

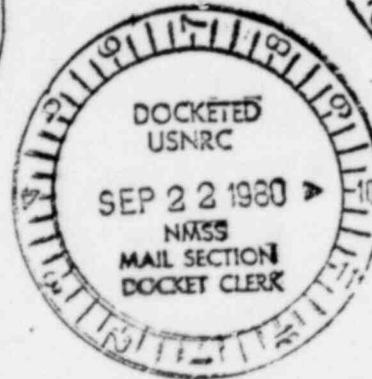
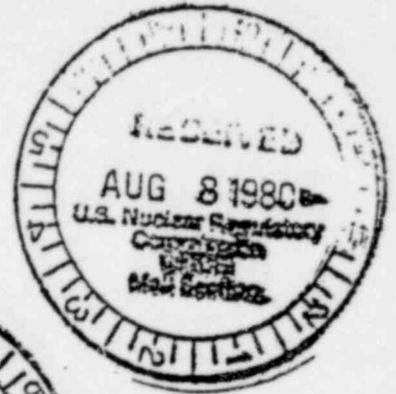


PDR WM-39

Department of Energy
Washington, D.C. 20545



August 1, 1980



Mr. Hubert J. Miller
Section Leader
New Facilities Section
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Dear Mr. Miller:

Enclosed is a tentative outline for the Uranium Mill Tailings Remedial Action Program Environmental Impact Statements that was developed for the UMTRA Project Office at Sandia.

Your review and comments would be appreciated. Through an oversight, I did not include the NRC in my initial distribution of this document. I would, therefore, appreciate receiving your comments at your earliest possible convenience. In transmitting your comments to me, please provide a copy directly to Richard H. Campbell, Project Manager, Uranium Mill Tailings Project Office, Albuquerque Operations Office.

Please call me (353-5221) if you have any questions.

Sincerely,

Donald H. Groelsema
Remedial Action Program
Nuclear Waste Management Programs
Office of Nuclear Energy

Enclosure

cc w/o encl:
S. Miller, GC-34
R. Stern, EV-11
R. Scott, NE-30

FE EXEMPT

Tentative Outline for UMRAP Environmental Impact Statements

This package contains two versions of the proposed outline for the UMRAP environmental impact statements. The first displays the basic structure of the statements; it lists only the titles of sections. The second is a guide to the contents of the statements; it gives under each title a brief summary of what the section contains. The outline is intended to comply with the CEQ regulations (10 CFR 1502) and the CEQ definitions of terms (10 CFR 1508); these regulations and definitions are implicitly part of the outline.

The outline is not intended to be followed inflexibly. The persons who write the statements will be expected to address all the listed topics, but the importance placed on any particular topic may be different in different statements. If, for example, the remedial action will have little effect on land use around one of the tailings piles, Sections 4.11 and 4.12 may be limited to one or two pages. In a statement covering action at another tailings pile, these sections may need to be three or four pages long.

The page lengths attached to each chapter are not limits; they are simply suggestions intended to show roughly how much space can be allotted to each chapter within the limit of 150 pages. In practice they could easily vary by 15 or 20 percent, although an increase in the length of one chapter will require a decrease elsewhere. They show that 150 pages is not long; they show the necessity of reporting most or all of the detailed analyses in separate, referenced documents or appendixes to the statements.

Tentative Outline
ENVIRONMENTAL IMPACT STATEMENTS
FOR
THE URANIUM MILL TAILINGS REMEDIAL ACTION PROJECT

Cover sheet

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List of agencies, organizations, and persons receiving copies of this statement

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Responses to comments received on the draft environmental impact statement

POOR ORIGINAL

Tentative Annotated Outline
ENVIRONMENTAL IMPACT STATEMENTS
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Cover sheet

The contents of this one-page section are listed in 10 CFR 1502.11.

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The format for this table is discussed in the guide to format and style for the UMTRAP documents.

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The format for this list is discussed in the guide to format and style for the UMTRAP documents.

1 SUMMARY

The summary covers all the important points raised in the rest of the main text. It does not include material that appears only in the appendices. As much as possible, the summary presents material in the same order as the main text. It avoids technical terms because it, more than any other chapter, will convey information to the general public.

[15 pages.]

