Second 10-Year Carbon Monoxide Limited Maintenance Plan

Las Vegas Valley Maintenance Area Clark County, Nevada

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Clark County Department of Air Quality
4701 West Russell Road, Suite 200
Las Vegas, NV 89118

EXECUTIVE SUMMARY

This Limited Maintenance Plan is submitted by the Clark County Department of Air Quality for inclusion in the Nevada State Implementation Plan and will serve as the second 10-year carbon monoxide (CO) maintenance plan for the Las Vegas Valley maintenance area. It demonstrates how the Las Vegas Valley currently meets the federal 8-hour CO National Ambient Air Quality Standard and will maintain the standard through 2030.

The Las Vegas Valley was originally classified as a "moderate" nonattainment area for the 8-hour CO standard upon the enactment of the 1990 Clean Air Act Amendments (56 FR 56694). When Clark County did not attain the standard after a one-year attainment date extension, the Las Vegas Valley was reclassified as a "serious" nonattainment area. The area has been monitored in compliance with the 8-hour CO standard since 1998. On September 27, 2010, the Las Vegas Valley CO nonattainment area was redesignated to attainment when the U.S. Environmental Protection Agency's (EPA) approved Clark County's *Carbon Monoxide Redesignation Request and Maintenance Plan: Las Vegas Valley Nonattainment Area* (75 FR 59090). A second maintenance plan is now required and, once approved by EPA, will apply until 2030, fulfilling the maintenance planning requirements of the Act.

In accordance with EPA guidance,[1] the Las Vegas Valley qualifies for the use of a Limited Maintenance Plan, an option provided for areas at low risk of exceeding the CO standard. EPA will consider the maintenance demonstration satisfied if monitoring data shows the design value is at or below 7.65 parts per million, or 85 percent of the 8-hour standard. Based on the two most recent years of data (2016–2017), the current 8-hour CO design value for the Las Vegas Valley area is 2.8 parts per million, which is significantly lower than the standard.

Another requirement for using the Limited Maintenance Plan option is that the control and contingency measures from the previous maintenance plan remain in place. This plan essentially maintains existing controls and contingency provisions, and succeeds the plan EPA approved in 2010. CO levels are expected to remain well below the standard for the 10-year period ending in 2030.

In summary, this plan meets the requirements of Section 175A of the Act and conforms to EPA guidance for CO maintenance plans.

[1] Paisie, J.W. 1995. "Limited Maintenance Plan Option for Nonclassifiable CO Nonattainment Areas." Memorandum from Joseph W. Paisie, EPA Integrated Policy and Strategies Group, to EPA Air Branch chiefs, dated 10/6/95. Washington, D.C.: U.S. Environmental Protection Agency.

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ACRONYMS AND ABBREVIATIONS

Acronyms

BCC	Clark County Board of County Commissioners
CAA	Clean Air Act
CFR	Code of Federal Regulations
CO	carbon monoxide
DAQ	Clark County Department of Air Quality
DMV	Nevada Department of Motor Vehicles
EPA	U.S. Environmental Protection Agency
FMVECP	Federal Motor Vehicle Emissions Control Program
FR	*Federal Register*
HA	Hydrographic Area
HAP	hazardous air pollutant
I/M	Inspection/Maintenance Program
LMP	Limited Maintenance Plan
NAAQS	National Ambient Air Quality Standards
NEI	National Emissions Inventory
RVP	Reid vapor pressure
SIP	state implementation plan
VMT	vehicle miles traveled

Abbreviations

ppm	parts per million
psi	pounds per square inch
tpd	tons per day

1.0 INTRODUCTION

The Clean Air Act (CAA) requires the U.S. Environmental Protection Agency (EPA) to set National Ambient Air Quality Standards (NAAQS) to protect public health for six common air pollutants, including carbon monoxide (CO). There are two federal standards for CO: an 8-hour standard of 9 parts per million (ppm) and a 1-hour standard of 35 ppm. The standard allows no more than one exceedance of either standard in each calendar year; a violation occurs when two or more exceedances are recorded at the same monitoring site in the same year. Areas with levels above the standard must develop plans to reduce CO emissions. Areas that previously violated these standards, but are now in compliance, must submit plans to assure continued attainment.

1.1 PURPOSE

This Limited Maintenance Plan (LMP) shows how the Las Vegas Valley CO maintenance area will continue to attain the CO NAAQS through 2030. The Las Vegas Valley CO nonattainment area was redesignated to attainment following EPA's approval of the *Carbon Monoxide Redesignation Request and Maintenance Plan: Las Vegas Valley Nonattainment Area* (2008 CO maintenance plan) on September 27, 2010, in volume 5, page 59090 of the *Federal Register* (75 FR 59090). Section 175A of the CAA requires that areas redesignated to attainment submit a plan for maintaining the NAAQS for a second 10-year period following the expiration of the previous plan. The Clark County Department of Air Quality (DAQ) has determined the Las Vegas Valley CO maintenance area qualifies for an LMP.

