
2009 – 2010 OXYGENATED FUELS PROGRAM
FOR WASHOE COUNTY

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Background

The oxygenation of gasoline reduces carbon monoxide (CO) emissions from motor vehicles during the winter months, when climatic factors tend to exacerbate carbon monoxide problems. The U.S. Environmental Protection Agency (EPA), under authority of the Clean Air Act Amendments of 1990, mandated an oxygenated fuel (oxy-fuel) program for 39 urban areas, including Washoe County, which had exceeded federal health standards for CO. In 1992, the first year of the federal mandate, only two days were recorded on which any of the participating urban areas exceeded the CO health standard: one day in Provo, Utah and the other day in Missoula, Montana.¹

Washoe County began its oxy-fuel program in December 1989. It is estimated that oxy-fuels reduce CO emissions by 5 to 30%. Since the first year of the oxy-fuel program in Washoe County, decreases have been observed in concentrations of CO during the winter months. The 2009-2010 season, the 21st year of the program, continued the success that is achieved with minimal cost and inconvenience to motorists.

According to the Washoe County 2005 Carbon Monoxide Emissions Inventory, gasoline-powered on-road motor vehicles accounted for approximately 62% of the CO emissions in the Truckee Meadows. This portion amounts to over 78,000 tons of CO emissions per year. Based on the EPA MOBILE6.2 computer model, the oxy-fuel program reduced CO emissions by approximately 2,000 tons in Washoe County during the 2009-10 oxy-fuel season.

In addition to on-road mobile sources, non-road mobile sources contributed an additional 39,000 tons, or 30%, of the total CO emissions according to the 2005 CO emissions inventory. Since non-road mobile sources contribute the second largest amount of CO emissions in Washoe County, the Air Quality Management Division (AQMD) also calculated the non-road CO emissions reduction for the 2009-2010 oxy-fuel season. The AQMD used the EPA's NONROAD 2008 model to calculate non-road mobile sources CO emissions. This is the same method used to calculate the 2005 emissions inventory, but it is with a newer version of the software. Non-road CO emissions accounted for another 1,400 tons of CO reduction from oxy-fuel usage during the oxy-fuel season.

This report was prepared in accordance with Section 040.095.D.1 of the District Board of Health Regulations Governing Air Quality Management.

Air Quality

No exceedances of either the 8-hour or 1-hour National Ambient Air Quality Standards (NAAQS) for CO were observed at any of the air quality monitors in Washoe County this season. This totals to 18 seasons of clean data for Washoe County. The last CO exceedance of the federal health standard occurred on December 13, 1991. Figure 1 illustrates the number of CO exceedances since 1988 at the Sparks, Galletti, and Reno monitoring sites. These are the sites in the AQMD's air quality monitoring network that usually record the highest CO levels.

The federal health standards for CO are based on one-hour and eight-hour averages. The AQMD has never measured an exceedance of the 1-hour average of 35 ppm. As illustrated below in Figure 1, the District has not had an exceedance of the eight-hour average of 9 ppm since December 1991.

¹ "Oxygenated fuel cuts emissions, EPA data show," 1993. The Oil and Gas Journal 91: 32.

Washoe County 8-hr Carbon Monoxide Concentration & Exceedances (1988/1989 - 2009/2010)

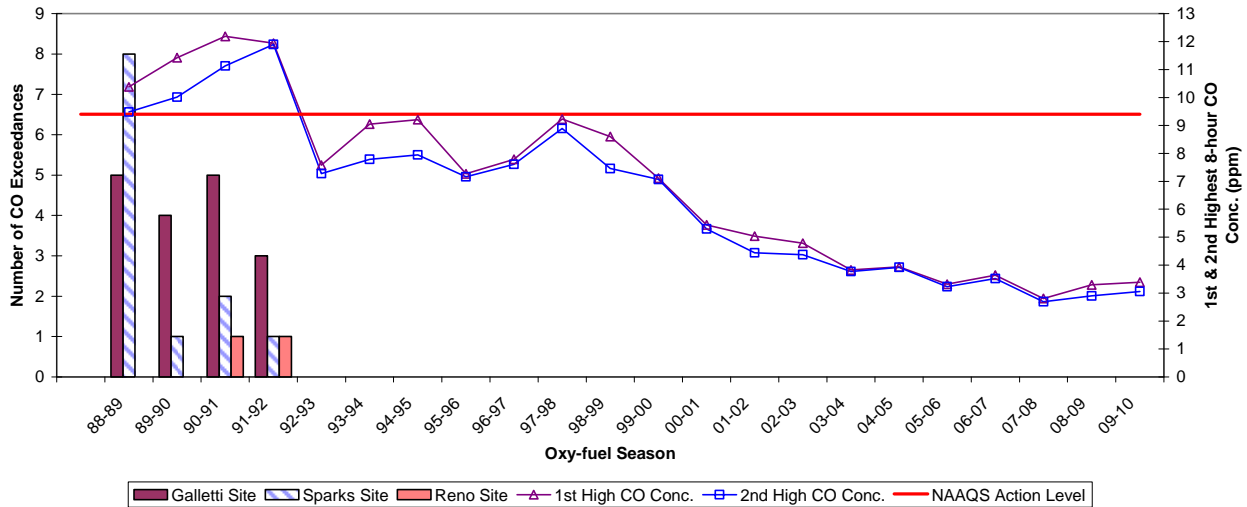


Figure 1

Additionally, Figure 1 graphically depicts the highest and second highest eight-hour CO concentrations from the 1988-1989 to 2009-2010 oxy-fuel season. Although Washoe County has not exceeded the federal standard for CO since 1991, CO levels in 1994-95 and 1997-98 oxy-fuel seasons were very close to the standard and probably would have exceeded the standard if not for the oxy-fuel program. The 2009-10 oxy-fuel season was a clean season for CO, and levels were comparable to those seen in the 2008-09 season, due to continuing improvement of motor vehicle technology and fleet turnover.