2 PURPOSE AND NEED

This short chapter briefly reviews the reasons for undertaking action at this tailings pile, including the legislation that requires the action. To show how the action will meet the need, the discussion outlines the improvement it will accomplish. [3 pages.]

References for Chapter 2

3 COMPARISON OF THE PROPOSED AND ALTERNATIVE ACTIONS

The CEQ calls this chapter "the heart of the environmental impact statement." It defines sharply the environmental issues that will enter into the decision among the proposed and alternative actions. Although based on the descriptions and

analyses in Chapters 4 and 5, it is only a summary. It does not describe the methods used in making the analyses unless an understanding of the methods is crucial to understanding the results. It emphasizes the more important or controversial impacts.

[35 pages.]

3.1 Description of the proposed action and of the alternatives to it.

This section explains exactly what the alternative actions are. The descriptions are complete enough to support the comparison of impacts that comes in the next section; they do not, however, contain information that the reader does not need for understanding the comparisons. The descriptions are clear, succinct, and in language every educated person can understand.

This section is really the introduction to the project, in spite of its appearance in the third chapter instead of the second. It identifies the particular environment that will be affected and the actions that will produce impacts. Not limited only to sites under the control of the DOE, this section introduces all the sites affected by the proposed action and the alternatives: mill-tailings sites, disposal sites, reprocessing sites, and sites where cover material may be obtained. This supporting information does not need to not be repeated in the other chapters.

3.1.1 The proposed action

This section not only outlines the proposed action; it serves as an introduction to the alternatives as well, for it describes the particular tailings pile that is to be treated and the area surrounding the pile. These descriptions are needed for the explanation of the alternatives as well as for this section.

An important goal of the proposed action and the alternatives is to meet the EPA standards governing the disposal of tailings and the cleanup of contaminated land and buildings. This section states those standards with a brief explanation, referring the reader to an appendix for a more detailed explanation. The proposed action will also meet pollution-control standards set by Federal, state, and local authorities; this section briefly describes these regulations and the monitoring program that will demonstrate compliance with them. It also describes briefly the plans for surveillance of the sites after the action has been completed. Details are presented in an appendix.

Environmental impact statements are frequently criticized for failing to make clear just what actions they are intended to support. This section leaves no doubt in the reader's mind.

3.1.2 Alternative 1: no action

This section is required by the CEQ even though this option is not available to the project because of the legislation requiring action. It explains that if no action is taken the sites will be left as they are now, although they will change in the future through natural processes and the actions of people. This section is less than one page long, but it is important because the impacts of no action, discussed in Section 3.2, are a reference against which the benefits of the proposed action and the alternative actions can be judged.

3.1.3 Alternative 2

The second alternative is described in enough detail to support the comparison of alternatives in Section 3.2.

3.1.4 Alternative 3

If there is a third alternative, this section describes it in enough detail to support the comparison of alternatives in Section 3.2.

3.1.5 Alternative 4

If there it is a fourth alternative, this section describes it in enough detail to support the comparison of alternatives in Section 3.2.

3.1.6 Alternatives eliminated from further consideration

This section, required by the CEQ, deals briefly with alternatives that are not analyzed in this statement even though they have previously been seriously considered or seriously proposed. It explains why they have been eliminated.

3.1.7 Mitigating measures

As required by the CEQ in 10 CFR 1502.14(f), this section discusses "appropriate mitigation measures not already included in the proposed action or alternatives." The more extended discussion supporting this summary is in Section 5.9.

3.2 Comparison of environmental impacts

This section is a summary of Chapter 5. Although it does not summarize every discussion in Chapter 5, it displays the predictions of all the impacts that appear to be significant or that differ appreciably among the alternatives. It uses tables extensively, showing the impacts of the alternatives side by side for easy comparison. The text of the section explains the tables in enough detail that a reader can understand each entry, but it does not usually describe the methods used to predict the impacts. Sometimes a brief mention of a method may be needed in order to explain the limitations of a prediction or the uncertainty in it, but descriptions of analyses appear, as a general rule, only in Chapter 5.

A short summary at the end of the section repeats the impacts that seem to be the most significant or the most controversial. The section emphasizes that the proposed action and all the alternatives will meet the EPA standards.

