

## Regional Haze: Four Factor Analysis



Hells Canyon Wilderness.



State of Oregon  
Department of  
Environmental  
Quality

### Air Quality Planning

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*DEQ is a leader in restoring,  
maintaining and enhancing  
the quality of Oregon's air,  
land and water.*

### Why did I receive a letter from DEQ requiring that my facility conduct a four factor analysis?

The Oregon Department of Environmental Quality is developing a State Implementation Plan for the second implementation period of the federal Regional Haze program (40 CFR 51.308). This implementation period focuses on making reasonable progress toward national visibility goals by analyzing progress-to-date from the 2000-2004 baseline and considering whether additional emission reductions are necessary to continue a reasonable rate of progress.

### What is a four factor analysis?

The four factor analysis involves assessing potential emission controls technologies against four statutory factors:

- (1) The cost of control,
- (2) Time necessary to install controls,
- (3) Energy and non-air quality impacts, and
- (4) Remaining useful life.

### How do I prepare a four factor analysis?

DEQ will rely on the following three resources to review facility four factor analyses to ensure accuracy and consistency. All information prepared as part of the reasonable progress analysis should be prepared using the guidance provided in these documents.

1. [EPA Guidance on Regional Haze SIPs for the Second Implementation Period. \("Guidance"\)](#)<sup>1</sup>

<sup>1</sup> Environmental Protection Agency, "Guidance on Regional Haze State Implementation Plans for the Second Implementation Period," August 2019, EPA-457/B-19-003. <https://www.epa.gov/visibility/guidance-regional-haze-state-implementation-plans-second-implementation-period>

<sup>2</sup> EPA, "EPA Air Pollution Control Cost Manual." <https://www.epa.gov/economic-and-cost-analysis-air-pollution-regulations/cost-reports-and-guidance-air-pollution>. Please refer to the most current finalized version of the relevant chapters.

Last updated 12/5/2019

2. [EPA Air Pollution Control Cost Manual \("Control Cost Manual"\)](#)<sup>2</sup>
3. [EPA Modeling Guidance for Demonstrating Air Quality Goals for Ozone, PM2.5, and Regional Haze \("Modeling Guidance"\)](#)<sup>3</sup>

For the four factor analysis, a 20-year planning horizon should be assumed. The only exception to this horizon is if there is a unit shutdown date identified that will cease operations before 20 years has expired. Additionally, the generally accepted accuracy in the Control Cost Manual is within plus or minus 30%. Facilities using technical experts and consultants may have more accurate projections due to their previous hands-on experience. Please explain any deviations from the 20-year planning horizon or the presumed 30% accuracy in your estimates.

The latest guidance from EPA points to the interest rate that is most appropriate for your facility based on previous project engineering experience at your facility. This most likely will result in the selection of an interest rate between 3% and 7%. In the absence of a more specific interest rate, EPA recommends that you use the current bank prime rate, which is 4.75% as of the date of this letter, as a default.<sup>4</sup>

<sup>3</sup> EPA, "Modeling Guidance for Demonstrating Air Quality Goals for Ozone, PM2.5, and Regional Haze," November 2018, EPA-454/R-18-009. <https://www.epa.gov/scram/state-implementation-plan-sip-attainment-demonstration-guidance>

<sup>4</sup> The current bank prime rate can be found on the Federal Reserve website: <https://www.federalreserve.gov/releases/h15/>

Capital and annual costs should be estimated as if the project will be constructed at the time the cost estimate is prepared. The annualized cost of the project should be presented by annualizing the capital cost and adding that to the annual operating costs. Calculate the cost in dollars per ton of emission reduction for each evaluated control alternative by dividing the uniform annual cost by the tons of annual emission reduction anticipated.

**Alternative formats**

DEQ can provide documents in an alternate format or in a language other than English upon request. Call DEQ at 800-452-4011 or email [deqinfo@deq.state.or.us](mailto:deqinfo@deq.state.or.us).