

Potential Visual Air Quality Impact Analysis

INTRODUCTION

The potential visual air quality impact of emissions from a proposed project can be evaluated with various simulation models, ranging from basic screening models to complex long range transport models. Since the proposed action consists of isolated, short term, relatively low emission rate activities, a screening model was used. The chosen screening model was the United States Environmental Protection Agency (USEPA)-approved model called VISCREEN. VISCREEN is a DOS-based model developed to assess the potential visual air quality impacts of isolated sources located less than 50 kilometers (km) from areas of interest. It uses default, hypothetical worst case meteorological parameters and hypothetical worst case observer-source geometry to calculate the potential worst case visual air quality impact of a single source of emissions.

IMPACT ASSESSMENT FOR PROPOSED ACTION

The Proposed Action involves potential drilling activities at up to five different locations, but only four of those locations will be actually drilled. These locations vary in distance from the Canyonlands National Park, with the closest location being "Hatch Point Federal No. 4", which is approximately 18 km east of the Canyonlands National Park Grand View Point Overlook.

The VISCREEN model uses the maximum short term (i.e., 24-hour) emissions of nitrogen oxides (NO_x) and particulate matter (PM). In the VISCREEN model it is assumed that other pollutants do not significantly affect visual air quality at the source-receptor distances analyzed in the VISCREEN model. Emissions from the entire project (i.e., four core holes drilled in one year) are estimated to be 11.12 tons per year NO_x for all four drilling locations, and 3.5 tons per year of PM. However, these emissions occur over a total of 600 hours of drilling per year for four locations (assumed to occur in a single year). Thus the maximum short term emissions from a single drill location (e.g., Hatchpoint Federal No. 4) were calculated as follows:

$$\text{NO}_x \text{ emissions} = 11.12 \text{ tons/yr} \times 1 \text{ location}/4 \text{ locations} \times 1 \text{ year}/600 \text{ hours} \times 1 \text{ hr}/3600 \text{ sec} \times 2000 \text{ lb/ton} \times 453.6 \text{ g/lb} = 1.28 \text{ grams/second.}$$

Likewise, the maximum short term PM emissions from a single location were 0.41 grams per second.

VISCREEN uses a default worst case background ozone concentration of 0.040 parts per million and a maximum background visual range of 170 km for the proposed project location. The model then assumes "F stability" (i.e., a highly stable atmosphere) and wind speed of 1 meter per second. This assumed meteorological condition is a hypothetical worst case condition for visual air quality impacts, and almost never occurs. In the proposed project location, if it occurred it would most likely only occur at night. Nevertheless, the default assumption was used in this evaluation.

The results of the VISCREEN model run are attached. The visual air quality parameter of interest presented by VISCREEN is "plume contrast", which is the contrast of the hypothetical plume against the background sky or background terrain that is assumed to be located immediately adjacent to the plume.

Visual Effects Screening Analysis for
 Source: Hatch 4
 Class I Area: Canyonlands National Par

*** Level-1 Screening ***
 Input Emissions for

Particulates	.41	G	/S
NOx (as NO2)	1.28	G	/S
Primary NO2	.00	G	/S
Soot	.00	G	/S
Primary SO4	.00	G	/S

**** Default Particle Characteristics Assumed

Transport Scenario Specifications:

Background Ozone:	.04	ppm
Background Visual Range:	170.00	km
Source-Observer Distance:	9.40	km
Min. Source-Class I Distance:	9.40	km
Max. Source-Class I Distance:	40.70	km
Plume-Source-Observer Angle:	11.25	degrees
Stability:	6	
Wind Speed:	1.00	m/s

R E S U L T S

Asterisks (*) indicate plume impacts that exceed screening criteria

Maximum Visual Impacts INSIDE Class I Area
 Screening Criteria ARE Exceeded

Backgrnd	Theta	Azi	Distance	Alpha	Delta E		Contrast	
					Crit	Plume	Crit	Plume
SKY	10.	165.	40.7	3.	2.00	1.592	.05	.019
SKY	140.	165.	40.7	3.	2.00	.499	.05	-.015
TERRAIN	10.	84.	9.4	84.	2.00	2.840*	.05	.010
TERRAIN	140.	84.	9.4	84.	2.00	.138	.05	.001

Maximum Visual Impacts OUTSIDE Class I Area
 Screening Criteria ARE Exceeded

Backgrnd	Theta	Azi	Distance	Alpha	Delta E		Contrast	
					Crit	Plume	Crit	Plume
SKY	10.	1.	1.0	167.	2.00	4.962*	.05	.073*
SKY	140.	1.	1.0	167.	2.00	2.871*	.05	-.052*
TERRAIN	10.	1.	1.0	167.	2.00	16.571*	.05	.113*
TERRAIN	140.	1.	1.0	167.	2.00	2.053*	.05	.020