References for Chapter 3

4 AFFECTED ENVIRONMENT

This chapter performs two almost contradictory jobs. It describes the environment affected by the remedial action in enough detail that the predictions of impacts are understandable. At the same time, it avoids describing that environment in so much detail that the document becomes unwieldy. The first rule for including an item in this chapter is that it be necessary for an understanding of the analyses in Chapter 5. Some material, however, must be included simply as background information because a reader needs to have a general understanding of the areas that the action will affect. But unless a discussion or a piece of information is needed to supply this general understanding or to support a specific statement in Chapter 5, it should not appear here.

The environment may be currently experiencing some adverse impacts, not related to the tailings piles, that the remedial action will improve: an eroded area, for example, that the remedial action will fill. If such conditions exist in the affected environment, this chapter describes them in preparation for discussion of the beneficial impact in Chapter 5.

The preparation of the statement will probably have required the collection of voluminous data on the affected environment. These data should be made available to users of the EIS, either in appendixes or in easily available supporting documents. Chapter 4 is not the place for them.

[45 pages.]

4.1 Brief description of the region and the affected sites

From this section a reader gains an overall understanding of the region where the actions will take place; the affected sites include the mill-tailings sites, disposal sites, reprocessing sites, and sites where cover material is obtained. A reader should learn whether the region is arid or wet, mountainous or hilly or flat, densely or sparsely populated, urban or rural, industrial or agricultural. Maps show the location of the affected sites, nearby urban areas, highways, railroads, and any other surface features that are important to the analyses in Chapter 5.

4.2 Weather and air quality at sites affected by the proposed action

This section describes the climate and its range of variation in enough detail to support the analyses in Chapter 5. Much of the discussion is qualitative. The section does not include detailed tables of temperatures, precipitation, wind speeds, and the like; if they are needed, they are put into an appendix.

4.2.1 Weather patterns

This section briefly describes the general features of the climate: seasonal variations, effects of nearby surface features like mountains, and noticeable variations in microclimate within the affected region.

4.2.2 Temperatures

This section contains short summaries of the extreme and average temperatures through the seasons.

4.2.3 Precipitation

This section briefly describes the extreme and average amounts of rain and snow through the seasons. It discusses the occurrence of droughts and exceptionally wet periods.

4.2.4 Winds

This section characterizes in general terms the prevailing winds and the seasonal variations in wind speed and direction. It discusses the possibilities for winds that might disperse material from the tailings piles.

4.2.5 Storms

This section briefly reviews the storms that take place near the sites. It discusses the possibilities for severe storms that might disrupt the tailings during the remedial action.

or afterwards. It briefly reviews the storm history of the region.

4.2.6 Air quality

This section reviews the present quality of the air in the region. The discussion is thorough enough to permit a comparison of the predicted impacts with the present conditions. Major sources of the present air pollution, if any, are identified; the present load of fugitive dust is discussed.

4.3 Weather and air quality at sites affected by the alternative actions

In some of the UMRAP impact statements this section may be unnecessary. If the alternative sites are in the region discussed in the preceding section, this section can be simply a paragraph explaining that the data in Section 4.2 apply to the alternative sites with only a few differences or no differences. Even if significant differences do exist, it is probably not necessary to discuss the alternative sites in the same detail as the previously discussed sites. Because the sites share many features of climate, simple references to Section 4.2, supplemented by discussion of the differences, are sufficient.

- 4.3.1 Weather patterns
- 4.3.2 Temperatures
- 4.3.3 Precipitation
- 4.3.4 Winds
- 4.3.5 Storms
- 4.3.6 Air quality

4.4 Surface and subsurface features of sites affected by the proposed action

This section emphasizes the features that might affect the movement of material from the piles or might produce conflicts with other uses of the land.

4.4.1 Soils

This section discusses the physical and chemical characteristics of the soil. In addition to a general, qualitative description, the section outlines the characteristics of the soil that would retard or enhance the movement of radionuclides or heavy metals. The agricultural characteristics of the soil are discussed in the section on ecosystems, not here.

4.4.2 Rock structure

This section describes the surface and

subsurface rocks at the site in enough detail to permit the reader to understand the importance of any differences among rocks at the different sites. A brief geologic history of the area puts into perspective the ability of the area to resist natural disruption of the tailings during the 1000 years mentioned in the EPA standards and during later times. The section includes a geologic column but not a full description of each rock layer; in general, the lower-lying rocks receive less-detailed treatment. Water-bearing formations are identified here, but full discussion of them is deferred to Section 4.6.2.

