require new developers to dedicate land, contribute to a fund, or a combination of both, for parks and recreational purposes.

Action 3.6: Through the Specific Plan process, provide incentives for developers to dedicate areas for parks and to plan for the development of parks.

Policy 4: The location and design of recreational facilities should reflect environmental constraints and site characteristics.

Action 4.1: All applications for recreational projects shall be required to address the potential adverse impacts of the development. Applications shall include measures to mitigate potential impacts.

Action 4.2: Locate and design community parks to minimize their effects on surrounding land uses.

Action 4.3: Provide adequate buffer zones around community parks.

Action 4.4: Minimize the use of outdoor lights.

Policy 5: Through the Specific Plan process, provide incentives for developers to provide not only project related but public indoor recreation facilities, such as swimming facilities, basketball courts, etc.

Objective B

Provide sufficient recreational facilities and opportunities outside community areas for residents and visitors.

Policy 1: Work with appropriate agencies and organizations to provide a full range of recreation opportunities to meet varied interests.

Action 1.1: Provision of county parks should occur in coordination with federal, state, and local agencies, and other recreation providers to avoid duplication of services and to ensure a full range of recreation opportunities.

Action 1.2: Participate in the development of recreation plans and policies with other agencies and organizations.

Policy 2: Recreational development outside community areas should be responsive to environmental limitations and market demand.

Action 2.1: Applications for such recreational projects shall be required to address the potential adverse impacts of the development. Applications shall include measures to mitigate potential impacts.

Action 2.2: Development proposals for major recreation facilities outside community areas may be required to submit a market demand analysis.

Policy 3: Reduce incompatibility between recreation uses and neighboring uses.

Action 3.1: Review locations of proposed recreational uses to ensure that the location is compatible with neighboring uses.

Policy 4: Protect natural resources from overuse due to recreational uses.

Action 4.1: Work with appropriate agencies to develop capacity goals for recreation facilities and to monitor visitor usage at recreation facilities.

Policy 5: Preserve rivers that provide recreational opportunities.

Action 5.1: Pursue Wild and Scenic River designation for appropriate county waterways.

Objective C

Provide convenient and safe access to recreation sites.

Policy 1: Local trails should connect to regional and interstate trails, where feasible.

Action 1.1: Inventory and map all trails in Mono County.

Action 1.2: Meet with federal and state agencies to identify priority trail links.

Action 1.3: Seek funding for and construct trail improvements.

Action 1.4: Investigate the feasibility of creating trails in utility corridors.

Action 1.5: Meet with other agencies to compare capital improvement programs and eliminate overlap of projects.

Policy 2: Encourage connections between trails and other transportation systems; e.g., public transit systems.

Policy 3: Develop countywide and community bike path systems in the Circulation Element.

Policy 4: When appropriate, major recreation destinations, such as lakes, ski areas or cultural resource areas, should have public transportation systems that serve them as an alternative to the private automobile.

Action 4.1: Development applications for major recreation projects shall address traffic impacts. The analysis shall include mitigation measures.

Policy 5: All communities should have trails and public transit services that link the community to adjacent recreation opportunities, where feasible.

Policy 6: Provide for public access from public roadways to navigable waterways through the subdivision process in a manner consistent with the Subdivision Map Act and other applicable laws.

Objective D
Encourage and promote year-round use of seasonal recreation areas and facilities.

Policy 1: Seasonal facilities should provide opportunities for alternative uses in the off-season.

Action 1.1: Promote the use of alpine and nordic ski facilities for summer mountain bike use.

Action 1.2: Increase public awareness of seasonal recreation opportunities through promotional programs.

CULTURAL RESOURCES

GOAL: Identify, preserve, restore, and interpret cultural resources[8] in Mono County.

Objective A
Provide a comprehensive approach to cultural resource management.

[8]In Mono County, cultural resources include buildings, sites, structures, objects and districts of interest to Mono County, the region, California and the nation. The term "cultural resources" includes both archaeological and historical resources.

Policy 1: Establish a Cultural Resource Management Program.

Action 1.1: Develop a Cultural Resource Management Ordinance that includes criteria, standards, and guidelines for identifying, preserving, and protecting the County's cultural resources.

Action 1.2: Establish a Cultural Resource Management Commission ("the Commission") to administer the Cultural Resource Management Program, to identify cultural resources, to apply for cultural resource grants, to act as a liaison with federal, state, and local agencies involved in cultural resource management, and to review development proposals affecting significant cultural resources.

Policy 2: Obtain funding to implement the Cultural Resource Management Program.

Action 2.1: Apply to the State Office of Historic Preservation for Certified Local Ordinance Status and Certified Local Government status.

Action 2.2: Consult with federal, state, and nonprofit groups concerning the availability of grants and funding for cultural resources preservation and management. Seek funding from available sources.

Policy 3: Encourage private preservation and conservation efforts.

Action 3.1: Contact owners of privately owned cultural resource sites to discuss long term plans for the sites and the possibility of obtaining grants or loans for restoration.

Action 3.2: Encourage productive and economically attractive uses of historic properties and structures.

Action 3.3: Provide technical assistance to private owners of cultural resource properties wishing to preserve, protect, or restore their properties.

Policy 4: Encourage a coordinated and cooperative approach to cultural resource management.

Action 4.1: Work with appropriate federal, state, and local agencies in the development and implementation of the Cultural Resource Management Program.

Action 4.2: Develop procedures for consulting with local Native American groups and with the California Native American Heritage Commission to ensure that federal and state requirements concerning the preservation and protection of Native American remains are met.

Action 4.3: Adopt provisions in the Cultural Resource Management Ordinance to ensure that traditional Native American religious and cultural practices are protected.

Objective B

Identify and inventory cultural resources in Mono County.

Policy 1: Work with private land owners to conduct a comprehensive inventory of cultural resources on private lands.

Action 1.1: Work with federal, state, and local agencies to analyze current data on cultural resources in the county, to develop a work program for a cultural resources inventory on private lands in the county, and to coordinate with inventory data on public lands.

Action 1.2: Investigate cooperative approaches to conducting a cultural resources inventory.

Action 1.3: Seek public involvement in the inventory process.

Action 1.4: Seek funding and establish procedures for an ongoing update of the inventory.

Objective C
Preserve, protect, and restore (where appropriate) the cultural resources of Mono County.

Policy 1: Future development projects shall avoid potential significant impacts to cultural resources or mitigate impacts to a level of non-significance, unless a statement of overriding considerations is made through the EIR process.

Action 1.1: Future development projects with the potential to significantly impact cultural resources shall provide an analysis of the potential impact(s) prior to project approval. Examples of potential significant impacts include:

a. disrupting or adversely affecting a prehistoric or historic archaeological site or a property of historic or cultural significance to a community or ethnic or social group, or a paleontological site except as a part of a scientific study; and/or

b. conflicting with established recreational, educational, religious or scientific uses of the area.

The analysis shall:

a. be funded by the applicant;

b. be prepared by a qualified person under the direction of Mono County;

c. assess the cultural resources in the general project vicinity;

d. describe the impacts of the proposed development upon cultural resources within the project site and on surrounding areas; and

e. recommend project alternatives or measures to avoid or mitigate impacts to cultural resources.

Mitigation measures shall be included in the project plans and specifications and shall be made a condition of approval for the project.

Action 1.2: Develop criteria in cooperation with other federal, state, and local agencies, to determine which cultural resources are significant.

Action 1.3: Develop procedures in the Cultural Resource Management Ordinance for the preservation and protection of significant resources, including guidelines for the use of mitigation measures to address the impacts of development on cultural resources.

Action 1.4: Prioritize sites to be nominated to the National Register of Historic Places and/or as California Historic Landmarks or Points of Historical Interest, as well as routes to be nominated for National Trails designation or the California Trails System.

Action 1.5: Make recommendations to the Board of Supervisors concerning the local designation of cultural landmarks and districts.

Policy 2: Explore all available measures, including the purchase of easements, dedication to the County, tax relief, the purchase of development rights, the formation of a local land trust, and the consideration of reasonable project alternatives in order to avoid development on or adjacent to culturally sensitive sites.

Policy 3: Establish buffer zones around significant cultural resource sites to protect the integrity of the resource, as well as the integrity of the setting.

Action 3.1: Work with the State Department of Parks and Recreation to address compatible land uses adjacent to State Historic Park properties.

Action 3.2: Encourage the State to purchase properties adjacent to State Historic Park properties in order to prevent impacts from future adjoining incompatible uses.

Action 3.3: Support the acquisition of areas with cultural resource values by federal or state land management agencies or land conservation organizations.

Action 3.4: Protect existing open space and/or designate or acquire open space around identified cultural properties to provide buffer space and to protect historic settings.

Action 3.5: Encourage other federal, state, and local agencies, as well as private individuals and organizations, to provide buffer zones around cultural properties.

Policy 4: Restore and maintain significant cultural resource sites.

Action 4.1: Adopt policies and standards in the Cultural Resource Management Ordinance for the maintenance and restoration of significant cultural resources.

Action 4.2: Establish a fund for the purchase, maintenance, and restoration of significant cultural resources.

Action 4.3: Study the potential of amending the General Plan to establish a cultural resource overlay zoning designation and/or local cultural resource or historic districts.

Policy 5: Implement incentives to encourage private preservation and conservation efforts.

Action 5.1: Develop tax incentives for the preservation or faithful restoration of properties with identified cultural resource value.

Action 5.2: Adopt the State Historic Building Code, in lieu of the Uniform Building Code, for significant historic structures.

Action 5.3: Establish requirements in the Cultural Resource Management Ordinance for compatible alterations and additions to historic structures.

Action 5.4: Allow minor variations from land use designation requirements (e.g., setbacks, parking standards) to maintain the historic quality of cultural properties.

Objective D

Interpret and make accessible to the public cultural resources in Mono County where feasible and appropriate.

Policy 1: Develop cooperative interpretation and education programs on cultural resources in Mono County.

Action 1.1: Work with federal, state, and local agencies and organizations to inventory existing interpretive and educational programs and to develop additional interpretive and educational programs, including living history programs.

Action 1.2: Utilize handouts developed by the USFS, the BLM, and the State Department of Parks on the restrictions on gathering artifacts or damaging cultural properties and the penalties involved in violations, and shall make these handouts available at existing visitor facilities.

Objective E

Promote Mono County's cultural resources, when feasible and appropriate.

Policy 1: Highlight Mono County's cultural resources, when feasible and appropriate, in promotional materials.

Action 1.1: Work with federal, state, and local agencies and organizations to develop a list of which cultural resources and activities in the county can be promoted without adverse harm to the resource.

Action 1.2: Encourage the USFS, the BLM, the county Chamber of Commerce, local Chambers of Commerce, and the Town of Mammoth Lakes to include cultural resources and activities in promotional materials.

Action 1.3: Encourage local communities and Chambers of Commerce to develop and promote local historically-oriented special events.

Action 1.4: Encourage local communities and agencies to support and promote traditional folk arts such as Native American arts and crafts and traditional western crafts.

Action 1.5: Study the feasibility of establishing a County historic designation program, with roadside markers.

PUBLIC HEALTH AND SAFETY

GOAL 1: Achieve and maintain excellent air quality, water quality, and noise quality such that public health is protected and to protect the public from adverse impacts from hazardous waste and materials.

Objective A
Maintain a high level of air quality that protects human health and wildlife, and prevents the degradation of scenic views.

Policy 1: Maintain air quality by complying with standards and regulations established by the Great Basin Unified Air Pollution Control District (GBUAPCD).

Action 1.1: Maintain countywide attainment of ambient standards for carbon monoxide (CO), nitrogen dioxide (NO_2), and sulfur dioxide (SO_2).

Action 1.2: Prohibit drive-through commercial facilities.

Action 1.3: Reduce winter CO levels.

Action 1.4: Institute a park-and-ride system to ski areas.

Action 1.5: Require CO concentrations analyses for projects that would generate more than 2,000 motor vehicle trips per day.

Policy 2: Support the GBUAPCD in its effort to improve the requirement of Best Available Control Technology on major stationary sources of nitrogen oxides (NO_x) and reactive organic compounds (ROC)[9].

Action 2.1: Work with the GBUAPCD to inspect and enforce existing permits.

Action 2.2: Inform developers of projects such as restaurants, parking structures, ski areas, and hotels of the secondary source permit requirements established by the GBUAPCD.

Policy 3: Future development projects shall avoid impacts to air quality or mitigate impacts to a level of non-significance, unless a statement of overriding considerations is made through the EIR process.

Action 3.1: Future development projects with the potential to significantly impact air quality shall assess potential impacts prior to project approval. Examples of potential significant impacts include:

[9]Reactive organic compounds, precursor chemicals for ozone generation.

a. Violating any ambient air quality standard; and/or

b. Contributing substantially to an existing or projected air quality violation; and/or

c. Exposing sensitive receptors to substantial pollutant concentrations.

The analysis shall:

a. be funded by the applicant;

b. be prepared by a qualified person under the direction of Mono County;

c. assess existing conditions in the general project vicinity;
d. describe the impacts of the proposed development upon air quality within the project site and on surrounding areas; and

e. recommend project alternatives or measures to avoid or mitigate impacts to air quality.

Mitigation measures shall be included in the project plans and specifications and shall be made a condition of approval for the project.

Policy 4: Promote mixed-use neighborhood commercial/residential development near employment centers to reduce the number of vehicle miles generated by land use development.

Policy 5: Reduce dust generation resulting from exposed alkali lake beds.

Action 5.1: Support the State Water Resources Control Board Decision 1631 requiring minimum flows to Mono Lake to raise the lake level over 6,391 feet above mean sea level by 2014.

Policy 6: Reduce emissions from wood-burning appliances.

Action 6.1: Require that all new wood-burning appliances be Phase II EPA certified.

Policy 7: Minimize the amount of fugitive dust generated by construction and other activities.

Action 7.1: Require project sponsors and their contractors to employ dust abatement techniques such as: sprinkling of exposed areas, preventing haul trucks from being overfilled, and sweeping spilled material off paved roads.

Policy 8: Encourage agricultural practices that reduce the amount of dust generated from tilling.

Action 8.1: Work with local soil conservation districts, the U.S. Soil Conservation Service, agricultural officials, and the GBUAPCD to assist landowners in adjusting agricultural practices to reduce dust generation.

Policy 9: Reduce the amount of dust entrained by vehicle movement over paved and unpaved roads.

Action 9.1: Require the paving or treatment of roads accompanying new development projects, in conformity to the county road standards.

Action 9.2: Pursue the paving or treating of existing unpaved roads in the county through capital improvement plans, redevelopment plans, or special assessment districts.

Action 9.3: Cinders used for winter road maintenance should be applied in a manner that does not cause degradation of air quality.

Policy 10: Restrict OHV use in order to minimize air quality impacts.

Action 10.1: Coordinate OHV use on private lands and County roads with the OHV use established by the USFS and BLM for public lands.

Objective B
Maintain a high level of water quality that protects human health and wildlife habitat.

Policy 1: Implement policies contained in the Water Resource section of the Conservation/Open Space Element.

Objective C
Maintain existing ambient noise levels to protect human health and preserve habitat values.

Policies to achieve this objective are included in the Noise Element of this plan.

Objective D
Provide for the safe transfer, storage, and disposal of hazardous materials and waste in order to protect human health and the environment.

Policies to achieve this objective are included in the Hazardous Waste Management Element of this plan.

GOAL 2: Protect the public from natural hazards, such as volcanoes, earthquakes, avalanches, floods, and fires.

Policies to achieve this goal are included in the Safety Element of this plan.

EXHIBIT K

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

Endangered and Threatened Wildlife and Plants; Endangered Status and Critical Habitat Designation for the Owens Tui Chub

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Final rule.

SUMMARY: The Service determines endangered status and designates critical habitat for the Owens tui chub (*Gila bicolor snyderi*). This action is being taken because the Owens tui chub has declined in recent years and has been extirpated from much of its range. It historically inhabited streams, rivers, springs, and irrigation ditches in the Owens Basin, Mono and Inyo Counties, California. Viable populations are now known from only two locations in Mono County, the headwater springs of Hot Creek and approximately 8 miles of the Owens River below Long Valley Dam. Habitat destruction, predation by exotic fish species, and hybridization with a closely related chub species further threaten the Owens tui chub.

Endangered species determination and designation of critical habitat affords the Owens tui chub the full protection provided by the Endangered Species Act of 1973, as amended.

DATE: The effective date of this rule is September 4, 1985.

ADDRESSES: The complete file for this rule is available for inspection, by appointment, during normal business hours at the U.S. Fish and Wildlife Service, Lloyd 500 Building, 500 NE. Multnomah Street, Suite 1692, Portland, Oregon 97232.

FOR FURTHER INFORMATION CONTACT: Mr. Wayne S. White, Chief, Division of Endangered Species, at the above address (503/231-6131 or FTS 429-6131).

SUPPLEMENTARY INFORMATION:

Background

The Owens tui chub (*Gila bicolor snyderi*) is a moderate to large subspecies of *Gila bicolor*, with males reaching up to four inches in length and females slightly over five inches. The fish is an olive color above and whitish below, with lateral blue and gold reflections (Miller, 1973). The side of the head, particularly along the margin of the preopercle, displays a noticable gold color. Based on past collections, the fish occupied a wide variety of habitats ranging from small springs that harbored only a few hundred individuals to the Owens River that provided habitat for tens or hundreds of thousands.

The Owens tui chub has been known to the scientific community since the late 1800's. Fish collections made around the turn of the century indicated the presence of tui chubs in the Owens River (Snyder, 1917) and Owens Lake (Gilbert, 1893). The collections of Carl Hubbs made during the 1930's (reported by Miller, 1973), provided the first major survey of aquatic habitats in the Owens Basin. Owens tui chubs were collected by Hubbs and co-workers in the following areas: irrigation canals south of Bishop, Owens River, headsprings of Fish Slough, drainage ditches south of Big Pine, North Fork of Bishop Creek, Bishop Creek, Hot Creek, headwater springs of Hot Creek, Whiskey Creek, Owens Lake, ponds at Lone Pine, Morton's Slough, and various ditches emanating from the Owens River. By the time the Owens tui chub was described in 1973 as a new subspecies endemic to the Owens Basin of Inyo and Mono Counties, California (Miller, 1973), the status of the fish was deteriorating rapidly.

Habitat alteration, predation and competition by exotic fishes, and hybridization with introduced Lahontan tui chubs (*Gila bicolor obesa*) have eliminated genetically pure Owens tui chubs from all but two localities. Owens tui chubs are now known only from approximately 8 miles of the Owens River below Long Valley Dam and from two adjacent headwater spring areas of Hot Creek. The population in the Owens River is greatly reduced in numbers, largely because of predation by brown trout (*Salmo trutta*). The population in the headwater springs of Hot Creek is small and is also threatened by the presence of exotic fishes. These habitats represent less than one percent of the original range of the Owens tui chub.

Both sites are within the Inyo National Forest boundary, but owned by the City of Los Angeles. A fish hatchery located at Hot Creek is managed by the State on a portion of the city owned land. The Owens tui chub has been reintroduced into Fish Slough, Mono County, but the success of this recovery effort is doubtful as no specimens have subsequently been secured from the slough. The California Department of Fish and Game (CDFG), Bureau of Land Management (BLM), and U.S. Fish and Wildlife Service (Service) plan to continue attempts at reintroducing the Owens tui chub at this historical site. Tui chubs of uncertain taxonomic identity have been recorded from Silver Lake (not historical habitat) in the Inyo National Forest. Specimens are being analyzed by R. R. Miller at the Museum of Zoology, University of Michigan to determine if they are *Gila bicolor snyderi*.

The status of the Owens tui chub, the most precarious of any fish in the Death Valley region (Pister, 1980), prompted the State of California to classify this fish as "endangered" (CDFG, 1980). The Owens tui chub was included in the Service's December 30, 1982, Review of Vertebrate Wildlife for Listing as Endangered or Threatened Species (47 FR 58454). In this review, the Owens tui chub was placed in category 1, indicating that the Service had substantial information on hand to support a proposed rule to list the fish as endangered or threatened. On April 12, 1983, the Service was petitioned by the Desert Fishes Council to list the Owens tui chub. After evaluation of this petition, the Service found that the petitioned action was warranted. A notice of this finding was published in the **Federal Register** on June 14, 1983 (48 FR 27273). In response to information in the Service's files and the petition, a rule proposing endangered status and critical habitat for the Owens tui chub was published on March 23, 1984 (49 FR 10959).

Summary of Comments and Recommendations

In the March 23, 1984, proposed rule (49 FR 10959) and associated notifications, all interested parties were requested to submit factual reports or information that might contribute to the development of a final rule. Appropriate State agencies, county governments, Federal agencies, scientific organizations, and other interested parties were contacted and requested to comment. Newspaper notices, inviting general public comment, were published in the *Los Angeles Times*, *Desert Dispatch* and *Inyo Register* on April 29, April 20, and April 20, 1984, respectively. Eleven comments were received and are discussed below.

Of the 11 comments received, 3 were non-substantive and 8 commented on the proposed rule or gave additional information. Statements of support were received from the Mono County, California, International Union for Conservation of Nature and Natural Resources, Defenders of Wildlife, California Department of Fish and Game, Desert Fishes Council, and chairman of the Wildlife and Fisheries Biology Department at the University of California, Davis. In addition to indicating support for the proposal, the Department of Fish and Game recommended expansion of the proposed critical habitat for the Hot Creek population to include all the groundwater aquifer that feeds the springs. Concern was expressed that the area might be subject to geothermal energy development in the future and that such development might adversely affect the aquatic habitat required for the fish. The Service believes that protection of the critical habitat as proposed on March 23, 1984, is sufficient for the conservation of the tui chub. Section 7 of the Endangered Species Act of 1973, as amended, requires Federal agencies to consult with the Service on any action that may destroy or adversely modify critical habitat. Therefore, the critical habitat of a species would receive protection from actions that could affect such habitat whether or not those actions occurred within the designated critical habitat.

In addition to the above supporting comments, a comment was received from the Department of Water and Power, City of Los Angeles, supporting the listing but questioning whether the habitat of the fish needed specific protection due to the fact that the two known populations are on lands in public ownership. While the Service agrees that public ownership of

important habitat areas typically results in protection of those areas, formal designation of critical habitat provides a description of those locations where the species is found and thereby may aid in the development of management plans. Furthermore, Section 4(a)(3) of the Endangered Species Act requires the Secretary to determine critical habitat to the maximum extent prudent and determinable concurrently with a determination of endangered or threatened status for a species. Protection afforded by critical habitat designation applies only to Federal agencies actions.

The final substantive comment was received from the Forest Supervisor of the Inyo National Forest. No opinion regarding the proposed rule was expressed, but information was provided about the possible occurrence of the Owens tui chub in Silver Lake. Specimens taken from this area, which is outside the fishes historical range, are being studied.

Summary of Factors Affecting the Species

After a thorough review and consideration of all information available, the Service has determined that the Owens tui chub (*Gila bicolor snyderi*) should be classified as an endangered species. Procedures found at section 4(a)(1) of the Endangered Species Act (16 U.S.C. 1531 *et seq.*) and regulations promulgated to implement the listing provisions of the Act (to be codified at 50 CFR Part 424; see 49 FR 38900, October 1, 1984) were followed. A species may be determined to be an endangered or threatened species due to one or more of the five factors described in section 4(a)(1). These factors and their application to the Owens tui chub (*Gila bicolor snyderi*) are as follows:

A. *The present or threatened destruction, modification, or curtailment of its habitat or range.* Ichthyological surveys conducted during the 1930's and 1940's found Owens tui chubs common in a wide range of aquatic habitats in the Owens Basin. Since that time, most suitable habitats have been modified, streams have been diverted, and rivers have been impounded. Presently, viable populations are known in only two locations, representing less than one percent of the fish's historical range. Demand for water resources of the Owens Basin is high. Water is extensively used for local agricultural and municipal purposes. The single largest consumer of Owens Basin water is the City of Los Angeles. Through a system of diversion structures and aqueducts, the city conducts water to the Los Angeles Basin. Adverse modifications of aquatic habitats to meet the various demands for water have reduced available suitable habitat for the Owens tui chub.

B. *Overutilization for commercial, recreational, scientific, or educational purposes.* There is no evidence to suggest that the Owens tui chub has declined as a result of overutilization.

C. *Disease or predation.* Introduction of exotic fishes, resulting in predation and competition, is the major threat facing the remaining populations of the Owens tui chub. Pister (1981) reported that 18 exotic fishes have been introduced into the Owens River, a river that historically supported four native fishes. Predation by brown trout (*Salmo trutta*) is responsible for reduced numbers of Owens tui chub in the Owens River.

D. *The inadequacy of existing regulatory mechanisms.* The State of California has listed the Owens tui chub as "endangered" and has a provision in its endangered species law to protect this species from taking. However, the State has no authority to protect habitat for the Owens tui chub, nor does it provide for Federal assistance with recovery actions.

E. *Other natural or manmade factors affecting its continued existence.* Lahontan tui chubs (*Gila bicolor obesa*) have been introduced as bait fish into many waters of the Owens Basin. Subsequently, they have hybridized extensively with the native and closely related Owens tui chub. Hybridization was first recognized as a problem in 1973 at Crowley Lake, where fishermen appear to have illegally introduced the Lahontan tui chub while fishing (Miller, 1973). Since that time, hybridization with the Lahontan tui chub has been demonstrated to be a major problem throughout the range of the Owens tui chub. Genetically pure Owens tui chubs are now restricted to two known localities.

The Service has carefully assessed the best scientific and commercial information available regarding the past, present, and future threats faced by this species in determining to make this rule final. Based on this evaluation, the preferred action is to list the Owens tui chub (*Gila bicolor snyderi*) as endangered. Due to the contraction of the species' range to less than one percent of its historical size and the threats present at the two localities where it is now found, endangered status is being determined. The designation of critical habitat is discussed below.

Critical Habitat

Critical habitat, as defined by Section 3 of the Act, means: (i) The specific areas within the geographical area occupied by a species, at the time it is listed in accordance with the Act, on which are found those physical or biological features (I) essential to the conservation of the species and (II) that may require special management considerations or protection, and (ii) specific areas outside the geographical area occupied by a species at the time it is listed, upon a determination that such areas are essential for the conservation of the species.

Section 4(a)(3) of the Act requires that critical habitat be designated to the maximum extent prudent and determinable concurrently with the determination that a species is endangered or threatened. Critical habitat is being designated for the Owens tui chub to include the following two areas of Mono County, California: (1) Owens River and 50 feet on each side of the river from Long Valley Dam downstream for a distance of 8 stream miles; and (2) A portion of Hot Creek and outflows, and those areas of land within 50 feet of all sides of the springs, their outflows, and the portion of Hot Creek. This area includes about 0.25 miles of stream and springs, and about 5 acres of fronting land. Known constitutent elements include high quality, cool water with adequate cover in the form of rocks, undercut banks, or aquatic vegetation, and a sufficient insect food base.

The areas proposed as critical habitat for the Owens tui chub satisfy all known criteria for the ecological, behavioral, and physiological requirements of the species. This fish successfully reproduces in the headwater springs of Hot Creek, where the population is apparently viable, although reduced in size from predation by exotic fishes. The population in the Owens River has decreased since the introduction of exotic fishes; however it continues to be a small but viable population. Both areas would provide excellent habitat for the Owens tui chub if exotic fishes were eliminated or greatly reduced. Lands adjacent to the streams and springs are included for the protection of the riparian habitat that is important to the maintenance of aquatic ecosystems. The areas designated as critical habitat include the entire range of the subspecies as known at this time.

Section 4(b)(8) requries, for any proposed or final regulation that designates critical habitat, a brief description and evaluation of those

activities (public or private) which may adversely modify such habitat or may be affected by such designation. Activities that may adversely modify the critical habitat for the Owens tui chub are identified as follows: (1) Introduction of exotic aquatic organisms; (2) Activities that decrease available water or cause a significant change in the physical or chemical properties (e.g., temperature, pH or dissolved gases) of the water; (3) Removal of natural riparian and/or submergent vegetation, except what might be required to maintain an open-water habitat for the Owens tui chub; (4) Pollution of aquatic habitats or adjacent terrestrial habitats; (5) channelization or diversion of water flows; and (6) Overgrazing of adjacent riparian areas.

The City of Los Angeles owns the entire proposed critical habitat. Activities within the critical habitat include sportfishing along the Owens River and operation of a trout hatchery by the State of California in the Hot Creek area. These activities do not involve Federal funds or permits and are not expected to affect or be affected by the critical habitat designation. The land surrounding the critical habitat is located within the Inyo National Forest. The adjacent land is administered by the Forest Service under the Mammoth-Mono Unit Plan (M-MUP). Forest Service management of the surrounding areas under the M-MUP is apparently compatible with the critical habitat designation. This critical habitat area around Hot Creek is part of a Known Geothermal Resource Area (KGRA). The Bureau of Land Management (BLM) has issued some geothermal leases in the area. These leases have stipulations that provide for protection of resources. No Plans of Operations have been submitted to BLM for exploration or development and no active exploration has occurred. BLM management of geothermal leasing is apparently compatible with the critical habitat designation. There is also a small privately-operated geothermal heating plant located on a privately-owned inholding of the Inyo National Forest in the vicinity of the critical habitat. No Federal funds or permits are involved in the operation of the heating plant, and its operation is not expected to affect or be affected by the critical habitat designation.

No activities are presently known that may affect or be affected by the designation of critical habitat. However, any Federal agency that believes its actions may affect the Owens tui chub, or may adversely modify its critical habitat is required to enter into consultation with the Service.

Section 4(b)(2) of the Act requires the Service to consider economic and other impacts of designating a particular area as critical habitat. To obtain this information, the Service contacted Federal and State agencies and other interested parties that might have activities involving Federal funds or permits within the area affected by the critical habitat designation. The Service has evaluated the critical habitat designation after considering all available information and concludes that no adjustments to the area proposed as critical habitat are warranted.

Available Conservation Measures

Conservation measures provided to species listed as endangered or threatened under the Endangered Species Act include recognition, recovery actions, requirements for Federal protection, and prohibitions against certain practices. Recognition through listing encourages and results in conservation actions by Federal, State, and private agencies, groups, and individuals. The Endangered Species Act provides for possible land acquisition and cooperation with the States and requires that recovery actions be carried out for all listed species. Such actions are initiated by the Service following listing. The protection required of Federal agencies and the prohibitions against taking and harm are discussed, in part, below.

Section 7(a) of the Act, as amended, requires Federal agencies to evaluate their actions with respect to any species that is proposed or listed as endangered or threatened and with respect to its critical habitat. Regulations implementing this interagency cooperation provision of the Act are codified at 50 CFR Part 402 and are now under revision (see proposal at 48 FR 29990; June 29, 1983). Section 7(a)(2) requires Federal agencies to ensure that activities they authorize, fund, or carry out are not likely to jeopardize the continued existence of a listed species or to destroy or adversely modify its critical habitat. If a Federal action may affect a listed species or its critical habitat, the responsible Federal agency must enter into formal consultation with the Service. There are no known ongoing Federal activities that will be affected by this proposal. If active geothermal development should occur in the future on Forest Service lands in the vicinity of the critical habitat, consultation with the Service will be necessary to ensure the protection of the Owens tui chub and its critical habitat.

The Act and implementing regulations found at 50 CFR 17.21 set forth a series of general prohibitions and exceptions that apply to all endangered wildlife. These prohibitions, in part, make it illegal for any person subject to the jurisdiction of the United States to take, import or export, ship in interstate commerce in the course of a commercial activity, or sell or offer for sale in interstate or foreign commerce any listed species. It also is illegal to possess, sell, deliver, carry, transport, or ship any such wildlife that has been taken illegally. Certain exceptions apply to agents of the Service and State conservation agencies.

Permits may be issued to carry out otherwise prohibited activities involving endangered wildlife species under certain circumstances. Regulations governing permits are at 50 CFR 17.22 and 17.23. Such permits are available for scientific purposes, to enhance the propagation or survival of the species, and/or for incidental take in connection with otherwise lawful activities. In some instances, permits may be issued during a specified period of time to relieve undue economic hardship that would be suffered if such relief were not available.

National Environmental Policy Act

The Fish and Wildlife Service has determined that an Environmental Assessment, as defined under the authority of the National Environmental Act of 1969, need not be prepared in connection with regulations adopted pursuant to section 4(a) of the Endangered Species Act of 1973, as amended. A notice outlining the Service's reasons for this determination was published in the **Federal Register** on October 25, 1983 (48 FR 49244).

Regulatory Flexibility Act and Executive Order 12291

The Department of the Interior has determined that designation of critical habitat for this species will not constitute a major action under Executive Order 12291 and certifies that this designation will not have a significant economic effect on a substantial number of small entities under the Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*). The critical habitat designation as defined in the proposed rule did not bring forth economic or other impacts to warrant consideration of revising the critical habitat designation due to such impacts. The critical habitat is located at two sites in Mono County, California. The lands are within the Inyo National Forest boundary on lands owned by the City of

Los Angeles and used as a watershed. The City of Los Angeles has informed the Service that protection of this watershed is of concern and no future developments that would adversely affect the critical habitat are anticipated. The State of California has informed the Service that management of the small fish hatchery on Hot Creek is compatible with the designation of critical habitat. No significant economic or other impacts are expected as a result of the critical habitat designation. This conclusion is based on current BLM and Forest Service management of the KGRA area surrounding the critical habitat, no anticipated impact from the privately-owned geothermal heating plant, no known involvement of Federal funds or permits for the city-owned land included in the critical habitat, and the unquantifiable benefits that may result from the critical habitat designation for the Owens tui chub. No direct costs, enforcement costs, or information collection or recordkeeping requirements are imposed on small entities by this designation. These determinations are based on a Determination of Effects that is available at the Services Regional Division of Endangered Species (See "Addresses" section, above).

Literature Cited

California Department of Fish and Game. 1980. At the crossroads 1980, a report on California's endangered and rare fish and wildlife. 147 pp.

Gilbert, C.H. 1893. Report on the fishes of the Death Valley expedition collected in southern California and Nevada in 1891, with description of new species. No. Amer. Fauna No. 7.

Miller, R.R. 1973. Two new fishes, *Cila bicolor snyderi* and *Catostomus fumeiventris*, from the Owens River Basin, California. Occ. Pap. Mus. Zool. Univ. Michigan 667:1–19.

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Pister, E.P. 1981. The conservation of desert fishes. Pp. 411–445 in, Fishes in North American Deserts. R.J. Naiman and D.L. Soltz (eds.). John Wiley and Sons, New York.

Snyder, J.O. 1917. An account of some fishes from Owens River, California. Proc. U.S. Nat. Mus. 54:201–205.

Author

The primary author of this final rule is Dr. Jack E. Williams, U.S. Fish and Wildlife Service, 2800 Cottage Way, Room E–1823, Sacramento, California 95825 (916/484–4935 or FTS 468–4935).

List of Subjects in 50 CFR Part 17

Endangered and threatened wildlife, Fish, Marine mammals, Plants (agriculture).

Regulations Promulgation

PART 17—[AMENDED]

Accordingly, Part 17, Subchapter B of Chapter I, Title 50 of the Code of Federal Regulations, is amended as set forth below:

1. The authority citation for Part 17 continues to read as follows:

Authority: Pub. L. 93–205, 87 Stat. 884; Pub. L. 94–359, 90 Stat. 911; Pub. L. 95–632, 92 Stat. 3751; Pub. L. 96–159, 93 Stat. 1225; Pub. L. 97–304, 96 Stat. 1411 (16 U.S.C. 1531 *et seq.*).

2. Amend § 17.11(h) by adding the following, in alphabetical order under "FISHES", to the List of Endangered and Threatened Wildlife:

§ 17.11 Endangered and threatened wildlife.

* * * * *

(h) * * *

Species		Historic range	Vertebrate population where endangered or threatened	Status	When listed	Critical habitat	Special rules
Common name	Scientific name						
FISHES							
Chub, Owens tui	*Gila bicolor snyderi*	U.S.A. (CA)	Entire	E	192	17.95(e)	NA

3. Amend Section 17.95(e) by adding critical habitat of the Owens tui chub, as follows: The position of this entry under § 17.19(e) will follow the same sequence as the species occurs in § 17.11.

§ 17.95 Critical habitat—fish and wildlife.

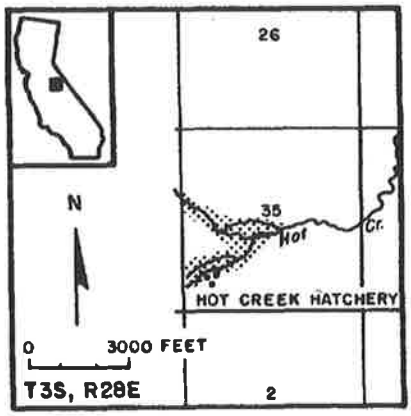
(e) * * *

* * * * *

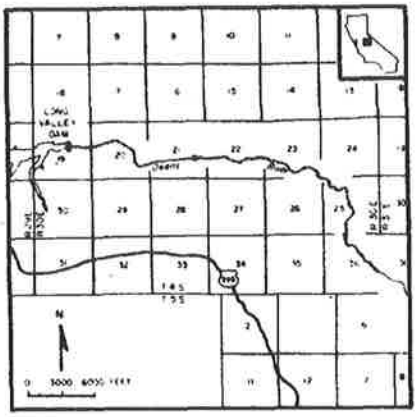
Owens tui chub (*Gila bicolor snyderi*)

California, Mono County.

1. Hot Creek, adjacent springs and their outflows in the vicinity of Hot Creek Hatchery, and 50 feet of riparian habitat on all sides of the creek and springs in T3S, R28E, SW¼ Section 35.



2. Owens River, and 50 feet on both sides of the river, from Long Valley Dam downstream for 8 stream miles in T4S, R30E, Sections 19, 20, 21, 22, 23, 24, 25, and 36.



Known constituent elements include high quality, cool water with adequate cover in the form of rocks, undercut banks, or aquatic vegetation and a sufficient insect food base.

* * * * *

Dated: July 5, 1985.

Susan E. Recce,

Acting Assistant Secretary for Fish and Wildlife and Parks.

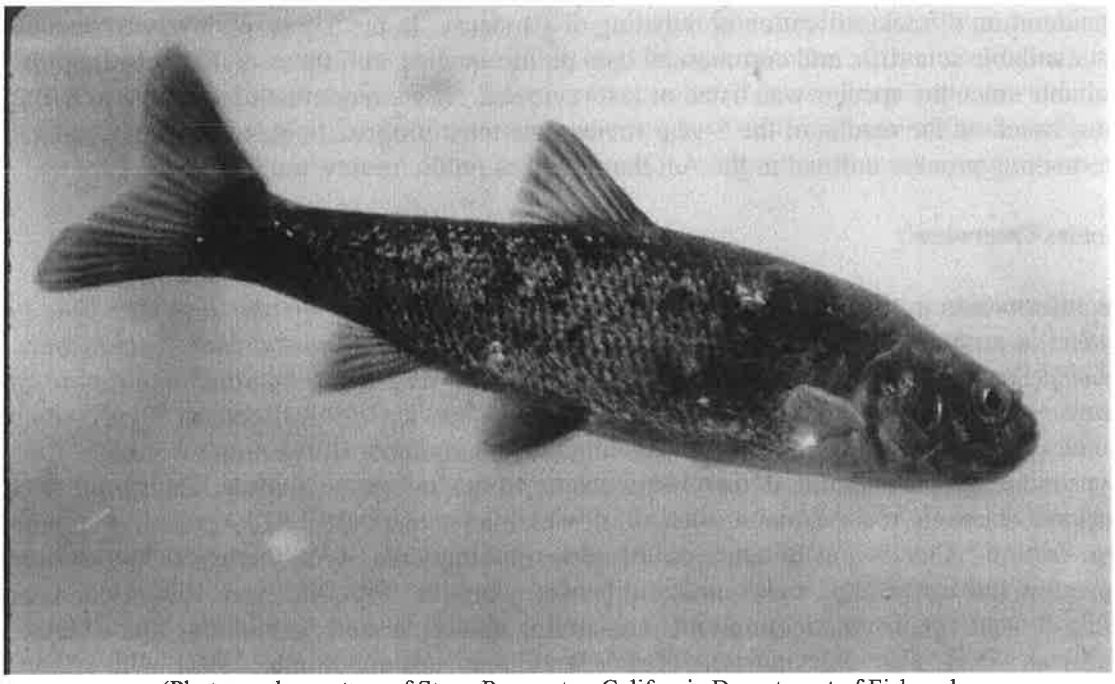
[FR Doc. 85-18469 Filed 8-2-85; 8:45 am]

BILLING CODE 4310-55-M

EXHIBIT L

Owens Tui Chub
(Siphateles bicolor snyderi = Gila bicolor snyderi)

5-Year Review:
Summary and Evaluation



(Photograph courtesy of Steve Parmenter, California Department of Fish and Game, Bishop, California)

U.S. Fish and Wildlife Service
Venture Fish and Wildlife Office
Ventura, California

May 19, 2009

5-YEAR REVIEW

Owens tui chub (*Siphateles bicolor snyderi* = *Gila bicolor snyderi*)

I. GENERAL INFORMATION

Purpose of 5-Year Reviews:

The U.S. Fish and Wildlife Service (Service) is required by section 4(c)(2) of the Endangered Species Act (Act) to conduct a status review of each listed species at least once every 5 years. The purpose of a 5-year review is to evaluate whether or not the species' status has changed since it was listed (or since the most recent 5-year review). Based on the 5-year review, we recommend whether the species should be removed from the list of endangered and threatened species, be changed in status from endangered to threatened, or be changed in status from threatened to endangered. Our original listing of a species as endangered or threatened is based on the existence of threats attributable to one or more of the five threat factors described in section 4(a)(1) of the Act, and we must consider these same five factors in any subsequent consideration of reclassification or delisting of a species. In the 5-year review, we consider the best available scientific and commercial data on the species, and focus on new information available since the species was listed or last reviewed. If we recommend a change in listing status based on the results of the 5-year review, we must propose to do so through a separate rule-making process defined in the Act that includes public review and comment.

Species Overview:

The information in this section on the Owens tui chub (*Siphateles bicolor snyderi* = *Gila bicolor snyderi*) is summarized from the *Draft Recovery Plan for the Owens tui chub, Gila bicolor snyderi* (Service 1990) (Draft Recovery Plan) and the *Owens Basin Wetland and Aquatic Species Recovery Plan, Inyo and Mono Counties, California* (Service 1998) (Recovery Plan), which includes the Owens tui chub. The Owens tui chub is a member of the minnow family (Cyprinidae) and is endemic to the Owens Basin, Mono and Inyo Counties, California. It is restricted currently to six isolated sites, all of which have been artificially created or altered in some fashion. The Owens tui chub prefers slow-moving water, with the presence of submerged vegetation and cover (e.g., rocks, undercut banks) (Jenkins 1990, McEwan 1990, Leunda et al. 2005). It is an opportunistic omnivore, consuming aquatic insects, vegetation, and detritus (McEwan 1991). Life expectancy is likely several years (Scoppettonne 1988), with sexual maturity reached by age 2 (McEwan 1990). Spawning occurs from late winter to early summer, usually over gravel substrate or aquatic vegetation. Females can produce large numbers of eggs (McEwan 1989), and there are multiple spawning bouts. Recent genetic analysis of several Owens tui chub populations revealed that there are two distinct lineages within the Owens tui chub, an Owens lineage and a Toikona lineage (Chen et al. 2007). Threats to the Owens tui chub include: habitat loss and alteration, predation, disease, competition, inbreeding depression, genetic drift, hybridization, population loss from stochastic events, and climate change.

Methodology Used to Complete This Review:

The Ventura Fish and Wildlife Office (VFWO) prepared this review, following the Region 8 guidance issued in March 2008. We used information from the Draft Recovery Plan and the Recovery Plan, published journal articles on the species, reports from experts who have been monitoring various populations of this species, dissertations and theses from universities, and the California Natural Diversity Database (CNDDB) maintained by the California Department of Fish and Game (CDFG). We received no information from the public in response to our *Federal Register* notice initiating this 5-year review (73 FR 11945). This 5-year review contains updated information on the species' biology and threats, and an assessment of that information compared to that known at the time of listing. We focus on current threats to the species that are attributable to the Act's five listing factors. The review synthesizes all this information to evaluate the listing status of the species and provides an indication of its progress towards recovery. Finally, based on this synthesis and the threats identified in the five-factor analysis, we recommend a prioritized list of conservation actions be completed or initiated within the next 5 years.

Contact Information:

> **Lead Field Office:** Judy Hohman, Senior Biologist, (805) 644-1766, ext. 304, and Michael McCrary, Listing and Recovery Coordinator, (805) 644-1766, ext. 372, Ventura Fish and Wildlife Office, Ventura, California.

Federal Register (FR) Notice Citation Announcing Initiation of This Review: A notice announcing initiation of the 5-year review of this taxon and the opening of a 60-day period to receive information from the public was published in the *Federal Register* on March 5, 2008 (73 FR 11945). We received no information from the public in response to this notice.

Listing History:

> **Original Listing**
> **FR Notice:** *Federal Register* Volume 50, Number 150, pp. 31592-31597
> **Date of Final Listing Rule:** August 5, 1985
> **Entity Listed:** *Gila bicolor snyderi*, a fish subspecies. The genus was changed to *Siphateles* in 1998, with the publication of genetic data for the family Cyprinidae in the western United States by Simons and Mayden (1998).
> **Classification:** Endangered
>
> **State Listing:** The Owens tui chub, *Gila bicolor snyderi*, was listed by the State of California as endangered on January 10, 1974.

Associated Rulemakings: The Service designated critical habitat for the Owens tui chub in 1985 in the *Federal Register* Volume 50, Number 150, pp. 31592-31597.

Review History: Although this is the first 5-year status review for the Owens tui chub since it was listed in 1985, updated information on status and threats was included in the 1998 Recovery Plan.

Species' Recovery Priority Number at Start of 5-Year Review: The recovery priority number for *Siphateles bicolor snyderi* is 9 according to the 2008 Recovery Data Call for the Ventura Fish and Wildlife Office, based on a 1-18 ranking system where 1 is the highest-ranked recovery priority and 18 is the lowest (Endangered and Threatened Species Listing and Recovery Priority Guidelines, 48 FR 43098, September 21, 1983). This number indicates that the taxon is a subspecies that faces a moderate degree of threat and has a high potential for recovery. Based on the information obtained during the preparation of this 5-year review, we believe the recovery priority number should be changed to 3. Please see the "New Recovery Priority Number and Brief Rationale" section below for our reason for making this change.

Recovery Plan or Outline

> **Name of Plan or Outline:** *Owens Basin Wetland and Aquatic Species Recovery Plan, Inyo and Mono Counties, California*
> **Date Issued:** September 30, 1998
> **Dates of Previous Revisions, if applicable:** There have been no revisions to this recovery plan.

II. REVIEW ANALYSIS

Application of the 1996 Distinct Population Segment (DPS) Policy

The Endangered Species Act defines "species" as including any subspecies of fish or wildlife or plants, and any distinct population segment (DPS) of any species of vertebrate wildlife. This definition of species under the Act limits listing as distinct population segments to species of vertebrate fish or wildlife. The 1996 Policy Regarding the Recognition of Distinct Vertebrate Population Segments under the Endangered Species Act (61 FR 4722, February 7, 1996) clarifies the interpretation of the phrase "distinct population segment" for the purposes of listing, delisting, and reclassifying species under the Act.

The Owens tui chub was listed as a subspecies with no mention of a DPS. Recent genetic analyses of this subspecies and various populations suggest that the Owens tui chub could be considered a separate species. Within this possible species designation there are there are two distinct genetic lineages, the Owens lineage and the Toikona lineage. Researchers have not proposed a formal taxonomic split of these lineages until more information on meristic (counting quantitative features of fish, such as the number of fins or scales) and osteological characters are available. Each of these lineages could potentially be classified as a DPS. However, we do not believe it is crucial to the recovery of the Owens tui chub to conduct a formal DPS analysis at the present time. The Service and the CDFG are developing and implementing a management plan to ensure that both lineages are managed for and maintained.

Information on the Species and its Status

Species Biology and Life History

The Owens tui chub evolved in the Owens River watershed with only three other smaller species of fishes, Owens pupfish (*Cyprinodon radiosus*), Owens speckled dace (*Rhinichthys osculus* ssp.), and Owens sucker (*Catostomus fumeiventris).* These species are not predators of other fish species. Thus, the Owens tui chub evolved in an environment with no aquatic predators.

Little is known about the life history of the Owens tui chub. It likely has similar requirements as other subspecies of tui chubs to which it is closely related (Service 1990). As with other tui chubs, the Owens tui chub prefers water with low velocities such as portions of the Owens River, associated tributaries, springs, sloughs, drainage ditches, and irrigation canals (Service 1990), with dense aquatic vegetation for cover and habitat for insect food items (McEwan 1990).

The Owens tui chub is an opportunistic omnivore, consuming aquatic insects, vegetation, and detritus (Cooper 1978; McEwan 1990, 1991). Owens tui chubs feed mainly by gleaning and grazing among submerged vegetation. Its diet varies seasonally (McEwan 1990); the dominant items in its diet are chironomid larvae and algae in spring, chironomid larvae in summer, hydroptilid caddisflies in fall, and chironomid larvae in winter (McEwan 1990, Geologica 2003).

Life expectancy is likely several years. At Hot Creek Headwaters (see Figure 2), the age of the oldest fish captured was estimated to be at least 7 years (McEwan 1989, 1990). However, age determination for fish that occupy spring habitats with constant water temperatures is difficult because growth is relatively constant year-round, and annular marks on otoliths, scales, or bones used to determine age are either absent or unreliable (McEwan 1990).

For Owens tui chubs in springs with constant water temperature, sexual maturity is reached at 2 years of age for females and 1 year of age for males (McEwan 1989, 1990). At other sites with varied temperatures, both male and female Owens tui chubs likely become sexually mature at age 2 (McEwan 1990). Spawning occurs from late winter to early summer at spring habitats (McEwan 1990), with spawning likely triggered by day length. In riverine and lacustrine or lake-like habitats where water temperatures fluctuate seasonally, the Owens tui chub spawns in spring and early summer (McEwan 1989), with spawning triggered by warming water temperatures. Spawning usually occurs over gravel substrate or aquatic vegetation, with the eggs adhering to these features. There are multiple spawning bouts during the breeding season (Moyle 1976), and each female produces large numbers of eggs at each bout (McEwan 1989). Similar species of tui chubs produce 4,000 to 5,000 eggs per season (Service 1984). Hatching time is likely influenced by water temperature, with eggs hatching earlier in warmer water (Cooper 1978). Fry congregate in areas with cover (Moyle 1976). Growth during the first summer is rapid, with yearling fish ranging in size from 22 to 42 millimeters (mm) (0.9 to 1.8 inches (in)) (Moyle 1976).

Taxonomy and Morphology

The Owens tui chub is a member of the minnow family (Cyprinidae). Individuals range from 15 mm (0.6 in) to 180 mm (7 in) in length (Miller 1973). This fish is dusky-olive in color from

above with a gold-colored head. The sides of the body are blue and gold. The fins are olive-brown to reddish-brown. The Owens tui chub is distinguished from other tui chubs by the presence of lateral radii on the scales with a rounded or shield-shaped scale base (Miller 1973, Madoz et al. 2005). It is similar morphologically to the Mohave tui chub (*Siphateles bicolor mohavensis*), which occurs to the south of the Owens tui chub in the Mojave Desert, and the Lahontan tui chub (*Siphateles bicolor obesa*), which occurs to the north in the Walker River. The similarity of these three subspecies plus hydrographic evidence suggest that the drainages where these species currently occur were once connected, although not contemporaneously.

Distribution and Abundance

The Owens tui chub is endemic to the Owens Basin (Owens Valley, Round Valley, and Long Valley) of Inyo and Mono Counties, California (Service 1998) (see Figure 1). Historically, the Owens tui chub occurred in large numbers in suitable habitat throughout the Owens Basin, including the Owens River and associated tributaries, springs, drainage ditches, and irrigation canals. Capture efforts by researchers in the late 19th and early-to-mid 20th centuries suggest that the Owens tui chub was common in the Owens Valley floor (Gilbert 1893, Snyder 1917, Miller 1973). However, when Miller published the official scientific description of the subspecies in 1973, the population size and range of the Owens tui chub had been drastically reduced.

When listed in 1985, only two populations of Owens tui chub were believed to exist (50 FR 31592, Chen et al. 2007). One is the Hot Creek Headwaters population, which is located at the headwaters of Hot Creek above the Hot Creek Fish Hatchery (Figure 2). The site consists of two springs, AB Spring and CD Spring. The second population is in the Upper Owens Gorge located below Long Valley Dam and above the town of Bishop (Figure 2).

Subsequent to listing, a third population at Cabin Bar Ranch (owned by the Anheuser Busch Company) was discovered in 1987 (Miller 1997). The Cabin Bar Ranch population consisted of fish occupying irrigation ditches fed by a spring on the southwest shore of Owens Dry Lake (Chen 2006). Predation from introduced largemouth bass (*Micropterus salmoides*) and sunfish (*Lepomis macrochirus*) and failure to maintain adequate water quality and quantity extirpated the Cabin Bar Ranch population of Owens tui chub in 2003.

Prior to 2003, individuals from the Hot Creek Headwaters, Upper Owens Gorge, and Cabin Bar Ranch populations were translocated to establish additional populations of Owens tui chubs. Currently, the Owens tui chub is limited to six isolated sites (Figure 2): Hot Creek Headwaters (AB Spring and CD Spring), Little Hot Creek Pond, Upper Owens Gorge, Mule Spring, White Mountain Research Station (operated by the University of California), and Sotcher Lake, the last of which is outside the historical range of the species in Madera County. The populations at these six sites are genetically pure Owens tui chubs (see Genetics section). The current populations of the Owens tui chub and the origins of the fish stock from relict populations are listed in Table 1 (Conservation Management Institute 1996, Service 1998, Potter 2004, Chen et al. 2007, and Parmenter *in litt.* 2007).

The population that may have expanded its range is the Upper Owens Gorge population. Individuals thought to be Owens tui chubs were observed in the Lower Owens Gorge in 1995

Figure 1. Historical Distribution of Owens Tui Chub Populations

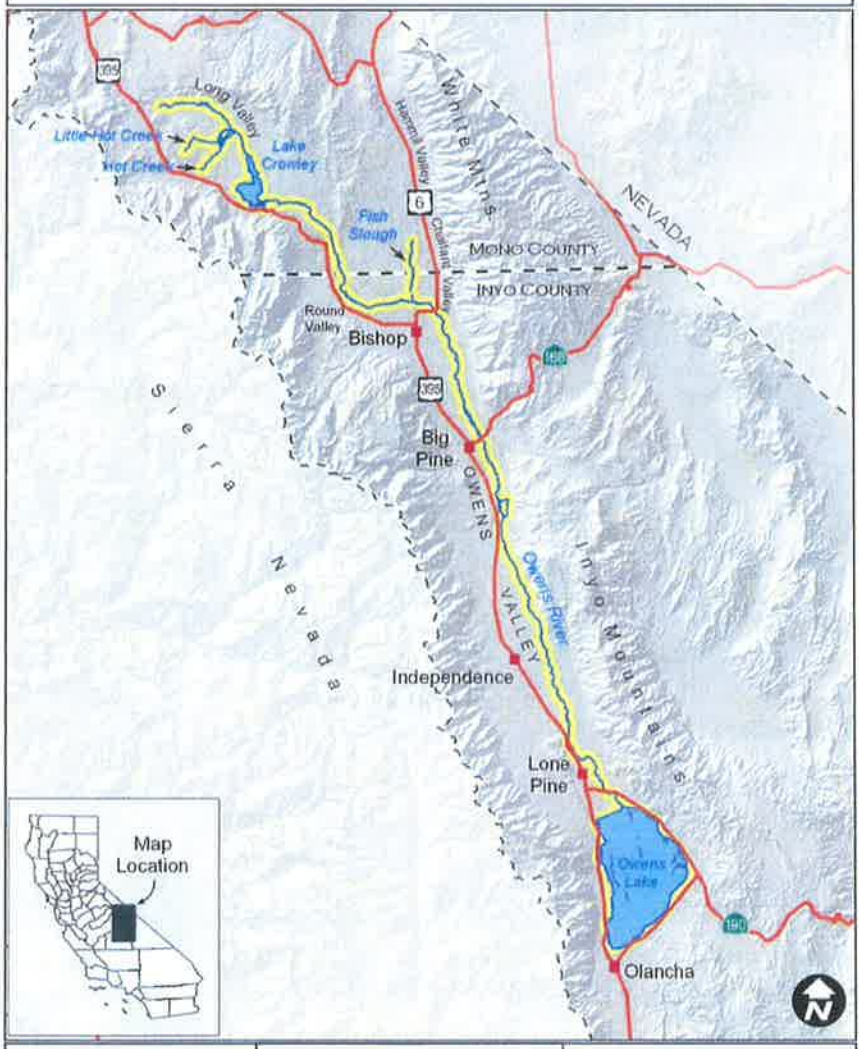


Figure 2. Current Distribution of Owens Tui Chub Populations.

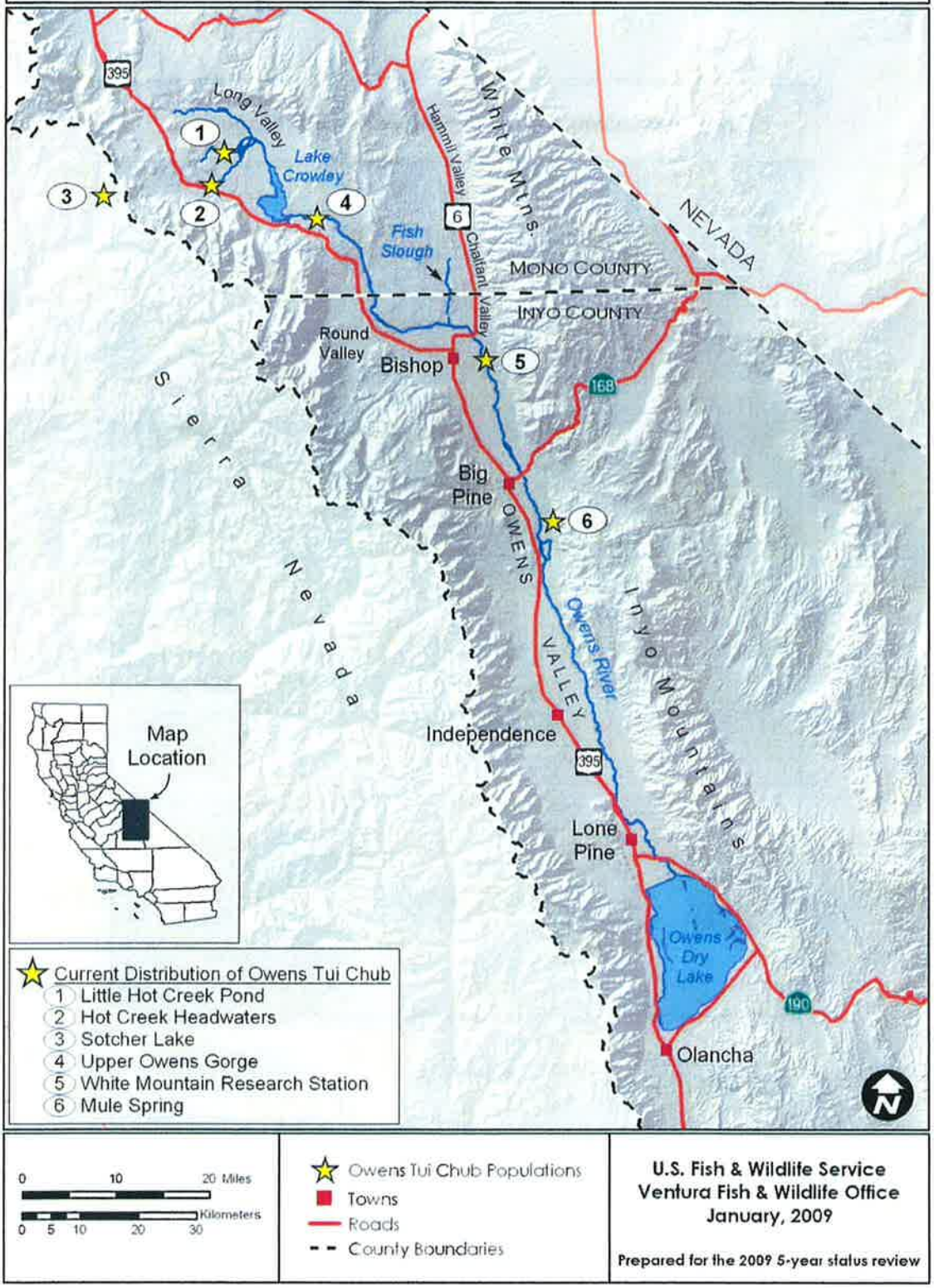


Table 1. Owens tui chub (*Siphateles bicolor snyderi*) populations at the time of listing in 1985, current populations, land ownership, and estimated population size.

Populations at the Time of Listing	Current Populations	Land Ownership	Initial Population Count and Date	Most Recent Population Count and Date
Owens Tui Chub Lineage				
Hot Creek Headwaters AB Spring CD Spring	Hot Creek Headwaters AB Spring CD Spring	LADWP[1]	 334 ± 105 (1988) 523 ± 146 (1988)	 180-245 (1999) None observed in 1998-99
	Little Hot Creek Pond	Inyo National Forest	811 transplanted (1988)	No count
Upper Owens Gorge	Upper Owens Gorge	LADWP	2818 (1989)	28 observed (1999)
	White Mountain Research Station (3 ponds)	LADWP	40 transplanted (1999)	No count
	Sotcher Lake	Inyo National Forest	No count	No count
Toikona Tui Chub Lineage				
Cabin Bar Ranch		Anheuser Busch Co.	No count	Extirpated
	Mule Spring	BLM[2]	59 transplanted (1991)	250-338 (2007) 214-305 (2008)
	White Mountain Research Station (1 pond)	LADWP	24 transplanted (1987)	No count

[1] LADWP = Los Angeles Department of Water and Power
[2] BLM = Bureau of Land Management

and 2008 in a portion of the Owens Gorge re-watered since 1992 (Fransz 1997, Hill *in litt.* 2008). However, no Owens tui chubs were captured in the Lower Owens Gorge in 1998 despite extensive trapping and electrofishing efforts (Malengo 1998). We need to conduct a genetic analysis of these fish to determine whether they are pure Owens tui chubs or hybrids.

The Hot Creek Headwaters (AB and CD Springs), Upper Owens Gorge, and White Mountain Research Station populations of the Owens tui chub are on lands owned by the Los Angeles

Department of Water and Power (LADWP). The Sotcher Lake and Little Hot Creek Pond populations are on lands managed by the Inyo National Forest, and the Mule Spring population is on land managed by the Bureau of Land Management (Chen and May 2003).

Information on Owens tui chub abundance or changes in population size is limited or unknown for these populations (Table 1), and when counts have been made, the methodologies used to estimate population size have varied (Malengo 1999, Geologica 2003, Eckland and McKee 2007, and Holmes et al. 2008). While we know that these populations currently exist, we are unable to determine whether they are increasing, decreasing, or stable. No information is available on population age structure, sex ratio, or mortality.

Habitat or Ecosystem

Much of the aquatic habitat in the Owens Valley has been eliminated or modified since the early 1900s. Water has been dammed, diverted, and transported to Los Angeles for human consumption, or is used locally for agriculture and human consumption. Of the remaining perennial aquatic habitat in the Owens Valley, much of it contains the abiotic features (e.g., water velocity, water quality, cover) needed by the Owens tui chub but not the biotic features (e.g., absence of non-native aquatic species that prey on or hybridize with Owens tui chubs) (see Five Factor Analysis, C: Disease or Predation section).

The Owens tui chub occurs in low-velocity waters with well-developed beds of aquatic vegetation, rocks, and undercut banks (Leunda et al. 2005). Jenkins (1990) observed Owens tui chubs only in the lacustrine habitats of a weir pool and beaver pond in the upper portion of the Owens Gorge. These areas had mud bottoms and aquatic vegetation. Riffle and run habitats of the Owens River in the Gorge were devoid of chubs. Vegetation is likely important to Owens tui chubs for predator avoidance, reproduction, food, and reduced water velocity (McEwan 1990, 1991, Conservation Management Institute 1996, Geologica 2003). Aquatic vegetation is especially important as it provides plant food and habitat for aquatic invertebrates, the main food item of the Owens tui chub (McEwan 1990, 1991). Water temperature is usually fairly constant at spring sites (e.g., 59 degrees Fahrenheit (°F) (15 degrees Centigrade [°C])) at Hot Creek Headwaters, but can fluctuate from 36 to 78 °F (2 to 25 °C) in a river (e.g., Owens Gorge) (Geologica 2003). The pH ranges from 6.6 to 8.9 (McEwan 1989, Geologica 2003), dissolved oxygen varies from 5 to 9.3 milligrams/liter (mg/l or parts per million (ppm)) (Malengo 1999, Geologica 2003), and alkalinity varies from 68.0 to 88.4 parts per million (McEwan 1989).

In 1997, a Memorandum of Understanding (MOU) among the litigants (LADWP and Inyo County) and interveners required LADWP to release a permanent base flow of 40 cubic feet per second in the lower Owens River. This action was accepted, and stipulated by the Superior Court of the State of California, County of Inyo. The LADWP initiated this release and in 2007, the court determined that LADWP had complied with the permanent base flow release requirement in the MOU. This release increased the availability of runs, riffles, and pools in the lower Owens River, much of which was historical habitat for the Owens tui chub. However, this increase in habitat has not benefited the Owens tui chub; rather, it has benefited the non-native largemouth bass and other non-native aquatic species (Hill *in litt.* 2008), which prey on or compete with the Owens tui chub (see Factor C: Disease or Predation and Factor E: Other

Natural or Manmade Factors Affecting Its Continued Existence sections).

We provide a description of the habitat at each of the extant populations below.

Hot Creek Headwaters (AB and CD Springs): Both springs are the headwaters for Hot Creek, a tributary of the Owens River. The habitat for the AB Spring subpopulation has four spring discharge locations among its 123-meter (m) (400-foot (ft)) long, flowing channel (McEwan 1991). The habitat for the CD Spring population has five spring discharge locations and is about 178 m (600 ft) long (McEwan 1990, 1991). Both springs are similar in width, 6.3 m (20.5 ft), and depth, 0.15 to 0.77 m (0.5 to 2.5 ft) (McEwan 1990, 1991). Both springs have a profuse growth of emergent and submergent vegetation (McEwan 1990). Rainbow trout (*Oncorhynchus mykiss*), a competitor with the Owens tui chub for food and a predator of its eggs and fry, are present.

Little Hot Creek Pond: This population occupies a man-made pond constructed by the U.S. Forest Service in 1986 to enhance waterfowl habitat. The stream channel was impounded about 0.4 kilometer (km) (0.25 mi) downstream from the thermal headsprings of Little Hot Creek (Moskowitz 1989). The pond is shallow; covered with muskgrass (*Chara* sp.), an invasive alga which provides cover for the chubs; and cattail (*Typha* sp.) is abundant. Mosquitofish (*Gambusia affinis*) are also present. Mosquitofish prey on the eggs and fry of Owens tui chubs and compete for aquatic insects.

Owens Gorge: This portion of the Owens River, which supports the Upper Owens Gorge population, is located below Crowley Lake and Long Valley Dam. The water source for the upper gorge is seepage through the Long Valley Dam. Owens tui chubs are located downstream of the dam and upstream of a weir (a low dam built across a stream to raise water level or divert water), which is 1,610 m (5232 ft) below the dam. The dam and weir function as barriers to movement of non-native fish species from Crowley Lake above the dam and the Owens River below the weir.

The aquatic habitat in the Upper Owens Gorge consists of narrow, heavily silted channels (Bogan et al. 2002). Lacustrine habitat for the chub is confined to a long pond created by a beaver dam. The banks of the pond and channel are heavily vegetated with willow (*Salix* sp.), cattail, grasses, stinging nettle (*Urtica* sp.), and wild rose (*Rosa californica*). Pondweed (*Potamogeton* sp.) is abundant along the banks (Bogan et al. 2002). Non-native fish present in the Owens Gorge include brown trout (*Salmo trutta*), which prey on Owens tui chubs, and Lahontan tui chub, which hybridize with Owens tui chubs (Malengo 1998).

White Mountain Research Station: This population is at the University of California's White Mountain Research Station, a facility leased from the LADWP near the Owens River and the town of Bishop, California. The facility includes three 18.5 by 18.5 m (60 by 60 ft) lined, square, man-made ponds and one small, unlined, rectangular, man-made pond (Parmenter *in litt.* 2007). The small ponds are fed by ground water. The square ponds have submerged tires to provide cover for fish and the rectangular pond is bordered with cottonwood trees that provide cover. Each pond has a drain at the bottom center to allow water to flow through the ponds (Bogan et al. 2002). Non-native fish are not present.

Mule Spring: This population occupies a small, 9 by 13 m (30 by 42 ft) man-made pond (Bogan et al. 2002). The spring that feeds the pond flows from a nearby old mine site. A dense stand of cattail dominates most of the pond, leaving about 30 percent open water. Muskgrass grows around the pond edge and willows grow in the channel below the pond. Non-native fish are not present, but non-native bullfrogs (*Rana catesbeiana*) are present (Bogan et al. 2002).

Sotcher Lake: This is a 26-hectare (ha) (64-acre (ac)) alpine lake located in the Upper San Joaquin River watershed of the western Sierra Nevada. The lake elevation is 2,332 m (7,651 ft). Non-native rainbow and brown trout are present. There is no additional information available about the habitat at Sotcher Lake.

Genetics

Since the time of listing and approval of the Recovery Plan, research has been conducted on the genetics of the Owens tui chub. The Owens tui chub is the most distinct of the tui chubs based on both allozymes and amplified fragment length polymorphisms (AFLP) data and could probably be considered a separate species (May 1999).

One reason the Owens tui chub was extirpated throughout most of its range was from introgression (i.e., hybridization) with the introduced Lahontan tui chub (50 FR 31594) (Chen et al. 2007). Introgression is the movement of a gene from one species into the gene pool of another species. Recent genetic analyses of various populations of presumed pure (i.e., non-introgressed) Owens tui chubs revealed that some populations were introgressed (Chen 2006). These include June Lake, Mammoth Creek, Hot Creek below the fish hatchery, Twin Lakes-Mammoth, Owens River Upper Gorge Tailbay (the area downstream of a dam where water is released into the river after passing through the turbines of a generating station), A1 Drain, C2 Ditch, and McNally Canal. Chen (2006) determined that the following populations, which were sampled in 2002, were non-introgressed Owens tui chubs:

Hot Creek Headwaters - AB Spring and CD Spring subpopulations
Little Hot Creek Pond
Owens Gorge – Upper Owens Gorge
White Mountain Research Station
Mule Spring
Sotcher Lake
Cabin Bar Ranch (extirpated after sampling)

These remaining non-introgressed populations of Owens tui chubs persist in a small number of fragmented habitats. Chen et al. (2007) compared populations of introgressed and non-introgressed Owens tui chubs based on microsatellite DNA loci (Meredith and May 2002) and genomic screening (Chen 2006). Using factorial correspondence (a statistical analysis of data), Chen et al. (2007) discovered that the differences between the Cabin Bar Ranch population and other populations of Owens tui chubs are much greater than between the recognized subspecies of *S. bicolor snyderi* and *S. bicolor obesa*. Thus, the Owens tui chubs and Cabin Bar Ranch tui chubs (translocated to Mule Spring and one pond at the White Mountains Research Station prior

to the Cabin Bar Ranch extirpation) represent distinct, independent lines of evolution in the Owens Basin (Chen 2006).

Changes in Taxonomic Classification or Nomenclature

Nomenclature: The most recent peer-reviewed paper to address the classification of the North American genera of Cyprinidae is Simons and Mayden (1998). Using mitochondrial and ribosomal RNA sequences, they recognized *Gila* as a monophyletic genus of primarily Colorado River fishes, and restored *Siphateles* from a subgenus to a full genus. The Owens tui chub was previously classified in the subgenus *Siphateles*. This usage was subsequently adopted by Smith et al. (2002), Moyle (2002), Baerwald and May (2004), Leunda et al. (2005), Chen et al. (2007), Chen et al. (2008), and others. Additional non-peer-reviewed work by Hughson and Woo (2004), Scharpf (2005), and Garron (2006) also follow this usage. Based on this recent information, we suggest a nomenclature change from *Gila bicolor snyderi*, the scientific name used in the final rule and the Recovery Plan, to *Siphateles bicolor snyderi*.

Taxonomy: Based on his genetic research (see Genetics section), Chen (2006) proposed that the Cabin Bar Ranch population is a separate lineage, the Toikona tui chub lineage, from the Owens tui chub lineage. Fish from the Cabin Bar Ranch population have been translocated and populations established at Mule Spring and the White Mountain Research Station; the Cabin Bar Ranch population has subsequently been extirpated (Parmenter *in litt.* 2008). Chen does not propose making a formal taxonomic split from the Owens tui chub until more information on meristic and osteological characters becomes available. However, this information cannot be collected at this time because, in their present small pond locations (Mule Spring and White Mountains Research Station), Toikona tui chubs do not attain sufficient body size at maturity for the indicative characters to develop fully (Miranda and Escala 2000).

Five-Factor Analysis

The following five-factor analysis describes and evaluates the threats attributable to one or more of the five listing factors outlined in section 4(a)(1) of the Act.

FACTOR A: Present or Threatened Destruction, Modification, or Curtailment of Habitat or Range

The listing rule identified extensive habitat destruction and modification as threatening the Owens tui chub (50 FR 31594). These continue to be threats. Currently, most streams and rivers in the Owens Basin have been diverted and some impounded. The Owens tui chub, which used to occur throughout the Owens River and its tributaries in the Owens Basin, is restricted to six isolated populations, five of which are within the historical range of the species. Of these five populations, three (Hot Creek Headwaters, Little Hot Creek Pond, and Upper Owens Gorge) are located in small, isolated, man-altered portions of these waterways. The other two populations (Mule Spring and White Mountain Research Station) exist in man-made ponds at upland sites with water supplied by artificial methods. The occupied habitat at Hot Creek Headwaters, Little Hot Creek Pond, White Mountain Research Station, and Mule Spring is 0.8 ha (2 ac) or smaller at each site. The habitats for these five populations are threatened by water diversions, failure of

infrastructures that deliver water to these habitats, and/or emergent vegetation.

Most of the water rights in the Owens Basin are owned by the city of Los Angeles. Currently, the demand for water from the Owens Basin is high and growing as Los Angeles continues to grow. The LADWP operates and maintains dams, diversion structures, groundwater pumps, and canals to capture and convey much of the water from the Owens Basin to Los Angeles. The remaining ground water, which provides water to isolated springs and springs that are the headwaters of streams in the Owens Basin, and surface water are used extensively for agriculture and municipal purposes in the Owens Basin. These man-made changes to aquatic habitat in the Owens Basin dramatically reduced suitable aquatic habitat for the Owens tui chub. They reduced the occurrence of the Owens tui chub from a common, wide-ranging species in the Owens Basin to a rare species occurring at a few sites, representing less than 1 percent of the fish's historical range (50 FR 31594).

In addition to the increasing water demands for the greater Los Angeles area, areas adjacent to the Owens Valley (e.g., Round, Chalfant, and Hammil Valleys) are growing, and the demand for water is growing. This increased demand has resulted in an increased withdrawal of ground and surface water from the Owens Valley Groundwater Basin (see Factor D: Inadequacy of Existing Regulatory Mechanisms), which affects springs and other surface waters in the Owens Basin (Pinter and Keller 1991).

