Bureaus of Air Pollution Control & Air Quality Planning

Implementation of Air Quality Standards

December 2014

Introduction

Under the Clean Air Act (CAA), the Environmental Protection Agency (EPA) has a non-discretionary legal requirement to review National Ambient Air Quality Standards (NAAQS) every 5 years. If during its review the EPA discovers that a standard may be made more protective of human health and the environment, the CAA requires EPA to revise the standard. Once the EPA finishes rule making for a standard, the Nevada Division of Environmental Protection (NDEP) must implement it within 3 years to keep its air quality permitting programs in good standing with Federal regulations. NDEP's implementation must be approved by EPA and adopted into the Applicable State Implementation Plan (ASIP). The ASIP contains a collection of State regulations (NAC 445B), that comprise the permitting implementation plans and are state and federal enforceable requirements.

New Ambient Air Quality Standards

There are four new air pollutant standards that the NDEP is now obligated to implement, **BEGINNING JANUARY 1, 2015**. The NDEP's implementation was approved by EPA (79 FR 62846) after multiple public notices and workshops were provided for public participation and comment. The four new standards are:

1. 2006 $PM_{2.5}$ 24-hr 35 µg/m^3
2. 2006 $PM_{2.5}$ Annual 15 µg/m^3
3. 2010 NO_2 1-hr 100 ppb
4. 2010 SO_2 1-hr 75 ppb

These standards can be found in NAC 445B.22097 **"Standards of Quality for Ambient Air."** NAC 445B.22097 states that "*The Director [NDEP] shall use the **Nevada Standards** in considering whether to issue a permit for a stationary source and shall ensure that the stationary source will not cause the Nevada Standards to be exceeded in areas where the general public has access."* (the NAC 445B.22097 standards table is attached). This requirement is echoed in regulations NAC 445B.3364(10)(d) for Class I permits, and NAC 445B.3457(4)(c)(3) for Class II permits, where it is required that the NDEP considers the impacts of a proposed project on the maintenance of the state and national ambient air quality standards contained in NAC 445B.22097 and the ASIP as a prerequisite to permit issuance. For Class III permits, compliance with the Nevada Standards is built into the mandatory 5-ton emission cap. For Class IV permits the Nevada Standards do not apply because Class IV is for Hazardous Air Pollutants (HAPs) only, which are not pollutants in the Nevada Standards.

Impacts on Permit Projects

AFTER JANUARY 1, 2015, an application for a Class I or Class II permit will require complete application information for all current Nevada Standards in NAC 445B.22097, including the four new Nevada Standards listed above.

- Application

  A permit application's emissions inventory must now include $PM_{2.5}$. In the *Emission Units Application Forms*, $PM_{2.5}$ must be recognized as a pollutant for each emission unit with potential to emit values in rates of pounds per hour (lb/hr) and tons per year (tpy). Similarly, $PM_{2.5}$ values must be included in the *Facility-Wide Potential to Emit Tables*. As always, please cite the source of your emission factors and do not use PM_{10} emission factors for $PM_{2.5}$, as it will greatly over estimate emissions.

  - Emission factors. Emission factors must be accurate and representative of the industrial process and material involved. Emission factors are site specific and unit specific. Resources for emission factors include: CEMs, stack tests, manufacturer's performance rating, state/industry factors, material balance and EPA's AP-42 emission factors.
    - AP-42 factors are not "default" factors and EPA recommends that they be used with caution. This is because even when the major process variables are accounted for, the AP-42 factors developed may be the result of averaging source tests that differ by factors of five or more. This variability may provide a large difference between the AP-42 factor and a measured (or tested) value for a site-specific unit.
    - The facility must be able to demonstrate compliance with emission limits derived from the proposed emission factors.

- Environmental Evaluation

  If an applicant is required to provide an air dispersion model, model runs must be performed for all current Nevada Standards including the new $PM_{2.5}$ (24-hour and annual), 1-hour NO_2 and 1-hour SO_2 standards. If an applicant does not meet the assignment threshold to provide an air dispersion model, the NDEP will perform this modeling and will require complete application information to do so. Please note that pursuant to NAC 445B.311(4)(a), environmental modeling must comport with the requirements of Appendix W of 40 CFR Part 51. As always, the NDEP recommends an applicant utilize a model protocol prior to modeling to verify the model data and settings.