4.4.3 Mineral resources

This section points out the locations of mineral resources in the area. It briefly describes their size and value to the economy of the region. If access to any of these resources would be affected by the proposed action, the description is more detailed, in support of the discussion of impacts in Chapter 5.

4.4.4 Seismicity

This section briefly reviews the seismic history of the region. It discusses the possibility of seismic activity that might be able to disrupt the tailings during the next 1000 years.

4.5 Surface and subsurface features of sites affected by the alternative actions

This section is likely to be short because the features of the alternative sites will probably be similar to those at the sites affected by the proposed action. Most of the information presented here will be simply the differences from the information presented in Section 4.5. Features that are significantly different will be discussed at the same level of detail as those in Section 4.5.

4.5.1 Soils

4.5.2 Rock structure

4.5.3 Mineral resources

4.5.4 Seismicity

4.6 Water at sites affected by the proposed action

Because the effects of tailings on drinking water usually arouse special interest, this section discusses all the waters that in worst-case analyses might be assumed to receive material from the piles. The

discussion must be complete enough to support the analyses of potential contamination in Chapter 5.

4.6.1 Surface water

This section mentions all the important bodies of water in the region; it emphasizes the bodies that might conceivably receive material from the piles. The context of the data presentation is a discussion of the overall surface hydraulic system. The discussion explains the general flow patterns in the region, the location and extent of the water bodies, and how the bodies are recharged and drained. The section also describes the quality of the water and its present and possible future uses.

4.6.2 Ground water

This section describes the general features of the regional subsurface hydraulic system. Deep aquifers receive little discussion unless the analyses in Chapter 5 show some possibility that they could become contaminated. The data describing the aquifers include extent, depth, thickness, transmissivities, recharge points, discharge points, direction of water movement, chemical composition, and commercial and agricultural importance.

4.7 Water at sites affected by the alternative actions

If the water systems at the alternative sites are distinct from those at the proposed sites, this section describes them at the level of detail in Section 4.6. If these systems are simply different parts of the same overall system, the section describes only the differences; as much as possible, it avoids repeating the information in Section 4.6.

4.7.1 Surface water

4.7.2 Ground water

4.8 Ecosystems at sites affected by the proposed action

The emphasis in this section is on the parts of the ecosystem that could affect the tailings piles or be affected by them.

4.8.1 Agricultural resources

This section describes the use of the land for crops and the raising of livestock. Its principal purpose is to support the analysis in Chapter 5 of the loss or gain in productivity of the land under the different remedial actions. The data presented here may include the types and

amounts of crops, the number of animals supported, a brief resume of the way the land has been used in the past and may be expected to be used in the future, and the importance of the agricultural activity to the people living in the region.

4.8.2 Terrestrial vegetation

This section lists and describes the principal types of plants found in the region and at the sites. It emphasizes plants that are particularly important to the entire ecosystem and plants that might disrupt a tailings pile. It discusses economically important species like timber trees. A detailed list of plant species in the area appears in an appendix or a separate supporting document, not in this section.

4.8.3 Terrestrial wildlife

This section lists and describes the principal types of animals found in the region and at the sites. It emphasizes animals that might be displaced or otherwise disturbed by the remedial actions and animals that might disrupt a tailings pile. It discusses the occurrence of game animals and their importance to recreation in the region. Detailed lists of species appear in an appendix or a supporting document, not in this section.

4.8.4 Aquatic biota

This section lists and describes the principal aquatic plants and animals found in the surface water systems described earlier in this chapter. It emphasizes biota that might be severely affected by the remedial actions. Because the remedial actions will be designed to have little effect on water systems, this section is not so elaborate as the two preceding sections.

4.8.5 Endangered and threatened species

This section reports the results of the studies made to find whether any rare or endangered species of plants and animals exist in the region.

4.9 Ecosystems at sites affected by the alternative actions

If the ecosystems at the alternative sites are distinct from those at the proposed sites, this section describes them at the level of detail in Section 4.8. If they are simply different parts of a single larger

ecosystem, the section describes only the differences; as much as possible, it avoids repeating the information in Section 4.8.