As mentioned above, two of the populations (White Mountain Research Station and Mule Spring) are confined to small, man-made ponds with artificial water sources. The survival of these two populations is dependent upon the continual maintenance of the artificial water supply and ensuring adequate water quality. When water flow is not maintained, aquatic habitat and/or water quality will likely degrade rapidly because the ponds are so small. This loss of habitat or degradation of water quality could result in the loss of a population of Owens tui chubs. This scenario almost occurred at Mule Spring when the pipe supplying water from Mule Spring to the Owens tui chub pond was plugged by calcic deposits. Fortunately, the plugged line was quickly discovered and the deposits were removed (Bogan et al. 2002). Currently, there is no routine maintenance program for this population of the Owens tui chub and its habitat.

In the upper portion of the Owens Gorge, the water gradient is mostly riffle and run habitat and is not suitable for Owens tui chubs. Water is supplied by leakage through Long Valley Dam, an earthen structure. This dam does not have outlet gates to control the release of water into the upper gorge. The only occupied or suitable habitat in the upper gorge is at a pool created by a beaver dam. The limited habitat created by the beaver dam is eroding resulting in a reduction of lacustrine habitat for Owens tui chubs (Jenkins 1990).

Habitat requirements for the Owens tui chub include aquatic submerged vegetation but not large amounts of emergent vegetation. At the spring sites (Hot Creek Headwaters, Little Hot Creek Pond, and Mule Spring), invasive emergent plants (e.g. cattail) have altered the aquatic habitat. Cattail proliferation results in deposition of large amounts of organic biomass, eventually converting aquatic habitat to upland habitat (Potter 2004). This conversion results in a loss of habitat for the Owens tui chub. In addition, dense emergent vegetation provides cover for non-native predators of Owens tui chubs, such as bullfrogs and crayfish (*Procambarus* sp.), which

enables non-native predators to thrive at these sites (see Factor C: Disease or Predation). CDFG has installed a device in the waterway between the Hot Creek Hatchery and Hot Creek Headwaters to help remove emergent vegetation. This device requires routine, manual cleaning. No structures to remove emergent vegetation occur at the other population sites. These sites rely on routine, manual clearing of emergent vegetation. At Mule Spring, cattail has been removed by hand from littoral zone or nearshore aquatic areas. Currently, there is no formal program or management plan to conduct this activity by the land management agencies.

Of the five populations within the historical range of the Owens tui chub, two (Mule Spring and White Mountain Research Station) require routine management of water quantity and water quality and three (Mule Spring, Hot Creek Headwaters, and Little Hot Creek) require routine removal of emergent vegetation. One (Upper Owens Gorge) has been severely altered by the construction of a dam, with no mechanism to manage adequate releases of water downstream of the dam; thus, there is no way to manage water quantity, water quality, and water velocity in the Upper Gorge. Given the dependency of these populations of the Owens tui chub to the routine maintenance of their habitats, the continued existence of these restricted habitats and the associated populations of Owens tui chubs are tenuous.

FACTOR B: Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

Overutilization for commercial, recreational, scientific, or educational purposes was not identified as a factor in the 1985 final listing rule (50 FR 31594). Since listing, only five individuals/entities, including the Service and the CDFG, have received recovery permits to take the Owens tui chub for scientific purposes (Marquez *in litt.* 2008). The permits authorized capture and release; no mortality was permitted. Thus, there has been limited use of the Owens tui chub for scientific purposes but no evidence that overutilization is a threat to the species.

There is no information in the literature that suggests that the Owens tui chub is or has been used for commercial, recreational, or educational purposes since listing in 1985. Therefore, overutilization for commercial, recreational, scientific, or educational purposes is not known to be a threat at this time or expected to be a threat in the future.

FACTOR C: Disease or Predation

Disease

The final rule listing the Owens tui chub as endangered did not identify disease as a factor (50 CFR 31594). Since listing, evidence of disease has been observed in some populations of the Owens tui chub. One Owens tui chub from Cabin Bar Ranch had 183 Asian tapeworms (*Bothriocephalus acheilognathi*) (Bogan et al. 2002). However, Bogan et al. (2002) did not find any evidence of parasites in 15 Owens tui chubs from Hot Creek Headwaters (seven from AB Spring and eight from CD Spring). Bogan et al. (2002) did find evidence of infection in six of the seven Owens tui chubs from AB Spring that were collected for genetic analysis. Five of the six had intraperitoneal fluid and hypertrophied livers, four had lesions around the anal opening, one had red eyes, and one had a curved spinal cord. Most of these symptoms are characteristic

of either bacterial or viral infections or water pollution (Bogan et al. 2002). Since disease has been identified in Owens tui chubs, it is considered a threat. However, the magnitude of this threat is unknown.

Predation

The final listing rule (50 FR 31594) identified predation by introduced non-native fish, specifically brown trout, as a major threat to the Owens tui chub. Chen and May (2003) identified predation by non-native largemouth bass and brown trout as eliminating Owens tui chubs from much of their historical range in the Owens River. These species (Table 2) are abundant in the Owens River system (Chen and May 2003). The presence of non-native aquatic predators in the Owens Basin has greatly limited the locations in which the Owens tui chub can survive and persist. Subsequent to the listing of the Owens tui chub as endangered in 1985, a new population of Owens tui chubs was established at Fish Slough (Figure 2). This population was lost within a short time due to introduction of and predation by largemouth bass (Parmenter *in litt.* 2009). The Cabin Bar Ranch population of the Owens tui chub was lost shortly after the discovery of largemouth bass and sunfish in this population (see Distribution and Abundance section).

Table 2. Occurrence of aquatic predators of the Owens tui chub at current and historical locations.

	Hot Creek Head-waters	**Little Hot Creek Pond**	**Upper Owens Gorge**	**White Mtn Research Station**	**Mule Spring**	**Sotcher Lake**	**Cabin Bar Ranch**	**Histor-ical Range**
Brown trout	X		X			X		X
Rainbow trout	X		X			X		X
Largemouth bass			X				X	X
Bluegill sunfish							X	X
Sacramento perch			X					X
Mosquito-fish		X						X
Bullfrog					X			X
Crayfish								X

Much of the recreation-based economy of the Owens Basin depends on recreational fishing, primarily for trout and largemouth bass. Because of the miles of riverine habitat and the historical and current practice of angling in the Owens Basin, it is unlikely that curtailing stocking these species would eliminate them from the Basin. Consequently, restoring the Owens tui chub to most of the Owens River or its connected tributaries is unlikely to occur.

At the Hot Creek Headwaters, predation by rainbow trout, which escape from the Hot Creek Fish Hatchery, does not seem to be a threat (McEwan 1990, 1991). Although rainbow trout eat Owens tui chub eggs, an examination of stomach contents of 109 rainbow trout in CD Spring revealed no Owens tui chub. McEwan (1990, 1991) hypothesized that this absence of evidence of predation on hatched Owens tui chubs may be due to the less piscivorous (fish-eating) nature of rainbow trout and/or the small size of the hatchery trout.

Mosquitofish are abundant at Little Hot Creek Pond. Data are not available regarding their interaction with the Owens tui chub (Moskowitz 1990). However, we do know that mosquitofish will prey on small individuals of Mohave tui chub (Archdeacon 2007).

Brown trout occur in both the upper and lower portions of the Owens Gorge (Bogan et al. 2002). In 1989, Jenkins sampled the fish population in the first 9 km (5.6 mi) of the upper portion of the Gorge downstream from Crowley Dam. Population estimates were 2,818 for the Owens tui chub, 5,961 for the Owens sucker, and 50,000 for brown trout (Jenkins 1990). The Upper Owens Gorge population receives protection from the movement of introduced brown trout upstream from the Lower Owens Gorge by a landslide and concrete weir making upstream movement unlikely (Fransz 1997). During a survey of the Lower Owens Gorge in 1998, 19 brown trout ranging in length from 65 to 120 mm (2.5 to 4.7 in) (forklength) were captured (Malengo 1998). Bogan et al. (2002) believed that the Owens tui chub did not occur in the Lower Owens Gorge; however, individuals thought to be Owens tui chubs were observed there in 2008 (Hill *in litt.* 2008). Sacramento perch (*Archoplites interruptus*), another non-native predatory species, also occur in the lower portion of the Owens Gorge.

At Mule Spring, bullfrogs are present and probably prey on Owens tui chubs. Although there is no report in the literature of direct observations of bullfrog preying on Owens tui chubs, bullfrogs prey on many species of fish, including other subspecies of tui chubs (Parmenter *in litt.* 2009).

Although avian predation on Owens tui chubs has not been observed, McEwan (1990) hypothesized that birds occasionally prey on them at Hot Creek Headwaters. Predation by black-crowned night herons (*Nycticorax nycticorax*) and great blue herons (*Ardea herodias*) on rainbow trout at the Hot Creek Fish Hatchery immediately downstream from Hot Creek Headwaters has been documented.

FACTOR D: Inadequacy of Existing Regulatory Mechanisms

The inadequacy of existing regulatory mechanisms was identified as a threat to the Owens tui chub at the time of listing in 1985 and, in the absence of the protections afforded by the Act, would continue to be a threat. The final rule noted that as a State-listed endangered species, the California Endangered Species Act (CESA) and California Fish and Game Code 2080 protected

the Owens tui chub from take. Take is defines in section 86 of the California Fish and Game Code as "hunt, pursue, catch, capture, or kill; or attempt to hunt, pursue, catch, capture, or kill." If the take is incidental, CDFG requires that the permit applicant fully mitigate for it. If the take is intentional or purposeful (e.g., for research purposes), the researcher must first obtain a Memorandum of Understanding (MOU) with the CDFG. However, CESA does not protect the species' habitat, and habitat destruction and alteration were identified as factors threatening the Owens tui chub (see Factor A: Present or Threatened Destruction, Modification, or Curtailment of Habitat or Range).

The Endangered Species Act (Act) is the primary Federal law providing protection for this species. Since its listing, the Service has analyzed the potential effects of Federal projects under section 7(a)(2), which requires Federal agencies to consult with the Service prior to authorizing, funding, or carrying out activities that may affect listed species. A jeopardy determination is made for a project that is reasonably expected, either directly or indirectly, to appreciably reduce the likelihood of both the survival and recovery of a listed species in the wild by reducing its reproduction, numbers, or distribution (50 C.F.R. § 402.02). A non-jeopardy opinion may include reasonable and prudent measures that minimize the amount or extent of incidental take of listed species associated with a project. Incidental take refers to taking of listed species that results from, but is not the purpose of, carrying out an otherwise lawful activity by a Federal agency or applicant (50 C.F.R. § 402.02). In cases where some incidental take is unavoidable, the Service works with the agency to include additional conservation measures to minimize negative impacts. For projects without a Federal nexus that may take a listed species, the Service may issue incidental take permits pursuant to section 10(a)(1)(B). To qualify for an incidental take permit, applicants must develop, fund, and implement a Service-approved habitat conservation plan (HCP) that details measures to minimize and mitigate the project's adverse impacts to listed species. Regional HCPs in some areas now provide an additional layer of regulatory protection for covered species, and these HCPs are coordinated with the related Natural Communities Conservation Program, a State program.

The Recovery Plan did not identify inadequacy of existing regulatory mechanisms as a threat to the Owens tui chub; therefore, it did not identify any recovery tasks that would mitigate this factor. There is no information in the literature that suggests this factor is a direct threat to the Owens tui chub, but there is a concern about indirect effects to the Owens tui chub and its habitat from actions that are not regulated. The unregulated actions are those that may result in the overdrafting of the aquifer in the Owens Valley Groundwater Basin area, which underlies the Benton, Hammil, and Chalfant Valleys in Mono County and Round and Owens Valleys in Inyo County. Groundwater withdrawal is an activity under state jurisdiction. However, in California, groundwater withdrawal is controlled and monitored only in those areas that have been adjudicated (settled by judicial procedure). The aquifer in the Owens Basin has not been adjudicated; therefore, its use is not regulated. Without regulated groundwater use, groundwater pumping could result in reduced or no water flow to existing isolated springs and headwater springs of streams in the Owens Basin. This change would result in a reduction or loss of aquatic habitat for the Owens tui chub. For example, from the early 1900s to the 1960s, there was a 40 percent decrease in water flow from the springs at Fish Slough near Bishop (Pinter and Keller 1991). The reduction was greater than could be explained by natural, aboveground processes, such as evaporation and transpiration losses from phreatophytes (deep-rooted plants that obtain water from a permanent ground supply or from the water table). The decrease in

water flow at Fish Slough may have been related to increased groundwater pumping in the Owens Valley Groundwater Basin (Pinter and Keller 1991, MHA 2001).

The Recovery Plan identified protecting spring discharge as a recovery task for the spring-fed Conservation Areas (see Strategy of Recovery – Conservation Areas section). Springs are supplied by ground water, and the State of California is responsible for regulating ground water. However, California has not issued groundwater regulations for the Owen Valley Groundwater Basin. The Recovery Plan noted that the City of Los Angeles and Inyo County had recently agreed to manage groundwater resources to minimize the effects of groundwater pumping on Owens Valley vegetation (EIP Associates 1991). This agreement covers only the Owens Valley. It does not include areas outside the Owens Valley but within the Owens Valley Groundwater Basin, such as the Long, Chalfant, and Hammil Valleys. Long Valley was identified as a Conservation Area for downlisting and delisting the Owens tui chub. Recently, the amount of groundwater pumping in the Chalfant and Hammil Valleys for agricultural use exceeded the amount of water that was recharged by precipitation and snowmelt (MHA 2001). Ground water in the Long, Chalfant, and Hammil Valleys provides water to Owens tui chub Conservation Areas. Any reduction in flow from springs in the Owens Basin would result in further reductions of habitat quality and quantity for the Owens tui chub at springs and tributaries of the Owens River. Therefore, inadequacy of existing regulatory mechanisms is a threat at this time.

FACTOR E: Other Natural or Manmade Factors Affecting Its Continued Existence

The final listing rule identified introduction of the Lahontan tui chub and subsequent hybridization and competition as major threats to the Owens tui chub. Hybridization and competition continue to be threats; although not discussed in the listing rule, stochasticity (i.e., random events), catastrophic events, and climate change are also potential threats.

Hybridization

Until recently, the Owens tui chub and the closely related Lahontan tui chub were isolated from each other. Lahontan tui chubs were introduced as baitfish into many of the streams in the Owens Basin. This was first observed at Crowley Lake in 1973, where fishermen illegally introduced the Lahontan tui chub (Miller 1973). Since that time, hybridization between the Owens tui chub and Lahontan tui chub has been documented for populations in Mono County at Hot Creek (downstream from the hatchery), Mammoth Creek, Twin Lakes-Mammoth, June Lake, and Owens River Upper Gorge Tailbay, and in Inyo County at A1 Drain, C2 Ditch, and McNally Canal (Madoz et al. 2005, Chen 2006). At the time of listing, only three populations of genetically pure Owens tui chubs existed, while at the present time, there are six genetically pure populations (see Spatial Distribution section).

Using Lahontan tui chubs in the Owens Basin as baitfish is not allowed under fishing regulations. However, Lahontan tui chubs and hybrids are present in the Owens Basin including Crowley Lake, Hot Creek and tributaries, including Little Hot Creek, and the lower portion of the Owens Gorge (Malengo 1998, Chen 2006). If man-made barriers isolating the Owens tui chub populations at these sites are degraded or removed, this degradation/removal could result in the loss of the pure populations of Owens tui chubs at Hot Creek Headwaters, Little Hot Creek

Pond, and the Upper Owens Gorge. In addition, the opportunities to establish new populations of Owens tui chubs in the Owens Basin is limited by the presence of hybrids in the Owens River and tributaries, the historical habitat for the Owens tui chub. Currently, the only viable locations for establishing the Owens tui chub are isolated springs or the headwaters of streams with downstream barriers to upstream movement of Lahontan tui chubs or hybrids.

Competition

The final listing rule identified competition with non-native fish species as a threat to the Owens tui chub. However, little specific information on the impact of competition on the Owens tui chub is available in the literature.

Non-native insectivorous fish occur at Hot Creek Headwaters (rainbow trout) and Little Hot Creek Pond (mosquitofish) (McEwan 1989). A major part of the diets for these non-native species is the same aquatic insects consumed by Owens tui chubs. Although information is not available for rainbow trout, mosquitofish are known to affect some southwestern native fishes through competition and predation (Deacon et al. 1964, Courtenay and Meffe 1989).

Stochasticity

The creation and maintenance of small, often intensively managed, populations have prevented extinction of the Owens tui chub. Only six populations of the Owens tui chub exist, and they are isolated from each other. Species consisting of small populations, such as the Owens tui chub, are recognized as being vulnerable to extinction from stochastic (i.e., random) threats, such as demographic, genetic, and environmental stochasticity and catastrophic events (Shaffer 1981).

Demographic stochasticity refers to random variability in survival and/or reproduction among individuals within a population (Shaffer 1981). Random variability in survival or reproduction can have a significant impact on population viability for populations that are small, have low fecundity, and are short-lived. In small populations, reduced reproduction or die-offs of a certain age-class will have a significant effect on the whole population. Individuals vary naturally in their ability to produce viable offspring; for example, a particular male may be sterile or a female may produce fewer eggs than average. Although of only minor consequence to large populations, this randomly occurring variation in individuals becomes an important issue for small populations.

Currently Owens tui chub populations are small, between 100 and 10,000 individuals; therefore, random events that may cause high mortality, or decreased reproduction may have a significant effect on the viability of Owens tui chub populations. Furthermore, because the number of populations is small (six) and each is vulnerable to this threat, the risk of extinction is exacerbated.

Genetic stochasticity results from the changes in gene frequencies caused by founder effect, random fixation, or inbreeding bottlenecks (Shaffer 1981). Founder effect is the loss of genetic variation when a new population is established by a very small number of individuals. Random fixation is when some portion of loci is fixed at a selectively unfavorable allele because the

intensity of selection is insufficient to overcome random genetic drift. Random genetic drift happens when only a portion of alleles in the population is transmitted from one generation to the next, because only a fraction of all possible zygotes become breeding adults. A bottleneck is an evolutionary event in which a significant percentage of a population is killed or prevented from breeding.

In small populations, such as the Owens tui chub, these factors may reduce the amount of genetic diversity retained within populations and may increase the chance that deleterious recessive genes are expressed. Loss of diversity could limit the species' ability to adapt to environmental changes and contributes to inbreeding depression (i.e., loss of reproductive fitness and vigor). Deleterious recessive genes could reduce the viability and reproductive success of individuals. Isolation of the six remaining populations preventing any natural genetic exchange will lead to a decrease in genetic diversity.

Long-term prospects for the conservation of rare fishes depend on the availability of genetic variation within a population. This is the raw material to respond to natural selection and allow for continued evolutionary change (Meffe 1990). The remnant Toikona tui chubs descended from 24 founder fish that were relocated from Cabin Bar Ranch in 1987; their extant populations are confined to two small artificial ponds (Mule Spring and White Mountain Research Station) (Chen 2006).

Environmental stochasticity is the variation in birth and death rates from one season to the next in response to weather, disease, competition, predation, or other factors external to the population (Shaffer 1981). Drought or predation in combination with a low population year could result in extinction. The origin of the environmental stochastic event can be natural or human-caused. The Owens tui chub has experienced population loss from environmental stochastic events and will likely do so in the future. The Cabin Bar Ranch population was lost because of an apparent failure to maintain adequate water quality and quantity and the introduction of non-native predators (largemouth bass and sunfish) (Parmenter *in litt.* 2006). Owens tui chubs have also disappeared from the Owens Valley Native Fishes Sanctuary (Fish Slough). Reasons for the loss of this population are not known, but the small, isolated nature of this population likely contributed to their extirpation.

Catastrophic events are an extreme form of environmental stochasticity. Although they generally occur infrequently, catastrophic events, such as severe floods or prolonged drought, can have disastrous effects on small populations and can directly result in extinction.

All three of these factors may also act in combination. One possible scenario of how these factors in combination could increase the risk of extinction for the Owens tui chub would be the loss of one or two populations during a drought period at the same time a predator is introduced to one of the remaining populations. Although one or two of the populations may survive and be a source for future reintroductions, the resulting loss of genetic diversity would further increase the risk of extinction.

Climate change

Impacts to the Owens tui chub under predicted future climate change are unclear. However, a trend of warming in the Sierra Nevada and Inyo Mountains is expected to increase winter rainfall, decrease snowpack, hasten spring runoff, reduce summer stream flows, and reduce ground water recharge (Cayan 2008). Increased summer heat may increase the frequency and intensity of wildfires (Parmesan and Matthews 2005, Intergovernmental Panel on Climate Change 2007). Loss of upland and riparian vegetation leads to soil erosion, increased sedimentation, downcutting of waterways, loss of bank stabilization, and decreased ability of soils to hold moisture and slowly release it into nearby waterways, all of which would negatively affect Owens tui chub habitat. While it appears reasonable to assume that the species may be affected, we lack sufficient certainty regarding: the magnitude and intensity of these impacts; the timing of these effects to the species; the extent of average temperature increases in California/Nevada; or potential changes to the level of threat posed by drought, fire regime, or heavy rainfall events. The most recent literature on climate change includes predictions of hydrological changes, higher temperatures, and expansion of drought areas, which would result in a northward and/or upward elevation shift in range for many species (Intergovernmental Panel on Climate Change 2007). While northward and/or higher elevation habitats could be important factors in the future conservation of this species, currently the isolated populations of the Owens tui chub are unable to access these habitats because of other threats, including a lack of connectivity of habitats caused by physical barriers (e.g., dams and diversion structures); habitat destruction and alteration; and predation, competition, and hybridization with introduced species. We have no knowledge of more detailed climate change information specifically for the range of the Owens tui chub.

III. RECOVERY CRITERIA

Recovery plans provide guidance to the Service, States, and other partners and interested parties on ways to minimize threats to listed species, and on criteria that may be used to determine when recovery goals are achieved. There are many paths to accomplishing the recovery of a species and recovery may be achieved without fully meeting all recovery plan criteria. For example, one or more criteria may have been exceeded while other criteria may not have been accomplished. In that instance, we may determine that, over all, the threats have been minimized sufficiently, and the species is robust enough, to downlist or delist the species. In other cases, new recovery approaches and/or opportunities unknown at the time the recovery plan was issued may provide better ways to achieve recovery. Likewise, new information may change the extent that criteria need to be met for recognizing recovery of the species. Overall, recovery is a dynamic process requiring adaptive management, and assessing a species' degree of recovery is likewise an adaptive process that may, or may not, follow fully the guidance provided in a recovery plan. We focus our evaluation of species status in this 5-year review on progress that has been made toward recovery since the species was listed by eliminating or reducing the threats discussed in the five-factor analysis. In that context, progress towards fulfilling recovery criteria serves to indicate the extent to which threat factors have been reduced or eliminated.

The Recovery Plan describes the recovery criteria for the Owens tui chub. Although the five factors are not mentioned specifically, the Recovery Plan addressed factors A, C, and E. Listing

factors B and D were not identified specifically as threats to the species at the time the Recovery Plan was prepared.

The Recovery Plan states that the Owens tui chub will be considered for downlisting to threatened status when the following goals have been achieved:

1. Reproducing and self-sustaining populations of the Owens tui chub must exist throughout six Conservation Areas. Two of the Conservation Areas must be in the Long Valley and four in the Owens Valley. The Conservation Areas are Little Hot Creek, Hot Creek, Fish Slough, Round Valley, Warm Springs, Blackrock, and Southern Owens (see Figure 3).

   This criterion addresses Factors A and E.

   The concept behind the Conservation Area approach is that the past approach of managed refuges that are wholly or partially isolated from non-native fish and severe habitat alteration has successfully averted extinction of the species, but the populations continue to experience extirpation or deleterious effects from demographic, genetic, and environmental stochasticity. Consequently, reliance on small, isolated refuges cannot accomplish recovery of the Owens tui chub (Service 1998). Instead, the Recovery Plan focuses on protection and management of Conservation Areas, which are landscape units that include habitat for the Owens tui chub and sufficient buffers to maintain ecological and geological processes necessary to protect aquatic ecosystems. They were selected because the impacts of existing land and water uses are minimal and chances for recovery of the Owens tui chub are greatest. If population abundance can be increased and if new populations can be established, the amount of stochasticity from inbreeding depression, genetic drift, and other sources will decrease, allowing for more genetic variation and preventing the loss of alleles (Holmes et al. 2008).

   When the Recovery Plan was approved, the Owens tui chub occurred at Hot Creek Headwaters, Little Hot Creek Pond, Upper Owens Gorge, White Mountain Research Station, Sotcher Lake, Cabin Bar Ranch, and Mule Spring. Recent surveys found that the Owens tui chub has been extirpated from Cabin Bar Ranch. Sotcher Lake is outside the historical range of the Owens tui chub and is not within the Owen Basin hydrologic unit. No introductions have occurred at Fish Slough, Round Valley, Warm Springs, Blackrock, or Southern Owens. There are no plans to establish new populations of Owens tui chubs at any of these sites. Since the approval of the Recovery Plan in 1998, one population of the Owens tui chub has been established and one has been lost. Reproducing and self-sustaining populations do not exist within the six Conservation Areas. Therefore, criterion 1 has not been achieved.

2. Threats must be controlled.

   This criterion addresses Factors A, C and E. Threats to the Owens tui chub under Factors A, C and E are described in the Recovery Plan and are still present. Since release of the Recovery Plan, the threat to the Owens tui chub from overutilization of ground water in the

Figure 3. Conservation Areas identified for Owens tui chub downlisting and delisting in the 1998 Owens Basin Wetland and Aquatic Species Recovery Plan, Inyo and Mono Counties, California.

valleys adjacent to the Owens Valley (Long, Chalfant, and Hammil Valleys), which reduces spring flow and habitat for the Owens tui chub, has been identified. Because threats to the Owens tui chub under Factors A, C and E continue to occur and no efforts have been implemented to control these threats, criterion 2 has not been achieved.

3. Each Conservation Area must have an approved management plan and implementing agreement with the landowner and the Service.

   This criterion addresses Factors C and E.

   None of the six existing populations of Owens tui chubs has approved management plans or implementing agreements between the Service and the landowners, and therefore this criterion has not been achieved.

4. Successful establishment of populations includes presence of juveniles and three additional age classes of Owens tui chubs.

   This criterion addresses Factors C and E.

   Surveys of population demographics for the Owens tui chub since approval of the Recovery Plan have been implemented for only one of the six populations. Therefore, data are not available to assess whether criterion 4 has been achieved.

5. Ensure that hybrid tui chubs do not occur in the Conservation Areas.

   This criterion addresses Factor E.

   Genetic analysis of 23 populations has been completed and has identified eight introgressed populations of Owen tui chubs (Chen and May 2003). These populations were at Hot Creek (including Little Hot Creek), Mammoth Creek, Twin Lakes near Mammoth, June Lake, and the Upper Gorge Tailbay in Mono County, and A1 Drain, C2 Ditch, and McNally Canal in Inyo County. Because none of these hybrid populations have been eliminated and efforts to prevent future introductions of hybrids and non-native Lahontan tui chubs to non-introgressed populations have not been implemented, criterion 5 has not been achieved.

6. The biomass of the Owens tui chub must exceed the biomass of deleterious, non-native fish species at each site.

   This criterion addresses Factor C.

   This criterion has been addressed where current populations of Owens tui chubs occur. However, populations must occur in the six Conservation Areas before the species may be considered for downlisting . Currently, populations occur in the Little Hot Creek and Hot Creek Conservation Areas. Therefore, criterion 6 has not been achieved.

The Owens tui chub can be considered for delisting when all of the following goals have been achieved:

1. Reproducing and self-sustaining populations of the Owens tui chub must exist throughout seven Conservation Areas for 5 consecutive years. Two of the Conservation Areas must be in the Long Valley and five in the Owens Valley. The Conservation Areas are Little Hot Creek, Hot Creek, Fish Slough, Round Valley, Warm Springs, Blackrock, and Southern Owens.

   This criterion addresses Factors A and E.

   Criterion 1 for downlisting has not been achieved yet (see downlisting above); therefore, this criterion for delisting has not been achieved.

2. Threats must be controlled.

   This criterion addresses Factors A, C and E. Threats to the Owens tui chub under Factors A, C and E are described in the Recovery Plan. Since release of the Recovery Plan, the threat to the Owens tui chub from overutilization of ground water, which reduces spring flow and habitat for the Owens tui chub, has been identified.

   Criterion 2 for downlisting has not been achieved yet (see downlisting above); therefore, this criterion for delisting has not been achieved.

3. Each Conservation Area must have an approved management plan and implementing agreement with the landowner and the Service.

   This criterion addresses Factors C and E.

   Criterion 3 for downlisting has not been achieved yet (see downlisting above); therefore, this criterion for delisting has not been achieved.

4. Successful establishment of populations includes presence of juvenile and three additional age classes of Owens tui chubs.

   This criterion addresses Factors C and E.

   Data are not available to assess whether Criterion 4 for downlisting has been achieved (see downlisting above); therefore, this criterion for delisting has not been achieved.

5. Ensure that hybrid tui chubs do not occur in the Conservation Areas.

   This criterion addresses Factor E.

   Criterion 5 for downlisting has not been achieved yet (see downlisting above); therefore, this criterion for delisting has not been achieved.

6. The biomass of the Owens tui chub must exceed the biomass of deleterious non-native fish species at each site.

   This criterion addresses Factor C.

   Criterion 6 for downlisting has not been achieved yet (see downlisting above); therefore, this criterion for delisting has not been achieved.

In summary, for the Owens tui chub to meet the downlisting or delisting criteria in the Recovery Plan, the following recovery tasks must be successfully implemented:

- establish multiple, self-sustaining populations of Owens tui chubs throughout much of the historical range of the species in identified Conservation Areas;
- ensure these populations are self-sustaining;
- ensure that each population contains juvenile and three additional age classes and that the biomass of Owens tui chubs exceed the biomass of deleterious, non-native aquatic predatory species, which would demonstrate successful recruitment and minimal predation on smaller Owens tui chubs by non-native aquatic species;
- reduce competition with non-native aquatic species;
- increase the ability to conserve and protect aquatic habitats;
- implement measures to prevent hybridization with introduced Lahontan tui chubs;
- to the extent possible, reduce the probability of the loss of Owens tui chub populations from stochastic events; and
- complete an approved management plan and implementing agreement that address water quantity and groundwater management with the land managers.

These Recovery Plan criteria do not address threats from disease; catastrophic events that may affect the Owens Basin; demographic, genetic, or environmental stochasticity; or climate change to the Owens tui chub. The Recovery Plan identifies no recovery criteria for the Toikona lineage, as the occurrence of this lineage was unknown when the Recovery Plan was approved.

IV. SYNTHESIS

When the Owens tui chub was first described in 1973, most of the habitat for the species had been altered or destroyed. At the time of listing in 1985, the Owens tui chub was on the edge of extinction; only the Hot Creek Headwaters, Upper Owens Gorge, and Cabin Bar Ranch populations existed, which made up about 1 percent of the species' original range (Service 1985). These three populations were isolated from each other, and the habitat between them had been destroyed or altered to such a degree that there was no possibility of genetic interchange between them.

Since its listing in 1985, new populations of Owens tui chubs have been established, bringing the current number to six. Four of these populations are in small, man-made or man-altered waters and one is outside the historical range of the species at an artificial lake (Sotcher Lake). All are isolated from each other.

The threats to the Owens tui chub that resulted in listing continue to threaten the species with extinction. They include the potential for further destruction and alteration of a greatly reduced habitat, predation by non-native aquatic species, inadequacy of existing laws and regulations to conserve and protect the remaining habitat for the species, and hybridization with introduced Lahontan tui chubs. Additional threats that were not described in the listing rule include demographic, genetic, and environmental stochasticity, catastrophic events, and climate change.

The success of the existing populations and establishing new populations, as recommended in the Recovery Plan for downlisting and delisting, is not likely for the long term unless the major threats are eliminated or reduced for these populations and new populations are established. The LADWP is the major land manager in the Owens Basin. With the CDFG and Service, they are developing a habitat conservation plan for the Owens tui chub that includes better management of populations on their lands and the creation of new aquatic habitats suitable for establishing new populations of the Owens tui chub. The LADWP's commitment to these actions makes the potential for recovery of this species high. Until LADWP implements these actions in the habitat conservation plan, the threats to the Owens tui chub remain. Therefore, we recommend that the endangered status of the Owens tui chub remain unchanged.

V. RESULTS

Recommended Listing Action:

____ Downlist to Threatened
____ Uplist to Endangered
____ Delist (indicate reason for delisting according to 50 CFR 424.11):
    ____ *Extinction*
    ____ *Recovery*
    ____ *Original data for classification in error*
__✓__ No Change

New Recovery Priority Number and Brief Rationale: We recommend that the recovery priority number be changed to 3. This number indicates that the taxon is a subspecies that faces a high degree of threat and has a high potential for recovery. The threats that were present when the Owens tui chub was listed are still present with new threats identified. Although the number of populations of Owens tui chubs has increased from three at the time of listing to six, there are now two distinct genetic lineages to consider. The major land manager in the Owens Valley (LADWP) is cooperating in the development and implementation of plans to establish and manage new populations of both lineages of Owens tui chub.

Listing and Reclassification Priority Number and Brief Rationale: No change needed

VI. RECOMMENDATIONS FOR ACTIONS OVER THE NEXT 5 YEARS

Develop management plans and implementation agreements for all existing and new populations. Implement population monitoring and adaptive management.

Establish and secure additional populations of the Toikona lineage of Owens tui chubs. Increasing the number of populations and the size of each population of the Toikona lineage will conserve the genetic distinctiveness of this evolutionary lineage, maintain the genetic variation, and prevent the loss of alleles. Recommended sites include but are not limited to the Cartago Springs Wildlife Management Area and the private duck club pond near Dirty Socks.

Establish new populations of the Owens lineage. Recommended locations include but are not limited to the Owens Valley Native Fish Sanctuary.

Improve habitat for existing populations at Little Hot Creek Pond, Owens Gorge, and Mule Spring. This improvement includes but is not limited to management/removal of non-native aquatic floral and faunal species. For the Upper Owens Gorge population, increase the availability of lacustrine habitat and provide for adequate water quality and quantity throughout the year.

Remove non-native aquatic species.

Conduct additional research to gain a better understanding of the origin, genetics, and ecophysiology of the Toikona lineage of the Owens tui chub. This information will help determine the best ways to conserve the unique attributes of this lineage.

Develop and implement an education and outreach program for residents of, and visitors to, the Owens and Mono Basins. The program would focus on the importance of conserving the native fish species including the Owens tui chub and the deleterious effects of non-native predatory fish species. It would involve residents and visitors, adults and children, in ways they can help conserve the Owens tui chub.

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U.S. FISH AND WILDLIFE SERVICE
5-YEAR REVIEW

Owens tui chub (*Siphateles bicolor snyderi*)

Current Classification: Endangered

Recommendation Resulting from the 5-Year Review:

____ Downlist to Threatened
____ Uplist to Endangered
____ Delist
✓ No change needed

Review Conducted By: Judy Hohman

FIELD OFFICE APPROVAL:

Lead Field Supervisor, U.S. Fish and Wildlife Service

Approve Diane L. Noda Date 5/28/09

EXHIBIT N

PROPOSED CASPER
RESOURCE MANAGEMENT PLAN AND
FINAL ENVIRONMENTAL IMPACT STATEMENT

APPENDIX L

Air Quality Mitigation Matrix

Appendix L
Air Quality Mitigation Matrix

The following table outlines options for air quality mitigation in the planning area.

Table L-1. Potential Mitigation Measures for Air Quality Impacts Associated with the Proposed Casper Resource Management Plan

Type of Mitigation	Estimated Cost of Mitigation	Environmental Liabilities	Environmental Benefit	Potential Limitations
Nitrogen Oxide (NO_X) and Carbon Monoxide (CO) Mitigation Measures				
Utilize selective catalytic reduction (SCR) on drill rig engines and compressors.	Relatively expensive as compared to nonselective catalysts. Typical costs are $125/hp (EPA Cost Control Manual, January 2002) for compressors.	Requires the use and storage of ammonia, which presents health and safety issues. Results in increased ammonia emissions, which may contribute to the formation of ammonium sulfates and increased visibility degradation.	NO_X emission rate for compressors reduced to 0.1 g/hp-hr; reduced ammonium nitrate formation and resulting visibility impacts. Application to drill rig engines may result in substantial NO_x reduction.	Not applicable for 2-stroke engines.
Application of nonselective catalytic reduction on drill rig engines and compressors	$5,000 to $25,000 per unit	Regeneration/disposal costs for catalysts.	As a result of the BACT process, average NO_X emission rates for Wyoming compressor engines 100 hp or greater is 1.0 g/hp-hr; the application of nonselective catalysts may reduce the NO_X emission rate to 0.7 g/hp-hr for some types of engines. Application to drill rig engines may result in substantial NO_x reduction (although less reduction than with SCR).	Not applicable for lean-burn or 2-stroke engines.

Table L-1. Potential Mitigation Measures for Air Quality Impacts Associated with the Proposed Casper Resource Management Plan (Continued)

Type of Mitigation	Estimated Cost of Mitigation	Environmental Liabilities	Environmental Benefit	Potential Limitations
Nitrogen Oxide (NO_X) and Carbon Monoxide (CO) Mitigation Measures (Continued)				
Utilize compressors driven by electrical motors.	Capital costs equal 40% of gas turbine costs; operating cost dependent on the location of high voltage powerlines.	Displaced air emissions from compressor units to electric generating stations (EGS).	May displace air emissions away from sensitive Class I areas; moderate emission reduction near compressor station. Also, typically emissions at an EGS are more heavily controlled than at individual compressor stations, so the displaced emissions are also lower than if emitted by a compressor station.	Requires high voltage power lines.
Increased diameter of sales pipelines	With larger diameter of sales pipelines, capital costs increase while operating costs decrease.	Slightly more surface disturbance.	Lower pipeline pressures, resulting in lower compression hp requirements.	None
Centralization of dehydrator units	Variable		Minor reduction in emissions.	Requires infrastructure to be feasible.
Reduce number of vehicle miles driven and unnecessary idling.	Minor		Minor to moderate emissions reduction.	
Utilize wind-generated electricity to power compressors.	Capital costs are very large.	Visual impacts from generation equipment; increased mortality of birds, including raptors.	Reduced use of fossil fuels and associated emissions.	Location of wind-generation facilities is critical; requires consistent strong winds for economic operation and high voltage transmission lines between generation facility and compressor stations.

Table L-1. Potential Mitigation Measures for Air Quality Impacts Associated with the Proposed Casper Resource Management Plan (Continued)

Type of Mitigation	Estimated Cost of Mitigation	Environmental Liabilities	Environmental Benefit	Potential Limitations
Nitrogen Oxide (NO_X) and Carbon Monoxide (CO) Mitigation Measures (Continued)				
Increased emissions monitoring	Minor to moderate	None	Allows better planning of when, and especially where to allow future emissions to occur and when/where to provide for additional emissions mitigation. The Wyoming DEQ AQD currently has an emission tracking agreement with the BLM. The *Amended Letter of Agreement for Tracking Nitrogen Oxide Emissions* dated April 2000 calls for annual reports tracking changes in NO_X emission beginning January 1, 1996.	The monitoring of emission sources provides improved information for estimating impacts, but does not necessarily reduce the magnitude of the impacts.
Increased ambient pollutant monitoring	Moderate	None	Will measure impacts from pollutant sources of concern if correctly located.	
Reduced rate of development	Short-term loss of state and federal royalties.	Emissions generated at a lower rate for a longer period.	Peak emissions and associated impacts reduced.	Economic limitations - A minimum production rate is required to cost-effectively develop the resource while maintaining the processing and transportation infrastructure.

Table L-1. Potential Mitigation Measures for Air Quality Impacts Associated with the Proposed Casper Resource Management Plan (Continued)

Type of Mitigation	Estimated Cost of Mitigation	Environmental Liabilities	Environmental Benefit	Potential Limitations
Particulate Matter (PM) Mitigation Measures				
Increase water application rate to achieve greater than 50% fugitive dust control.	Varies with the source of the water and the trucking distance.	None	Can achieve fugitive dust control rates up to 95%	Diminishing returns per gallon of water applied; water must be applied at much greater rates to achieve control efficiencies greater than 75%
Unpaved road dust suppressant treatments	$2,400 to $50,000 per mile	Treatment chemicals have the potential to negatively impact water quality.	Estimated 20% to 100% reduction in fugitive dust emissions.	None
Administrative control of speed limits	Relatively low costs for installing signs and enforcement.	None	Slower speeds may provide 20% to 50% reduction in dust emissions.	State or county may retain authority for determining speed limits on primary roads.
Installation of remote telemetry	Approximately $13,000 per well	None	Reduction in vehicle miles traveled and associated vehicle emissions during production operations; no benefit for construction operations, which generate the greatest amount of PM.	Effective only for the production phase of the operations; would have no impact on construction activities that generate the greatest amount of PM.
Gravel roads	Approximately $9,000 per mile	None	Estimated 30% reduction in fugitive road dust (NOTE: use of additional low-impact road design specifications [e.g., 95% base compaction prior to placement of gravel; use of non-chlorine based dust abatement chemicals] can provide greater reduction).	None
Paved roads	Approximately $11,000 to $60,000 per mile	None	Estimated 90% reduction in fugitive road dust.	None

Table L-1. Potential Mitigation Measures for Air Quality Impacts Associated with the Proposed Casper Resource Management Plan (Continued)

Type of Mitigation	Estimated Cost of Mitigation	Environmental Liabilities	Environmental Benefit	Potential Limitations
Volatile Organic Compounds (VOCs) and Hazardous Air Pollutants (HAPs) Mitigation Measures				
Flareless ("green") completion	Substantial cost for equipment and infrastructure (condensate pipeline), with the payoff in about one year at $3/Mcf.		Minor reduction in emissions; substantial reduction in noise and night-time disturbance.	Requires infrastructure to be feasible.
Condensate tank vents, carbon canisters or other VOC capture to the vent discharge	Minor costs		Minor emission reduction	

AQD	Air Quality Division	HAP	hazardous air pollutants
BACT	best available control technology	hp	horsepower
CO	carbon monoxide	hr	hour
DEQ	Department of Environmental Quality	NO_x	nitrogen oxides
EGS	electric generating systems	PM	particulate matter
EPA	U.S. Environmental Protection Agency	SCR	sensitive catalytic reduction
g	gram	VOC	volatile organic compound

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EXHIBIT O

TOXICOLOGICAL PROFILE FOR HYDROGEN SULFIDE

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Agency for Toxic Substances and Disease Registry

July 2006

1. PUBLIC HEALTH STATEMENT

This public health statement tells you about hydrogen sulfide and the effects of exposure to it.

The Environmental Protection Agency (EPA) identifies the most serious hazardous waste sites in the nation. These sites are then placed on the National Priorities List (NPL) and are targeted for long-term federal clean-up activities. Hydrogen sulfide has been found in at least 35 of the 1,689 current or former NPL sites. Although the total number of NPL sites evaluated for this substance is not known, the possibility exists that the number of sites at which hydrogen sulfide is found may increase in the future as more sites are evaluated. This information is important because these sites may be sources of exposure and exposure to this substance may harm you.

When a substance is released either from a large area, such as an industrial plant, or from a container, such as a drum or bottle, it enters the environment. Such a release does not always lead to exposure. You can be exposed to a substance only when you come in contact with it. You may be exposed by breathing, eating, or drinking the substance, or by skin contact.

If you are exposed to hydrogen sulfide, many factors will determine whether you will be harmed. These factors include the dose (how much), the duration (how long), and how you come in contact with it. You must also consider any other chemicals you are exposed to and your age, sex, diet, family traits, lifestyle, and state of health.

1.1 WHAT IS HYDROGEN SULFIDE?

Hydrogen sulfide (H_2S) is a flammable, colorless gas with a sweetish taste and characteristic odor of rotten eggs that can be poisonous at high concentrations. Other names for hydrogen sulfide include hydrosulfuric acid, sewer gas, hydrogen sulphide, and stink damp. People usually can smell hydrogen sulfide at low concentrations in air, ranging from 0.0005 to 0.3 parts per million (ppm) (0.0005–0.3 parts of hydrogen sulfide in 1 million parts of air); however, at

high concentrations, a person might lose their ability to smell it. This can make hydrogen sulfide very dangerous.

Hydrogen sulfide occurs both naturally and from human-made processes. It is in the gases from volcanoes, sulfur springs, undersea vents, swamps, and stagnant bodies of water and in crude petroleum and natural gas. Hydrogen sulfide also is associated with municipal sewers and sewage treatment plants, swine containment and manure-handling operations, and pulp and paper operations. Industrial sources of hydrogen sulfide include petroleum refineries, natural gas plants, petrochemical plants, coke oven plants, food processing plants, and tanneries. Bacteria found in your mouth and gastrointestinal tract produce hydrogen sulfide during the digestion of food containing vegetable or animal proteins. Hydrogen sulfide is one of the principal components in the natural sulfur cycle. You will find more about the properties, production, and use of hydrogen sulfide in Chapters 4 and 5.

1.2 WHAT HAPPENS TO HYDROGEN SULFIDE WHEN IT ENTERS THE ENVIRONMENT?

Hydrogen sulfide is released primarily as a gas and spreads in the air. However, in some instances, it may be released in the liquid waste of an industrial facility or as the result of a natural event. When hydrogen sulfide is released as a gas, it remains in the atmosphere for an average of 18 hours. During this time, hydrogen sulfide can change into sulfur dioxide and sulfuric acid. Hydrogen sulfide is soluble in water, and is a weak acid in water. You will find more about what happens to hydrogen sulfide when it enters the environment in Chapter 6.

1.3 HOW MIGHT I BE EXPOSED TO HYDROGEN SULFIDE?

Your body makes small amounts of hydrogen sulfide. Hydrogen sulfide is produced by the natural bacteria in your mouth and is a component of bad breath (halitosis). Breakdown of sulfur-containing proteins by bacteria in the human intestinal tract also produces hydrogen sulfide. The levels of hydrogen sulfide in air and water are typically low. The amount of hydrogen sulfide in the air in the United States is 0.11–0.33 parts per billion (ppb) (one

thousandth of a ppm). In undeveloped areas of the United States, concentrations have been reported at 0.02–0.07 ppb. The amount of hydrogen sulfide in surface water is low because hydrogen sulfide readily evaporates from water. Groundwater concentrations of hydrogen sulfide generally are less than 1 ppm; however, measured sulfur concentrations in surface and waste waters have ranged from slightly less than 1 to 5 ppm. Household exposures to hydrogen sulfide can occur through misuse of drain cleaning materials. Hydrogen sulfide can be found in well water and formed in hot water heaters, giving tap water a rotten egg odor. Cigarette smoke and emissions from gasoline vehicles contain hydrogen sulfide. The general population can be exposed to lower levels from accidental or deliberate release of emissions from pulp and paper mills; from natural gas drilling and refining operations; and from areas of high geothermal activity, such as hot springs.

People who work in certain industries can be exposed to higher levels of hydrogen sulfide than the general population. These industries include rayon textiles manufacturing, pulp and paper mills, petroleum and natural gas drilling operations, and waste water treatment plants. Workers on farms with manure storage pits or landfills can also be exposed to higher levels of hydrogen sulfide than the general population. As a member of the general public, you might be exposed to higher-than-normal levels of hydrogen sulfide if you live near a waste water treatment plant, a gas and oil drilling operation, a farm with manure storage or livestock confinement facilities, or a landfill. Exposure from these sources is mainly from breathing air that contains hydrogen sulfide. You will find further information about hydrogen sulfide exposure in Chapter 6.

1.4 HOW CAN HYDROGEN SULFIDE ENTER AND LEAVE MY BODY?

Hydrogen sulfide enters your body primarily through the air you breathe. Much smaller amounts can enter your body through the skin. Hydrogen sulfide is a gas, so you would not likely be exposed to it by ingestion. When you breathe air containing hydrogen sulfide or when hydrogen sulfide comes into contact with skin, it is absorbed into the blood stream and distributed throughout the body. In the body, hydrogen sulfide is primarily converted to sulfate and is excreted in the urine. Hydrogen sulfide is rapidly removed from the body. Additional information about how hydrogen sulfide can enter or leave your body is discussed in Chapter 3.

1.5 HOW CAN HYDROGEN SULFIDE AFFECT MY HEALTH?

Scientists use many tests to protect the public from harmful effects of toxic chemicals and to find ways for treating persons who have been harmed.

One way to learn whether a chemical will harm people is to determine how the body absorbs, uses, and releases the chemical. For some chemicals, animal testing may be necessary. Animal testing may also help identify health effects such as cancer or birth defects. Without laboratory animals, scientists would lose a basic method for getting information needed to make wise decisions that protect public health. Scientists have the responsibility to treat research animals with care and compassion. Scientists must comply with strict animal care guidelines because laws today protect the welfare of research animals.

Exposure to low concentrations of hydrogen sulfide may cause irritation to the eyes, nose, or throat. It may also cause difficulty in breathing for some asthmatics. Brief exposures to high concentrations of hydrogen sulfide (greater than 500 ppm) can cause a loss of consciousness. In most cases, the person appears to regain consciousness without any other effects. However, in some individuals, there may be permanent or long-term effects such as headaches, poor attention span, poor memory, and poor motor function. No health effects have been found in humans exposed to typical environmental concentrations of hydrogen sulfide (0.00011–0.00033 ppm). Deaths due to breathing in large amounts of hydrogen sulfide have been reported in a variety of different work settings, including sewers, animal processing plants, waste dumps, sludge plants, oil and gas well drilling sites, and tanks and cesspools.

Very little information is available about health problems that could occur from drinking or eating something with hydrogen sulfide in it. Scientists have no reports of people poisoned by such exposures. Pigs that ate feed containing hydrogen sulfide experienced diarrhea for a few days and lost weight after about 105 days.

Scientists have little information about what happens when you are exposed to hydrogen sulfide by getting it on your skin, although they know that care must be taken with the compressed liquefied product to avoid frostbite. Hydrogen sulfide will irritate your eyes if you are exposed to the gas. These types of exposures are more common in certain kinds of jobs.

Hydrogen sulfide has not been shown to cause cancer in humans, and its possible ability to cause cancer in animals has not been studied thoroughly. Hydrogen sulfide has not been classified for its ability to cause or not cause cancer.

1.6 HOW CAN HYDROGEN SULFIDE AFFECT CHILDREN?

This section discusses potential health effects in humans from exposures during the period from conception to maturity at 18 years of age.

Children are likely to be exposed to hydrogen sulfide in the same manner as adults, except for adults at work. However, because hydrogen sulfide is heavier than air and because children are shorter than adults, children sometimes are exposed to more hydrogen sulfide than adults. There is very little information on possible health problems in children who have been exposed to hydrogen sulfide. Exposed children probably will experience effects similar to those experienced by exposed adults. Whether children are more sensitive to hydrogen sulfide exposure than adults or whether hydrogen sulfide causes birth defects in people is not known. The results of studies in animals suggest that exposure to low concentrations of hydrogen sulfide during pregnancy does not cause birth defects.

For more information about the potential health effects of hydrogen sulfide on children, see Sections 3.7 and 6.6.

1.7 HOW CAN FAMILIES REDUCE THE RISK OF EXPOSURE TO HYDROGEN SULFIDE?

If your doctor finds that you have been exposed to substantial amounts of hydrogen sulfide, ask whether your children might also have been exposed. Your doctor might need to ask your state health department to investigate.

Hydrogen sulfide is part of the natural environment; the general population will have some exposure to hydrogen sulfide. Families can be exposed to more hydrogen sulfide than the general population if they live near natural or industrial sources of hydrogen sulfide, such as hot springs, manure holding tanks, or pulp and paper mills. However, their exposure levels are unlikely to approach those that sicken people exposed at work. Families can reduce their exposure to hydrogen sulfide by avoiding areas that are sources of hydrogen sulfide. For example, individuals of families that live on farms can avoid manure storage areas where high concentrations of hydrogen sulfide may be found.

1.8 IS THERE A MEDICAL TEST TO DETERMINE WHETHER I HAVE BEEN EXPOSED TO HYDROGEN SULFIDE?

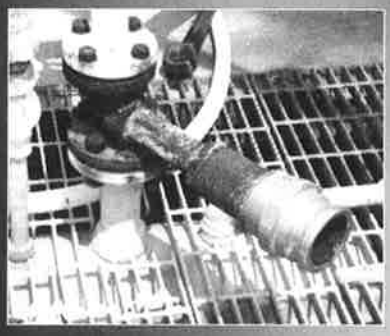
Hydrogen sulfide can be measured in exhaled air, but samples must be taken within 2 hours after exposure to be useful. A more reliable test to determine if you have been exposed to hydrogen sulfide is the measurement of increased thiosulfate levels in urine. This test must be done within 12 hours of exposure. Both tests require special equipment, which is not routinely available in a doctor's office. Samples can be sent to a special laboratory for the tests. These tests can tell whether you have been exposed to hydrogen sulfide, but they cannot determine exactly how much hydrogen sulfide you have been exposed to or whether harmful effects will occur. Exposure to high levels of hydrogen sulfide can cause long-term effects on the nervous system. There are tests that can measure nervous system function. However, these tests are not specific for hydrogen sulfide and could indicate that you have been exposed to other chemicals that affect the nervous system.

See Chapters 3 and 7 for more information on tests for exposure to hydrogen sulfide.

EXHIBIT P

Leak Detection and Repair

A Best Practices Guide



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

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Appendices

1.0 Purpose

In general, EPA has found significant widespread noncompliance with Leak Detection and Repair (LDAR) regulations and more specifically, noncompliance with Method 21 requirements. In 1999, EPA estimated that, as a result of this noncompliance, an additional 40,000 tons of VOCs are emitted annually from valves at petroleum refineries alone.

This document is intended for use by regulated entities as well as compliance inspectors to identify some of the problems identified with LDAR programs focusing in on Method 21 requirements and describe the practices that can be used to increase the effectiveness of an LDAR program. Specifically, this document explains:

- The importance of regulating equipment leaks;
- The major elements of an LDAR program;
- Typical mistakes made when monitoring to detect leaks;
- Problems that occur from improper management of an LDAR program; and
- A set of best practices that can be used to implement effective an LDAR program.

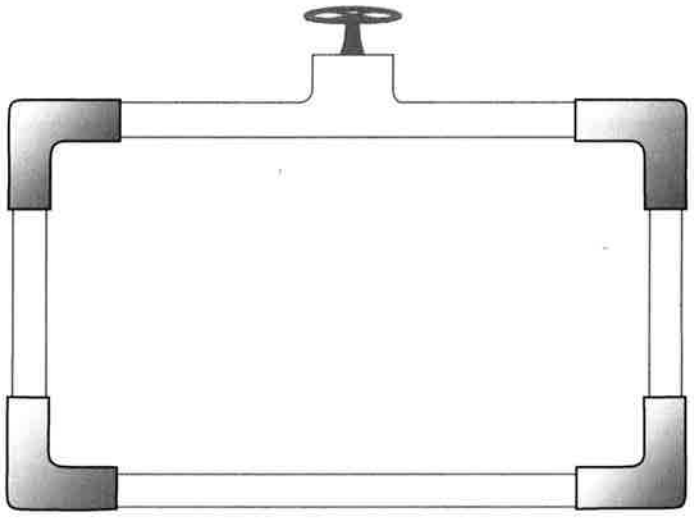
Some of the elements of a model LDAR program, as described in Section 7.0, are required by current Federal regulations. Other model LDAR program elements help ensure continuous compliance although they may not be mandated from a regulatory standpoint. Furthermore, State or local requirements may be more stringent than some elements of the model LDAR program, such as with leak definitions. Prior to developing a written LDAR program plan, all applicable regulations should be reviewed to determine and ensure compliance with the most stringent requirements.

2.0 Why Regulate Equipment Leaks?

EPA has determined that leaking equipment, such as valves, pumps, and connectors, are the largest source of emissions of volatile organic compounds (VOCs) and volatile hazardous air pollutants (VHAPs) from petroleum refineries and chemical manufacturing facilities. The Agency has estimated that approximately 70,367 tons per year of VOCs and 9,357 tons per year of HAPs have been emitted from equipment leaks. Emissions from equipment leaks exceed emissions from storage vessels, wastewater, transfer operations, or process vents.

VOCs contribute to the formation of ground-level ozone. Ozone is a major component of smog, and causes or aggravates respiratory disease, particularly in children, asthmatics, and healthy adults who participate in moderate exercise. Many areas of the United States, particularly those areas where refineries and chemical facilities are located, do not meet the National Ambient Air Quality Standard (NAAQS) for ozone. Ozone can be transported in the atmosphere and contribute to nonattainment in downwind areas.

Some species of VOCs are also classified as VHAPs. Some known or suspected effects of exposure to VHAPs include cancer, reproductive effects, and birth defects. The highest concentrations of VHAPs tend to be closest to the emission source, where the highest public exposure levels are also often detected. Some common VHAPs emitted from refineries and chemical plants include acetaldehyde, benzene, formaldehyde, methylene chloride, naphthalene, toluene, and xylene.



3.0 Sources, Causes And Control Of Equipment Leaks

A typical refinery or chemical plant can emit 600-700 tons per year of VOCs from leaking equipment, such as valves, connectors, pumps, sampling connections, compressors, pressure-relief devices, and open-ended lines.

Table 3.1 shows the primary sources of emissions from components subject to equipment leak regulations. In a typical facility, most of the emissions are from valves and connectors because these are the most prevalent components and can number in the thousands (Table 3.2). The major cause of emissions from valves and connectors is seal or gasket failure due to normal wear or improper maintenance.

Previous EPA studies have estimated that valves and connectors account for more than 90% of emissions from leaking equipment with valves being the most significant source (Table 3.3). Newer information suggests that open-ended lines and sampling connections may account for as much as 5-10% of total VOC emissions from equipment leaks.

3.1 How are emissions from equipment leaks reduced?

Facilities can control emissions from equipment leaks by implementing a leak detection and repair (LDAR) program or by modifying/replacing leaking equipment with "leakless" components. Most equipment leak regulations allow a combination of both control methods.

- Leaks from open-ended lines, compressors, and sampling connections are usually fixed by modifying the equipment or component. Emissions from pumps and valves can also be reduced through the use of "leakless" valves and "sealless" pumps. Common leakless valves include bellows valves and diaphragm valves, and common sealless pumps are diaphragm pumps, canned motor pumps, and magnetic drive pumps. Leaks from pumps can also be reduced by using dual seals with or without barrier fluid.

- Leakless valves and sealless pumps are effective at minimizing or eliminating leaks, but their use may be limited by materials of construction considerations and process operating conditions. Installing leakless and sealless equipment components may be a wise choice for replacing individual, chronic leaking components.

LDAR is a work practice designed to identify leaking equipment so that emissions can be reduced through repairs. A component that is subject to LDAR requirements must be monitored at specified, regular intervals to determine whether or not it is leaking. Any leaking component must then be repaired or replaced within a specified time frame.

Table 3.1 – Sources of equipment leaks.

Pumps are used to move fluids from one point to another. Two types of pumps extensively used in petroleum refineries and chemical plants are centrifugal pumps and positive displacement, or reciprocating pumps.	**Leaks from pumps** typically occur at the seal.
Valves are used to either restrict or allow the movement of fluids. Valves come in numerous varieties and with the exception of connectors, are the most common piece of process equipment in industry.	**Leaks from valves** usually occur at the stem or gland area of the valve body and are commonly caused by a failure of the valve packing or O-ring.
Connectors are components such as flanges and fittings used to join piping and process equipment together. Gaskets and blinds are usually installed between flanges.	**Leaks from connectors** are commonly caused from gasket failure and improperly torqued bolts on flanges.
Sampling connections are utilized to obtain samples from within a process.	**Leaks from sampling connections** usually occur at the outlet of the sampling valve when the sampling line is purged to obtain the sample.
Compressors are designed to increase the pressure of a fluid and provide motive force. They can have rotary or reciprocating designs.	**Leaks from compressors** most often occur from the seals.
Pressure relief devices are safety devices designed to protect equipment from exceeding the maximum allowable working pressure. Pressure relief valves and rupture disks are examples of pressure relief devices.	**Leaks from pressure relief valves** can occur if the valve is not seated properly, operating too close to the set point, or if the seal is worn or damaged. Leaks from rupture disks can occur around the disk gasket if not properly installed.
Open-ended lines are pipes or hoses open to the atmosphere or surrounding environment.	**Leaks from open-ended lines** occur at the point of the line open to the atmosphere and are usually controlled by using caps, plugs, and flanges. Leaks can also be caused by the incorrect implementation of the block and bleed procedure.

Table 3.2 – Equipment component counts at a typical refinery or chemical plant.

Component	Range	Average
Pumps	10 – 360	100
Valves	150 – 46,000	7,400
Connectors	600 – 60,000	12,000
Open-ended lines	1 – 1,600	560
Sampling connections	20 – 200	80
Pressure relief valves	5 – 360	90

Source: "Cost and Emission Reductions for Meeting Percent Leaker Requirements for HON Sources." Memorandum to Hazardous Organic NESHAP Residual Risk and Review of Technology Standard Rulemaking docket. Docket ID EPA-HQ-OAR-2005-0475-0105.

Table 3.3 – Uncontrolled VOC emissions at a typical facility.

Component	Average Uncontrolled VOC Emissions (ton/yr)	Percent of Total Emissions
Pumps	19	3
Valves	408	62
Connectors	201	31
Open-ended lines	9	1
Sampling connections	11	2
Pressure relief valves	5	1
Total	653	

Source: Emission factors are from Protocol for Equipment Leak Emission Estimates, EPA-453/R-95-017, Nov 1995, and equipment counts in Table 3.2.

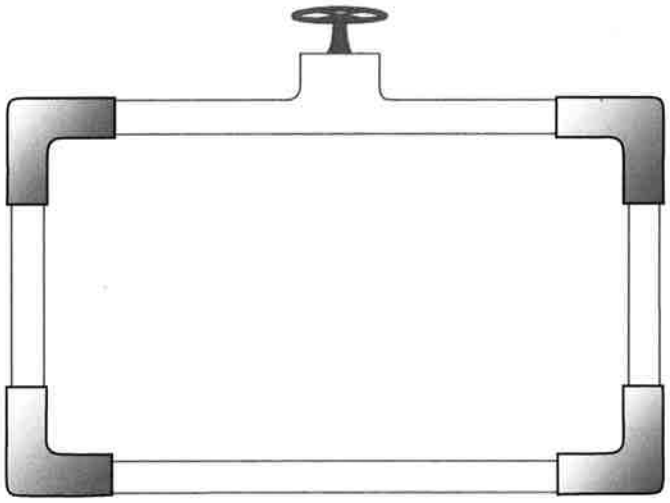
More recent data indicates that open-ended lines and sampling connections each account for approximately 5-10% of total VOC emissions.

3.2 What regulations incorporate LDAR programs?

LDAR programs are required by many New Source Performance Standards (NSPS), National Emission Standards for Hazardous Air Pollutants (NESHAP), State Implementation Plans (SIPs), the Resource Conservation and Recovery Act (RCRA), and other state or local requirements. There are 25 federal standards that require facilities to implement LDAR programs. Appendix A shows the 25 federal standards that require the implementation of a formal LDAR program using Method 21. Appendix B lists 28 other federal regulations that require some Method 21 monitoring, but do not require LDAR programs to be in place.

- NSPS (40 CFR Part 60) equipment leak standards are related to fugitive emissions of VOCs and apply to stationary sources that commence construction, modification, or reconstruction after the date that an NSPS is proposed in the Federal Register.
- NESHAP (40 CFR Parts 61, 63, and 65) equipment leak standards apply to both new and existing stationary sources of fugitive VHAPs.
- RCRA (40 CFR Parts 264 and 265) equipment leak standards apply to hazardous waste treatment, storage, and disposal facilities.
- Many state and local air agencies incorporate federal LDAR requirements by reference, but some have established more stringent LDAR requirements to meet local air quality needs.

A facility may have equipment that is subject to multiple NSPS and NESHAP equipment leaks standards. For example, a number of manufacturing processes listed in the Hazardous Organic NESHAP (HON) equipment leak standard (40 CFR 63, Subpart H) may utilize equipment for which other NESHAP or NSPS equipment leak standards could apply (such as 40 CFR 60, Subpart VV). In addition, one process line may be subject to one rule and another process line subject to another rule. Facilities must ensure that they are complying with the proper equipment leak regulations if multiple regulations apply.



4.0 What Are the Benefits of an LDAR Program?

When the LDAR requirements were developed, EPA estimated that petroleum refineries could reduce emissions from equipment leaks by 63% by implementing a facility LDAR program. Additionally, EPA estimated that chemical facilities could reduce VOC emissions by 56% by implementing such a program.

Table 4.1 presents the control effectiveness of an LDAR program for different monitoring intervals and leak definitions at chemical process units and petroleum refineries.

Emissions reductions from implementing an LDAR program potentially reduce product losses, increase safety for workers and operators, decrease exposure of the surrounding community, reduce emissions fees, and help facilities avoid enforcement actions.

Example – Emissions reductions at a typical SOCMI facility.

Applying the equipment modifications and LDAR requirements of the HON to the sources of uncontrolled emissions in the typical facility presented in Tables 3.2 and 3.3 would reduce the emissions per facility by approximately 582 tons per year of emissions, an 89% reduction.

Table 4.1 – Control effectiveness for an LDAR program at a chemical process unit and a refinery.

Equipment Type and Service	Control Effectiveness (% Reduction)		
	Monthly Monitoring 10,000 ppmv Leak Definition	Quarterly Monitoring 10,000 ppmv Leak Definition	500 ppm Leak Definition[a]
Chemical Process Unit			
Valves – Gas Service[b]	87	67	92
Valves – Light Liquid Service[c]	84	61	88
Pumps – Light Liquid Service[c]	69	45	75
Connectors – All Services			93
Refinery			
Valves – Gas Service[b]	88	70	96
Valves – Light Liquid Service[c]	76	61	95
Pumps – Light Liquid Service[c]	68	45	88
Connectors – All Services			81

Source: Protocol for Equipment Leak Emission Estimates, EPA-453/R-95-017, Nov 1995

[a] Control effectiveness attributable to the HON negotiated equipment leak regulation (40 CFR 63, Subpart H) is estimated based on equipment specific leak definitions and performance levels. However, pumps subject to the HON at existing process units have a 1,000 to 5,000 ppm leak definition depending on the type of process.

[b] Gas (vapor) service means the material in contact with the equipment component is in a gaseous state at the process operating conditions.

[c] Light liquid service means the material in contact with the equipment component is in a liquid state in which the sum of the concentration of individual constituents with a vapor pressure above 0.3 kilopascals (kPa) at 20°C is greater than or equal to 20% by weight.

4.1 Reducing Product Losses

In the petrochemical industry, saleable products are lost whenever emissions escape from process equipment. Lost product generally translates into lost revenue.

4.2 Increasing Safety for Facility Workers and Operators

Many of the compounds emitted from refineries and chemical facilities may pose a hazard to exposed workers and operators. Reducing emissions from leaking equipment has the direct benefit of reducing occupational exposure to hazardous compounds.

4.3 Decreasing Exposure for the Surrounding Community

In addition to workers and operators at a facility, the population of a surrounding community can be affected by severe, long-term exposure to toxic air pollutants as a result of leaking equipment. Although most of the community exposure may be episodic, chronic health effects can result from long-term exposure to emissions from leaking equipment that is either not identified as leaking or not repaired.

4.4 Potentially Reducing Emission Fees

To fund permitting programs, some states and local air pollution districts charge annual fees that are based on total facility emissions. A facility with an effective program for reducing leaking equipment can potentially decrease the amount of these annual fees.

4.5 Avoiding Enforcement Actions

In setting Compliance and Enforcement National Priorities for Air Toxics, EPA has identified LDAR programs as a national focus. Therefore, facilities can expect an increased number and frequency of compliance inspections and a closer review of compliance reports submitted to permitting authorities in an effort by the Agency to assess LDAR programs and identify potential LDAR problems. A facility with an effective LDAR program decreases the chances of being targeted for enforcement actions and avoids the costs and penalties associated with rule violations.

Example – Cost of product lost.

In previous rulemaking efforts, EPA has estimated that the average value of product lost due to equipment leaks is $1,370 per ton.[a]

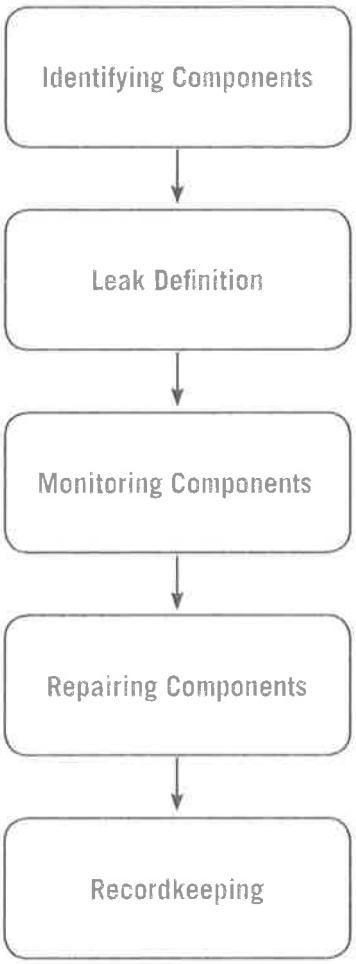
Applying this cost factor results in a potential savings of $730,000 per year per facility.

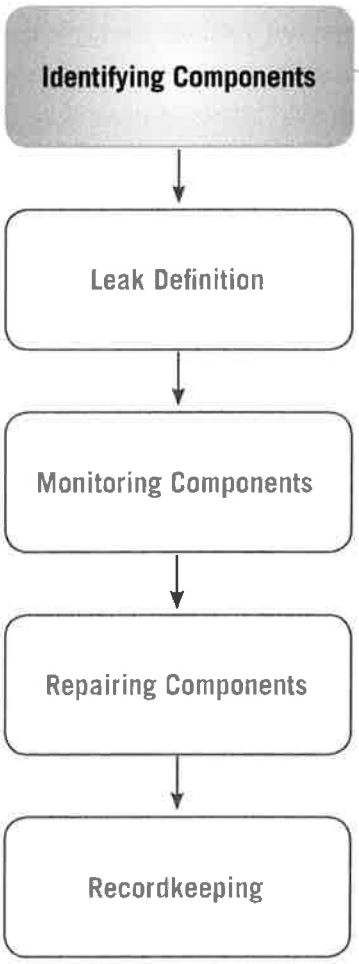
[a] Source: Hazardous Air Pollutant Emissions From Process Units in the Synthetic Organic Chemical Manufacturing Industry-Background Information for Proposed Standards, Vol. 1C-Model Emission Sources. Emission Standards Division, US EPA. Office of Air and Radiation, OAQPS, Research Triangle Park, NC, Nov 1992

5.0 Elements of an LDAR Program

The requirements among the regulations vary, but all LDAR programs consist of five basic elements, which are discussed in detail in Sections 5.1 through 5.5.

For each element, this section outlines the typical LDAR program requirements, common compliance problems found through field inspections, and a set of best practices used by facilities with effective LDAR programs.





Current Requirements

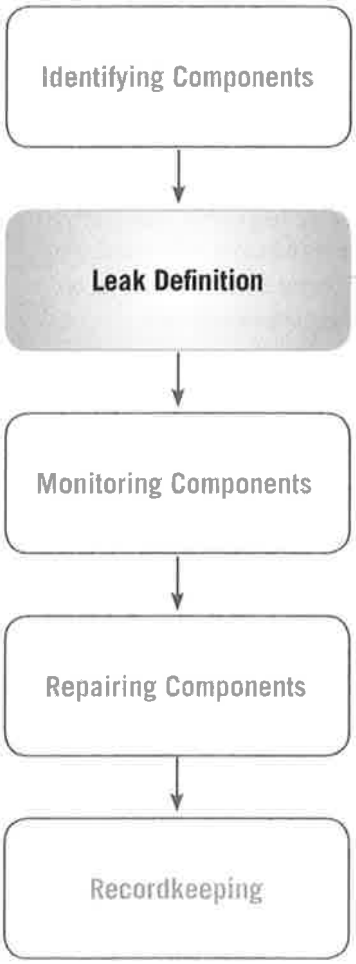
- Assign a unique identification (ID) number to each regulated component.
- Record each regulated component and its unique ID number in a log.
- Physically locate each regulated component in the facility, verify its location on the piping and instrumentation diagrams (P&IDs) or process flow diagrams, and update the log if necessary. Some states require a physical tag on each component subject to the LDAR requirements.
- Identify each regulated component on a site plot plan or on a continuously updated equipment log.
- Promptly note in the equipment log when new and replacement pieces of equipment are added and equipment is taken out of service.

Common Problems

- Not properly identifying all regulated equipment components.
- Not properly documenting exempt components (e.g., <300 hour exemption and <5 (or <10) weight % HAP).

Best Practices

- Physically tag each regulated equipment component with a unique ID number.
- Write the component ID number on piping and instrumentation diagrams.
- Institute an electronic data management system for LDAR data and records, possibly including the use of bar coding equipment.
- Periodically perform a field audit to ensure lists and diagrams accurately represent equipment installed in the plant.



Current Requirements

- Method 21 requires VOC emissions from regulated components to be measured in parts per million (ppm). A leak is detected whenever the measured concentration exceeds the threshold standard (i.e., **leak definition**) for the applicable regulation.
  - Leak definitions vary by regulation, component type, service (e.g., light liquid, heavy liquid, gas/vapor), and monitoring interval.
  - Most NSPS have a leak definition of 10,000 ppm. Many NESHAP use a 500-ppm or 1,000-ppm leak definition.
- Many equipment leak regulations also define a leak based on visual inspections and observations (such as fluids dripping, spraying, misting or clouding from or around components), sound (such as hissing), and smell.

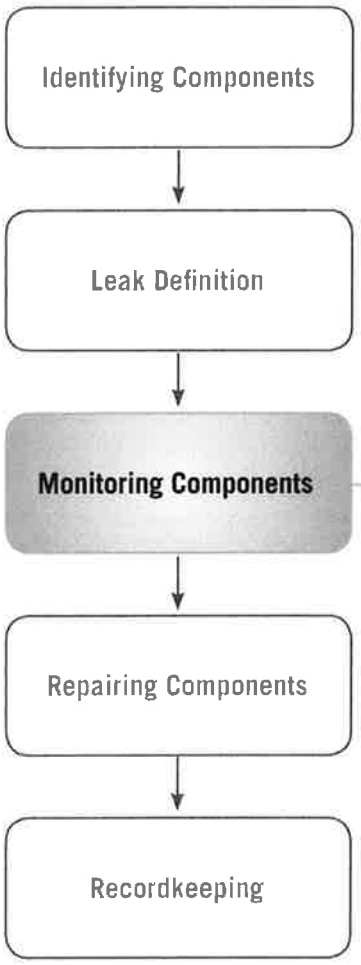
  Note: The LDAR requirements specify weekly visual inspections of pumps, agitators, and compressors for indications of liquids leaking from the seals.

Common Problems

- Using the wrong leak definition for a particular component due to confusion at facilities where multiple LDAR regulations apply.

Best Practices

- Utilize a leak definition lower than what the regulation requires.
- Simplify the program by using the lowest leak definition when multiple leak definitions exist.
- Make the lowest leak definition conservative to provide a margin of safety when monitoring components.
- Keep the lowest leak definition consistent among all similar component types. For example, all valves in a facility might have a leak definition of 500 ppm.



Current Requirements

- For many NSPS and NESHAP regulations with leak detection provisions, the primary method for monitoring to detect leaking components is EPA Reference Method 21 (40 CFR Part 60, Appendix A).
- Method 21 is a procedure used to detect VOC leaks from process equipment using a portable detecting instrument.
- Appendix C of this guide explains the general procedure and Appendix D presents the complete Method 21 requirements.
- Monitoring intervals vary according to the applicable regulation, but are typically weekly, monthly, quarterly, and yearly. For connectors, the monitoring interval can be every 2, 4, or 8 years. The monitoring interval depends on the component type and periodic leak rate for the component type.

