Chapter 6.
Irreversible and Irretrievable Commitments of Resources and Local Short-Term Uses and Long-Term Productivity of the Environment

6 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES AND LOCAL SHORT-TERM USES AND LONG-TERM PRODUCTIVITY OF THE ENVIRONMENT

6.1 Irreversible and Irretrievable Commitments of Resources

A resource commitment is considered irreversible when impacts from its use would limit future use options and the change cannot be reversed, reclaimed, or repaired. Irreversible commitments generally occur to nonrenewable resources such as minerals or cultural resources, and to those resources that are renewable only over long time spans, such as soil productivity.

A resource commitment is considered irretrievable when the use or consumption of the resource is neither renewable nor recoverable for use by future generations until reclamation is successfully applied. Irretrievable commitments generally apply to the loss of production, harvest, or natural resources and are not necessarily irreversible.

The land that would be committed to develop the proposed TCEP would include land used for construction staging areas for the polygen plant and linear facilities, the footprint of the polygen plant, and the footprint of associated linear facilities. Although not all of the 600 ac (243 ha) at the polygen plant site would actually be developed, it is likely that the entire site would be unavailable for other uses. Similarly, the land required for the linear facilities could be restricted from some other uses. However, after the operational life of the polygen plant is over and the plant and linear facilities have been decommissioned and reclaimed, the land would again be available for other uses. Therefore, during the lifespan of the project, land use would experience an irretrievable impact.

The land areas required for the polygen plant and linear facilities would be cleared, graded, and filled, as needed, to suit construction of the project. These actions would result in additional impacts that are irreversible and/or irretrievable. Existing vegetation and soils would be removed, causing mortality of some wildlife, such as burrow-dwelling species and slow-moving species that are unable to relocate when ground-disturbance activities begin. In addition, the vegetation and soil habitats would be lost for future use by wildlife until reclamation could be successfully implemented. The direct mortality of wildlife would be an irreversible impact and the loss of habitat would be an irretrievable impact. It can be argued that the loss of soil (which requires a very long time to generate) would constitute an irreversible and irretrievable resource commitment; however, reclamation would likely include replacing any lost topsoil and not relying on natural soil-producing processes. Therefore, it is likely that the soil removal would ultimately be an irretrievable impact but not irreversible.

The clearing and grading actions also pose a risk to cultural resources that may exist at the polygen plant and linear facilities. If cultural resources were discovered during construction, they would be documented and likely relocated from the site. Disturbances to these resources would be considered irreversible.

Process water would be used primarily in the cooling towers, which would convert the water to vapor. Potable water used during construction and operations would be discharged through a septic system. Because the project would not directly discharge any of the process or potable water directly back to ground water or surface water, much of this water may be lost to the local area and downstream users. This would result in an irretrievable commitment of water resources. In the event the ground water option is used, due to the amount of time required for ground water recharge through the hydrologic cycle, this use could also result in an irreversible commitment of ground water resources.

Aesthetics would experience irretrievable, but not irreversible, commitments during the life of the polygen plant operation. The viewshed would be altered as long as the polygen plant was present.

Although air emissions would be greatly reduced compared to typical coal-fueled electricity generation facilities, there would be some emissions that would contribute to reduced air quality.

Material and energy resources committed for the TCEP would include construction materials (e.g., steel, concrete) and fuels (e.g., coal, diesel, gasoline). All energy used during construction and operation would be irreversible and irretrievable. During operation, the project would use up to 2.1 million tn (1.9 million t) of coal annually. The sub-bituminous coal resources would be irreversibly and irretrievably committed. Based on 2009 U.S. coal production statistics, the TCEP would use approximately 0.42 percent of the sub-bituminous coal produced annually in the U.S. (Energy Information Administration 2010a). The polygen plant would also use natural gas during startup and as a backup fuel. Although the amount of natural gas used would be negligible in relation to local capacity, it would be irreversibly and irretrievably committed.

6.2 Relationship between Short-term Uses of the Environment and Long-term Productivity

Short-term uses of the environment would be associated with construction activities and have been described in Chapter 3. These include, for example, the use of aesthetic, air, wetlands, and transportation resources, as well as the short-term use of land for construction staging areas. Aesthetic impacts affecting nearby residents include the effects to viewsheds from land-clearing activities and increased noise levels. Aesthetics and air quality would both experience short-term impacts from fugitive dust emissions. Although there are no surface waters that would be impacted by the project, there are wetlands along some of the proposed linear facilities sites that would be disturbed or reduced through land-clearing activities The disturbance of these wetlands, as well as general vegetation and wildlife habitat along the linear facilities, would be considered short term because they would likely re-establish after the facilities were constructed. Any reductions in wetlands could be long-term or even permanent. Short-term impacts would also include traffic diversions and disruptions during construction activities.

The long-term impacts of land use for the project are described and discussed above. There would be short-term land use impacts as well. During construction, staging areas and laydown yards would be cleared and made usable. These areas would be reclaimed and restored at the end of the construction phase.

In the long term, the project would support the DOE objective of demonstrating and promoting innovative coal power technologies that can provide the U.S. with clean, reliable, and affordable energy using abundant domestic sources of coal. The proposed project is expected to contribute approximately ***130***–213 MW (net) of electricity to the electric grid system. The project, if successful, would serve as an example of a way to either minimize SO_2, NO_x, Hg, CO_2, and PM emissions from coal-fueled power plants or to increase the efficiency in which energy in coal is converted into electricity. If older coal-fueled power plants were replaced with new plants similar to the TCEP, the total U.S. and worldwide emissions of pollutants could be reduced and the efficient use of nonrenewable resources could be improved.

Specifically the successful development of low-emissions electricity production from sub-bituminous coal would further the goal of reducing anthropogenic emissions of CO_2. If the project is approved and developed, the project would establish a precedent for long-term positive impacts on reducing CO_2 emissions per unit of electricity generated. In addition, increased oil production through EOR would result in more complete resource extraction from existing oil fields and increase the benefit-to-cost ratio for each unit extracted. Likewise, the integrated production of urea for fertilizer would benefit the agricultural industry and reduce the need for imports or the development of a separate urea production facility and its corresponding impacts.

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