- 4.9.1 Agricultural resources
- 4.9.2 Terrestrial vegetation
- 4.9.3 Terrestrial wildlife
- 4.9.4 Aquatic biota
- 4.9.5 Endangered and threatened species

4.10 Radiation at the affected sites

The data presented in this section are primarily for comparison to the predictions in Chapter 5 of the radiation levels during and after the remedial actions.

4.10.1 Naturally occurring radiation

This brief section tells the present levels of naturally occurring background radiation at the sites.

4.10.2 Radiation resulting from human actions

This section reports the present level of radioactivity that is occurring at and near the sites because of human actions. Unless the sites or the surrounding areas contain sources of radiation other than the present tailings piles, this section will present simply the radiation levels at and near those tailings piles.

4.11 Land use at sites affected by the proposed action

This section details the use of the land for agriculture, mineral extraction, industry, or other activity. A map is a simple way to show this use; the text can then be limited to a supporting discussion that lists the most important activities and the approximate land area devoted to each.

4.12 Land use at sites affected by the alternative actions

If there are significant differences between the land use at the proposed site and the land use at the alternative sites, this section explains those differences, using the same methods, such as maps, as those used in the preceding section. If there are no significant differences, this section is simply a note stating that the preceding section describes all the sites.

4.13 Noise at the affected sites

This section reports noise levels at and around the sites affected by the remedial action. Because few data are needed, this section discusses the alternative sites as well as the proposed sites. To allow direct

comparison with the predictions of Chapter 5, the reported data are noise levels near the places for which Chapter 5 predicts noise levels.

4.14 Scenic, historic, and cultural resources at sites affected by the proposed action

4.14.1 General appearance

This section gives the reader an overall impression of the way the region looks. It points out any nearby natural features that are recognized nationally or locally as unusually attractive. But since any natural feature is interesting to at least some people, the discussion does not attempt to judge whether the region is scenically attractive.

4.14.2 History

This brief section reviews the use of the land since prehistoric times. Its primary purposes are to acquaint the reader with an overall understanding of the region and to support the following section.

4.14.3 Places of archaeological, historic, or cultural interest

This section summarizes the results of the archaeological investigations carried out as part of the investigation of the sites. It points out nearby features of recognized historical interest, such as sites listed on the National Register of Historic Places. It mentions other features that attract special interest, such as unusual buildings or artifacts, celebrations or other public observances, and occupations or lifestyles that bring visitors to the area.

4.15 Scenic, historic, and cultural resources at sites affected by the alternative actions

If the alternative sites are near the proposed sites, most of the information presented in the preceding section will apply to them. This section is limited to a discussion of places and features not covered in the preceding section.

4.15.1 General appearance

4.15.2 History

4.15.3 Places of archaeological, historic, or cultural interest

4.16 Socioeconomic characteristics of the affected region

The data that can be gathered in support of this section can easily become voluminous. The section is

therefore a summary; the data themselves appear in an appendix or a separate supporting document.

4.16.1 Population

This section gives not only the present population of the area and of the urban communities in it, but also a brief history of the population. This history supports a rough forecast of the population for the next two or three decades. The section also summarizes the racial and ethnic backgrounds of the people and the distribution of ages among them.

4.16.2 Social structure

This section presents data summarizing the patterns of employment, the earnings of the workers, and the status of incomes in the area. It also discusses the civic, social, and religious organizations active in the area, the social services provided by public and private organizations, and the attitudes of the people toward their community.

4.16.3 Economic structure

This section lists the sectors that contribute to the economic activity in the area, summarizes the contributions of the major sectors, and describes the financial resources available.

4.16.4 Work force

This section reviews the employment in each of the economic sectors in the area, the major employers, the unemployment rates, and the per-capita personal income.

4.16.5 Housing

This section reviews the types of housing and the number of housing units available in the area. The presentation of this information allows direct comparison with the predictions in Chapter 5 of the housing required by the labor force during the remedial actions.

4.16.6 Governmental structure

This section reviews briefly the form of government in the area and the governmental revenues and expenditures.

4.16.7 Community services

This section briefly reviews the services offered by the communities: education, systems

for water and wastewater, utilities, fire and police protection, health care, disposal of solid waste, and recreation. The discussion of recreation includes a description of the outdoors activities, like hunting, that take place near the affected sites.