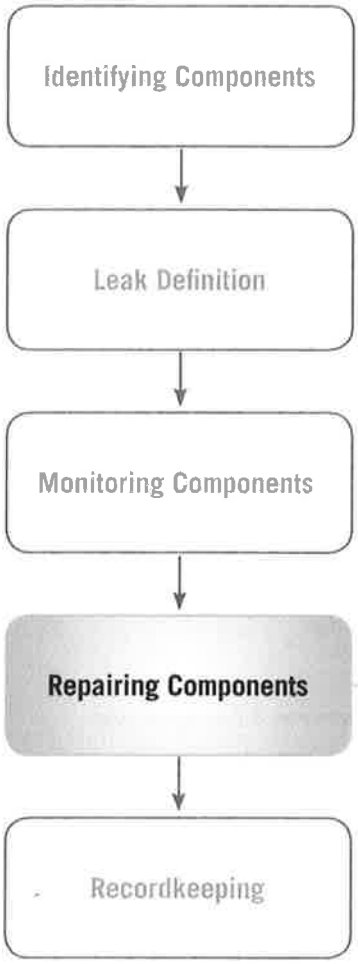
Common Problems

- Not following Method 21 properly.
- Failing to monitor at the maximum leak location (once the highest reading is obtained by placing the probe on and around the interface, hold the probe at that location approximately two times the response rate of the instrument).
- Not monitoring long enough to identify a leak.
- Holding the detection probe too far away from the component interface. The reading must be taken at the interface.
- Not monitoring all potential leak interfaces.
- Using an incorrect or an expired calibration gas.
- Not monitoring all regulated components.
- Not completing monitoring if the first monitoring attempt is unsuccessful due to equipment being temporarily out of service.

Best Practices

- Although not required by Method 21, use an automatic (electronic) data logger to save time, improve accuracy, and provide an audit record.
- Audit the LDAR program to help ensure that the correct equipment is being monitored, Method 21 procedures are being followed properly, and the required records are being kept.
- Monitor components more frequently than required by the regulations.
- Perform QA/QC of LDAR data to ensure accuracy, completeness, and to check for inconsistencies.
- Eliminate any obstructions (e.g., grease on the component interface) that would prevent monitoring at the interface.
- If a rule allows the use of alternatives to Method 21 monitoring, Method 21 should still be used periodically to check the results of the alternative monitoring method.

The **monitoring interval** is the frequency at which individual component monitoring is conducted. For example, valves are generally required to be monitored once a month using a leak detection instrument, but the monitoring interval may be extended (e.g. to once every quarter for each valve that has not leaked for two successive months for Part 60 Subpart VV, or on a process unit basis of once every quarter for process units that have less than a 2% leak rate for Part 63 Subpart H).



Current Requirements

- Repair leaking components as soon as practicable, but not later than a specified number of calendar days (usually 5 days for a first attempt at repair and 15 days for final attempt at repair) after the leak is detected.
- First attempts at repair include, but are not limited to, the following practices where practicable and appropriate:
- Tightening bonnet bolts
- Replacing bonnet bolts
- Tightening packing gland nuts
- Injecting lubricant into lubricated packing
- If the repair of any component is technically infeasible without a process unit shutdown, the component may be placed on the Delay of Repair list, the ID number is recorded, and an explanation of why the component cannot be repaired immediately is provided. An estimated date for repairing the component must be included in the facility records.

  Note: The "drill and tap" method for repairing leaking valves is generally considered technically feasible without requiring a process unit shutdown and should be tried if the first attempt at repair does not fix the leaking valve. See section 6.7 for a discussion of "drill and tap".

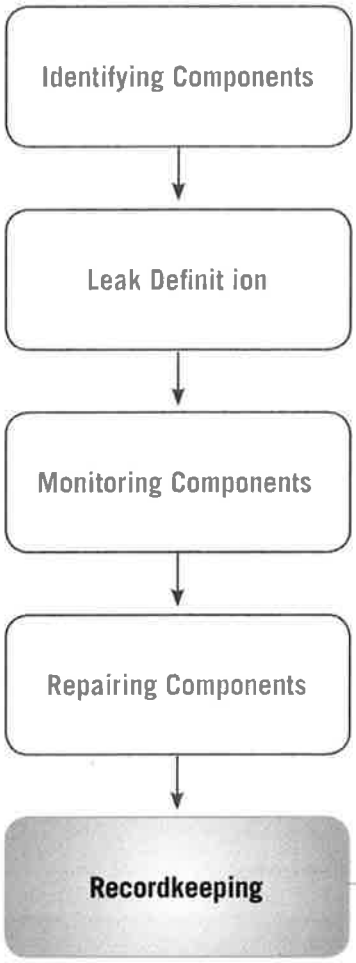
- The component is considered to be repaired only after it has been monitored and shown not to be leaking above the applicable leak definition.

Common Problems

- Not repairing leaking equipment within the required amount of time specified by the applicable regulation
- Improperly placing components on the Delay of Repair list.
- Not having a justifiable reason for why it is technically infeasible to repair the component without a process unit shutdown.
- Not exploring all available repair alternatives before exercising the Delay of Repair exemption (specifically as it pertains to valves and "drill and tap" repairs).

Best Practices

- Develop a plan and timetable for repairing components.
- Make a first attempt at repair as soon as possible after a leak is detected.
- Monitor components daily and over several days to ensure a leak has been successfully repaired.
- Replace problem components with "leakless" or other technologies.



Current Requirements

For each regulated process:

- Maintain a list of all ID numbers for all equipment subject to an equipment leak regulation.
- For valves designated as "unsafe to monitor," maintain a list of ID numbers and an explanation/review of conditions for the designation.
- Maintain detailed schematics, equipment design specifications (including dates and descriptions of any changes), and piping and instrumentation diagrams.
- Maintain the results of performance testing and leak detection monitoring, including leak monitoring results per the leak frequency, monitoring leakless equipment, and non-periodic event monitoring.

For leaking equipment:

- Attach ID tags to the equipment.
- Maintain records of the equipment ID number, the instrument and operator ID numbers, and the date the leak was detected.
- Maintain a list of the dates of each repair attempt and an explanation of the attempted repair method.
- Note the dates of successful repairs.
- Include the results of monitoring tests to determine if the repair was successful.

Common Problems

- Not keeping detailed and accurate records required by the applicable regulation.
- Not updating records to designate new components that are subject to LDAR due to revised regulations or process modifications.

Best Practices

- Perform internal and third-party audits of LDAR records on a regular basis to ensure compliance.
- Electronically monitor and store LDAR data including regular QA/QC audits.
- Perform regular records maintenance.
- Continually search for and update regulatory requirements.
- Properly record and report first attempts at repair.
- Keep the proper records for components on Delay of Repair lists.

6.0 What Compliance Problems Have Been Found With Current LDAR Programs?

Many regulatory agencies determine the compliance status of LDAR programs based on a review of submitted paperwork. Some conduct walk-through inspections to review LDAR records maintained on site and perform a visual check of monitoring practices. However, a records review will not show if monitoring procedures are being followed. Similarly, the typical walkthrough inspection will not likely detect improper monitoring practices since operators will tend to ensure that they are following proper procedures when they are being watched.

EPA's National Enforcement Investigations Center (NEIC) conducted a number of sampling investigations of LDAR programs at 17 petroleum refineries. Appendix E summarizes the comparative monitoring results, and Appendix F contains a copy of the 1999 Enforcement Alert that explains the monitoring results. The investigations consisted of records review and comparative leak monitoring (comparing the leak rate found by NEIC to the facility's historic leak rate) at a subset of the facility's total components. These investigations have shown a pattern of significantly higher equipment leak rates (5%) than what the refineries reported (1.3%). While there have been improvements since 1999, facility audits are still showing significantly elevated leak rates, especially in the chemical manufacturing industries.

The discrepancy in leak rates indicates that monitoring staff may not be complying with Method 21 procedures. Failure to accurately detect leaks may be due to a lack of internal quality control oversight or management accountability for the LDAR programs regardless of whether the monitoring is done by contractors or in-house personnel.

Each leak that is not detected and repaired is a lost opportunity to reduce emissions. In the October 1999 Enforcement Alert, EPA estimates that an additional 40,000 tons of VOCs are emitted annually from petroleum refineries because leaking valves are not found and repaired.

Several important factors contribute to failing to identify and repair leaking components:

1. **Not identifying all regulated components/units in inventory**

   If a facility does not properly identify all of its regulated components, some leaks may go unidentified. Unidentified components may leak or have existing leaks that will worsen over time if the components are not properly identified, monitored and repaired. Facilities can fail to identify regulated components when new processes are constructed, existing process are modified, or new or revised equipment leak regulations are published.

2. **Not monitoring components**

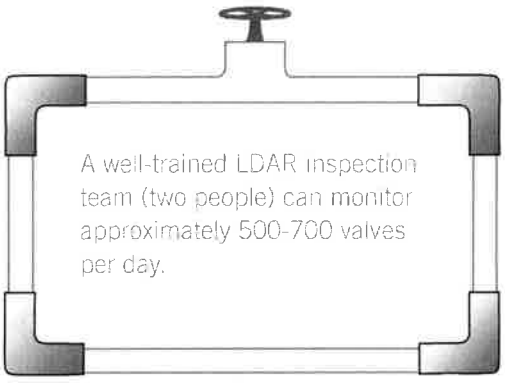
   In some cases, the number of components reported to have been monitored may indicate problems with monitoring procedures. What facility inspectors have found:

   - A data logger time stamp showed valves being monitored at the rate of one per second with two valves occasionally be-

ing monitored within the same 1-second period.

- At one facility, a person reported monitoring 8,000 components in one day (assuming an 8-hour work day, that represents one component every 3.6 seconds).
- Records evaluations showed widely varying component monitoring counts, suggesting equipment might not always be monitored when required.
- Equipment was marked "temporarily out of service" because the initial inspection attempt could not be performed. However, the equipment was in service for most of the period, and no subsequent (or prior) inspection attempts were performed to meet the monitoring requirement.

However, even when records show a realistic number of components are being monitored, if there are no oversight or accountability checks, then there is no guarantee that components are actually being monitored.



A well-trained LDAR inspection team (two people) can monitor approximately 500-700 valves per day.

3. **Insufficient time to identify a leak**

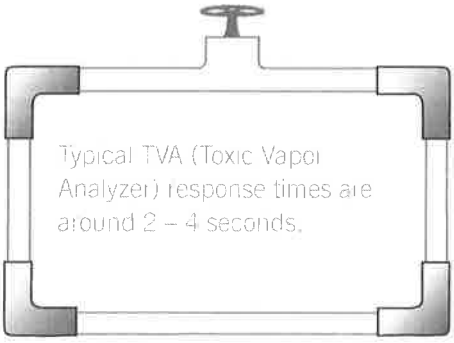
   In other cases, facilities are not following proper monitoring procedures, resulting in a lower number of leaking components being reported.

   - If a worker moves the probe around the component interface so rapidly that the instrument does not have time to properly respond, then a component may never be identified as leaking.
   - If a worker fails to find the maximum leak location for the component and then does not spend twice the response time at that location, then the monitoring instrument will not measure the correct concentration of hydrocarbons and the leak may go undetected. **Optical leak imaging shows the importance of identifying the maximum leak location, as hydrocarbons are quickly dispersed and diluted by air currents around the component**.

4. **Holding the probe away from the component interface**

   The probe must be placed at the proper interface of the component being analyzed. Placing the probe even 1 centimeter from the interface can result in a false reading, indicating that the component is not leaking, when in fact it is leaking. Eliminate any issues (e.g., grease on the component interface) that prevent monitoring at the interface (e.g., remove excess grease from the component before monitoring or use a monitor that won't be impacted by the grease and is easy to clean.

For equipment with rotating shafts (pumps and compressors), Method 21 requires the probe be placed within 1 centimeter of the



shaft-seal interface. Placing the probe at the surface of the rotating shaft is a safety hazard and should be avoided.

5. **Failing to properly maintain monitoring instrument**

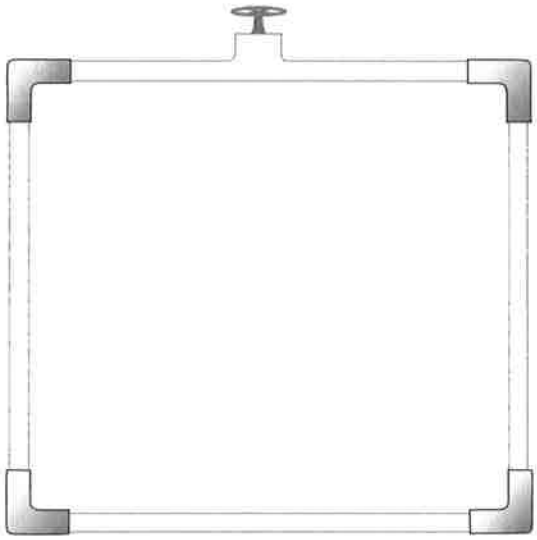
   Factors that may prevent the instrument from identifying leaks are:

   - Not using an instrument that meets the specifications required in Method 21, section 6.
   - Dirty instrument probes;
   - Leakage from the instrument probes;
   - Not zeroing instrument meter;
   - Incorrect calibration gases used; and
   - Not calibrating the detection instrument on a daily basis.

6. **Improperly identifying components as "unsafe" or "difficult" to monitor**

   Components that are identified as being "unsafe to monitor" or "difficult to monitor" must be identified as such because there is a safety concern or an accessibility issue that prevents the component from being successfully monitored.

   All unsafe or difficult-to-monitor components must be included on a log with identification numbers and an explanation of why the component is "unsafe to monitor" or "difficult to monitor." Monitoring can be deferred for all such components, but the facility must maintain a plan that explains the conditions under which the components become safe to monitor or no longer difficult to monitor.



7. Improperly placing components/units on the "Delay of Repair" list

Generally, placing a leaking component on the "Delay of Repair" list is permissible only when the component is technically infeasible to repair without a process unit shutdown (e.g., for valves the owner/operator must demonstrate that the emissions from immediate repair will be greater than waiting for unit shutdown).

Repair methods may exist, such as "drill and tap" for valves, that allow leaks to be fixed while the component is still in service. Failing to consider such repair methods before exercising the "Delay of Repair" list may constitute noncompliance with repair requirements (usually 15 days under federal LDAR standards).

Components placed on the "Delay of Repair" list must be accompanied by their ID numbers and an explanation of why they have been placed on the list. These components cannot remain on the list indefinitely – they must be repaired by the end of the next process unit shutdown.

Drill and Tap is a repair method where a hole is drilled into the valve packing gland and tapped, so that a small valve and fitting can be attached to the gland. A packing gun is connected to this fitting and the small valve is opened allowing new packing material to be pumped into the packing gland.

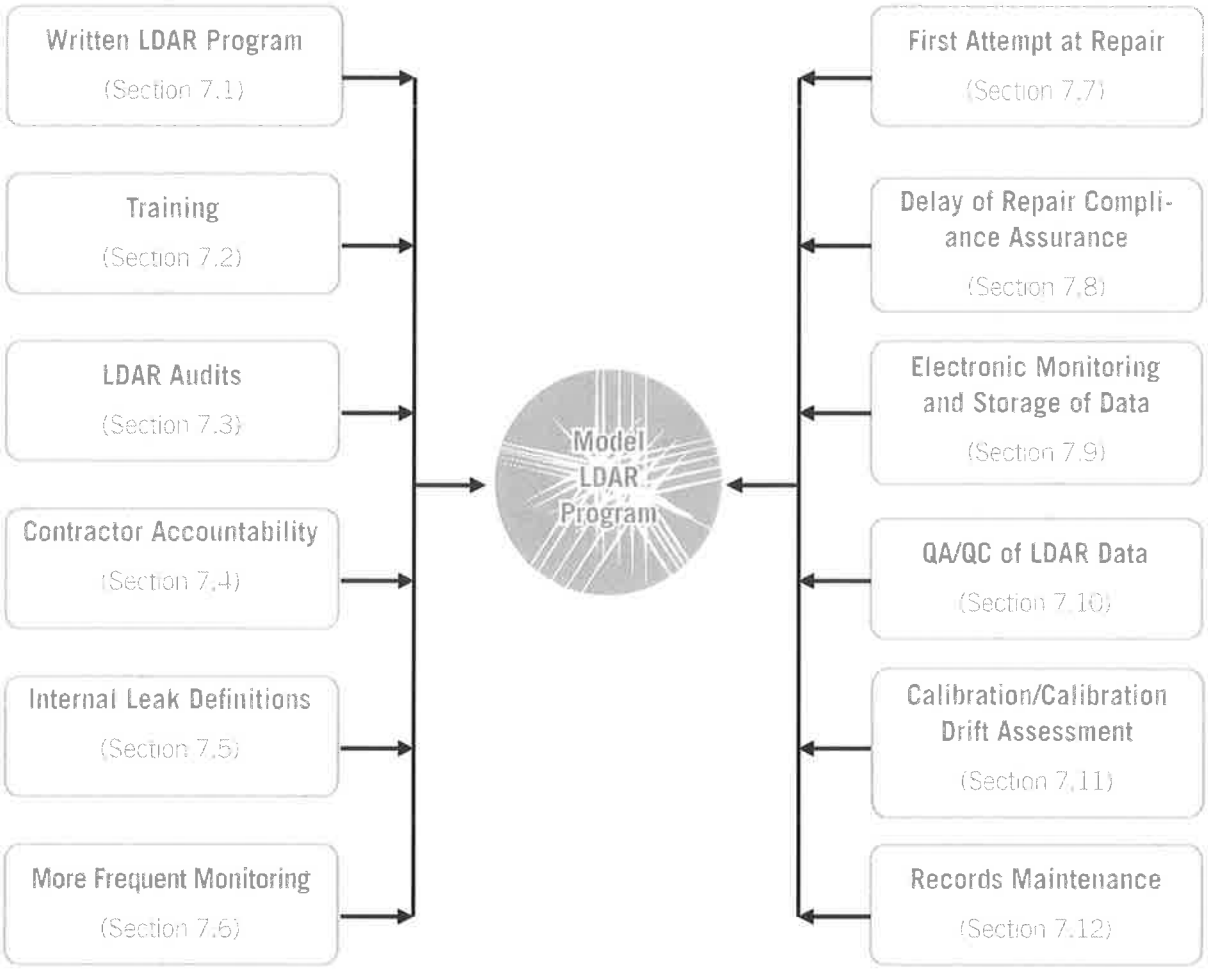
Many companies consider this a permanent repair technique, as newer, pumpable packing types are frequently superior to the older packing types they replace. Packing types can be changed and optimized for the specific application over time.

7.0 Model LDAR Program

Experience has shown that facilities with an effective record of preventing leaks integrate an awareness of the benefits of leak detection and repair into their operating and maintenance program. This section outlines some of the major elements of successful LDAR programs. These program elements were developed from:

- Evaluation of best practices identified at facilities with successful LDAR programs, and
- Analysis of the root causes of noncompliance at facilities that were found to have recurring violations of LDAR regulatory requirements.

LDAR programs that incorporate most or all of the elements described in the following sections have achieved more consistent results in their LDAR programs, leading to increased compliance and lower emissions.



7.1 Written LDAR Program

A written LDAR program specifies the regulatory requirements and facility-specific procedures for recordkeeping certifications, monitoring, and repairs. A written program also delineates the roles of each person on the LDAR team as well as documents all the required procedures to be completed and data to be gathered, thus establishing accountability. The plan should identify all process units subject to federal, state, and local LDAR regulations and be updated as necessary to ensure accuracy and continuing compliance.

Elements:

- An overall, facility-wide leak rate goal that will be a target on a process-unit-by-process-unit basis;
- A list of all equipment in light liquid and/or in gas/vapor service that has the potential to leak VOCs and VHAPs, within process units that are owned and maintained by each facility;
- Procedures for identifying leaking equipment within process units;
- Procedures for repairing and keeping track of leaking equipment;
- A process for evaluating new and replacement equipment to promote the consideration of installing equipment that will minimize leaks or eliminate chronic leakers;
- A list of "LDAR Personnel" and a description of their roles and responsibilities, including the person or position for each facility that has the authority to implement improvements to the LDAR program; and
- Procedures (e.g., a Management of Change program) to ensure that components added to each facility during maintenance and construction are evaluated to determine if they are subject to LDAR requirements, and that affected components are integrated into the LDAR program.

Within thirty (30) days after developing the written facility-wide LDAR program, submit a copy of the Program to EPA and to the appropriate state agency.

7.2 Training

A training program will provide LDAR personnel the technical understanding to make the written LDAR program work. It also will educate members of the LDAR team on their individual responsibilities. These training programs can vary according to the level of involvement and degree of responsibility of LDAR personnel.

Elements:

- Provide and require initial training and annual LDAR refresher training for all facility employees assigned LDAR compliance responsibilities, such as monitoring technicians, database users, QA/QC personnel, and the LDAR Coordinator;
- For other operations and maintenance personnel with responsibilities related to LDAR, provide and require an initial training program that includes instruction on aspects of LDAR that are relevant to their duties (e.g., operators and mechanics performing valve packing and unit supervisors that approve delay of repair work). Provide and require "refresher" training in LDAR for these personnel at least every three years.
- Collect training information and records of contractors, if used.

7.3 LDAR Audits

Whether LDAR monitoring is done in house or contracted to third parties outside the company, the potential exists for LDAR staff not to adhere correctly to the LDAR program. Internal and third-party audits of a facility LDAR program are a critical component of effective LDAR programs. The audits check that the correct equipment is being monitored, Method 21 procedures are being followed, leaks are being fixed, and the required records are being kept. In short, the audits ensure that the LDAR program is being conducted correctly and problems are identified and corrected.

Elements:

- Review records on a regular cycle to ensure that all required LDAR-related records, logs, and databases are being maintained and are up to date.
- Ensure and document that the correct equipment is included in the LDAR program and that equipment identified as leaking is physically tagged with the equipment ID number.
- Observe the calibration and monitoring techniques used by LDAR technicians, in particular to ensure the entire interface is checked and the probe is held at the interface, not away from the interface.
- Retain a contractor to perform a third-party audit of the facility LDAR program at least once every four (4) years.
- Perform facility-led audits every four (4) years.
  - Use personnel familiar with the LDAR program and its requirements from one or more of the company's other facilities or locations (if available).
  - Perform the first round of facility-led LDAR audits no later than two (2) years after completion of the third-party audits outlined above, and every four (4) years thereafter.
  - This rotation ensures that the facility is being audited once every two (2) years.
- If areas of noncompliance are discovered, initiate a plan to resolve and document those issues.
- Implement, as soon as practicable, steps necessary to correct causes of noncompliance, and prevent, to the extent practicable, a recurrence of the cause of the noncompliance.
- Retain the audit reports and maintain a written record of the corrective actions taken in response to any deficiencies identified.

7.4 Contractor Accountability

Contractors performing monitoring are frequently compensated for the number of components they monitor, which might provide an incentive to rush through monitoring procedures and not adhere to Method 21 requirements for response time, monitoring distance, etc. If this happens, some equipment leaks may not be detected. To overcome this potential problem, facilities should have in place sufficient oversight procedures to increase the accountability of contractors.

Elements:

- Write contracts that emphasize the quality of work instead of the quantity of work only.
- Require contractors to submit documentation that their LDAR personnel have been trained on Method 21 and facility-specific LDAR procedures.
- Ensure that the contractor has a procedure in place to review and certify the monitoring data before submitting the data to the facility.
- Review daily results of contractor work to ensure that a realistic number of components are being monitored.
- Perform spot audits in the field to ensure that Method 21 procedures are being followed. This can include spot-checking monitored components with another hydrocarbon analyzer or following LDAR personnel as they perform monitoring.
- Have periodic reviews of contractor performance (e.g., quarterly or semi-annually) to resolve issues and correct problems.

7.5 Internal Leak Definition for Valves and Pumps

The varying leak definitions that can apply to different process units and components can be confusing and lead to errors in properly identifying leaks. To counter this potential problem, operate your LDAR program using an internal leak definition for valves and pumps in light liquid or gas vapor service. The internal leak definition would be equivalent to or lower than the applicable definitions in your permit and the applicable federal, state, and local regulations. Monitoring against a uniform definition that is lower than the applicable regulatory definition will reduce errors and provide a margin of safety for identifying leaking components. The internal leak definition would apply to valves and pumps (and possibly connectors) in light liquid or gas vapor service.

Elements:

- Adopt a 500-ppm or lower internal leak definition for VOCs for all valves in light liquid and/or gas vapor service, excluding pressure relief devices.
- Adopt a 2,000-ppm or lower internal leak definition for pumps in light liquid and/or gas/vapor service.
- Record, track, repair, and monitor leaks in excess of the internal leak definition. Repair and monitor leaks that are greater than the internal leak definitions but less than the applicable regulatory leak definitions within thirty (30) days of detection.

Consent Decrees between EPA and many chemical facilities subject to the HON require using a 250-ppm leak definition for valves and connectors and a 500-ppm leak definition for pumps.

Note: If a state or local agency has lower leak definitions, then the internal leak definition should be set to the lowest definition or even lower to include/allow for margin of error.

7.6 More Frequent Monitoring

Many regulations allow for less frequent monitoring (i.e. skip periods) when good performance (as defined in the applicable regulation) is demonstrated. Skip period is an alternative work practice found in some equipment leak regulations and usually applies only to valves and connectors. After a specified number of leak detection periods (e.g., monthly) during which the percentage of leaking components is below a certain value (e.g., 2% for NSPS facilities), a facility can monitor less frequently (e.g., quarterly) as long as the percentage of leaking components remains low. The facility must keep a record of the percentage of the component type found leaking during each leak detection period.

Experience has shown that poor monitoring rather than good performance has allowed facilities to take advantage of the less frequent monitoring provisions. To ensure that leaks are still being identified in a timely manner and that previously unidentified leaks are not worsening over time, implement a plan for more frequent monitoring for components that contribute most to equipment leak emissions.

Elements:

- Monitor pumps in light liquid and/or gas vapor service on a monthly basis.
- Monitor valves in light liquid and/or gas vapor service – other than difficult-to-monitor or unsafe-to-monitor valves – with no skip periods.

Consent Decrees between EPA and many chemical facilities subject to the HON require semiannual monitoring of connectors.

7.7 Repairing Leaking Components

To stop detected leaks while they are still small, most rules require a first attempt at repair within 5 days of the leak detection and a final repair within 15 days. However, any component that cannot be repaired within those time frames must be placed on a "Delay of Repair" list to be repaired during the next shutdown cycle.

First attempts at repair include, but are not limited to, the following best practices where practicable and appropriate:

- Tightening bonnet bolts;
- Replacing bonnet bolts;
- Tightening packing gland nuts; and
- Injecting lubricant into lubricated packing.

Elements:

- Schedule the "first attempt at repair" of those components that the monitoring personnel are not authorized to repair consistent with the existing regulatory requirements.
- Monitor the component for which a "first attempt at repair" was performed no later than the next regular business day to ensure the leak has not worsened.
- If the first attempt at repair has not succeeded then other methods, such as "drill and tap" should be employed where feasible. Drill and tap procedures are no longer considered extraordinary practices.

7.8 Delay of Repair Compliance Assurance

Any component that cannot be repaired during the specified repair interval must be placed on a "Delay of Repair" list to be repaired during the next shutdown cycle. Delay of repair compliance assurance procedures ensure that the appropriate equipment is justifiably on the "Delay of Repair" list and that facilities have a plan to fix these components.

Elements:

- Have the unit supervisor approve in advance and certify all components that are technically infeasible to repair without a process unit shutdown.
- Continue to monitor equipment that is placed on the "Delay of Repair" list in the facility's regular LDAR monitoring. For leaks above the internal leak definition rate and below the regulatory rate, put the equipment on the "Delay of Repair" list within 30 days.
- Implement the following repair policies and procedures within 15 days of implementing the written LDAR program:
  - For valves, other than control valves or pressure relief valves, that are leaking at a rate of 10,000 ppm or greater and cannot be feasibly repaired without a process unit shutdown, use "drill and tap" repair methods to fix the leaking valve, unless you can determine and document that there is a safety, mechanical, or major environmental concern posed by repairing the leak in this manner.
  - Perform up to two "drill and tap" repair attempts to repair a leaking valve, if necessary, within 30 days of identifying the leak.

7.9 Electronic Monitoring and Storage of LDAR Data

Electronic monitoring and storage of LDAR data will help evaluate the performance of monitoring personnel (via time/date stamps), improve accuracy, provide an effective means for QA/QC, and retrieve records in a timely manner for review purposes. Incorporate and maintain an electronic database for storing and reporting LDAR data. Use data loggers or other data collection devices during all LDAR monitoring.

Elements:

- Use best efforts to transfer, on a daily basis, electronic data from electronic data logging devices to the database.
- For all monitoring events in which an electronic data collection device is used, include a time and date stamp, operator identification, and instrument identification.
- Paper logs can be used where necessary or more feasible (e.g., small rounds, re-monitoring fixed leaks, or when data loggers are not available or broken), and should record, at a minimum, the monitoring technician, date, and monitoring equipment used.
- Transfer any manually recorded monitoring data to the database within 7 days of monitoring.
- Review records to identify "problem" components for preventative maintenance (repair prior to anticipated failure) or for replacement with "leakless" technology.

7.10 QA/QC of LDAR Data

QA/QC audits ensure that Method 21 procedures are being followed and LDAR personnel are monitoring the correct components in the proper manner. Develop and implement a procedure to ensure QA/QC review of all data generated by LDAR monitoring technicians on a daily basis or at the conclusion of each monitoring episode.

Elements:

Some QA/QC procedures include:

- Daily review/sign-off by monitoring technicians of the data they collected to ensure accuracy and validity.
- Periodic review of the daily monitoring reports generated in conjunction with recordkeeping and reporting requirements.
- Quarterly QA/QC of the facility's and contractor's monitoring data including:
  - Number of components monitored per technician;
  - Time between monitoring events; and
  - Abnormal data patterns.

7.11 Calibration/Calibration Drift Assessment

Always calibrate LDAR monitoring equipment using an appropriate calibration gas, in accordance with 40 CFR Part 60, EPA Reference Test Method 21.

Elements:

- Conduct calibration drift assessments of LDAR monitoring equipment at the end of each monitoring shift, at a minimum.
- Conduct the calibration drift assessment using, at a minimum, approximately 500 ppm of calibration gas.
- If any calibration drift assessment after the initial calibration shows a negative drift of more than 10% from the previous calibration, re-monitor all valves that were monitored since the last calibration with a reading of greater than 100 ppm. Re-monitor all pumps that were monitored since the last calibration with a reading of greater than 500 ppm.

7.12 Records Maintenance

Organized and readily available records are one potential indication of an effective LDAR program. Well-kept records may also indicate that the LDAR program is integrated into the facility's routine operation and management. The equipment leak regulations specify recordkeeping and reporting requirements; incorporating the elements below will help ensure your facility LDAR records are thorough and complete.

Elements:

Records to maintain:

- A certification that the facility implemented the "first attempt at repair" program.
- A certification that the facility implemented QA/QC procedures for review of data generated by LDAR technicians.
- An identification of the person/position at each facility responsible for LDAR program performance as defined in the written program.
- A certification that the facility developed and implemented a tracking program for new valves and pumps added during maintenance and construction defined in the written program.
- A certification that the facility properly completed calibration drift assessments.
- A certification that the facility implemented the "delay of repair" procedures.
- The following information on LDAR monitoring:
  - (1) The number of valves and pumps present in each process unit during the quarter;
  - (2) The number of valves and pumps monitored in each process unit;
  - (3) An explanation for missed monitoring if the number of valves and pumps present exceeds the number of valves and pumps monitored during the quarter;
  - (4) The number of valves and pumps found leaking;
  - (5) The number of "difficult to monitor" pieces of equipment monitored;
  - (6) A list of all equipment currently on the "Delay of Repair" list and the date each component was placed on the list;
  - (7) The number of repair attempts not completed promptly or completed within 5 days;
  - (8) The number of repairs not completed within 30 days and the number of components not placed on the "Delay of Repair" list; and
  - (9) The number of chronic leakers that do not get repaired.
- Records of audits and corrective actions. Prior to the first third-party audit at each facility, include in your records a copy of each audit report from audits conducted in the previous calendar year and a summary of the actions planned or taken to correct all deficiencies identified in the audits.
- For the audits performed in prior years, identification of the auditors and documentation that a written plan exists identifying corrective action for any deficiencies identified and that this plan is being implemented.

8.0 Sources of Additional Information

Inspection Manual: Federal Equipment Leak Regulations for the Chemical Manufacturing Industry, EPA/305/B-98/011, December 1998.
http://cfpub.epa.gov/compliance/resources/publications/assistance/sectors/chemical/index.cfm

Vol 1: Inspection Manual
http://www.epa.gov/compliance/resources/publications/assistance/sectors/insmanvol1.pdf

Vol 2: Chemical Manufacturing Industry Regulations (3 parts on the Internet)
http://www.epa.gov/compliance/resources/publications/assistance/sectors/insmanvol2pt1.pdf
http://www.epa.gov/compliance/resources/publications/assistance/sectors/insmanvol2pt2.pdf
http://www.epa.gov/compliance/resources/publications/assistance/sectors/insmanvol2pt3.pdf

Vol 3: Petroleum Refining Industry Regulations
http://www.epa.gov/compliance/resources/publications/assistance/sectors/insmanvol3.pdf

1995 Protocol for Equipment Leak Emission Estimates, EPA-453/R-95-017, Nov 1995.
http://www.epa.gov/ttnchie1/efdocs/equiplks.pdf

Enforcement Alert, EPA Office of Enforcement and Compliance Assurance,
EPA 300-N-99-014, Oct 1999.
http://www.epa.gov/compliance/resources/newsletters/civil/enfalert/emissions.pdf

National Petroleum Refinery Initiative, EPA.
http://www.epa.gov/compliance/resources/cases/civil/caa/refineryinitiative032106.pdf

Petroleum Refinery Initiative Fact Sheet, EPA.
http://www.epa.gov/compliance/resources/cases/civil/caa/petroleumrefinery-fcsht.html

Petroleum Refinery National Priority Case Results.
http://www.epa.gov/compliance/resources/cases/civil/caa/oil/

Draft Staff Report, Regulation 8, Rule 18, Equipment Leaks, Bay Area Air Quality Management District, Jul 1997.
http://www.baaqmd.gov/pln/ruledev/8-18/1997/0818_sr_071097.pdf

Standards of Performance for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry; Standards of Performance for Equipment Leaks of VOC in Petroleum Refineries; Proposed Rule, [EPA-HQ-OAR-2006-0699; FRL-] RIN 2060-AN71.
http://www.epa.gov/ttn/oarpg/t3/fr_notices/equip_leak_prop103106.pdf

Industrial Organic Chemicals Compliance Incentive Program, EPA Compliance and Enforcement.
http://www.epa.gov/compliance/incentives/programs/ioccip.html

Leak Detection and Repair Program Developments.
http://www.epa.gov/compliance/neic/field/leak.html

Compliance and Enforcement Annual Results: Important Environmental Problems / National Priorities.
http://www.epa.gov/compliance/resources/reports/endofyear/eoy2006/sp-airtoxics-natl-priorities.html

Portable Instruments User's Manual For Monitoring VOC Sources, EPA-340/1-86-015.
Inspection Techniques For Fugitive VOC Emission Sources, EPA 340/1-90-026a,d,e,f (rev May 1993) Course #380.

Environmental compliance assistance resources can be found at:

http://cfpub.epa.gov/clearinghouse/
http://www.assistancecenters.net/
http://www.epa.gov/compliance/assistance/sectors/index.html

Appendix A Federal Regulations That Require a Formal LDAR Program With Method 21

40 CFR Part	40 CFR Subpart	Regulation Title
60	VV	SOCMI VOC Equipment Leaks NSPS
60	DDD	Volatile Organic Compound (VOC) Emissions from the Polymer Manufacturing Industry
60	GGG	Petroleum Refinery VOC Equipment Leaks NSPS
60	KKK	Onshore Natural Gas Processing Plant VOC Equipment Leaks NSPS
61	J	National Emission Standard for Equipment Leaks (Fugitive Emission Sources) of Benzene
61	V	Equipment Leaks NESHAP
63	H	Organic HAP Equipment Leak NESHAP (HON)
63	I	Organic HAP Equipment Leak NESHAP for Certain Processes
63	J	Polyvinyl Chloride and Copolymers Production NESHAP
63	R	Gasoline Distribution Facilities (Bulk Gasoline Terminals and Pipeline Breakout Stations)
63	CC	Hazardous Air Pollutants from Petroleum Refineries
63	DD	Hazardous Air Pollutants from Off-Site Waste and Recovery Operations
63	SS	Closed Vent Systems, Control Devices, Recovery Devices and Routing to a Fuel Gas System or a Process
63	TT	Equipment Leaks – Control Level 1
63	UU	Equipment Leaks – Control Level 2
63	YY	Hazardous Air Pollutants for Source Categories: Generic Maximum Achievable Control Technology Standards
63	GGG	Pharmaceuticals Production
63	III	Hazardous Air Pollutants from Flexible Polyurethane Foam Production
63	MMM	Hazardous Air Pollutants for Pesticide Active Ingredient Production
63	FFFF	Hazardous Air Pollutants: Miscellaneous Organic Chemical Manufacturing
63	GGGGG	Hazardous Air Pollutants: Site Remediation
63	HHHHH	Hazardous Air Pollutants: Miscellaneous Coating Manufacturing
65	F	Consolidated Federal Air Rule – Equipment Leaks
264	BB	Equipment Leaks for Hazardous Waste TSDFs
265	BB	Equipment Leaks for Interim Status Hazardous Waste TSDFs

Note: Many of these regulations have identical requirements, but some have different applicability and control requirements.

Appendix B Federal Regulations That Require the Use of Method 21 But Do Not Require a Formal LDAR Program

40 CFR		Regulation Title
Part	Subpart	
60	XX	Bulk Gasoline Terminals
60	QQQ	VOC Emissions from Petroleum Refinery Wastewater Systems
60	WWW	Municipal Solid Waste Landfills
61	F	Vinyl Chloride
61	L	Benzene from Coke By-Products
61	BB	Benzene Transfer
61	FF	Benzene Waste Operations
63	G	Organic Hazardous Air Pollutants from SOCMI for Process Vents, Storage Vessels, Transfer Operations, and Wastewater
63	M	Perchloroethylene Standards for Dry Cleaning
63	S	Hazardous Air Pollutants from the Pulp and Paper Industry
63	Y	Marine Unloading Operations
63	EE	Magnetic Tape Manufacturing Operations
63	GG	Aerospace Manufacturing and Rework Facilities
63	HH	Hazardous Air Pollutants from Oil and Gas Production Facilities
63	OO	Tanks – Level 1
63	PP	Containers
63	QQ	Surface Impoundments
63	VV	Oil/Water, Organic/Water Separators
63	HHH	Hazardous Air Pollutants from Natural Gas Transmission and Storage
63	JJJ	Hazardous Air Pollutant Emissions: Group IV Polymers and Resins
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264	AA	Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities - Process Vents
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270	B	Hazardous Waste Permit Program – Permit Application
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Appendix C Method 21 General Procedure

Failure of facilities to follow Method 21 can lead to them not properly identifying and subsequently repairing leaking components. It is critical for facilities to refer to the complete text of Method 21 (see Appendix D) for detailed explanations of each general procedure found below and how to properly perform each step.

1. **Evaluate Instrument Performance**

   Performance criteria for the monitoring instrument:

   - For each VOC measured, the response factor should be <10 unless specified in the applicable regulation. Response factor is the ratio of the known concentration of a VOC compound to the observed meter reading when measured using an instrument calibrated with the reference compound specified in the applicable regulation.
   - The calibration precision should be <10 percent of the calibration gas value. Calibration precision is the degree of agreement between measurements of the same known value, expressed as the relative percentage of the average difference between the meter readings and the known concentration to the known concentration.
   - The response time should be ≤30 seconds. Response time is the time interval from a step change in VOC concentration at the input of the sampling system to the time at which 90% of the corresponding final value is reached as displayed on the instrument readout meter.

2. **Calibrate Instrument**

   Before each monitoring episode:

   - Let the instrument warm up.
   - Introduce the calibration gas into the instrument probe.
   - Adjust the instrument meter readout to match the calibration gas concentration value.

3. **Monitor Individual components**

   When monitoring components:

   - Place the probe at the surface of the component interface where leakage could occur.
   - Move the probe along the interface periphery while observing the instrument readout.
   - Locate the maximum reading by moving the probe around the interface.
   - Keep the probe at the location of the maximum reading for 2 times the response factor.
   - If the concentration reading on the instrument readout is above the applicable leak definition, then the component is leaking and must be repaired.

Appendix D Method 21—Determination of Volatile Organic Compound Leaks

1.0 Scope and Application

1.1 Analytes.

Analyte	CAS No.
Volatile Organic Compounds (VOC).....	No CAS number assigned.

1.2 Scope. This method is applicable for the determination of VOC leaks from process equipment. These sources include, but are not limited to, valves, flanges and other connections, pumps and compressors, pressure relief devices, process drains, open-ended valves, pump and compressor seal system degassing vents, accumulator vessel vents, agitator seals, and access door seals.

1.3 Data Quality Objectives. Adherence to the requirements of this method will enhance the quality of the data obtained from air pollutant sampling methods.

2.0 Summary of Method

2.1 A portable instrument is used to detect VOC leaks from individual sources. The instrument detector type is not specified, but it must meet the specifications and performance criteria contained in Section 6.0. A leak definition concentration based on a reference compound is specified in each applicable regulation. This method is intended to locate and classify leaks only, and is not to be used as a direct measure of mass emission rate from individual sources.

3.0 Definitions

3.1 Calibration gas means the VOC compound used to adjust the instrument meter reading to a known value. The calibration gas is usually the reference compound at a known concentration approximately equal to the leak definition concentration.

3.2 Calibration precision means the degree of agreement between measurements of the same known value, expressed as the relative percentage of the average difference between the meter readings and the known concentration to the known concentration.

3.3 Leak definition concentration means the local VOC concentration at the surface of a leak source that indicates that a VOC emission (leak) is present. The leak definition is an instrument meter reading based on a reference compound.

3.4 No detectable emission means a local VOC concentration at the surface of a leak source, adjusted for local VOC ambient concentration, that is less than 2.5 % of the specified leak definition concentration. That indicates that a VOC emission (leak) is not present.

3.5 Reference compound means the VOC species selected as the instrument calibration basis for specification of the leak definition concentration. (For example, if a leak definition concentration is 10,000 ppm as methane, then any source emission that results in a local concentration that yields a meter reading of 10,000 on an instrument meter calibrated with methane would be classified as a leak. In this example, the leak definition concentration is 10,000 ppm and the reference compound is methane.)

3.6 Response factor means the ratio of the known concentration of a VOC compound to the observed meter reading when measured using an instrument calibrated with the reference compound specified in the applicable regulation.

3.7 Response time means the time interval from a step change in VOC concentration at the input of the sampling system to the time at which 90 percent of the corresponding final value is reached as displayed on the instrument readout meter.

4.0 Interferences [Reserved]

5.0 Safety

5.1 Disclaimer. This method may involve hazardous materials, operations, and equipment. This test method may not address all of the safety problems associated with its use. It is the responsibility of the user of this test method to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to performing this test method.

5.2 Hazardous Pollutants. Several of the compounds, leaks of which may be determined by this method, may be irritating or corrosive to tissues (e.g., heptane) or may be toxic (e.g., benzene, methyl alcohol). Nearly all are fire hazards. Compounds in emissions should be determined through familiarity with the source. Appropriate precautions can be found in reference documents, such as reference No. 4 in Section 16.0.

6.0 Equipment and Supplies

A VOC monitoring instrument meeting the following specifications is required:

6.1 The VOC instrument detector shall respond to the compounds being processed. Detector types that may meet this requirement include, but are not limited to, catalytic oxidation, flame ionization, infrared absorption, and photoionization.

6.2 The instrument shall be capable of measuring the leak definition concentration specified in the regulation.

6.3 The scale of the instrument meter shall be readable to ±2.5 % of the specified leak definition concentration.

6.4 The instrument shall be equipped with an electrically driven pump to ensure that a sample is provided to the detector at a constant flow rate. The nominal sample flow rate, as measured at the sample probe tip, shall be 0.10 to 3.0 l/min (0.004 to 0.1 ft 3 /min) when the probe is fitted with a glass wool plug or filter that may be used to prevent plugging of the instrument.

6.5 The instrument shall be equipped with a probe or probe extension or sampling not to exceed 6.4 mm (1/4 in) in outside diameter, with a single end opening for admission of sample.

6.6 The instrument shall be intrinsically safe for operation in explosive atmospheres as defined by the National Electrical Code by the National Fire Prevention Association or other applicable regulatory code for operation in any explosive atmospheres that may be encountered in its use. The instrument shall, at a minimum, be intrinsically safe for Class 1, Division 1 conditions, and/or Class 2, Division 1 conditions, as appropriate, as defined by the example code. The instrument shall not be operated with any safety device, such as an exhaust flame arrestor, removed.

7.0 Reagents and Standards

7.1 Two gas mixtures are required for instrument calibration and performance evaluation:

7.1.1 Zero Gas. Air, less than 10 parts per million by volume (ppmv) VOC.

7.1.2 Calibration Gas. For each organic species that is to be measured during individual source surveys, obtain or prepare a known standard in air at a concentration approximately equal to the applicable leak definition specified in the regulation.

7.2 Cylinder Gases. If cylinder calibration gas mixtures are used, they must be analyzed and certified by the manufacturer to be within 2 % accuracy, and a shelf life must be specified. Cylinder standards must be either reanalyzed or replaced at the end of the specified shelf life.

7.3 Prepared Gases. Calibration gases may be prepared by the user according to any accepted gaseous preparation procedure that will yield a mixture accurate to within 2 percent. Prepared standards must be replaced each day of use unless it is demonstrated that degradation does not occur during storage.

7.4 Mixtures with non-Reference Compound Gases. Calibrations may be performed using a compound other than the reference compound. In this case, a conversion factor must be determined for the alternative compound such that the resulting meter readings during source surveys can be converted to reference compound results.

8.0 Sample Collection, Preservation, Storage, and Transport

8.1 Instrument Performance Evaluation. Assemble and start up the instrument according to the manufacturer's instructions for recommended warmup period and preliminary adjustments.

8.1.1 Response Factor. A response factor must be determined for each compound that is to be measured, either by testing or from reference sources. The response factor tests are required before placing the analyzer into service, but do not have to be repeated at subsequent intervals.

8.1.1.1 Calibrate the instrument with the reference compound as specified in the applicable regulation. Introduce the calibration gas mixture to the analyzer and record the observed meter reading. Introduce zero gas until a stable reading is obtained. Make a total of three measurements by alternating between the calibration gas and zero gas. Calculate the response factor for each repetition and the average response factor.

8.1.1.2 The instrument response factors for each of the individual VOC to be measured shall be less than 10 unless otherwise specified in the applicable regulation. When no instrument is available that meets this specification when calibrated with the reference VOC specified in the applicable regula-

tion, the available instrument may be calibrated with one of the VOC to be measured, or any other VOC, so long as the instrument then has a response factor of less than 10 for each of the individual VOC to be measured.

8.1.1.3 Alternatively, if response factors have been published for the compounds of interest for the instrument or detector type, the response factor determination is not required, and existing results may be referenced. Examples of published response factors for flame ionization and catalytic oxidation detectors are included in References 1–3 of Section 17.0.

8.1.2 Calibration Precision. The calibration precision test must be completed prior to placing the analyzer into service and at subsequent 3-month intervals or at the next use, whichever is later.

8.1.2.1 Make a total of three measurements by alternately using zero gas and the specified calibration gas. Record the meter readings. Calculate the average algebraic difference between the meter readings and the known value. Divide this average difference by the known calibration value and multiply by 100 to express the resulting calibration precision as a percentage.

8.1.2.2 The calibration precision shall be equal to or less than 10 % of the calibration gas value.

8.1.3 Response Time. The response time test is required before placing the instrument into service. If a modification to the sample pumping system or flow configuration is made that would change the response time, a new test is required before further use.

8.1.3.1 Introduce zero gas into the instrument sample probe. When the meter reading has stabilized, switch quickly to the specified calibration gas. After switching, measure the time required to attain 90 % of the final stable reading. Perform this test sequence three times and record the results. Calculate the average response time.

8.1.3.2 The instrument response time shall be equal to or less than 30 seconds. The instrument pump, dilution probe (if any), sample probe, and probe filter that will be used during testing shall all be in place during the response time determination.

8.2 Instrument Calibration. Calibrate the VOC monitoring instrument according to Section 10.0.

8.3 Individual Source Surveys.

8.3.1 Type I—Leak Definition Based on Concentration. Place the probe inlet at the surface of the component interface where leakage could occur. Move the probe along the interface periphery while observing the instrument readout. If an increased meter reading is observed, slowly sample the interface where leakage is indicated until the maximum meter reading is obtained. Leave the probe inlet at this maximum reading location for approximately two times the instrument response time. If the maximum observed meter reading is greater than the leak definition in the applicable regulation, record and report the results as specified in the regulation reporting requirements. Examples of the application of this general technique to specific equipment types are:

8.3.1.1 Valves. The most common source of leaks from valves is the seal between the stem and housing. Place the probe at the interface where the stem exits the packing gland and sample the stem circumference. Also, place the probe at the interface of the packing gland take-up flange seat and sample

the periphery. In addition, survey valve housings of multipart assembly at the surface of all interfaces where a leak could occur.

8.3.1.2 Flanges and Other Connections. For welded flanges, place the probe at the outer edge of the flange-gasket interface and sample the circumference of the flange. Sample other types of nonpermanent joints (such as threaded connections) with a similar traverse.

8.3.1.3 Pumps and Compressors. Conduct a circumferential traverse at the outer surface of the pump or compressor shaft and seal interface. If the source is a rotating shaft, position the probe inlet within 1 cm of the shaft-seal interface for the survey. If the housing configuration prevents a complete traverse of the shaft periphery, sample all accessible portions. Sample all other joints on the pump or compressor housing where leakage could occur.

8.3.1.4 Pressure Relief Devices. The configuration of most pressure relief devices prevents sampling at the sealing seat interface. For those devices equipped with an enclosed extension, or horn, place the probe inlet at approximately the center of the exhaust area to the atmosphere.

8.3.1.5 Process Drains. For open drains, place the probe inlet at approxima tely the center of the area open to the atmosphere. For covered drains, place the probe at the surface of the cover interface and conduct a peripheral traverse.

8.3.1.6 Open-ended Lines or Valves. Place the probe inlet at approximately the center of the opening to the atmosphere.

8.3.1.7 Seal System Degassing Vents and Accumulator Vents. Place the probe inlet at approximately the center of the opening to the atmosphere.

8.3.1.8 Access door seals. Place the probe inlet at the surface of the door seal interface and conduct a peripheral traverse.

8.3.2 Type II—"No Detectable Emission". Determine the local ambient VOC concentration around the source by moving the probe randomly upwind and downwind at a distance of one to two meters from the source. If an interference exists with this determination due to a nearby emission or leak, the local ambient concentration may be determined at distances closer to the source, but in no case shall the distance be less than 25 centimeters. Then move the probe inlet to the surface of the source and determine the concentration as outlined in Section 8.3.1. The difference between these concentrations determines whether there are no detectable emissions. Record and report the results as specified by the regulation. For those cases where the regulation requires a specific device installation, or that specified vents be ducted or piped to a control device, the existence of these conditions shall be visually confirmed. When the regulation also requires that no detectable emissions exist, visual observations and sampling surveys are required. Examples of this technique are:

8.3.2.1 Pump or Compressor Seals. If applicable, determine the type of shaft seal. Perform a survey of the local area ambient VOC concentration and determine if detectable emissions exist as described in Section 8.3.2.

8.3.2.2 Seal System Degassing Vents, Accumulator Vessel Vents, Pressure Relief Devices. If applicable,

observe whether or not the applicable ducting or piping exists. Also, determine if any sources exist in the ducting or piping where emissions could occur upstream of the control device. If the required ducting or piping exists and there are no sources where the emissions could be vented to the atmosphere upstream of the control device, then it is presumed that no detectable emissions are present. If there are sources in the ducting or piping where emissions could be vented or sources where leaks could occur, the sampling surveys described in Section 8.3.2 shall be used to determine if detectable emissions exist.

8.3.3 Alternative Screening Procedure.

8.3.3.1 A screening procedure based on the formation of bubbles in a soap solution that is sprayed on a potential leak source may be used for those sources that do not have continuously moving parts, that do not have surface temperatures greater than the boiling point or less than the freezing point of the soap solution, that do not have open areas to the atmosphere that the soap solution cannot bridge, or that do not exhibit evidence of liquid leakage. Sources that have these conditions present must be surveyed using the instrument technique of Section 8.3.1 or 8.3.2.

8.3.3.2 Spray a soap solution over all potential leak sources. The soap solution may be a commercially available leak detection solution or may be prepared using concentrated detergent and water. A pressure sprayer or squeeze bottle may be used to dispense the solution. Observe the potential leak sites to determine if any bubbles are formed. If no bubbles are observed, the source is presumed to have no detectable emissions or leaks as applicable. If any bubbles are observed, the instrument techniques of Section 8.3.1 or 8.3.2 shall be used to determine if a leak exists, or if the source has detectable emissions, as applicable.

9.0 Quality Control

Section	Quality control measure	Effect
8.1.2.....	Instrument calibration precision check.	Ensure precision and accuracy, respectively, of instrument response to standard.
10.0.....	Instrument calibration.	

10.0 Calibration and Standardization

10.1 Calibrate the VOC monitoring instrument as follows. After the appropriate warmup period and zero internal calibration procedure, introduce the calibration gas into the instrument sample probe. Adjust the instrument meter readout to correspond to the calibration gas value.

Note: If the meter readout cannot be adjusted to the proper value, a malfunction of the analyzer is indicated and corrective actions are necessary before use.

11.0 Analytical Procedures [Reserved]

12.0 Data Analyses and Calculations [Reserved]

13.0 Method Performance [Reserved]

14.0 Pollution Prevention [Reserved]

15.0 Waste Management [Reserved]

16.0 References

1. Dubose, D.A., and G.E. Harris. Response Factors of VOC Analyzers at a Meter Reading of 10,000 ppmv for Selected Organic Compounds. U.S. Environmental Protection Agency, Research Triangle Park, NC. Publication No. EPA 600/2–81051. September 1981.
2. Brown, G.E., et al. Response Factors of VOC Analyzers Calibrated with Methane for Selected Organic Compounds. U.S. Environmental Protection Agency, Research Triangle Park, NC. Publication No. EPA 600/2–81–022. May 1981.
3. DuBose, D.A. et al. Response of Portable VOC Analyzers to Chemical Mixtures. U.S. Environmental Protection Agency, Research Triangle Park, NC. Publication No. EPA 600/2–81–110. September 1981.

4. Handbook of Hazardous Materials: Fire, Safety, Health. Alliance of American Insurers. Schaumberg, IL. 1983.

17.0 Tables, Diagrams, Flowcharts, and Validation Data [Reserved]

Appendix E Summary of NEIC Comparative Monitoring Results of Leaking Valves at 17 Refineries

	Refineries Total	NEIC Total
Valves Monitored	170,717	47,526
Number of Leaks	2,266	2,372
Leak Rate (%)	1.3	5.0 (avg)
Emissions Rate (lb/hr)	1,177.0	2,775.5
Potential Emissions from Undetected Leaks (lb/hr)[a]	**1,598.5**	

Source: Enforcement Alert – Proper Monitoring Essential to Reducing 'Fugitive Emissions' Under Leak Detection and Repair Programs, EPA 300-N-99-014. US EPA Office of Enforcement and Compliance Assurance. Vol. 2, No. 9, Oct 1999.

[a] Potential Emissions from Undetected Leaks (lb/hr) = NEIC Total Emissions Rate (lb/hr) – Refineries Total Emissions Rate (lb/hr)

Appendix F Enforcement Alert

United States Environmental Protection Agency | Office of Enforcement and Compliance Assurance (2201A) | EPA 300-N-99-011

EPA **Enforcement Alert**

Volume 2, Number 9 | Office of Regulatory Enforcement | October 1999

Proper Monitoring Essential to Reducing 'Fugitive Emissions' Under Leak Detection and Repair Programs

The Clean Air Act requires refineries to develop and implement a Leak Detection and Repair (LDAR) program to control fugitive emissions. Fugitive emissions occur from valves, pumps, compressors, pressure relief valves, flanges, connectors and other piping components.

Comparison monitoring conducted by the U.S. Environmental Protection Agency's (EPA) National Enforcement Investigations Center (NEIC) shows that the number of leaking valves and components is up to 10 times greater than had been reported by certain refineries *(see Table, Page 2)* EPA believes this great disparity between what refineries are reporting and what EPA is finding may be attributable to refineries not monitoring in the manner prescribed in 40 CFR Part 60, Appendix A, Method 21.

Federal regulations require refiners to routinely monitor for leaks and to fix any equipment found leaking. Failure to identify leaking equipment results in necessary repairs not being made and continuing fugitive emissions of volatile organic chemicals (VOCs) and other hazardous chemicals. EPA estimates that the failure to identify and repair leaks at petroleum refineries could be resulting in additional VOC emissions of 80 million pounds annually. VOC's contribute to ground-level ozone, a principal component of smog, which can cause significant health and environmental problems.

> EPA estimates that leaks not found and repaired could be resulting in additional volatile organic chemical emissions of 80 million pounds annually.

What the Law Requires

Specific requirements for refinery fugitive emissions are identified in 40 CFR Part 60, New Source Performance Standards (NSPS), and 40 CFR Parts 61 and 63, National Emission Standards for Hazardous Air Pollutants (NESHAP). Many State and local air agencies incorporate federal requirements but some have established more stringent requirements as authorized by law. The various regulations require refineries to implement an LDAR program to reduce fugitive emissions from valves, pumps, compressors, pressure relief valves, flanges, connectors, and other piping components.

Valves are usually the single largest source of fugitive emissions. Emissions from any single piece of equipment are usually small. Based on the large number of equipment components that can leak and are subject to LDAR requirements, however, cumulative emissions can be very large. To obtain a proper reading of emissions from leaking components the monitoring equipment must be calibrated cor-

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About Enforcement Alert

"Enforcement Alert" is published periodically by the Office of Regulatory Enforcement to inform and educate the public and regulated community of important environmental enforcement issues, recent trends and significant enforcement actions.

This information should help the regulated community anticipate and prevent violations of federal environmental law that could otherwise lead to enforcement action. Reproduction and wide dissemination of this newsletter is encouraged.

See Page 4 for useful EPA Websites and additional resources.

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Enforcement Alert

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rectly and held at the component interface where leakage could occur (e.g., at the seal between the valve stem and housing) for a sufficient length of time to obtain a valid measurement.

LDAR Programs Should Consist of Several Processes

LDAR programs are generally comprised of four processes. Regulations vary, but usually require refineries to:

- Identify components to be included in the program;
- Conduct routine monitoring of identified components;
- Repair any leaking components; and
- Report monitoring results.

Compliance issues associated with each of these processes have resulted in numerous enforcement actions by EPA Regional offices, State agencies, or local air boards, depending on the specific regulations. Common violations include:

- Failure to identify process units and components that must be monitored;
- Failure to follow prescribed monitoring procedures;
- Use of incorrect or expired calibration gasses;
- Failure to repair components within specified timeframes; and
- Failure to submit quarterly reports and maintain appropriate calibration and/or monitoring records.

Comparative Monitoring Results

Refinery	Company Monitoring: Valves/Leaks	NEIC Monitoring: Valves/Leaks	Leak Rate: Company/ NEIC (%)	Emissions Rate: Company/ NEIC (lb/hr)	Potential Emissions: Undetected Leaks (lb/hr)
A	7,694/170	3,363/354	2.3/10.5	38.8/106.6	67.8
B	7,879/223	3,407/216	2.8/6.3	44.0/73.5	29.5
C	3,913/22	2,008/108	0.6/5.4	18.3/90.1	71.8
D	2,229/26	1,764/24	1.2/1.4	16.5/17.1	1.6
E	5,555/96	2,109/112	0.7/5.3	50.7/125.8	75.1
F	42,505/124	3,053/53	0.3/1.7	154.7/382.3	227.6
G	14,307/226	3,852/236	1.6/6.1	122.2/369.7	247.5
H	20,719/736	3,351/179	3.6/5.3	332.2/469.7	137.5
I	5,339/9	2,754/84	0.2/3.1	16.9/76.6	59.7
J	8,374/78	2,981/55	0.9/1.8	50.8/78.5	27.7
K	6,997/101	1,658/114	1.4/6.9	56.1/201.2	145.1
L	12,686/26	3,228/125	0.2/3.8	34.9/84.0	49.1
M	4,160/40	1,926/222	1.0/11.5	25.7/192.2	166.5
N	5,944/29	2,487/106	0.5/4.3	26.1/112.3	86.2
O	7,161/112	2,897/130	1.6/4.5	60.8/140.9	80.1
P	8,532/203	4,060/181	2.4/4.5	98.8/167.5	68.7
Q	6,640/36	2,608/74	0.5/2.8	30.5/87.5	57.0
Total	170,717/2,266	47,526/2,372	1.3/5.0 (avg)	1,177.0/ 2,775.5	1,598.5

Refinery Monitoring Reports; What EPA is Finding

During the past several years NEIC has monitored for leaking components at refineries. For 17 facilities investigated by NEIC, the average leak rate reported by the facilities was 1.3 percent. The average leak rate determined by NEIC and confirmed by the facilities was 5.0 percent. One explanation for this difference in leak rates may be found in a report published by the Bay Area Air Quality Management District ("Rule Effectiveness Study"). The Bay Area Air Quality Management District determined that when valves were inspected at a distance of one centimeter (0.4 inches) from the component instead of at the interface with the component as the regulations require,

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57 percent of the leaking valves would be missed when monitoring above the 500 ppm level.

Fugitive emissions account for 22 percent of all emissions from non-refineries but account for more than 55 percent of all refinery emissions identified in the 1996 Toxic Release Inventory (TRI). Since TRI includes only "reportable" hydrocarbons, total fugitive emissions were significantly larger than the 33 million pounds then identified by reporting refineries.

The failure to identify leaks means that they remain unrepaired and will continue to release VOCs and hazardous substances into the atmosphere. Emission estimates using a 50/50 split between components in gas light liquid service (*see Table, Page 2*) suggest that these 17 refineries' annual fugitive emissions could be more than 6,000 tons per year greater than previously believed. Extrapolating this difference to all refineries larger than the smallest refinery investigated by NEIC also suggests that there may be an additional 80 million pounds of VOCs being emitted each year because refinery leaks are not being identified properly and repaired promptly, as required by LDAR programs. Significantly and as recognized by industry, fugitive emissions can be reduced by up to 90 percent if leaks are detected and repaired in a timely manner.

EPA Policies for Reducing, Eliminating Penalties for Self-Policing

EPA has adopted two policies designed to encourage the regulated community to comply with environmental laws.

For more information, see EPA's Audit Policy Website at: http://www.epa.gov/oeca/auditpol.html, and the Small Business Policy at: http://www.epa.gov/oeca/smbusi.html.

Regulatory Impacts of Inadequate Fugitive Monitoring

By not fully identifying all leaking components, refineries are likely causing the unnecessary release of excess hydrocarbons. The impacts of these additional hydrocarbon releases may result in:

- Additional VOC emissions that could worsen local or transboundry smog problems;
- Under reporting of fugitive emissions on the annual Toxic Reporting Inventory;
- Under reporting of various TRI chemicals on annual Form R submissions; and
- Delayed or denied permits for expansion.

Most LDAR regulations allow for decreased monitoring frequency if certain performance standards are consistently achieved. Monitoring frequency is decreased from quarterly to annual monitoring if less than two percent of the valves within a process unit are found leaking. Conversely, if greater than two percent of the valves are found to be leaking, monitoring must be conducted quarterly. EPA monitoring showing a greater than two percent leak rate has resulted in refineries reverting back to quarterly monitoring.

Improving Leak Detection Monitoring Reliability

Although not required under current LDAR programs, several practices appear to improve the reliability of monitoring data and LDAR compliance:

- Energetic LDAR coordinators (advocates) with the responsibility and authority to make things happen;
- Continuing education/refresher programs for plant operators. Plant operators can have a major impact on LDAR compliance;
- Diligent and well-motivated monitoring personnel.
- Use of a lower than required leak definition. Several refineries use a leak definition lower than the regulatory limit. For example, several refineries use a 500 ppm limit rather than the regulatory limit of 10,000 ppm;
- More frequent monitoring than required. Rather than monitoring annually, some refineries monitor quarterly. More frequent monitoring also may permit lower emissions to be reported on the annual Toxic Reporting Inventory and or Form Rs; and
- Established Quality Assurance/Quality Control procedures. Several refineries have initiated a program to check the monitoring results submitted by the monitoring team (in-house or contractor).

EPA's Office of Enforcement and Compliance Assurance is encouraged by efforts currently underway by the National Advisory Committee on Environmental Policy and Technology (NACEPT) petroluem refining workgroup to find more cost-effective ways to identify significant leaks

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through new technology that allows for quick identification of the most significant losses. Meanwhile, however, the regulated industry is expected to comply fully with existing LDAR requirements.

Contact Ken Garing, National Enforcement Investigations Center, (303)236-6658; Email: garing.ken@epa.gov; Tom Ripp, Office of Compliance, Manufacturing, Energy and Transportation Division, (202)564-7003; Email: ripp.tom@epamail.epa.gov; or Jim Jackson, Office of Regulatory Enforcement, Air Enforcement Division, (202) 564-2002; Email: jackson.james@epamail.epa.gov.

EPA'S Y2K Enforcement Policy

EPA's Y2K Enforcement Policy is designed to encourage the expeditious testing of computer associated hardware and software that may be potentially vulnerable to Y2K problems.

Under this policy, which was published in the Federal Register on March 10, 1999, EPA intends to waive 100 percent of the civil penalties and recommend against criminal prosecution for environmental violations resulting from Y2K testing designed to identify and eliminate Y2K-related malfunctions. To receive the policy's benefits (e.g., waiver of penalties due to testing), regulated entities must address specific criteria and conditions identified in the policy.

For more about the Y2K Enforcement Policy, contact *Gary Jonesi, Office of Regulatory Enforcement, (202) 564-4002 or E-mail: jonesi.gary@epa.gov.*

Useful Websites

EPA's Technical Web site for Information Transfer and Sharing Related to Air Pollution Topics: http://www.epa.gov/ttn/

Toxics Release Inventory (TRI): http://www.epa.gov/opptintr/tri/

EPA Home Page: http://www.epa.gov/epahome

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EXHIBIT Q

Code of Federal Regulations

Title 40 - Protection of Environment

Volume: 15
Date: 2011-07-01
Original Date: 2011-07-01
Title: Section 68.130 - List of substances.
Context: Title 40 - Protection of Environment. CHAPTER I - ENVIRONMENTAL PROTECTION AGENCY (CONTINUED). SUBCHAPTER C - AIR PROGRAMS (CONTINUED). PART 68 - CHEMICAL ACCIDENT PREVENTION PROVISIONS. Subpart F - Regulated Substances for Accidental Release Prevention.

§ 68.130 List of substances.

(a) Regulated toxic and flammable substances under section 112(r) of the Clean Air Act are the substances listed in Tables 1, 2, 3, and 4. Threshold quantities for listed toxic and flammable substances are specified in the tables.

(b) The basis for placing toxic and flammable substances on the list of regulated substances are explained in the notes to the list.

Table 1 to § 68.130—List of Regulated Toxic Substances and Threshold Quantities for Accidental Release Prevention

[Alphabetical Order—77 Substances]

Chemical name	CAS No.	Threshold quantity (lbs)	Basis for listing
Acrolein [2-Propenal]	107-02-8	5,000	b
Acrylonitrile [2-Propenenitrile]	107-13-1	20,000	b
Acrylyl chloride [2-Propenoyl chloride]	814-68-6	5,000	b
Allyl alcohol [2-Propen-1-ol]	107-18-61	15,000	b
Allylamine [2-Propen-1-amine]	107-11-9	10,000	b
Ammonia (anhydrous)	7664-41-7	10,000	a, b
Ammonia (conc 20% or greater)	7664-41-7	20,000	a, b
Arsenous trichloride	7784-34-1	15,000	b
Arsine	7784-42-1	1,000	b
Boron trichloride [Borane, trichloro-]	10294-34-5	5,000	b
Boron trifluoride [Borane, trifluoro-]	7637-07-2	5,000	b

Boron trifluoride compound with methyl ether (1:1) [Boron, trifluoro [oxybis [metane]]-, T-4-	353-42-4	15,000	b
Bromine	7726-95-6	10,000	a, b
Carbon disulfide	75-15-0	20,000	b
Chlorine	7782-50-5	2,500	a, b
Chlorine dioxide [Chlorine oxide (ClO2)]	10049-04-4	1,000	c
Chloroform [Methane, trichloro-]	67-66-3	20,000	b
Chloromethyl ether [Methane, oxybis[chloro-]	542-88-1	1,000	b
Chloromethyl methyl ether [Methane, chloromethoxy-]	107-30-2	5,000	b
Crotonaldehyde [2-Butenal]	4170-30-3	20,000	b
Crotonaldehyde, (E)- [2-Butenal, (E)-]	123-73-9	20,000	b
Cyanogen chloride	506-77-4	10,000	c
Cyclohexylamine [Cyclohexanamine]	108-91-8	15,000	b
Diborane	19287-45-7	2,500	b
Dimethyldichlorosilane [Silane, dichlorodimethyl-]	75-78-5	5,000	b
1,1-Dimethylhydrazine [Hydrazine, 1,1-dimethyl-]	57-14-7	15,000	b
Epichlorohydrin [Oxirane, (chloromethyl)-]	106-89-8	20,000	b
Ethylenediamine [1,2-Ethanediamine]	107-15-3	20,000	b
Ethyleneimine [Aziridine]	151-56-4	10,000	b
Ethylene oxide [Oxirane]	75-21-8	10,000	a, b
Fluorine	7782-41-4	1,000	b
Formaldehyde (solution)	50-00-0	15,000	b
Furan	110-00-9	5,000	b
Hydrazine	302-01-2	15,000	b
Hydrochloric acid (conc 37% or greater)	7647-01-0	15,000	d
Hydrocyanic acid	74-90-8	2,500	a, b
Hydrogen chloride (anhydrous) [Hydrochloric acid]	7647-01-0	5,000	a
Hydrogen fluoride/Hydrofluoric acid (conc 50% or greater)	7664-		

[Hydrofluoric acid]	39-3	1,000	a, b
Hydrogen selenide	7783-07-5	500	b
Hydrogen sulfide	7783-06-4	10,000	a, b
Iron, pentacarbonyl- [Iron carbonyl (Fe(CO)5), (TB-5-11)-]	13463-40-6	2,500	b
Isobutyronitrile [Propanenitrile, 2-methyl-]	78-82-0	20,000	b
Isopropyl chloroformate [Carbonochloridic acid, 1-methylethyl ester]	108-23-6	15,000	b
Methacrylonitrile [2-Propenenitrile, 2-methyl-]	126-98-7	10,000	b
Methyl chloride [Methane, chloro-]	74-87-3	10,000	a
Methyl chloroformate [Carbonochloridic acid, methylester]	79-22-1	5,000	b
Methyl hydrazine [Hydrazine, methyl-]	60-34-4	15,000	b
Methyl isocyanate [Methane, isocyanato-]	624-83-9	10,000	a, b
Methyl mercaptan [Methanethiol]	74-93-1	10,000	b
Methyl thiocyanate [Thiocyanic acid, methyl ester]	556-64-9	20,000	b
Methyltrichlorosilane [Silane, trichloromethyl-]	75-79-6	5,000	b
Nickel carbonyl	13463-39-3	1,000	b
Nitric acid (conc 80% or greater)	7697-37-2	15,000	b
Nitric oxide [Nitrogen oxide (NO)]	10102-43-9	10,000	b
Oleum (Fuming Sulfuric acid) [Sulfuric acid, mixture with sulfur trioxide] 1	8014-95-7	10,000	e
Peracetic acid [Ethaneperoxoic acid]	79-21-0	10,000	b
Perchloromethylmercaptan [Methanesulfenyl chloride, trichloro-]	594-42-3	10,000	b
Phosgene [Carbonic dichloride]	75-44-5	500	a, b
Phosphine	7803-51-2	5,000	b
Phosphorus oxychloride [Phosphoryl chloride]	10025-87-3	5,000	b
Phosphorus trichloride [Phosphorous trichloride]	7719-12-2	15,000	b
Piperidine	110-89-4	15,000	b
Propionitrile [Propanenitrile]	107-12-0	10,000	b
Propyl chloroformate [Carbonochloridic acid, propylester]	109-61-5	15,000	b

Propyleneimine [Aziridine, 2-methyl-]	75-55-8	10,000	b
Propylene oxide [Oxirane, methyl-]	75-56-9	10,000	b
Sulfur dioxide (anhydrous)	7446-09-5	5,000	a, b
Sulfur tetrafluoride [Sulfur fluoride (SF4), (T-4)-]	7783-60-0	2,500	b
Sulfur trioxide	7446-11-9	10,000	a, b
Tetramethyllead [Plumbane, tetramethyl-]	75-74-1	10,000	b
Tetranitromethane [Methane, tetranitro-]	509-14-8	10,000	b
Titanium tetrachloride [Titanium chloride (TiCl4) (T-4)-]	7550-45-0	2,500	b
Toluene 2,4-diisocyanate [Benzene, 2,4-diisocyanato-1-methyl-] 1	584-84-9	10,000	a
Toluene 2,6-diisocyanate [Benzene, 1,3-diisocyanato-2-methyl-] 1	91-08-7	10,000	a
Toluene diisocyanate (unspecified isomer) [Benzene, 1,3-diisocyanatomethyl-] 1	26471-62-5	10,000	a
Trimethylchlorosilane [Silane, chlorotrimethyl-]	75-77-4	10,000	b
Vinyl acetate monomer [Acetic acid ethenyl ester]	108-05-4	15,000	b

1 The mixture exemption in § 68.115(b)(1) does not apply to the substance.

Note: Basis for Listing:

aMandated for listing by Congress.

bOn EHS list, vapor pressure 10 mmHg or greater.

cToxic gas.

dToxicity of hydrogen chloride, potential to release hydrogen chloride, and history of accidents.

eToxicity of sulfur trioxide and sulfuric acid, potential to release sulfur trioxide, and history of accidents.

