
2007 – 2008 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 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 oxygenated fuel (oxy-fuel) program in December 1989. It is estimated that oxygenated 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 2007-2008 season, the nineteenth 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 account for approximately 64% of the CO emissions in the Truckee Meadows. This portion amounts to over 81,000 tons of CO emissions per year. Based on the EPA MOBILE6 computer model, the oxy-fuel program for 2007-2008 reduced CO emissions by approximately 2,700 tons in Washoe County during the 4-month program period.

In addition to on-road mobile sources, non-road mobile sources contribute an additional 31% 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 2007-2008 oxy-fuel season. The AQMD used the EPA's NONROAD 2005 model to calculate non-road mobile sources CO emissions, the same method used to calculate the 2005 emissions inventory. Non-road CO emissions accounted for another 2,100 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 16 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 a one-hour average and an eight-hour average. The AQMD has never measured a violation of the 1-hour average of 35 ppm. As illustrated below

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

in Figure 1, the District has not had an exceedance of the eight-hour average of 9 ppm since the 91-92 winter season.

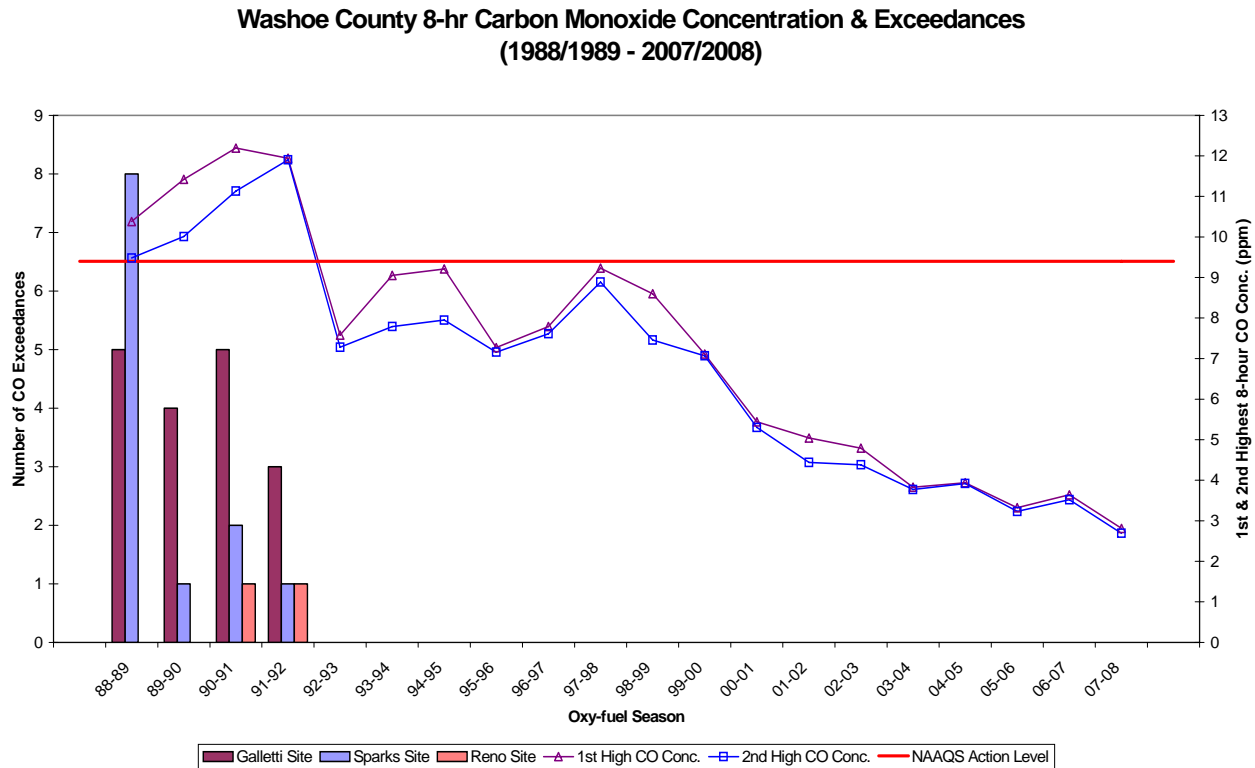


Figure 1

Additionally, Figure 1 also graphically depicts the highest and second highest eight-hour CO concentrations from the 1988-1989 to 2007-2008 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 2007-08 oxy-fuel season was a clean season for CO and levels were comparable to the levels seen in the 2006-07 season, due to continuing improvement of motor vehicle technology and fleet turnover.

2007 - 2008 Program Details

For the sixteenth 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 59.4 million gallons of gasoline were delivered in Washoe County between October 1, 2007, and January 31, 2008. 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. It has been estimated that there may be an increase of 5 cents per gallon due to the addition of oxygenates in gasoline. Using an increase of 5 cents per gallon, this amounts to a cost of approximately \$600 per ton of 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 105 random fuel samples of all available grades of gasoline during routine on-site inspections of gasoline stations. The AQMD also took two additional control samples during this season, bringing the total up to 107 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 2007-08 oxy-fuel season, the Dept. of Ag tested 182 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 289 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 289 samples tested, 7 samples were below the required oxygen content level. Based on delivery receipts, AQMD confirmed that the low oxygen content in those samples were from low sales of existing inventories due to low throughput. Therefore, no action was taken.

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

Summary

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

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

- The population has increased 55%;³
- Vehicle miles traveled has increased 70%;⁴ and
- The amount in gallons of gasoline sold in Washoe County has increased over 35% 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 5% annual reduction of CO emissions from non-road mobile sources.

Since older vehicles have less efficient pollution control devices, oxygenated 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. In January 2008, EPA proposed to approve the redesignation request and Section 040.095 (See 73 FR 1175). The public comment period ended on February 6, 2008 and EPA has not yet issued a final rule. When redesignation of the Truckee Meadows occurs, the oxy-fuel program will be reevaluated for its effectiveness in maintaining the CO NAAQS. 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 Washoe County Community Development's Website on Demographics.

⁴ Vehicle Miles Traveled information obtained from RTC Planning Dept.

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