4.16.8 Transportation networks

This section reviews the highways and railroads in the region. It emphasizes the parts of the network that the remedial action will use most heavily--probably highways between the existing tailings pile and the disposal sites. It discusses traffic patterns and volumes on these emphasized routes.

4.16.9 Public reactions to the remedial-action project

This section summarizes the attitudes of the people toward the remedial-action project. It may report opinions expressed in public hearings on the project or in the local communications media. It may rely on a survey especially taken for this EIS.

References for Chapter 4

5 ENVIRONMENTAL CONSEQUENCES

This chapter reports the predictions of environmental impacts at the places affected by the remedial action. It explains briefly how each prediction was made, although it does not reproduce mathematical calculations, which are presented in appendixes or in supporting documents. When an understanding of a prediction rests intimately on an understanding of the methods used to make it, the text outlines the calculation in the required detail. But the explanation avoids technical language and jargon; it explains technical terms when they cannot be avoided, referring the reader to the supporting documents for technical details.

[45 pages.]

5.1 Radiological impacts of the proposed action

This section predicts the rates at which radionuclides will be released during and after the remedial action. Because the remedial action is designed to meet the EPA standards, this section does not need to analyze the releases and doses of radiation in detail. It does contain a brief resume of the basis for the standards, explaining the reduction in dose and health effects achieved by the remedial action.

5.1.1 Pathways and mechanisms for the transport of radioactive material to people

This section outlines the routes that radionuclides could take in reaching people. It outlines the processes that could contribute to a movement of radionuclides along these routes. It mentions all the pathways that seem credible or have been expressly discussed in scoping meetings; it points out which pathways are considered in the analyses presented in the rest of the section. It is careful to treat any pathways that have aroused controversy or unusual interest even though the analyses may have shown them to be insignificant; it tells why such pathways can be dismissed from further analysis.

5.1.2 Radiation doses during normal remedial action

This section predicts doses to workers and members of the general public during the remedial action. It predicts maximum individual doses and population doses from external and internal exposure. It expresses internal doses in terms of 50-year dose commitment. It compares the doses to those received normally from natural background radiation.

The discussion briefly explains the technical terms and concepts it uses. More-extensive discussion of the terms and of health effects appears in an appendix.

5.1.3 Radiation doses from hypothetical accidents

This section discusses the radiation doses that might occur as a result of accidents during the remedial action. The possibilities for accidents depend heavily on the details of the proposed action and the characteristics of the sites, but they may include transportation accidents and spills of tailings materials into important waterways.

The section includes a discussion of the mitigating measures taken to prevent accidents and to reduce the dispersal of radioactive material if they occur.

5.1.4 Radiation doses after the remedial action has been completed

This section describes the long-term effects of the tailings after the remedial action has been completed. It relies heavily on the EPA standards, which the remedial action has been designed to meet, and on the discussions in the

EPA environmental impact statement for remedial action standards. It predicts the doses and dose commitments that would result from the allowed emissions of radiation; in doing so, it refers to the predictions that formed the basis for the standards. If the expected emissions will be substantially below those allowed by the standards, the text points out the difference in doses and health effects that the action will provide.

Like the preceding section, this section refers the reader to an appendix for the details of dose and health-effects terms and calculations.

5.2 Nonradiological impacts of the proposed action

This section discusses all the impacts of the proposed action that do not stem from releases of radiation. The level of detail is kept appropriate to the severity of the impact; the more severe or controversial impacts receive the greater detail.

5.2.1 Air quality

This section discusses the pollutants emitted during the remedial action; it points out that the tailings will not affect the air quality of the region after the action has been completed. It estimates the amounts of pollutants emitted by machinery performing the earth-moving operations at the present pile and at the other sites affected by the proposed action; it also estimates the pollutants emitted by vehicles during the transportation of the material. It compares the emissions to applicable standards. Because the pollutants emitted by machinery and vehicles are not likely to be a major impact of the action, their treatment is brief.

The section also discusses the fugitive dust and other particulates raised during the earth-moving and hauling operations. It predicts the concentrations of particulates, compares them to applicable standards, and explains in simple terms what the effects near the sites will be like.

5.2.2 Soils

This section predicts the changes in the soils at the sites affected by the proposed action. It explains the effects of mitigating measures such as stockpiling topsoil.

