

2.0 OBJECTIVES

In May of 1999, the U.S. Bureau of Land Management issued a Draft Environmental Impact Statement (EIS) for the Wyodak Coal Bed Methane Project in the Powder River Basin of Wyoming (BLM, 1999). The Draft EIS included a cumulative air quality impact analysis that used the CALPUFF modeling methodology to estimate impacts on regional visibility in future years resulting from projected future PRB activities, including expanded surface coal mining. The results of the analysis suggested a potential for significant degradation in visibility at distant national parks and sensitive areas. The emissions inventory for the analysis indicated that a major contributor to future pollutant levels and impacts would be coal mining and related coal rail transport.

When new coal leasing activities or mine developments occur in the PRB, it is likely that new cumulative air impact analyses will be required. It is important that the implications and reliability of these analyses be better understood. New national and state regulations for control of regional haze and small particle concentrations in the air are currently in development. If new regulations are to be effective and appropriate, it is essential that potential impacts of existing and new mining operations be quantified as realistically as possible. Meaningful evaluation of future impacts is essential both for public policy development, and for development of any mitigating measures that may be necessary.

It was therefore proposed to carry out analyses with the currently recommended air quality and visibility modeling methodology, and to evaluate model results in relation to measured trends. The overall objective of the research was to compare predicted impacts of recent PRB coal mining operations, using current CALPUFF methodology, to observed conditions over the same years at Badlands National Park. In addition, characteristics of the current methodology were investigated, along with sensitivity of results to model inputs. Finally, a critical evaluation was made of the implications of past and proposed new procedures and baseline data specified by Federal Land Managers for Class I area visibility impact analyses.

Specific objectives of the research were to:

1. Determine the historical correlation, if any, between PRB coal mining air emissions and observed visibility at Badlands National Park, SD.
2. Compare observed visibility and pollutant concentration trends at Badlands NP to those predicted by the CALPUFF air modeling methodology as currently applied.
3. Quantify model-predicted impacts resulting from coal mining activities on a pollutant-specific basis.
4. Determine the relative magnitude of coal mining sources compared to other pollutant sources with regard to model-predicted impacts.
5. Determine sensitivity of model results to background concentration and pollutant parameter inputs required by the CALPUFF model.
6. Evaluate and compare results of recommended methods for deriving and presenting visibility impact model results.