Table 2 to § 68.130—List of Regulated Toxic Substances and Threshold Quantities for Accidental Release Prevention

[CAS Number Order—77 Substances]

CAS No.	Chemical name	Threshold quantity (lbs)	Basis for listing
50-00-0	Formaldehyde (solution)	15,000	b
57-14-7	1,1-Dimethylhydrazine [Hydrazine, 1,1-dimethyl-]	15,000	b
60-34-4	Methyl hydrazine [Hydrazine, methyl-]	15,000	b
67-66-3	Chloroform [Methane, trichloro-]	20,000	b
74-87-3	Methyl chloride [Methane, chloro-]	10,000	a
74-90-8	Hydrocyanic acid	2,500	a, b
74-93-1	Methyl mercaptan [Methanethiol]	10,000	b
75-15-0	Carbon disulfide	20,000	b

75-21-8	Ethylene oxide [Oxirane]	10,000	a, b
75-44-5	Phosgene [Carbonic dichloride]	500	a, b
75-55-8	Propyleneimine [Aziridine, 2-methyl-]	10,000	b
75-56-9	Propylene oxide [Oxirane, methyl-]	10,000	b
75-74-1	Tetramethyllead [Plumbane, tetramethyl-]	10,000	b
75-77-4	Trimethylchlorosilane [Silane, chlorotrimethyl-]	10,000	b
75-78-5	Dimethyldichlorosilane [Silane, dichlorodimethyl-]	5,000	b
75-79-6	Methyltrichlorosilane [Silane, trichloromethyl-]	5,000	b
78-82-0	Isobutyronitrile [Propanenitrile, 2-methyl-]	20,000	b
79-21-0	Peracetic acid [Ethaneperoxoic acid]	10,000	b
79-22-1	Methyl chloroformate [Carbonochloridic acid, methylester]	5,000	b
91-08-7	Toluene 2,6-diisocyanate [Benzene, 1,3-diisocyanato-2-methyl-] 1	10,000	a
106-89-8	Epichlorohydrin [Oxirane, (chloromethyl)-]	20,000	b
107-02-8	Acrolein [2-Propenal]	5,000	b
107-11-9	Allylamine [2-Propen-1-amine]	10,000	b
107-12-0	Propionitrile [Propanenitrile]	10,000	b
107-13-1	Acrylonitrile [2-Propenenitrile]	20,000	b
107-15-3	Ethylenediamine [1,2-Ethanediamine]	20,000	b
107-18-6	Allyl alcohol [2-Propen-1-ol]	15,000	b
107-30-2	Chloromethyl methyl ether [Methane, chloromethoxy-]	5,000	b
108-05-4	Vinyl acetate monomer [Acetic acid ethenyl ester]	15,000	b
108-23-6	Isopropyl chloroformate [Carbonochloridic acid, 1-methylethyl ester]	15,000	b
108-91-8	Cyclohexylamine [Cyclohexanamine]	15,000	b
109-61-5	Propyl chloroformate [Carbonochloridic acid, propylester]	15,000	b
110-00-9	Furan	5,000	b
110-89-4	Piperidine	15,000	b
123-73-9	Crotonaldehyde, (E)- [2-Butenal, (E)-]	20,000	b
126-98-7	Methacrylonitrile [2-Propenenitrile, 2-methyl-]	10,000	b

151-56-4	Ethyleneimine [Aziridine]	10,000	b
302-01-2	Hydrazine	15,000	b
353-42-4	Boron trifluoride compound with methyl ether (1:1) [Boron, trifluoro[oxybis[methane]]-, T-4-	15,000	b
506-77-4	Cyanogen chloride	10,000	c
509-14-8	Tetranitromethane [Methane, tetranitro-]	10,000	b
542-88-1	Chloromethyl ether [Methane, oxybis[chloro-]	1,000	b
556-64-9	Methyl thiocyanate [Thiocyanic acid, methyl ester]	20,000	b
584-84-9	Toluene 2,4-diisocyanate [Benzene, 2,4-diisocyanato-1-methyl-] 1	10,000	a
594-42-3	Perchloromethylmercaptan [Methanesulfenyl chloride, trichloro-]	10,000	b
624-83-9	Methyl isocyanate [Methane, isocyanato-]	10,000	a, b
814-68-6	Acrylyl chloride [2-Propenoyl chloride]	5,000	b
4170-30-3	Crotonaldehyde [2-Butenal]	20,000	b
7446-09-5	Sulfur dioxide (anhydrous)	5,000	a, b
7446-11-9	Sulfur trioxide	10,000	a, b
7550-45-0	Titanium tetrachloride [Titanium chloride (TiCl4) (T-4)-]	2,500	b
7637-07-2	Boron trifluoride [Borane, trifluoro-]	5,000	b
7647-01-0	Hydrochloric acid (conc 37% or greater)	15,000	d
7647-01-0	Hydrogen chloride (anhydrous) [Hydrochloric acid]	5,000	a
7664-39-3	Hydrogen fluoride/Hydrofluoric acid (conc 50% or greater) [Hydrofluoric acid]	1,000	a, b
7664-41-7	Ammonia (anhydrous)	10,000	a, b
7664-41-7	Ammonia (conc 20% or greater)	20,000	a, b
7697-37-2	Nitric acid (conc 80% or greater)	15,000	b
7719-12-2	Phosphorus trichloride [Phosphorous trichloride]	15,000	b
7726-95-6	Bromine	10,000	a, b

7782-41-4	Fluorine	1,000	b
7782-50-5	Chlorine	2,500	a, b
7783-06-4	Hydrogen sulfide	10,000	a, b
7783-07-5	Hydrogen selenide	500	b
7783-60-0	Sulfur tetrafluoride [Sulfur fluoride (SF4), (T-4)-]	2,500	b
7784-34-1	Arsenous trichloride	15,000	b
7784-42-1	Arsine	1,000	b
7803-51-2	Phosphine	5,000	b
8014-95-7	Oleum (Fuming Sulfuric acid) [Sulfuric acid, mixture with sulfur trioxide]1	10,000	e
10025-87-3	Phosphorus oxychloride [Phosphoryl chloride]	5,000	b
10049-04-4	Chlorine dioxide [Chlorine oxide (ClO_2)]	1,000	c
10102-43-9	Nitric oxide [Nitrogen oxide (NO)]	10,000	b
10294-34-5	Boron trichloride [Borane, trichloro-]	5,000	b
13463-39-3	Nickel carbonyl	1,000	b
13463-40-6	Iron, pentacarbonyl- [Iron carbonyl ($Fe(CO)_5$), (TB-5-11)-]	2,500	b
19287-45-7	Diborane	2,500	b
26471-62-5	Toluene diisocyanate (unspecified isomer) [Benzene, 1,3-diisocyanatomethyl-1]1	10,000	a

1 The mixture exemption in § 68.115(b)(1) does not apply to the substance.

Note: Basis for Listing:

aMandated for listing by Congress.

bOn EHS list, vapor pressure 10 mmHg or greater.

cToxic gas.

dToxicity of hydrogen chloride, potential to release hydrogen chloride, and history of accidents.

eToxicity of sulfur trioxide and sulfuric acid, potential to release sulfur trioxide, and history of accidents.

Table 3 to § 68.130—List of Regulated Flammable Substances 1 and Threshold Quantities for Accidental Release Prevention

[Alphabetical Order—63 Substances]

Chemical name	CAS No.	Threshold quantity (lbs)	Basis for listing

Acetaldehyde	75-07-0	10,000	g
Acetylene [Ethyne]	74-86-2	10,000	f
Bromotrifluorethylene [Ethene, bromotrifluoro-]	598-73-2	10,000	f
1,3-Butadiene	106-99-0	10,000	f
Butane	106-97-8	10,000	f
1-Butene	106-98-9	10,000	f
2-Butene	107-01-7	10,000	f
Butene	25167-67-3	10,000	f
2-Butene-cis	590-18-1	10,000	f
2-Butene-trans [2-Butene, (E)]	624-64-6	10,000	f
Carbon oxysulfide [Carbon oxide sulfide (COS)]	463-58-1	10,000	f
Chlorine monoxide [Chlorine oxide]	7791-21-1	10,000	f
2-Chloropropylene [1-Propene, 2-chloro-]	557-98-2	10,000	g
1-Chloropropylene [1-Propene, 1-chloro-]	590-21-6	10,000	g
Cyanogen [Ethanedinitrile]	460-19-5	10,000	f
Cyclopropane	75-19-4	10,000	f
Dichlorosilane [Silane, dichloro-]	4109-96-0	10,000	f
Difluoroethane [Ethane, 1,1-difluoro-]	75-37-6	10,000	f
Dimethylamine [Methanamine, N-methyl-]	124-40-3	10,000	f
2,2-Dimethylpropane [Propane, 2,2-dimethyl-]	463-82-1	10,000	f
Ethane	74-84-0	10,000	f
Ethyl acetylene [1-Butyne]	107-00-6	10,000	f
Ethylamine [Ethanamine]	75-04-7	10,000	f
Ethyl chloride [Ethane, chloro-]	75-00-3	10,000	f
Ethylene [Ethene]	74-85-1	10,000	f
Ethyl ether [Ethane, 1,1'-oxybis-]	60-29-7	10,000	g
Ethyl mercaptan [Ethanethiol]	75-08-1	10,000	g
Ethyl nitrite [Nitrous acid, ethyl ester]	109-95-5	10,000	f
Hydrogen	1333-74-0	10,000	f
Isobutane [Propane, 2-methyl]	75-28-5	10,000	f
Isopentane [Butane, 2-methyl-]	78-78-4	10,000	g
Isoprene [1,3-Butadinene, 2-methyl-]	78-79-5	10,000	g
Isopropylamine [2-Propanamine]	75-31-0	10,000	g
Isopropyl chloride [Propane, 2-chloro-]	75-29-6	10,000	g
Methane	74-82-8	10,000	f
Methylamine [Methanamine]	74-89-5	10,000	f

3-Methyl-1-butene	563-45-1	10,000	f
2-Methyl-1-butene	563-46-2	10,000	g
Methyl ether [Methane, oxybis-]	115-10-6	10,000	f
Methyl formate [Formic acid, methyl ester]	107-31-3	10,000	g
2-Methylpropene [1-Propene, 2-methyl-]	115-11-7	10,000	f
1,3-Pentadinene	504-60-9	10,000	f
Pentane	109-66-0	10,000	g
1-Pentene	109-67-1	10,000	g
2-Pentene, (E)-	646-04-8	10,000	g
2-Pentene, (Z)-	627-20-3	10,000	g
Propadiene [1,2-Propadiene]	463-49-0	10,000	f
Propane	74-98-6	10,000	f
Propylene [1-Propene]	115-07-1	10,000	f
Propyne [1-Propyne]	74-99-7	10,000	f
Silane	7803-62-5	10,000	f
Tetrafluoroethylene [Ethene, tetrafluoro-]	116-14-3	10,000	f
Tetramethylsilane [Silane, tetramethyl-]	75-76-3	10,000	g
Trichlorosilane [Silane, trichloro-]	10025-78-2	10,000	g
Trifluorochloroethylene [Ethene, chlorotrifluoro-]	79-38-9	10,000	f
Trimethylamine [Methanamine, N,N-dimethyl-]	75-50-3	10,000	f
Vinyl acetylene [1-Buten-3-yne]	689-97-4	10,000	f
Vinyl chloride [Ethene, chloro-]	75-01-4	10,000	a, f
Vinyl ethyl ether [Ethene, ethoxy-]	109-92-2	10,000	g
Vinyl fluoride [Ethene, fluoro-]	75-02-5	10,000	f
Vinylidene chloride [Ethene, 1,1-dichloro-]	75-35-4	10,000	g
Vinylidene fluoride [Ethene, 1,1-difluoro-]	75-38-7	10,000	f
Vinyl methyl ether [Ethene, methoxy-]	107-25-5	10,000	f

1 A flammable substance when used as a fuel or held for sale as a fuel at a retail facility is excluded from all provisions of this part (see § 68.126).

Note: Basis for Listing:

a Mandated for listing by Congress.

f Flammable gas.

g Volatile flammable liquid.

Table 4 to § 68.130—List of Regulated Flammable Substances 1 and Threshold Quantities for Accidental Release Prevention

[CAS Number Order—63 Substances]

CAS No.	Chemical name	CAS No.	Threshold quantity (lbs)	Basis for listing

60-29-7	Ethyl ether [Ethane, 1,1'-oxybis-]	60-29-7	10,000	g
74-82-8	Methane	74-82-8	10,000	f
74-84-0	Ethane	74-84-0	10,000	f
74-85-1	Ethylene [Ethene]	74-85-1	10,000	f
74-86-2	Acetylene [Ethyne]	74-86-2	10,000	f
74-89-5	Methylamine [Methanamine]	74-89-5	10,000	f
74-98-6	Propane	74-98-6	10,000	f
74-99-7	Propyne [1-Propyne]	74-99-7	10,000	f
75-00-3	Ethyl chloride [Ethane, chloro-]	75-00-3	10,000	f
75-01-4	Vinyl chloride [Ethene, chloro-]	75-01-4	10,000	a, f
75-02-5	Vinyl fluoride [Ethene, fluoro-]	75-02-5	10,000	f
75-04-7	Ethylamine [Ethanamine]	75-04-7	10,000	f
75-07-0	Acetaldehyde	75-07-0	10,000	g
75-08-1	Ethyl mercaptan [Ethanethiol]	75-08-1	10,000	g
75-19-4	Cyclopropane	75-19-4	10,000	f
75-28-5	Isobutane [Propane, 2-methyl]	75-28-5	10,000	f
75-29-6	Isopropyl chloride [Propane, 2-chloro-]	75-29-6	10,000	g
75-31-0	Isopropylamine [2-Propanamine]	75-31-0	10,000	g
75-35-4	Vinylidene chloride [Ethene, 1,1-dichloro-]	75-35-4	10,000	g
75-37-6	Difluoroethane [Ethane, 1,1-difluoro-]	75-37-6	10,000	f
75-38-7	Vinylidene fluoride [Ethene, 1,1-difluoro-]	75-38-7	10,000	f
75-50-3	Trimethylamine [Methanamine, N, N-dimethyl-]	75-50-3	10,000	f
75-76-3	Tetramethylsilane [Silane, tetramethyl-]	75-76-3	10,000	g
78-78-4	Isopentane [Butane, 2-methyl-]	78-78-4	10,000	g
78-79-5	Isoprene [1,3,-Butadiene, 2-methyl-]	78-79-5	10,000	g
79-38-9	Trifluorochloroethylene [Ethene, chlorotrifluoro-]	79-38-9	10,000	f
106-97-8	Butane	106-97-8	10,000	f
106-98-9	1-Butene	106-98-9	10,000	f
196-99-0	1,3-Butadiene	106-99-0	10,000	f
107-00-6	Ethyl acetylene [1-Butyne]	107-00-6	10,000	f
107-01-7	2-Butene	107-01-7	10,000	f
107-25-5	Vinyl methyl ether [Ethene, methoxy-]	107-25-5	10,000	f
107-31-3	Methyl formate [Formic acid, methyl ester]	107-31-3	10,000	g
109-66-0	Pentane	109-66-0	10,000	g

109-67-1	1-Pentene	109-67-1	10,000	g
109-92-2	Vinyl ethyl ether [Ethene, ethoxy-]	109-92-2	10,000	g
109-95-5	Ethyl nitrite [Nitrous acid, ethyl ester]	109-95-5	10,000	f
115-07-1	Propylene [1-Propene]	115-07-1	10,000	f
115-10-6	Methyl ether [Methane, oxybis-]	115-10-6	10,000	f
115-11-7	2-Methylpropene [1-Propene, 2-methyl-]	115-11-7	10,000	f
116-14-3	Tetrafluoroethylene [Ethene, tetrafluoro-]	116-14-3	10,000	f
124-40-3	Dimethylamine [Methanamine, N-methyl-]	124-40-3	10,000	f
460-19-5	Cyanogen [Ethanedinitrile]	460-19-5	10,000	f
463-49-0	Propadiene [1,2-Propadiene]	463-49-0	10,000	f
463-58-1	Carbon oxysulfide [Carbon oxide sulfide (COS)]	463-58-1	10,000	f
463-82-1	2,2-Dimethylpropane [Propane, 2,2-dimethyl-]	463-82-1	10,000	f
504-60-9	1,3-Pentadiene	504-60-9	10,000	f
557-98-2	2-Chloropropylene [1-Propene, 2-chloro-]	557-98-2	10,000	g
563-45-1	3-Methyl-1-butene	563-45-1	10,000	f
563-46-2	2-Methyl-1-butene	563-46-2	10,000	g
590-18-1	2-Butene-cis	590-18-1	10,000	f
590-21-6	1-Chloropropylene [1-Propene, 1-chloro-]	590-21-6	10,000	g
598-73-2	Bromotrifluorethylene [Ethene, bromotrifluoro-]	598-73-2	10,000	f
624-64-6	2-Butene-trans [2-Butene, (E)]	624-64-6	10,000	f
627-20-3	2-Pentene, (Z)-	627-20-3	10,000	g
646-04-8	2-Pentene, (E)-	646-04-8	10,000	g
689-97-4	Vinyl acetylene [1-Buten-3-yne]	689-97-4	10,000	f
1333-74-0	Hydrogen	1333-74-0	10,000	f
4109-96-0	Dichlorosilane [Silane, dichloro-]	4109-96-0	10,000	f
7791-21-1	Chlorine monoxide [Chlorine oxide]	7791-21-1	10,000	f
7803-62-5	Silane	7803-62-5	10,000	f
10025-78-2	Trichlorosilane [Silane,trichloro-]	10025-78-2	10,000	g
25167-67-3	Butene	25167-67-3	10,000	f

1 A flammable substance when used as a fuel or held for sale as a fuel at a retail facility is excluded from all provisions of this part (see § 68.126).

Note: Basis for Listing:

a Mandated for listing by Congress.

f Flammable gas.

g Volatile flammable liquid.

[59 FR 4493, Jan. 31, 1994. Redesignated at 61 FR 31717, June 20, 1996, as amended at 62 FR 45132, Aug. 25, 1997; 63 FR 645, Jan. 6, 1998; 65 FR 13250, Mar. 13, 2000]

United States
Environmental Protection
Agency

Office of Solid Waste and
Emergency Response

Office of Enforcement and
Compliance Assurance

EPA 550-K-11-001
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www.epa.gov/emergencies
www.epa.gov/compliance

Guidance for Conducting Risk Management Program Inspections under Clean Air Act Section 112(r)

Acronyms Used in This Guidance

AIChE	American Institute of Chemical Engineers
ANSI	American National Standards Institute
API	American Petroleum Institute
ASME	American Society of Mechanical Engineers
CAA	Clean Air Act
CBI	Confidential Business Information
CCPS	Center for Chemical Process Safety
CFR	Code of Federal Regulations
D&B	Dun and Bradstreet
EPA	Environmental Protection Agency
EPCRA	Emergency Planning and Community Right-to-Know Act
ERNS	Emergency Response Notification System
HAZWOPER	Hazardous Waste Operations and Emergency Response
LEPC	Local Emergency Planning Committee
NCP	National Contingency Plan
NFPA	National Fire Protection Association
NRS	National Response System
OSHA	Occupational Safety and Health Administration
PHA	Process Hazard Analysis
PPE	Personal Protective Equipment
PSM	Process Safety Management
RMP	Risk Management Plan
SARA	Superfund Amendments and Reauthorization Act
SERC	State Emergency Response Commission

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INTRODUCTION

Purpose

This document provides guidance for implementing agencies that conduct inspections of facilities (i.e., stationary sources) subject to 40 CFR Part 68, also called the EPA Risk Management Program. It is designed as a tool for inspectors reviewing industry compliance with the Risk Management Program regulation. However, this guidance does not reflect all requirements that a facility must meet to be in compliance with the regulation.

Background

The Environmental Protection Agency (EPA) works closely with stakeholders to reduce the likelihood and severity of chemical accidents.

Several important planning and legislative initiatives have been introduced since 1968. These include the National Contingency Plan (NCP) (started in 1968), EPA's voluntary Chemical Emergency Preparedness Program started after the December 1984 accident in Bhopal (India), the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA), and the Accidental Release Prevention requirements under Section 112(r) of the Clean Air Act (CAA), as amended in 1990. These initiatives address the entire safety continuum dealing with chemical accident preparedness, response, and prevention.

In this document "RMP" denotes Risk Management Plan, which summarizes the source's risk management program and is submitted to EPA

Interrelated Opportunities for Chemical Accident Prevention

From a government point of view, chemical accident prevention involves: (1) working with facilities (both management personnel and employees) to improve their chemical safety management program, and (2) encouraging communities to coordinate risk reduction activities with facilities even as they enhance emergency preparedness for response to possible accidents. Improving the safe use and management of chemicals begins with an understanding of:

Accident prevention opportunities include:

- Chemical safety audits
- Accident investigations
- General Duty Clause inspections
- RMP inspections

- How and why accidents occur;
- How industry identifies chemical and process hazards;
- How industry designs, maintains, and operates a safe facility; and
- How the consequences of accidents are minimized.

Industry has the expertise and responsibility, with assistance from their employees, to make sure that the elements of safe operation (e.g., procedures, training, and maintenance) are brought together and managed day-to-day. Government agencies can help facilities by inspecting their safety management programs, comparing them to successful practices used by other facilities, and stimulating improvements.

The Risk Management Program regulations are among several tools implementing agencies have to help facilities prevent chemical accidents. Existing and new programmatic tools are briefly described below. Each of these programs is designed to help identify the causes of accidental chemical releases as well as the means to prevent them from occurring. Additionally, these activities can be used to promote coordination within the local community.

Chemical Safety Audits

Chemical Safety Audits are designed to:

- Share information about chemical safety practices and technologies when visiting facilities that handle hazardous substances;
- Heighten awareness of the need for and promote chemical safety at chemical facilities and in the communities where chemicals are located; and
- Build cooperation among facilities, government agencies, and others.

Chemical safety audits are usually voluntary and may include facilities not covered by the Risk Management Program provisions. One purpose of conducting a chemical safety audit at a facility is to identify and characterize the strengths and weaknesses of specific chemical accident prevention program areas, as a means to highlight the elements which form an effective program. Additionally, chemical safety audits facilitate the sharing of information about successful practices and generally result in (non-mandatory) recommendations for safety improvements. This can lead to process safety improvements, which may prevent or mitigate releases by the audited facility.

Accident Investigations

The fundamental objective of a chemical accident investigation is to determine the facts, conditions, circumstances, and causes or probable causes of chemical accidents. In determining the root causes or management system failures resulting in an accident, the ultimate goal of the accident investigation is to reduce the likelihood of recurrence, minimize the consequences associated with accidental releases, and make chemical production, processing, handling, and storage safer. The accident investigation also looks at contributing factors of the event that may have broad applicability to industry, and the potential to develop recommendations and lessons learned to prevent similar accidents in the future. In addition to determining causes, lessons learned, and recommendations, EPA accident investigations may be combined with inspections in order to identify specific violations of regulatory or statutory requirements, leading to enforcement actions.

The Chemical Safety Board began operating in 1998 after it was funded by Congress. EPA and the Chemical Safety Board have developed a Memorandum of Understanding which addresses their respective authorities and coordination on accident investigation. To view this MOU, see http://www.epa.gov/oem/docs/chem/csbepa.pdf.

For further information concerning the Chemical Safety Board, visit the web site at www.chemsafety.gov or www.csb.gov.

CAA Section 112(r)(6) established an independent safety board known as the Chemical Safety and Hazard Investigation Board ("the Chemical Safety Board"). One of the objectives of the Chemical Safety Board, as directed by the CAA, is to investigate, determine and report to the public, the facts, conditions, circumstances, and cause or probable cause of any accidental release resulting in fatality, serious injury or substantial property damage.

The Chemical Safety Board does not issue fines or citations, but does make recommendations to facilities, regulatory agencies such as OSHA and EPA, industry organizations, and labor groups. Congress designed the CSB to be non-regulatory and independent of other agencies so that its investigations might, where appropriate, review the effectiveness of regulations and regulatory enforcement. In the event of a large chemical accident, EPA inspectors will likely interact with CBS investigators. The two agencies have developed a Memorandum of Understanding to address their respective authorities and coordination on such investigations (see inset at right).

The General Duty Clause

CAA Section 112(r)(1), known as the "General Duty Clause," further expands the range of activities EPA can undertake to promote chemical safety.

Owners and operators of facilities producing, processing, handling, or storing extremely hazardous substances have a general duty to:

- Identify hazards associated with a potential accidental release, using appropriate hazard assessment techniques;
- Design and maintain a safe facility, taking steps to prevent releases; and
- Minimize the consequences of accidental releases that do occur.

The General Duty Clause is not limited to a finite list of chemicals or established thresholds.

To the extent state or local law establishes a similar general duty, implementing agencies other than EPA can take actions to promote safe operating practices and the prevention of chemical accidents.

RMP Inspections and Audits

RMP inspections and audits help ensure compliance with the Risk Management Program, but the two terms carry different meanings within the context of 40 CFR Part 68. Within Part 68, the term "audit" refers to the process that implementing agencies may use to verify the quality of the RMP submitted to EPA and require revisions when necessary to ensure compliance with the requirements of subpart G of the rule. Like inspections, RMP audits will generally involve on-site verification of a facility's underlying risk management program. However, section 68.220 of the rule requires implementing agencies to select facilities for audits based on specific criteria, and to follow a specific process for resolving audit findings (involving steps known as preliminary determinations and final determinations) prior to any enforcement action.

RMP inspections are different from audits in that facilities are not necessarily selected for inspection based on Part 68 regulatory criteria, and inspections can lead directly to implementing agency enforcement actions for regulatory violations. Also, RMP inspections always involve on-site verification activities. In general, the on-site activities performed by implementing agency inspectors and auditors are the same, and this guidance can be applied to either activity. However, most implementing agency oversight and enforcement of CAA Section 112(r) and 40 CFR Part 68 involves inspections, rather than audits. Annex A contains additional information related to the specific requirements for implementing agencies when conducting audits in accordance with the process described in section 68.220 of the rule.

The above-mentioned activities are not mutually exclusive. Many times, a combination of activities may be used to achieve results. For example, an agency might investigate a chemical accident at a facility. While the investigation may determine a root cause, a chemical safety audit may confirm that procedures are being used to reduce the risk of future accidents. Additionally, the agency may also perform an inspection to evaluate compliance with the General Duty Clause and/or RMP requirements.

Risk Management Program Requirements

CAA Section 112(r) requires EPA to publish rules and guidance for chemical accident prevention. The rules promulgating the list of regulated substances (published January 31, 1994) and the Risk Management Program provisions (published June 20, 1996) are found at 40 CFR Part 68. The Risk Management Program contains three elements: a hazard assessment, a prevention program, and an emergency response program. The entire program is to be described and documented in a Risk Management Plan (RMP) which is submitted to EPA (delegated state and local implementing agencies receive RMP data from EPA).

In general, the RMP submitted by most facilities includes the following:

- Executive summary;
- Registration information;
- Off-site consequence analysis;
- Five-year accident history;
- Prevention program; and
- Emergency response program.

Who is covered?

EPA estimates that approximately 13,000 facilities are covered by the provisions of 40 CFR Part 68, including:

- Chemical manufacturers (industrial organics and inorganics, paints, pharmaceuticals, adhesives, sealants, fibers),
- Petrochemical (refining and gas processing operations, plastics and resins, synthetic rubber),
- Other manufacturing (electronics, semiconductors, paper, fabricated metals, industrial machinery, furniture, textiles),
- Agriculture (fertilizers),
- Public facilities (drinking and waste water treatment works),
- Electric utilities,
- Food and cold storage,
- Chemical warehousing,
- Chemical wholesalers,
- Military and energy installations, and
- Other facilities.

Owners or operators of a facility with more than a threshold quantity of a regulated substance (one of the 140 listed toxic and flammable substances in 40 CFR Section 68.130) in a process, as determined under section 68.115, must submit an RMP no later than the latest of the following dates:

- Three years after the date on which a substance is first listed under 40 CFR 68.130; or
- The date on which a regulated substance is first present in a process above a threshold quantity.

The Risk Management Program regulations also define the activities that facilities must undertake to identify and minimize the risks posed by regulated substances in covered processes. Specifically, EPA defined three "program levels" to ensure that individual chemical processes are subject to appropriate requirements based on the size of the process and the associated risks (see table on next page).

Table 1: RMP Program Levels and Requirements			
PROGRAM LEVEL	Program 1	Program 2	Program 3
DESCRIPTION	Requirements apply to processes where (1) a Worst case release, as determined by the hazard assessment, is not expected to reach public receptors; (2) no accidental release has occurred in the last five years that caused specified offsite impacts; and (3) the facility has coordinated emergency response procedures with the local planning and response organizations. The most likely processes for this program level are those at remotely located facilities and/or those using listed flammable chemicals.	Requirements apply to processes that do not meet the eligibility requirements of Program 1 or 3.	Requirements apply to processes not eligible for Program 1, and which are in certain specified industrial categories or are already subject to the OSHA Process Safety Management (PSM) standard. These generally include higher-risk, complex chemical processing and petroleum refining operations.
REQUIREMENTS	• Conduct an offsite consequence analysis that evaluates worst-case accidental release scenario(s); • Document the five-year history of certain accidental releases of regulated substances from covered processes; • Coordinate response plans with local emergency planning and response agencies; and • Revise, update, and submit the RMP at least every five years.	• Conduct an offsite consequence analysis that evaluates worst-case accidental release scenario(s); • Document the five-year history of certain accidental releases of regulated substances from covered processes; • Coordinate response plans with local emergency planning and response agencies; and • Revise, update, and submit the RMP at least every five years. Evaluate alternative accident release scenarios and establish: • An integrated prevention program for managing risk; • Provisions for responding to emergencies; and • An overall management system supervising the implementation of these program elements.	• Conduct an offsite consequence analysis that evaluates worst-case accidental release scenario(s); • Document the five-year history of certain accidental releases of regulated substances from covered processes; • Coordinate response plans with local emergency planning and response agencies; and • Revise, update, and submit the RMP at least every five years. Evaluate alternative accident release scenarios and establish: • An integrated prevention program for managing risk; • Provisions for responding to emergencies; and • An overall management system supervising the implementation of these program elements.

Developing an RMP Inspection Program

Objective

RMP Inspections focus on verifying compliance with the Risk Management Program and Plan.

The RMP regulation states that implementing agencies shall conduct inspections for the purposes of regulatory development and enforcement of the CAA. RMP inspections focus on the underlying Risk Management Program, as well as the data contained in the Risk Management Plan. An RMP is a blueprint of how Risk Management Program provisions are incorporated into process safety at the facility, just as an emergency response plan is a blueprint of an emergency response program for a community or a facility. Risk Mangement Plans do not directly protect the public; Risk Managment Programs are the comprehensive approach to protecting the public.

Approaches to an RMP Inspection

Full compliance with the Risk Management Program regulations cannot be determined without on-site or independent verification of all or part of the information submitted in an RMP. However, each implementing agency should determine the scope of the inspection process to be used. This determination is based on available resources, priorities, expertise, and other factors. Inspecting to ensure compliance with the Risk Management Program regulation may consist of a range of off-site and on-site activities. Off-site activities might include determining that the rule applies to the facility, that the facility placed itself in the correct program level, and that the facility submitted a complete and correct RMP. On-site activities might include verification of documentation; interviews with facility managers, employees, and employee representatives; and observations of ongoing process operations or maintenance activities.

To ease the inspection burden, the implementing agency should also determine how the scope and conduct of on-site inspection activities can be coordinated with other regulatory inspections. For example, the implementing agency might coordinate with either the federal or state OSHA office within its jurisdiction. If chemical facilities are subject to the OSHA Process Safety Management (PSM) Standard, OSHA has its own authority over the facilities' prevention program. Also, other state agencies, such as state fire marshal offices, state departments of agriculture, or state environmental offices may regulate certain activities at RMP facilities. Coordinating inspection activities and sharing appropriate information with such agencies may save inspection resources and decrease the burden on the facility.

How to Use Reviews/Audits/Inspections

The Risk Management Program regulations mention the use of completeness checks, reviews, audits, and inspections. These terms are defined below.

RMP Completeness Checks. The implementing agency may conduct an in-office "completeness check" of the RMP. RMP*eSubmit (a submission system developed by EPA) will check each RMP before it is submitted to ensure that all the required data elements have been completed. The software program will indicate which fields are missing any required information. In addition, the EPA reporting center will use a similar technique to review every RMP submitted to see if all necessary fields have been completed.

RMP Reviews. Implementing agencies may want to review the data in an RMP to identify discrepancies. For example, the Executive Summary and registration data can be compared to chemical inventory data submitted to the state under EPCRA section 312 (always remembering that EPCRA section 312 and CAA section 112(r) may have differences in thresholds). Agencies may also want to review RMPs to identify internal data inconsistencies (e.g., dates listed for activities should be verified as internally consistent), facilities with potential problems based on their accident histories, and unusual data (e.g., failure to list appropriate hazards under the prevention program). For example, if an RMP reports that there has recently been a major change in a process that triggered a review or revision of certain requirements (see 68.170(k)), but the RMP indicates that these requirements have not been reviewed or revised since the date of the change, further inquiry is warranted.

RMP Audits. In an audit, the implementing agency evaluates the adequacy of the RMP submitted to EPA and requires revisions to RMPs when necessary to ensure compliance with the Risk Management Plan requirements of Part 68. As previously discussed, implementing agencies must select facilities for audits and resolve audit findings using criteria and procedures specified in 40 CFR 68.220. See Annex A for additional information on RMP Audits.

Inspections. Inspections complement other compliance monitoring activities and are valuable for evaluating compliance with the CAA Section 112(r) requirements. Many implementing agencies that have programs for the protection of public health and safety already have staff who are qualified to conduct on-site inspections (e.g., water permitting agencies visit water treatment plants; fire inspectors check on propane distributors). With proper training, it may be efficient for these regulators and inspectors to add 112(r) compliance elements to their inspection checklist.

Pursuant to an inspection, a facility may be required to revise its RMP and correct deficiencies in its underlying Risk Management Program. For example, if an inspection indicated that a facility had not reviewed and updated operating procedures after a change and that such updates were needed, the facility could be required to update the procedures, re-train workers in the new procedures, and submit a revised RMP. Inspections may also result in a variety of enforcement actions and penalties. Implementing agencies should consult legal counsel and applicable agency policies to determine appropriate enforcement actions following an inspection.

THE RMP INSPECTION PROCESS

Step (1): Selecting Facilities for RMP Inspections

EPA policy requires EPA regional offices to prioritize inspections at "high-risk" facilities. High-risk facilities include facilities with a large residential population within the facility's worst-case scenario vulnerable zone, facilities with a history of significant accidental releases, and facilities with very large quantities of regulated substances held on site (or with multiple regulated substances held above a threshold quantity). While EPA expects that every RMP facility will periodically be inspected, implementing agencies should inspect high-risk RMP facilities more frequently than other RMP facilities.

There are several basic steps to conducting an RMP inspection:

1. The first is selecting facilities to be inspected.
2. Next, there is a range of potential off-site, on-site, and concluding activities.
3. Finally, there is a series of post-inspection actions.

EPA policy also requires regional offices to periodically search for regulated facilities that have failed to submit RMPs (i.e., "RMP non-filers"), identify known RMP facilities that have failed to update their RMP as required by the rule, and take appropriate enforcement or compliance assistance actions in order to resolve the status of such facilities.

Beyond these considerations, implementing agencies have significant flexibility to select facilities for inspection. In making their selections, implementing agencies may choose to consider additional factors such as geographic location or clustering, proximity to minority or low-income residential areas, industry sector trends, and specific facility hazards or characteristics.

Step (2): Off-Site Activities

If more than one inspector is participating in the inspection, the entire inspection team should participate in a planning meeting prior to the inspection. This meeting should include any personnel from outside the implementing agency who will participate in the inspection, such as personnel from other agencies (e.g., fire marshal, emergency management staff, or environmental management staff), or outside contractors or experts who will provide technical support to the inspection team. Additionally, if possible, the implementing agency should include LEPC members and/or local response agency members. To the extent that Offsite Consequence Analysis information is shared during planning, the members of the team should be aware of restrictions on dissemination of this information to the public.

The lead inspector should determine at this point whether the facility will be notified in advance of the site visit. Prior notification may be dictated by implementing agency policy or practices. If the facility is to be notified in advance of the visit, the lead inspector should schedule the date, time, and point of arrival at the facility.

- CAA Section 112(r)(6)(L) provides facility employees and employee representatives with the same rights to participate in the physical inspection of any workplace conducted pursuant to CAA Section 112(r) as provided in the Occupational Safety and Health (OSH) Act (29 CFR 1903.8). Therefore, if there is advance notification of the site visit, the notification should be provided to both the owner/operator and facility employees/employee representative(s).
- If advanced written notification to the owner/operator is provided (e.g., Notice of Inspection (NOI) Letter) it should reference the statutory right for employees and employee representatives to participate in Section 112(r) inspections. The notification also should instruct the owner/operator to notify, upon receipt of the notification, the employee representative(s), if any, of the date and time of the on-site inspection and make arrangement for their participation. The owner/operator should be instructed to provide a copy of the notification to the employee representative(s).
  - » The owner/operator also should be instructed to post the notification, upon receipt, in the area subject to the inspection.
- If the name and contact information of the employee representative(s) is readily available to the lead inspector, a copy of the notification should be sent to the employee representative(s) concurrently with the notification being sent to the owner/operator.

The lead inspector should:

- Brief all inspectors on the rationale for the inspection;
- Assign each inspector specific section(s) of the inspection report, including collecting facility background information related to his/her report section;
- Identify related regulatory requirements (e.g., hot work permit, HAZWOPER); and
- Establish a schedule for completing collection of the necessary background information, conducting the pre-visit meeting, conducting the inspection, and completing the inspection report.

Collecting Background Information

Preliminary preparation is crucial to a well organized inspection. It is useful to collect as much of the facility background information as possible in advance of the inspection. The lead inspector may elect to notify the facility (both owner/operator and employee representative(s)), state, and local officials of the pending inspection and request appropriate background information. The inspector(s) then can review this information prior to the visit, prepare a detailed list of topics and questions to help organize their on-site activities, and minimize the amount of time spent at the facility. The table on the following page lists some examples of background information that may be useful to inspectors.

Table 2: Background Information

TYPES OF INFORMATION	SOURCES OF INFORMATION
Submitted RMP	RMP*Info and/or RMP*Review (database available to the implementing agency from EPA).
History of releases at the facility and/or similar facilities	On-scene coordinator reports, Accidental Release Investigation Program (ARIP) questionnaires, RMPs, Emergency Response Notification System (ERNS) data, EPCRA 304 release notifications, Toxic Release Inventory data, state release files.
Chemical processes	Industry standards and processing techniques from trade and professional groups (e.g., American Institute of Chemical Engineers (AIChE), ASME, and the Chlorine Institute), process flow diagrams, and piping and instrumentation diagrams.
EPCRA Chemical Inventory Data	SERC, LEPC, local fire department.
Other information	OSHA facility inspection information, EPA databases, state databases.

Inspectors should also determine the applicability of existing checklists specific to the facility being inspected such as checklists developed by EPA in sector-specific RMP guidance may be used (e.g., ammonia refrigeration, publicly owned treatment works, chemical warehouses, propane users). Inspectors should also familiarize themselves with industry and government standards specific to the facility (e.g., standards developed by OSHA, NFPA, and ANSI).

Planning the Inspection

An on-site inspection might include review of programs and records, verification of data, interviews with employees, and analysis of prevention measures. See the following table of potential inspection components for suggestions.

Table 3: Potential Inspection Components	
Review	• accident history • incident investigation reports, and documentation of corrective measures taken • preventive maintenance program • process hazard analysis or hazard review, including review of safety information and risk scenarios • soundness of air modeling results • operation and maintenance records, inspection procedures, and repairs records • training records and review of emergency plan exercise program • emergency response program capabilities, including exercises, equipment, training, off-site programs, public notification, procedures, and communication with local emergency responders • management of change program, pre-start review program, employee participation program, hot work permit program, and contractor employee training
Verify	• facility classification and program designation • air modeling methods and results • model input parameters • mitigation measures and systems • process enhancements, including facility-conducted compliance inspection results and recommendations
Evaluate	• additional (unreported) covered processes
Engineering review	• processes
Engineering analyses	• release prevention measures
Engineering verification	• mitigation measures, design parameters

Prepare Inspection Staff and Plan Logistics

The lead inspector should hold a pre-visit meeting with all inspectors as close to the date of the inspection as possible. By this time, all inspectors should be familiar with this guidance and any information they have collected about the facility to be inspected and its processes. Additional information to be obtained at the facility should be identified and inspectors should develop individual plans for conducting their portion of the inspection. For extensive inspections, the pre-visit meeting should:

- Establish the entry authority of each inspector;
- Review each inspector's area of responsibility;
- Review the inspection objectives and highlight areas of special interest;
- Review any site-specific personal health and safety issues, and complete, if necessary, a site safety plan for on-site activities;
- Review information about key personnel and operations at the site;

- Establish an agenda for each day of the site visit;
- Review logistical matters (e.g., nightly team meetings to discuss results and plan the next day's activity);
- Review the RMP submitted by the facility and preliminarily evaluate compliance with regulatory requirements;
- Arrange for proper management of confidential business information (CBI); and
- Cover any additional topics.

The lead inspector should also:

- Develop site-specific guidance, if needed;
- Reserve work space and equipment at the facility;
- Develop employee interview questionnaires, if an interview is planned; and
- Schedule opening meetings, closing meetings, and daily debriefings.

Step (3): At the Site

Entering the Facility

Upon entering the facility, the inspector(s) should present official credentials. The inspector(s) should not relinquish credentials or allow photocopying of them. The inspector(s) should arrive at the facility during normal working hours. The inspector(s) may sign a "sign-in" sheet, log, or visitor register. However, the inspector(s) must not sign any type of "waiver" or "visitor release" which would relieve the facility of responsibility for injury or limit the rights of the inspecting agencies to collect or use data obtained from the facility. If a waiver or release is presented, the lead inspector should explain that such a document will not be signed and request a blank "sign-in" sheet. If the inspector(s) is refused entry as a result of not signing the release, the lead inspector should report all pertinent facts to the implementing agency's legal counsel. If the matter cannot be resolved, the inspector(s) should leave the facility. All events surrounding the refused entry must be fully documented, including the name(s) and title(s) of the person(s) refusing entry, and the stated reason for denying access to the facility. The inspector(s) should also document any observations made at the facility prior to the denial of entry.

In addition to presenting official credentials, the lead inspector may also present a Notice of Inspection to provide further clarification to the facility that the purpose of the inspection is to determine compliance with CAA Section 112(r) as well as with CERCLA Section 103(e) and EPCRA Sections 302 -312.

Once credentials have been presented and entry gained, the lead inspector should advise the owner/operator that CAA Section 112(r) requires employee representatives be given an opportunity to participate in the physical inspection of the facility (as referenced in the NOI if advance notification had been provided). As soon as practicable after entering the facility, the lead inspector should determine whether the facility employees are represented and, if so, offer the employee representative(s) an opportunity to participate in the on-site inspection.

If employees are not represented by an authorized representative or employees have not chosen a representative for the Section 112(r) inspection (e.g., chosen by employees at large or through an established employee safety committee), the lead inspector should determine, if able, the employee(s) who may serve as employee representative(s) for purposes of the inspection. If the lead inspector is unable to make such a determination, the inspector(s) should interview during the course of the inspection a reasonable number of employees the inspector(s) deems necessary to conduct the inspection.

Pursuant to CAA Section 112(r)(6)(L) and the OSH Act, the employee representative is to be an employee of the employer. Having an employee who works at the facility and has knowledge of the Risk Management Program participate in the inspection may assist the inspector(s) in evaluating compliance with CAA Section 112(r) requirements. However, if the inspector(s) determines that good cause has been shown why accompaniment by a third party who is not an employee of the employer is reasonably necessary to the conduct of an effective and thorough physical inspection of the workplace, such third party may accompany the inspector(s) during the inspection. The determination to include a third party is at the discretion of the inspector(s).

The lead inspector should document in the inspection report the offer to employees and employee representatives the opportunity to participate in the Section 112(r) inspection.

- The inspection should not be postponed or unreasonably delayed if an employee representative is unavailable when the inspector(s) arrives to begin the on-site visit. The reason for an employee representative not being available to participate in the inspection should be noted in the inspection report

(e.g., representative is not present at facility; representative does not accept offer to join inspection due to participation in an ongoing strike or labor dispute.)

If management personnel attempt to interfere with participation by employees and employee representatives in the inspection, the lead inspector should advise management that such participation, as indicated in the NOI letter, is a statutory right pursuant to CAA Section 112(r)(6)(L). Any attempt by management to interfere in such participation should be documented in the inspection report. Depending upon the nature and scope of the management interference, the lead inspector may determine the interference to be a refusal to permit the inspection.

Opening Meeting

The inspector(s) should conduct a joint opening meeting with management personnel (e.g., plant manager, superintendents of safety and operations, legal counsel, corporate representative) and the employee representative(s). The lead inspector should clearly explain the purpose and objectives of the inspection.

- If either management personnel or the employee representatives object to a joint opening meeting, the inspector(s) should conduct separate opening meetings.

The lead inspector may give management personnel and employee representative(s) each a copy of this guidance to help them understand the scope, purpose, and objective of the inspection. In addition, this guidance may help management personnel and employee representatives in assembling information to be reviewed by the inspector(s). At a minimum, the following items should be addressed during the opening meeting:

- Discussion of entry and information gathering authorities;
- Inspection purpose and objectives;
- On-site agenda;
- Identification and management of CBI;
- Information necessary to conduct the inspection;
- Safety issues (e.g., facility-specific safety orientation training, emergency response procedures and alarms that may sound in an emergency); and
- Schedule for closing conference.

The inspector(s) should also request a detailed overview of the chemical processes and/or manufacturing operations at the facility, including block flow and/or process flow diagrams indicating chemicals and processes involved.

Prior to walking around the facility, the inspector(s) should request an explanation of the facility's Risk Management Program, including, at a minimum:

- How the elements of the program are implemented;
- Personnel who are responsible for the implementation of the various elements of the program; and
- A description of the facility's records documenting compliance.

At the conclusion of the opening meeting, the lead inspector should request access to the following information, where applicable:

- Documentation for the hazard assessment, including selection of model and procedures followed;
- Documentation supporting reports under the five-year accident history (e.g., follow-up release reports, initial notifications);
- Documentation for the process hazards analysis or hazard review;
- Standard operating procedures;
- Training records (e.g., hazard communication, emergency response) for all employees;
- Pre-startup safety review;
- Integrity or preventive maintenance records;
- Hot work permit program;
- Written procedures to manage change to processes;
- Plan of action for implementation of employee participation;
- Written process safety information;
- Incident investigation reports;
- The emergency response plan developed by the facility;
- The two most recent compliance audit reports; and
- Documentation on coordination with local officials on emergency response activities.

Collecting and Analyzing Information

After the opening meeting, the inspector(s) may accomplish their tasks individually or in small groups, performing their work as quickly and efficiently as possible. Special attention should be paid to:

- Verifying the reported program level; and
- Comparing the facility's RMP to policies and procedures actually implemented, especially for production or equipment changes.

Annex D, Inspection Checklist (on page D-1) may be used as guidance to ensure regulatory requirements are met and a basic level of data quality is achieved. However, this checklist is not intended to be comprehensive of all applicable requirements. Accordingly, the checklist is not a substitute for knowledge and understanding of the regulations.

Confidential Business Information

- During the course of the inspection, inspector(s) may have access or obtain information that may be entitled to confidential treatment.
- It is the source's responsibility to identify this information as Confidential Business Information (CBI) to the inspector(s), in accordance with the Risk Management Program regulations.
- This information will be handled in accordance with the implementing agency's procedures (e.g., 40 CFR Part 2 for EPA personnel).
- Before visiting the site, inspector(s) should check to see if their agency has training or programs on handling CBI.

During the inspection, a variety of materials will be gathered relating to operations at the facility. These materials should be referenced in the inspection report and maintained in a central file. Examples of the types of material that might be included are:

- Sample facility memoranda, guidelines, safe operating procedures, policy statements (e.g., safety practices, Responsible Care);
- Correspondence between the facility and the implementing agency; or
- Graphic materials such as photographs, maps, charts, plot plans, organizational charts.

All materials should be labeled with:

- Name of facility;
- Names of inspection team members;
- Date of inspection; and
- Other identifying information.

While collecting information, and in order to aid the inspection without causing interference to the conduct of the inspection, the inspector(s), as provided by Section 112(r)(6)(L), may determine the following is appropriate:

- To permit additional employer and employee representatives to participate in the inspection.
- To permit different employer and employee representatives to participate in the inspection as the inspector(s) visits different areas of the workplace. For example,
  - » Provide for participation of employees who have familiarity with specific work areas or have expertise with certain process units.
  - » Address issues concerning workplace areas containing confidential business information or trade secrets by including employees in the inspection who are authorized to have access to those areas.

To provide for an effective inspection and to assist in the collection and analysis of information, the inspector(s) may interview employees. As statutorily provided, such employee interviews may be conducted privately. Consent by management personnel to conduct private employee interviews is not necessary. Any interference by management personnel with the ability of the inspector(s) to conduct private interviews should be documented in the inspection report. Such interference includes attempts by management to be present during private interviews.

- Employee interviews should occur during normal working hours and at other reasonable times during or after the on-site visit at the facility or at an alternate location agreed upon between the inspector and employee.
- The inspector interviewing an employee should provide the employee with contact information (e.g., a business card). While the NOI letter should include contact information, the lead inspector also should provide such contact information to the employee representative(s).

- The inspector(s) should inform employees and employee representatives participating in the inspection that only matters related to the inspection (e.g., workplace hazards; processes; emissions units) are to be discussed.

During the course of the inspection, the inspector(s) has the statutory right to deny participation in the inspection to any person whose conduct interferes with a fair and orderly inspection. Such denial should be documented and explained in the inspection report.

Personal Protective Equipment (PPE)

In addition to normal protective equipment (e.g., safety shoes, hard hats, goggles), inspector(s) may need special equipment:

- Flame-retardant coveralls in all areas of the facility where there is potential for flash fires and as may be required by facility policy;
- Emergency escape respirators during the walk-around portion of the inspection (personnel conducting these inspections should have received proper training in the use of emergency escape respirators);
- Alert monitors approved for the environment where they will be used (e.g., HCN, Cl2); and
- Electronic equipment (e.g., still cameras, video cameras, cellular phones) that are safe for use in the process areas being inspected.

Inspectors should follow facility guidance relative to the appropriate use of PPE and request notice of any unusual conditions which may dictate specific precautions.

Closing Conference

Prior to the closing conference, the inspector(s) should meet privately to review preliminary inspection observations and establish topics for the conference. Significant observations should be presented to management personnel and employee representatives. Any issues requiring clarification should be listed for discussion with the management personnel and employee representatives. The lead inspector will determine what should be communicated during the closing conference.

The inspector(s) should conduct the closing conference with management personnel (e.g., plant manager, superintendents of safety and operations, legal counsel, corporate representative) and the employee representative(s). Other employees who participated in the inspection should also be invited to the closing conference.

Closing Conference

- Maintain a professional courteous demeanor.
- Make management and employee representative(s) aware of helpful standards, guidelines, or resources.
- Alert management and employee representative(s) to situations requiring immediate remediation.
- Avoid implying a "consulting" relationship.
- Do not state that violations have been observed.
- Avoid statements that affect subsequent enforcement actions.

- If either management personnel or the employees/ employee representatives object to a joint closing conference, the inspector(s) should conduct separate closing conferences.

The inspector(s) should use the closing conference to gather additional information, answer questions and verbally communicate preliminary inspection observations. The closing conference provides an opportunity for management personnel and employee representatives to enhance their ability to take timely action to correct deficiencies as a result of receiving preliminary inspection observations and appropriate compliance assistance.

The inspector(s) should maintain a professional, courteous demeanor throughout the inspection, including the closing conference. The inspector(s) should ensure management personnel and employee representatives are aware of any standards, guidelines, or resources that would be helpful in improving the facility Risk Management Program. However, the inspector(s) should be careful to avoid making suggestions which imply a "consultant" type of relationship, such as endorsing one product or firm exclusively.

The inspector(s) should never state that the facility is "in compliance" or that "violations" have been observed. Determining that a violation has occurred is done after the inspection by the appropriate enforcement program in consultation with legal counsel. The inspector(s) should not make any representations that could affect subsequent enforcement actions against the facility (e.g., guaranteeing no enforcement will be taken if a facility performs certain actions to correct a deficiency).

- In addition to verbally communicating preliminary inspection observations, the inspector(s), consistent with regional practice, may provide written information concerning such observations during the closing conference or after conclusion of the inspection. However, this information should not identify or characterize such observations as "violations."
- An "in-compliance" letter should not be sent to a facility.

The lead inspector should alert management personnel and employee representatives to situations that are in need of immediate remediation (e.g., improper storage of incompatible chemicals).

The lead inspector should document in the inspection report whether a closing conference was conducted and, if so, with whom. If a closing conference was not conducted, the report should include the reasons why the conference was not conducted and confirm that contact information was left.

Step (4): Concluding Activities

Follow-up Meeting

The inspector(s) should meet as soon as possible after completion of the site visit to ensure details of the inspection are accurately recorded. At a minimum, inspector(s) should:

- Immediately review and edit personal notes taken during the site visit for clarity and completeness;
- Review report format, and identify any additional information needed to complete the report;
- Review all important preliminary observations and facts obtained;
- Agree on a date for the final report;
- Differentiate recommendations from any observed potential noncompliance; and
- Resolve recommendations that are not supported by team consensus.

Inspection Report

Sufficient documentation of the inspection is to be provided to allow for a compliance determination to be made. To ensure sufficient documentation with complete information, the inspection report documenting a Section 112(r) inspection should include the following basic elements. Annex D, Inspection Checklist (on page D-1) may be helpful and also may be used as a component of the inspection report.

- A basic profile of the facility and general information about the inspection:
  - » Facility name, location, mailing address;
  - » Facility contact, phone number, e-mail address;
  - » Employee representative(s), phone number(s), e-mail address(es);
    - Nature, extent, and substance of the employee(s) and employee representative(s) involvement;
  - » Date of inspection and name of inspector(s);
  - » Inspection activities – e.g., processes and emission units evaluated; on-site observations; employee interviews; whether compliance assistance was provided and if so, nature of assistance; any action taken by facility to come back into compliance during on-site visit;
- Date and program levels of submitted RMP;
- A description of the criteria, rationale, and factual information used to select the facility for an inspection (including information on enforcement actions resulting from previous Section 112(r) inspections); and
- Observations and recommendations.

Each observation should be supported and documented with information collected through such activities as document reviews, sampling, interviews and/or facility walkthroughs. The inspector(s) should only provide factual observations without any legal conclusions about whether there were violations or deficiencies. Preliminary inspection observations should be accompanied by recommendations based upon a comparative

analysis of the observation with applicable rules, regulations, standards, and accepted guidance. Each recommendation should cite the specific rules, regulations, standards, accepted guidance, or technical basis used to formulate the recommendation. If more than one inspector participated in the inspection, the lead inspector should consult with appropriate personnel in the implementing agency to determine if recommendations that are not supported by team consensus should be included. Each inspector should sign the report. The original report should be maintained by the implementing agency. When finalized, a copy of the report may be provided, consistent with Regional practice, to facility owners/operators; employee representatives; the State Emergency Response Commission; the Local Emergency Planning Committee in whose area the facility is located; and/or other federal, state, and local agencies as appropriate. However, when considering whether to provide an inspection report, the regional office must take into account the necessity to ensure trade secrets and confidential business information are protected pursuant to statutory requirements and implementing agency regulations and policies. Also, any potential enforcement action is not to be compromised when providing an inspection report.

Step (5): Post-Inspection Actions

Post-inspection actions will largely depend on the observations of the inspector and the information obtained during the inspection. If observations and other information support the determination of violations, there are several types of enforcement actions among which the implementing agency may choose to pursue. Such actions include, for example, notices of violations, administrative orders, monetary fines and penalties, injunctive relief, and supplemental environmental projects. Implementing agencies should consult applicable enforcement response policies in order to determine appropriate enforcement actions.

Inspections do not necessarily result in enforcement actions. If the implementing agency concludes that enforcement action is not warranted (e.g., only minor deficiencies are discovered during the inspection), the implementing agency may choose to take no post-inspection actions or to provide compliance assistance. Such assistance could include providing training, regulatory guidance, reference materials, or other information to the facility owner/operator. Since implementing agencies have discretion in regulatory enforcement matters, inspectors, case development officers and legal counsel should work in a coordinated manner when determining the appropriate enforcement response.

ANNEXES

Annex A:
RMP Audits Conducted Pursuant to 40 CFR Part 68.220

Annex B:
Site Safety Plan for On-Site Activities

Annex C:
Inspection Report

Annex D:
Inspection Checklist

Annex E:
Risk Management Program and OSHA PSM:
List of Regulated Substances

Annex A: RMP Audits Conducted Pursuant to 40 CFR Part 68.220

This Annex describes the process for conducting audits in accordance with 40 CFR Part 68.220. In general, the guidelines contained in the main document may be applied to both inspections and audits. However, Part 68.220 contains specific guidance to implementing agencies on selecting facilities for RMP audits, as well as on resolving audit findings.

Selecting Facilities for RMP Audits

Under 68.220(b), the implementing agency may select facilities for audits based on any of the following criteria:

1. Accident history;
2. Accident history of other facilities in the same industry;
3. Quantity of regulated substances;
4. Location and proximity to the public and environmental receptors;
5. Presence of specific regulated substances;
6. Hazards identified in the RMP; or
7. A plan providing for neutral, random oversight.

Related criteria could include the number of accidental releases, whether there have been any catastrophic accidental releases, and the known toxicity of chemicals used in the processes.

Facilities with a "Star" or "Merit" ranking under OSHA's voluntary protection program are exempt from audits based solely on criteria (2) and (7). However, these facilities may be audited based on any of the other five criteria [68.220(c)]. Each implementing agency should develop a targeting system, based on their resources and priorities.

Under 40 CFR 68.220(d), the implementing agency shall have access to the facility, supporting documentation, and any area where an accidental release could occur.

After-Audit Actions

Preliminary Determination

Based on the results of the audit, the implementing agency may issue the owner or operator a written preliminary determination of necessary revisions to the facility's RMP to ensure that the RMP meets the criteria of 40 CFR Part 68, Subpart G. The preliminary determination should include an explanation of the basis for the revisions, reflecting applicable industry standards and guidelines (such as American Institute of Chemical Engineers (AIChE)/Center for Chemical Process Safety (CCPS) guidelines and American Society of Mechanical Engineers (ASME) and American Petroleum Institute (API) standards). The preliminary determination should also include a timetable for the implementation of the revisions [68.220(e)].

The owner or operator should respond in writing to the preliminary determination. The response should state that the owner or operator will implement the revisions contained in the preliminary determination in accordance with the timetable included in the preliminary determination, or should state that the owner or operator rejects the revisions in whole or in part. For each rejected revision, the owner or operator should explain the basis for rejecting that revision. Such explanation may include substitute revisions [68.220(f)(1)].

The owner or operator should submit the written response to the implementing agency within 90 days of issuance of the preliminary determination. The implementing agency may specify a shorter period of time in the preliminary determination to protect public health and the environment. Prior to the written response being due and upon written request from the owner or operator, the implementing agency may provide additional time for the response to be received [68.220(f)(2)].

Final Determination

After providing the owner or operator an opportunity to respond to the preliminary determination, the implementing agency may issue the owner or operator a written final determination of necessary revisions to the facility's RMP. The final determination may adopt or modify the revisions contained in the preliminary determination, or may adopt or modify the substitute revisions provided in response to the preliminary determination. A final determination that adopts a revision rejected by the owner or operator should include an explanation of the basis for the revision. A final determination that fails to adopt a substitute revision provided under 68.220(f) should include an explanation of the basis for finding such substitute revision unreasonable [68.220(g)].

Thirty days after completion of the actions detailed in the implementation schedule set in the final determination, the owner or operator will be in violation of subpart G of part 68 unless the owner or operator revises the RMP, as required by the final determination, and submits the revised RMP [68.220(h)].

Once a final determination has been made and the facility is deemed to be in violation of 40 CFR Part 68, the audit report along with the final determination should be referred to the appropriate program within the implementing agency for enforcement actions. If warranted, the implementing agency may initiate an enforcement action, rather than use the preliminary and final determination process.

The public should have access to the preliminary determination, response, and final determination pursuant to 42 U.S.C. 7414(c) [68.210(a), 68.220(i)]. The disclosure of classified information by the Department of Defense or other federal agencies or contractors of such agencies will be controlled by applicable laws, regulations, or executive orders concerning the release of classified information [68.210(b)].

None of the actions described above will preclude, limit, or interfere in any way with the authority of the implementing agency to exercise its enforcement, investigatory, and information gathering authorities under the CAA concerning accidental releases [68.220(j)].

Annex B: Site Safety Plan for On-Site Activities

The EPA Safety Manual and other EPA policies articulate certain safety planning efforts prior to field activities. The following format is consistent with these requirements. Extensive training and certifications, and further planning in the form of a more extensive Site Safety Plan, may be necessary in addition to the following plan.

FACILITY:

LEAD INSPECTOR:

DATE:

DESCRIPTION OF ACTIVITIES

Location and approximate size of facility:

Description of activities to be performed by each of the inspectors:

Proposed date of on-site activities beginning:

Duration of the planned activities:

Site topography:

Site accessibility by roads and air:

HAZARDOUS SUBSTANCES AND HEALTH HAZARDS INVOLVED OR SUSPECTED AT THE SITE

(Fill in any information that is known or suspected)

AREAS OF CONCERN	CHEMICAL AND PHYSICAL PROPERTIES	IDENTITY OF SUBSTANCE AND PRECAUTIONS
Explosivity		
Radioactivity		
Oxygen deficiency (e.g., confined spaces)		
Toxic gases		
Skin/eye contact hazards		
Heat stress		

Pathways from site for hazardous substance dispersion:

WORK PLAN INSTRUCTIONS

Recommended level of protection:

☐ A

☐ B

☐ C

Cartridge type if level C:

Monitoring equipment to be used:

Accompanying/helping persons (facility/contractors):

Safety clothing/equipment required for those persons:

OSHA required training and certification (29 CFR 1910.120) received by those persons:

FIELD INVESTIGATION AND DECONTAMINATION PROCEDURES

Decontamination procedures (e.g., contaminated protective clothing, instruments, equipment):

Disposal procedures (e.g., contaminated equipment, supplies, disposable items, washwater):

EMERGENCY CONTACTS

Hospital Name/Location: _____

Hospital Phone No.:_____

Fax: _____

Emergency Medial Treatment Phone No.: _____

Fax: _____

Ambulance Phone No.: _____

Fax: _____

Police Phone No.: _____

Fire Assistance Phone No.: _____

Regional Health and Safety Officer
(or position with similar duties): _____

Phone No.: _____

Annex C: Inspection Report

Note: A report similar to this will be generated by RMP*Review, the software available to RMP implementing agencies.

EPA facility ID #:

City: _____ State: _____ County: _____

Date: _____

INSPECTION TEAM:

Lead Inspector: _____

Inspectors: _____

Date(s) of facility visit: _____

I. FACILITY IDENTIFICATION

Name: _____

Street Address: _____

City: _____ State: _____ County: _____

Zip: _____

Latitude: _____ Longitude: _____

Dun & Bradstreet (D&B) No.: _____

Name, address, and D&B of corporate parent company (if applicable): _____

_____

Owner/operator: _____ Phone No.: _____

E-mail Address: _____

Mailing Address: _____

City: _____ State: _____ Zip: _____

Contact information of person responsible for 40 CFR Part 68 implementation:

Name: _____ Title: _____ Phone No.: _____

E-mail Address: _____

Name and title of emergency contact: _____

Name: _____ Title: _____

Day Phone: _____ 24-hour Phone: _____ Cell: _____

E-mail Address: _____

Names, titles, phone numbers and e-mail addresses of facility personnel/employee representatives involved in inspection. Include information on nature, extent, and substance of such involvement (e.g., accompanied site tours; provided documents and explanatory information; participated in interviews):

II. DATE AND PROGRAM LEVELS OF SUBMITTED RMP

Date of Initial Submission: ___ ___ / ___ ___ / ___ ___

Date of Latest Update: ___ ___ / ___ ___ / ___ ___

Process (Program 1, 2, 3) as reported in RMP:

Process ID#: Program Level: NAICS Code:

CRITERIA, RATIONALE, and FACTUAL INFORMATION used to select the facility for an inspection (including information on enforcement actions resulting from previous Section 112(r) inspections:

III. INSPECTION ACTIVITIES

(e.g., processes and emission units evaluated; on-site observations; employee interviews; whether compliance assistance was provided and if so, nature of assistance; any action taken by facility to come back into compliance during on-site visit):

IV. OBSERVATIONS AND RECOMMENDATIONS

Signatures:

Lead Inspector: _____

Inspectors: _____

Approved by:

Signature: _____ Date: _____

Title: _____

* Observations and recommendations may be presented in one or more attachments and referred to in the report.

Annex D: Inspection Checklist

Process inspected: _____

Inspector: _____

Instructions: This checklist may be used for verification of RMP and Program compliance (Check boxes coding: Y=Yes, N=No, P=Partial, A=Not Applicable)

Note: Compliance Objectives are listed in the order they appear in the RMP rule

Compliance Objectives **Notes**

1. RISK MANAGEMENT PROGRAM AND PLAN (SUBPART A) [68.1 – 68.15]

Applicability [68.1]

___ 1.1 Does the owner or operator of the stationary source have more than a threshold quantity of a regulated substance in a process? [68.10(a)]

___ 1.2 Has the process had, in the five years prior to submission of the RMP, an accidental release of a regulated substance where exposure to the substance, its reaction products, overpressure generated by an explosion involving the substance, or radiant heat generated by a fire involving the substance led to any of the following off-site:

(i) Death; (ii) Injury; or (iii) Response or restoration activities for an exposure of an environmental receptor? [68.10(b)(1)]

___ 1.3 Is the distance to a toxic or flammable endpoint for a worst-case release assessment less than the distance to any public receptor? [68.10(b)(2)]

___ 1.4 Has the owner or operator coordinated emergency response procedures between the stationary source and local emergency planning and response organizations? [68.10(b)(3)]

___ 1.5 Is the covered process subject to OSHA PSM standard, 29 CFR 1910.119? [68.10(d)(2)]

___ 1.6 Is the covered process in one of the NAICS codes listed in 40 CFR §68.10(d) (1)? [68.10(d)(1)]

Inspector may need to re-answer 1.5 and 1.6 for multiple processes in comments section.