5.2.3 Mineral resources

The length and level of detail of this section depend on whether any valuable minerals lie near or beneath the sites involved in the proposed action. In accordance with the intent of the proposed 10 CFR 60, the discussion emphasizes reserves rather than resources. If no mineral resources would be affected, the section is a simple note saying so. If access to resources would be affected, the section describes the type and amounts of reserves, their approximate value, their role in providing jobs and income to the surrounding region, their contribution to government revenues, and measures that might be taken to mitigate their loss. The discussion of value distinguishes carefully between value before and after extraction.

5.2.4 Water

This section predicts the amount of water required by the project and compares it to the available supplies. It predicts the effects of the operation on nearby surface and ground waters, including the effects of possible spills during transportation and the migration of radionuclides or heavy metals from the final disposal site.

5.2.5 Plants and animals

This section predicts the effects of the action on the plants and animals that live at and near the sites. It discusses the effects of destroying vegetation and animal habitats, explaining which plants and animals will be affected. It explains the effects of the revegetation or other treatment planned for the sites, including the possible attraction of new plants and animals to the new habitat created by the treatment. It discusses the effects that might occur away from the sites because of the disruption at the sites.

5.2.6 Land use

This section describes the effects of the proposed action on the use of the land at and around the sites. The discussion predicts the effects on agricultural, business, recreational, and residential uses of the land. It compares these effects to the applicable official goals, plans, and zoning laws for the sites.

5.2.7 Noise

This section predicts noise levels at and around the sites involved in the proposed action. From the noise produced by the machinery and vehicles, it estimates the noise levels at the boundaries of the sites and in nearby populated areas. Because noise is not likely to be a major impact of the action, this section is short.

5.2.8 Scenic, historic, and cultural resources

This section describes the impacts on the resources described in Section 4.13. It describes the mitigation measures taken to preserve sites of archaeological interest. It deals not only with direct effects on the historic and cultural resources but also with effects that would make them more difficult to reach or see.

5.2.9 Population and work force

This section predicts, from the number of workers required to perform the remedial action, the effect on the local population. It estimates the number of workers that will come from the local work force and the effect on local employment. It predicts the number of workers that will come from outside the area and the number of family members and business people that may accompany them.

The length of this section and the two following sections depends largely on a comparison of these numbers with the existing population and the expected population at the time of the action. The treatment is more detailed if the number of incoming people is more than a few percent of the local population or if the economy will undergo severe changes, as in a boom-bust cycle.

If any people will have to be moved from homes on or near the sites, this section states the number of people affected and describes the plans for their temporary or permanent relocation.

5.2.10 Housing, social structure, and community services

This section predicts the effects of the increased population on the area around the proposed sites. It predicts the increases in demand for housing, the types of housing that are likely to be required, and the effects of the decreased demand after the action has been completed. It predicts changes, if any, in the

social structure of the community. It evaluates the necessity for changes in the services that the communities now supply. It discusses changes in the recreational use of the land around the sites, including, for example, the effects of increased or decreased hunting there. All these predictions include discussion of controversial impacts, even those that the analyses show to be negligible.

5.2.11 Transportation networks

This section discusses the changes in traffic patterns and volumes generated by the proposed action. It estimates the damage that may be done to the roads by the increased traffic. If any road improvements are planned, this section discusses them as a mitigation measure.

5.2.12 Economic structure

This section predicts the effects of the money moving into the local economy through workers' salaries and expenditures for the project. It predicts both direct and indirect impacts of this money flow into the economic sectors outlined in Section 4.17.3.

5.2.13 Use of energy and other resources

This section reviews the requirements of the project for electricity, fossil fuels, water, and building materials. It compares these requirements to the supplies available in the area. If reprocessing of the tailings is part of the remedial action, this section points out the conservation of resources that the reprocessing will achieve.

5.2.14 Effects of accidents

This section discusses the possibilities for accidents that might affect the environment. The list of possibilities depends heavily on the proposed action and the characteristics of the sites, but it may include transportation accidents and spills of tailings materials into important waterways. The section estimates the consequences of these accidents, omitting the consequences of releases of radiation, which are discussed in an earlier section.

