Outline of Increment Consumption Analysis  
KNO PSD Permit Application

PSD rules in 40 CFR §52.21(k)(1) specify the following:

(k) Source impact analysis--(1) Required demonstration. The owner or operator of the proposed source or modification shall demonstrate that allowable emission increases from the proposed source or modification, in conjunction with all other applicable emissions increases or reductions (including secondary emissions), would not cause or contribute to air pollution in violation of:

(k)(1)(i) Any national ambient air quality standard in any air quality control region; or

(k)(1)(ii) Any applicable maximum allowable increase over the baseline concentration in any area.

Although the analysis of increment consumption under §52.21(k)(1)(ii) has historically been focused on sources that were constructed or modified after the minor source baseline date as defined within the rule, EPA Region 10 staff have indicated that this analysis must account for increases and decreases in emissions of all sources to verify that PSD air quality increments are not exceeded. This is based on the following language in PSD rules related to the definition of “baseline concentration”:

(b)(13)(ii) The following will not be included in the baseline concentration and will affect the applicable maximum allowable increase(s):

(b)(13)(ii)(a) Actual emissions, as defined in paragraph (b)(21) of this section, from any major stationary source on which construction commenced after the major source baseline date; and

(b)(13)(ii)(b) Actual emissions increases and decreases, as defined in paragraph (b)(21) of this section, at any stationary source occurring after the minor source baseline date.

Thus actual emission increases and decreases in emissions from all existing stationary sources must be considered as a part of the increment analysis. ADEC has identified permitted sources that need to be considered in this analysis, which are those located within 50 km of the SIL area for KNO (in this case, those sources within 55 km of KNO). ADEC has also provided the most current assessable emissions for these sources.

The proposed approach to evaluating increment consumption from existing sources is outlined below:

1. Prepare a qualitative discussion of mobile source influence on increment consumption (objective is to eliminate mobile sources from further consideration in analysis). Factors to be considered will include the following:

* Tighter tailpipe standards
  + Standard changes from 1988 to 2019 for NOx
  + Standard changes from 1982 to 2019 for PM10
  + Any standard changes for PM2.5 from 2008 to 2019?
* Inventory trends
  + Mobile source inventory for Alaska
    - Data for NOx back to 1990
    - Any data for PM10 prior to 1990? Discuss national trends?

1. Perform a screening analysis to eliminate certain sources from further consideration in analysis

* Identify receptors of concern (only receptors within SIL area for KNO?)
* Remove sources with no or minimal NOx/PM10/PM2.5 emissions
* Eliminate any sources where all emission units are already accounted for in the current increment analysis
* Eliminate sources based on distance from KNO
  + Use SIL as criterion for eliminating sources based on distance (ie. SIL distance from source compared to distance from KNO SIL area/critical receptors)
  + Use direction from KNO as criterion for eliminating sources based on predominant wind direction in meteorological data

1. Perform modeling of remaining sources against increment consumption

* Prepare a discussion of sources relative to short term increment consumption (objective is to limit increment consumption analysis for existing sources to long-term (annual) increment only).
  + Availability of data
    - No established procedure to evaluate short-term impacts
    - The definition of “actual emissions” under PSD rules refers to “the average rate, in tons per year, at which the unit actually emitted…”
    - Theoretical approach would be to quantify maximum short term actual emissions at baseline date and compare to maximum short term actual emissions now. Data not available to quantify maximum short term (ie., daily) actual emissions from baseline period or from current
    - (only practical approach is to smear emissions out over the entire year; which correlates to annual increment consumption rather than short term)
  + Presumption that permitted sources periodically operate at maximum short term emission rate such that any change in short term emissions would only occur through a change in the physical capacity of the unit, which would be reflected in a permit modification.
* Modeling of remaining sources against long term impact
  + Emissions inventory – use data from most recent assessable year; compare source emissions to next most recent year to show most recent year is expected to be representative of two-year average
  + Assume baseline actual emissions of zero, to provide conservative estimate of increase; assuming this results in emission impacts within the increment, no further analysis needed
  + In the event that increment exceeded, more detailed analysis will be needed for contributing sources