___ 1.7 Has the owner or operator submitted a single RMP, which included a registration that reflects all covered processes, as provided in 68.150 to 68.185? [68.12(a)]

1.8 For Program 1 processes inspected, has the owner or operator: [68.12(b)]

___ 1.8.1 Analyzed the worst-case release scenario for the process(es), as provided in 68.25; [68.12(b)(1)]

___ 1.8.2 Documented that the nearest public receptors is beyond the distance to an endpoint defined in 68.22(a); and [68.12(b)(1)]

___ 1.8.3 Included the scenario(s) in the RMP as provided in 68.165? [68.12(b)(1)]

___ 1.8.4 Completed the five-year accident history for the process as provided in 68.42 [68.12(b)(2)]; and

___ 1.8.5 Included the history in the RMP as provided in 68.168? [68.12(b)(2)]

___ 1.8.6 Ensured that response actions have been coordinated with local emergency planning and response agencies? [68.12(b)(3)]

___ 1.8.7 Included the appropriate certification statement for Program 1 processes? [68.12(b)(4)]

1.9 For Program 2 processes, has the owner or operator: [68.12(c)]

___ 1.9.1 Developed and implemented a management system as provided in 68.15? [68.12(c)(1)]

___ 1.9.2 Conducted a hazard assessment as provided in 68.20 through 68.42? [68.12(c)(2)]

___ 1.9.3 Implemented the Program 2 prevention steps provided in 68.48 through 68.60 or implemented the Program 3 prevention steps provided in 68.65 through 68.87? [68.12(c)(3)]

___ 1.9.4 Developed and implemented an emergency response program as provided in 68.90 to 68.95? [68.12(c)(4)]

___ 1.9.5 Submitted, as part of the RMP, the data on prevention program elements for Program 2 processes as provided in 68.170? [68.12(c)(5)]

1.10 For Program 3 processes, has the owner or operator: [68.12(d)]

___ 1.10.1 Developed and implemented a management system as provided in 68.15? [68.12(d)(1)]

___ 1.10.2 Conducted a hazard assessment as provided in 68.20 through 68.42? [68.12(d)(2)]

___ 1.10.3 Implemented the prevention requirements provided in 68.65 through 68.87? [68.12(d)(3)]

___ 1.10.4 Developed and implemented an emergency response program as provided in 68.90 to 68.95? [68.12(d)(4)]

___ 1.10.5 Submitted, as part of the RMP, the data on prevention program elements for Program 3 processes as provided in 68.175? [68.12(d)(5)]

Compliance Objectives **Notes**

Management [68.15]

Has the owner or operator:

___ 1.11 Developed a management system to oversee the implementation of the Risk Management Program elements? [68.15(a)]

___ 1.12 Assigned a qualified person or position that has the overall responsibility for the development, implementation, and integration of the Risk Management Program elements? [68.15(b)]

___ 1.13 Documented other persons responsible for implementing individual requirements of the Risk Management Program and defined the lines of authority through an organization chart or similar document? [68.15(c)]

Findings:

_____

_____

_____

Documentation obtained to support Findings:

_____

_____

_____

Compliance Objectives **Notes**

2. RMP SUBMISSION (SUBPART G) [68.150 – 68.190]

___ 2.1 Did the owner or operator submit an RMP on or before June 21, 1999? Postmark date of initial submission: [68.10, 68.10(a)(1), 68.150(a) & (b)]

If submission was after June 21, 1999, was submittal required because: [68.10 & 68.150(b)]

___ 2.1.1 Initial listing of a regulated substance under 68.130 after June 21, 1999 [68.10(a)(2) & 68.150(b)(2)]

___ 2.1.2 A regulated substance was first present at the stationary source above the threshold quantity in a process [68.10(a)(3) & 68.150(b)(2)]

___ 2.2 Has the owner or operator revised and updated the RMP within 5 years of initial submission? Date of the last revision and update [68.190(a)]:

2.3 If required, has the owner or operator submitted a revised RMP for any of the following: [68.190(b)]

___ 2.3.1 Within 3 years after EPA first listed a newly regulated substance? [68.190(b)(2)]

___ 2.3.2 No later than the date on which a new regulated substance is first present in an already covered process above a threshold quantity? [68.190(b)(3)]

___ 2.3.3 No later than the date on which a regulated substance is first present above a threshold quantity in a new process? [68.190(b)(4)]

___ 2.3.4 Within six months of a change that requires a revised PHA or hazard review? [68.190(b)(5)]

___ 2.3.5 Within six months of a change that requires a revised off-site consequence analysis as provided in 68.36? [68.190(b)(6)]

___ 2.3.6 Within six months of a change that alters the Program level that applied to any covered process? [68.190(b)(7)]

___ 2.4 Has the owner or operator included information submitted as CBI in the RMP? [68.150(d)]

___ 2.4.1 If so, were the provisions of 68.151 and 68.152 followed?

RMP: Executive Summary [68.155]

2.5 Has the owner or operator included a brief description of the following elements in the executive summary of the RMP: [68.155]

___ 2.5.1 The accidental release prevention and emergency response policies at the stationary source? [68.155(a)]

___ 2.5.2 The stationary source and regulated substances handled? [68.155(b)]

___ 2.5.3 The general accidental release prevention program and chemical-specific prevention steps? [68.155(c)]

___ 2.5.4 The five-year accident history? [68.155(d)]

___ 2.5.5 The emergency response program? [68.155(e)]

___ 2.5.6 Planned changes to improve safety? [68.155(f)]

RMP: Registration [68.160]

___ 2.6 Has the owner or operator included a single registration form in the RMP which covers all regulated substances handled in covered processes? [68.160(a)]

2.7 Does the registration include the following data: [68.160(b)]

___ 2.7.1 Stationary source name, full address, Dun and Bradstreet number; longitude and latitude with method and description? [68.160(b)(1) & (2)]

___ 2.7.2 Corporate parent company name and Dun and Bradstreet number? [68.160(b)(3)]

___ 2.7.3 The name, telephone number, and mailing address of the owner or operator? [68.160(b)(4)]

___ 2.7.4 The name and title of the person or position with overall responsibility for RMP elements and implementation? [68.160(b)(5)]

___ 2.7.5 The name, title, telephone number, and 24-hour number of the emergency contact? [68.160(b)(6)]

___ 2.7.6 For each covered process, the name and CAS number of each regulated substance held above the threshold quantity in the process, the maximum quantity of each regulated substance or mixture in the process, the NAICS code, and the Program level of the process? [68.160(b)(7)]

___ 2.7.7 The stationary source EPA identifier? [68.160(b)(8)]

___ 2.7.8 The number of full-time employees at the stationary source? [68.160(b)(9)]

___ 2.7.9 Whether the stationary source is subject of 29 CFR §1910.119, OSHA's Process Safety Management Standard? [68.160(b)(10)]

___ 2.7.10 Whether the stationary source is subject to 40 CFR Part 355, the Emergency Planning Requirements of the Emergency Planning and Community Right-to-Know Act? [68.160(b)(11)]

___ 2.7.11 If the stationary source has a CAA Title V operating permit, its permit number? [68.160(b)(12)]

___ 2.7.12 The date of the last safety inspection of the stationary source by a Federal, state, or local government agency and the identity of the inspecting entity? [68.160(b)(13)]

RMP: Off-site Consequence Analysis [68.165]

2.8 Does the RMP include the following: [68.165(a)]

___ 2.8.1 One worst-case release scenario for each Program 1 process? [68.165(a)(1)]

___ 2.8.2 For Program 2 and 3 processes, one worst-case release scenario to represent all regulated toxic substances held above the threshold quantity and one worst-case release scenario to represent all regulated flammable substances held above the threshold quantity? [68.165(a)(2)]

___ 2.8.3 For Program 2 and 3 processes, were additional worst-case scenarios also submitted, if required by 68.25(a)(2)(iii)? [68.165(a)(2)]

___ 2.8.4 For Program 2 and 3 processes, was information submitted on one alternative scenario for each regulated toxic substance held above the threshold quantity and one alternative scenario to represent all regulated flammable substances held above the threshold? [68.165(a)(2)]

2.9 Does the RMP include the following information for each submitted release scenario: [68.165(b)]

___ 2.9.1 Scenario type (explosion, fire, toxic gas release, or liquid spill and vaporization)? [68.165(b)(5)]

___ 2.9.2 Chemical name of released substance? [68.165(b)(1)]

___ 2.9.3 Percentage weight of the chemical in a liquid mixture (toxics only)? [68.165(b)(2)]

___ 2.9.4 Physical state of substance (toxics only)? [68.165(b)(3)]

___ 2.9.5 Basis of results (model name if used)? [68.165(b)(4)]

___ 2.9.6 Quantity released in pounds? [68.165(b)(6)]

___ 2.9.7 Release rate? [68.165(b)(7)]

___ 2.9.8 Release duration? [68.165(b)(8)]

___ 2.9.9 Wind speed and atmospheric stability class (toxics only)? [68.165(b)(9)]

___ 2.9.10 Topography (toxics only)? [68.165(b)(10)]

___ 2.9.11 Distance to endpoint? [68.165(b)(11)]

___ 2.9.12 Public and environmental receptors within the distance? [68.165(b)(12)]

___ 2.9.13 Passive mitigation considered? [68.165(b)(13)]

___ 2.9.14 Active mitigation considered (alternative releases scenarios only)? [68.165(b)(14)]

RMP: Five-Year Accident History [68.168]

___ 2.10 Has the owner or operator provided the five-year accident history information in 68.42 on each accident covered by 68.42? [68.168]

___ 2.11 Does the RMP include the following information for each reported accidental release: [68.42(b)]

___ 2.11.1 Date, time, and approximate duration of the release? [68.42(b)(1)]

___ 2.11.2 Chemical(s) released? [68.42(b)(2)]

___ 2.11.3 Estimated quantity released in pounds and percentage weight in a mixture (toxics)? [68.42(b)(3)]

___ 2.11.4 NAICS code for the process? [68.42(b)(4)]

___ 2.11.5 The type of release event and its source? [68.42(b)(5)]

___ 2.11.6 Weather conditions (if known)? [68.42(b)(6)]

___ 2.11.7 On-site impacts? [68.42(b)(7)]

___ 2.11.8 Known offsite impacts? [68.42(b)(8)]

___ 2.11.9 Initiating event and contributing factors (if known)? [68.42(b)(9)]

___ 2.11.10 Whether offsite responders were notified (if known)? [68.42(b)(10)]

___ 2.11.11 Operational or process changes that resulted from investigation of the release? [68.42(b)(11)]

RMP: Prevention Program/Program 2 [68.170]

2.12 Has the owner or operator included the following information for each covered process in Program 2: [68.170(a)]

___ 2.12.1 The NAICS code for the process? [68.170(b)]

___ 2.12.2 The name(s) of the chemical(s) covered? [68.170(c)]

___ 2.12.3 The date of the most recent review or revision of the safety information and a list of Federal or state regulations or industry-specific design codes and standards used to demonstrate compliance with the safety information requirement. [68.170(d)]

___ 2.12.4 The date of completion of the most recent hazard review or update? [68.170(e)]

___ 2.12.4.1 The expected date of completion of any changes resulting from the hazard review or update? [68.170(e)(1)]

___ 2.12.4.2 Major hazards identified? [68.170(e)(2)]

___ 2.12.4.3 Process controls in use? [68.170(e)(3)]

___ 2.12.4.4 Mitigation systems in use? [68.170(e)(4)]

___ 2.12.4.5 Monitoring and detection systems in use? [68.170(e)(5)]

___ 2.12.4.6 Changes since the last hazard review? [68.170(e)(6)]

___ 2.12.5 The date of the most recent review or revision of operating procedures? [68.170(f)]

___ 2.12.6 The date of the most recent review or revision of training programs? [68.170(g)]

___ 2.12.6.1 The type of training provided--classroom, classroom plus on the job, on the job? [68.170(g)(1)]

___ 2.12.6.2 The type of competency testing used? [68.170(g)(2)]

___ 2.12.7 The date of the most recent review or revision of maintenance procedures and the date of the most recent equipment inspection or test and the equipment inspected or tested? [68.170(h)]

___ 2.12.8 The date of the most recent compliance audit and the expected date of completion of any changes resulting from the compliance audit? [68.170(i)]

___ 2.12.9 The date of the most recent incident investigation and the expected date of completion of any changes resulting from the investigation? [68.170(j)]

___ 2.12.10 The date of the most recent change that triggered a review or revision of safety information, hazard review, operating or maintenance procedures, or training? [68.170(k)]

RMP: Prevention Program/Program 3 [68.175]

___ 2.13 Has the owner or operator included in the RMP information addressing 68.175(b) to 68.175(p)? [68.175(a)]

___ 2.13.1 The NAICS code for the process? [68.175(b)]

___ 2.13.2 The name(s) of the substance(s) covered? [68.175(c)]

___ 2.13.3 The date on which the safety information was last reviewed or revised? [68.175(d)]

___ 2.13.4 The date of completion of the most recent process hazard analysis (PHA) or update and the technique used? [68.175(e)]

___ 2.13.4.1 The expected date of completion of any changes resulting from the PHA? [68.175(e)(1)]

___ 2.13.4.2 Major hazards identified? [68.175(e)(2)]

___ 2.13.4.3 Process controls in use? [68.175(e)(3)]

___ 2.13.4.4 Mitigation systems in use? [68.175(e)(4)]

___ 2.13.4.5 Monitoring and detection systems in use? [68.175(e)(5)]

___ 2.13.4.6 Changes since the last PHA? [68.175(e)(6)]

___ 2.13.5 The date of the most recent review or revision of operating procedures? [68.175(f)]

___ 2.13.6 The date of the most recent review or revision of training programs? [68.175(g)]

___ 2.13.6.1 The type of training provided – classroom, classroom plus on the job, on the job? [68.175(g)(1)]

___ 2.13.6.2 The type of competency testing used? [68.175(g)(2)]

___ 2.13.6.1 The type of training provided – classroom, classroom plus on the job, on the job? [68.175(g)(1)]

___ 2.13.6.2 The type of competency testing used? [68.175(g)(2)]

___ 2.13.7 The date of the most recent review of revision of maintenance procedures and the date of the most recent equipment inspection or test and the equipment inspected of tested? [68.175(h)]

___ 2.13.8 The date of the most recent change that triggered management of change procedures and the date of the most recent review or revision of management of change procedures? [68.175(i)]

___ 2.13.9 The date of the most recent pre-startup review? [68.175(j)]

___ 2.13.10 The date of the most recent compliance audit and the expected date of completion of any changes resulting from the compliance audit? [68.175(k)]

___ 2.13.11 The date of the most recent incident investigation and the expected date of completion of any changes resulting from the investigation? [68.175(l)]

___ 2.13.12 The date of the most recent review or revision of employee participation plans? [68.175(m)]

___ 2.13.13 The date of the most recent review or revision of hot work permit procedures? [68.175(n)]

___ 2.13.14 The date of the most recent review or revision of contractor safety procedures? [68.175(o)]

___ 2.13.15 The date of the most recent evaluation of contractor safety performance? [68.175(p)]

RMP: Emergency Response Program [68.180]

2.14 Has the owner or operator included the following information in the RMP on the emergency response program: [68.18]

___ 2.14.1 Does a written emergency response plan exist? [68.180(a)(1)]

___ 2.14.2 Does the plan include specific actions to be taken in response to an accidental release of a regulated substance? [68.180(a)(2)]

___ 2.14.3 Does the plan include procedures for informing the public and local agencies responsible for responding to accidental releases? [68.180(a)(3)]

___ 2.14.4 Does the plan include information on emergency health care? [68.180(a)(4)]

___ 2.14.5 Date of the most recent review of update of emergency response plan? [68.180(a)(5)]

___ 2.14.6 Date of the most recent emergency response training for employees? [68.180(a)(6)]

Compliance Objectives		Notes
___ 2.15	Has the owner or operator provided the name and telephone number of the local agency with which emergency response activities and the emergency response plan is coordinated? [68.180(b)]	
___ 2.16	Has the owner or operator listed other Federal or state emergency plan requirements to which the stationary source is subject? [68.180(c)]	

RMP: Certification [68.185]

2.17	Has the owner or operator: [68.185]	
___ 2.18	For Program 1 processes, submitted the certification statement in 68.12(b)(4)? [68.185(a)]	
___ 2.19	For Program 2 or 3 processes, submitted the appropriate certification statement that to the best of the signer's knowledge, information, and belief formed after reasonable inquiry, the information submitted is true, accurate, and complete? [68.185(b)]	

Findings:

_____

_____

_____

Documentation obtained to support Findings:

_____

_____

_____

3. HAZARD ASSESSMENT (SUBPART B) [68.20 – 68.42]

Hazard Assessment: Applicability [68.20]

___ 3.1 Has the owner or operator prepared a worst-case release scenario analysis as provided in 68.25 and completed the five-year accident history as provided in 68.42? [68.20]

Hazard Assessment: Offsite Consequence Analysis Parameters [68.22]

3.2 Has the owner or operator used the following endpoints for offsite consequence analysis for a worst-case scenario: [68.22(a)]

___ 3.2.1 For toxics: the endpoints provided in Appendix A of 40 CFR Part 68? [68.22(a)(1)]

___ 3.2.2 For flammables: an explosion resulting in an overpressure of 1 psi? [68.22(a)(2)(i)]

___ 3.3 Has the owner or operator used the following endpoints for offsite consequence analysis for an alternative release scenario: [68.22(a)]

___ 3.3.1 For toxics: the endpoints provided in Appendix A of 40 CFR Part 68? [68.22(a)(1)]

___ 3.3.2 For flammables: an explosion resulting in an overpressure of 1 psi? [68.22(a)(2)(i)]

___ 3.3.3 For flammables: a fire resulting in a radiant heat/exposure of 5 kw/m2 for 40 seconds? [68.22(a)(2)(ii)]

___ 3.3.4 For flammables: a concentration resulting in a lower flammability limit, as provided in NFPA documents or other generally recognized sources? [68.22(a)(2)(iii)]

3.4 In the release analysis, has the owner or operator used appropriate values for the following parameters:

___ 3.4.1 Wind speed and atmospheric stability class?

___ 3.4.2 Ambient temperature and humidity?

___ 3.4.3 Height of the release?

___ 3.4.4 Surface roughness?

___ 3.4.5 Dense or neutrally buoyant gases?

___ 3.4.6 Temperature of the released substance?

Compliance Objectives		Notes
Hazard Assessment: Worst-case Release Scenario Analysis [68.25]		
	3.5 Has the owner or operator of Program 1 processes:	
___	3.5.1 Analyzed and reported in the RMP one worst-case scenario for each Program 1 process? [68.25(a)(1)]	
	3.6 Has the owner or operator of Program 2 or 3 processes:	
___	3.6.1 Analyzed and reported in the RMP one worst-case release scenario estimated to create the greatest distance to an endpoint resulting from an accidental release of a regulated toxic substance from covered processes under worst-case conditions? [68.25(a)(2)(i)]	
___	3.6.2 Analyzed and reported in the RMP one worst-case release scenario estimated to create the greatest distance to an endpoint resulting from an accidental release of a regulated flammable substance from covered processes under worst-case conditions? [68.25(a)(2)(ii)]	
___	3.6.3 Analyzed and reported in the RMP additional worst-case release scenarios for a hazard class if the a worst-case release from another covered process at the stationary source potentially affects public receptors different from those potentially affected by the worst-case release scenario developed under 68.25(a)(2)(i) or 68.25(a) (2) (ii)? [68.25(a)(2)(iii)]	
	3.7 Has the owner or operator determined the worst-case release quantity to be the greater of the following: [68.25(b)]	
___	3.7.1 If released from a vessel, the greatest amount held in a single vessel, taking into account administrative controls that limit the maximum quantity? [68.25(b)(1)]	
___	3.7.2 If released from a pipe, the greatest amount held in the pipe, taking into account administrative controls that limit the maximum quantity? [68.25(b)(2)]	
	3.8 For toxic substances that are normally gases at ambient temperature and handled as a gas or liquid under pressure, has the owner or operator: [68.25(c)(1)]	
___	3.8.1 Assumed the whole quantity in the vessel or pipe would be released as a gas over 10 minutes? [68.25(c)(1)]	
___	3.8.2 Assumed the release rate to be the total quantity divided by 10, if there are no passive mitigation systems in place? [68.25(c)(1)]	
	3.9 For toxic gases handled as refrigerated liquids at ambient pressure, has the owner or operator: [68.25(c)(2)]	

Compliance Objectives **Notes**

___ 3.9.1 Assumed the substance would be released as a gas in 10 minutes, if not contained by passive mitigation systems or if the contained pool would have a depth of 1 cm or less? [68.25(c)(2)(i)]

___ 3.9.2 Assumed the quantity in the vessel or pipe would be spilled instantaneously to form a liquid pool, if the released substance would be contained by passive mitigation systems in a pool with a depth greater than 1 cm? [68.25(c)(2)(ii)]

___ 3.9.3 Calculated the volatilization rate at the boiling point of the substance and at the conditions specified in 68.25(d)? [68.25(c)(2)(ii)]

3.10 For toxic substances that are normally liquids at ambient temperature, has the owner or operator: [68.25(d)]

___ 3.10.1 Assumed the quantity in the vessel or pipe would be spilled instantaneously to form a liquid pool? [68.25(d)(1)]

___ 3.10.2 Determined the surface area of the pool by assuming that the liquid spreads to 1 cm deep, if there is no passive mitigation system in place that would serve to contain the spill and limit the surface area, or if passive mitigation is in place, the surface area of the contained liquid shall be used to calculate the volatilization rate? [68.25(d)(1)(i)]

___ 3.10.3 Taken into account the actual surface characteristics, if the release would occur onto a surface that is not paved or smooth? [68.25(d)(1)(ii)]

___ 3.10.4 Determined the volatilization rate by accounting for the highest daily maximum temperature in the past three years, the temperature of the substance in the vessel, and the concentration of the substance if the liquid spilled is a mixture or solution? [68.25(d)(2)]

___ 3.10.5 Determined the rate of release to air from the volatilization rate of the liquid pool? [68.25(d)(3)]

___ 3.10.6 Determined the rate of release to air by using the methodology in the RMP Offsite Consequence Analysis Guidance, any other publicly available techniques hat account for the modeling conditions and are recognized by industry as applicable as part of current practices, or proprietary models that account for the modeling conditions may be used provided the owner or operator allows the implementing agency access to the model and describes model features and differences from publicly available models to local emergency planners upon request. [68.25(d)(3)]

3.11 For flammables, has the owner or operator:

___ 3.11.1 Assumed the quantity in a vessel(s) of flammable gas held as a gas or liquid under pressure or refrigerated gas released to an undiked area vaporizes resulting in a vapor cloud explosion? [68.25(e)]

___ 3.11.2 For refrigerated gas released to a contained area or liquids released below their atmospheric boiling point, assumed the quantity volatilized in 10 minutes results in a vapor cloud. [68.25(f)]

___ 3.11.3 Assumed a yield factor of 10% of the available energy is released in the explosion for determining the distance to the explosion endpoint, if the model used is based on TNT-equivalent methods? [68.25(e)]

___ 3.12 Has the owner or operator used the parameters defined in 68.22 to determine distance to the endpoints? [68.25(g)]

___ 3.13 Has the owner or operator determined the rate of release to air by using the methodology in the RMP Offsite Consequence Analysis Guidance, any other publicly available techniques that account for the modeling conditions and are recognized by industry as applicable as part of current practices, or proprietary models that account for the modeling conditions? [68.25(g)]

___ 3.13.1 Modeling technique used: _____

___ 3.14 Has the owner or operator ensured that any passive mitigation system considered for the worst case analysis is capable of withstanding the release event triggering the scenario and will still function as intended? [68.25(h)]

___ 3.15 Has the owner or operator considered selecting a scenario involving a smaller quantity handled at higher process temperature or pressure, or located closer to the boundary of the stationary source, if such a scenario would result in a greater distance to an endpoint beyond the stationary source boundary? [68.25(i)]

Hazard Assessment: Alternative Release Scenario Analysis [68.28]

___ 3.16 Has the owner or operator identified and analyzed at least one alternative release scenario for each regulated toxic substance held in covered processes and at least one alternative release scenario to represent all flammable substances held in covered processes? [68.28(a)]

Compliance Objectives			Notes
	3.17	Has the owner or operator selected a scenario: [68.28(b)]	
___	3.17.1	That is more likely to occur than the worst-case release scenario under 68.25? [68.28(b)(1)(i)]	
___	3.17.2	That will reach an endpoint off-site, unless no such scenario exists? [68.28(b)(1)(ii)]	
	3.18	Has the owner or operator considered release scenarios which included, but are not limited to, the following: [68.28(b)(2)]	
___	3.18.1	Transfer hose releases due to splits or sudden hose uncoupling? [68.28(b)(2)(i)]	
___	3.18.2	Process piping releases from failures at flanges, joints, welds, valves and valve seals, and drains or bleeds? [68.28(b)(2)(ii)]	
___	3.18.3	Process vessel or pump releases due to cracks, seal failure, or drain, bleed, or plug failure? [68.28(b)(2)(iii)]	
___	3.18.4	Vessel overfilling and spill, or overpressurization and venting through relief valves or rupture disks? [68.28(b)(2)(iv)]	
___	3.18.5	Shipping container mishandling and breakage or puncturing leading to a spill? [68.28(b)(2)(v)]	
___	3.19	Used the parameters defined in 68.22 to determine distance to the endpoints? [68.28(c)]	
___	3.20	Has the owner or operator determined the rate of release to air by using the methodology in the RMP Offsite Consequence Analysis Guidance, any other publicly available techniques that account for the modeling conditions and are recognized by industry as applicable as part of current practices, or proprietary models that account for the modeling conditions? [68.28(c)]	
___	3.21	Has the owner or operator ensured that the passive and active mitigation systems, if considered, are capable of withstanding the release event triggering the scenario and will be functional? [68.28(d)]	
	3.22	Has the owner or operator considered the following factors in selecting the alternative release scenarios: [68.25(e)]	
___	3.22.1	The five-year accident history provided in 68.42? [68.25(e)(1)]	
___	3.22.2	Failure scenarios identified under 68.50 or 68.67? [68.25(e)(2)]	

Hazard Assessment: Defining Off-site Impacts – Population [68.30]

Has the owner or operator:

___ 3.23 Estimated population that would be included in the distance to the endpoint in the RMP based on a circle with the point of release at the center? [68.30(a)]

___ 3.24 Identified the presence of institutions, parks and recreational areas, major commercial, office, and industrial buildings in the RMP? [68.30(b)]

___ 3.25 Used most recent Census data, or other updated information to estimate the population? [68.30(c)]

___ 3.26 Estimated the population to two significant digits? [68.30(d)]

Hazard Assessment: Defining Off-site Impacts – Environment [68.33]

Has the owner or operator:

___ 3.27 Identified environmental receptors that would be included in the distance to the endpoint based on a circle with the point of release at the center? [68.33(a)]

___ 3.28 Relied on information provided on local U.S.G.S. maps, or on any data source containing U.S.G.S. data to identify environmental receptors? [Source may have used LandView to obtain information] [68.33(b)]

Hazard Assessment: Review and Update [68.36]

Has the owner or operator:

___ 3.29 Reviewed and updated the off-site consequence analyses at least once every five years? [68.36(a)]

___ 3.30 Completed a revised analysis and submit a revised RMP within six months of a change in processes, quantities stored or handled, or any other aspect that might reasonably be expected on increase or decrease the distance to the endpoint by a factor of two or more? [68.36(b)]

Hazard Assessment: Documentation [68.39]

Has the owner or operator:

___ 3.31 For worst-case scenarios: a description of the vessel or pipeline and substance selected, assumptions and parameters used, the rationale for selection, and anticipated effect of the administrative controls and passive mitigation on the release quantity and rate? [68.39(a)]

___ 3.32 For alternative release scenarios: a description of the scenarios identified, assumptions and parameters used, the rationale for the selection of specific scenarios, and anticipated effect of the administrative controls and mitigation on the release quantity and rate?[68.39(b)]

___ 3.33 Documentation of estimated quantity released, release rate, and duration of release? [68.39(c)]

___ 3.34 Methodology used to determine distance to endpoints? [68.39(d)]

___ 3.35 Data used to estimate population and environmental receptors potentially affected? [68.39(e)]

Hazard Assessment: Five-Year Accident History [68.42]

___ 3.36 Has the owner or operator included all accidental releases from covered processes that resulted in deaths, injuries, or significant property damage on site, or known offsite deaths, injuries, evacuations, sheltering in place, property damage, or environmental damage? [68.42(a)]

3.37 Has the owner or operator reported the following information for each accidental release: [68.42(b)]

___ 3.37.1 Date, time, and approximate duration of the release? [68.42(b)(1)]

___ 3.37.2 Chemical(s) released? [68.42(b)(2)]

___ 3.37.3 Estimated quantity released in pounds and percentage weight in a mixture (toxics)? [68.42(b)(3)]

___ 3.37.4 NAICS code for the process? [68.42(b)(4)

___ 3.37.5 The type of release event and its source? [68.42(b)(5)]

___ 3.37.6 Weather conditions (if known)? [68.42(b)(6)]

___ 3.37.7 On-site impacts? [68.42(b)(7)]

___ 3.37.8 Known offsite impacts? [68.42(b)(8)]

___ 3.37.9 Initiating event and contributing factors (if known)? [68.42(b)(9)]

___ 3.37.10 Whether offsite responders were notified (if known)? [68.42(b)(10)]

___ 3.37.11 Operational or process changes that resulted from investigation of the release? [68.42(b)(11)]

Compliance Objectives **Notes**

Findings:

Documentation obtained to support Findings:

4. PROGRAM 2 PREVENTION PROGRAM (SUBPART C) [68.48 – 68.60]

Program 2 Prevention: Safety Information [68.48]

Has the owner or operator:

4.1 Compiled and maintained the following up-to-date safety information, related to the regulated substances, processes, and equipment: [68.48(a)]

___ 4.1.1 Material Safety Data Sheets (MSDS) that meet the requirements of the OSHA Hazard Communication Standard [29 CFR 1910.1200(g)]? [68.48(a)(1)]

___ 4.1.2 Maximum intended inventory of equipment in which the regulated substances are stored or processed? [68.48(a)(2)]

___ 4.1.3 Safe upper and lower temperatures, pressures, flows, and compositions? [68.48(a)(3)]

___ 4.1.4 Equipment specifications? [68.48(a)(4)]

___ 4.1.5 Codes and standards used to design, build, and operate the process? [68.48(a)(5)]

___ 4.2 Ensured the process is designed in compliance with recognized and generally accepted good engineering practices? [68.48(b)]

___ 4.3 Updated information if a major change has occurred that made the information inaccurate? [68.48(c)]

Program 2 Prevention: Hazard Review [68.50]

___ 4.4 Has the owner or operator conducted a review of the hazards associated with the regulated substances, processes, and procedures? [68.50(a)]

4.5 Did the review identify:

___ 4.5.1 The hazards associated with the process and regulated substances? [68.50(a)(1)]

___ 4.5.2 Opportunities for equipment malfunctions or human errors that could cause an accidental release? [68.50(a)(2)]

___ 4.5.3 The safeguards used or needed to control the hazards or prevent equipment malfunctions or human error? [68.50(a)(3)]

___ 4.5.4 Any steps used or needed to detect or monitor releases? [68.50(a)(4)]

Has the owner or operator:

___ 4.6 Determined by inspecting all equipment that the processes are designed, fabricated, and operated in accordance with applicable standards or rules, if designed to meet industry standards or Federal or state design rules? [68.50(b)]

___ 4.7 Documented the results of the review? [68.50(c)]

___ 4.8 Ensured that problems identified were resolved in a timely manner? [68.50(c)]

___ 4.9 Updated the review at least once every five years or whenever a major change in the processes occurred? [68.50(d)]

___ 4.10 Resolved all issues identified in the review before startup of the changed process? [68.50(d)]

Program 2 Prevention: Operating Procedures [68.52]

___ 4.11 Has the owner or operator prepared written operating procedures that provide clear instructions or steps for safely conducting activities associated with each covered process consistent with the safety information for that process? [68.52(a)]

4.12 Do the procedures address the following: [68.52(b)]

___ 4.12.1 Initial startup? [68.52(b)(1)]

___ 4.12.2 Normal operations? [68.52(b)(2)]

___ 4.12.3 Temporary operations? [68.52(b)(3)]

___ 4.12.4 Emergency shutdown and operations? [68.52(b)(4)]

___ 4.12.5 Normal shutdown? [68.52(b)(5)]

___ 4.12.6 Startup following a normal or emergency shutdown or a major change that requires a hazard review? [68.52(b)(6)]

___ 4.12.7 Consequences of deviations and steps required to correct or avoid deviations? [68.52(b)(7)]

___ 4.12.8 Equipment inspections? [68.52(b)(8)]

___ 4.13 Has the owner or operator ensured that the operating procedures have been updated, if necessary, whenever a major change occurred and prior to startup of the changed process? [68.52(c)]

Program 2 Prevention: Training [68.54]

Has the owner or operator:

___ 4.14 Certified that each employee presently operating a process, and each employee newly assigned to a covered process have been trained or tested competent in the operating procedures provided in § 68.52 that pertain to their duties? [68.54(a)]

___ 4.15 Provided refresher training at least every three years, or more often if necessary, to each employee operating a process, to ensure that the employee understands and adheres to the current operating procedures of the process? [68.54(b)]

___ 4.16 Determined, in consultation with the employees operating the process, the appropriate frequency of refresher training? [68.54(b)]

___ 4.17 Certified that each employee was trained in any updated or new procedures prior to startup of a process after a major change? [68.54(d)]

Program 2 Prevention: Maintenance [68.56]

Has the owner or operator:

___ 4.18 Prepared and implemented procedures to maintain the on-going mechanical integrity of the process equipment? [68.56(a)]

___ 4.19 Trained or caused to be trained each employee, involved in maintaining the on-going mechanical integrity of the process, in the hazards of the process, in how to avoid or correct unsafe conditions, and in the procedures applicable to the employee's job tasks? [68.56(b)]

___ 4.20 Has every maintenance contractor ensured that each contract maintenance employee is trained to perform the maintenance procedures developed? [68.56(c)]

___ 4.21 Has the owner or operator performed or caused to be performed inspections and tests on process equipment that follow recognized and generally accepted engineering practices? [68.56(d)]

Program 2 Prevention: Compliance Audits [68.58]

Has the owner or operator:

___ 4.22 Has the owner or operator certified that compliance audits are conducted at least every three years to verify that the procedures and practices are adequate and are being followed? [68.58(a)]

___ 4.23 Has compliance audit been conducted by at least one person knowledgeable in the process? [68.58(b)]

___ 4.24 Has the owner operator developed a report of the audits findings? [68.58(c)]

___ 4.25 Has the owner or operator promptly determined and documented an appropriate response to each of the findings of the audit and documented that deficiencies had been corrected? [68.58(d)]

___ 4.26 Has the owner or operator retained the two most recent compliance audit reports, unless more than five years old? [68.58(e)]

Program 2 Prevention: Incident Investigation [68.60]

Has the owner or operator:

___ 4.27 Has the owner or operator investigated each incident which resulted in, or could reasonably have resulted in a catastrophic release? [68.60(a)]

___ 4.28 Were all incident investigations initiated not later than 48 hours following the incident? [68.60(b)]

___ 4.29 Was a summary prepared at the conclusion of every investigation, which included: [68.60(c)]

___ 4.29.1 Date of incident? [68.60(c)(1)]

___ 4.29.2 Date investigation began? [68.60(c)(2)]

___ 4.29.3 A description of incident? [68.60(c)(3)]

___ 4.29.4 The factors that contributed to the incident? [68.60(c)(4)]

___ 4.29.5 Any recommendations resulting from the investigation? [68.60(c)(5)]

___ 4.30 Has the owner or operator promptly addressed and resolved the investigation findings and recommendations, and are the resolutions and corrective actions documented? [68.60(d)]

Compliance Objectives		Notes
___ 4.31	Has the owner or operator reviewed the finding with all affected personnel whose job tasks are affected by the findings? [68.60(e)]	
___ 4.32	Has the owner or operator retained investigation summaries for five years? [68.60(f)]	

Findings:

_____

_____

_____

Documentation obtained to support Findings:

_____

_____

_____

5. PROGRAM 3 PREVENTION PROGRAM (SUBPART D) [68.65 – 68.87]

Program 3 Prevention: Process Safety Information [68.65]

___ 5.1 Has the owner or operator compiled written process safety information, which includes information pertaining to the hazards of the regulated substances used or produced by the process, information pertaining to the technology of the process, and information pertaining to the equipment in the process, before conducting any process hazard analysis required by the rule? [68.65(a)]

5.2 Does the process safety information contain the following for hazards of the substances: [68.65(b)]

___ 5.2.1 Toxicity information? [68.65(b)(1)]

___ 5.2.2 Permissible exposure limits? [68.65(b)(2)]

___ 5.2.3 Physical data? [68.65(b)(3)]

___ 5.2.4 Reactivity data? [68.65(b)(4)]

___ 5.2.5 Corrosivity data? [68.65(b)(5)]

___ 5.2.6 Thermal and chemical stability data? [68.65(b)(6)]

___ 5.2.7 Hazardous effects of inadvertent mixing of materials that could foreseeably occur? [68.65(b)(7)]

5.3 Does the process safety information contain the following for technology of the process: [68.65(c)(1)]

___ 5.3.1 A block flow diagram or simplified process flow diagram? [68.65(c)(1)(i)]

___ 5.3.2 Process chemistry? [68.65(c)(1)(ii)]

___ 5.3.3 Maximum intended inventory? [68.65(c)(1)(iii)]

___ 5.3.4 Safe upper and lower limits for such items as temperatures, pressures, flows or compositions? [68.65(c)(1)(iv)]

___ 5.3.5 An evaluation of the consequences of deviations? [68.65(c)(1)(v)]

5.4 Does the process safety information contain the following for the equipment in the process: [68.65(d)(1)]

___ 5.4.1 Materials of construction? [68.65(d)(1)(i)]

___ 5.4.2 Piping and instrument diagrams? [68.65(d)(1)(ii)]

___ 5.4.3 Electrical classification? [68.65(d)(1)(iii)]

___ 5.4.4 Relief system design and design basis? [68.65(d)(1)(iv)]

___ 5.4.5 Ventilation system design? [68.65(d)(1)(v)]

___ 5.4.6 Design codes and standards employed? [68.65(d)(1)(vi)]

___ 5.4.7 Material and energy balances for processes built after June 21, 1999? [68.65(d)(1)(vii)]

___ 5.4.8 Safety systems? [68.65(d)(1)(viii)]

___ 5.5 Has the owner or operator documented that equipment complies with recognized and generally accepted good engineering practices? [68.65(d)(2)]

___ 5.6 Has the owner or operator determined and documented that existing equipment, designed and constructed in accordance with codes, standards, or practices that are no longer in general use, is designed, maintained, inspected, tested, and operating in a safe manner? [68.65(d)(3)]

___ 5.7 Has the owner or operator performed an initial process hazard analysis (PHA), and has this analysis identified, evaluated, and controlled the hazards involved in the process? [68.67(a)]

___ 5.8 Has the owner or operator determined and documented the priority order for conducting PHAs, and was it based on an appropriate rationale? [68.67(a)]

5.9 Has the owner or operator used one or more of the following technologies: [68.67(b)]

___ 5.9.1 What-If? [68.67(b)(1)]

___ 5.9.2 Checklist? [68.67(b)(2)]

___ 5.9.3 What-If/Checklist? [68.67(b)(3)]

___ 5.9.4 Hazard and Operability Study (HAZOP)? [68.67(b)(4)]

___ 5.9.5 Failure Mode and Effects Analysis (FMEA)? [68.67(b)(5)]

___ 5.9.6 Fault Tree Analysis? [68.67(b)(6)]

___ 5.9.7 An appropriate equivalent methodology? [68.67(b)(7)]

5.10 Did the PHA address: [68.67(c)]

___ 5.10.1 The hazards of the process? [68.67(c)(1)]

___ 5.10.2 Identification of any incident which had a likely potential for catastrophic consequences? [68.67(c)(2)]

___ 5.10.3 Engineering and administrative controls applicable to hazards and interrelationships? [68.67(c)(3)]

___ 5.10.4 Consequences of failure of engineering and administrative controls? [68.67(c)(4)]

___ 5.10.5 Stationary source siting? [68.67(c)(5)]

___ 5.10.6 Human factors? [68.67(c)(6)]

___ 5.10.7 An evaluation of a range of the possible safety and health effects of failure of controls? [68.67(c)(7)]

___ 5.11 Was the PHA performed by a team with expertise in engineering and process operations and did the team include appropriate personnel? [68.67(d)]

___ 5.12 Has the owner or operator established a system to promptly address the team's findings and recommendations; assured that the recommendations are resolved in a timely manner and documented; documented what actions are to be taken; completed actions as soon as possible; developed a written schedule of when these actions are to be completed; and communicated the actions to operating, maintenance and other employees whose work assignments are in the process and who may be affected by the recommendations? [68.67(e)]

___ 5.13 Has the PHA been updated and revalidated by a team every five years after the completion of the initial PHA to assure that the PHA is consistent with the current process? [68.67(f)]

___ 5.14 Has the owner or operator retained PHAs and updates or revalidations for each process covered, as well as the resolution of recommendationsfor the life of the process? [68.67(g)]

Program 3 Prevention: Operating procedures [68.69]

___ 5.15 Has the owner or operator developed and implemented written operating procedures that provide instructions or steps for conducting activities associated with each covered process consistent with the safety information? [68.69(a)]

5.16 Do the procedures address the following: [68.69(a)]

___ 5.16.1 Steps for each operating phase? [68.69(a)(1)]

___ 5.16.1.1 Initial startup? [68.69(a)(1)(i)]

___ 5.16.1.2 Normal operations? [68.69(a)(1)(ii)]

___ 5.16.1.3 Temporary operations? [68.69(a)(1)(iii)]

___ 5.16.1.4 Emergency shutdown including the conditions under which emergency shutdown is required, and the assignment of shutdown responsibility to qualified operators to ensure that emergency shutdown is executed in a safe and timely manner? [68.69(a)(1)(iv)]

___ 5.16.1.5 Emergency operations? [68.69(a)(1)(v)]

___ 5.16.1.6 Normal shutdown? [68.69(a)(1)(vi)]

___ 5.16.1.7 Startup following a turnaround, or after emergency shutdown? [68.69(a)(1)(vii)]

5.16.2 Operating limits: [68.69(a)(2)]

___ 5.16.2.1 Consequences of deviations? [68.69(a)(2)(i)]

___ 5.16.2.2 Steps required to correct or avoid deviations? [68.69(a)(2)(ii)]

5.16.3 Safety and health considerations: [68.69(a)(3)]

___ 5.16.3.1 Properties of, and hazards presented by, the chemicals used in the process? [68.69(a)(3)(i)]

___ 5.16.3.2 Precautions necessary to prevent exposure, including engineering controls, administrative controls, and personal protective equipment? [68.69(a)(3)(ii)]

___ 5.16.3.3 Control measures to be taken if physical contact or airborne exposure occurs? [68.69(a)(3)(iii)]

___ 5.16.3.4 Quality control for raw materials and control of hazardous chemical inventory levels? [68.69(a)(3)(iv)]

___ 5.16.3.5 Any special or unique hazards? [68.69(a)(3)(v)]

___ 5.16.4 Safety systems and their functions? [68.69(a)(4)]

___ 5.17 Are operating procedures readily accessible to employees who are involved in a process? [68.69(b)]

___ 5.18 Has the owner or operator certified annually that the operating procedures are current and accurate and that procedures have been reviewed as often as necessary? [68.69(c)]

___ 5.19 Has the owner or operator developed and implemented safe work practices to provide for the control of hazards during specific operations, such as logout/tagout? [68.69(d)]

Program 3 Prevention: Training [68.71]

___ 5.20 Has each employee presently involved in operating a process, and each employee before being involved in operating a newly assigned process, been initially trained in an overview of the process and in the operating procedures? [68.71(a)(1)]

___ 5.21 Did initial training include emphasis on safety and health hazards, emergency operations including shutdown, and safe work practices applicable to the employee's job tasks?

[68.71(a)(2) allows in lieu of initial training for those employees already involved in operating a process on June 21, 1999 an owner or operator may certify in writing that the employee has the required knowledge, skills, and abilities to safely carry out the duties and responsibilities as specified in the operating procedures] [68.71(a)(1)]

___ 5.22 Has refresher training been provided at least every three years, or more often if necessary, to each employee involved in operating a process to assure that the employee understands and adheres to the current operating procedures of the process? [68.71(b)]

___ 5.23 Has owner or operator ascertained and documented in a record that each employee involved in operating a process has received and understood the training required? [68.71(c)]

___ 5.24 Does the prepared record contain the identity of the employee, the date of training, and the means used to verify that the employee understood the training? [68.71(c)]

Program 3 Prevention: Mechanical integrity [68.73]

___ 5.25 Has the owner or operator established and implemented written procedures to maintain the on-going integrity of the process equipment listed in 68.73(a)? [68.73(b)]

___ 5.26 Has the owner or operator trained each employee involved in maintaining the on-going integrity of process equipment? [68.73(c)]

Has the owner or operator:

___ 5.27 Performed inspections and tests on process equipment? [68.73(d)(1)]

___ 5.28 Followed recognized and generally accepted good engineering practices for inspection and testing procedures? [68.73(d)(2)]

___ 5.29 Ensured the frequency of inspections and tests of process equipment is consistent with applicable manufacturers' recommendations, good engineering practices, and prior operating experience? [68.73(d)(3)]

___ 5.30 Documented each inspection and test that had been performed on process equipment, which identifies the date of the inspection or test, the name of the person who performed the inspection or test, the serial number or other identifier of the equipment on which the inspection or test was performed, a description of the inspection or test performed, and the results of the inspection or test? [68.73(d)(4)]

___ 5.31 Corrected deficiencies in equipment that were outside acceptable limits defined by the process safety information before further use or in a safe and timely manner when necessary means were taken to assure safe operation? [68.73(e)]

___ 5.32 Assured that equipment as it was fabricated is suitable for the process application for which it will be used in the construction of new plants and equipment? [68.73(f)(1)]

___ 5.33 Performed appropriate checks and inspections to assure that equipment was installed properly and consistent with design specifications and the manufacturer's instructions? [68.73(f)(2)]

___ 5.34 Assured that maintenance materials, spare parts and equipment were suitable for the process application for which they would be used? [68.73(f)(3)]

Program 3 Prevention: Management of change [68.75]

___ 5.35 Has the owner or operator established and implemented writtenprocedures to manage changes to process chemicals, technology, equipment, and procedures, and changes to stationary sources that affect a covered process? [68.75(a)]

5.36 Do procedures assure that the following consideration are addressed prior to any change: [68.75(b)]

___ 5.36.1 The technical basis for the proposed change? [68.75(b)(1)]

___ 5.36.2 Impact of change on safety and health? [68.75(b)(2)]

___ 5.36.3 Modifications to operating procedures? [68.75(b)(3)]

___ 5.36.4 Necessary time period for the change? [68.75(b)(4)]

___ 5.36.5 Authorization requirements for the proposed change? [68.75(b)(5)]

___ 5.37 Were employees, involved in operating a process and maintenance, and contract employees, whose job tasks would be affected by a change in the process, informed of, and trained in, the change prior to start-up of the process or affected part of the process? [68.75(c)]

___ 5.38 If a change resulted in a change in the process safety information, was such information updated accordingly? [68.75(d)]

___ 5.39 If a change resulted in a change in the operating procedures or practices, had such procedures or practices been updated accordingly? [68.75(e)]

Program 3 Prevention: Pre-startup review [68.77]

___ 5.40 Has the owner or operator performed a pre-startup safety review for new stationary sources and for modified stationary sources when the modification was significant enough to require a change in the process safety information? [68.77(a)]

5.41 Did the pre-startup safety review confirm that prior to the introduction of regulated substances to a process: [68.77(b)]

___ 5.41.1 Construction and equipment was in accordance with design specifications? [68.77(b)(1)]

___ 5.41.2 Safety, operating, maintenance, and emergency procedures were in place and were adequate? [68.77(b)(2)]

___ 5.41.3 For new stationary sources, a process hazard analysis had been performed and recommendations had been resolved or implemented before startup? [68.77(b)(3)]

___ 5.41.4 Modified stationary sources meet the requirements contained in management of change? [68.77(b)(3)]

___ 5.41.5 Training of each employee involved in operating a process had been completed? [68.77(b)(4)]

Program 3 Prevention: Compliance audits [68.79]

___ 5.42 Has the owner or operator certified that the stationary source has evaluated compliance with the provisions of the prevention program at least every three years to verify that the developed procedures and practices are adequate and are being followed? [68.79(a)]

___ 5.43 Has the audit been conducted by at least one person knowledgeable in the process? [68.79(b)]

___ 5.44 Are the audits findings documented in report? [68.79(c)]

___ 5.45 Has the owner or operator promptly determined and documented an appropriate response to each of the findings of the audit and documented that deficiencies had been corrected? [68.79(d)]

___ 5.46 Has the owner or operator retained the two most recent compliance audit reports? [68.79(e)]

Program 3 Prevention: Incident investigation [68.81]

___ 5.47 Has the owner or operator investigated each incident which resulted in, or could reasonably have resulted in a catastrophic release of a regulated substance? [68.81(a)]

___ 5.48 Were all incident investigations initiated not later than 48 hours following the incident? [68.81(b)]

___ 5.49 Was an incident investigation team established and did it consist of at least one person knowledgeable in the process involved, including a contract employee if the incident involved work of the contractor, and other persons with appropriate knowledge and experience to thoroughly investigate and analyze the incident? [68.81(c)]

___ 5.50 Was a report prepared at the conclusion of every investigation? [68.81(d)]

5.51 Does every report include: [68.81(d)]

___ 5.51.1 Date of incident? [68.81(d)(1)]

___ 5.51.2 Date investigation began? [68.81(d)(2)]

___ 5.51.3 A description of the incident? [68.81(d)(3)]

___ 5.51.4 The factors that contributed to the incident? [68.81(d)(4)]

___ 5.51.5 Any recommendations resulting from the investigation? [68.81(d)(5)]

___ 5.52 Has the owner or operator established a system to address and resolve the report findings and recommendations, and are the resolutions and corrective actions documented? [68.81(e)]

___ 5.53 Was the report reviewed with all affected personnel whose job tasks are relevant to the incident findings including contract employees where applicable? [68.81(f)]

Program 3 Prevention: Employee participation [68.83]

Has the owner or operator:

___ 5.54 Developed a written plan of action regarding the implementation of the employee participation required by this section? [68.83(a)]

___ 5.55 Consulted with employees and their representatives on the conduct and development of process hazards analyses and on the development of the other elements of process safety management in chemical accident prevention provisions? [68.83(b)]

___ 5.56 Provided to employees and their representatives access to process hazard analyses and to all other information required to be developed under chemical accident prevention rule? [68.83(c)]

Program 3 Prevention: Hot work permit [68.85]

___ 5.57 Has the owner or operator issued a hot work permit for each hot work operation conducted on or near a covered process? [68.85(a)]

___ 5.58 Does the permit document that the fire prevention and protection requirements in 29 CFR 1910.252(a) have been implemented prior to beginning the hot work operations? [68.85(b)]

___ 5.59 Does the permit indicate the date(s) authorized for hot work and the object on which hot works to be performed? [68.85(b)]

___ 5.60 Are the permits being kept on file until completion of the hot work operations? [68.85(b)]

Program 3 Prevention: Contractors [68.87]

Has the owner or operator:

___ 5.61 Obtained and evaluated information regarding the contract owner or operator's safety performance and programs when selecting a contractor? [68.87(b)(1)]

___ 5.62 Informed contract owner or operator of the known potential fire, explosion, or toxic release hazards related to the contractor's work and the process? [68.87(b)(2)]

___ 5.63 Explained to the contract owner or operator the applicable provisions of emergency response program? [68.87(b)(3)]

Compliance Objectives **Notes**

___ 5.64 Developed and implemented safe work practices consistent with §68.69(d), to control the entrance, presence, and exit of the contract owner or operator and contract employees in covered process areas? [68.87(b)(4)]

Findings:

_____

_____

_____

Documentation obtained to support Findings:

_____

_____

_____

6. EMERGENCY RESPONSE (SUBPART E) [68.90 – 68.95]

Emergency Response: Applicability [68.90]

___ 6.1 Has the owner or operator of a stationary source developed an emergency response program, unless the source need not comply? [68.90(a)]

If the employees of the stationary source will not respond to accidental releases of regulated substances:

___ 6.2 For stationary sources with any regulated toxic substance held in a process above the threshold quantity, is the stationary source included in the community emergency response plan developed under EPCRA? [68.90(b)(1)]

___ 6.3 For stationary sources with only regulated flammable substances held in a process above the threshold quantity, has the owner or operator coordinated response actions with the local fire department? [68.90(b)(2)]

___ 6.4 Are appropriate mechanisms in place to notify emergency responders when there is a need for a response? [68.90(b)(3)]

Emergency Response Program [68.95]

___ 6.5 Has the owner or operator developed and implemented an emergency response program for the purpose of protecting public health and the environment? [68.95(a)]

6.6 Does the program include the following elements: [68.95(a)]

___ 6.6.1 An emergency response plan which is maintained at the stationary source? [68.95(a)(1)]

___ 6.6.2 Procedures for the use of emergency response equipment and for its inspection, testing, and maintenance? [68.95(a)(2)]

___ 6.6.3 Training for all employees in relevant procedures? [68.95(a)(3)]

___ 6.6.4 Procedures to review and update, as appropriate, the emergency response plan to reflect changes at the stationary source and ensure that employees are informed of changes? [68.95(a)(4)]

6.7 Does the emergency response plan contain the following elements: [68.95(a)(1)]

___ 6.7.1 Procedures for informing the public and local emergency response agencies about accidental releases? [68.95(a)(1)(i)]

Compliance Objectives **Notes**

___ 6.7.2 Documentation of proper first-aid and emergency medical treatment necessary to treat accidental human exposures? [68.95(a)(1)(ii)]

___ 6.7.3 Procedures and measures for emergency response after an accidental release of a regulated substance? [68.95(a)(1)(iii)]

___ 6.8 Did the owner or operator use a written plan that complies with other Federal contingency plan regulations or is consistent with the approach in the National Response Team's Integrated Contingency Plan Guidance ("One Plan")? If so, does the plan include the elements provided in paragraph (a) of 68.95, and also complies with paragraph (c) of 68.95? [68.95(b)]

___ 6.9 Has the emergency response plan been coordinated with the community emergency response plan developed under EPCRA? [68.95(c)]

___ 6.10 Has the owner or operator provided to the local emergency response officials information necessary for developing and implementing the community emergency response plan requested by the LEPC or emergency response officials? [68.95(c)]

Findings:

Documentation obtained to support Findings:

Annex E: Risk Management Program and OSHA Process Safety Management: List of Regulated Substances (by chemical name)

CAS	Chemical Name	RMP Threshold Quantity (TQ) lbs	RMP Threshold Corrected to Gals	PSM Threshold Quantity (TQ) lbs	Toxic Endpoint
106-98-9	1-butene	10,000	**		
97-00-7	1-chloro-2,4-dinitrobenzene			5,000	
590-21-6	1-chloropropylene {1-propene, 1-chloro-}	10,000	**		
109-67-1	1-pentene	10,000	1,869		
57-14-7	1,1-dimethylhydrazine {Dimethylhydrazine} {Hydrazine, 1,1-dimethyl-}	15,000	2,271	1,000	0.012
106-99-0	1,3-butadiene	10,000	1,930		
504-60-9	1,3-pentadiene	10,000	1,753		
107-01-7	2-butene	10,000	**		
590-18-1	2-butene-cis	10,000	1,929		
624-64-6	2-butene-trans {2-butene, (E)}	10,000	1,983		
557-98-2	2-chloropropylene {1-propene, 2-chloro-}	10,000	**		
563-46-2	2-methyl-1-butene	10,000	1,844		
115-11-7	2-methylpropene {1-propene, 2-methyl-}	10,000	2,031		
646-04-8	2-pentene (E)-	10,000	1,827		
627-20-3	2-pentene (Z)-	10,000	1,849		
463-82-1	2,2-dimethylpropane {Propane, 2,2-dimethyl-}	10,000	2,028		
97-02-9	2,4-dinitroaniline			5,000	
563-45-1	3-methyl-1-butene	10,000	1,911		
75-07-0	Acetaldehyde	10,000	1,536	2,500	
74-86-2	Acetylene {Ethyne}	10,000	1,955		
107-02-8	Acrolein {2-propenal}	5,000	714	150	0.0011
107-13-1	Acrylonitrile {2-propenenitrile}	20,000	2,994		0.076
814-68-6	Acrylyl Chloride {2-propenoyl Chloride}	5,000	527	250	0.0009
Varies	Alkylaluminums			5,000	
107-18-6	Allyl Alcohol {2-propen-1-ol}	15,000	2,105		0.036
107-05-1	Allyl Chloride	1,000			
107-11-9	Allylamine {2-propen-1-amine}	10,000	1,577	1,000	0.0032
7664-41-7	Ammonia (Anhydrous)	10,000	1,758	10,000	0.14
7664-41-7	Ammonia (>=20% for RMP) (>44% for PSM)	20,000	2,723	15,000	0.14
7790-98-9	Ammonium Perchlorate			7,500	
7787-36-2	Ammonium Permanganate			7,500	

CAS	Chemical Name	RMP Threshold Quantity (TQ) lbs	RMP Threshold Corrected to Gals	PSM Threshold Quantity (TQ) lbs	Toxic Endpoint
7784-34-1	Arsenous Trichloride	15,000	836		0.01
7784-42-1	Arsine {Arsenic Hydride}	1,000	45	100	0.0019
10294-34-5	Boron Trichloride {Borane, Trichloro-}	5,000	444	2,500	0.01
7637-07-2	Boron Triflouride {Borane, Trifluoro-}	5,000	374	250	0.028
353-42-4	Boron Triflouride Compound with Methyl Ether (1:1) {Boron, Trifluoro[oxybis[methane]-,T-4}	15,000	1,451		0.023
7726-95-6	Bromine	10,000	386	1,500	0.0065
13863-41-7	Bromine Chloride			1,500	
7787-71-5	Bromine Trifluoride			15,000	
7789-30-2	Bromine Pentafluoride			2,500	
598-73-2	Bromotrifluorethylene {Ethene, Bromotrifluoro-}	10,000	**		
106-97-8	Butane	10,000	1,997		
25167-67-3	Butene	10,000	2,014		
75-91-2	Butyl Hydroperoxide (Tertiary)			5,000	
614-45-9	Butyl Perbenzoate			7,500	
75-15-0	Carbon Disulfide	20,000	1,897		0.16
463-58-1	Carbon Oxysulfide {Carbon Oxide Sulfide (Cos)} {Carbonyl Sulfide}	10,000	571		
353-44-5	Carbonyl Fluoride			2,500	
9004-70-0	Cellulose Nitrate (>12.6% Nitrogen for PSM)			2,500	
7782-50-5	Chlorine	2,500	210	1,500	0.0087
10049-04-4	Chlorine Dioxide {Chlorine Oxide (ClO2)}	1,000	75	1,000	0.0028
7791-21-1	Chlorine Monoxide {Chlorine Oxide}	10,000			
13637-63-3	Chlorine Pentrafluoride			1,000	
7790-91-2	Chlorine Trifluoride			1,000	
96-06-2	Chlorodiethylaluminum {Diethylaluminum Chloride}			5,000	
67-66-3	Chloroform {Methane, Trichloro-}	20,000	1,616		0.49
542-88-1	Chloromethyl Ether {Bis(chloromethyl) Ether} {Methane, Oxybis[chloro-} {Dichloromethyl Ether}	1,000	91	100	0.00025
107-30-2	Chloromethyl Methyl Ether {Methane, Chloromethoxy-}	5,000	565	500	0.0018
76-06-2	Chloropicrin			500	
None	Chloropicrin and Methyl Bromide Mixture			1,500	
None	Chloropicrin and Methyl Chloride Mixture			1,500	
4170-30-3	Crotonaldehyde {2-butenal}	20,000	2,833		0.029
123-73-9	Crotonaldehyde, (E)- {2-butenal, (E)-}	20,000	2,810		0.029
80-15-9	Cumene Hydroperoxide			5,000	
460-19-5	Cyanogen {Ethanedinitrile}	10,000	1,256	2,500	
506-77-4	Cyanogen Chloride	10,000	980	500	0.03
675-14-9	Cyanuric Fluoride			100	
108-91-8	Cyclohexylamine {Cyclohexanamine}	15,000	2,079		0.16

CAS	Chemical Name	RMP Threshold Quantity (TQ) lbs	RMP Threshold Corrected to Gals	PSM Threshold Quantity (TQ) lbs	Toxic Endpoint
75-19-4	Cyclopropane	10,000	1,773		
110-22-5	Diacetyl Peroxide (>70% for PSM)			5,000	
334-88-3	Diazomethane			500	
94-36-0	Dibenzoyl Peroxide			7,500	
19287-45-7	Diborane {Diborane (6)}	2,500	**	100	0.0011
110-05-4	Dibutyl Peroxide (Tertiary)		5,000		
4109-96-0	Dichlorosilane {Silane, Dichloro-}	10,000	999	2,500	
557-20-0	Diethylzinc			10,000	
75-37-6	Difluoroethane {Ethane, 1,1-difluoro-}	10,000	1,261		
105-64-6	Diisopropyl Peroxydicarbonate			7,500	
105-74-8	Dilauroyl Peroxide			7,500	
124-40-3	Dimethylamine {Methanamine, N-methyl-}	10,000	1,786	2,500	
75-78-5	Dimethyldichlorosilane {Silane, Dichlorodimethyl-}	5,000	545	1,000	0.026
106-89-8	Epichlorohydrin {Oxirane, (Chloromethyl)-}	20,000	1,331		0.076
74-84-0	Ethane	10,000	2,195		
107-00-6	Ethyl Acetylene {1-butyne}	10,000	1,767		
75-00-3	Ethyl Chloride {Chloroethane} {Ethane, Chloro-}	10,000	1,323		
60-29-7	Ethyl Ether {Ethane, 1,1'-oxybis-}	10,000	1,678		
75-08-1	Ethyl Mercaptan {Ethanethiol}	10,000	1,451		
1338-23-4	Ethyl Methyl Ketone Peroxide			5,000	
109-95-5	Ethyl Nitrite {Nitrous Acid, Ethyl Ester}	10,000	1,331	5,000	
75-04-7	Ethylamine {Monoethylamine} {Ethanamine}	10,000	1,762	7,500	
74-85-1	Ethylene {Ethene}	10,000	2,106		
371-62-0	Ethylene Fluorohydrin			100	
75-21-8	Ethylene Oxide {Oxirane}	10,000	1,379	5,000	0.09
107-15-3	Ethylenediamine {1,2-ethanediamine}	20,000	2,669		0.49
151-56-4	Ethyleneimine {Aziridine}	10,000	1,440	1,000	0.018
7782-41-4	Fluorine	1,000	79	1,000	0.0039
50-00-0	Formaldehyde (Solution)	15,000	1,591	1,000	0.012
110-00-9	Furan	5,000	639	500	0.0012
684-16-2	Hexafluoroacetone			5,000	
302-01-2	Hydrazine	15,000	1,918		0.011
7647-01-0	Hydrochloric Acid (>=37% for RMP)	15,000	1,510		0.03
74-90-8	Hydrocyanic Acid {Hydrogen Cyanide}	2,500	434	1,000	0.011
1333-74-0	Hydrogen	10,000	**		
10035-10-6	Hydrogen Bromide			5,000	
7647-01-0	Hydrogen Chloride (Anhydrous for CAA 112(r) RMP and PSM) {Hydrochloric Acid}	5,000	503	5,000	0.03
7664-39-3	Hydrogen Fluoride/hydrofluoric Acid (>=50% for RMP) {Hydrofluoric Acid}	1,000	121	1,000	0.016

CAS	Chemical Name	RMP Threshold Quantity (TQ) lbs	RMP Threshold Corrected to Gals	PSM Threshold Quantity (TQ) lbs	Toxic Endpoint
7722-84-1	Hydrogen Peroxide (>= 52% for PSM)			7,500	
7783-07-5	Hydrogen Selenide	500	28	150	0.00066
7783-06-4	Hydrogen Sulfide	10,000	1,308	1,500	0.042
7803-49-8	Hyroxylamine		2,500		
13463-40-6	Iron, Pentacarbonyl- {Iron Carbonyl (Fe(co)5), (Tb-5-11)-}	2,500	206	250	0.00044
75-28-5	Isobutane {Propane, 2-methyl}	10,000	2,151		
78-82-0	Isobutyronitrile {Propanenitrile, 2-methyl-}	20,000	3,149		0.14
78-78-4	Isopentane {Butane, 2-methyl-}	10,000	1,933		
78-79-5	Isoprene {1,3-butadiene, 2-methyl-}	10,000	1,760		
75-31-0	Isopropylamine {2-propanamine}	10,000	1,734	5,000	
75-29-6	Isopropyl Chloride {Propane, 2-chloro-}	10,000	1,390		
108-23-6	Isopropyl Chloroformate {Carbonochloridic Acid, 1-methylethyl Ester}	15,000	1,664		0.1
463-51-4	Ketene			100	
78-85-3	Methacrylaldehyde			1,000	
126-98-7	Methacrylonitrile {2-propenenitrile, 2-methyl-} {Methylacrylonitrile}	10,000	1,497	250	0.0027
920-46-7	Methacryloyl Chloride			150	
74-82-8	Methane	10,000	2,853		
74-83-9	Methyl Bromide			2,500	
74-87-3	Methyl Chloride {Chloromethane} {Methane, Chloro-}	10,000	1,202	15,000	0.82
79-22-1	Methyl Chloroformate {Carbonochloridic Acid, Methylester} {Methyl Chlorocarbonate}	5,000	489	500	0.0019
115-10-6	Methyl Ether {Methane, Oxybis-}	10,000	1,655		
1338-23-4	Methyl Ethyl Ketone Peroxide (>60% for PSM)			5,000	
453-18-9	Methyl Fluoroacetate			100	
421-20-5	Methyl Florosulfate			100	
107-31-3	Methyl Formate {Formic Acid, Methyl Ester}	10,000	1,235		
60-34-4	Methyl Hydrazine	15,000	2,066	100	0.0094
74-88-4	Methyl Iodide			7,500	
624-83-9	Methyl Isocyanate {Methane, Isocyanato-}	10,000	1,248	250	0.0012
74-93-1	Methyl Mercaptan {Methanethiol} {Thiomethanol}	10,000	1,343	5,000	0.049
556-64-9	Methyl Thiocyanate {Thiocyanic Acid, Methyl Ester}	20,000	2,244		0.085
79-84-4	Methyl Vinyl Ketone			100	
74-89-5	Methylamine {Methanamine} {Monomethylamine}	10,000	1,729	1,000	
75-79-6	Methyltrichlorosilane {Silane, Trichloromethyl-}	5,000	472		0.018
13463-39-3	Nickel Carbonyl {Nickel Tetracarbonyl}	1,000	91	150	0.00067
7697-37-2	Nitric Acid (>=80% for RMP) (>=94.5% for PSM)	15,000	1,196	500	0.026
10102-43-9	Nitric Oxide {Nitrogen Oxide (No)}	10,000	943	250	0.031
100-01-6	Nitroaniline {Para Nitroaniline}			5,000	

CAS	Chemical Name	RMP Threshold Quantity (TQ) lbs	RMP Threshold Corrected to Gals	PSM Threshold Quantity (TQ) lbs	Toxic Endpoint
7783-54-2	Nitrogen Trifluoride			5,000	
10102-44-0	Nitrogen Oxides (NO, NO2, N2O4, N2O3)			250	
10544-72-6	Nitrogen Tetroxide {Nitrogen Peroxide}			250	
10544-73-7	Nitrogen Trioxide			250	
10102-44-0	Nitrogen Dioxide			250	
75-52-5	Nitromethane			2,500	
8014-95-7	Oleum (Fuming Sulfuric Acid) (65-80% for PSM) {Sulfuric Acid, with Sulfur Trioxide}	10,000	608	1,000	0.01
20816-12-0	Osmium Tetroxide			100	
7783-41-7	Oxygen Difluoride {Fluorine Monoxide}			100	
10028-15-6	Ozone			100	
19624-22-7	Pentaborane			100	
109-66-0	Pentane	10,000	1,914		
79-21-0	Peracetic Acid (>60% Acetic Acid for PSM) {Ethaneperoxoic Acid} {Peroxyacetic Acid}	10,000	977		0.0045
7601-90-3	Perchloric Acid (>60% for PSM)			5,000	
594-42-3	Perchloromethylmercaptan {Methanesulfenyl Chloride, Trichloro-}	10,000	707	150	0.0076
7616-94-6	Perchloryl Fluoride			5,000	
75-44-5	Phosgene {Carbonic Dichloride} {Carbonyl Chloride}	500	42	100	0.00081
7803-51-2	Phosphine {Hydrogen Phosphide}	5,000	803	100	0.0035
10025-87-3	Phosphorus Oxychloride {Phosphoryl Chloride}	5,000	364	1,000	0.003
7719-12-2	Phosphorus Trichloride {Phosphorous Trichloride}	15,000	1,142	1,000	0.028
110-89-4	Piperidine	15,000	2,085		0.022
463-49-0	Propadiene {1,2-propadiene}	10,000	**		
74-98-6	Propane	10,000	2,381		
106-96-7	Propargyl Bromide {3-bromopropyne}			100	
107-12-0	Propionitrile {Ethyl Cyanide} {Propanenitrile}	10,000	1,494		0.0037
627-13-4	Propyl Nitrate			2,500	
109-61-5	Propyl Chloroformate {Carbonochloridic Acid, Propylester}	15,000	1,649		0.01
115-07-1	Propylene {1-propene}	10,000	1,968		
75-56-9	Propylene oxide {oxirane, methyl-}	10,000	1,395		0.59
75-55-8	Propyleneimine {Aziridine, 2-methyl}	10,000	1,485		0.12
74-99-7	Propyne {1-propyne}	10,000	1,697		
107-44-8	Sarin			100	
7783-79-1	Selenium Hexafluoride			1,000	
7803-62-5	Silane	10,000	1,762		
7803-52-3	Stibine {Antimony Hydride}			500	
7446-09-5	Sulfur Dioxide (Anhydrous for RMP)	5,000	418		0.0078
5714-22-7	Sulfur Pentafluoride			250	

CAS	Chemical Name	RMP Threshold Quantity (TQ) lbs	RMP Threshold Corrected to Gals	PSM Threshold Quantity (TQ) lbs	Toxic Endpoint
7783-60-0	Sulfur Tetraflouride {Sulfur Fluoride, (Sf4) (T-4)-}	2,500	154	250	0.0092
7446-11-9	Sulfur Trioxide {Sulfuric Anhydride}	10,000	624	1,000	0.01
7783-80-4	Tellurium Hexafluoride			250	
116-14-3	Tetrafluoroethylene {Ethene, Tetrafluoro-}	10,000	**	5,000	
10036-47-2	Tetrafluorohydrazine			5,000	
75-74-1	Tetramethyllead {Plumbane, Tetramethyl-}	10,000	601	1,000	0.004
75-76-3	Tetramethylsilane {Silane, Tetramethyl-}	10,000	1,849		
509-14-8	Tetranitromethane {Methane, Tetranitro-}	10,000	732		0.004
7719-09-7	Thionyl Chloride			250	
7550-45-0	Titanium Tetrachloride {Titanium Chloride (Ticl4)(T-4)}	2,500	174		0.02
584-84-9	Toluene 2,4-diisocyanate {Benzene, 2,4-diisocyanato-1-methyl-}	10,000	979		0.007
91-08-7	Toluene 2,6-diisocyanate {Benzene, 1,3-diisocyanato-2-methyl-}	10,000	978		0.007
26471-62-5	Toluene Diisocyanate (Unspecified Isomer) {Benzene, 1,3-diisocyanatomethyl-}	10,000	1,007		0.007
1558-25-4	Trichloro(chloromethyl)silane			100	
27137-85-5	Trichloro(dichlorophenyl)silane			2,500	
10025-78-2	Trichlorosilane {Silane, Trichloro-}	10,000	892	5,000	
79-38-9	Trifluorochloroethylene {Ethene, Chlorotrifluoro-}	10,000	917	10,000	
75-50-3	Trimethylamine {Methanamine, N,n-dimethyl-}	10,000	1,893		
75-77-4	Trimethylchlorosilane {Silane, Chlorotrimethyl-}	10,000	1,403		0.05
2487-90-3	Trimethyoxysilane			1,500	
108-05-4	Vinyl Acetate Monomer {Acetic Acid Ethenyl Ester}	15,000	1,929		0.26
689-97-4	Vinyl Acetylene {1-buten-3-yne}	10,000	1,689		
75-01-4	Vinyl Chloride {Ethene, Chloro-}	10,000	1,237		
109-92-2	Vinyl Ethyl Ether {Ethene, Ethoxy-}	10,000	1,579		
75-02-5	Vinyl Fluoride {Ethene, Fluoro-}	10,000	1,695		
107-25-5	Vinyl Methyl Ether {Ethene, Methoxy-}	10,000	1,542		
75-35-4	Vinylidene Chloride {Ethene, 1,1-dichloro-} {1,1-dichlorethylene}	10,000	990		
75-38-7	Vinylidene Fluoride {Ethene, 1,1-difluoro-}	10,000	**		

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(June 1969)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

MANUAL TRANSMITTAL SHEET

Release
6-121
Date
1/17/01

Subject

6840 - Special Status Species Management

1. Explanation of Material Transmitted: This release revises BLM Manual 6840.

2. Reports Required: None

3. Materials Superseded: Manual pages superseded by this release are listed under "REMOVE" below. No other directives are superseded.

4. Filing Instructions: File as directed below.

REMOVE	INSERT
All of 6840 (Rels. 1-116)	6840
(Total 13 Sheets)	(Total 26 Sheets)

Assistant Director, Renewable Resources & Planning

6840 - SPECIAL STATUS SPECIES MANAGEMENT

Table of Contents

6840 - SPECIAL STATUS SPECIES MANAGEMENT

.01 Purpose. The purpose of this Manual Section is to provide policy and guidance, consistent with appropriate laws, for the conservation of special status species of plants and animals, and the ecosystems upon which they depend. These are species which are proposed for listing, officially listed as threatened or endangered, or are candidates for listing as threatened or endangered under the provisions of the Endangered Species Act (ESA); those listed by a State in a category such as threatened or endangered implying potential endangerment or extinction; and those designated by each State Director as sensitive. Conservation in this section and pursuant to the ESA means the use of all methods and procedures which are necessary to improve the status of federally listed species and their habitats to a point where the provisions of the ESA are no longer necessary. Conservation of special status species means the use of all methods and procedures which are necessary to improve the condition of special status species and their habitats to a point where their special status recognition is no longer warranted.

.02 Objectives. The objectives of the special status species policy are:

A. To conserve listed species and the ecosystems on which they depend.

B. To ensure that actions requiring authorization or approval by the Bureau of Land Management (BLM or Bureau) are consistent with the conservation needs of special status species and do not contribute to the need to list any special status species, either under provisions of the ESA or other provisions of this policy.

.03 Authority.

A. Endangered Species Act of 1973 (16 U.S.C. 1531 *et seq.*), as amended.

B. Sikes Act, Title II (16 U.S.C. 670g *et seq.*) , as amended.

C. The Federal Land Policy and Management Act of 1976 (43 U.S.C.1701 *et seq.*), as amended.

D. Departmental Manual 235.1.1.A., General Program Delegation, Director, Bureau of Land Management.

E. Departmental Manual 632.1.1-1.6, Endangered Species Management.

F. Secretarial Order 3206 (American Indian Tribal Rights, Federal-Tribal Trust Responsibilities, and the Endanger Species Act).

.04 Responsibility.

A. Director is responsible for the overall conservation of special status species, oversees implementation of the ESA on public lands, may designate BLM sensitive species, and

makes any applications for project exemptions under Section 7 of the ESA to the Secretary of the Interior.

B. Assistant Director for Renewable Resources and Planning is responsible for the timely development, approval, and implementation of policy and procedures for carrying out the special status species conservation program.

C. Fish, Wildlife and Forests Group Manager is responsible for initiating and recommending policies, objectives, general procedures, and priorities relating to the conservation of special status species and overall coordination of the special status species program at the national level.

D. Threatened and Endangered Species Senior Specialist is responsible for:

1. Maintaining appropriate interactions with BLM Offices and Groups, headquarters of other Federal agencies and bureaus, national conservation organizations, international conservation groups and individual authorities.

2. Maintaining a thorough knowledge of the legislation, regulations, court rulings, and litigation actions relative to special status species and understanding how these may affect BLM programs. This includes ensuring, through directives and training, that all field offices are notified of any changes in a species' status or agency policy on special status species.

3. Reviewing and recommending necessary changes to objectives and policies for the special status species program.

4. Providing centralized review and analysis of present and future needs related to research, management, and information transfer for special status species.

5. Developing and recommending budget documents, including budget justifications and the Annual Work Plan.

E. State Directors are responsible for:

1. Developing and implementing programs for the conservation of special status species within their states.

2. Coordinating the special status species program with adjoining BLM State Offices, State and other Federal agencies, various private organizations, and BLM constituents.

3. Establishing programs to determine which special status species occur on public land, the condition of the populations and their habitats, and how discretionary BLM actions affect those species and their habitats.

4. Designating BLM sensitive species, and periodically reviewing and updating the BLM sensitive species list, as appropriate, in coordination with State agencies that are responsible for fisheries, wildlife, and botanical resources and State Natural Heritage programs.

5. Ensuring that provisions for the conservation of special status species, particularly the objectives from approved recovery plans and conservation agreements, are incorporated in land use plans and subsequent activity and interdisciplinary level plans.

6. Ensuring that all actions comply with the ESA, its implementing regulations, and other directives associated with conserving special status species.

7. Ensuring appropriate consultations with the U. S. Fish and Wildlife Service (FWS) and National Marine Fisheries Service (NMFS).

8. Designating a special status species program coordinator whose responsibilities are:
   a. To maintain a cooperative working relationship with State and Federal agencies and local conservation groups, especially the regional and local offices of the FWS and NMFS.

   b. To recommend policy and guidance changes when necessary to maintain consistency with national level direction and to ensure compliance with the ESA and State laws protecting special status species.

   c. To recommend and develop training material to keep field offices current on policies and direction changes.

   d. To monitor implementation of the special status species program and recommend changes to ensure compliance with law, regulation, and policy and maintain effectiveness of the program.

F. Field Office Managers are responsible for implementing the special status species program within their area of jurisdiction by:

1. Conducting and maintaining current inventories for special status species on public lands.

2. Providing for the conservation of special status species in the preparation and implementation of recovery plans with which BLM has concurred, interagency plans and conservation agreements.

3. Ensuring that all actions comply with the ESA, its implementing regulations, and other directives associated with conserving special status species.

4. Coordinating field office activities with Federal, State, and local groups to ensure the most effective program for special status species conservation.

5. Ensuring actions are evaluated to determine if special status species objectives are being met.

6. Ensuring all actions authorized, funded or carried out by BLM follow the interagency consultation procedures as outlined in 50 CFR Part 402- Interagency cooperation - Endangered Species Act of 1973, as amended.

7. Ensuring results of formal section 7 consultations, including terms and conditions in incidental take statements, are implemented.

.05 References.

A 50 CFR Part 17 - Endangered and Threatened Wildlife and Plants.

B. 50 CFR Part 17 Subpart H - Experimental Population.

C. 50 CFR Part 226 - Designated Critical Habitat.

D. 50 CFR Part 402- Interagency Coordination –Endangered Species Act of 1973, as amended.

E. 50 CFR Part 424 - Listing Endanger and Threatened Species and Designating Critical Habitat.

F. 50 CFR Part 451 - Application Procedure.

G. 43 CFR 4180 - Fundamentals of Rangeland Health and Standards and Guidelines for Grazing Administration.

J. Memorandum of Understanding (MOU) entered into with the U. S. Dept. of Agriculture Forest Service, U. S. Dept. of Defense, U. S. Dept. of the Army Corps of Engineers, U.S. Dept. of Commerce National Marine Fisheries Serv., U. S. Dept. of the Interior Fish and Wildlife Serv., Bureau of Land Management, Bureau of Reclamation, Minerals Management Service, National Park Service, Bureau of Mines, U. S. Dept. of Transportation Coast Guard, Federal Aviation Administration, Federal Highway Administration, and U. S. Environmental Protection Agency on Implementation of the Endangered Species Act, September 29, 1994.

K. Memorandum of Understanding (MOU) (94-SMU-058) - U. S. Dept. of Agriculture and the U. S. Dept. of the Interior Fish and Wildlife Service, Bureau of Land Management,

National Park Service, U.S. Dept. of Commerce National Marine Fisheries Service on candidate species conservation, January 25, 1994.

L. Memorandum of Agreement ESA Section7 Programmatic Consultations and Coordination among Bureau of Land Management, Forest Service, National Marine Fisheries Service, and Fish and Wildlife Service dated August 30, 2000.

M. BLM Manual Section1601 - Land Use Planning.

N. BLM Handbook H-1601 - Land Use Planning Handbook.

O. BLM Handbook H-1790-1- NEPA Handbook.

P. BLM Handbook H-8160-1 - General Procedural Guidance for Native American Consultation.

Q. BLM Handbook H-8560-1 - Management of Designated Wilderness Areas.

R. BLM Handbook H-8550-1 - Interim Management Policy and Guidelines for Lands Under Wilderness Review.

S. BLM Manual 1745 - Introduction, Transplant, Augmentation, and Reestablishment of Fish, Wildlife, and Plants.

.06 Policy. The policy of the BLM is described below.

A. Federally Listed Threatened and Endangered Species and Designated Critical Habitats.

1. The BLM shall conserve listed species and the ecosystems upon which they depend and shall use existing authority in furtherance of the purposes of the ESA. Specifically the BLM shall:

a. Determine, to the extent practicable, the occurrence, distribution, population dynamics and habitat condition of all listed species on lands administered by BLM, and evaluate the significance of lands administered by BLM in the conservation of those species.

b. Ensure management plans and programs provide for the conservation of designated critical habitat on lands administered by the BLM.

c. Develop and implement management plans and programs that will conserve listed species and their habitats.

d. Monitor and evaluate ongoing management activities to ensure conservation objectives for listed species are being met.

e. Ensure that all activities affecting the populations and habitats of listed species are designed to be consistent with recovery needs and objectives.

f. Implement mandatory terms and conditions and reasonable and prudent alternatives as outlined in final biological opinions.

g. Implement conservation recommendations included in biological opinions if they are consistent with BLM land use planning and policy and they are technologically and economically feasible.

2. Ensure that all actions authorized, funded, or carried out by the BLM are in compliance with the ESA. To accomplish this, the BLM shall:

a. Evaluate all proposed actions to determine if individuals or populations of listed species or their habitat, including designated critical habitat, may be affected.

b. Initiate consultation with the FWS and/or NMFS, including preparation of biological assessments, as appropriate, for those actions that may affect listed species or their habitats.

c. Until the consultation proceedings are completed and a final biological opinion has been issued, BLM shall not carry out any action that would cause an irreversible or irretrievable commitment of resources such that it would foreclose the formulation or implementation of any reasonable and prudent alternative measure that might avoid jeopardy to listed species and/or prevent the adverse modification of critical habitat.

d. Ensure that BLM actions will not reduce the likelihood of survival and recovery of any listed species or destroy or adversely modify their designated critical habitat.

3. Cooperate with the FWS and NMFS in planning and providing for the recovery of listed species. To accomplish this, the BLM shall:

a. As appropriate, participate on recovery teams and in recovery plan preparation, in addition to participating on State or regional working teams responsible for listed species recovery.

b. Review technical and agency drafts of recovery plans for species affected by BLM management to ensure that proposed actions assigned to BLM are technically and administratively feasible and consistent with BLM's mission and authority.

c. Cooperate with FWS and NMFS and non-Federal entities, as appropriate, in preparation of Habitat Conservation Plans.

d. Ensure that decisions, standards and guidelines, and best management practices in resource management plans and site-specific plans prepared for lands covered by previously approved recovery plans are consistent with meeting recovery plan objectives and terms and conditions of applicable biological opinions.

4. Retain in Federal ownership all habitat essential for the survival and recovery of any listed species, including habitat that was used historically, that has retained its potential to sustain listed species, and is deemed to be essential to their survival.

B. Federally Proposed Species and Proposed Critical Habitats. The BLM shall manage species proposed for listing as threatened or endangered and proposed critical habitat with the same level of protection provided for listed species and designated critical habitat except that formal consultations are not required. Specifically, the BLM shall:

1. Confer with the FWS and/or NMFS on any action that is likely to adversely affect a proposed species or proposed critical habitat.

2. Until the conference proceedings are completed, BLM shall not carry out any action that would cause an irreversible or irretrievable commitment of resources such that it would foreclose the formulation or implementation of a reasonable and prudent alternative that might avoid jeopardy to the proposed species and/or prevent the adverse modification of proposed critical habitat.

C. Candidate Species . Consistent with existing laws, the BLM shall implement management plans that conserve candidate species and their habitats and shall ensure that actions authorized, funded, or carried out by the BLM do not contribute to the need for the species to become listed. Specifically, BLM shall:

1. In coordination with FWS and/or NMFS determine, to the extent practicable, the distribution, population dynamics, current threats, abundance, and habitat needs for candidate species occurring on lands administered by the BLM; evaluate the significance of lands administered by the BLM or actions undertaken by the BLM in maintaining and restoring those species.

2. For candidate species where lands administered by the BLM or BLM authorized actions have a significant effect on their status, manage the habitat to conserve the species by:

a. Ensuring candidate species are appropriately considered in land use plans (BLM 1610 Planning Manual and Handbook, Appendix C).

b. Developing, cooperating with, and implementing range-wide or site-specific management plans, conservation strategies, and assessments for candidate species that include specific habitat and population management objectives designed for conservation, as well as management strategies necessary to meet those objectives.

c. Ensuring that BLM activities affecting the habitat of candidate species are carried out in a manner that is consistent with the objectives for managing those species.

d. Monitoring populations and habitats of candidate species to determine whether management objectives are being met.

