



September, 2013

### Timeline

#### December 2012

State air plans due to EPA by December 2012. The state submitted the Logan SIP to the EPA December 2012.

#### End of Year 2013

Implementation of all SIP controls is required in the Logan nonattainment area. This marks the beginning of a phase-in period for the Wasatch Front nonattainment areas (Salt Lake and Provo) for implementation of SIP controls over a five-year period.

#### End of Year 2014

Strategies implemented by the state in the Logan nonattainment area must begin to demonstrate success in bringing the area into compliance with the  $PM_{2.5}$  health standard. Strategies implemented by the state for Wasatch Front nonattainment areas must demonstrate success in bringing emissions below levels prescribed for 2014.

#### End of Year 2019

Strategies implemented by the state for Wasatch Front nonattainment areas must begin to demonstrate success in bringing the area into compliance with the  $PM_{2.5}$  health standard. Ambient air monitoring data collected in 2019 should reflect the entire SIP control strategy and be within the  $PM_{2.5}$  health standard. EPA may require two more years of clean monitoring data to show compliance.

## Utah Department of Environmental Quality Division of Air Quality

# Information Sheet

## $PM_{2.5}$ State Implementation Plan (SIP)

### Salt Lake and Provo SIPs

#### Inversions

Winter inversions are a common event in Utah, generally occurring between December and February. Prolonged inversions can lead to high levels of fine particulate pollution, or  $PM_{2.5}$ . These high pollutant levels create significant health and air quality concerns, particularly on days when the concentrations exceed the national health standards.

Inversions occur when normal atmospheric conditions (cool air above, warm air below) invert. Inversions trap a dense layer of cold air under a layer of warm air. The warm layer acts like a lid, trapping emissions from vehicles, businesses, and industrial processes in the cold air near the valley floor. These emissions mix in this cold layer of air to form fine particulates.

#### Particulate Pollution

Particulate matter (PM) is a mixture of solid particles and liquid droplets. It appears as soot or smoke when the particles are large, and is detectable only with an electron microscope when it is small.

Fine particulates are less than or equal to 2.5 micrometers in diameter and are measured in micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ). Because of their small size (approximately  $1/30^{\text{th}}$  the width of the average human hair), fine particulates can pass through the nose and throat, lodge deeply in the lungs, and pass across the lungs into the cardiovascular system. They aggravate health conditions such as asthma, chronic obstructive pulmonary disorder (COPD), and other respiratory illnesses. Fine particulates are a specific concern for the very young, the elderly, and anyone with respiratory disorders.

There are two types of fine particulates: primary and secondary. Primary  $PM_{2.5}$  is emitted directly as a particle and enters the atmosphere as soot. Secondary particulates form when precursor emissions react in the atmosphere to create  $PM_{2.5}$ . Most of Utah's  $PM_{2.5}$  pollution comes from secondary particles.

The health-based National Ambient Air Quality Standards (NAAQS) regulate concentrations of  $PM_{2.5}$ . Fine particulates are subject to two standards: a 24-hour standard of  $35\mu\text{g}/\text{m}^3$  and an annual standard of  $12\mu\text{g}/\text{m}^3$ .

Utah meets the annual standard in all areas of the state. Salt Lake and Davis Counties and parts of Utah, Weber, Box Elder, Tooele and Cache counties exceed the 24-hour standard at times during the winter. As a result, the Environmental Protection Agency (EPA) has designated these areas as nonattainment.

## State Implementation Plan (SIP) Process

After the EPA designated areas along the Wasatch Front and Cache County as nonattainment for PM<sub>2.5</sub>, the Division of Air Quality (DAQ) initiated a multi-year process to develop a State Implementation Plan (SIP) to reduce current PM<sub>2.5</sub> emissions and bring fine particulate levels below the standard. Through the SIP development process, DAQ:

- 1 identified the sources of emissions through emission inventories;
- 2 developed a model to mimic atmospheric conditions; and,
- 3 tested possible emission reduction strategies.

### Emission Reductions from Control Strategies

Salt Lake City Nonattainment Area  
Combined PM<sub>2.5</sub>, SO<sub>2</sub>, NO<sub>x</sub>, and VOCs

2014	-22.3 tons per day
2017	-43.1 tons per day
2019	-64.5 tons per day

### Emission Reductions from Control Strategies

Provo Nonattainment Area  
Combined PM<sub>2.5</sub>, SO<sub>2</sub>, NO<sub>x</sub>, and VOCs

2014	-8.1 tons per day
2017	-11.0 tons per day
2019	-13.4 tons per day

Public comment period runs: October 1 through October 30, 2013.  
Submit comments to Mark Berger at [mberger@utah.gov](mailto:mberger@utah.gov).

The public can also submit comments at the following public information meetings and public hearings:

October 8th (10:00 a.m.): Salt Lake Nonattainment Area  
Weber-Morgan Health Department Auditorium  
477 E. 23rd Street, Ogden, Utah

October 9th (9:00 a.m.): Provo Nonattainment Area  
Utah County Commission Chambers  
100 E. Center Street, Suite #1400, Provo, Utah

October 15th (10:00 a.m.): Salt Lake Nonattainment Area  
DEQ Board Room, #1015  
195 North 1950 West, Salt Lake City, Utah

[www.airquality.utah.gov/Public-Interest/Current-Issues/pm2.5/](http://www.airquality.utah.gov/Public-Interest/Current-Issues/pm2.5/)

## SIP Reduction Strategies

Because past SIPs led to considerable reductions in the emissions that form particulates, it was challenging to find additional control strategies to reduce these emissions further. DAQ turned to emission reduction strategies that offer smaller, incremental improvements as the means to bring these areas into attainment.

### Mobile Sources

Vehicles contribute **over half** of the emissions that lead to the formation of PM<sub>2.5</sub> during winter inversions, so reducing mobile source emissions in nonattainment areas is a priority. The combination of Tier 2 federal fleet standards and local transportation plans to reduce trips and vehicle miles travelled (VMTs) will result in up to a 50 percent reduction in vehicle emissions by 2019. Transportation plans and programs by municipal planning organizations and UDOT within the Salt Lake and Utah County nonattainment areas will need to conform with the emission budgets in the SIP to ensure that transportation activities do not interfere with air quality progress.

### Point Sources

Large manufacturing (point) sources will reduce their emissions through the installation of Best Available Control Technology (BACT) required under the SIP. Costs to install point source controls will range between \$1,357 to \$25,319 per ton of reduction. Point sources will also be required to offset any future emission increases through the nonattainment area banking and trading program.

Utah's oil refineries will see the largest emissions reductions from the required application of state-of-the-art emissions controls. When fully implemented, these controls will reduce annual emissions by over 2,000 tons per year from current emission rates.

The permitting process and previous SIPs have regularly controlled emissions from point sources. Additional emission controls imposed by the Salt Lake and Provo PM<sub>2.5</sub> SIPs will result in 4,600 fewer tons per year emitted from point sources along the Wasatch Front.

### Area Sources

Area Sources include smaller, localized emission sources, such as: small businesses and manufacturers, home and commercial heating, food preparation, and printing services. The Air Quality Board approved 23 new area source rules to reduce area source emissions. Costs to install area source controls will range between \$238 and \$6,560 per ton.

New area source rules will reduce emissions from:

- Commercial Cooking
- Consumer Products
- Printing and Publishing
- Painting and Degreasing
- Wood Stoves and Boilers