1.2 CHARACTERISTICS OF CARBON MONOXIDE

CO is a colorless, odorless, poisonous gas that decreases the oxygen-carrying capacity of the blood. High concentrations can severely impair the function of oxygen-dependent tissues, including the brain, heart, and other vital organs. Prolonged exposure to even low levels can aggravate existing conditions in people with heart disease or circulatory disorders.

CO is produced by the incomplete combustion of carbon-containing compounds such as wood, coal, and liquid and gaseous fuels. Its formation is enhanced when the oxygen supply is inadequate for complete oxidation of fuels to carbon dioxide. Most CO emissions are from the incomplete combustion of gasoline by motor vehicles, with peak concentrations normally occurring along roadways and near intersections with high-traffic levels. Calm winds during the late fall and winter, coupled with night and early morning ground-based temperature inversions and low precipitation, generally precipitate the buildup of CO concentrations in the Las Vegas Valley.

1.3 BACKGROUND

1.3.1 Designation History

Portions of the Las Vegas Valley began violating the CO NAAQS during the winter months in the mid-1980s. The number and severity of these violations caused EPA to automatically designate the Las Vegas Valley a "moderate" nonattainment area upon enactment of the Clean Air Act Amendments of 1990 (56 FR 56694). Areas classified as "moderate" nonattainment were required

to submit state implementation plans (SIPs) demonstrating attainment of the standard by December 31, 1995. The valley was reclassified as a "serious" nonattainment area on October 2, 1997, when EPA determined the area had not attained the standard after receiving a one-year extension of the attainment date (62 FR 51604). Areas reclassified as "serious" nonattainment were required to establish measures and develop SIPs demonstrating attainment of the CO NAAQS by December 31, 2000.

In August 2000, the Clark County Board of County Commissioners (BCC) adopted Clark County's *Carbon Monoxide State Implementation Plan: Las Vegas Valley Nonattainment Area* (2000 CO SIP). EPA formally approved the 2000 CO SIP in September 2004 (69 FR 56351). In October 2005, the BCC adopted the *Carbon Monoxide State Implementation Plan Revision: Las Vegas Valley Nonattainment Area* (2005 CO SIP revision), which updated the CO motor vehicle emissions budgets contained in the 2000 CO SIP using the latest EPA-approved model (MOBILE6.2) for transportation conformity determinations. EPA issued formal approval of the 2005 CO SIP revision in August 2006 (71 FR 44587).

In September 2008, the BCC adopted the 2008 CO maintenance plan supporting redesignation of the Las Vegas Valley CO nonattainment area to attainment. EPA approved the plan, and the Las Vegas Valley was redesignated to attainment effective September 27, 2010 (75 FR 59090). The 2008 CO maintenance plan detailed Clark County's attainment of the CO NAAQS and the control measures in place to ensure the standard was maintained over the next 10 years (through 2020). This LMP serves as the second 10-year (through 2030) CO maintenance plan for the Las Vegas Valley CO maintenance area.

Due to the implementation of several control programs, CO concentrations in the Las Vegas Valley have improved substantially. There have been no recorded exceedances of the CO NAAQS since 1998. Details on CO trends in the Las Vegas Valley are provided in Section 2.2.1.

1.3.2 Las Vegas Valley Carbon Monoxide Maintenance Area

Figure 1-1 shows the Las Vegas Valley CO maintenance area, defined as Hydrographic Area (HA) 212, which is the geographic area subject to this maintenance plan. The area encompasses approximately 1,500 square miles, largely under federal control.