3. Request technical assistance from the FWS and/or NMFS, and other qualified sources, on any planned action that may contribute to the need to list a candidate species as threatened or endangered.

D. State Listed Species. The BLM shall carry out management for the conservation of State listed plants and animals. State laws protecting these species apply to all BLM programs and actions to the extent that they are consistent with the Federal Land Policy and Management Act (43 U.S.C. 1701 et seq.) and other Federal laws. In states where the State government has or proposes species in categories such as State threatened or endangered, implying potential endangerment or extinction, State Directors will develop policies that will assist States in achieving their management objectives for those species.

E. Sensitive Species. State Directors, generally in cooperation with State agencies that are responsible for fisheries, wildlife and botanical resources and State Natural Heritage programs, shall designate BLM sensitive species. The Director in some cases, may designate BLM sensitive species. The protection provided by the policy for candidate species shall be used as the minimum level of protection for BLM sensitive species. The State Director shall establish the process for developing, reviewing, maintaining and coordinating with other agencies, organizations, and States to ensure the accuracy and completeness of the state's BLM sensitive species list. The sensitive species designation is normally used for species that occur on Bureau administered lands for which BLM has the capability to significantly affect the conservation status of the species through management. The State Director may designate additional categories of special status species as appropriate and applicable to his or her state's needs. The sensitive species designation, for species other than federally listed, proposed, or candidate species, may include such native species as those that:

1. could become endangered in or extirpated from a state, or within a significant portion of its distribution in the foreseeable future,

2. are under status review by FWS and/or NMFS,

3. are undergoing significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution,

4. are undergoing significant current or predicted downward trends in population or density such that federally listed, proposed, candidate, or State listed status may become necessary,

5. have typically small and widely dispersed populations,

6. are inhabiting ecological refugia, specialized or unique habitats, or

7. are State listed but which may be better conserved through application of BLM sensitive species status. Such species should be managed to the level of protection required by State laws or under the BLM policy for candidate species, whichever would provide better opportunity for its conservation.

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.1 The Endangered Species Act. On December 28, 1973, the Endangered Species Act of 1973 (16 U.S.C. 1531 *et seq.*) became law and superseded earlier endangered species legislation, passed in 1966 and 1969, which focused on animals and which provided only limited protection to listed species. The Endangered Species Act of 1973 was the first Federal legislation to include a comprehensive effort to conserve plants and wildlife. The provisions of the ESA, as amended, apply to plants and animals that have been listed as endangered or threatened, those proposed for being listed, and designated and proposed critical habitat. The responsibility for carrying out the ESA was assigned to the Federal Government (50 CFR Part 402).

.11 Requirements under the ESA. BLM requirements for management of federally listed and proposed species come from the ESA. There are a total of 18 sections within the ESA, 9 of which contain requirements or authorizations for the BLM. Listed below are those sections which pertain to BLM with a summary of the BLM's requirements or authorizations under each.

A. Section 2 (Policy on conservation of listed species). BLM shall seek to conserve listed species and shall utilize its authorities in furtherance of the purposes of the ESA. In addition, BLM shall cooperate with State and local agencies to resolve water resource issues in concert with conservation of endangered species.

B. Section 4 (Determination of endangered species and threatened species and development of recovery plans). While predominately a requirement of FWS and/or NMFS, BLM should provide relevant information to FWS and/or NMFS on species or habitats proposed for listing and may petition to add a species to, or to remove a species from, the threatened or endangered species list. In addition, BLM should provide information to the FWS and/or NMFS on proposed critical habitat for lands the Bureau administers and cooperate, as appropriate, with FWS/NMFS in developing recovery plans for listed species that occur on Bureau administered lands.

C. Section 5 (Land Acquisition). Authorizes the Secretary to use Land and Water Conservation funds to acquire lands to conserve fish, wildlife, and plants, including those which are listed as endangered species or threatened species.

D. Section 6 (Cooperation with the States). Authorizes the Secretary to cooperate to the maximum extent practicable with States including entering into management agreements and cooperative agreements for the conservation of threatened and endangered species.

E. Section 7 (Interagency Cooperation). Outlines requirements and procedures for interagency cooperation to conserve listed species and designated critical habitats. This section:

1. Requires BLM, in consultation with the FWS and/or NMFS, to use its authorities to further the purposes of the act by carrying out conservation programs for listed species.

2. Requires BLM, in consultation with the FWS and/or NMFS, to ensure that any action it authorizes, funds or carries out is not likely to jeopardize the continued existence of any listed species, using the best scientific and commercial data available.

3. Requires BLM to confer with the FWS and/or NMFS on any action that is likely to jeopardize proposed species or result in the destruction or adverse modification of proposed critical habitat.

4. Requires BLM to prepare a biological assessment if listed species or critical habitat may be present in the area affected by any major construction activity.

5. Prohibits BLM and applicants from making any irreversible or irretrievable commitment of resources with respect to the agency action which would foreclose the formulation and implementation of any reasonable and prudent alternatives that might avoid jeopardy to listed species or prevent the adverse modification of critical habitat.

6. Requires BLM to request early consultation on any action at the request of, and in cooperation with, the prospective permit or license applicant if the applicant has reason to believe that a listed species may be present in the area affected by the project and that implementation of such action will likely affect such species.

7. Sets procedures for BLM or a permit or license applicant to apply for an ESA exemption.

F. Section 9 (Prohibited Acts). This section identifies prohibited acts by any person subject to the jurisdiction of the United States, relating to species protected under the ESA. Except as authorized under Section 7(o) or Section 10(a) of the ESA, the prohibited acts include:

1. The BLM shall not take endangered species of fish or wildlife.

2. With respect to endangered plants, the BLM shall not remove or reduce to possession any such species from areas under Federal jurisdiction; maliciously damage or destroy any such species on any such area; or remove, cut, dig up, or damage or destroy any such species on any other area in knowing violation of any law or regulation of any State or in the course of any violation of a state criminal trespass law.

3. The BLM shall not violate any regulation established under Section 4 of the ESA pertaining to threatened fish and wildlife or plants.

G. Section 10 (Exceptions to Prohibited Acts). This section identifies means by which exceptions to Section 9 of the ESA can occur for activities that include scientific purposes, establishment of experimental populations, or take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. The BLM shall acquire appropriate permits or authorizations to comply with the ESA and implementing regulations if its actions would result in a prohibited act.

H. Section 11 (Penalties and Enforcement). Within its authority, BLM may modify, suspend or revoke the lease, license, permit or other agreement authorizing the use of BLM managed lands, of any person who is convicted of a criminal violation of the ESA or any regulation, permit, or certificate issued pursuant to the ESA.

I. Section 18 (Annual Cost Analysis by the Fish and Wildlife Service). As requested by the FWS, the BLM should provide a summary of its expenditures for the conservation of listed species.

.12 BLM Policy Requirements. Actions authorized by BLM shall further the conservation of federally listed and other special status species and shall not contribute to the need to list any special status species under provisions of the ESA, or designate additional sensitive species under provisions of this policy.

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.2 Administration. The BLM will conserve federally listed, proposed, candidate, sensitive, and State listed species by fulfilling the requirements of the ESA and by using other authorized methods to ensure that the actions authorized by BLM are consistent with the conservation of such species and that they do not contribute to the need to list any special status species under provisions of the ESA, or designate additional sensitive species under provisions of this policy.

.21 Administration of the ESA. The BLM will conserve listed species, designated critical habitat, proposed species, and proposed critical habitat through administration of the various sections of the ESA that apply to Federal agencies.

A. Section 2 (Findings, purposes and policy). The policy of the ESA, as stated in Section 2, is that all Federal departments and agencies shall seek to conserve endangered species and threatened species and shall utilize their authorities in furtherance of the purposes of this Act. The BLM shall comply with all applicable sections of the ESA. In addition:

1. The BLM should continue its cooperative role in the Memorandum of Understanding (MOU) on the implementation of the ESA, entered into with the U. S. Forest Service, U. S. Department of Defense, U. S. Army Corps of Engineers, NMFS, FWS, Bureau of Reclamation, Minerals Management Service, National Park Service, U. S. Coast Guard, Federal Aviation Administration, Federal Highway Administration, and U. S. Environmental Protection Agency (Implementation of the Endangered Species Act, dated September 29, 1994). The purpose of the MOU was to establish a general framework for cooperation and participation among the cooperators in the exercise of their responsibilities under the ESA. To meet the purpose of the MOU and the requirements of Section 2 of the ESA, the BLM should:

a. Seek to improve efficiency by combining efforts with the other cooperators of the MOU to foster better working relationships and promote the conservation of listed species.

b. Use its authorities to further the purposes of the ESA by carrying out cooperative programs for the conservation of listed species .

c. Identify opportunities to conserve listed species and the ecosystems upon which those species depend within existing BLM programs or authorities.

d. Determine whether BLM planning processes effectively help conserve listed species and the ecosystems on which they depend.

e. Use existing programs, or establish a program if needed, to evaluate, recognize, and reward the performance and achievements of personnel who are responsible for planning or implementing programs to conserve or recover listed species or the ecosystems on which they depend.

f. Establish or participate in existing regional interagency working groups that identify geographic areas within which the groups will coordinate agency actions and create opportunities, and overcome barriers, to conserve listed species and the ecosystems upon which they depend and, to the extent practicable, protect candidate, or sensitive species and the ecosystems upon which they depend.

g. Participate in a national ESA working group to coordinate the implementation of the ESA.

2. As specifically addressed in Section 2 of the ESA, the BLM shall cooperate with State and local agencies to resolve water resource issues in concert with conservation of endangered species. The BLM should:

a. Participate on watershed councils.

b. Provide technical assistance to State and local agencies on species, critical habitats, and resources.

B. Section 4 (Determination of endangered species and threatened species and development of recovery plans).

1. Determination of endangered or threatened status. Determination of endangered or threatened status of species by the FWS and/or NMFS is provided for in Section 4 of the Endangered Species Act and the procedures in 50 CFR Part 424. BLM should provide assistance to the FWS and/or NMFS for actions that affect public land, including as follows:

a. Responsibilities. BLM is responsible for preparing and maintaining, on a continuing basis, a current inventory of the public land and its resources (FLPMA, 43 USC 1701 Sec.201 (a)). This inventory information, along with monitoring data, shall be used to evaluate the current condition of plants and animals and their habitats on the public land to determine if their status under the ESA should be changed (listed or delisted).

b. Petitions. When conditions warrant, BLM State Directors may petition the FWS and/or NMFS to change the status of any species or revise critical

habitat. These petitions shall contain concise biological evidence to substantiate any proposed change.

(1) Among other things a petition to delist a species must demonstrate clearly that the recovery plan objectives have been met or that there is new evidence to show that the conditions on which the initial listing was based no longer exist. Petitions to delist should also include a statement on how BLM intends to manage the species to ensure that the provisions of the ESA will not be required in the future.

(2) Petitions to list or delist species must be based solely on substantial scientific information for the species and its habitat and must address the five factors for listing included in Section 4 of the ESA.

(3) All petitions shall be coordinated with the State agency having responsibility for the species involved. Information copies of all petitions will be forwarded to the Washington Office, Fish, Wildlife and Forests Group.

2. Recovery plans. Recovery plans are developed by the FWS and/or NMFS and establish recovery objectives for a species, provide a listing of tasks necessary to achieve those objectives, and recommend assignments to involved agencies to carry out these tasks. A primary function of recovery plans is to combine programs of all agencies involved in managing a species into a coordinated management effort. BLM may adopt recovery plans. If BLM does adopt a recovery plan, BLM should incorporate the objectives of the recovery plan into appropriate land use and activity plans.

a. Recovery Teams. The FWS and/or NMFS often request that BLM provide representatives to serve as members on recovery teams to assist in preparation of recovery plans for species where public land has a significant role in recovery. These requests usually include a suggestion for a particular employee with special qualifications.

(1) State Directors should make employees with special expertise available and to provide whatever support is necessary to help ensure timely completion of recovery plans.

(2) BLM employees should accept these nominations. The role of the team member is to be a technical expert and advisor, to provide biological input for the species and its habitat, and to inform the recovery team of BLM policies, programs, and procedures for the recovery team.

(3) BLM participation in recovery plan preparation does not indicate BLM approval of the plan.

b. Technical Review Drafts. BLM should review technical review drafts of recovery plans to ensure that the information is biologically correct and complete. This review and input does not represent agency concurrence.

c. Agency Review Drafts. All BLM offices that will be involved in implementation of a particular recovery plan should review draft plans. Field offices should complete the following analysis:

(1) Determine whether measurable objectives are stated clearly and that BLM can realistically meet its proposed share of the recovery efforts including personnel and financial obligations.

(2) Identify any conflicts with other laws, regulations, and policies governing BLM programs and activities.

(3) Identify constraints on other BLM programs, activities, or practices mentioned or implied in the plan.

(4) Evaluate the effects of planned actions carried out by other cooperators on BLM programs.

(5) Identify any modifications to other BLM plans, ongoing programs, or ongoing practices that need to be made to carry out the plan, including the need to amend resource management plans.

(6) Check accuracy of cost estimates for BLM tasks, and evaluate personnel and funding needs.

3. Delisted Species. The results of recovery plans and actions should ultimately be removal from the Federal threatened or endangered species list (delisting). Responsibilities of BLM when this occurs take two paths.

a. BLM shall assess and determine the new status of the delisted species. If the species is still State listed, then the provisions of policy regarding State listed species will apply (.06D). If the species is not State listed, BLM shall determine if it should become a BLM sensitive species (.06E).

b. A minimum 5-year monitoring commitment is required for delisted species under the ESA. BLM shall work with partners such as the FWS, NMFS, State agencies, and others to monitor delisted species.

C. Section 5 (Land Acquisition). The BLM shall consider and seek opportunity for the acquisition by purchase, donation, land exchange, conservation easement, or other means, land, water, or interests for the purpose of conserving listed species, designated critical habitat, proposed species, or proposed critical habitat.

D. Section 6 (Cooperation with States). Section 6 of the ESA requires cooperation between the FWS and/or NMFS and States for the purposes of conserving any listed species. The BLM should assist with this, as follows:

1. The BLM should provide technical assistance to, and coordinate with, State agencies responsible for the conservation of endangered and threatened species at the state level.

2. The BLM shall comply with State laws protecting listed species for all programs and actions to the extent that State laws are consistent with FLPMA and other Federal laws.

E. Section 7 (Interagency Cooperation). Section 7(a)(1) requires the BLM to utilize their authorities in furthering the purposes of the Act by implementing programs for the conservation of threatened and endangered species. To meet the requirements of Section 7(a)(1) the BLM will include a discussion of conservation programs for threatened and endangered species separate from any consultation requirements in the NEPA document for actions affecting listed species. The requirements of Section 7(a)(2) are to be carried out in consultation with and with the assistance of the Secretary of the Interior and the Secretary of Commerce. The procedures for carrying out this consultation are included in 50 CFR Part 402, Interagency Cooperation. The need to initiate a consultation is usually determined by the BLM and is based on an analysis to determine if a listed species or its habitat may be affected by a proposed action. If a listed species is known or suspected to occur on land that will be affected by an action, and BLM determines that individuals, populations, or designated critical habitat may be affected by the action, either positively or negatively; then BLM must initiate consultation. FWS and/or NMFS may request BLM to enter into consultation if they identify an action for which there has been no consultation that may affect a listed species or designated critical habitat.

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1. Types of Activities. Section 7 applies to all actions for which there is discretionary BLM involvement or control. All actions that are authorized, funded, or carried out by the BLM that may affect listed or proposed species or designated or proposed critical habitat are subject to the provisions of the ESA.

a. This includes all such actions, whether or not:

(1) the species or critical habitat occurs on BLM managed lands.

(2) the proposed action occurs, either wholly or in part, on BLM managed lands.

(3) the BLM itself carries out the proposed action.

(4) the proposed action benefits BLM resources.

b. If BLM approval or authorization is for the entire action, e.g. authorizing a right-of-way for a powerline installation across public land for a powerline route extending beyond public land, the BLM may request that the FWS and/or NMFS conduct consultation in incremental steps when by statute the BLM is allowed to take incremental steps toward completion of the action. The biological opinion will include the Service's views on the entire action (50 CFR Part 402.14(k)).

(1) The first consultation must be formal (see .21E5).

(2) The BLM may proceed with the incremental step provided that the FWS and/or NMFS finding for the incremental step is not a jeopardy opinion; the BLM continues consultation with respect to the entire action and obtains biological opinions, as required, for each incremental step; the BLM fulfills its obligation to obtain sufficient data upon which to base the final biological opinion on the entire action; the incremental step does not result in the irreversible or irretrievable commitment of resources; and there is reasonable likelihood that the entire action will not result in jeopardizing the continued existence of a listed species or destruction or adverse modification of designated critical habitat.

2. Environmental Baseline, Direct Effects, Indirect Effects, and Interrelated and Interdependent Actions and Effects. To decide if consultation under Section 7 is necessary, the BLM needs to determine if its action within an action area may affect a listed species or designated critical habitat or is likely to adversely affect a proposed species or proposed critical habitat. The effects can be negative, benign, or beneficial to the listed or proposed species and critical habitat. The BLM shall evaluate the direct and indirect effects and the effects of interrelated and interdependent actions on the listed or proposed species and designated or proposed critical habitat as compared to the environmental baseline. Cumulative effects are considered relative to the requirements of the ESA only during the formal consultation process and are discussed in Section .21.E.5.b. The baseline and effects are defined as:

a. Environmental Baseline. The environmental baseline is the condition of a species or critical habitat at a specified point in time. The baseline does not include effects of the action under review for consultation. It does include the tribal, State, local and private actions already affecting a species or critical habitat or those that will occur while the consultation is in progress. Federal actions, unrelated to the action under consultation, that have affected or are affecting the species or critical habitat and have a completed formal or early consultation, are also part of the baseline.

b. Direct Effects. Those effects caused by or that will result from the action and will occur in the same time and place.

c. Interrelated and Interdependent Actions and Effects. Interrelated actions are those actions that are part of a larger action and depend on the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consideration. The "but, for" test should be used to assess whether an action is interrelated or interdependent to the proposed action. If the activity would not occur but for the proposed action, then the activity is interrelated or interdependent and must be considered during consultation on the proposed action.

d. Indirect Effects. Those effects caused by or that will result from the action and are later in time or farther removed in distance, but are reasonably certain to occur.

3. Informal Consultation. Informal consultation is a process that includes all discussions and correspondence between the FWS and/or NMFS and the BLM or its designated non-Federal representative designed to assist the BLM in determining if formal consultation or a conference is required. The BLM shall not dismiss the effects of an action on individuals of a listed species or its habitat, even when the overall net effect may be beneficial, without consulting with the FWS and/or NMFS.

a. The BLM shall seek recommendations for modification of actions that will avoid the likelihood of adverse effects and contribute to achieving recovery and conservation objectives.

b. If the BLM determines that the proposed action may affect but is not likely to adversely affect listed species, designated critical habitat, proposed species or proposed critical habitat, the BLM has the opportunity to conclude Section 7 consultation. This includes proposed actions that may have beneficial, benign, discountable, or insignificant effects. Informal consultation does not conclude unless the BLM has written concurrence of its determination from the FWS and/or NMFS.

c. The BLM shall continue Section 7 consultation if the BLM determines that the proposed action may affect and is likely to adversely affect listed species, designated critical habitats, proposed species, or proposed critical habitats; if there are undetermined effects; or if BLM's determination of not likely to adversely affect is not based on a biological assessment or has no written concurrence from the FWS and/or NMFS.

(1) The BLM shall continue informal consultation and seek recommendations for modification of actions that will avoid the likelihood of adverse effects and contribute to achieving recovery and conservation objectives.

(2) If project modifications cannot be made such that the proposed action is not likely to adversely affect listed species, designated critical habitat, proposed species, or proposed critical habitat, or if there are undetermined effects, BLM shall initiate formal consultation for listed species or designated critical habitat or conference for proposed species or proposed critical habitat. This includes actions for which the overall effect may be beneficial to the listed species or designated critical habitat but is likely to cause adverse effects. This also includes all actions for which incidental take is anticipated to occur.

4. Conference on Proposed Species and Proposed Critical Habitat. Section 402.10 of 50 CFR provides the procedures necessary for compliance with Section 7(a)(4) of the ESA.

a. BLM shall confer with the FWS and/or NMFS on any action that is likely to jeopardize the continued existence of any proposed species or result in the destruction or adverse modification of proposed critical habitat.

b. In order to meet policy objectives, BLM shall also confer on an action or project that may affect and is likely to adversely affect a proposed species or proposed critical habitat although this step is not required by the ESA or regulations.

c. For proposed species, the BLM should request formal conference in anticipation of future listing. Formal conference follows the procedures for formal consultation. The conference opinion issued at the conclusion of a formal conference may be adopted as the biological opinion once the species or critical habitat is listed or designated provided the project proposal has not changed and no new pertinent information exists. The FWS and/or NMFS usually provides advisory recommendations on ways to avoid or minimize adverse effects.

d. The BLM should consider the advisory recommendations for minimizing or avoiding adverse effects to proposed species or proposed critical habitat that are provided by the FWS and/or NMFS in the conference report from a non-formal conference or conference opinion from a formal conference. Implementation of recommendations is at the discretion of the BLM.

5. Formal Consultation. Formal consultation is required on all actions that may affect a listed species, its habitat, or any designated critical habitat (50 CFR Part 402.14), unless written concurrence that an action is not likely to adversely affect the species is received from FWS and/or NMFS. When it is determined by the BLM that a proposed action may affect and is likely to adversely affect a listed species or designated critical habitat, BLM shall initiate formal consultation. Formal consultation is conducted to determine if the proposed action, taken together with cumulative affects is likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of designated critical habitat. Formal consultation is initiated with submission of a biological assessment and a written request to initiate formal consultation.

a. Providing Information. During formal consultation, BLM shall provide the FWS and/or NMFS with the best scientific information available for an adequate review of the effects that a proposed action may have on a listed species or designated critical habitat. If information is lacking, the FWS and/or NMFS can request that the BLM conduct additional surveys to better address listed species issues. Although additional surveys or studies are not required by the ESA, they can be in BLM's best interest, as the FWS and/or NMFS are required to err on the side of conserving listed species when rendering a biological opinion based upon limited information.

(1) The BLM shall prepare a biological assessment, as described in 50 CFR 402.12 and 402.14, as the means of providing information to the FWS and/or NMFS.

(2) The BLM shall request in writing a list from the FWS and/or NMFS of listed species and designated critical habitat in the project area of a major construction activity, as defined in NEPA. In lieu of this, the BLM may determine these and request concurrence from the FWS and/or NMFS. If listed species or designated critical habitat are present in the project area, BLM shall prepare a biological assessment.

b. Cumulative Effects. In accordance with Section 7 regulations, the FWS and/or NMFS is required to consider cumulative effects in determining jeopardy or non-jeopardy to a species. The regulations require the BLM to provide an analysis of cumulative effects in its biological assessment. Cumulative effects, as defined for the purposes of the ESA, involve those effects from future non-Federal action (tribal, State, local, private and other entities) that are reasonably certain to occur in the action area under consideration. These future non-Federal actions are reasonably certain to occur if they have been approved by all control agencies and are economically viable. Past effects are considered as part of the environmental baseline and are not considered cumulative effects.

(1) The BLM may submit the appropriate cumulative effects analysis that is required for NEPA compliance. However, the ESA and NEPA requirements for cumulative effects analysis are different. For the ESA, future Federal actions unrelated to the proposed action are not considered part of cumulative effects because they will require a separate evaluation for consultation. The NEPA definition includes the incremental effects of the action plus the effects of other past, present, and reasonably foreseeable future actions regardless of the source, Federal or non-Federal. If the NEPA cumulative effects analysis is submitted, BLM should make the distinction between the ESA cumulative effects and NEPA cumulative effects.

c. Irreversible and Irretrievable Commitment of Resources. Once a request for formal consultation is made, BLM shall ensure that the agency and any of its applicants do not make any irreversible or irretrievable commitments of resources on public land with respect to the consulted action, that have the effect of foreclosing the formulation or implementation of any reasonable and prudent alternatives that could avoid jeopardy to listed species or destruction or adverse modification of designated critical habitat. In coordination with the FWS and/or NMFS, BLM shall immediately evaluate any ongoing projects that are part of an ongoing consultation to determine if there will be any such irreversible or irretrievable commitments of resources. Any BLM discretionary actions with such irreversible or irretrievable commitments of resources shall be immediately suspended until consultation has concluded and it is determined that the subject project can comply with the biological opinion or be appropriately modified to eliminate adverse effects.

d. Reasonable and Prudent Alternatives. If the FWS and/or NMFS concludes that an action is likely to jeopardize the continued existence of a listed species or will result in the destruction or adverse modification of designated critical habitat, it will prepare a biological opinion that identifies the availability of any reasonable and prudent alternatives. Reasonable and prudent alternatives are those that can be implemented in a manner consistent with the intended purpose of the action, can be implemented consistent with the scope of the action agency's legal authority and jurisdiction, are economically and technologically feasible, and would avoid the likelihood of jeopardizing the continued existence of listed species or resulting in the destruction or adverse modification of designated critical habitat. The final biological opinion, if a jeopardy opinion, will include any available reasonable and prudent alternatives.

(1) The BLM should provide expertise to the FWS and/or NMFS in determining the availability and development of reasonable and prudent alternatives, although the FWS and/or NMFS retains the final decision on which alternatives are included in the biological opinion. The BLM should encourage applicant (see .21E5i and Glossary) participation in the development of reasonable and prudent alternatives.

(2) The BLM should request and review a copy of the draft biological opinion from the FWS and/or NMFS and provide comments if needed.

(A) The BLM should forward a copy of the draft biological opinion to any applicants and inform them that any comments they may have for the FWS and/or NMFS must go through the BLM, although they may provide copies to the FWS and/or NMFS directly.

(B) The BLM should forward applicant comments to the FWS and/or NMFS.

e. Termination of the Consultation Procedures. Formal consultation may terminate as follows:

(1) The FWS and/or NMFS issues a biological opinion.

(2) During any stage of consultation the BLM notifies the FWS and/or NMFS in writing that the proposed action is not likely to occur.

(3) During any stage of consultation the BLM determines, with the written concurrence of the FWS and/or NMFS, that the proposed action is not likely to adversely affect any listed species.

(4) The BLM notifies the FWS and/or NMFS in writing that it will accept one of the reasonable and prudent alternatives and accept other mandatory requirements.

f. BLM responsibility after issuance of the biological opinion. After the FWS and/or NMFS issues the biological opinion, the BLM determines how it will proceed.

(1) BLM shall notify FWS and/or NMFS in writing of its final decision on any proposed actions that receive a jeopardy or adverse modification of critical habitat determination in the biological opinion. If the BLM determines that it cannot comply with the requirements of Section 7(a)(2) (no jeopardy) of the ESA, it may apply for exemption.

(2) After acceptance of the biological opinion, BLM shall implement the proposed action or reasonable and prudent alternative as described and shall implement all mandatory terms and conditions. BLM shall review conservation recommendations in biological opinions and implement them if they are consistent with BLM land use planning and policy and they are technologically and economically feasible.

g. Reinitiation. The BLM in writing shall reinitiate consultation if one or more of the four conditions occur: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the action that may affect listed species or designated critical habitat in a manner or extent not previously considered; (3) the action is modified in a manner causing an effect to listed species or critical habitat not previously considered; (4) a new species is listed or critical habitat is designated which may be affected by the action. The State Director or Field Manager of the administrative unit that received the biological opinion shall determine if a reinitiation condition has occurred and shall reinitiate the consultation, if needed, with the appropriate FWS and/or NMFS office.

h. Plan Level Consultation. The Director, State Directors, and Field Managers shall initiate or reinitiate consultation on land use plans, other

forms of land management plans, or programmatic level plans when new listings or proposals of species and critical habitats occur.

i. Applicants. An applicant is defined as any person who requires formal approval or authorization; such as for permits, licenses, leases, or letters of authorization or approval, from the BLM as a prerequisite to conducting an action. The applicant is involved in the ESA conference or consultation process if the applicant's specific action that requires approval or authorization by the BLM may affect a federally threatened, endangered, or proposed species.

(1) BLM responsibilities relative to applicants in the context of early consultation are described in Section .21.E.5.k.

(2) If possible, the BLM shall identify and determine who is an applicant for the purposes of ESA consultation. Not all applicants will be identifiable by the BLM at the time of consultation. The BLM does not identify applicants in association with programmatic consultations, e.g. land use plan level consultation, because no specific action that may require authorization or approval is involved. Under programmatic consultations, the BLM usually retains the discretion to provide formal authorization or approval for more specific actions. If consultation for a more specific action is required, applicants for that specific action will be identified at that time.

(3) BLM shall promptly inform FWS and/or NMFS if there is an applicant identified for a project that has been or will be submitted for consultation.

(4) BLM shall notify known applicants promptly if the conference or consultation process is required and of their opportunities for participation in the process.

(A) The BLM shall provide any applicant the opportunity to submit information for consideration during the consultation process should provide the same opportunity during the conference process.

(B) If a required biological assessment will not be completed within the 180 day time period, after receipt of or concurrence with the species list, the BLM shall provide the applicant with a written statement setting forth the estimated length of the proposed extension and the reasons why such an extension is necessary.

(C) If requested by the applicant, the BLM should request a copy of the draft biological opinion from the FWS and/or NMFS, provide a copy to the applicant, and forward any applicant comments to the FWS and/or NMFS.

(D) The BLM should encourage the FWS and/or NMFS to discuss the basis for the biological determination in the biological opinion to enhance the applicant's understanding of the outcome. BLM will also involve the applicant in discussions with FWS and/or NMFS to develop reasonable and prudent alternatives to the proposed action in instances where a proposed action is determined to be likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of designated critical habitat.

j. Designation of non-Federal Representative. The BLM may designate a non-Federal representative to conduct informal consultation or prepare a biological assessment under 50 CFR Part 402.08. However, the ultimate responsibility for compliance with Section 7 of the ESA remains with the BLM.

(1) The BLM shall provide written notice to the FWS and/or NMFS if it designates a non-Federal representative.

(2) An applicant may be the designated non-Federal representative. If an applicant is involved and is not the designated non-Federal representative, then the applicant and BLM must agree on the choice of the designated non-Federal representative.

(3) The BLM shall furnish guidance and supervision and shall independently review and evaluate the scope and contents of the biological assessment prepared by the designated non-Federal representative.

k. Early Consultation. Section 7(a)(3) of the ESA and Secretarial exercise of authority in regulations provides the means, referred to as "early consultation," for a prospective applicant for public land use to request an early consultation if the prospective applicant has reason to believe that the prospective action may affect listed species or designated critical habitat (50 CFR Part 402.11). For early consultation, BLM shall:

(1) Receive in writing the prospective applicant's certification that it has a definitive proposal outlining the action and its effects and it intends to implement its proposal, if authorized.

(2) Upon receipt of the prospective applicant's certification, initiate early consultation in writing with the FWS and/or NMFS and provide all of the information required under initiation of formal consultation (50 CFR Part 402.14.(c)).

(3) For a major construction activity, include a biological assessment at the time of initiating early consultation.

(4) Provide any prospective applicant with the opportunity to submit information for consideration during early consultation.

(5) If the prospective applicant requests through the BLM a copy of the draft preliminary biological opinion, forward the request and the prospective applicant's comments on the draft preliminary biological opinion to the FWS and/or NMFS.

(6) Not consider the incidental take statement of the preliminary biological opinion as authority to take listed species.

(7) Request in writing to FWS and/or NMFS confirmation of the preliminary biological opinion as the final biological opinion if the BLM feels that there have been no significant changes in the action as planned or in the information used during the early consultation. If confirmation from FWS and/or NMFS is not received, initiate formal consultation.

6. Exemption. The ESA allows opportunity to apply for an exemption from the requirements of section 7(a)(2).

a. The Director has sole authority to make an exemption application if the BLM is the exemption applicant.

b. The application for an exemption shall be submitted to the Secretary of the Interior or Secretary of Commerce, as appropriate, within 90 days following the termination of the consultation process.

c. Procedures for applications for exemption are in 50 CFR Part 451.

7. Consultation and Conference Approaches. A number of approaches to improve the efficiency and effectiveness of Section 7 consultation and conference have been utilized in various areas of the BLM. The overall goal is to enhance compliance with obligations under Section 7(a)(1) and 7(a)(2). The Director, State Directors and Field Managers, in cooperation with other Federal agencies, should develop and utilize techniques to further the consultation and conference process, such as the Interagency Memorandum of Agreement ESA Section7 Programmatic Consultations and Coordination among BLM, FS, NMFS, and FWS dated August 30, 2000. Examples of these approaches are:

a. Completing and using national, ecosystem or regional level consultations and conferences that address broad scale programs or wide ranging species or critical habitats. The BLM should tier to and utilize the information, analysis, and determinations of effects of these consultations and conferences to the greatest extent practicable when consulting or conferring at more local or project-specific levels.

b. Consulting and conferring jointly with other Federal agencies on programs or actions affecting the same species or critical habitats in the same project or geographic area.

c. Completing combined consultations and conferences with FWS and NMFS together when programs or actions include effects on species or critical habitats under both agencies' jurisdictions (e.g., an action affects both listed plants and anadromous fish).

d. When programmatic consultation results in biological opinions that provide conservation recommendations or design criteria for future agency proposals, considering these recommendations or design criteria in the development of future proposals. If these future proposals are designed to be consistent with these recommendations or criteria, consultation will be facilitated and compliance with Sections 7(a)(1) and 7(a)(2) furthered.

e. Completing batched consultations or conferences on logical groupings of program or activity types. This can be done on a quarterly, annual or longer time frame.

f. Using streamlined processes. For example, in the Pacific Northwest, the FWS, NMFS, BLM and FS utilize joint procedures termed "streamlined consultation." This focuses on early involvement of FWS and/or NMFS in program or action design; interagency teams that complete consultation or conference; ensuring program or action are consistent with existing plans' standards, conference reports, conference opinions, and biological opinions; and submitting complete, "agreed-to" biological assessments. Consultations and conferences average completion times of less that 60 days for formal consultation or conferences and 30 days for informal consultation.

F. Section 9 (Prohibited Acts). The BLM shall not allow actions that result in take of listed animals, remove or reduce to possession endangered plants, or violate any regulations pertaining to threatened plants, except as provided for under Section 7(o) or Section 10(a) of the ESA.

1. Plants. Section 9 of the ESA prohibits take of all individuals of listed fish or wildlife. For plants, there is no "take" prohibition, but Section 9 makes it unlawful for anyone to remove and reduce to possession any endangered plant species; maliciously damage or destroy any endangered plant species on Federal lands; remove, cut, dig up, or damage or destroy any such species from any other area in knowing violation of any law or regulation of any state or in the course of any violation of a state criminal trespass law; or violate any regulations pertaining to threatened plants.

G. Section 10 (Exceptions to the ESA). Section 10 of the ESA provides for exceptions to the requirements and prohibited acts of other sections of the ESA.

1. Take and incidental take. Section 10 of the ESA provides exceptions for activities otherwise prohibited by Section 9. The BLM shall obtain permits from the FWS and/or NMFS if take of listed fish or wildlife species or the removal or reduction to possession of listed plants is anticipated and is not otherwise authorized. Authorization for take can occur in several ways.

a. If Section 7 consultation has occurred, for federally threatened and endangered fish and wildlife, the final biological opinions normally include an incidental take statement, with which the BLM shall comply. This statement will specify the impact, i.e. the amount or extent, of such incidental take; specify those reasonable and prudent measures that FWS and/or NMFS

considers necessary or appropriate to minimize such impact; set forth the terms and conditions (including, but not limited to, reporting requirements) that must be complied with by the BLM or any applicant; specify procedures to be used to handle or dispose of any individuals of a species actually taken, and monitor and report the impact on the species to FWS and/or NMFS.

(1) Biological opinions for plants do not contain an incidental take statement, only conservation recommendations. To the extent practicable, the BLM should implement such recommendations.

b. If an incidental take statement from a biological opinion is not applicable for an action, the BLM shall obtain a Section 10 permit from the FWS and/or NMFS for take of listed fish or wildlife or removal or reduction to possession of listed plants under 50 CFR Part 17 prior to conducting activities for scientific purposes, including scientific studies for biological assessments prior to Section 7 consultation.

(1) For federally threatened fish and wildlife species that have special rules identified in 50 CFR Parts 17 Subpart B, the BLM shall follow the special rules in lieu of obtaining a Section 10 permit.

(2) A conservation plan (usually a Habitat Conservation Plan) is required for a Section 10 permit.

c. For potential take of any experimental fish or wildlife species or removal or reduction to possession of any experimental plant outside of those allowed under biological opinions, the BLM shall follow permit requirements in special rules identified in 50 CFR Part 17 Subpart B.

d. A conservation agreement does not authorize take.

e. An incidental take statement provided with a conference opinion does not become effective unless the FWS and/or NMFS adopts the conference opinion as the final biological opinion once the listing is final.

f. With early consultation, the incidental take statement provided with a preliminary biological opinion does not constitute a statement of anticipated take under Section 10 of the ESA unless it is confirmed by the FWS and/or NMFS as the final biological opinion.

g. For fish and wildlife, the exceptions to the requirement of permission for take are as follows and shall be reported to the FWS and/or NMFS as described in 50 CFR Part 17.21(4):

(1) Any BLM employee may take endangered wildlife in defense of his or her own life or the lives of others.

(2) Any BLM employee may, when acting in the course of his or her official duties, take endangered wildlife without a permit if such action is necessary to: (i) aid a sick, injured or orphaned specimen; or (ii) dispose of a dead specimen; or (iii) salvage a dead specimen which may be useful for scientific study; or (iv) remove specimens which constitute a demonstrable but non-immediate threat to human safety, provided that the taking is done in a humane manner; the taking may involve killing or injuring only if it has not been reasonably possible to eliminate such threat by live-capturing and releasing the specimen unharmed, in a remote area.

(3) Any BLM employee may, when acting in the course of his or her official duties, remove and reduce to possession a federally endangered plant without a permit if such action is necessary to (i) care for a damaged or diseased specimen; (ii) dispose of a dead specimen; or (iii) salvage a dead specimen which may be useful for scientific study.

2. Experimental Populations.

a. General. FWS and/or NMFS can designate experimental populations of listed plants and animals. These populations can only be released outside the species current natural range but within its probable historic range if the Secretary determines that such release will further the conservation of the species (with rare exceptions). The intent is to ensure separation between experimental and natural populations. The Secretary of Interior or Commerce must determine whether the experimental population is:

(1) "Essential" - Essential to the continued existence of a listed species in the wild.

(2) "Nonessential" - Not essential to the continued existence of a listed species.

b. Management. BLM shall treat essential experimental populations as threatened species, and nonessential experimental populations as proposed species for purposes of Section 7 (other than subsection 7(a)(1)). For nonessential experimental populations, this means:

(1) Incidental take can occur without specific authorization by FWS and/or NMFS.

(2) Conferencing (as opposed to consultation) is required.

(3) As required by Section 7(a)(1), the BLM shall use its authorities to conserve these populations.

c. Planning. Planning efforts must reflect those actions necessary for recovery of species to the extent BLM management can influence recovery. State Directors and field managers will:

(1) Keep informed on recovery plan development so needs can be addressed during planning.

(2) Ensure participation with FWS and/or NMFS in developing recovery needs for species that may have experimental population designation.

d. Wilderness. In some cases, it is appropriate to transplant and reintroduce listed species into their historic ranges within designated wilderness and wilderness study areas. BLM shall use only the minimum actions necessary and the methods most appropriate for wilderness areas. Further information on guidelines for fish and wildlife is contained in BLM Handbook H-8560-1 for wilderness areas, in H-8550-1 for wilderness study areas, and in MS 1745 for Introductions and Transplants.

H. Section 11 (Penalties and Enforcement). The BLM shall exercise all of its authorities to ensure compliance with the ESA. The BLM may modify, suspend or revoke the lease, license, permit or other agreement of a person who is convicted of a criminal violation of the ESA or any regulation, permit, or certificate issued pursuant to the ESA.

I. Section 18 (Annual Cost Analysis by the Fish and Wildlife Service). The BLM shall provide to FWS a summary of its expenditures on the conservation of listed species for FWS annual expenditure report to Congress.

J. Activities for which BLM has no discretion. Some activities that involve BLM may not require BLM approval (e.g. reciprocal road rights-of-way). If an action is not authorized, funded, or carried out by BLM, or BLM no longer retains discretionary authority over the activity, it is considered to be non-discretionary with respect to the ESA and BLM is not responsible for conducting a Section 7 consultation. However, provisions of the ESA may be applicable to the person or persons involved with the activity. In such situations, BLM's responsibilities are as follows.

1. If BLM becomes aware of a non-discretionary activity involving Bureau administered lands that may affect listed or proposed species, BLM should notify the person or persons involved of the possible conflict with the ESA.

2. BLM should take all actions allowed or required under regulations, law, and policy that would result in avoiding or minimizing adverse effects on listed or proposed species and designated or proposed critical habitat.

3. If the person or persons involved with the non-discretionary activity wish to develop measures that would eliminate conflicts with the ESA, the BLM shall arrange for the participation of BLM specialists and, if needed, specialists from FWS and/or NMFS during the process of developing such measures.

.22 Conservation of species other than under the ESA. The ESA establishes policy, procedures, and requirements for the conservation of listed species, designated critical habitat, proposed species, and proposed critical habitat. BLM policy is broader than the ESA in that it addresses special status species that may be affected by BLM activities, as well as federally listed and proposed species. It is in the interest of the public and the affected special status species for BLM to undertake conservation actions for such species before listing is warranted or the designation of critical habitat becomes necessary. It is also in the interest of the public and the affected special status species for BLM to undertake conservation actions that improve the status of such species to the point where their special status recognition is no longer warranted. By doing so, BLM will have greater flexibility in managing the public lands to accomplish native species conservation objectives, while fulfilling other FLPMA mandates.

A. Planning. The BLM should obtain and use the best available information deemed necessary to evaluate the status of special status species in areas affected by land use plans or other proposed actions and to develop sound conservation practices. Land use plans shall be sufficiently detailed to identify and resolve significant land use conflicts with special status species without deferring conflict resolution to implementation-level planning. Implementation-level planning should consider all site-specific methods and procedures which are needed to bring the species and their habitats to the condition under which the provisions of the ESA are not necessary, current listings under special status species

categories are no longer necessary, and future listings under special status species categories would not be necessary.

B. Coordination and Cooperation with Tribes. The relationship between the United States and Indian tribes is defined by treaties, statutes, executive orders, judicial decisions, and agreements, and differentiates tribes from other entities that deal with, or are affected by, the Federal government. Tribes are self-governing with fundamental rights to set their own priorities and make decisions affecting their resources and distinctive ways of life. However, as with other entities, coordination on the conservation and management of resources would benefit the tribal resources and public resources as they relate to special status species.

1. Secretarial Order 3206 on American Indian Tribal Rights, Federal-Tribal Trust Responsibilities, and the ESA. The Secretarial Order, signed on June 5, 1997, by the Secretary of the Interior and Secretary of Commerce clarifies the responsibilities of agencies of the Department of the Interior and Department of Commerce when actions taken under the authority of the ESA and associated implementing regulations affect, or may affect, Indian land, tribal trust resources, or the exercise of American Indian tribal rights. The Secretarial Order does not apply to Alaska. In addition to BLM Policy 8160, the BLM shall administer the conservation provisions of the Secretarial Order as follows:

a. Whenever the BLM is aware that its actions planned under the ESA may impact tribal trust resources, the exercise of tribal rights, or Indian lands, the BLM shall consult (as defined in BLM Handbook H8160-1 and distinct from ESA consultation procedure) with the tribes that are affected and seek their participation to the maximum extent practicable. This shall include providing affected tribes adequate opportunities to participate in data collection, consensus seeking, and associated processes.

b. The BLM shall assist Indian tribes in developing and expanding tribal programs that promote the health of ecosystems upon which special status species depend. This includes:

(1) Offering and providing such scientific and technical assistance and information as may be available for the development of tribal conservation and management plans to promote the maintenance, restoration, enhancement and health of the ecosystems upon which special status species depend.

(2) Cooperatively identifying appropriate management measures to address concerns for such species and their habitats.

c. The BLM shall give deference to tribal conservation and management plans for tribal trust resources that govern activities on Indian lands and that address the conservation needs of listed species.

d. At the earliest indication that it is considering management actions that may be restrictive to tribes, for the conservation of any species, the BLM shall promptly notify all potentially affected tribes, and assist tribes in identifying and implementing tribal conservation and other measures necessary to protect such species.

e. The BLM should assist the FWS and/or NMFS and other Federal agencies with their required actions under the Secretarial Order regarding the conservation of species.

f. The BLM should coordinate with the affected tribes and the BIA on BLM's Section 7 consultations of which it is aware that tribal rights or tribal trust resources may be affected.

g. Consistent with the provisions of the Privacy Act, the Freedom of Information Act, and the Department's ability to continue to assert FOIA exemptions, the BLM shall make available to a tribe all information held by the BLM that is related to a tribe's Indian lands and tribal trust resources.

h. The BLM shall, when appropriate and at the request of a tribe, pursue intergovernmental agreements to formalize arrangements involving special status species.

2. BLM 8160 Policy. The BLM should use any opportunity available under its 8160 Policy to seek coordinated conservation activities with tribes.

C. Agreements, Assessments, and Cooperative Strategies for Conservation. The BLM shall work cooperatively with other agencies, organizations, governments, and interested parties for the conservation of plants and animals and their habitats to reduce, mitigate, and possibly eliminate the need for their identification as a special status species. Cooperative efforts are important for conservation based on an ecosystem management approach and will improve efficiency by combining efforts and fostering better working relationships. Stabilizing and improving habitat conditions before a species is listed may allow more conservation and other management flexibility, reduce conflicts, and reduce the cost of conservation.

1. Requests for Technical Assistance on Candidate Species. The FWS and/or NMFS may have additional information on candidate species that was used as the basis for

adding the species to the candidate species list. Although requests for technical assistance are not required by any statute, the BLM would best serve the interests of the public and the species involved by ensuring that the best scientific information available is used to make final decisions. To help ensure that the best scientific data are available, the BLM shall request technical assistance and information from the FWS and/or NMFS as needed on candidate species for use in the BLM decision-making process to avoid actions that contribute to the need to list. The FWS and/or NMFS often provide advisory recommendations for reducing adverse effects to candidate species.

2. Habitat Conservation Assessments and Conservation Agreements. In an effort to eliminate the need for listings under the ESA, the BLM shall participate in developing habitat conservation assessments leading to conservation agreements for proposed, candidate, and sensitive species, groups of species, or specific ecosystems. This is pursuant to the MOU (94-SMU-058, dated June 25, 1994) entered into by the BLM, U. S. Forest Service, FWS, NMFS and the National Park Service to establish an interagency framework for cooperation and participation to achieve this objective. BLM's role in implementing the MOU is as follows:

a. State Directors and line managers shall make available employees with appropriate skills and expertise to support cooperative efforts for the development and implementation of habitat conservation assessments and conservation agreements.

b. State Directors and line managers should identify opportunities for habitat conservation assessments or, if none exists, initiate the development of these assessments and conservation agreements for the purpose of furthering the conservation of the subject species on BLM-administered and other lands.

c. The BLM should use habitat conservation assessments to develop conservation agreements that outline the procedural assurance necessary to reduce, eliminate, or mitigate specific threats to proposed, candidate, or sensitive species; to develop an ecosystem management approach to conservation on Federal lands; to facilitate coordination and cooperation with others, such as States and private entities, to achieve species and habitat conservation through an ecosystem management approach that extends beyond Federal land.

d. The BLM should be signatory to conservation agreements developed under the MOU if public land or BLM authorization is involved.

e. Contingent upon results of habitat conservation assessments, applicable objectives of conservation agreements, and appropriate procedures to ensure adherence to all legal requirements in analyzing changes, the BLM should establish new management direction for habitat conservation. Where appropriate, this will include amendment or revision of land use plans to provide a basis for and commitment to the conservation of the species.

f. The BLM should consider successful implementation of the program in evaluating line officer performance. Key leaders who contribute to notable successes will be recognized on a continuing basis.

3. Other Cooperation and Coordination. Conservation activities in general would benefit from cooperation and coordination with other agencies, organizations, governments, and interested parties.

a. The BLM in coordination with the FWS and/or NMFS and other interested entities should develop habitat conservation assessments and conservation agreements for any special status species that the Bureau feels would benefit from such an agreement.

b. The BLM should provide technical assistance to, and coordinate with appropriate State agencies and other agencies, organizations, or private landowners developing Habitat Conservation Plans.

c. The BLM should seek partnerships and cooperative relationships with other agencies, organizations, governments, and interested parties for the purposes of conservation of species and administration of the ESA. The BLM already has MOU's with several agencies and organizations. Partnerships beyond existing MOU's are encouraged. Partnerships and cooperative relationships should be sought with agencies that include, but are not limited to, the following:

(1) Other resource management and regulatory agencies, such as the Natural Resource Conservation Service, State fish and wildlife agencies, State forestry agencies, State water quality agencies, and municipal parks and recreation agencies.

(2) State and local governments, such as governor's offices, county commissioners, and city councils, county extension units, watershed councils, and resource conservation districts, and interested landowners.

(3) Federal advisory groups, such as Resource Advisory Councils, Provincial Advisory Boards, and Grazing Advisory Boards.

(4) Research entities, such as the Biological Resource Division of the U. S. Geological Survey, and university researchers.

(5) Professional societies, such as The Wildlife Society, the American Fisheries Society, and the Society for Ecological Restoration.

(6) Groups representing private sector interest in resources and resource uses, such as Trout Unlimited, National Audubon Society, The Nature Conservancy, National Cattlemen's Beef Association, and American Sports Tackle Manufacturers.

d. The BLM's role in partnerships and cooperative relationships should include, but not be limited to, developing conservation programs based on ecosystem management; providing expertise for programs affecting lands outside of the public land if benefits to BLM managed resources may result; and developing challenge cost-share projects, to support conservation activities.

4. Ecosystem Management and Native Biodiversity. BLM management should take into consideration ecosystem management and the conservation of native biodiversity to reduce the likelihood of placing any native species on a special status species list.

a. For rangelands, the BLM shall take actions that progress towards the conditions indicating attainment of the Fundamentals of Rangeland Health (described in 43 CFR 4180.1) and associated Standards (43 CFR 4180.2). Such actions would include management that restores, protects or enhances those resources necessary to support, as site potential and BLM authorities allow, a full complement of native species in their historical proportions.

b. The BLM should participate in and coordinate with State Natural Heritage Programs.

c. The BLM should seek opportunities to conserve and improve special status species and habitats for native animals and wildlife in the development of land use plans, activity plans, and in other BLM-authorized, funded or approved activities.

6840 - SPECIAL STATUS SPECIES MANAGEMENT

Glossary of Terms

-A-

action, activities, or programs: unless attributed to another entity, all actions of any kind authorized, funded, or carried out by BLM in whole or part. Examples include, but are not limited to: (1) actions intended to conserve special status species or their habitat; (2) the promulgation of regulations; (3) the granting of licenses, contracts, leases, easements, rights-of-way, permits, or grants-in-aid; (4) loss of habitat or transferring habitat out of Federal ownership; or (5) actions directly or indirectly causing modifications to the land, water, or air.

action area: areas to be affected directly or indirectly by the action, not merely the immediate area involved in the action.

adversely (adverse) affect: to have a detrimental effect on any or all portions of the life cycle of a threatened or endangered species or on its habitat or a component thereof.

advisory recommendations: recommendations provided by the FWS during informal consultation, conferences, or as technical assistance on candidate species, proposed species, or proposed critical habitat that assist in minimizing or avoiding effects of proposed actions.

animals: any member of the animal kingdom, including without limitation any mammal, fish, bird, amphibian, reptile, mollusk, crustacean, arthropod, or other invertebrate, and includes any part, product, egg, or offspring thereof, or the dead body or parts thereof. As used here, the words "animals," "fish or wildlife," and "wildlife" are interchangeable.

applicant: any person who requires formal approval or authorization from BLM as a prerequisite to conducting an action. This can include an individual, corporation, partnership, trust, association, or any other private entity; or any officer, employee, agent, department, or instrumentality of the Federal Government, of any State, municipality, or political subdivision of a State, or of any foreign government; any State, municipality, or political subdivision of a State; or any other entity subject to the jurisdiction of the United States.

-B-

batched consultation or batched conference: a single consultation or conference effort and biological assessment on a logical grouping of projects, activities, or programs of a similar nature. Projects, activities, or programs typically should occur in the same watershed, geographic area, administrative units or have some other elements in common. The biological assessment may be interagency (e.g., BLM and FS). The intent is to facilitate the consultation and conference process.

biological assessment: the document prepared by or under the direction of BLM concerning listed and proposed species and designated and proposed critical habitat that may be present in the action area and contains the BLM's determination of potential effects of the action on such species and habitat. Biological assessments are required for formal consultations and conferences on "major construction projects." They are recommended for all formal consultations and formal conferences and many informal consultations where a written evaluation of the effects of an action on listed or proposed species and on designated or proposed critical habitat is needed. Also referred to as a BA.

biological opinion: the document which includes: (1) the opinion of the FWS and/or NMFS as to whether or not a Federal action is likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of designated critical habitat; (2) a summary of the information on which the opinion is based; and (3) a detailed discussion of the effects of the action on listed species or designated critical habitat. Depending upon the determination of jeopardy or non-jeopardy, the biological opinion may contain reasonable and prudent alternatives, a statement of anticipated take of listed animals and conservation recommendations for listed plants. Also referred to as a BO.

BLM managed lands: public lands managed by BLM whether they are held in fee title or BLM manages the surface or subsurface.

-C-

candidate species: taxa for which the FWS has sufficient information on their status and threats to support proposing the species for listing as endangered or threatened under the ESA but for which issuance of a proposed rule is currently precluded by higher priority listing actions. Separate lists for plants, vertebrate animals, and invertebrate animals are published periodically in the Federal Register.

conference: a process which involves informal discussions between BLM and the FWS and/or NMFS regarding the likely impact of an action on proposed species or proposed critical habitat, and recommendations to minimize or avoid the adverse effects. Formal conference, following procedures for formal consultation, may be requested by the BLM if a proposed species is soon to be listed or project impacts are expected to continue after listing and involve take.

conference opinion: document issued by the FWS and/or NMFS as a result of formal conference, similar to a biological opinion. The document may be adopted as biological opinion when the proposed species becomes listed or critical habitat becomes designated if no significant new information is developed and no significant changes to the action are made that would alter the content of the opinion.

conference report: document issued by the FWS and/or NMFS as a result of conference process that includes conclusions and advisory recommendations to the Federal agency and applicant.

conservation (also conserve and conserving): 1) Definition from ESA Section 3(3) and as applied to threatened, endangered and proposed species in this policy: to use, and the use of, all methods and procedures that are necessary to bring a listed species to the point at which the measures of the ESA no longer apply. Methods and procedures of conservation include, but are not limited to, all activities associated with scientific resources management such as research, census, law enforcement, habitat acquisition and maintenance, propagation, live trapping, and transportation, and, in the extraordinary case where population pressures within a given ecosystem cannot be otherwise relieved, may include regulated taking of animals. 2) As applied to other special status species, to use, and the use of, methods and procedures such that there is no longer any threat to their continued existence or need for continued listing as a special status species.

conservation agreement: A formal written document agreed to by FWS and/or NMFS and another Federal agency, State agency, local government, or the private sector to achieve the conservation of candidate species or other special status species through voluntary cooperation. It documents the specific actions and responsibilities for which each party agrees to be accountable. The objective of a conservation agreement is to reduce threats to a special status species or its habitat. An effective conservation agreement may lower species' listing priority or eliminate the need for listing.

conservation recommendations: non-mandatory suggestions by the FWS and/or NMFS in biological opinions which will reduce any adverse effects of a proposed action on listed species or critical habitat, or which will assist the BLM in complying with its obligations under Section 7 of the ESA, especially Section 7(a)(1) [see 50 CFR 402.02].

consultation with tribes: As defined in BLM Handbook H8160-1, the active, affirmative process of (1) identifying and seeking input from appropriate Native American governing bodies, community groups, and individuals and (2) considering their interests as a necessary and integral part of the BLM's decision making process.

critical habitat: (1) the specific areas within the geographical area currently occupied by a species, at the time it is listed in accordance with the ESA, on which are found those physical or biological features (i) essential to the conservation of the species and (ii) that may require special management considerations or protection, and (2) specific areas outside the geographical area occupied by a species at the time it is listed upon determination by the FWS and/or NMFS that such areas are essential for the conservation of the species. Critical habitats are designated in 50 CFR Parts 17 and 226. The constituent elements of critical habitat are those physical and biological features of designated or proposed critical habitat essential to the conservation of the species, including, but not limited to: (1) space for individual and population growth, and for normal behavior; (2) food, water, air, light, minerals, or other nutritional or physiological requirements; (3) cover or shelter; (4) sites for breeding, reproduction, rearing of offspring, germination, or seed dispersal; and (5) habitats that are protected from disturbance or are representative of the historic geographic and ecological distributions of a species.

cumulative impact (ESA definition): Effects of future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation. 50 CFR 402.02. (For reference purposes, the NEPA definition is: The impact on the environment which results 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. Cumulative impacts can result from individually minor, but collectively significant actions taking place over a period of time. BLM Manual H-1790-1).

-D-

designated critical habitat: see critical habitat.

destruction or adverse modification: direct or indirect alteration of critical habitat which appreciably diminishes the value of the habitat for both the survival and recovery of a listed species. Such alterations include, but are not limited to, alterations adversely modifying any of those physical or biological features that were the basis for determining the habitat to be critical.

direct effect: see effects of the action.

discountable effect: effects that are extremely unlikely to occur.

-E-

early consultation: a component of the consultation process that has been requested by Federal agency on behalf of a prospective applicant after it has been determined that the proposed action may affect listed species or designated critical habitat.

effects of the action: the direct and indirect effects of an action on the species or critical habitat that will be added to the environmental baseline. It includes the direct and indirect effects of the Federal action under consideration together with the effects of actions that are interrelated or interdependent with the action. Direct effects are those that are caused by the proposed action and occur at the same time and place. Indirect effects are those that are caused by the proposed action and are later in time or farther removed in distance, but are still reasonably foreseeable. Interrelated actions are those that are part of a larger action and depend on the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consideration.

endangered species: see special status species.

experimental populations: an introduced population (including any offspring arising solely therefrom) that has been so designated in accordance with the procedures of 50 CFR Subpart H Section 17.80 but only when, and at such times as, the population is wholly separate

geographically from non-experimental populations of the same species. Where a part of an experimental population overlaps with natural populations of the same species on a particular occasion, but is wholly separate at other times, specimens of the experimental population will not be recognized as such while in the area of overlap. That is, experimental status will only be recognized outside the areas of overlap. Thus, such a population shall be treated as experimental only when the times of geographic separation are reasonably predictable; e.g. fixed migration patterns, natural, or manmade barriers. A population is not treated as experimental if total separation will occur solely as a result of random and unpredictable events.

essential experimental population: an experimental population whose loss would be likely to appreciably reduce the likelihood of the survival of the species in the wild. All other experimental populations are to be classified as nonessential.

nonessential experimental populations: those populations whose loss would not appreciably affect the continued existence of the species.

-F-

fish or wildlife: see animals.

formal conference: see conference.

formal consultation: a component of the consultation process under Section 7 of the ESA that commences with the BLM's written request for consultation after it has determined that its action may affect and is likely to adversely affect listed species or designated critical habitats.

-H-

habitat: the place where an organism (plant or animal) lives. There are four major divisions of habitat, namely, terrestrial, freshwater, estuarine, and marine.

habitat conservation assessment: A comprehensive, state-of-knowledge technical document that describes life history, habitat requirements and management considerations for a species or group of species throughout its occupied range on the lands managed by the cooperating agencies. Habitat conservation assessments are often done as a forerunner to preparation of a conservation agreement.

Habitat Conservation Plan: Under section 10(a)(2)(A) of the ESA, a document that is a mandatory component of an incidental take permit application, also known as a Conservation Plan.

-I-

incidental take: see take.

indirect effects: see effects.

informal consultation: a component of the consultation process that includes all discussions, correspondence, etc., between the FWS and/or NMFS and the BLM agency or the designated non-Federal representative, prior to formal consultation, to determine if a proposed action may affect listed species or critical habitat and to use FWS and/or NMFS expertise, if necessary, to modify the proposed action to avoid potentially adverse effects.

interdependent action: see effects.

interrelated action: see effects.

insignificant effect: impact that is small enough in scale that it take should never occur and that, based on best judgment, a person should not be able meaningfully to measure, detect, or evaluate insignificant effects.

-J-

jeopardize the continued existence of (also jeopardize, cause jeopardy to): engage in an action which reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of listed species in the wild by reducing the reproduction, numbers, or distribution of a listed species or otherwise adversely affecting the species.

-L-

listed species: see special status species.

-M-

major construction activity: a construction project (or other undertaking having similar physical impacts) which is a major Federal action significantly affecting the quality of the human environment as referred to in NEPA. These include dams, buildings, pipelines, roads, water developments, channel improvements, dredging, blasting, and other such undertakings which significantly modify the physical environment.

may affect: the conclusion that a proposed action may pose any effect on listed species or designated critical habitat.

multiple use: the management of the public lands and their various resource values so that they are utilized in the combination that will best meet the present and future needs of the American people; making the most judicious use of the land for some or all of these resources or related services over areas large enough to provide sufficient latitude for periodic adjustments in use to

conform to changing needs and conditions; the use of some land for less than all of the resources; a combination of balanced and diverse resource uses that takes into account the long-term needs of future generations for renewable and nonrenewable resources, including, but not limited to, recreation, range, timber, minerals, watershed, wildlife and fish, and natural scenic, scientific and historical values; and harmonious and coordinated management of the various resources without permanent impairment of the productivity of the land and the quality of the environment with consideration being given to the relative values of the resources and not necessarily to the combination of uses that will give the greatest economic return or the greatest unit output (FLPMA).

-P-

person: an individual, corporation, partnership, trust, association, or any other private entity, or any officer, employee, agent, department, or instrumentality of the Federal Government, or any State or political subdivision thereof, or of any foreign government.

plant: any member of the plant kingdom, including seeds, roots, flowers, and other parts thereof.

preliminary biological opinion: an opinion issued by the FWS and/or NMFS as a result of early consultation.

programmatic consultation: consultation addressing an agency's multiple actions on a program, regional or other basis.

proposed critical habitat: habitat proposed in the Federal Register to be designated as critical habitat under Section 4 of the Endangered Species Act.

proposed species: see special status species.

-R-

reasonable and prudent alternatives: those alternatives identified during consultation that can be implemented in a manner consistent with the intended purpose of the action, can be implemented consistent with the scope of the action agency's legal authority and jurisdiction, are economically and technologically feasible, and would avoid the likelihood of jeopardizing the continued existence of listed species or resulting in the destruction or adverse modification of designated critical habitat. Alternatives not considered reasonable and prudent are those that were not previously under consideration (e.g. locating a project in uplands instead of requiring a Corps permit to fill a wetland), require actions of a third party not involved in the proposed action, require actions on lands outside of the BLM's jurisdiction or authority.

recovery: improvement in the status of listed species to the point at which the measures provided by the ESA are no longer necessary.

request for technical assistance: communication with the FWS and/or NMFS concerning actions that will potentially have an adverse effect on a candidate species or its habitat. The objectives of these requests are to obtain as much biological information as possible about the species involved and its habitat, the reasons the species is designated as a candidate species, and their recommendations on how the proposed management action might be carried out without contributing to the further deterioration of the species habitat.

-S-

species: any species or subspecies of fish or wildlife or plants (and in the case of plants, any varieties), and any distinct population segment of any species of vertebrate fish or wildlife which interbreeds when mature.

special status species: includes the following;

(1) proposed species- species that have been officially proposed for listing as threatened or endangered by the Secretary of the Interior. A proposed rule has been published in the Federal Register.

(2) listed species-species officially listed as threatened or endangered by the Secretary of the Interior under the provisions of the ESA. A final rule for the listing has been published in the Federal Register.

(A) endangered species - any species which is in danger of extinction throughout all or a significant portion of its range.

(B) threatened species - any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

(3) candidate species -species designated as candidates for listing as threatened or endangered by the FWS and/or NMFS. A list has been published in the Federal Register.

(4) State listed species -species listed by a State in a category implying but not limited to potential endangerment or extinction. Listing is either by legislation or regulation.

(5) sensitive species are those designated by a State Director, usually in cooperation with the State agency responsible for managing the species and State Natural heritage programs, as sensitive. They are those species that: (1) could become endangered in or extirpated from a State, or within a significant portion of its distribution; (2) are under status review by the FWS and/or NMFS; (3) are undergoing significant current or predicted downward trends in

habitat capability that would reduce a species' existing distribution; (4) are undergoing significant current or predicted downward trends in population or density such that federal listed, proposed, candidate, or State listed status may become necessary; (5) typically have small and widely dispersed populations; (6) inhabit ecological refugia or other specialized or unique habitats; or (7) are State listed but which may be better conserved through application of BLM sensitive species status.

status review: process of examination by FWS and/or NMFS to determine if a species situation warrants protection under the ESA. Results are published in the Federal Register.

survival: for determination of jeopardy or adverse modification, the species' persistence as listed or as a subset identified by the FWS and/or NMFS for recovery management purposes, beyond the conditions leading to its endangerment, with sufficient resilience to allow for the potential recovery from endangerment. It is the condition in which a species continues to exist into the future while retaining the potential for recovery. This condition is characterized by a species with a sufficient population, represented by all necessary age classes, genetic heterogeneity, and number of sexually mature individuals producing viable offspring, which exists in an environment providing all requirements for completion of the species' entire life cycle, including reproduction, sustenance, and shelter.

-T-

take: harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. The term applies only to fish and wildlife.

(1) incidental take Any taking otherwise prohibited, if such taking is incidental to, and not the purpose of, the carrying out an otherwise lawful activity.

(2) harm as used in the definition of take means to commit an act which actually kills or injures wildlife. Such act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavior patterns, including breeding, feeding, or sheltering.

(3) harass as used in the definition of take means to commit an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavior patterns, which include but are not limited to breeding, feeding, or sheltering.

threatened species: see special status species.

tribes (Indian tribes): any Federally recognized Indian tribe, band, nation, pueblo, community or other organized group within the United States which the Secretary of the Interior has identified on the most current list of Federally recognized tribes maintained by the Bureau of Indian Affairs.

(1) tribal trust resources: those natural resources, either on or off Indian lands, retained by, or reserved by or for Indian tribes through treaties, statutes, judicial decisions, and executive orders, which are protected by a fiduciary obligation on the part of the United States.

(2) tribal rights: those rights legally accruing to a tribe or tribes by virtue of inherent sovereign authority, unextinguished aboriginal title, treaty, statute, judicial decisions, executive order or agreement, and which give rise to legally enforceable remedies.

(3) Indian lands: any lands title to which is either 1) held in trust by the United States for the benefit of any Indian tribe or individual; or 2) held by any Indian tribe or individual subject to restrictions by the United States against alienation.

-W-

wildlife: see animals.

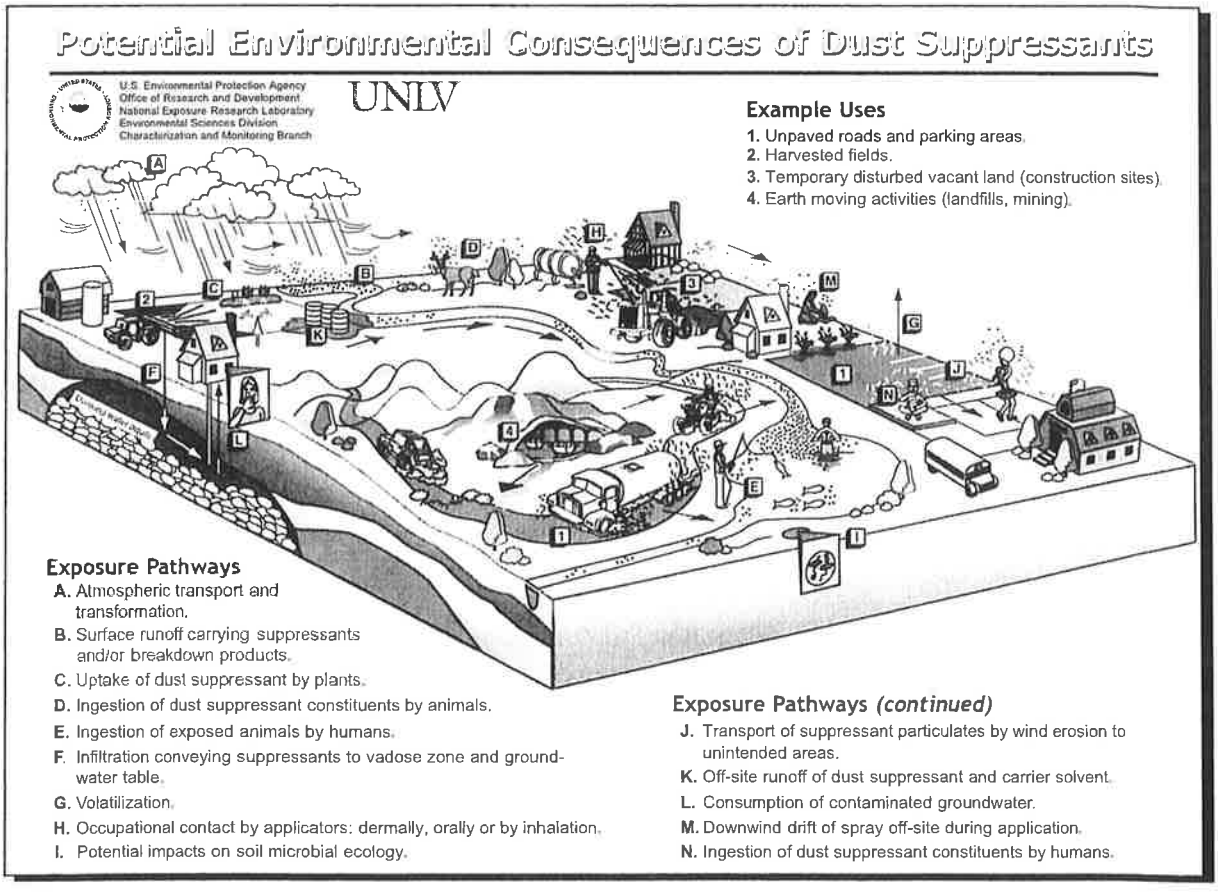
EXHIBIT U

Potential Environmental Impacts of Dust Suppressants: "Avoiding Another Times Beach"

An Expert Panel Summary

Las Vegas, Nevada

May 30 – 31, 2002



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Potential Environmental Impacts of Dust Suppressants: "Avoiding Another Times Beach"

An Expert Panel Summary
Las Vegas, Nevada
May 30-31, 2002

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Executive Summary

A.1 Background

In the past decade, there has been an increased use of chemical dust suppressants such as water, salts, asphalt emulsion, vegetable oils, molasses, synthetic polymers, mulches, and lignin products. Dust suppressants abate dust by changing the physical properties of the soil surface and are typically used on construction sites, unpaved roads, and mining activities. The use of chemical dust suppressants has increased dramatically due to rapid population growth and increased emphasis on the need to control particulates in the interest of air quality. In the United States, there are over 2,500,000 km of public unpaved roads, of which 25% (625,000 km) are treated with chemical dust suppressants. A critical problem in the arid southwestern U.S. is dust suppression on land disturbed for residential construction.

Recognizing that it is important to achieve and maintain clean air, the concern that prompted this report is that application of dust suppressants to improve air quality could potentially have other adverse environmental impacts. Times Beach, Missouri is a classic example where the resolution of dust emissions from unpaved roads leads to the creation of a Superfund site. In 1972 and 1973 waste oil contaminated dioxin was sprayed on unpaved roads and vacant lots for dust control in Times Beach. After realizing the adverse situation that had occurred, the costs to relocate the residents and clean up the site was over $80 million. Much more stringent regulations are now in place to avoid another Times Beach; however, there is still concern over the use of dust suppressants since most products used as dust suppressants are by-products and their exact composition is unknown.

The purpose of this report is to summarize the current state of knowledge on the potential environmental impacts of chemical dust suppressants. Furthermore, the report summarizes the views of an Expert Panel that was convened on May 30-31, 2002 at the University of Nevada, Las Vegas to probe into the potential environmental issues associated with the use of dust suppressants.

A.2 Current State of Knowledge

There are several major categories of dust suppressants: hygroscopic salts, organic petroleum-based, organic nonpetroleum-based, synthetic polymer emulsions, electrochemical products, mulches of wood fiber or recycled newspaper, and blends that combine components from the major categories. Dust suppressants are frequently formulated with waste products recycled from other industries.

Most of the research on dust suppressants has been conducted by industry and has focused on the effectiveness (or performance) of dust suppressants, that is, the ability to abate dust. Little information is available on the potential environmental and health impacts of these compounds. Potential environmental impacts include: surface and groundwater quality deterioration; soil contamination; toxicity to soil and water biota; toxicity to humans during and after application; air pollution from volatile dust suppressant components; accumulation in soils; changes in hydrologic characteristics of the soils; and impacts on native flora and fauna populations.

The major known effects of salts in the environment relate to their capacity to move easily with water through soils. Water quality impacts include possible elevated chloride concentrations in

streams downstream of application areas and shallow groundwater contamination. In the area near the application of salts, there could be negative impacts to plant growth. For organic non-petroleum based dust suppressants, ligninsulfonate has been shown to reduce biological activity and retard fish growth. Organic petroleum-based dust suppressants have been shown to be toxic to avian eggs; however, the leachate concentrations in other studies were low in comparison to health-based standards. There is also concern with the use of recycled oil waste that may have heavy metals and PCBs.

A.3 View of the Experts

The expert panel was not able to identify specific concerns on the use of dust suppressants due to the high amount of variability associated with site conditions, dust suppressant composition, and application techniques. The experts did agree more attention should be paid to dust suppressant composition and management. The determination of whether a problem might exist in any given case, however, must be based on the assessment of site-specific conditions.

The potential impact of dust suppressants on soils and plants includes changes in surface permeability, uptake by plant roots that could affect growth, and biotransformation of the dust suppressants in the soil into benign or toxic compounds depending on the environmental conditions and associated microbiota. Vegetation adjacent to the area where dust suppressants are applied could be impacted by airborne dust suppressants. This includes browning of trees along roadways and stunted growth. These effects will vary since different plants have different tolerances.

The potential impact of dust suppressants to water quality and aquatic ecosystems include contaminated ground and surface waters, and changes in fish health. Dust suppressants that are water-soluble can be transported into surface waters and materials that are water-soluble but do not bind tenaciously to soil can enter the groundwater. Fish may be affected by direct ingestion of toxic constituents and also by changes in water quality (e.g., BOD, DO, salinity).

A.4 Current Programs/Guidelines

There are no federal regulations controlling the application of dust suppressants; however, some states have developed guidelines for the use of dust suppressants. These include the U.S. Environmental Protection Agency (EPA) Environmental Technology Verification (ETV) program, three state programs in California, Michigan, and Pennsylvania, and a county-level program in Clark County, Nevada. In Canada, there is the Canada ETV national program.

Although there are no specific regulations in place to control dust suppressant application, it is noteworthy that existing regulations promulgated under the Resource Conservation Recovery Act (RCRA), Comprehensive Environmental Response Compensation and Liability Act (CERCLA), Superfund Amendments and Reauthorization Act (SARA), Clean Water Act (CWA) and TOSCA restrict the introduction of harmful substances into the environment. Regardless, there is concern that since no one program addresses the use of dust suppressants, the enforcement of what is used as dust suppressants could "slip through the regulatory cracks."