The discussion includes estimates of the number of accidents that would produce serious injury or death, even if their effect on the environment would not otherwise be major.

The section includes a discussion of the mitigating measures taken to prevent accidents.

5.3 Radiological impacts of alternatives to the proposed action

This section does not repeat the discussion of Section 5.1. If the pathways for the release of radiation and the impacts of the releases are the same at the alternative sites and at the sites affected by the proposed action, this section simply says so. If these pathways and impacts are different, the section discusses them at the level of detail of Section 5.1, referring to that section for explanations needed in both discussions.

- 5.3.1 Pathways and mechanisms for the transport of radioactive material to people
- 5.3.2 Radiation doses during normal remedial action
- 5.3.3 Radiation doses from hypothetical accidents
- 5.3.4 Radiation doses after the remedial action has been completed

5.4 Nonradiological impacts of alternatives to the proposed action

This section describes for the alternative actions the impacts described in Section 5.2 for the proposed action. Impacts that are the same are discussed only by reference to Section 5.2, but impacts that are different are treated at the level of detail of Section 5.2.

- 5.4.1 Air quality
- 5.4.2 Soils
- 5.4.3 Mineral resources
- 5.4.4 Water
- 5.4.5 Plants and animals
- 5.4.6 Land use
- 5.4.7 Noise
- 5.4.8 Scenic, historic, and cultural resources
- 5.4.9 Population and work force
- 5.4.10 Housing, social structure, and community services
- 5.4.11 Economic structure
- 5.4.12 Use of energy and other resources
- 5.4.13 Effects of accidents

5.5 Unavoidable adverse impacts

This section is mentioned in the National Environmental Policy Act. It is a much-abbreviated review of the major unavoidable impacts discussed in Chapters 3 and 5. It omits the minor impacts and presents no new material. The impacts of the proposed and the alternative actions are discussed in separate sections.

- 5.6 Irreversible and irretrievable commitments of resources
This section, also mentioned in the NEPA, is a review of the commitments of resources required for the remedial action. It is simply a list with little discussion; it contains nothing not already presented in the statement.
- 5.7 Relationships to land-use plans, policies, and controls
This section presents information already presented in the statement. It is therefore mainly a summary. If the conflicts with plans are severe or if many separate plans and policies apply to the affected region, this section may present a more extended discussion than the earlier sections do.
- 5.8 Relationship between short-term use of the environment and the maintenance and enhancement of long-term productivity
This section, mentioned in the NEPA, is a review that enables a decisionmaker to understand quickly the tradeoff, if any, between the short-term effects of the project and the possibilities for improving productivity during the long term. It contains no new information, but it does present old information in a slightly different form from that of preceding sections. It should be brief, perhaps one page or less.
- 5.9 Mitigation measures
This section reviews the measures built into the proposed and alternative actions to mitigate the adverse impacts. It also suggests other mitigation measures, not a part of the proposed action or the listed alternatives, that could be carried out if further mitigation becomes necessary.

References for Chapter 5

Glossary

The glossary defines unusual words and phrases used in the statement. The rules for including words in the glossary and for omitting them are in the format-and-style guide for the UMITRAP documents.

List of acronyms

This list defines all acronyms used in the statement.

List of preparers of this statement

According to the CEQ regulations, this two-page list includes "the names, together with their qualifications (expertise, experience, professional disciplines), of the persons who were primarily responsible for preparing the environmental impact statement or significant background papers." The list also tells who performed particular analyses "where possible."

List of agencies, organizations, and persons receiving copies of this statement

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Appendix A

The number of appendixes and the topics they cover are different in different statements. They include more-complete presentations of data discussed in Chapter 4 and descriptions of the methods used in the analyses in Chapter 5. They may include copies of important correspondence supporting the preparation of the text. They may include background material intended to increase the reader's understanding of technical topics that are important in the text--the health effects produced by ionizing radiation, for example. If information that might appear in an appendix is voluminous, it appears in a separately issued document instead.

Appendix B

Appendix C

Responses to comments received on the draft environmental impact statement

This section appears only in the final environmental impact statement. It lists all persons who made formal comments on the draft statement. It responds to these comments, explaining what changes were made in the final statement as a result of them; if no changes were made in response to a particular comment, this discussion tells why. The discussion does not list each comment separately; it groups similar comments that can receive a single reply.