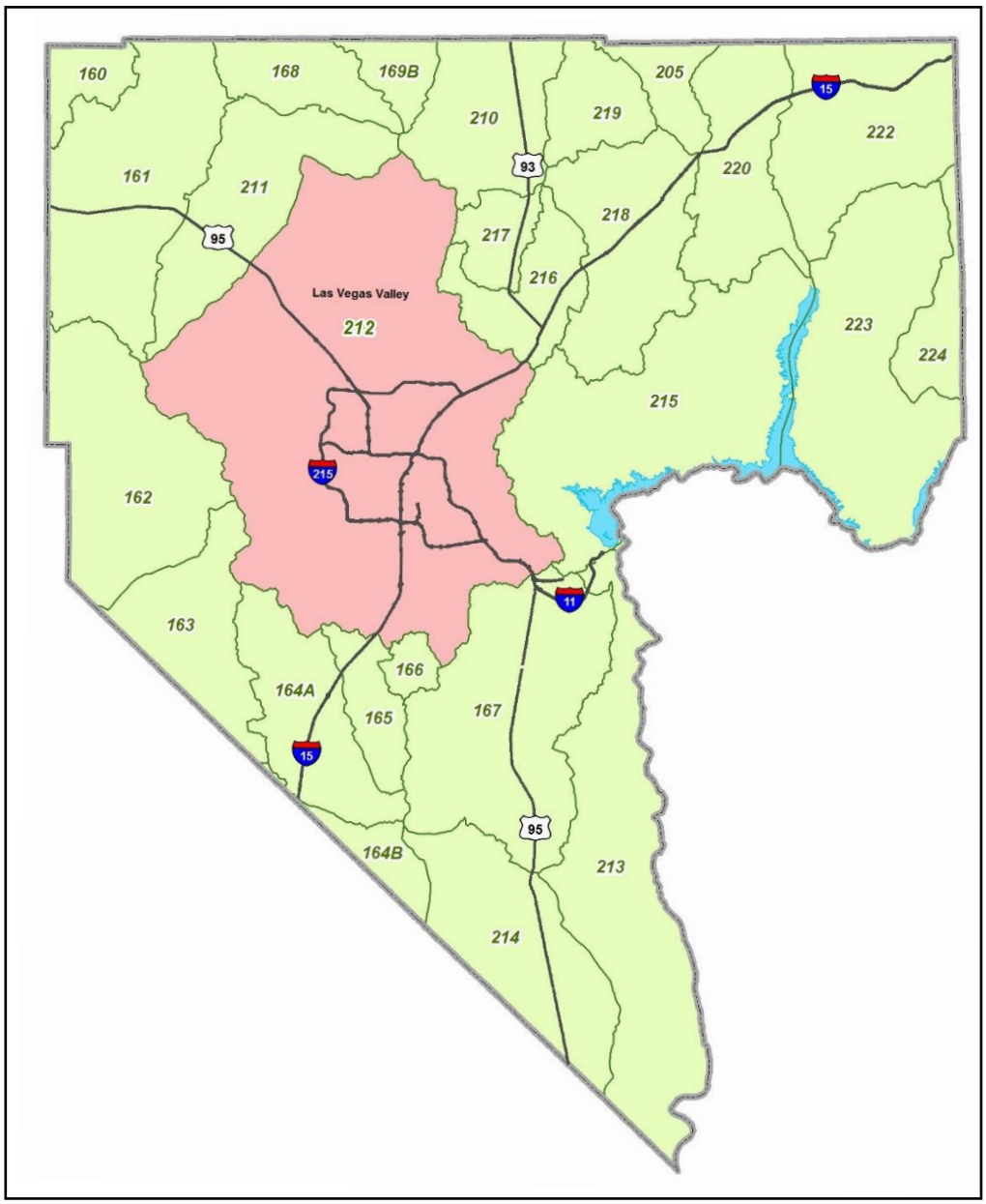

Figure 1-1. Las Vegas Valley CO Maintenance Area (HA 212).

1.3.3 Monitoring Network

DAQ's current CO monitoring network consists of three State and Local Air Monitoring Stations (SLAMS), all located in the Las Vegas Valley CO maintenance area. Figure 1-2 is a map of DAQ's 2017 CO monitoring network. Three of the stations shown on this map remain in operation: Jerome Mack, Sunrise Acres, and Rancho & Teddy. The J.D. Smith station was permanently shut down with EPA's approval on December 31, 2017, due to measurement challenges posed by siting obstructions. The Rancho & Teddy station is a near-road site that opened in 2015 and began monitoring CO in January 2017. It is located in a heavily trafficked area adjacent to Interstate 15. On August 7, 2017, EPA approved DAQ's proposal for a monitoring station at the Walnut

Community Center in the northeast part of the Las Vegas Valley, an area underrepresented by the existing network. This site is currently under development and will replace the J.D. Smith station, operating a CO SLAMS monitor. Appendix A contains a copy of EPA's letter approving the J.D. Smith station closure and the proposed Walnut Community Center station.