- Air Dispersion Model Guidelines

  EPA has provided numerous guidance documents and clarification memos for modeling the $PM_{2.5}$, 1-hour NO_2 and 1-hour SO_2 standards. Please note that the majority of these documents support PSD permitting actions, and non-PSD actions will not require the same rigor. These guidance documents are provided below, but non-PSD actions should begin with the "*Nevada Bureau of Air Pollution Control General Air Dispersion Modeling Guidelines 2008*" (BAPC Guidelines).

Please note that the BAPC Guidelines reference an older version of NAC 445B.22097 that does not include the 4 new Nevada standards. Please utilize the most current version of NAC 445B.22097 (attached) when developing a permit application submittal.

- **$PM_{2.5}$** – Non-PSD actions should use the BAPC Guidelines with default AERMOD settings for direct $PM_{2.5}$. PSD actions must use direct and secondary $PM_{2.5}$ and should submit a model protocol.
  - EPA Guidance for $PM_{2.5}$ (May 2014).
  - EPA $PM_{2.5}$ Clarification Memo: Interim Guidance on Treatment of Condensable PM from stack tests (Apr 2014).
  - EPA $PM_{2.5}$ Clarification Memo: Demonstrating Compliance with PM2.5 NAAQS (Mar 2010).

- **NO_2** – EPA has proposed a three-tiered evaluation process for quantifying NO_2 mass emission rates for air dispersion modeling. Tier 1 assumes full conversion of NO_x to NO_2. That is, the applicant assumes all NO_x is emitted in the form of NO_2. Tier 2 employs an empirically-derived conversion ratio (NO_2/ NO_x), whereby the result from the Tier 1 value is multiplied by 0.80 for the ambient air (known as the 'Ambient Ratio Method'). This tier (2) is available to a source when low-level releases occur with limited plume rise and ozone concentrations are likely to be relatively low. When using a ratio value other than 0.80, the analysis would be considered a Tier 3 evaluation. Tier 3 represents a general category of "detailed screening methods" which may be considered on a case-by-case basis. Tier 1 factors may be used for all permit applications without additional support documentation with default AERMOD settings. Tier 2 conversion factors will require additional support documentation for all applications. Documentation would include acknowledgement of source-surrounding characteristics that meet applicable assumptions (as noted by the EPA in their June, 2010 memo). Tier 3 approaches will require substantial background information, and pre-approval via a model protocol is required.
  - EPA Guidance for NO_2 (Jun 2010).
  - EPA NO_2 Clarification Memo (Sep 2014). Supplements Mar 2011 & Jun 2010 memos.
  - EPA NO_2 Clarification Memo for Appendix W (Mar 2011).
  - EPA NO_2 Clarification Memo for Appendix W (Jun 2010).

- **SO_2** – PSD and non-PSD actions should use the BAPC Guidelines with default AERMOD settings.
  - EPA Guidance for SO_2 (Aug 2010).
  - EPA SO_2 Clarification Memo for Appendix W (Aug 2010)

- Permit Emission Limits
  Enforceable permit emission limits will be added to Class I and Class II permits for $PM_{2.5}$ and NO_x where applicable. As with other pollutants, there will be permit requirements for monitoring, recordkeeping, reporting, and potentially compliance testing (stack tests).

  - **NO_x** - Per NAC 445B.109, "Nitrogen oxides" means all oxides of nitrogen except nitrous oxide, as measured by test methods approved by the EPA. The EPA test method for NO_x is 7E. Test method 7E is an instrument method that can quantify both nitric oxide (NO) and nitrogen dioxide (NO_2), but not nitrates (NO_3) in gas form.

  - **$PM_{2.5}$** – Per NAC 445B.1348, "$PM_{2.5}$" means an particulate matter in the atmosphere with an aerodynamic diameter ≤ 2.5 micrometers as measured by test methods approved by the EPA. The EPA test method for $PM_{2.5}$ is 201A.