A.5 Path Forward (Recommendation)

The expert panel and organizing committee identified several important issues related to scientific research and information about dust suppressant, and regulations on the use of the products. Below is a summary of the major issues and recommendations for each of these categories:

Scientific issues

- Develop a comprehensive definition of an "effective" dust suppressant that includes the performance, costs and environmental impacts
- Better understanding of the composition of the dust suppressants and how they change after application
- Better understanding of dust characteristics and development of methods to assist in the selection of the most appropriate dust suppressant for a specific site
- Develop a framework (e.g., decision-making tree, expert system) for dust suppressant selection and assessing potential environmental impacts
- Develop an easily accessible information center, a "clearinghouse", which could help applicators, regulators, and the public acquire the information about dust suppressants. The recommended form of this clearinghouse is as a World Wide Web site
- Conduct field experiments that provide additional information on the "effectiveness" of a dust suppressant with a particular focus on the environmental impacts as well as the performance of the dust suppressants

Regulations

- Establishing an interagency working group that evaluates the cross media and cross jurisdictional issues associated with the use of dust suppressants
- Review existing state and federal regulatory databases to determine if the compounds found in dust suppressants are restricted or prohibited. This should also be done to close regulatory loopholes that allow entry of unlimited industrial waste into the environment when they are classified as dust suppressants
- Evaluate whether existing programs such as Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), RCRA, CERCLA, SARA, CWA, TOSCA and Ecological Soil Screening Level (Eco-SSL) guidance will serve as good models for the development of risk-based regulations
- Develop a standardized assessment methodology that can be used to estimate soil mass fractions of dust suppressant constituents at a particular site. An example is provided in the main part of this report
- Identify standardized environmental tests (e.g., water quality, toxicity) that all dust suppressants manufacturers would have to perform on their products

Foreword

The purpose of this report is to summarize the current state of knowledge of dust suppressants and potential environmental consequences. The material presented here is based on knowledge gained from scientific literature, industry reports, conversations with industry representatives and regulators, and an expert panel hosted by the University of Nevada - Las Vegas (UNLV) and the U.S. Environmental Protection Agency (EPA). The expert panel on the "Potential Environmental Effects of Dust Suppressant Use: Avoiding Another Times Beach" met on the University of Nevada, Las Vegas, campus on May 30-31, 2002 to consider whether or not dust suppressants pose risks to the environment or human health and how they should be used and managed.

Support for the expert panel and preparation of this report was provided by EPA Region 9 who encouraged the EPA's Office of Research and Development in Las Vegas to consider the use of dust suppressants and their potential environmental and human health impacts.

The expert panel considered the potential for unintended consequences from dust suppressants and also if guidelines or regulations on the use of dust suppressants might prevent future problems. Twenty-six (26) experts from varying disciplines were invited to participate in the panel. They represented hydrologists, soil scientists, microbiologists, industry, applicators, and regulators. Several participants had specific knowledge about dust suppressants, but the majority was selected because of their expertise in a specific discipline. They were asked to participate in the panel and use their expertise for discussing the current and future use of dust suppressants in a variety of settings. The specific objectives for this expert panel were to: (1) review, and add to, industrial and scientific knowledge on the composition of dust suppressants; (2) interpret the body of knowledge, and identify physical, chemical, biological, and regulatory issues related to the environmental impacts of dust suppressants; (3) begin to develop a strategy to assist federal, state, and local agencies in regulating the use of dust suppressants; and (4) contribute to a report describing the expert interpretations and a strategy for permitting the use of dust suppressants.

The panel and additional reviewers were asked to review this final report as to whether it fairly reflects the current knowledge of dust suppressants and their applications, potential problems, and a path forward to further resolve those problems and other issues. The report reflects a combination of views of the Expert Panel Organizing Committee and the Expert Panel, and information from the scientific literature and industry. There were many views presented by the group of experts and some of them differed. The statements and/or views of individual members or several members of the Expert Panel are referenced as (Expert Panel 2002), and scientific literature references use a standard reference form (e.g., Bolander, 1999).

The report is written for several audiences. It is intended to be a guidance document for regulators at federal, state, and local levels, scientific researchers, and the environmental community. It serves as a primer to give readers general background information on what dust suppressants are, how they are used, and what potential regulatory issues arise from their use. It provides the local-level employee, who has been given the task of learning about dust suppressants and assessing whether her or his organization should develop regulations, a basic understanding of the issues and kinds of questions that need to be asked about a particular dust suppressant application. It also provides information that could ultimately be used to determine the need for federal regulation of dust suppressants.

Section 1 of the report provides an introduction and frames the potential problems associated with the use of dust suppressants. Section 2 provides an overview of dust suppressants, the various uses, and the current regulations/guidelines. Section 3 summarizes the current state of knowledge on environmental impacts of dust suppressants from the scientific literature and the Expert Panel. Section 4 outlines a framework for assessing the potential environmental impacts of dust suppressants. Finally, Section 5 lists the scientific and regulatory issues that are not resolved at this time and should be considered if guidelines are to be developed for dust suppressant use.

A draft version of this report was submitted to all of the 26 Expert Panelists and 10 outside individuals from government agencies, universities, and industry. A total of 19 individuals provided comments to the Organizing Committee. All comments were considered, and revisions were made to strengthen the report. Following is a list of the external reviewers.

Amy, Penny, Ph.D.	University of Nevada, Las Vegas
Bassett, Scott, Ph.D.	Desert Research Institute, Reno
Bolander, Peter	U.S. Department of Agriculture, Forest Service
Colbert, Woodrow	Pennsylvania State Conservation Commission
Detloff, Cheryl	Midwest Industrial Supply, Inc.
Franke, Deborah	Research Triangle Institute
Johnson, Jolaine, P.E.	Nevada Division of Environmental Protection
Knight, Gaye	City of Phoenix, Office of Environmental Programs
Langston, Rodney	Clark County Department of Air Quality
Lee, G. Fred, Ph.D., P.E.	G. Fred Lee Associates
Letey, John, Ph.D.	University of California, Riverside
Pickrell, John, Ph.D.	Kansas State University
Sanders, Thomas, Ph.D.	Colorado State University
Scheetz, Barry, Ph.D.	Pennsylvania State University
Spear, Terry, Ph.D.	Montana Tech of the University of Montana
Starkweather, Peter, Ph.D.	University of Nevada, Las Vegas
Tyler, Scott, Ph.D.	University of Nevada, Reno
Wells, Jason	ILS, Inc., ESAT Contractor for U.S. EPA Region 4
Wierenga, Peter, Ph.D.	The University of Arizona

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List of Tables and Figures

Acronyms

APG	Application Practice Guidelines
ASTM	American Society of Testing and Materials
BOD	Biological oxygen demand
CalCert	California Environmental Technology Certification program
CCCP	Clark County Comprehensive Planning
CERCLA	Comprehensive Environmental Response Compensation and Liability Act
COD	Chemical oxygen demand
CWA	Clean Water Act
DO	Dissolved oxygen
Eco-SSL	Ecological Soil Screening Level guidance
ETV	Environmental Technology Verification program
FIFRA	Federal Insecticide, Fungicide and Rodenticide Act
MDEQ	Michigan Department of Environmental Quality
MSDS	Material Safety Data Sheet
PM	Particulate matter
PSCDGRS	Pennsylvania Conservation Commission Dirt and Gravel Roads Maintenance Program
RBCA	Risk Based Corrective Action
RCRA	Resource Conservation Recovery Act
RO	Reverse Osmosis
RTAC	Road and Transportation Association of Canada
SARA	Superfund Amendments and Reauthorization Act
SIPs	State Implementation Plans
TCDD	Tetrachlorodibenzodioxin
TCLP	Toxicity characteristic leaching procedure
TDS	Total Dissolved Solids
TOC	Total organic carbon
TOSCA	Toxic Substance Control Act
TPH	Total petroleum hydrocarbons
TSCA	Toxic Substance Control Act
TPH	Total petroleum hydrocarbons
TS	Total solids

TSS	Total suspended solids
TVS	Total volatile solids
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USDOT	U.S. Department of Transportation
UNLV	University of Nevada, Las Vegas
VOC	Volatile organic compounds

Section 1

Introduction

The use of chemical dust suppressants in the United States is increasing, due to high rates of population growth in arid regions, the need to reduce airborne particulate matter to meet air quality standards, and increased recognition of the value of reducing erosion and maintenance costs on unpaved roads. Dust suppressants are used to control erosion and maintenance costs on unpaved roads, and to abate fugitive dust in mining, on construction sites, agricultural fields, livestock facilities, disturbed vacant land, landfills, and in steel mills. Materials used as dust suppressants include water, salts, asphalt emulsion, vegetable oils, molasses, synthetic polymers, mulches, and lignin products. Dust suppressants abate dust by changing the physical properties of the soil surface. The mechanisms by which suppressants abate dust vary with product type; some form crusts or protective surfaces on the soil, others act as binding agents causing particles to agglomerate together, and some attract moisture to the soil particles.

Across the United States, over 625,000 kilometers of public, unpaved roads are treated with chemical dust suppressants (Midwest Industrial Supply, Inc., personal communication). In Las Vegas, Nevada, and Phoenix, Arizona, degraded air quality from disturbed land and unpaved roads in the extremely arid environment has led to the potential for widespread use of dust suppressants. In spite of the growing use of dust suppressants, there are no agreed upon definitions, standards of performance and almost no regulation of dust suppressant contents, application rates, or management practices. Understanding of direct and indirect effects of dust suppressants on human health and the environment is limited. Frameworks for making meaningful cost benefit analysis of either benefits or risks are not yet developed.

There is concern that the unexamined use of dust suppressants might create future environmental and health liabilities similar to the problems resulting from dust suppressant use in Times Beach, Missouri in the 1970's. In 1972 and 1973 waste oil containing dioxin was sprayed on unpaved roads for dust control in Times Beach (EPA, 1983). A subsequent flood raised fears that dioxin had contaminated homes and yards. In 1983, the 2,800 people of Times Beach were permanently relocated at a cost of approximately $30 million (EPA, 1988) and the town was closed. Costs to excavate and incinerate the contaminated soils were estimated to be an additional $50 million (EPA, 1988). To avoid similar contamination and cost from current uses of dust suppressants, it is important to take an early, comprehensive look at dust suppressants and their application and to develop policies, guidelines, and recommendations for their use.

Although some programs have been developed to evaluate dust suppressant effectiveness and safety, most programs are voluntary; so most dust suppressant use is unregulated. Waste products or industrial by-products are often used as suppressants, with little examination of the product's hazardous constituents. Application practices are also not regulated. The method and frequency of application and amount of material applied varies. While risks to human health and the environment may be taken into consideration, the primary consideration driving the decision to use a particular suppressant is its initial cost. Frequently reliable performance data does not exist to determine true cost-effectiveness.

Several states (California, Michigan, Pennsylvania) and counties (Clark County, Nevada) are developing guidelines for the use of dust suppressants: where, when and which suppressant to use for a given environment. The guidelines (See Section 2.7) developed by the above agencies are based on limited information and are not sufficient for developing standard protocol in determining whether a dust suppressant should be used. These guidelines were developed out of a need to prevent adverse environmental impacts. An extensive testing program would be needed to develop standard protocol for dust suppressant use.

Other agencies are interested in developing regulations for dust suppressant use, but feel there is little guidance available. Thus, the overall goal of this report is to summarize the current state of knowledge on dust suppressants. The material in the following sections focuses on the current state of knowledge about dust suppressants, areas where information is missing, and proposes an assessment framework for making decisions on the use of dust suppressants.

Section 2

Background

2.1 What are Dust Suppressants?

There is no standard definition of a dust suppressant. Dust suppressants are materials used to control particulate matter emissions from land surfaces. They can include physical covers (such as vegetation, aggregate, mulches, or paving) and chemical compounds. This report focuses on chemical dust suppressants and one physical cover (fiber mulch). Chemical products used for dust suppression fall into eight main categories, listed in Table 2-1. They include water, products manufactured specifically as dust suppressants, natural or synthetic compounds, and waste or by-products from other uses and manufacturing processes. In 1991, 75-80% of all dust suppressants used were chloride salts and salt brine products, 5-10% were ligninsulfonates, and 10-15% were petroleum-based products (Travnik, 1991). The products are usually provided as a concentrate. Dilution for application varies from 1:1 to 1:20 (1 part concentrate to 20 parts water) depending on the specific dust suppressant, application type, and site conditions. Since many of the products are mixed with water, non-aqueous phase liquids are not commonly used in dust suppressant formulation (Expert Panel, 2002).

The control of dust emission is closely related to erosion control, but differs slightly. In both cases, the goal is to restrict the movement of soil particles. Dust suppressants are used to prevent soil particles from becoming airborne. Erosion control technologies aim to minimize soil movement on and off a given site. Since erosion control agents counteract the forces of both wind and water, they may have different properties than dust suppressants, which are used primarily to prevent wind erosion. The minor differences in the definition and classification of these materials may become important as decision makers and regulators begin to focus on unintended, negative consequences of these products.

Water alone can be a dust suppressant. It is commonly used on construction sites and unpaved roads where the surfaces are disturbed only for short time periods. Water is probably the most cost effective short-term solution for dust control (Gebhart *et al.*, 1999); however, the cost will vary depending on climatic conditions influencing water availability. The application rate is important since a heavy application may turn the road into mud destroying the soil's structure and damage its ability to perform as the subgrade. In some areas, reclaimed water is used for dust control. In these cases, the quality needs to be considered as well as the potential for human exposure to reclaimed water and environmental and wildlife impacts.

Salts and Brines are the most common type of dust suppressant used (Travnik, 1991). Calcium chloride ($CaCl_2$) and magnesium chloride ($MgCl_2$) are the major products in this category (Sanders and Addo, 1993). Calcium chloride is a byproduct of the ammonia soda (Solvay) process and a joint product from natural salt brines. Magnesium chloride is derived from seawater evaporation or from industrial byproducts. These products stabilize the soil surface by absorbing moisture from the atmosphere, so it is critical to have sufficient humidity levels of 20-80% when applying these products (Bolander, 1999a).

Organic Non-petroleum Products include ligninsulfonate, tall (pine) oil, vegetable derivatives, and molasses. Ligninsulfonate is derived from the sulfite pulping process in

the paper industry where sulfuric acid is used to break down wood fiber. Tall oil is a by-product of the wood pulp industry recovered from pinewood in the sulfate Kraft paper process. Vegetable oils are extracts from the seeds, fruit or nuts of plants and are generally a mixture of glycerides. Molasses is the thick liquid left after sucrose has been removed from the mother liquor in sugar manufacturing. It contains approximately 20% sucrose, 20% reducing sugar, 10% ash, 20% organic non-sugar, and 20% water (Lewis, 1993).

Synthetic Polymer Products comprise many different compounds that promote the binding of soil particles. The exact composition of these products is usually not provided in the Material Safety Data Sheets (MSDS) since the makeup of the product is confidential information of manufacturers.

Organic Petroleum Products are derived from petroleum and include used oils, solvents, cutback solvents, asphalt emulsions, dust oils, and tars. Petroleum-based products are not water-soluble or prone to evaporation, and generally resist being washed away (Travnik, 1991).

Electrochemical dust suppressants are typically derived from sulphonated petroleum and highly ionic products. This group of products includes sulphonated oils, enzymes, and ammonium chloride. A disadvantage of these products is that their effectiveness depends on the clay mineralogy of the site and may only work with certain types of soils.

Clay Additives are composed of silica oxide tetrahedra (SiO_4) and alumina hydroxide octahedra ($Al(OH)_6$) (Scholen, 1995). Clay additives provide some tensile strength in warm dry climates, however, their tensile strength decreases as moisture in the soil increases (Bolander, 1999b).

Mulch and Fiber Mixtures are formulated from waste wood fibers or recycled newspapers, a binding agent (for example, plaster of paris) and a carrier solvent (usually water). They generally work by forming a protective layer or crust over the soil surface instead of by binding soil particulates together.

Table 2-1: Most commonly used dust suppressants (modified from Bolander, 1999a).

Suppressant Type	Products
Water	Fresh and seawater
Salts and brines	Calcium chloride, magnesium chloride
Petroleum-based organics	Asphalt emulsion, cutback solvents, dust oils, modified asphalt emulsions
Non-petroleum based organics	Vegetable oil, molasses, animal fats, ligninsulfonate, tall oil emulsions
Synthetic polymers	Polyvinyl acetate, vinyl acrylic
Electrochemical products	Enzymes, ionic products (e.g. ammonium chloride), sulfonated oils
Clay additives	Bentonite, montmorillonite
Mulch and fiber mixtures	Paper mulch with gypsum binder, wood fiber mulch mixed with brome seed

2.2 Uses of Dust Suppressants

Dust suppressants are used on unpaved roads, road shoulders, construction sites, landfills, mining operations, military sites, animal enclosures, vacant lands and agricultural fields (Expert Panel, 2002). Figure 2-1 presents a conceptual model of major dust suppressant uses. The use of dust suppressants is largely driven by air quality regulations, but other concerns can also motivate their use (Expert Panel, 2002). For instance, transportation agencies may use dust suppressants to reduce the maintenance on unpaved roads. Private property owners may use dust suppressants to reduce nuisance dust.

The selection of a dust suppressant varies for the different uses. For example, magnesium chloride and petroleum-based products would not be suitable for agricultural use because they could affect crops grown on the fields after application. A fiber mulch might be more appropriate for use in agriculture areas. For an unpaved road, the dust suppressant needs to be more durable and a fiber mulch would not be appropriate to use. Instead, a petroleum-based product may hold up better under traffic conditions.

There is significant regional variation in the use of dust suppressants (Expert Panel, 2002). In Pennsylvania, the major use is on unpaved roads. In other parts of the eastern United States, dust suppressants are used on landfills, coal fields, steel mills, and mines. They are also used as temporary covers on lands that are disturbed for short periods, such as slopes exposed during road construction that are eventually revegetated. In Texas, dust suppressants are used largely on construction sites with disturbed lands and haul roads. In Clark County, Nevada, and other parts of the southwest, 90% of the use is on disturbed vacant land – land that has been cleared for residential or commercial development but on which construction has not yet begun. In some cases, disturbed land can remain vacant for several years. In eastern Oregon and Washington, dust suppressants are used on fallow agriculture fields. The United States Department of Agriculture (USDA) Forest Service also uses dust suppressants on unpaved roads.

2.3 Current and Potential Magnitude of Use

An important consideration is the current magnitude of chemical dust suppressant usage. An unpublished 2001 analysis by the dust suppressant manufacturer, Midwest Industrial Supply, Inc., summarized existing and potential markets for chemical dust suppressants. Some of the study's key findings are noted below.

1. There are over 2,500,000 km of public unpaved roads in the United States. It is estimated that 25% (625,000 km) of these roads are treated with a chemical dust suppressant. In addition, there are over 340,000 km of private unpaved roads of which 22% (74,000 km) are treated with a chemical dust suppressant.
2. Globally, there are over 8,000,000 km of unpaved roads. On the South American continent, over 2,000,000 km of unpaved roads is estimated to exist. A small portion (less than 1%) of these unpaved roads in South America is currently treated with dust suppressants.
3. The United States constitutes about 63% of the global market for chemical dust suppressants and has a current annual market value of approximately $300,000,000.
4. The existing global annual application rate of chemical dust suppressant concentrate is approximately 483,000 tons. This could increase to over 1,200,000 tons if markets in other regions of the world (particularly South America) are developed to the extent of the U.S. market.

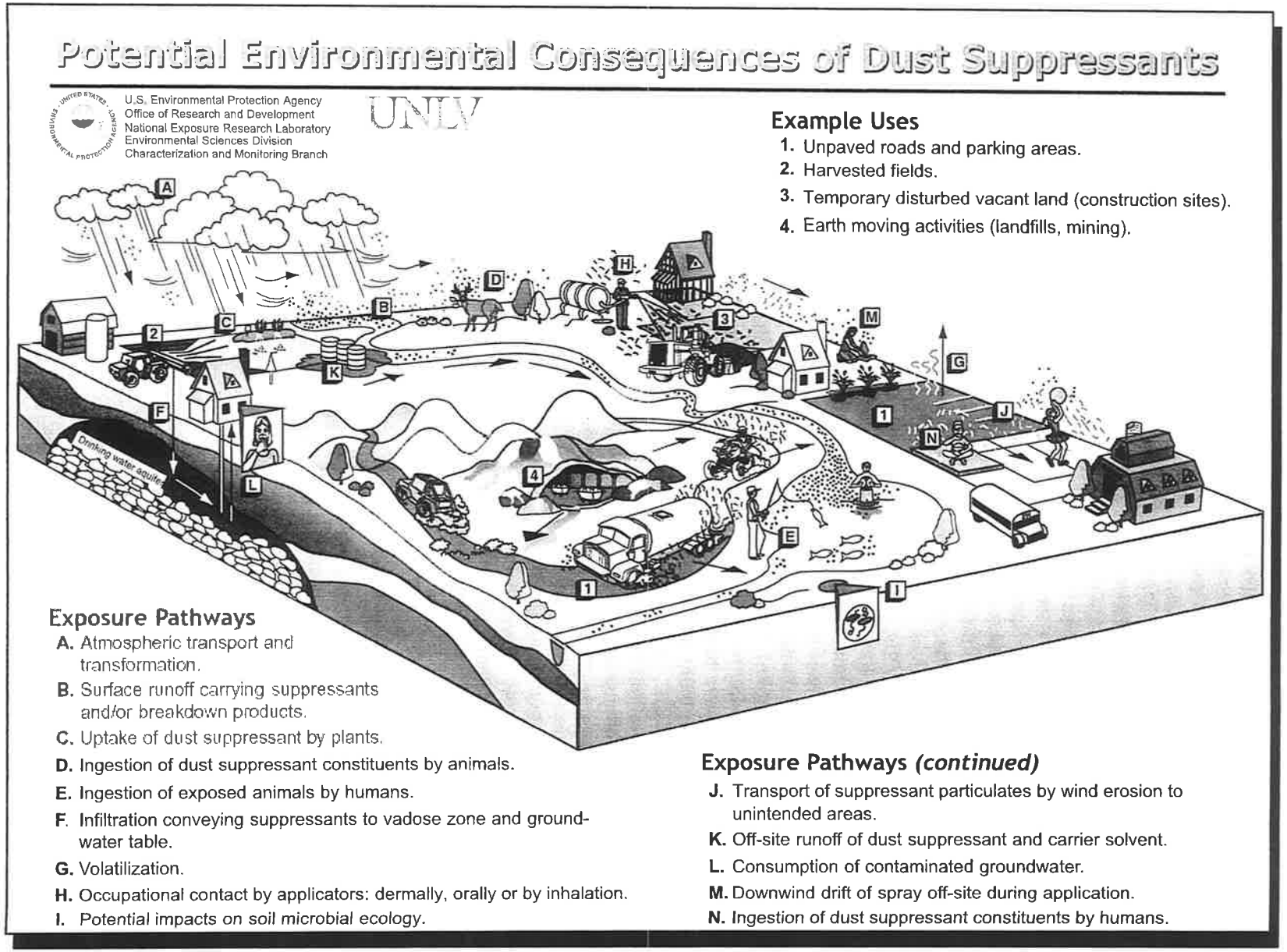

Figure 2-1: Conceptual model of the various uses of dust suppressants and the potential environmental consequences.

It is also important to note the potential uses at a regional scale. Pennsylvania, for example, has over 33,000 km of public unpaved roads that could potentially be treated with dust suppressants (Expert Panel, 2002). In Maricopa County, Arizona, the Department of Transportation applies ligninsulfonate to 92 miles of road shoulders three times a year (Arizona Department of Transportation, personal communication). Clark County, Nevada, has 100-200 km of unpaved roads and approximately 150,000 acres (60,000 hectares) of vacant land in the urban core of the Las Vegas Valley (James *et al.*, 1999). Of these 150,000 acres, 10-20% (15,000-30,000 acres, or 6,000-12,000 hectares) are estimated to have a high potential to emit PM-10 (particulate matter less than 10 μm), and could be stabilized through physical cover (vegetation, aggregate) or via application of chemical dust suppressants. Clark County has decided to pave high-use public roads instead of treating them with chemical dust suppressants (CCCP, 2001). It was reported in Pennsylvania that long term environmental and maintenance costs are set in motion by public pressure to pave roads before a proper road base and drainage system is in place. Paved road failures in even the first year have occurred. However, haul roads at construction and mining sites are often treated with chemical dust suppressants.

2.4 How Dust Suppressants Work

Dust suppressants abate dust by changing the physical properties of the soil surface. When a dust suppressant is applied the soil particles become coated and bound together, making them heavier. Some products form a crust on the surface and others penetrate through the surface. Water and petroleum-based products form a crust by agglomerating the soil particles. The formation of a crust with adequate thickness with petroleum-based products reduces the amount of immediate maintenance that is required on unpaved roads, however, in the long term, when failures such as potholes occur, there is no way to repair them using normal low cost techniques, such as grading. Unless these roads are milled to return them to unsealed status, the structural failures get paved over, again setting in motion the long-term maintenance and environmental costs referenced earlier (Expert Panel, 2002). Many of the synthetic organic materials are derived from petroleum products and are mixed with a binding agent that glues the particles together (Expert Panel, 2002). Salts absorb moisture from the air and retain it by resisting evaporation (Foley *et al.*, 1996). Organic non-petroleum and synthetic polymer products act as a weak cement by binding the soil particles together or weighing down and agglomerating particles. The electrochemical stabilizers work by expelling adsorbed water from the soil, which decreases air voids and increases compaction (Foley *et al.*, 1996).

2.5 How Dust Suppressants are Applied

Dust suppressants are applied either topically or mixed into the top layer of the soil. Topical application is with a spray bar on the back of a truck or through a large hose with a nozzle on the end (See Figures 2-2 and 2-3). On vacant lands, dust suppressants are applied topically. On small plots, application is by hand-directed hoses (Figure 2-2). On larger properties, application is by truck-mounted spray bars (Figure 2-3) and modified water cannons (Figure 2-4). A less common type of application is when the dry products (flakes) are spread on the surface and the product is mixed into the soil (Expert Panel, 2002).

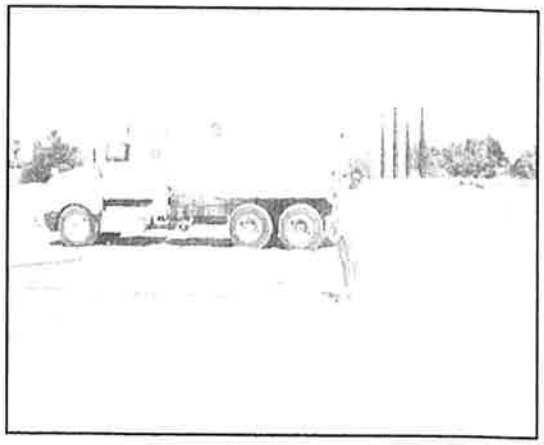

Figure 2-2: Topical application of a dust suppressant using a spray hose.

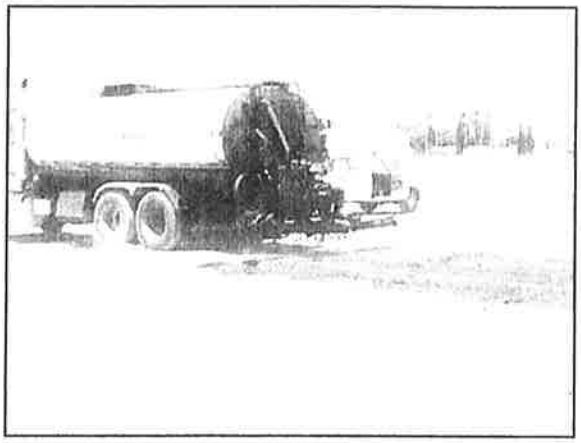

Figure 2-3: Topical application of a dust suppressant using a spray bar.

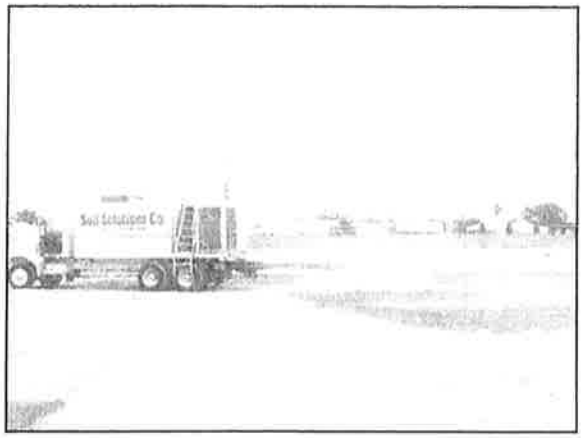

Figure 2-4: Topical application of a dust suppressant using a spray gun.

Another application method is to mix the dust suppressant into the travel surface by a sequence of steps comprising, 1) grading the road surface to remove a windrow of earth from the travel lane, 2) application of dust suppressant, 3) grading the earth windrow back onto the travel lane and compaction to maximum density, and 4) a second topical application on top of the graded earth. Mixing the dust suppressant into the soil is more difficult, but it tends to last longer since the product is exposed to more soil particles.

Some dust suppressant vendors have software available to make recommendations to customers based on traffic conditions, vehicle speed, and other site conditions. However, a major factor that impacts the application rate for many situations is the amount of funding available for dust suppression. For instance, a heavier application often increases the durability of the dust suppressant and reduces the need for repeated applications (Expert Panel, 2002). Seldom are analysis made of the soil types, which may change numerous times on one road in some geographic areas.

2.5.1 Typical Application Rates of Dust Suppressants

Typical liquid application rates vary from 0.3 to 1.0 gallons per sq yard (1.4 to 4.5 liter/m^2) and will depend on site-specific conditions (e.g., soil type, land use, weather during application, and weather after application). For liquid emulsions, dust suppressant concentrates are mixed with diluent (usually water) to give the correct mass application rate of solids for the desired application. For example, solids application rates for acrylic polymer emulsions are usually 0.20 to 1.00 pounds per square yard (0.11 - 0.54 kg/m^2) at liquid application rates of 0.50 to 1.00 gallons per square yard (2.26-4.53 liter/m^2). It is generally better to apply multiple light applications rather than a single heavy application, as the light applications generally allow for better penetration into the surface soil and also reduce the fraction of dust suppressant that may run off the target area.

The performance of a dust suppressant is determined by the mass of applied solids per unit volume of treated soil. Mass of applied solids per unit volume of soil will be the product of the mass application rate, and the penetration depth of solids into the soil. The mass application rate of a dust suppressant is computed as the liquid application rate times the mass concentration of bulk suppressant in applied liquid.

For example, if the liquid application rate is 0.50 gallon/yd^2 (2.26 liter/m^2) and the solids concentration is 1.00 lb / gallon (0.120 kg/ liter), then the mass application rate of the dust suppressant is 0.50 gallon / yd^2 x 1.00 lb/gallon = 0.50 lb/ yd^2 (0.271 kg/m^2). If the penetration of the suppressant material was uniform to a depth of 2 inches (0.05 meters), then the bulk concentration of the suppres-

sant in the surface layer of soil would be 0.50 lb/yd^2 / (9 ft^2/yd^2) / 0.167 ft = 0.336 lb/ft^3 (or, 2.71 kg/m^2 / 0.05 meters = 5.40 kg/m^3). This bulk concentration is about 1/300 the mass density of typical soils (~100 lb/ft^3 or ~1,560 kg/m^3), so the suppressant solids are present in the soil at a mass fraction of about 1/300. Mass and liquid rate data for typical application rates of dust suppressants are shown in Table 2-2 (James *et al.*, 1999).

Table 2-2: Typical dust suppressant use rates for unpaved roads and vacant lands based on industry data. English and (SI units).

	Unpaved Roads			
	Low Rate		High Rate	
Liquid application rate	0.50 gallon/yd^2	(2.26 l/m^2)	1.00 gallon/yd^2	(4.53 l/m^2)
Solids concentration	0.40 lb/gallon	(0.05 kg/l)	1.00 lb/gallon	(0.12 kg/l)
Solids application rate	0.20 lb/yd^2	(0.11 kg/m^2)	1.00 lb/yd^2	(0.54 kg/m^2)
10 foot (3.05 m)-wide travel lane:				
Topical 1 layer (solids)	1,173 lb/lane-mile	(330 kg/lane-km)	5,867 lb/lane-mile	(1,653 kg/lane-km)
Topical 1 layer (liquid)	2,933 gal/lane-mile	(6,898 l/lane-km)	5,867 gal/lane-mile	(13,799 l/lane-km)
Graded 2 layer (solids)	2,347 lb/lane-mile	(661 kg/lane-km)	11,733 lb/lane-mile	(3,306 kg/lane-km)
Graded 2 layer (liquid)	5,867 gal/lane-mile	(13,799 l/lane-km)	11,733 gal/lane-mile	(27,596 l/lane-km)

	Vacant Lands			
	Low Rate		High Rate	
Liquid application rate	0.50 gallon/yd^2	(2.26 l/m^2)	1.00 gallon/yd^2	(4.52 l/m^2)
Solids concentration	0.40 lb/gallon	(0.05 kg/l)	1.00 lb/gallon	(0.12 kg/l)
Solids application rate	0.20 lb/yd^2	(0.11 kg/m^2)	1.00 lb/yd^2	(0.54 kg/m^2)
Application rate:				
per 100 ft^2 (solids)	2.2 lb/100 ft^2	(10.7 kg/100m^2)	11.1 lb/100 ft^2	(54.2 kg/100 m^2)
per 100 ft^2 (liquid)	5.6 gal/100 ft^2	(228.1 l/100m^2)	11.1 gal/100 ft^2	(452.1 l/100 m^2)
per acre (solids)	968 lb/acre	(1,085 kg/ha)	4,840 lb/acre	(5,426 kg/ha)
per acre (liquid)	2,420 gal/acre	(22,637 l/ha)	4,840 gal/acre	(45,273 l/ha)

2.6 Effectiveness of Dust Suppressants

The majority of research on dust suppressants has been on the effectiveness of the products, where "effectiveness" reflects the ability of the product to keep soil particles on the soil surface when subjected to some erosive force, such as wind. Effectiveness varies with type of use, site condition, and climate. Water has been found to be between 40% and 85% effective in suppressing the suspension of soil particles for short time periods, but not effective over longer time periods (Thompson, 1990; Travnik, 1991; Foley *et al.*, 1996; Kestner, 1989; Cowherd *et al.* 1989). Salts are more effective than water in controlling dust if sufficient moisture is available (Bolander, 1999a). Ligninsulfonates remain effective during long, dry periods with low humidity. They also tend to remain plastic, allowing reshaping and traffic compaction when applied to soils with high amounts of clay. The effectiveness of ligninsulfonates may be reduced or completely destroyed in the presence of heavy rain because of the solubility of these products in water (Bolander, 1999a). Synthetic polymer emulsions increase the tensile strength of clays on typical roads and trails up to ten times. Tests have shown that synthetic polymers applied in wet climates tend to break down if

exposed to moisture or freezing for an increased time (Bolander, 1999a). Petroleum-based products generally resist being washed away, but oil is not held tightly by most soils and can be leached away by rain. Under the right conditions, these products can remain 90% effective after a year (Gilles *et al.*, 1997).

The length of time that a dust suppressant is effective varies according to variables such as the type of product, soils, weather, application rate, and traffic conditions. However, many manufacturers advertise that the products will be effective from 6-12 months. Some products will last up to 24 months under certain conditions.

2.7 Current Regulations/ Guidelines

At least six programs in the United States and one in Canada are directly or indirectly developing, or have developed, guidelines for dust suppressant use. Appendix B includes fact sheets for the programs and following is a summary of the key program elements. In the United States, there is the Environmental Protection Agency (EPA) Environmental Technology Verification (ETV) program, three states programs in California (CalCert), Michigan, and Pennsylvania, and a county level program in Clark County, Nevada. In Canada, there is the Canada ETV national program. The Canada ETV, CalCert, and EPA ETV programs are voluntary and available to any developer/vendor of environmental technology, including dust suppressants. All three verification programs (ETV, CalCert, and Canada ETV) were created by partnerships between regulatory environmental agencies and either the private sector or non-profit organizations, with an emphasis on the performance claims and some environmental tests of the products. Other programs that are ancillary to dust suppressants are those that provide specifications for the use of snow and ice control products such as the Pacific Northwest Snowfighters (www.wsdot.wa.gov/partners/pns/default.htm).

The testing program in Pennsylvania was developed by joint efforts of conservation interests, academia and industry and, is used, for all materials, including suppressants, for projects funded by the Dirt and Gravel Roads Maintenance Program under the State of Pennsylvania Conservation Commission (PSCDGRS, 2003). The stringent specifications require product testing by a certified lab and manufacturer guaranteed product uniformity, delivery, application and cure. Results in the program have been so positive, and reception by industry so strong, it has been used voluntarily by others. The Michigan Department of Environmental Quality created specific regulations for the application of oil field brine as a dust suppressant (MDEQ, 2000). Clark County, Nevada has issued detailed interim guidelines for the use of dust suppressants on disturbed lands (CCCP, 2001). The guidelines were drafted by a working group composed of air and water quality professionals from state and local agencies, as directed by the Clark County Commissioners.

In all three voluntary certification programs and in the Pennsylvania Dirt and Gravel Road regulations, it is the responsibility of the technology vendor/developer to provide sufficient performance data and documentation to support the claims of the technology under consideration. While the other programs do not specify what data should be provided to support the technology claim, the Environmental Protection Agency (EPA) ETV and the Pennsylvania programs note specific tests that have to be performed to evaluate the environmental impacts of the products under consideration. In the EPA ETV, ETV Canada, and CalCert voluntary programs, scientists and engineers from regulatory agencies, universities, research laboratories, and the private sector examine the supporting documentation for product verification. However, ETV Canada maintains a list of approved expert entities (e.g. universities, private consultants) to be used to conduct tests to support the verification. An agreement is reached with the vendor/ developer regarding the expert entity to be used in the technology verification process.

In the case of Pennsylvania, the data supporting the claim, issued by EPA certified labs, are evaluated by the State Conservation Commission for authenticity. All three voluntary verification programs, as well as Pennsylvania's, issue a report or certificate as proof of verification. Only the Canada ETV and the California CalCert programs require renewal of the verification after three years.

Michigan's regulations for brine application as a dust suppressant do not specify any specific test methods. Instead, it establishes acceptable application rates and methods, and types of areas where it can and cannot be applied. It also requires the property owner or contractor to maintain detailed record keeping of the specific locations, amount, and source of brine applied. Clark County, Nevada guidelines specify types of areas where the application of specific dust suppressants are discouraged. In addition, they contain recommendations on the types of suppressants, dilution, and application rates to be used in different types of dust control areas (e.g. roads, construction sites). In general, the Clark County guidelines discourage the application of products known to potentially contain specific pollutants near lakes, streams, channels, and flood control channels.

The EPA ETV program requires acute and chronic toxicity tests (EPA/600/4-90/027F and EPA/600/4-91/002), and analyses of biological oxygen demand (BOD), chemical oxygen demand (COD), volatile organic compounds (VOC), toxicity characteristic leaching procedure (TCLP) [EPA Method 1311], inorganics/metals (EPA 6010B), semi-volatile organics (EPA 8270D), volatile organics (EPA 8260B), pesticides/herbicides (EPA 8270D), and PAHs. The Pennsylvania program requires bulk analysis of products using EPA SW-846 tests (originally designed for testing RCRA wastes), leach analysis by EPA Method 1312 (includes metals, volatiles, and semi-volatiles), 7-day survival and growth test for rainbow trout and *Ceriodaphinia dubia*, BOD, and COD.

In addition to the programs noted above, the United States Department of Agriculture (USDA) Forest Service is developing the "Forest Service Specifications for the Construction of Roads and Bridges" that will have new requirements for dust suppressants. These requirements will include a certificate that states that the dust suppressant meets the chemical requirements of the Pacific Northwest Snowfighters, that a toxicity test (ASTM E 729) be submitted, and that the pH of the product be on the certificate as well.

Section 3

What is Known About Potential Environmental Effects

The majority of research on dust suppressants has been by industry and has focused on the effectiveness (or performance) of dust suppressants to abate dust, however, little information is available on the potential environmental and health impacts of these compounds. The numerous pathways of exposure to dust suppressants for humans, flora, and fauna and how suppressants may migrate through the environment to potentially sensitive recaptors are shown in Figure 2-1. Impacts will depend upon their composition, application rates, and interactions with other environmental components. Potential environmental impacts include: surface and groundwater quality deterioration; soil contamination; toxicity to soil and water biota; toxicity to humans during and after application; air pollution; accumulation in soils; changes in hydrologic characteristics of the soils; and impacts on native flora and fauna populations.

This conceptual model and all of the potential pathways and receptors of concern were presented to the expert panel for their consideration. Following is a brief summary of the literature on known potential effects of dust suppressants. A complete description of the studies is provided in the literature review presented in Appendix A. The views of the Expert Panel on potential environmental effects of dust suppressants are then presented Section 3.2.

3.1 Overview of Scientific Literature

Although there are several noteworthy studies on the effects of dust suppressants to water quality, plants, and fish, the majority of the studies have focused on salts and brines, ligninsulfonates, and a few organic petroleum-based products.

3.1.1 Salts and Brines

The major known effects of salt in the environment relate to its capacity of moving easily with water through soils. Water quality impacts include possible elevated chloride concentrations in streams downstream of application areas (Demers and Sage, 1990) and shallow groundwater contamination (Heffner, 1997). In the area near the application of salts, there have been negative impacts to the growth of fruit trees (RTAC, 1987), pine, poplar, and spruce (Foley *et al.*, 1996, Hanes *et al.*, 1976, and Hanes *et al.*, 1970), and alterations in the plant nutrition due to increases in the osmotic pressure of soils (Sanders and Addo, 1993). Chloride concentrations as low as 40 ppm have been found to be toxic to trout, and concentrations up to 10,000 mg/L have been found to be toxic to other fish species (Foley *et al.*, 1996, Golden, 1991). Salt concentrations greater than 1,800 mg/L have been found to kill daphnia and crustaceans (Sanders and Addo, 1993), and 920 mg/L of calcium chloride has been found to be toxic to daphnia (Anderson, 1984).

3.1.2 Organic Non-petroleum Products

The majority of research in this category has focused on the impacts of ligninsulfonate. The toxicity of ligninsulfonates to rainbow trout and other biota has been investigated (Heffner, 1997). The 48-hour LC_{50} (concentration of ligninsulfonates which would be lethal to 50 percent of the tested population within 48 hours) value for ligninsulfonates was found to be 7,300 mg/L (Roald, 1977a and 1977b). A mortality of 50% was achieved for rainbow trout exposed to 2,500 mg/L ligninsulfonate for 275 hours. For concentrations equal to or higher than 2,500

mg/L, rainbow trout showed loss of reaction to unexpected movements, rapid and irregular breathing, and finally loss of co-ordination before death. It has been found that calcium and sodium ligninsulfonate negatively affect the colon of guinea pigs causing weight gain and producing ulceration in those animals (Watt and Marcus, 1976).

High levels of ligninsulfonate in water bodies have high coloring effects, increase biochemical oxygen demand, reduce biological activity, and retard growth in fish (Raabe, 1968, Heffner, 1997, RTAC, 1987, Bolander, 1999a, Singer *et al.*, 1982). However, ligninsulfonate compounds do not impact seed germination in the areas where applied (Singer *et al.*, 1982).

3.1.3 Organic Petroleum Products

Potential environmental impacts are highest from organic petroleum products. The chemical characteristics of the oil deposit from which the petroleum product originated, results in varied impacts with the potential for high levels of heavy metals from specific oil deposits. Several studies have shown that waste oils may contain known toxic and carcinogenic compounds (e.g. PCBs); therefore EPA prohibits the use of these materials (RTAC, 1987; Metzler, 1985, and USEPA, 1983).

The accidental introduction of a petroleum-based dust suppressant (Coherex) into a stream in Southern Pennsylvania affected fish and benthic macroinvertebrate communities and killed a large number of fish (Ettinger, 1987). Organic petroleum-based products have also been found to be toxic to avian mallard eggs. When the eggs were exposed to a concentration of 0.5 μL/egg, 60% mortality was observed by 18 days of development (Hoffman and Eastin, 1981).

3.1.4 Water Quality Impacts from University of Nevada, Las Vegas (UNLV) Study

A recent UNLV study, funded by several local agencies in the Las Vegas Valley, generated preliminary data highlighting the potential of the major dust suppressant categories. The research focused on the quality of urban runoff and on the changes in the chemical composition of soils where suppressants were applied (Piechota *et al.*, 2002 and Singh *et al.*, 2003). Rainfall events were simulated on the dust-suppressant treated plots and the changes in soil composition and the quality of the runoff emanating from the plots were examined.

In the study, a site was graded and divided into several individual plots. Each plot was 2.4 meters x 2.4 meters. Six categories of dust suppressant (11 individual products) were topically applied to the plots by local dust suppressant applicators. The dust suppressants applied included acrylic polymer emulsion, ligninsulfonate, petroleum-based organic, non-petroleum based organic, fiber mulch, and magnesium chloride salt. Rainfall was simulated using water treated by a reverse osmosis (RO) system. The water supply characteristics were designed to be similar to those of the rainfall in the Las Vegas Valley. An approximate rainfall of 20 mm was generated for a 1-hour period. The first five gallons of runoff emanating from the plots were combined to form a composite sample that was divided into aliquots, preserved, and analyzed for chosen parameters. In addition, the top two-inches of soil from each plot were sampled after the rainfall events to determine remaining levels of different compounds. The soil samples were leached using the EPA Synthetic Precipitation Leaching Procedure (Method 1312). Parameters evaluated in the runoff and soil leachate include 67 toxic volatile and 76 semi-volatile organic compounds, organic pesticides, PCBs, 11 metals, nutrients, biochemical oxygen demand (BOD), total solids (TS), total volatile solids (TVS), total suspended solids (TSS), total dissolved solids (TDS), turbidity, total organic carbon (TOC), pH, alkalinity, chemical oxygen demand (COD), hardness, nitrate, ammonia, phosphate, sulfide, sulfate, cyanide, chloride, and coliform bacteria.

The results show that petroleum-based products had a higher number of potentially

toxic contaminants with concentrations greater than the control plot, followed by acrylic polymers and ligninsulfonate. Magnesium chloride presented the lowest number of contaminants with concentrations greater than the control. The majority of the dust suppressants created a surface that is more impermeable than the natural soil surface. This increased the runoff volume similar to that emanating from a developed land surface.

Although several compounds that affect water quality have been detected in the runoff of plots to which dust suppressants were applied, this information alone should not be used to evaluate the impacts of dust suppressants to water quality. The data generated in this study and others should be combined with information on dust suppressant effectiveness, the frequency of application, proximity to water bodies, and cost to thoroughly evaluate the feasibility of using these compounds when water quality is a concern.

3.2 View of the Experts

This section summarizes the expert panel views on potential environmental impacts of dust suppressants, presented during the panel discussions. It is problematic to attribute specific views to a specific expert; therefore, the major points of consensus are noted below and collectively these represent the views of the experts as captured in the Expert Panel and through their review of the document.

3.2.1 Potential Factors Affecting Environmental Impacts of Dust Suppressants

On-site and off-site environmental effects of dust suppressant application depend on many factors including the physical characteristics of the suppressant, its chemical composition, concentration, the form it takes when it migrates, soil composition, and the climate conditions during and after application. From all the aforementioned factors, the lack of knowledge on the chemical composition of the suppressants is of critical importance to the evaluation of the environmental impacts of these compounds.

There is a need to improve information about the chemical composition of suppressants. Although Material Safety Data Sheets (MSDS's) for suppressants include the major components of the dust suppressants, they do not always include adequate details on toxic compounds that may be present and are of environmental concern. Because the vast majority of compounds used as dust suppressants are waste products from the manufacturing industry, their chemical composition is often unknown and complex and may vary widely for each batch. Organic suppressants sometimes contain surfactants or foaming agents that can cause environmental effects. One applicator cited an instance in which they unexpectedly found benzene, a carcinogenic hydrocarbon, in an off-spec water-based paint product sold as a dust suppressant. The compound was detected in tests performed on the dust suppressant prior to application. However, testing of the dust suppressants prior to application is expensive and not a common practice.

3.2.2 Unintended Off-site Environmental Impacts

Dust suppressants can potentially affect the environment beyond the application site. Overspray during application affects land, plants and fauna adjacent to the site. In addition, dust suppressants can be transported onto adjacent lands by surface flow or air. Material can be spilled from application trucks during transport to or from the application site, and commonly during off-loading from tankers to distributor trucks. It is a concern that trucks applying suppressants to roads have been observed to continue spraying when they cross bridges, resulting in dust suppressants being sprayed directly into streams below.

After the application of the dust suppressants it must be borne in mind that suppressants attached to soil particles covered with dust suppressants can be transported due to wind or erosion to off-site

areas. In Pennsylvania it has been observed that a farmer's machinery kept under an open-sided shelter was completely rusted from salts carried on the dust from a nearby brine application demonstration.

Humans who are on the site during application (e.g., applicators) or after application could also come in direct contact with the dust suppressant. Road applications bear the additional exposure of suppressant product becoming embedded under the skin of errant runners or cyclers. In addition, there is the potential for deleterious effects of pumping water from remote streams to construction sites for dust control. One instance was reported in Pennsylvania where the contractor pumped a stream dry.

3.2.3 Effects on Soils

Dust suppressants may cause undesired dissolution of some soil constituents. In the simplest case, even water used as a suppressant may cause chemical dissolution of compounds bound to soil particles. In soils from arid regions, which have high salt content, water used as a suppressant can mobilize the salts, increasing the salt concentration in nearby waterbodies or groundwater. In more complex scenarios, the chemical constituents of the suppressant can react with and leach toxic components out of the soils at the application site. The issue of leaching is particularly relevant where dust suppressants are used on coalfields, landfills, and mine tailings piles, which may contain hazardous material.

The constituents of the suppressants may be taken up by plant roots and systemically affect plants. In addition, soil microorganisms may biotransform the suppressants into benign or more toxic compounds depending on the environmental conditions on the site of application.

The application of dust suppressants will have secondary effects on the characteristics of soils to which suppressants are applied including a decrease of surface permeability. Depending on precipitation, the change in surface permeability can lead to increased runoff from the site to adjacent sites and decreased soil moisture. Changes in surface flow can then change patterns of erosion on and off the application site.

3.2.4 Effects on Air Quality

Dust suppressant use can affect air quality characteristics in a number of ways. In arid areas, for example, the use of water may add moisture to air fostering the proliferation of microorganisms. Dust suppressants that adhere to soil particles can be re-entrained into the air with strong winds, potentially adding contaminants to the air in addition to particulate matter. It is noteworthy that dust suppressants have little efficacy at suppressing small respirable dust that have the potential to be inhaled directly into lung parenchyma and cause lung disease (Reilly *et al.*, 2003). Dust suppressants are generally used to comply with PM10 regulations and improve visibility; but could be potentially harmful since smaller dust particles (less than 10 μm) can be inhaled. Lastly, some dust suppressants may have volatile organic compounds in the products that may be dispersed into the air when the product is applied. This is a particular concern in the formation of ozone.

3.2.5 Effects on Flora and Fauna

Dust suppressant application is not limited to the soils on the site. Since dust suppressants are generally applied over the surface, any vegetation or fauna on the site, including soil microorganisms, may also come into direct contact with the suppressant. Application of dust suppressants, especially magnesium chloride, has been associated with the browning of trees along roadways and stunted vegetation growth in forestlands. Effects vary, because different plants have different tolerances.

Aquatic ecosystems are affected by direct contamination from spills or runoff from offsite applications of dust suppressants. Fish may be affected by direct ingestion of toxic constituents or their degradation products. They are also sensitive to increased salinity resulting from salts and brine applications.

Dust suppressants that result in an increase in biochemical oxygen demand (BOD) can result in decreased DO concentrations in nearby streams, which may affect fish health and survival. Dust suppressants that affect macroinvertebrates could cause a decrease in food supplies for fish. Dust suppressants that result in increased suspended solids concentration, either directly or indirectly, via erosion, can potentially degrade aquatic habitat. At the micro level, suppressants can potentially be toxic to soil and water micro-organisms.

There is a chance that reproductive effects for fauna could also be found in these areas. An example of adverse impact of dust suppressants in animals relates to using finely chopped asphalt in feedlots to suppress dust. With time, the animals started having convulsions and high levels of lead were found in their blood. When the animals were moved to another feedlot, the symptoms were reduced.

3.2.6 *Effects on Surface and Groundwater*

Dust suppressant use can potentially affect both surface and groundwater. Spills directly affect surface water and can impact groundwater depending on site characteristics. Dust suppressants that are water-soluble can be transported into surface waters and materials that are water-soluble but do not bind tenaciously to soil can enter the groundwater. If the soil surface is not bound together well (i.e., chlorides, lignin) or if the rain event is extreme, dust suppressant treated soil particles can be carried by overland flow into streams, rivers, and ditches. Sedimentation and uptake of soil particles could adversely affect aquatic or marine life, if sufficient numbers of treated particles have significant and mobile concentrations of hazardous compounds. Settled particles can also change the composition of the ecological community and the dominant species (Sanders *et al.*, 2003).

3.2.7 *What can be done to Avoid Another Times Beach?*

To further engage the experts and to work through the scientific and policy issues associated with dust suppressant use, the experts were posed the above question and asked to respond individually. Following is a compilation of the responses.

Primarily, materials that fail existing regulatory thresholds for toxicity and those containing FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act), TSCA (Toxic Substance Control Act), and RCRA (Resource Conservation and Recovery act) regulated compounds should not be used as dust suppressants. Chlorinated compounds and materials containing any paints should be carefully evaluated if used in a dust suppressant. Food products (e.g. soy oil, molasses) could be used, when possible, for they are likely to contain less toxic compounds than the industrial materials and waste products currently used as dust suppressants. Natural products are likely to biodegrade in the environment and therefore toxic effects are expected to be minimal. However, the make up of these products needs to be considered since some biodegradable products can be toxic before degradation occurs.

Application of all types of chemical dust suppressants should not be ruled out or permitted under all conditions. Instead, guidelines should be drafted to indicate where specific dust suppressants should be applied. Application of chemical dust suppressants should be avoided near sensitive environments, near water bodies and fractured rock, in areas with a shallow groundwater table, and other areas where water could quickly reach the saturated zone. Site-specific characteristics should be considered when approving the use of dust suppressants. All of these recommendations would require the screening of suppressants via a certification program, and a proper monitoring program of product make up over time. This would eliminate suppressants that do not meet expected standards. Alternatively, the number of dust suppressants to be

applied could be limited to specific types; that would facilitate regulation and monitoring of the environmental impacts.

The public perception of toxicity may be an important component of the acceptance of dust suppressants as a dust abatement technology notwithstanding the actual threat the suppressant may pose. Factors such as the smell and the visual impact of dust suppressants should be considered. Finally, information on environmental impacts and effectiveness of dust suppressants should be used together when determining the type of suppressant to be used. If only environmental concerns are used as guidance to select dust suppressants, one could end-up with the most environmentally friendly suppressants instead of the best suppressant for the application with the least potential environmental risks. Before adopting new regulations, the advantages (e.g., improved air quality) and disadvantages (e.g., contaminated soils) associated with dust suppressant should be considered in risk management analysis.

3.2.8 What would be a Significant Concern that would Limit Use?

The Expert Panel was also presented with the above question on what would constitute a concern for them. The following items would cause the experts to limit the use of dust suppressants:

1. Data indicating a potential ecological impact (e.g., plant stress, isolation of animal communities, habitat disruption).
2. Data indicating carcinogens, toxins in levels that would cause negative impacts in human health.
3. Industrial waste by-product containing potential toxic contaminants.
4. Suppressant containing significant amounts of products regulated under FIFRA, TSCA, and RCRA.
5. Potential or observed negative impacts to adjacent landowners.

3.3 User and Agency Survey Results

To further probe into the current practices used for dust suppressant selections, several agencies and dust suppressant applicators were asked what characteristics in a dust suppressant they felt were important when deciding on the use for a particular situation, and what other factors influence their decisions. The main considerations include:

- Environmental impacts, especially near detention basins/waterways
- Toxicity such as LC50 test of dust suppressant on fish
- Cost of dust suppressant per acre
- Application costs
- Warranty time and durability
- Availability of product
- Type of equipment needed to apply product
- Penetration characteristics
- Past history of dust suppressant use
- Traffic impacts (i.e., different products for different conditions)
- Long term maintenance costs
- Category of dust suppressant

Section 4

Framework for Assessing Potential Environmental Effects

To make decisions about dust suppressant use, managers must evaluate the potential level of concern that use will generate. The level of concern about a given dust suppressant depends on a number of site-, use-, and composition-specific factors. These factors are highly variable and information about many of them is uncertain. The diagram shown in Figure 4-1 presents a framework for assessing the level of concern about the use of a particular dust suppressant. This is not meant to be a comprehensive decision-tree model. Instead, it outlines it identifies the type of information needed to evaluate the product. It also summarizes the relationship between the purpose of application, type of dust suppressant, site conditions, and level of concern. This is intended for managers and/or policy-makers who would use this framework to make a decision about the use of a particular dust suppressant on a specific site. This would guide the person on what information would need to be collected for each of these categories specific to the suppressant and the site in question. An explanation of the diagram from the bottom (endpoint) to the top is provided below.

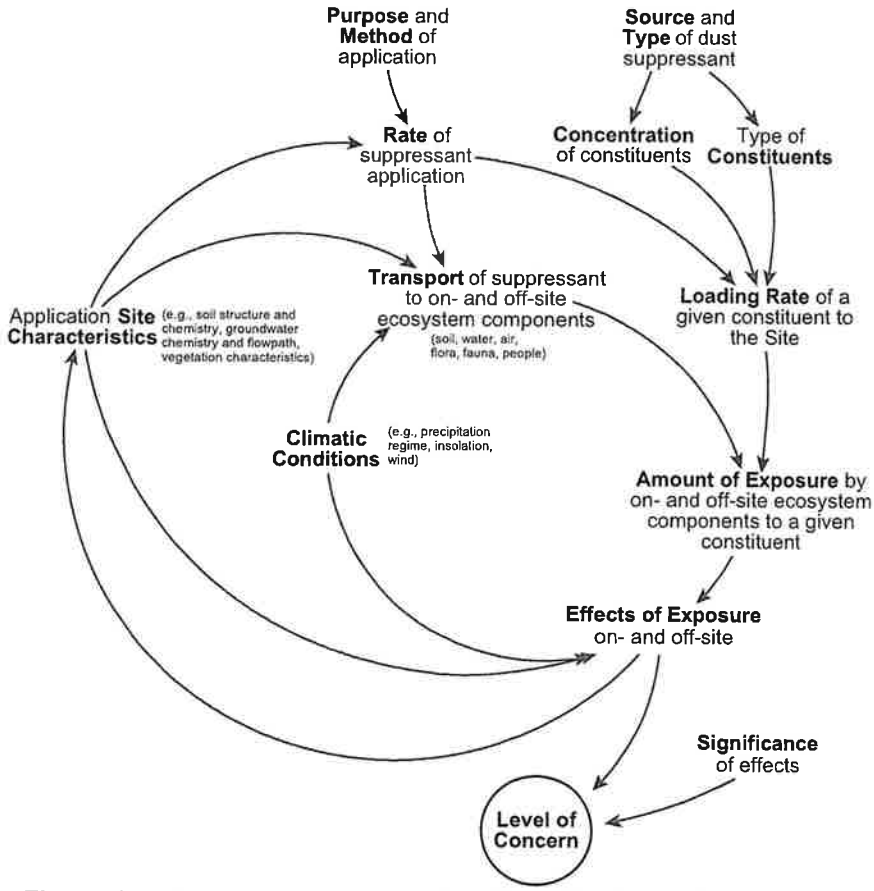

Figure 4-1: Framework for assessing the potential environmental impacts of dust suppressants.

To determine the *level of concern* about a given use, both the *effects of exposure* of the suppressant on a range of ecosystem components and the *significance* of those effects must be considered. If a suppressant applied to a given site were carried off the site and into an adjacent stream, for example, the level of concern would depend on the effect of that suppressant on the aquatic ecosystem – an algal bloom caused by an input of phosphorus, for example – and the significance of that effect. The same effect could be critical in one system and insignificant in another. An algal bloom might be unacceptable in a water body used for swimming but unremarkable in a wastewater treatment plant outfall. The significance of the effect might also be determined by comparing the effect of use with the effect of *not* using the suppressant. Any decision to use or not use a suppressant should be based on an assessment of benefits and risks (Expert Panel, 2002).

The effects of dust suppressant exposure on and off the application site are a function of the *site characteristics*, *amount of exposure* the different ecosystem components receive, and *climatic conditions* at the site. Site characteristics such as topography, soil texture and chemistry, groundwater flow path, vegetation and wildlife types, and distribution set the parameters for environmental responses to dust suppressant exposure. A basic set of ecosystem components whose response to the dust suppressant should be evaluated, include air, soil, water, soil microbes, aquatic organisms, vegetation, fauna, and people (Expert Panel, 2002). Different categories might be more or less important at different sites. One site may contain species sensitive to a particular compound while another may not. Site characteristics can also affect the ecosystem response to a suppressant. Alkaline soils may buffer acidic constituents of a suppressant. Dense vegetation may take up excess nutrients in organic suppressants. Soil microbes may break down potentially toxic suppressant constituents. Climatic conditions at the site, including the precipitation regime, wind exposure, and temperature, also affect the response of ecosystem components to the suppressants. Dust suppressant constituents might react differently under different moisture and temperature conditions, for example. The degradation rates of some constituents of dust suppressants may vary with exposure to ultraviolet radiation. The ecosystem response also depends on the amount of exposure to a given suppressant constituent received by the ecosystem component. The response of any given ecosystem component may be non-linear, or involve thresholds.

The *amount of exposure* received by a given ecosystem component to a given suppressant constituent depends on the rate at which it is applied to the site (*loading rate)* and the *transport* of constituents to each ecosystem component. The constituent loading rate depends on the rate at which the suppressant is applied, the type of constituents in the suppressant, and their concentration. Once the suppressant is applied to the site, its constituents may migrate within the site, from the soil surface to the sub-surface, for example, or to the groundwater or into the air. The pathways and rate at which any given constituent moves within the site or off the site are a function of the site characteristics, climatic conditions, and the characteristics of the constituents. The amount of precipitation a site receives affects the transport of water-soluble constituents, as do its topography, soil, and geologic characteristics. Some constituents are more mobile than others. They may be more soluble, or more likely to be volatilized. Depending on soil chemistry, some may be adsorbed to soil particles. Constituents may be transformed after application, reacting chemically with each other or with components at the site, or being degraded.

The *rate* of suppressant application depends on the *purpose and method* of application. The purpose of application – to stabilize disturbed vacant land or agricultural land or to reduce the dust generated from travel over unpaved roads, for example – together with specific site characteristics and climatic conditions, determine the amount and fre-

quency at which the suppressant is applied. The purpose and site characteristics also influence the method of application. If the surface to be stabilized is not expected to be disturbed, the suppressant may be applied topically. If the surface must withstand vehicle traffic, the suppressant may be mixed into the soil by grading.

The *type* and *concentration* of constituents in the suppressant are a function of the *type and source* of the suppressant. Dust suppressants can be water, brines, lignin-sulfonates, petroleum-based products, or other types, as discussed in Section 2.1. Dust suppressants may contain components other than the primary suppressant, depending on the source of the suppressant (Expert Panel, 2002). Most suppressants are derived from waste materials from manufacturing processes. Even the source water (e.g., reclaimed water, groundwater) may contain additional constituents. The composition of the suppressant, together with the rate of application determines the amount (mass) of each constituent applied to the site.

Section 5

Path Forward – Issues and Potential Solutions

There are a significant number of "data gaps" that need to be filled to more adequately address environmental and regulatory issues (Expert Panel, 2002). Research questions range from "What is the national scale of the problem?"; "How much is being applied and where?"; "What tests should one run to determine the chemicals leached into soil and the biological impacts of dust suppressants after they are applied?" These types of questions must be answered before a decision can be made about whether or not more federal regulation is needed. This section focuses on the scientific and regulatory issues, and then provides suggestions for a path forward.

5.1 Scientific Issues

5.1.1 Better Definition of What is Meant by "Effective" Dust Suppressant

As noted earlier, there is no standard definition of a dust suppressant. Current usage of the term "dust suppressant" implies that it can be any chemical formulation applied to the ground to control emission of dust. Furthermore, the term "effective" dust suppressant is not well defined. Currently, the definition of an effective dust suppressant focuses on the ability (efficiency) of the product to suppress particulate matter from becoming air borne over a period of time (Expert Panel, 2002). To support this, Industry has developed data on the performance of dust suppressants on various types of land surfaces (see Literature Review in Appendix A).

A more comprehensive definition of an effective dust suppressant is needed to consider the overall impacts of using the products. A comprehensive definition of an "effective" dust suppressant might consider the following (Expert Panel, 2002):

1. The efficiency and durability of the product
2. The costs and benefits associated with the use of the product
3. The potential environmental impacts

In making the determination of what dust suppressant to use, it is also important to select the proper dust suppressant based on soil characteristics. Soil characterization tests are not always performed on sites when selecting a dust suppressant; however, several experts were asked what tests they would recommend. Recommendations included gradation tests (AASHTO T-11 and T-27), plasticity tests (AASHTO T-89 and T-90), pH tests of the soil, tests for the ability of soil to attract of bind a particular dust suppressant, particle size distribution, moisture content, and a visual survey of the site (Expert Panel, 2002). A thorough description of soils tests necessary to determine the optimum product performance has been prepared by the US EPA ETV Generic Verification Protocol for Dust Suppression and Soil Stabilization Products.

5.1.2 Better Understanding of Dust Characteristics as an Air Pollutant

To properly evaluate the impacts of dust suppressants one must understand the characteristics of dust. One key factor is the size of the particle matter. Airborne particle size fractions are classified as either Particulate Matter (PM) 2.5 or PM10, based on their aerodynamic diameter, when they are regulated under the Clean Air Act. Airborne fugitive dust entrained from road surfaces

and wind-eroded from construction sites, agricultural fields and vacant lands span a physical size range from less than 1 micron to about 100 microns; this range includes (and exceeds, on the large end) the PM2.5 and PM10 size fractions. There is a need for proper characterization of particle size distribution and mineralogy related to variables such as vehicle tire loading and speeds on unpaved roads in different regions (Expert Panel, 2002). As noted earlier, the smaller PM2.5 particles may be more harmful from a human health perspective if inhaled.

The soil surface chemistry, moisture content, and shapes of dust particles can affect the ability of different suppressant formulations to adhere to the particles. The particle size, shape, surface chemistry, and soil moisture content are seldom used to assist in the selection of an appropriate suppressant. In some cases, the soil silt content (given as percent passing a #200 screen) and moisture content may be obtained prior to dust suppressant application. Many of the standard soil characterization tests are time-consuming and not well suited to the daily exigencies of field operations. Development of simple, robust field apparatus and rapid methods for characterization of relevant soil properties could assist in the selection of the right type of suppressant and the appropriate application rate for a particular region.

5.1.3 Better Understanding of How Dust Suppressants Change After Application

The fundamental mechanisms of how the dust suppressants work, break down, degrade, and move in the environment are not well understood at this time. "Degradation" includes effects of solar radiation, abiotic oxidation, biological transformations, dissolution, and physical weathering. In addition, the soils characteristics will influence how the suppressants are degraded (Expert Panel, 2002). Mechanisms of how dust suppressants work are well established and based on research and industry development. However, it is not known what happens to the products after they are applied and weathering occurs. What daughter products are produced as dust suppressants break down? Are they benign or toxic, mobile or immobile? Answers to these questions can only be obtained from long-term testing of dust suppressants under field conditions.

5.1.4 Better Definition of Current and Potential Problems/Uses

Preliminary data was provided in Section 2.3 on the current and potential uses of dust suppressants; however, this issue should be further explored. If national regulations/ guidelines are considered for the use of dust suppressants, then there needs to be a better understanding of the scale of current and potential usage of dust suppressants. Answers to the following questions are needed:

1. In what regions of the United States are dust suppressants currently being applied?
2. How much dust suppressant is being applied nationwide?
3. Have there been adverse environmental impacts in regions where dust suppressants were applied?
4. What is the potential use of dust suppressants on unpaved roads and disturbed lands?
5. Do local and state agencies track the use of dust suppressants?

5.1.5 Source of Dust Suppressants and Dilution Water

A major concern is the current lack of information on the chemical composition of dust suppressants. Material Safety Data Sheets (MSDS's) are commonly provided for dust suppressant products; however, since proprietary information may be involved, MSDS's do not necessarily provide information about all the chemicals present in the products. Major manufacturers (e.g., Midwest Industrial Supply and Pennzoil Products) will provide results of environmental tests if the customer asks for the information, or post the information on the Internet (Expert Panel, 2002). Manufacturers' environmental testing data, while

valuable, is currently not standardized. As an example, several vendors provide reports containing bioassay data, but it is sometimes difficult to compare results among different products because different test species (e.g. fathead minnows or water fleas) and different test protocols may be used.

Chemical properties, particularly toxic contaminants, can vary significantly depending on the product. Constituents can also vary from batch to batch (Expert Panel, 2002). The environmental impacts of dust suppressants cannot be adequately identified until concentration ranges for major and trace chemical constituents are known for the most common products. Most experts in soil science, ecology, and biology can estimate potential environmental impacts in their field of expertise if they know the chemical composition of the product and the site-specific conditions (Expert Panel, 2002). However, that information is not fully available.

There is also a concern regarding the sources of the products used in the dust suppressants. Although some manufacturers formulate suppressants from virgin materials, a majority of commercial products are reformulated by-products or brines from industries that would otherwise dispose of these materials as wastes. Several examples of waste products reformulated as dust suppressants include lignin sulfonates and magnesium chloride brines. In effect, unpaved roads have become disposal system for these by-products that are reformulated and used as dust suppressants. The chemical composition of broad categories of by-products, such as lignin sulfonates, oils, and brines will depend on the original source of the by-products and also on the chemical processes that generated them. For example, the waste oils originating from California crude oils may contain more metals than waste oils originating from Pennsylvania crudes (Expert Panel, 2002). Used oils and solvents may have even higher toxic concentrations.

It is also noteworthy that the use of toxic by-products in dust suppressants is a recycling process. The recycling of non-hazardous waste products into dust suppressants reduces the cost of the dust suppressant and eliminates the need for disposal in landfills. Depending on the by-product, recycling and reuse into dust suppressants may be the best way to dispose of some non-hazardous wastes (Expert Panel, 2002). For example, some mulch-type suppressants are formulated with non-hazardous wood fiber or paper pulp, and large volume use of mulch-type suppressants can significantly reduce the volume of waste pulp that must either be landfilled or incinerated.

The sources of the water used for dust suppressants should also be considered in assessing the potential impacts. The majority of suppressants require dilution and typically applicators will use the water that is most readily available. Tap water, untreated surface or ground water or reclaimed municipal or industrial wastewater could all be used. Reclaimed wastewater may have higher levels of nutrients and pathogens than ordinary tap water or some surface or groundwaters. In some areas, contaminated groundwater could inadvertently be used for mixing of the dust suppressants (Expert Panel, 2002). Minimum quality standards for water used directly as a dust suppressant or as a dilution product should be established to prevent inadvertent contamination of lands treated with dust suppressants.

5.1.6 Clearinghouse for Dust Suppressant Information

There is a need for more information about the chemicals and formulations used in dust suppressants (Expert Panel, 2002). Regulators, applicators, and the public don't have easy access to information that would help them to decide which dust suppressant types are safe and effective for specific applications. An easily-accessible information center, a "clearinghouse", could help applicators, regulators, and the public acquire the information needed to make good dust control decisions. The recommended form of this clearinghouse is as a World Wide Web site. EPA maintains several web sites that could serve as models for a dust suppressant clearinghouse. An example is the

CHIEF bulletin board that serves the needs of state and local air quality regulators. The clearinghouse could be maintained by EPA or by another public agency or university. Content categories for this clearinghouse could include (Expert Panel, 2002):

1. Information on composition of dust suppressants
2. Easy to follow guidelines for selection and application
3. List of products not to use
4. Occupational and environmental toxicity information for different types of dust suppressants
5. Applicable state and local ordinances regulating dust suppressant application
6. Information about what happens after application, both in terms of suppressant performance and environmental impacts
7. Information for the affected public as well as for regulators/manufacturers/applicators, including:

   a. Contact information for federal, local, and state agencies regulating use of dust suppressants

   b. Contact information for dust suppressant manufacturers

Complete disclosure by dust suppressant manufacturers, formulators, and vendors would be needed in order to address all the items shown above. Some manufacturers, formulators, and vendors might be reluctant to release exact formulation information, since they could consider the information to be proprietary. The model for disclosure of pesticide formulations, where only "active" ingredients are specifically listed, might prove useful. However, in the case of dust suppressants the definition of an "active" ingredient should include both those constituents that control dust and any other trace constituent, which when applied to the land surface at the intended application rate, has the potential for environmental impact. However, the lack of complete cooperation from vendors should not delay the creation of the clearinghouse.

5.1.7 Risk Assessment and How to Decide What to Test For

When making the determination on which dust suppressant should be used, a robust risk assessment framework is needed along with the identification of which test should be performed. In Section 4, a framework was provided that outlines the considerations that one might use to make an assessment. There are several detailed risk assessment frameworks available to the industry that could be used as models.

- The American Society of Testing and Materials (ASTM)'s Risk-Based Corrective Action (RBCA) is one of the standard frameworks for assessing the extent of petroleum contamination and developing remedial measures for contaminated lands (ASTM, 1999)
- ASTM also publishes guides and standards for ecological considerations for the use of chemical dispersants in oil spill response that may provide insight into development of standards for dust suppressants (ASTM, 2003)
- EPA has also published guidelines for remediation of hazardous waste sites (EPA, 2002)

Unfortunately, these frameworks for risk assessment were developed for cases where contamination had already occurred. One proprietary general guideline exists for evaluating potential environmental impacts of release of chemicals to the environment (see Rohm and Haas Consumer and Industrial Specialties' Risk Assessment Flow Chart for Safe Product Use, available at http://www.rohmhaas.com/rhcis/environmental/safeproduct.html).

There are no relevant guidelines available for minimizing environmental and human health risk from intentional application of dust suppressants to roads construction sites, agricultural fields, and vacant lands. Guidelines do exist for:

- Intentional application of fertilizers to crops and turf, and

- Intentional application of pesticides to croplands, turf, and residences

However, in both of these cases, the active ingredients are well known and impacts have been fairly well studied. The situation with dust suppressants is much more ambiguous, as in many cases, data about their chemical composition and biological impacts are lacking.

It is recommended that tests performed, as part of a risk assessment for dust suppressants should focus on the constituents in the dust suppressant concentrate, in runoff, and in the soil after application. It is very likely that no dust suppressants will be free of every potential harmful chemical; however, it is important that guidance documents and initial recommended threshold levels be developed to reduce risk. Relevant EPA methods, compiled from both Expert Panel recommendations and from the literature review, are summarized in Table 5-1. These tests could be applied to the raw product, the collected runoff, and/or the soils.

Table 5-1: Relevant EPA and Standard test to be considered in assessing impacts of dust suppressants.