2009 - 2010 Program Details

For the 18th year since the federal mandate, the oxy-fuel season began on October 1 and ended on January 31. According to the State of Nevada, Department of Motor Vehicles, approximately 56.8 million gallons of gasoline were delivered in Washoe County between October 1, 2009, and January 31, 2010. Ethanol again was the only oxygenate fuel in the market this year. The oxygenate Methyl Tertiary Butyl Ether (MTBE) was not found in any of the tested stations.

On October 25, 2000, the District Board of Health adopted revisions to Section 040.095 (Oxygen Content of Motor Vehicle Fuels) of the District Board of Health Regulations Governing Air Quality Management. The revised regulation phases out the use of MTBE to satisfy the 2.7% oxygen requirement “effective the same date as the phase-out of MTBE in California.” The original first phase-out date for California was December 31, 2002, but the California Governor extended that date to December 31, 2003. In 2004, MTBE in California gasoline was fully phased out.

Section 040.095 was revised on September 22, 2005. This revision primarily addressed enforceability issues during emergency fuel supply interruptions.

Normal fluctuations in market prices make it difficult to isolate the increase in gasoline prices due to the oxy-fuel program. According to Western Energetix, LLC, a major local gasoline distributor, oxygenates has not contributed to any gasoline price increase in the last few years thus amounts to no extra cost incurred for CO emissions reduced by the oxy-fuel program. In comparison, the maximum reasonable cost for CO emission reductions per year for implementation of Best Available Control Technology in Washoe County is \$2,000 per ton.²

Compliance and Investigation

To ensure compliance, the AQMD collected a total of 128 random fuel samples of all available grades of gasoline during routine on-site inspections of gasoline stations. The AQMD also took eight additional control samples during this season, bringing the total up to 136 oxy-fuel samples to be tested. Gasoline samples collected by AQMD are tested by the Petroleum Laboratory of the Nevada Department of Agriculture (Dept. of Ag), which is responsible for testing gasoline octane and Reid Vapor Pressure (RVP) year round. The Dept. of Ag also tests for oxygenates during the oxy-fuel season. For the 2009-10 oxy-fuel season, the Dept. of Ag tested 82 additional samples separate from AQMD's samples. The Dept. of Ag's sample results cannot be used for AQMD enforcement; however, they indicate if a station's fuel supply contains any oxygenate thus determining whether a follow-up inspection needs to be conducted. Altogether, the Dept. of Ag tested 218 samples of gasoline in Washoe County for oxygenates this past season.

The Dept. of Ag analyzed all samples using gas chromatography. As a quality assurance measure, some samples were split and submitted to the lab as blind samples to ensure the analysis of each sample was accurate.

All gasoline sold during the program period is required by regulation to contain a minimum of 2.7% oxygen by weight. The AQMD accepts a testing tolerance, used by the laboratories, which allows for minor variations in percent oxygen due to problems of test reproducibility.

Among the 218 samples tested, 11 samples were below the required oxygen content level. Based on delivery receipts, AQMD confirmed that the low oxygen content in most of those samples were from low sales of existing inventories due to low throughput. Therefore, no action will be taken. However, two of the 11 failed samples were devoid of oxygen content. Since these samples came from two gasoline stations where the samples were collected by the Dept. of Ag, they are outside the jurisdiction of AQMD so no action will be taken.

The AQMD received no formal complaints from the public regarding oxygenated fuel this season.

Summary

Washoe County's oxy-fuel program is effective. Since the federal mandate of the oxy-fuel program in 1992:

² "Procedures for determining BACT emission controls," Washoe County District Health Dept. Air Quality Management Division, Policy # P-1-92, February 13, 1992

- The population has increased 54%;³
- Vehicle miles traveled has increased 50%;⁴ and
- The amount in gallons of gasoline sold in Washoe County has peaked at over 40% (2003-04 season) and over 28% (2009-2010 season) during oxy-fuel season.⁵

While at the same time:

- The AQMD has not recorded an exceedance of the CO NAAQS since December 13, 1991;
- Oxy-fuel accounted for 3% annual reduction of CO emissions from on-road mobile sources; and
- Oxy-fuel also accounted for 4% annual reduction of CO emissions from non-road mobile sources.

Since older vehicles have less efficient pollution control devices, oxy-fuel provides the greatest benefit to these older vehicles. In future years, as the Washoe County fleet turns over and these older vehicles are replaced with newer vehicles with more efficient pollution control equipment, the oxy-fuel program may have diminishing returns.

In November 2005, the Washoe County AQMD submitted a request to EPA for redesignation of the Truckee Meadows from a “moderate” CO non-attainment area to an “attainment/maintenance” area. The submittal also included the September 2005 revisions to Section 040.095 of the Washoe County District Board of Health Regulations Governing Air Quality Management. The redesignation to attainment/maintenance became effective on August 4, 2008. The oxy-fuel program will be reevaluated for its effectiveness in maintaining the CO NAAQS in the future. If the oxy-fuel program is removed from the State Implementation Plan, it will become a contingency measure to be reconsidered if the Truckee Meadows violates the CO NAAQS.

³ Population information obtained from the State of Nevada, Demographer's website.

⁴ Vehicle Miles Traveled information obtained from RTC Planning Dept - Supporting data for 2040 RTP, Approved November 21, 2008.

⁵ Gasoline Sale information for Washoe County obtained from the State of Nevada, Dept. of Motor Vehicle, Motor Carrier Division.