- Annual Reporting and Fees
  Facilities that have permits with $PM_{2.5}$ emission limits will have to include actual $PM_{2.5}$ emissions data in their annual emissions report. Pursuant to NAC 445B.327(5) Class I permit facilities must pay an annual emissions fee based on $16 times the total tons of each regulated pollutant for which a standard is established in NAC 445B.22097 or a National Ambient Air Quality Standard. Please note that carbon monoxide and greenhouse gases are excluded by regulation. Applicable billable pollutants include: volatile organic compounds (VOCs) as a precursor to Ozone, nitrogen oxides (NO_x), sulfur dioxide (SO_2), particulate matter as PM_{10}, particulate matter as $PM_{2.5}$, lead, and hydrogen sulfide. Class II, III and IV permits do not have "per ton" emissions fees.

Assistance / Workshops

The NDEP Air Bureaus will initiate a series of public workshops to discuss permitting and modeling under the new standards. The first meeting will be held January 6, 2015, at 1:00 PM. The meeting location is the Nevada Department of Transportation (NDOT) Third Floor Conference Room, located at 1263 South Stewart St., Carson City NV 89712.

For any questions regarding this document or the workshop please contact permit supervisor Phillip Shoopman, P.E. at pshoopman@ndep.nv.gov.

Attachment 1

NAC 445B.22097 as adopted by the Nevada State Environmental Commission on May 2, 2014.

NAC 445B.22097 Standards of quality for ambient air. (NRS 445B.210)

1. The table contained in this section lists the minimum standards of quality for ambient air.

		NEVADA STANDARDS[A]		NATIONAL STANDARDS[B]		
POLLUTANT	AVERAGING TIME	CONCENTRATION[C]	METHOD[D]	PRIMARY[C, E]	SECONDARY[C, F]	METHOD[D]
Ozone	8 hours	0.075 ppm	Chemiluminescence	0.075 ppm	Same as primary	Chemiluminescence
Ozone-Lake Tahoe Basin, #90	1 hour	0.10 ppm (195 µg/m^3)	Ultraviolet absorption	--	--	--
Carbon monoxide less than 5,000′ above mean sea level	8 hours	9 ppm (10,500 µg/m^3)	Nondispersive infrared photometry	9 ppm (10 mg/m^3)	None	Nondispersive infrared photometry
At or greater than 5,000′ above mean sea level		6 ppm (7,000 µg/m^3)				
Carbon monoxide at any elevation	1 hour	35 ppm (40,500 µg/m^3)		35 ppm (40 mg/m^3)		
Nitrogen dioxide	Annual arithmetic mean	0.053 ppm (100 µg/m^3)	Gas phase chemiluminescence	53 ppb[G]	Same as primary	Gas phase chemiluminescence
	1 hour	***100 ppb***	--	100 ppb	None	
Sulfur dioxide	Annual arithmetic mean	0.030 ppm (80 µg/m^3)	Ultraviolet fluorescence	0.03 ppm[H] (1971 standard)	None	Spectrophotometry (Pararosaniline method)
	24 hours	0.14 ppm (365 µg/m^3)		0.14 ppm[H] (1971 standard)		
	3 hours	0.5 ppm (1,300 µg/m^3)		None	0.5 ppm	
	1 hour	***75 ppb***	--	75 ppb	None	
Particulate matter as PM_{10}	Annual arithmetic mean	50 µg/m^3	High volume PM_{10} sampling	None	None	--
	24 hours	150 µg/m^3		150 µg/m^3	Same as primary	High or low volume PM_{10} sampling
Particulate matter as $PM_{2.5}$	Annual arithmetic mean	***15.0 µg/m^3***	--	15.0 µg/m^3	Same as primary	Low volume $PM_{2.5}$ sampling
	24 hours	***35 µg/m^3***	--	35 µg/m^3	Same as primary	
Lead (Pb)	Rolling 3 mo. average	0.15 µg/m^3	High volume sampling, acid extraction and atomic absorption spectrometry	0.15 µg/m^3	Same as primary	High volume sampling, acid extraction and atomic absorption spectrometry
Hydrogen sulfide	1 hour	0.08 ppm (112 µg/m^3)[I]	Ultraviolet fluorescence	--	--	--