	Analytical Method	EPA/ASTM Number
Organic	Volatile organic compounds	8260B
	Semi-volatile organic compounds	8270D
	Pesticides and herbicides	8270D
	Chlorinated hydrocarbons	8121
	Petroleum hydrocarbons	8440
	PAHs	Tentatively identified compounds (TIC)
Inorganics/Metals	Inductively Coupled Plasma-Atomic Emission Spectrometry	6010B
Toxicity	Terrestrial bird toxicity	850.2200
	Insect toxicity	850.3020
	Vegetation toxicity	850.4000
	Algal Toxicity	850.4400
	Acute to fishes and microinvertebrates	ASTM E-1192-88
	Marine and Estuary organisms	EPA/600/4-85-013 and EPA 600/4-87-028
	Chronic to fishes and microinvertebrates	EPA/600/4-89-001
	Dredge material chemical and biological evaluation	U.S. Corps. Engr. Rep-D90
	Bioconcentration	ASTM E-1022-84
Biodegradability	Soluble Chemical Oxygen Demand	410.4
	Biochemical Oxygen Demand	405.1

5.1.8 Example of a Standardized Assessment Methodology

As part of an initial risk assessment for this report, a proposed standardized methodology for estimating soil mass fractions of dust suppressant constituents is shown below in Tables 5-2 and 5-3. The worksheets use known information about a dust suppressant constituent concentration, the application rate, the soil penetration, and soil density to estimate a dust suppressant constituent concentration in soil. Table 5-2 is provided as a blank worksheet for vendors, applicators, regulators, and investigators to use in their risk assessments. Table 5-3 shows an example calculation for a constituent present at a 50 mg/L in a dust suppressant concentrate.

Table 5-2: Blank Worksheet A – Estimation of soil mass fraction from suppressant constituent concentration.

Blank Worksheet A: Calculation of constituent concentration in soil

Fill in shaded blanks with your data and complete calculations in other rows per Calculation Instructions

User-supplied	Row #	Data Entry or Calculation Instruction	Value	Units
*	1	Concentrate constituent concentration		mg/L
*	2	Dilution: volume water/volume concentrate		
	3	Mixed constituent concentration = concentrate concentration / (1 + dilution)		mg/L
*	4	Liquid mixture application rate per pass		gallon/yd2
*	5	Number of passes		
	6	Total liquid mixture application rate/yd2 = rate/pass x number passes		gallon/yd2
	7	Land area conversion	1.20	yd2/m2
	8	Converted total liquid mixture application rate per m2 = row 6 x row 7		gallon/m2
	9	Mixture volume conversion	3.78	liter/gallon
	10	Total Liquid mixture application rate (metric) = row 8 x row 9		liter/m2
*	11	Runoff fraction (fraction leaving site before infiltration into soil)		
	12	Retained liquid application rate = Total rate x (1 - runoff fraction)		
	13	Mixture liquid depth applied to soil = (row 12 x (1 meter3/1000 liter) x 100cm/meter x 1 inch/2.54 cm		inches
	14	Constituent application rate as mass/area soil = mixed constituent concentration (row 3) x liquid mixture rate (row 12)		mg/m2
*	15	Diluted mixture penetration (inches)		inches
	16	Length conversion	2.54	cm/inch
	17	Diluted mixture penetration (centimeters) = row 15 x row 16		centimeters
	18	Diluted mixture penetration (meters) = row 17 / 100		meters
	19	Constituent soil concentration as mass constituent/volume soil = constituent application rate (row 14) / diluted mixture penetration (row 18)		mg/m3
*	20	Soil bulk density		kg/m3
	21	Initial constituent mass fraction in soil = constituent soil concentration (row 19) / soil bulk density (row 20)		mg/kg = ppm

Table 5-3: Example calculation using Worksheet A. Soil mass fraction resulting from application of dust suppressant with constituent concentration of 50 mg/L. Assumes 1,600 kg/m^3 soil bulk density, 0.45 inch (1.14 cm) suppressant penetration into soil, 2 suppressant applications at 0.50 gallon/yd^2, no runoff of liquid suppressant, and mixing of 1 volume of suppressant concentrate with 1 volume of water.

Worksheet A Example 1: Estimation of constituent soil mass fraction based on constituent concentration in suppressant as supplied (concentrate)

User-supplied	Row #	Data Entry or Calculation Instruction	Value	Units
*	1	Concentrate constituent concentration	50	mg/L
*	2	Dilution: volume water/volume concentrate	1	
	3	Mixed constituent concentration = concentrate concentration / (1 + dilution)	25	mg/L
*	4	Liquid mixture application rate per pass	0.50	gallon/yd2
*	5	Number of passes	2	
	6	Total liquid mixture application rate/yd2 = rate/pass x number passes	1.00	gallon/yd2
	7	Land area conversion	1.20	yd2/m2
	8	Converted total liquid mixture application rate per m2 = row 6 x row 7	1.20	gallon/m2
	9	Mixture volume conversion	3.78	liter/gallon
	10	Total Liquid mixture application rate (metric) = row 8 x row 9	4.53	liter/m2
*	11	Runoff fraction (fraction leaving site before infiltration into soil)	0.00	
	12	Retained liquid application rate = Total rate x (1 - runoff fraction)	4.53	liter/m2
	13	Mixture liquid depth applied to soil = (row 12 x (1 meter3/1000 liter) x 100cm/meter x 1 inch/2.54 cm	0.18	inches
	14	Constituent application rate as mass/area soil = mixed constituent concentration (row 3) x liquid mixture rate (row 12)	113	mg/m2
*	15	Diluted mixture penetration (inches)	0.45	inches
	16	Length conversion	2.54	cm/inch
	17	Diluted mixture penetration (centimeters) = row 15 x row 16	1.14	centimeters
	18	Diluted mixture penetration (meters) = row 17 / 100	0.0114	meters
	19	Constituent soil concentration as mass constituent/volume soil = constituent application rate (row 14) / diluted mixture penetration (row 18)	9,900	mg/m3
*	20	Soil bulk density	1,600	kg/m3
	21	Initial constituent mass fraction in soil = constituent soil concentration (row 19) / soil bulk density (row 20)	6.19	mg/kg = ppm

Environmental regulations establish action levels for contaminants or contaminant classes in soils. Remediation is usually required if values above these levels are recorded for a contaminated site. Tables 5-4, 5-5, and 5-6 show a proposed calculation methodology for using an action level in soil to estimate the maximum allowable constituent concen-

tration in a formulated dust suppressant concentrate. Table 5-4 is provided as a blank worksheet for interested parties to use in risk assessments involving suppressants. Table 5-5 shows a sample calculation for a RCRA-based action level of 100 ppm for total petroleum hydrocarbons (TPH). Table 5-6 shows a sample calculation for a CERCLA-based action level of 1 ppb for tetrachlorodibenzodioxin (TCDD). The final result computed at the bottom of Tables 5-5 and 5-6 should not be considered as a fixed "not to exceed" value for TPH or TCDD, as the numerical result depends on dust suppressant liquid application rate, penetration depth into the soil, fraction suppressant retained on the target surface, suppressant dilution, and soil bulk density. However, the results are instructive, and the accompanying blank worksheet (Table 5-4) could be used with site-specific data to compute maximum allowable constituent (or contaminant) concentrations for other combinations of site conditions, suppressant dilutions, and application rates.

Table 5-4: Blank Worksheet B – Estimation of maximum allowable dust suppressant constituent concentration from risk-based limit in soil.

Blank Worksheet B: Calculation of maximum suppressant contaminant concentration based on maximum allowed soil contaminant mass fraction

Fill in shaded blanks with your data and complete calculations in other rows per Calculation Instructions

User-supplied	Row #	Data Entry or Calculation Instruction	Value	Units
*	1	Initial constituent mass fraction in soil		mg/kg = ppm
*	2	Soil bulk density		kg/m3
	3	Constituent soil concentration as mass constituent/volume soil = constituent soil mass fraction (row 1) x soil bulk density (row 2)		mg/m3
*	4	Diluted mixture penetration (inches)		inches
	5	Length conversion	2.54	cm/inch
	6	Diluted mixture penetration (centimeters) = row 4 * row 5		centimeters
	7	Diluted mixture penetration (meters) = row 6 / 100		meters
	8	Constituent application rate as mass/area soil = constituent soil concentration (row 3) x diluted mixture penetration (row 7)		mg/m2
*	9	Liquid mixture application rate per pass		gallon/yd2
*	10	Number of passes		
	11	Total liquid mixture application rate/yd2 = row 9 x row 10		gallon/yd2
	12	Land area conversion	1.20	yd2/m2
	13	Converted total liquid mixture application rate per m2 = row 11 x row 12		gallon/m2
	14	Mixture volume conversion	3.78	liter/gallon
	15	Total liquid mixture application rate (metric) = row 13 x row 14		liter/m2
*	16	Runoff fraction (fraction leaving site before infiltration into soil)		
	17	Net liquid application rate = row 15 x (1 - row 16) as volume/ area soil		liter/m2
	18	Mixture liquid depth applied to soil = (row 17 x (1 meter3/1000 liter) x 100cm/meter x 1 inch/2.54 cm		inches
	19	Max allowed concentration in diluted mixture = row 8 / row 17		mg/L
*	20	Intended dilution: volume water / volume concentrate		
	21	Maximum allowed concentration in suppressant concentrate as supplied = row 19 x (1 + row 20)		mg/L

Table 5-5: Example calculation of maximum allowable suppressant concentration based on RCRA 100 ppm action level for Total Petroleum Hydrocarbons (TPH) in soil as determined using EPA Method 8015. Assumes 1,600 kg/m^3 soil bulk density, 0.45 inch (1.14 cm) suppressant penetration into soil, 2 suppressant applications at 0.50 gallon/yd^2, no runoff of liquid suppressant, and mixing of 1 volume of suppressant concentrate with 1 volume of water.

Worksheet B Example #2: Calculation of maximum allowable suppressant contaminant concentration based on maximum allowed soil contaminant mass fraction. RCRA soil limit of 100 ppm maximum allowable TPH in soil from EPA Method 8015

User-supplied	Row #	Data Entry or Calculation Instruction	Value	Units
*	1	Initial constituent mass fraction in soil	100.00	mg/kg = ppm
*	2	Soil bulk density	1,600	kg/m3
	3	Constituent soil concentration as mass constituent/volume soil = constituent soil mass fraction (row 1) x soil bulk density (row 2)	160,000	mg/m3
*	4	Diluted mixture penetration (inches)	0.45	inches
	5	Length conversion	2.54	cm/inch
	6	Diluted mixture penetration (centimeters) = row 4 * row 5	1.14	centimeters
	7	Diluted mixture penetration (meters) = row 6 / 100	0.0114	meters
	8	Constituent application rate as mass/area soil = constituent soil concentration (row 3) x diluted mixture penetration (row 7)	1829	mg/m2
*	9	Liquid mixture application rate per pass	0.50	gallon/yd2
*	10	Number of passes	2	
	11	Total liquid mixture application rate/yd2 = row 9 x row 10	1.00	gallon/yd2
	12	Land area conversion	1.20	yd2/m2
	13	Converted total liquid mixture application rate per m2 = row 11 x row 12	1.20	gallon/m2
	14	Mixture volume conversion	3.78	liter/gallon
	15	Total liquid mixture application rate (metric) = row 13 x row 14	4.53	liter/m2
*	16	Runoff fraction (fraction leaving site before infiltration into soil)	0.00	
	17	Net liquid application rate = row 15 x (1 - row 16) as volume/ area soil	4.53	liter/m2
	18	Mixture liquid depth applied to soil = (row 17 x (1 meter3/1000 liter) x 100cm/meter x 1 inch/2.54 cm	0.18	inches
	19	Max allowed concentration in diluted mixture = row 8 / row 17	404	mg/L
*	20	Intended dilution: volume water / volume concentrate	1	
	21	Maximum allowed concentration in suppressant concentrate as supplied = row 19 x (1 + row 20)	808	mg/L

Table 5-6: Example calculation of maximum allowable suppressant concentration based on CERCLA 1 ppb action level for TCDD. Assumes 1,600 kg/m^3 soil bulk density, 0.45 inch (1.14 cm) suppressant penetration into soil, 2 suppressant applications at 0.50 gallon/yd^2, no runoff of liquid suppressant, and application of undiluted suppressant to land surface.

Worksheet B Example #3: Calculation of maximum allowable suppressant contaminant concentration based on maximum allowed soil contaminant mass fraction. CERCLA limit of 1 ppm maximum allowable dioxin in soil.

User-supplied	Row #	Data Entry or Calculation Instruction	Value	Units
*	1	Initial constituent mass fraction in soil	0.001	mg/kg = ppm
*	2	Soil bulk density	1,600	kg/m3
	3	Constituent soil concentration as mass constituent/volume soil = constituent soil mass fraction (row 1) x soil bulk density (row 2)	1.60	mg/m3
*	4	Diluted mixture penetration (inches)	0.45	inches
	5	Length conversion	2.54	cm/inch
	6	Diluted mixture penetration (centimeters) = row 4 * row 5	1.14	centimeters
	7	Diluted mixture penetration (meters) = row 6 / 100	0.0114	meters
	8	Constituent application rate as mass/area soil = constituent soil concentration (row 3) x diluted mixture penetration (row 7)	1.83E-02	mg/m2
*	9	Liquid mixture application rate per pass	0.50	gallon/yd2
*	10	Number of passes	2	
	11	Total liquid mixture application rate/yd2 = row 9 x row 10	1.00	gallon/yd2
	12	Land area conversion	1.20	yd2/m2
	13	Converted total liquid mixture application rate per m2 = row 11 x row 12	1.20	gallon/m2
	14	Mixture volume conversion	3.78	liter/gallon
	15	Total liquid mixture application rate (metric) = row 13 x row 14	4.53	liter/m2
*	16	Runoff fraction (fraction leaving site before infiltration into soil)	0.00	
	17	Net liquid application rate = row 15 x (1 - row 16) as volume/ area soil	4.53	liter/m2
	18	Mixture liquid depth applied to soil = (row 17 x (1 meter3/1000 liter) x 100cm/meter x 1 inch/2.54 cm	0.18	inches
	19	Max allowed concentration in diluted mixture = row 8 / row 17	4.04E-03	mg/L
*	20	Intended dilution: volume water / volume concentrate	0	
	21	Maximum allowed concentration in suppressant concentrate as supplied = row 19 x (1 + row 20)	4.04E-03	mg/L
	22	Maximum allowed concentration (ppb) = row 21 x 1000	4.04	µg/L (ppb)

5.2 Regulatory Issues

5.2.1 Gaps in Existing Regulations

At present, few specific regulations for dust suppressants exist. Decision-makers currently rely on emerging voluntary certification programs (Section 2.7), and a limited number of state and local guidelines to screen the different types of dust suppressants for a variety of application scenarios. Current state, local, and national guidelines are not uniform. While current voluntary certification programs have merit, they need to be expanded to incorporate a majority of dust suppressants in commerce. Dust suppressants should be evaluated not only for their effectiveness in suppressing dust but also for their potential toxicological and environmental effects.

Regulations to support existing environmental laws (e.g., RCRA, CERCLA/SARA guidelines, as were used to clean up the Superfund site at Times Beach) may apply at some point after a dust suppressant has been applied. However, existing regulations are not applicable to the production and application of dust suppressant. RCRA rules were not written with dust suppressants in mind. Although they allow for waste exchanges and other waste reprocessing steps, their principal intent is to regulate the treatment, storage, and disposal of municipal and hazardous wastes. CERCLA/SARA rules are intended to finance and guide the clean up of contaminated sites. In contrast, the major regulatory need for dust suppressants is to develop guidelines that will prevent the creation of hazardous waste sites from the inappropriate use of dust suppressants. The Toxic Substance Control Act (TOSCA) is intended to regulate hazardous substances prior to them becoming hazardous waste.

5.2.2 Filling the Regulatory Gaps – What's Available in Existing Regulations?

Is the current regulatory environment for dust suppressants adequate to ensure that the risks have been considered and their use is acceptable? It was the opinion of the Expert Panel that it is not adequate. The Expert Panel generally agreed that more research is needed to answer questions about the potential environmental impacts of dust suppressants, but also agreed that development of regulations should not wait for all the science to be completed (Expert Panel, 2002).

A complication in developing new regulations is that the composition of dust suppressants may not be adequately known and components or byproducts of the suppressants may have potentially harmful environmental impacts. Although existing regulations are not intended to regulate the flows of Industrial wastes into the formulation of dust suppressants and thence to the environment, the existing regulations do contain limits on contaminant concentrations in soil that could be used as a starting point for regulations and guidelines for dust suppressants. For instance, a similar approach may be considered as that for the land application sludges. The regulations currently in place for the land application of sewage sludge and wastewater on agricultural fields limits the loading rate of metals based on land use.

The Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), Resource Conservation Recovery Act (RCRA), Comprehensive Environmental Response Compensation and Liability Act (CERCLA), Superfund Amendments and Reauthorization Act (SARA), Ecological Soil Screening Level (Eco-SSL) guidance with supporting regulations and guidelines collectively restrict the environmental concentrations of hundreds or thousands of chemicals. Many of these programs are good models for identifying potential problems; however, they need to be followed up with site-specific studies. It is recommended that:

1. State and federal regulatory databases for these compounds be reviewed, and the results organized to produce a database of compounds whose use would be restricted or prohibited in dust suppressants (Expert Panel, 2002).
2. Contaminant concentrations of modeled dust suppressant constituents and by-

products in water should be compared against action levels used in the Clean Water Act and Safe Drinking Water Act since dust suppressants could eventually be transported into surface and ground waters. Any dust suppressant compound that could reasonably be expected to exceed existing regulatory-based action levels or thresholds would need to be examined in detail to determine whether additional regulatory controls were needed to prevent unreasonable risks to human health and the environment.

Regarding regulating dust suppressant application practices, some guidance might be found in U.S. Department of Agriculture (USDA) regulations that control the application of chemical fertilizers and also in regulations that control the application of pesticides under FIFRA. As noted earlier, there are also state programs being developed. These state programs may be the most appropriate since they can better address regional issues related to dust suppressant use than a "one size fits all" federal program.

5.2.3 What's Next for Regulations?

New regulations must be developed to deal with the variety of compounds, application scenarios, and potential receptors that are involved with the growing use of dust suppressants. A variety of potential regulatory approaches specifically focused on dust suppressants exist, ranging from extending the current patchwork approach of local and state regulations to development of a comprehensive national program enforcement of which would likely be delegated to the states. An alternative to a comprehensive national program might be a basic national program that specifically makes dust suppressant products subject to other existing regulatory thresholds for toxicity and requires some type of testing and/or certification to validate that these limits are met. States could be encouraged to develop a more comprehensive regulatory program for dust suppressant products and their use based on regional topography, hydrology, soil types, ecosystems, and material availability.

The range of regulatory topics could include:

1. Limiting the types and number of suppressants allowed, and
2. Regulating the locations and application practices of specific types of dust suppressants (Expert Panel, 2002).
3. Regulating the exposure of workers to dust suppressants.

An effort to limit and specify which dust suppressants could be applied for dust control would be challenging because of the broad variety of products used as dust suppressants, their complex chemistry, and the increasing number of products and industrial by-products regularly introduced to the market. However, limiting the types of dust suppressants allowed for use would make enforcement of environmental regulations much simpler (Expert Panel, 2002). A regulatory-derived list of acceptable dust suppressants would bar access of several vendors to the market and would not be well received. In addition, there was concern that such an approach would discourage the development of more effective and more environmentally benign suppressants (Expert Panel, 2002).

Regulating dust suppressant application locations and application practices, rather than the types and number of suppressants, would allow for the varying sensitivities of different ecosystems to different dust suppressant formulations (See framework proposed in Section 4). For example, a dust suppressant with relatively insignificant impacts in one area (an arid flatland system with no perennial surface water flows and deep groundwater) might have significant impacts in another area (a humid mountainous system with significant perennial surface water flows and shallow groundwater). In the flat arid land case, the suppressant is likely to stay put in the soil for a long time, with minimal aquatic impacts. In the mountainous humid case, significant portions of the suppressant may rapidly reach surface and ground waters and could have significant aquatic impact.

Also, application rates and practices are important since dust suppressants with seemingly benign characteristics when applied at a rate of 1,000 mg/kg soil might produce significant impacts on the environment or human health if it is applied at 10 times the rate (10,000 mg/kg soil) or if the surrounding environment and individuals are particularly sensitive. High soil mass fractions could inadvertently develop if there is significant overspray onto previously treated surfaces during application.

The effectiveness of a suppressant should be considered in any evaluation of the application and potential impacts of dust suppressants. A short-lived, easily weathered dust suppressant requiring frequent re-application could have more significant environmental impacts than a long-lived, weather-resistant suppressant, when both contain the same concentration of a mobile trace contaminant. Frequent reapplication of the easily weathered suppressant would produce higher soil and aquatic concentrations of the trace contaminant than infrequent applications of the weather-resistant suppressant. If effectiveness is not considered, decision-makers might choose the "most environmentally friendly suppressant" rather than select a more effective dust suppressant that is just as environmentally benign for one application and more benign over the long term (Expert Panel, 2002).

The evaluation and/or certification of specific dust suppressants should not be a one-time process, but should instead be subject to periodic renewal. Waste products that are recycled into dust suppressants can vary in composition through time, and this variability must be considered in any comparison of a dust suppressant batch to a fixed set of environmental criteria. Out-of-specification products should not be considered bad, but they should be scrutinized (Expert Panel, 2002).

If additional regulations are developed for dust suppressants, certain criteria should be met (Expert Panel, 2002):

1. Regulations should be practical.
2. A regulatory program to track dust suppressants should not be overwhelming in amount of required information.
3. Regulatory guidelines should benefit governments who rely on dust control in preparing State Implementation Plans (SIPs) for PM10.
4. Training needs to accompany the regulations.
5. A model, decision-tree, or expert system is needed to help decide: what to use, how much to use, for different dust applications and environmental situations (e.g., Figure 4-1).
6. Sufficient EPA-approved and standard analytical testing methods to evaluate suppressant chemical characteristics exist (Table 5-1); however, as part of the regulatory process, the types of tests to be used should be specified. Tests should be carefully selected to provide the information that is necessary to assess potential exposures to critical receptors through those media that are of concern in the area where the suppressant will be applied. The EPA's Data Quality Objective process provides the framework for assessing the type of information that is critically needed to assess the data that are required to evaluate potential exposures.
7. In addition to the tests to determine the potential environmental impacts, the regulations should contain Application Practice Guidelines (APGs). Application Practice Guidelines should include information about the types of areas where specific suppressants can be applied (predominant biota and soil types), wind velocity limitations at the time of application, specific limitations on application in proximity to water bodies, runoff channels, and residential areas, regulations on the types of containers that may be used to transport suppressants [some of this may already be in place in RCRA-inspired rules promulgated by EPA and the U.S. Department of Transportation (DOT)].

Among the questions that applicators and regulators would need answered in order to establish a list of prohibited categories of dust suppressants are (Expert Panel, 2002):

1. What formulated and in-soil concentrations should not be exceeded for specific compounds?
2. If some formulations are already known to contain harmful contaminants (such as TCDD), one could start by prohibiting or restricting suppressant formulations containing those harmful compounds. Additional detailed discussion of this approach, using restrictions found in existing environmental regulations, can be found in Section 5.2.2 above.
3. Can obviously ineffective chemical formulations, passed off as dust suppressants, be prohibited? For example, could a 5% sodium hydroxide NAOH solution in water, be applied to soil and be labeled as a dust suppressant? What can be done to prevent this? Does any existing legislation cover this situation?
4. Should there be a required consistency of dust suppressant composition? A public right-to-know may lead to a requirement for batch-to-batch consistency of composition.
5. How does one develop a reliable testing process to determine if industrial wastes or byproducts, not originally formulated for use as dust suppressants, can be effective suppressants and safely applied? Currently, manufacturers do "in-house" or contracted testing of performance and toxicity.

Additional Recommendations by the Expert Panel included the following:

1. Regulatory exclusions for certain classes of compounds should be re-examined. For example, the RCRA petroleum exclusion allows reintroduction of oily wastes into the marketplace and some of these could cycle back into the environment in dust suppressant formulations (Expert Panel, 2002).
2. Information contained in the MSDS is not sufficient to evaluate the potential environmental impacts of suppressants. Manufacturers should transparently and completely report the chemical compositions of their dust suppressant formulations. (Expert Panel, 2002). Regulations requiring more information on an MSDS should be considered.
3. Finally, regulations should prevent entry of "rogue" dust suppressants into the marketplace. A reputable dust suppressant should have a consistent formulation and independently verifiable test results demonstrating product effectiveness and low environmental impacts, and will be made by manufacturers with consistent track records in the dust suppressant business. Rogue products will typically come without test results from one-time manufacturers that are looking to get rid of a waste product. Certification and regulation are the best ways to prevent entry of rogue products into the marketplace and the environment. Reputable manufacturers would welcome a certification program (Expert Panel, 2002).

5.2.4 Response to Regulatory Uncertainty – Risk Driven Regulatory Response

While current certification and testing protocols focus on evaluating the effectiveness of a dust suppressant, more needs to be done to assess potential adverse impacts from dust suppressants and to estimate risks. Regulatory efforts should be focused first on those compounds and applications that pose the greatest risks to human health and the environment.

A risk assessment model combined with a transport and fate model is required to evaluate potential exposures and adverse risks. For the decision-maker or regulator, a decision-making model or expert system to assist in making site-specific decisions would be of value. Without these models or tools, a decision-maker could either make decisions or develop regulations that are very conservative in the use of dust suppressants. Excessively conservative regulation may not maximize the benefits to be gained from

using dust suppressant products and could be challenged in the courts. Conversely, the decision-maker could allow widespread use of dust suppressants with the potential for unintended consequences. Sufficient information already exists to make a start at preventing either of the above two scenarios. After 25 years of environmental remediation efforts, risk-based concentration limits have been established for a number of compounds and compound classes. Additionally, risk assessment frameworks, such as ATSM's RBCA guidelines, may prove instructive.

An example of this approach would be a risk-benefit analysis to determine how much PM10, and PM2.5 dust is suppressed with each suppressant. Information that would be needed include the potential environmental impacts, the costs associated with the using or not using dust suppressants, the potential environmental benefits associated using dust suppressants. There also needs to be a consideration that many regions are rapidly moving toward a PM2.5 standard and away from a PM10 standard. This is due to the emerging cancer issues and cardiopulmonary disease. However, tighter standards will raise the quality of the environment and the cost associated with that environment.

5.3 Final Recommendations

The additional environmental regulations that have been developed since the 1970's when the Times Beach situation occurred have reduced the chances that dioxin-contaminated waste oil be used as dust suppressants. However, dust suppressants are not specifically regulated under any major federal legislation and there is still significant potential for other environmentally hazardous materials to be used.

1. In the SHORT TERM, the chances that hazardous materials are used can be reduced by:
    a. Establishing an interagency working group that evaluates the cross media and cross jurisdictional issues associated with the use of dust suppressants.
    b. Closing regulatory loopholes that allow entry of unlimited industrial wastes into the environment when they are classified as dust suppressants. All industrial waste must be sampled prior to use.
    c. Requiring complete disclosure of all dust suppressant constituents through independent standardized testing of dust suppressant formulations. Testing should recur periodically and whenever the formulation changes manufacturers using waste products must test each batch.
    d. Developing and employ a risk-based expert system (or decision tree) to prohibit or severely restrict the concentrations of environmental contaminants known to be persistent and harmful.
    e. Developing conservative guidelines (APGs) for application of different types of dust suppressants in major broad ecosystem categories.
    f. Requiring standardized biological toxicity testing for major dust suppressant types.
    g. Requiring training for all personnel who use and regulate dust suppressants.
2. The risks associated with dust suppressant use can be reduced in the LONG TERM by:
    a. Encouraging the development of dust suppressant formulations that are long-lived and environmentally benign.
    b. Continuing to develop scientific information about the environmental impacts of dust suppressants.
    c. Using information developed in 2a and 2b to update risk-based regulations and application and management practices.

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Appendix A

Literature Review

Literature Review

Dust Suppression and Its Environmental Impacts

Prepared for the Expert Panel on

Potential Environmental Impacts of Dust Suppressants:

"Avoiding Another Times Beach"

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Dust Suppression and Its Environmental Impacts

In recent years, studies on fugitive dust control have significantly increased in the United States. This literature review summarizes the current status of the use of dust suppressants with respect to types of materials used, application rates, effectiveness, environmental impacts, and costs. In 1991, 75-80% of all dust suppressants used were chlorides and salt brine products, 5-10% were ligninsulfonates, and 10-15% were petroleum-based products (Travnik, 1991). There has been much research on the effectiveness of dust suppressants; however, little information is available on the potential environmental impacts and costs of these compounds. The categories of dust suppressants most frequently used to control fugitive dust are listed in Table 1.

Table 1 – Most commonly used dust suppressants (modified from Bolander, 1999a)

Suppressant Type	Products
Water	Fresh, reclaimed, and seawater
Salts and brines	Calcium chloride, and magnesium chloride
Petroleum-based organics	Asphalt emulsion, cutback solvents, dust oils, modified asphalt emulsions
Non-petroleum based organics	Vegetable oil, molasses, animal fats, ligninsulfonate, and tall oil emulsions
Synthetic polymers	Polyvinyl acetate, vinyl acrylic
Electrochemical products	Enzymes, ionic products (e.g. ammonium chloride), sulfonated oils
Clay additives	Bentonite, montmorillonite
Mulch and fiber mixtures	Paper mulch with gypsum binder, wood fiber mulch mixed with brome seed

Water

Surface watering is an immediate, inexpensive short-term solution to control dust (Gebhart *et al.*, 1999). Water suppresses dust by agglomerating surface particles. However, the effectiveness depends upon temperature and humidity. Water can be effective for a period as short as half an hour and as long as twelve hours (Foley *et al.*, 1996, Schwendeman, 1981). Thompson (1990) found water was 85% effective in controlling dust in coal mines. Water effectiveness in controlling dust in roads and dirty beds has been estimated to be 40% (Travnik, 1991, Foley *et al.*, 1996). Water has little residual effect. Once applied it evaporates quickly, especially in hot, dry climates (Kestner, 1989a). Cowherd *et al.* (1989) reports that dust suppression efficiency decays from 100% to 0% in a very short time. Water is most efficient on sites where vehicular traffic is limited. Seawater is more effective than fresh water as a suppressant owing to the presence of salts.

Salts and Brines

The most widely used compounds in this category of suppressants are magnesium chloride ($MgCl_2$), and calcium chloride ($CaCl_2$) (Sanders and Addo, 1993). Salts suppress dust by attracting moisture from the air, which keeps the surface humid (Foley *et al.*, 1996). Sodium chloride is not a very useful suppressant in arid regions because it only absorbs water when the humidity exceeds 75%.

Calcium chloride is a by-product of the ammonia-soda (Solvay) process and a joint product from natural salt brines. The ability of calcium chloride to absorb water from the air is a function of the relative humidity and ambient temperature. Calcium chloride is more effective in places that have high humidity and low temperatures (Foley *et al.*, 1996). Bolander (1999a) reports that calcium chloride at a temperature of 25°C, for example, starts to absorb water at 29% relative humidity, and at 38°C it starts to absorb water at 20% relative humidity.

Magnesium chloride is created either from seawater evaporation or from industrial by-products prepared from magnesium ammonium chloride hexahydrate in the presence of HCl. It is a more effective salt than calcium chloride because it increases the surface tension and has a harder surface when it is dry (Foley *et al.*, 1996). It has a low freezing point (-34°C) and serves as a de-icing agent. Magnesium chloride needs a minimum of 32% humidity to absorb water from the air independent of the temperature. It remains more hygroscopic at higher temperature than calcium chloride and is therefore more suitable to dry climates (Langdon and Williamson, 1983). Compared to water, salts are more effective in controlling dust if sufficient moisture is available. The effectiveness of salts to control dust significantly decreases with time. The dust abatement properties of magnesium chloride have been found to last about 12 weeks (Monlux, 1993). Another problem with salts is that they migrate readily in the environment. DeCastro *et al.* (1996) modeled the movement of road stabilization additives of road surface to determine how long the additives remained effective. They found that calcium and magnesium chlorides are easily carried from the soil. Table 2 summarizes several studies on the effectiveness of salts in minimizing fugitive dust.

Table 2 - Effectiveness of salts as dust suppressants

Suppressant Type	Effectiveness	Reference
Calcium chloride	55% aggregate retention as compared to control.	Sanders and Addo, 1993
Magnesium chloride	Compared to control, retained 77% of the aggregates.	Sanders and Addo, 1993
Magnesium chloride sprayed during street sweeping	26% $MgCl_2$ solution reduced dust by 92%. 60% $MgCl_2$ solution reduced dust by 58%.	Satterfield and Ono, 1996
Calcium chloride, magnesium chloride, and ligninsulfonate	Reduced fugitive dust by 50-70% Increased aggregate retention by 42-61%. Under low humidity and high temperatures ligninsulfonate was more effective than salts.	Sanders *et al.*, 1997
Petro-tac, Coherex, Soil-Sement Generic Petroleum Resin, and Calcium chloride	95% effective after application to control dust particles < 15, 10, and 2.5 μm. Over a 30-day period, effectiveness decreased as much as 50% and as little as 10%.	Muleski and Cowherd, 1987

Organic Non-Petroleum Products

Organic non-petroleum products include ligninsulfonate, tall (pine) oil, vegetable derivatives, and molasses. Table 3 lists major studies performed on the effectiveness of non-petroleum based products and polymers to abate dust.

Ligninsulfonate is derived from the sulfite pulping process in the paper industry where wood is processed using sulfuric acid to break down the wood fiber. Lignin is a complex amorphous aromatic polymer that acts as a binder for the cellulose fibers in wood. It represents 17-33% dry weight of the wood and is resistant to hydrolysis (Kirk *et al.*, 1980). In the wood pulping process, the wood fiber is the valuable product and the pulp liquor, which contains lignin, is wasted. This waste liquor is processed further and neutralized prior to being used as a dust palliative. Ligninsulfonates act as a weak cement by binding the soil particles together. Ligninsulfonates remains effective during long dry periods with low humidity. They also tend to remain plastic, allowing reshaping and traffic compaction when applied to soils with high amounts of clay. The effectiveness of ligninsulfonates may be reduced or completely destroyed in the presence of heavy rain because of the solubility of these products in water (Bolander, 1999a).

Table 3 – Effectiveness of non-petroleum based and polymer products as dust suppressants

Suppressant Type	Effectiveness	Reference
Sprinkling of 40 ml/m^2/day of canola oil on swine barns	Reduction of 84% in dust concentration	Senthilselvan *et al.*, 1997
Lignin used on unpaved roads	63% more aggregates retained as compared to untreated sections.	Sanders and Addo, 1993
Ligninsulfonate used to control dust fungi and endotoxins in livestock housing facilities	Mass of dust, fungi, and endotoxins were reduced 6, 4, and 3 fold respectively, when ligninsulfonate solutions (27-39%) were applied.	Breum *et al.*, 1999
Synthetic polymer and tall oil	Increased tensile strength of soil. Strength dependent upon curing time.	Bolander, 1999b
Polymer emulsion (PE)	Initial = 94%, After 3 months = 96% After 11 months = 85%	Gilles *et al.*, 1997
Polymer Emulsion (PEP)	Initial = 99%, After 3 months = 72% After 11 months = 49%	Gilles *et al.*, 1997
Biocatalyst stabilizer (BS)	Initial = 33% - 5%, After 3 months = 0% After 11 months = 0%	Gilles *et al.*, 1997

Tall oil is a by-product of the wood pulp industry recovered from pinewood in the sulfate Kraft paper process. It contains rosin, oleic and linoleic acids. Tall oil is used in flotation agents, greases, paint alkyd resins, linoleum, soaps, fungicides, asphalt emulsions, rubber formulations, cutting oils, and sulfonated oils (Merck Index, 1989). Tall oil promotes adherence between soil particles, however, its surface binding actions can be limited or destroyed if this product is exposed to long–term rainfall. Increasing the residual content of tall oil was found to promote an increase in the tensile strength and resistance to periodic wetting or wet freeze of these products (Bolander, 1999a).

Vegetable oils are extracts from the seeds, fruit, or nuts of plants and are generally a mixture of glycerides (Lewis, 1993). Some examples of vegetable oils are canola oil, soybean oil, cottonseed oil, and linseed oil. Vegetable oils abate dust by promoting agglomeration of the surface particles.

Molasses is the thick liquid left after sucrose has been removed from the mother liquor in sugar manufacturing. It contains approximately 20% sucrose, 20% reducing sugar, 10% ash, 20% organic non-sugar, and 20 % water (Lewis, 1993). This type of dust suppressant provides temporary binding to the surface particles (Bolander, 1999a). Additional applications are necessary during the year, mainly after heavy rains, because molasses will dissolve in water (Sanders and Addo, 1993).

Synthetic Polymer Products

The adhesive property of synthetic polymers promotes the binding of soil particles. Products such as polyvinyl acetate and vinyl acrylic are used in synthetic polymers. In the laboratory, Bolander (1999b) investigated the effect of adding synthetic polymers to dense-graded aggregate. The results show that polymers increased the tensile strength of clays on typical roads and trails up to ten times. Synthetic polymer emulsions did not change the compacted dry density. The tests showed that synthetic polymers applied in wet climates would tend to break down if exposed to moisture or freezing for an increased time.

Organic Petroleum Products

Organic petroleum-based materials consist of products derived from petroleum. These include used oils, solvents, cutback solvents, asphalt emulsions, dust oils, and tars. These products agglomerate fine particles, generally forming a coherent surface that holds the soil particles in place. Petroleum-based products are not water-soluble or prone to evaporation (Travnik, 1991). They generally resist being washed away, but oil is not held tightly by most soils and can be leached away by rain. Langdon and Williamson (1983) divided petroleum based products into different categories: cutbacks (e.g. DO-1, DO-2,

DO-3, and DO-6KF), emulsions (e.g. DO-8, Coherex, and CSS-1), and others (e.g. DO-4, DO-6, DO-6P). Table 4 lists studies on the effectiveness of petroleum-based products.

Table 4 – Effectiveness of petroleum-based products as dust suppressants

Suppressant Type	Effectiveness	Reference
Oiling (petroleum-based)	50 to 98%	Foley *et al.*, 1996
Water (0.44 gal/yd^2), petroleum resin (0.84 gal/yd^2), and emulsified asphalt (0.71 gal/yd^2).	50% reduction in particulate emissions for at least one month. Reapplication increased suppressant lifetime. Lifetime decreased with decreasing particle size.	Muleski *et al.*, 1983
Emulsion of hydrocarbon-based textile oil applied to bulk-stored wheat, corn, and soybeans	50% reduction (0.04%emulsion) 92% reduction (0.07% emulsion) Similar results found for rapeseed and oils.	Jayas *et al.*, 1992
Emulsified petroleum resin, petroleum residue,	In general, an increase in water content during suppressant application improved cohesive strength of the aggregates	Lane *et al.*, 1983
Non-hazardous crude oil (NHCO)	Very effective in suppressing dust for a long period; after 11 months = 92% effective	Gilles *et al.*, 1997

Electro-Chemical Products

These suppressants are usually derived from sulphonated petroleum and highly ionic products. This group of products includes sulphonated oils, enzymes, and ammonium chloride. The electro-chemical stabilizers work by expelling adsorbed water from the soil which decreases air voids and increases compaction (Foley *et al.*, 1996). A disadvantage of these products is the dependence upon the clay mineralogy and therefore they are only effective when specific minerals are present.

Clay Additives

Clay additives are composed of silica oxide tetrahedra (SiO_4) and alumina hydroxide octahedra ($Al(OH)_6$) (Scholen, 1995). This type of dust suppressant agglomerates fine dust particles and increases the strength of the material under dry conditions. Clay additives provide some tensile strength in warm dry climates; however, increasing the moisture contents promotes loss of their tensile strength (Bolander, 1999b).

Others

In addition to the categories listed in Table 1, several other suppressants and technologies have been used to abate dust. Foley *et al.* (1996) reported that dust emissions on unpaved roads could be reduced significantly even with small reductions in vehicle speed. Over 40% of the dust was reduced when vehicle speed was decreased from 47 to 31 miles per hour and over 50% was reduced by decreasing vehicle speed from 40 to19 miles per hour. Applying an asphalt emulsion (sealing) or paving roads has been shown to reduce dust by 95-100%. Table 5 reports various treatments that have been successfully applied to unpaved roads to reduce dust.

Table 5 – Effectiveness of various treatments used to suppress dust

Suppressant Type	Effectiveness	Reference
Sealing or bound paving	95-100%	Foley *et al.*, 1996
Chemical dust suppression	High initial efficiency; it decays to zero after several months.	Cowherd *et al.*, 1989
Clay additive, chlorides, enzymes, and sulfonate	Increased tensile strength for moisture contents less than 5%.	Bolander, 1999b
Chemical dust suppression	40-98%	Foley *et al.*, 1996
Reduction of vehicle speed: from 47 mile/h to 31 mile/h from 40 mile/h to 19 mile/h	 40-75% 50-85%	Foley *et al.*, 1996

Application Rates

Table 6 shows typical application rates for several types of suppressants. Typical application frequency for most suppressants is 1-2 times per year, except for clay additives for which the application rate is every 5 years.

Table 6 – Application rates and frequencies of dust suppressants

Suppressant	Range of Application Rate	Application Frequency	Reference
Calcium chloride	0.8-2.0 lbs/yd^2 (dry salt) 0.2 –0.5 gal/yd^2 (solution)	1-2 times per year	Hoover, 1981; Bolander, 1999a, RTAC, 1987; Heffner, 1997, DeCastro *et al.*, 1996 Sanders and Addo, 1993
Mg chloride	0.3-0.5 gal/yd^2	1-2 times per year	Bolander, 1999a; RTAC, 1987 Heffner, 1997, DeCastro *et al.*, 1996 Sanders and Addo, 1993
Ligninsulfonate	0.2 – 1.5 gal/yd^2 (liquid) 1.0-2.0 lbs/yd ^{2} (powder)	1-2 times per year	Langdon and Williamson, 1983, Hoover, 1981; Bolander, 1999a, RTAC, 1987, Sanders and Addo, 1993
	40-50% residual concentrate applied diluted 1:4 w/water at 5.1 gal/yd^2	every two years	Bolander, 1999a
Vegetable oils	Typically 0.24-0.5 gal/yd^2	1 time per year	Bolander, 1999a
Oils	0.1-1.0 gal/yd^2	1 time per year	Hoover, 1981; Bolander, 1999a RTAC, 1987
Arcadias (DO-1, 2, 3), DO-4, DO-6PA, DO-8, CSS-1	0.2 – 0.5 gal/yd^2	--------	Langdon and Williamson, 1983
Coherex	0.5-1.5 gal/yd^2	--------	Langdon and Williamson, 1983 Hoover, 1981
Organic Binders application rate	Liquid: 0.5 gal/yd^2 Dry powder: 1-2 lb/yd^2	--------	Hoover, 1981
Polybind Acrylic (co-polymer resin emulsion)	40 gal/acre of a 1:20 water dilution.	--------	Hoover, 1981
Synthetic polymer derivatives	40-50% residual concentrate applied diluted 1:9 w/water at 0.50 gal/yd^2.	Once every two years	Bolander, 1999a
Clay additives	Typical application rate is 1-3% by dry weight.	Once every 5 years	Bolander, 1999a
Water	0.5-4% water applied to conveyor belt systems.	As often as needed	Goldbeck, 1997
Bituminous and tars or resinous adhesives	0.1-1.0 gal/yd^2 depending on road surface condition and dilution.	1-2 times per year	Sanders and Addo, 1993

Environmental Impacts

Salts and Brines

The potential environmental impacts of salts and brines include corrosion of vehicles and concrete and creation of a slippery surfaces when wet (Foley *et al.*, 1996). Calcium and magnesium chloride are highly soluble and are capable of moving with water through soil as a leachate contaminating groundwater (Heffner, 1997). They can also move as runoff and the dissociated calcium, magnesium and chloride ions can drain into lakes, rivers, streams, and ponds (Demers and Sage, 1990). High concentrations of salts cause high soil salinity and may be toxic to plants (Hanes *et al.*, 1970 and 1976); Sanders and Addo; 1993, Foley *et al.* 1996; RTAC, 1987). However, no conclusive studies have been performed to evaluate the effects of calcium and magnesium chloride on plants. Salts concentrations greater than 400 ppm have been found to be toxic to trout (Golden, 1991 and Foley *et al.*, 1996). Concentrations greater than 1,830 mg/L killed Daphnia and crustaceans fish (Sanders and Addo, 1993; Anderson, 1984).

Organic Non-Petroleum Products

The toxicity of ligninsulfonates to rainbow trout has been investigated. The 48-hour LC_{50} (concentration of ligninsulfonates which would be lethal to 50 percent of the tested population within 48 hours) value for ligninsulfonates was found to be 7,300 mg/L. A mortality of 50% was achieved for rainbow trout exposed to 2,500 mg/L ligninsulfonate for 275 hours. For concentrations equal to or higher than 2,500 mg/L rainbow trout showed loss of reaction to unexpected movements, rapid and irregular breathing, and finally loss of coordination before death (Roald, 1977a; Roald, 1977b). It has been found that calcium and sodium ligninsulfonate negatively affect the colon of guinea pigs causing weight gain and producing ulceration in those animals (Watt and Marcus, 1974 and 1976). Reduced biological activity has been observed in water due to excessive discoloration caused by the introduction of ligninsulfonates (Singer *et al.*, 1982; Raabe, 1968; Heffner, 1997; Foley *et al.*, 1996). Ligninsulfonate compounds were reported not to prevent seed germination in the areas where it was applied (Singer *et al.*, 1982). It has been suggested that ligninsulfonate is the most environmentally compatible dust suppressant (Schwendeman, 1981).

Organic Petroleum Products

Organic petroleum based products are considered long lasting products for dust suppression. However, since some of them are oil waste, their environmental impacts may be high. Waste oil used as dust suppressant is typically associated with contaminants that are known to be either toxic or carcinogenic (RTAC, 1987; Metzler, 1985; USEPA 1984, Foley *et al.*, 1996). The accidental introduction of a petroleum based dust suppressant (Coherex) into a stream in Southern Pennsylvania was found to affect fish and benthic macroinvertebrate communities and to kill an unknown number of fish (Ettinger, 1987). Organic petroleum-based products have also been found to be toxic to avian Mallard eggs. When the eggs were exposed to a concentration of 0.5 μL/egg of the product 60% mortality was observed by 18 days of development (Hoffman and Eastin, 1981).

Electro-Chemical Product

Electro-chemical products are thought to have minimum impact in the environment when used in their diluted form. However, it has been observed that vegetation could not be established in areas treated with sulfonated petroleum products (Foley *et al.*, 1996).

Costs

Reported costs for bulk dust suppressants and dust suppressant application are shown in Table 7. It is difficult to compare application costs of dust suppressants because of the different materials and dilution ratios used. From the data reported in the literature, bulk ligninsulfonate is about five times less expensive than Arcadias, Coherex, and CSS-1. The reported cost per acre for dust suppressant application reveals a wide range for different products used. In general, Chlortex (magnesium chloride) is the least expensive dust suppressant followed by ligninsulfonate, Pennzsuppress D (petroleum resin), and Plastex (paper mulch + gypsum binder).

Table 7 – Reported dust suppressant costs

Suppressants	Bulk Product Cost	Reference
Calcium Chloride	$114.00/ton-$273.00/ton $195 per dry ton	Langdon and Williams, 1983 Hoover, 1981
Magnesium chloride	$67.00/ton-182 gal/ton	Langdon and Williams, 1983
Ligninsulfonate	$40.00/ton	Langdon and Williams, 1983
Arcadia DO-1 Arcadia DO-2 Arcadia DO-4 Arcadia DO-6KF Arcadia DO-6PA Arcadia DO-8 Coherex (concentrate) CSS-1	$210.00/ton $210.00/ton $175.00/ton $215.00/ton $152.75/ton $150.00/ton $285.60/ton $150.00/ton	Langdon and Williams, 1983 Langdon and Williams, 1983 Langdon and Williams, 1983 Langdon and Williams, 1983 Langdon and Williams, 1983 Langdon and Williams, 1983 Langdon and Williams, 1983 Langdon and Williams, 1983

Suppressants	$ Cost/acre	Reference
Chlorides	$283-$2,023/ acre	Foley *et al.*, 1996
Calcium chloride cost/mile at a 21-ft width and 2 lb/yd^2	£165	Hoover, 1981
Chlortex ($MgCl_2$)	$600/acre	James *et al.*, 1999
ESI-Duster Dustac (Ligninsulfonate) Ligninsulfonate cost/mile length and 21-ft width	$9800 (bag of 50 lbs) $750/acre £350 ($800-$900)	Langdon and Williams, 1983 James *et al.*, 1999 Hoover, 1981
Organic Binders Petroleum Binder PennzsuppressD (petroleum resin)	$1011-$24282/acre $2023-$5261/acre $800/acre	Foley *et al.*, 1996 Foley *et al.*, 1996 James *et al.*, 1999
Surfactants Polymeric Binders Polytex (acrylic polymer emulsion) Soil-Sement (acrylic polymer emulsion)	< $1619/acre $6475/acre $700/acre $1050/acre	Foley *et al.*, 1996 Foley *et al.*, 1996 James *et al.*, 1999 James *et al.*, 1999
Plastex (paper mulch + gypsum binder) Hydroseed (wood fiber mulch + brome seed) Recycled Aggregate	$850/acre $1,200/acre $13,500/acre	James *et al.*, 1999 James *et al.*, 1999 James *et al.*, 1999
Ionic Stabilizers	$1,214-$4,047/acre	Foley *et al.*, 1996
Microbiological Binders	$3,642/acre	Foley *et al.*, 1996

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Appendix B

Fact Sheets for Verification Programs and Guidelines

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Environmental Technology Verification Program

California Environmental Technology Certification Program (CalCert)

May 2002

Responsible Agency

California Environmental Protection Agency

Environmental Technology Certification Program

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References

www.calepa.ca.gov/calcert

Disclaimer: This fact sheet was prepared by the UNLV organizing committee of the "Expert Panel on Environmental Impacts of Dust Suppressants" based on information contained in the above reference.

What are the goals of CalCert?

The California Environmental Technology Certification Program (CalCert) is the umbrella program for all technology certifications within the California Environmental Protection Agency (Cal/EPA). CalCert is a voluntary program for manufacturers seeking independent evaluation and certification of the performance of their environmental technology including dust suppressants. Certification efforts within the California Environmental Protection Agency (Cal/EPA) are authorized under section 71031 of the California Public Resources Code.

Who created CalCert?

In 1993, Cal/EPA and the Trade and Commerce Agency created the California Environmental Technology Partnership (CETP), a public-private partnership comprising of representatives from the financial and legal communities, public interest groups, the technology industry, laboratories, academia, and others. Among several strategies to strengthen California's environmental technology industry, CETP recommended Cal/EPA institute a voluntary statewide certification program for environmental technologies. Following enactment of Assembly Bill 2060 (Chapter 429, Statutes of 1993) and Assembly Bill 3215 (Chapter 412, Statutes of 1994), Cal/EPA implemented two voluntary pilot certification projects: one for hazardous waste-related technologies at the Department of Toxic Substances Control and another for air pollution control at the Air Resources Board. After two successful pilot programs, and enactment of Assembly Bill 1943 (Chapter 367, Statutes of 1996), CalCert expanded to address a broad array of technologies that prevent, treat, or cleanup pollution in air, water, and soil. The program seeks to maintain and advance high environmental standards by assuring that the best possible environmental technology is available to meet those high standards.

Who provides the performance verification?

Technology developers and manufactures define their performance claims and provide supporting documentation; Cal/EPA reviews that information and, where necessary, requires additional testing to verify the claims. Participation in the program generally involves four stages: eligibility request, application and data review, evaluation of test data, evaluation report, certification decision or statement, and certificate issuance.

Who may apply for verification?

Equipment, processes or products eligible for certification must have an environmental benefit, be commonly used or readily available, and not pose a significant potential hazard to public safety and the environment. Furthermore, applicants for the program must demonstrate that they can consistently and reliably produce technologies that perform at least as well as those previously considered in the CalCert evaluations.

What is needed to apply?

To apply to the program the applicant should hold manufacturing rights to the technology. The technology should be commercially ready with available quality testing data to support performance claim. The first step to have a technology certified is to request for a determination of eligibility. After CalCert has received the Eligibility Request and determined that the technology is eligible for California Certification, the applicant will receive an Application for Certification and will be invited to meet the Cal/EPA evaluation team in a scoping meeting. The evaluation team will meet with the applicant to discuss the scope, duration, and cost of the evaluation. The cost of evaluating the technology will vary depending on the scope of effort needed to evaluate it.

Who evaluates the application for verification?

Cal/EPA's staff which consist of scientists and engineers from the Air Resources Board, State Water Resources Control Board, Department of Toxic Substances Control, Integrated Waste Management Board, Department of Pesticide Regulation, and Office of Environmental Health Hazard Assessment evaluate the technologies. When necessary, CalCert also partners with California's universities and laboratories.

What are the criteria for verification?

The products eligible for certification must have an environmental benefit, be commonly-used or ready available, and not pose a significant potential hazard to public safety and the environment. The evaluation is based on a detailed review of validation materials submitted by the manufacturer, including original data generated by independent and in-house laboratories, whose findings are considered reliable by Cal/EPA staff.

What is the proof of verification?

A certificate signed by California's Secretary for Environmental Protection is awarded. The issuance of the evaluation report and certificate authorizes the use of the certified technology seal on certified products. The CalCert's certification is valid for three years. Certification does not imply that the technology has been permitted by any application.

What dust suppressants have been certified by CalCert?

In January, 2001 the California Environmental Protection Agency staff recommended certification of PennzSuppress® D, an organic based product from the Pennzoil–Quaker State Company, as a dust suppressant. The certification is valid for three years.

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Application of Oil Field Brine Regulations

Michigan

May 2002

Responsible Agency

Michigan Department of Environmental Quality Waste Management Division

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Lonnie C. Lee

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References

www.deq.state.mi.us/documents/deq-wmd-gwp-Rule2215OilFieldBrine-1.pdf

Disclaimer: This fact sheet was prepared by the UNLV organizing committee of the "Expert Panel on Environmental Impacts of Dust Suppressants" based on information contained in the above reference.

What are oil field brines?

Brines that are produced at oil and gas well facilities. These brines are used for dust control and soil stabilization.

How does Michigan regulate the application of oil field brines?

The Michigan Department of Environmental Quality through regulation R324.705 (3), Part 615, Supervisor of Wells, of Act 451 requires a permit for the application of brines for ice and dust control and soil stabilization. Pursuant to this general permit, applicant of brine may begin as soon as the conditions of the general permit have been met. All maintenance, operations, and monitoring of brine application must comply with the conditions set forth in this general permit by the Department. Failure to comply with the terms and provisions of this general permit may result in civil and/or criminal penalties as provided in Part 31.

What are the requirements of the Michigan oil field brine regulations?

The requirements for oil field application as a dust suppressant and road stabilizers include:

1. No application can occur until a certificate of authorization of coverage on a form approved by the Department is issued.
2. Only brine that meets the requirements of R 324.705 (3) of Part 615, as amended, may be used for ice and dust control and soil stabilization on land, such as roads, parking lots and other land.
3. To prevent other contaminants from becoming part of the brine discharge, brine shall be applied with vehicular equipment dedicated to this use or hauling fresh water.
4. Brine shall be applied for dust control and soil stabilization in accordance with the following criteria: (a) brine may be applied to the surface of roads, parking lots, and other land up to four applications each year south of the southern county lines of Madison, Lake, Osceola, Clare, Cladwin, and Arenac Counties. Counties north of this line may apply only three times per year; (b) brine may be applied to the surface of roads being used as a detour and on other areas during construction as necessary to control dust up to six applications each year; (c) brine must be applied to roads and parking areas with equipment described by the term "spreader bar". This device shall be constructed to deliver a uniform application of brine over a width of at least eight feet; (d) brine may be applied at a maximum rate of 1,500 gallons per lane mile of road or 1,250 gallons per acre of land, provided runoff does not occur; (e) Brine shall be applied in a manner to prevent runoff.

5. Brine shall be applied for dust control and soil stabilization in accordance with the following criteria: (a) brine may be applied to the surface of roads, parking lots, and other land up to four applications each year south of the southern county lines of Madison, Lake, Osceola, Clare, Cladwin, and Arenac Counties. Counties north of this line may apply only three times per year; (b) brine may be applied to the surface of roads being used as a detour and on other areas during construction as necessary to control dust up to six applications each year; (c) brine must be applied to roads and parking areas with equipment described by the term "spreader bar". This device shall be constructed to deliver a uniform application of brine over a width of at least eight feet; (d) brine may be applied at a maximum rate of 1,500 gallons per lane mile of road or 1,250 gallons per acre of land, provided runoff does not occur; (e) Brine shall be applied in a manner to prevent runoff.
6. Brine shall be applied for ice control in accordance with the following criteria: (a) brine shall be applied only on paved roads or paved parking lots; (b) brine shall be applied at a maximum rate of 500 gallons per lane mile of road or 400 gallons per acre of land; (c) brine must be applied only when the air temperature is above 20°F, unless used for pre-wetting solid salt; (d) brine must be applied with equipment designed to direct the discharge to the center of the pavement or high sides of curves.
7. Brine application measurement methods must be used to ensure that the brine application rates are within described in this general permit.
8. Brine shall not be applied at a location determined to be a site of environmental contamination for chlorides.
9. Records shall be kept of the use of brine and should contain driver's name, location, loading date, source of brine, date of brine, application, and gallons applied. Records should be kept by the application for a period of three calendar years after application and should be available for inspection by the Department or a peace officer.

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Interim Guidelines for Dust Palliative Use in Clark County

Nevada

May, 2002

Responsible Agency

Clark County Department of Air Quality Management

Nevada Department of Environmental Protection (NDEP)

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References

www.state,nv.us/cnr/

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What are the goals of the Interim Guidelines?

The Interim Guidelines aim to facilitate the implementation of air quality fugitive dust controls in a manner that prevents human exposure to harmful constituents and protects soil and water resources while achieving air quality objectives. The guidelines outline practices and procedures that should be followed to ensure compliance with the new Clark County Air Quality regulations (effective January 1, 2001) in a manner that minimizes environmental impacts.

Who created the Interim Guidelines?

A working group was formed in 2000 to draft interim guidelines for the use of dust palliatives in Clark County, Nevada. The working group, formed in response to direction from the Nevada Legislature to provide recommendations regarding the use of dust suppressants in the Las Vegas Valley, was composed of air and water quality professionals from state and local agencies including the Southern Nevada Water Authority, Clark County Health District, Clark County Comprehensive Planning, Clark County Regional Flood Control District, City of Las Vegas, UNLV Department of Civil and Environmental Engineering and the Nevada Department of Environmental Protection (NDEP).

What were the bases for the guidelines?

The working group considered existing state regulations and codes that could apply to the use of dust palliatives and the protection of human health and environment. However, because the environmental impacts of the various dust suppressant products have not been fully evaluated, the working group decided that it would not be prudent to recommend or deny the use of dust palliatives based solely on these regulations. Thus, the group also considered currently available scientific information. The guidelines are expected to be revised in the future to reflect public comments, advanced thinking of the working group, and changing technology of the construction industry. A research project, currently underway at UNLV and funded by local agencies, will provide additional scientific evaluation of the water quality impacts of dust palliatives. The Dust Palliative Working group will continue to meet on a regular basis to evaluate pertinent information relating to the environmental impacts of dust palliative use. It is envisioned that a permanent policy or set of regulations will be developed if such action is deemed necessary and that this policy/set of regulations will be more comprehensive in scope.

What is the content of the guidelines?

(a) The use of organic petroleum products, deliquescent/hygroscopic salts, and lignin-based palliatives are highly discouraged within twenty (20) yards of open bodies of water, including lakes, streams, canals, natural wastes and flood control channels, and drinking water well-heads. This buffer zone is intended to prevent leachate from these palliatives from reaching an open body of water or a ground water aquifer;

(b) The use of surfactants containing phosphates is highly discouraged because of adverse impacts on water quality. Surfactants by themselves are not allowed for use as a dust palliative because they do not form a durable soil surface. Non-phosphate surfactants may be combined with dust palliatives to assist penetration of dust palliatives into hydrophobic soils;

(c) Any person who applies any pesticide material with a dust palliative is required to hold a valid pesticide applicators license issued by the State of Nevada;

(d) Fiber mulch products should not be used for use as a dust palliative in traffic areas. These products do not hold up well for traffic use;

(e) Use of deliquescent/hygroscopic salts should be limited to magnesium chloride and only used for short-term (less than one year) stabilization of unpaved roads. Treated unpaved roads must be periodically maintained with additional applications of water and magnesium chloride as needed to maintain effectiveness. Magnesium chloride is not effective, even with product reapplication, for periods of more than one year. Magnesium chloride should not be used on trafficked areas within twenty (20) yards of an open body of water, a drinking water well-head, natural or artificial drainage channel, or other surface water feature;

(f) Organic petroleum products, including modified and unmodified asphalt emulsions, should not be used on non-traffic areas;

(g) Use of deliquescent/hygroscopic salts is highly discouraged for non-traffic stabilization. These salts require frequent re-watering to be effective in the Las Vegas Valley;

(h) Lignin-based palliatives are not recommended for non-traffic stabilization. Surface binding action of lignin-based palliatives may be reduced or completely destroyed when heavy rains occur;

(i) Suppressants containing banned pesticides, restricted pesticides, dioxin, PCBs, and asbestos should never be applied.

The guidelines also contain recommendations on the types of suppressants to be applied to specific areas as well as dilution and application rates.

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Dirt & Gravel Roads Maintenance (DGRM) Program

Pennsylvania

Responsible Agency

Center for Dirt and Gravel Road Studies
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References

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What is the DGRP Program?

Pennsylvania's State Conservation Commission Dirt & Gravel Roads Pollution Prevention Program is a grant program. It is an innovative effort to educate the public about pollution problems from roads and fund "environmentally sound" maintenance of unpaved roadways that have been identified as sources of dust and sediment pollution. Signed into law in April 1997 as Section 9106 of the PA Vehicle Code (§§ 9106), the program is based on the principle that informed local control is the most effective way to stop pollution. The program created a dedicated, non-lapsing fund - $4 million per year – to provide money to local communities for education and local road maintenance by way of streamlined appropriations to local conservation districts for use by local road maintenance entities under the environmental guidance of a local Quality Assurance Boards (QABs). Section 91060(f) (7) of the Vehicle code requires Quality Assurance Boards to adopt standards that prohibit the use of environmentally harmful materials and practices in dirt and gravel road maintenance. Implicit in these standards, are regulations for the control of dust suppressant application. Local municipalities and state agencies that maintain public dirt or gravel roads are eligible to receive the grant funds.

What are the goals of the DGRM Program?

The Pennsylvania Protocol has four main objectives:

1. To prohibit the use of environmental harmful materials or practices on Dirt and Gravel Roads Maintenance Program projects.
2. To recommend procedures that will satisfy the program's non-pollution requirement with a minimum of paperwork.
3. To provide Conservation Districts with a statewide information exchange system which will allow them to establish eligibility of local products.
4. To employ a product clearance system and notify conservation districts of products determined to be eligible for statewide use.

What are the provisions of the program?

The Interim program's requirements for compliance with the non-pollution criteria are currently in the draft form. In general, the guidelines call for compliance with all existing laws and conditions via a purchase contracting process, rather than a regulatory process. Vendors would comply voluntarily as part of their sales agreement. It is anticipated that such an approach would minimize challenges in court by products manufacturers.

The program places the responsibility of proving that a product meets Pennsylvania's existing laws on the manufacturer. It is expected that the adoption of such practice will minimize paperwork because it will be done once for each covered product. Participants may purchase products, listed as eligible and be reimbursed provided they have an active liability contract with the manufacturer and the conservation districts establishes that the product is approved. The program will be applied statewide to insure that individual QABs will not be sued for refusal to buy certain products.

Who provides the performance verification?

It is the responsibility of the vendor, as a condition of sale, to prove that the commercial product does not degrade the environment or create hazards in accordance with the standards of the DGRP program. The vendor has to have an EPA-Certified laboratory test the product according to the specified test procedures. Laboratory personnel complete the tests, certify the results, and report the eligibility of the product for program funding in writing. The Conservation Commission (SCC) will review the submission to confirm the certificate as authentic. The manufacturer must also (a) certify that the product submitted for testing is representative of the product as marked, (b) provide a copy of the certificate of eligibility to the conservation district, (c) provide the participant with a signed copy of a liability contract assuming all liability for supply, transport, application and curing of the product. The product must also comply with Pennsylvania's environmental laws: 25 PA Code 93.6 - Waste Discharge to Water; 25 PA Code 93.7c - Water Quality Criteria by Substance; 25 PA Code - Criteria by Toxic Substances; 25 PA Code 121.1 – Air Quality Criteria; 25 PA Code 124 - Air Quality Hazardous; 25 PA Code 129.64 Air Quality Cut Back Asphalts. In addition, the program encourages the use of by- and co-products if they are deemed to have non-pollution characteristics. Co-products that have "beneficial use" permits issued are considered as effective as commercial products if they meet the non-pollution criteria.

What tests are required from the applicant?

Labeled products, such as herbicides, do not require further testing and are acceptable according to the label restrictions. Plant and seeds are covered by both, the State and Federal Noxious weed laws. All other commercial products, which are not inert, must be certified. The guidelines divide the products used in dirt and gravel roads into solids (e.g. stone, geotextile, salts as crystals) and aqueous (e.g. brines, emulsions). Aqueous products must undergo the following required tests: a 7-day rainbow trout survival and growth test, and a 7-day cladoceran (*Ceriodaphinia dubia*) survival and reproduction test. Each product tested must report the NOEC, LOEC, LC50 and CHV values for the survival and growth of rainbow trout and one for the survival and reproduction of cladocerans. An MSDS sheet for each product should accompany the application. In addition, the materials have to undergo bulk and leach analysis. Bulk analysis should follow methods established in EPA SW-846 and leach analysis should be performed according to EPA Method 1312. Components analyzed in these tests include: pH, major, minor, and trace components, radionuclides, moisture content, loss of ignition (LOI) at 1000°C, metals, cyanide, volatile, and non-volatile organic compounds. The laboratory has to report each constituent that exceeds the trigger levels (50% of SPLP limits, as set forth in current PA DEP Mining Regulations Module 25). If any trigger level (s) is exceeded, a second sample of the material should be tested.

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Environmental Technology Verification Program

ETV Canada Inc.

May 2002

Responsible Agency

ETV Canada Inc.

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References

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What are the goals of the ETV Canada Program?

The main objective of the ETV Canada Program is to provide validation and independent verification of environmental technology performance, including that of dust suppressants. This program has been developed to promote the commercialization of new environmental technologies into the market place and thus provide industry with a tool to address environmental challenges efficiently, effectively and economically.

Who created the ETV Canada?

Environment Canada was the lead department in the development of the ETV program in cooperation with Industry Canada and with direction from the ETV Steering Committee. ETV Canada, Inc., a private sector company that operates under a license agreement with Environment Canada, was created to deliver the ETV program. The ETV Canada, Inc. is owned by the Ontario Centre for Environmental Technology Advancement (OCETA).

What is needed to apply?

The technology vendor must provide sufficient, acceptable documentation and data to support the performance claim of the technology being verified. ETV Canada reviews the Formal Application for completeness and determines if it can be accepted into the verification process. If the application is not acceptable, the applicant may choose to modify and resubmit it. Similarly, at this application review stage, ETV Canada may determine that the data supporting the claim is inadequate. If the applicant wishes to continue, it is their responsibility to first arrange and pay for the generation of the necessary data. Alternatively, the applicant may choose to modify their claim to align it with supporting data. Although ETV Canada would not be directly involved in the testing to develop additional data, it may outline the data requirements within the context of the General Verification Protocol. The formal application should be accompanied with the supporting data that is to be used in the verification process. Before confidential information or data can be passed to ETV Canada, a Confidentiality Agreement is signed. ETV Canada reviews the information and proposes a verification process for the claim, including identification of a Verification Entity and a cost estimate for the verification program. The cost of verification will include the administration and management of the application process by ETV Canada and the actual validation by the Verification Entity of the claim, using the supporting data. The cost will vary from application to application, and will depend on the scope of effort involved in the verification process. ETV Canada discusses the scope and cost of the proposed program with the applicant, and reaches agreement on the Verification Entity, including resolution of any conflict of interest between the applicant and the Verification Entity. ETV Canada keeps a list of approved Expert Entities, which include private consultants, universities, and research institutes that can conduct tests to support the verification of the technology.

Who provides the performance verification?

A formal application must be submitted to ETV Canada, Inc. for review in order to obtain technology verification. If the technology and performance claim are eligible for the ETV program, the applicant submits a Formal Application and a non-refundable $1,000.00 application fee. The Formal Application requests additional information about the technology, the claim to be verified, and the data and information that is available to support the claim. The Formal Application is available either by regular mail or electronically by e-mail and can be faxed back to ETV Canada with a signature. An original should follow by regular mail or by courier with the $1,000.00 fee.

Who may apply for verification?

Environmental technology vendors can apply to the ETV program for verification of the claims concerning the performance of their environmental technologies. For a technology to be eligible for the ETV program, it must be an environmental technology or an equipment-based environmental service, where equipment performance can be verified. The technology must offer an environmental benefit or address an environmental problem. It must also meet minimum Canadian standards and/or national guidelines for the specific technology or claim, as specified by ETV Canada, and be currently commercially available or commercially ready for full-scale application.

Who evaluates the application for verification?

ETV Canada reviews the Formal Application for completeness and determines if it can be accepted into the verification process. Verification Entities, which are approved by ETV Canada, provide the technical expertise to evaluate the technology.

What are the criteria for verification?

The claim must specify the minimum performance that is achievable by the technology and must be unambiguous. It must meet minimum standards and guidelines for the technology. Where federal standards are not available, the least stringent provincial standard shall apply. Technology must achieve federal, provincial, and/or municipal regulations or guidelines for discharge waters or treated effluents, soils, sediments, sludge or other solid-phase materials. ETV Canada will refer to such appropriate standards when assessing the claim. The claim must be measurable using acceptable test procedures and analytical techniques. It is essential that adequate, relevant, reliable data and information be provided to support the verification of the environmental technology performance claim.

What is the proof of verification?

If the claim is verified successfully, the company is issued three documents: a Verification Certificate, a Technology Fact Sheet, and a Final Verification Report.

What dust suppressants have been certified by ETV Canada?

In March 1999 Soil Sement®, a synthetic polymer emulsion, was certified by ETV Canada. Three years after approval, the verification should be renewed and a license renewal fee should be applied.

Appendix C

Expert Panel Agenda

THURSDAY, MAY 30TH, 2002	
8:00 – 8:30 AM	REGISTRATION
8:30 – 9:00 AM	INTRODUCTIONS Welcome and Logistics (Thomas Piechota, UNLV) Importance of issue to EPA (Jeff van Ee, U.S. EPA)
9:00 – 9:45 AM	FRAMING THE PROBLEM Introduction of Conceptual Model (David James, UNLV) Summary of Literature Review (UNLV) Fact Sheets from other relevant activities, programs, and/or protocols.
9:45 – 10:15 AM	PANEL I: WHAT ARE WE DEALING WITH? What is the composition of the dust suppressant and what are the sources of these compounds? How are the dust suppressants applied and at what rates? Where are dust suppressants applied?
10:15 – 10:30 AM	BREAK
10:30 AM – 12:00 PM	PANEL I (continued) What is the potential for trace levels of contaminants given the source and composition? Does the Conceptual Diagram outline all the possible pathways of exposure? What is known about the fate and transport of various dust suppressants? Are some pathways relatively more significant sources of exposure than others? How does the composition of the various dust suppressants change once they are in the environment? What is the potential magnitude of dust suppressant application in urban or rural areas?
12:00 – 1:00 PM	LUNCH (hosted by UNLV/EPA in Richard Tam Alumni Center)
1:00 – 2:45 PM	PANEL II: WATER PATHWAY How are dust suppressants likely to impact surface waters? What are potential impacts of runoff contaminated with dust suppressants to surface water quality and human health? What are potential impacts of runoff contaminated with dust suppressants to aquatic ecosystems? What is known about movement of dust suppressants in the vadose zone? Are dust suppressants likely to impact groundwater? Does Conceptual Model identify all receptors to water quality?
2:45 – 3:15 PM	BREAK
3:15 – 5:00 PM	PANEL III: SOIL AND LANDSCAPE PATHWAY What are the possible human health or ecological impacts related to soils contaminated with dust suppressants? How might application of dust suppressants alter soil properties and effect runoff and erosion? How might dust suppressants impact ecological patterns? How might different dust suppressants change the microbial ecology of local soils? Does the conceptual model clearly identify all pathways and receptors in the terrestrial environment?
5:00 – 7:00 PM	RECEPTION WITH YUCCA MOUNTAIN BOYS (hosted by UNLV/EPA in Alumni Center)

FRIDAY, MAY 31TH, 2002	
8:30 – 8:45 AM	FRAMING THE DAY
8:45 – 9:45 AM	PANEL IV: MAGNITUDE OF USE (GROUP DISCUSSION)
9:45 – 10:00 AM	BREAK
10:00 – 11:30 AM	WORKING GROUPS (See handout)
11:30 AM – 12:30 PM	PRESENTATION OF WORKING GROUPS Designated spokesperson to summarize working groups findings.
12:30 – 2:45 PM	PANEL V: QUESTION AND ANSWER WITH EXPERTS (What do they think?)
2:45 – 3:00 PM	BREAK
3:00 – 4:00 PM	PANEL VI: DEVELOPING GUIDELINES AND REGULATIONS Are current regulations adequate for permitting dust suppressants? Are existing regulations and test methods adequate to address potential effects of dust suppressants? Who should be responsible for tracking use of suppressants? Should long-term monitoring be conducted to evaluate dust suppressant impacts? PANEL VII: PATH FORWARD Recommendations on how best to summarize meeting. What are the follow-up actions from this meeting?
4:00 PM	ADJOURN

Appendix D

Organizing Committee and Expert Panel

Organizing Committee

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EPA/600/R-04/031
March 2004

EXHIBIT V

<< BACK to sage-grouse *homepage*

Protecting unfragmented habitats, minimizing habitat loss, and maintaining, enhancing or restoring conditions that meet life-history needs

Keeping things connected

The BLM grants rights-of-way (ROWs) for many different uses of public lands. Many energy-related projects — wind power, solar energy, pipelines and power transmission lines — are accomplished using ROWs on BLM-managed lands. ROWs usually consist of strips or corridors of land that may themselves be limited in size but which can nonetheless fragment the land through which they run.

The BLM and the U.S. Fish & Wildlife Service have identified fragmentation as a primary threat to sage-grouse and their habitat. So, current BLM policy addresses the authorization of ROWs in priority sage-grouse habitat.

:: Avoid :: Minimize :: Mitigate

When processing a ROW application, the BLM works with the applicant on a number of issues, including how best to avoid or minimize loss or fragmentation of sage-grouse habitat. Reasonable possibilities for siting the project outside of priority habitat areas or within a designated ROW corridor are part of the NEPA analysis for the proposal.

For ROWs less than 1 mile in length or which disturb less than 2 surface acres, the BLM develops mitigation measures in cooperation with the applicant and state wildlife managers that would cumulatively *maintain or enhance* sage-grouse habitat.

For larger ROWs – those longer than 1 mile or which would disturb more than 2 surface acres – the BLM requires measures that *minimize impacts* to sage-grouse habitat. In addition to this kind of onsite mitigation, the BLM will develop and consider offsite mitigation measures, in cooperation with the applicant and state wildlife managers.

Unless the BLM and state wildlife agency staff determine that a proposed ROW (1+ miles long or 2+ acres of disturbance) and associated mitigation measures would *cumulatively maintain or enhance* sage-grouse habitat, the decision on the proposed ROW is forwarded to a group composed of the appropriate BLM State Director, the Director of the relevant state wildlife agency and a representative of the U.S. Fish and Wildlife Service.

If this group cannot agree on appropriate mitigation for the proposed ROW, then the decision goes to the BLM sage-grouse National Policy Team for their review. The Team may also involve the State wildlife agency Director, if appropriate.

If this group cannot agree on appropriate mitigation, the Team will seek a final decision from the BLM Director in the absence of consensus.

Last updated: 11-16-2012