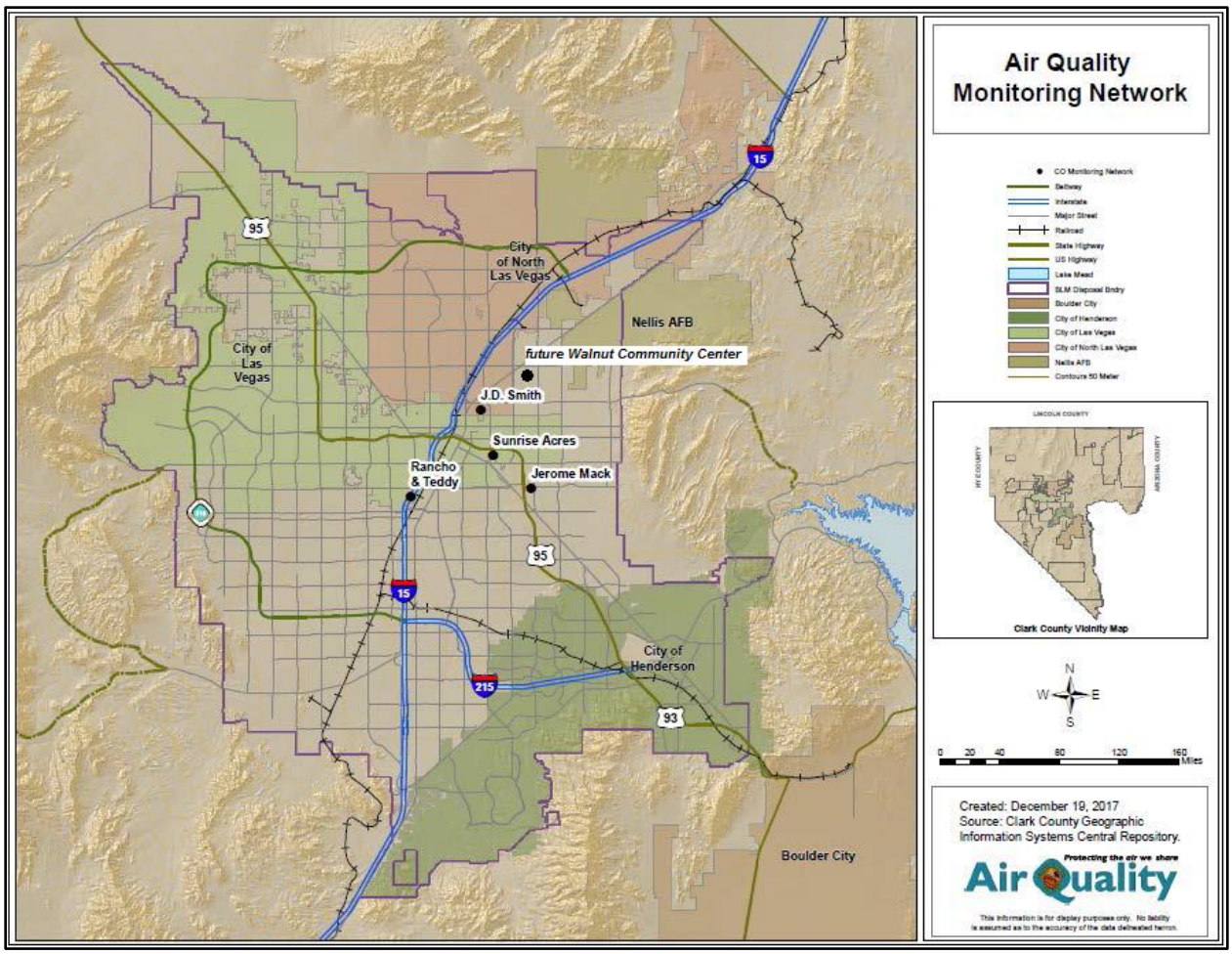

Figure 1-2. 2017 CO SLAMS Monitoring Network.

1.4 LIMITED MAINTENANCE PLAN OPTION

In 1995, EPA issued "Limited Maintenance Plan Option for Nonclassifiable CO Nonattainment Area" guidance,[2] providing areas that qualified the opportunity to use a less rigorous LMP for their second 10-year maintenance plan. This guidance requires that an area have a design value less than 85 percent of the 8-hour CO standard (7.65 ppm) to qualify for the LMP approach. The design value is based on the highest of the second highs using the two most recent years of data for all CO monitors in the maintenance area. Based on 2016–2017 monitoring data, the 8-hour CO design value for the Las Vegas Valley is 2.8 ppm. This is well below the 8-hour standard and 85 percent level, so the area is eligible for the LMP option.

[2] Joseph W. Paisie, "LMP Option for Nonclassifiable CO Nonattainment Areas" memo.

The LMP approach requires the development of an attainment emissions inventory for a typical winter day, but does not require projected future-year emissions inventories like a typical maintenance plan. Under an LMP, a maintenance demonstration is considered to be satisfied if monitoring data shows the area is meeting the air quality criteria for an LMP (i.e., 85 percent of the CO NAAQS). EPA believes the continued applicability of prevention of significant deterioration requirements, any control measures already contained in the SIP, and federal measures should provide adequate assurance of maintenance for such areas (Paisie 1995). Additionally, with an approved CO LMP, federal actions requiring conformity determinations under the transportation or general conformity rules could be considered to satisfy the budget test required in the respective rules. Section 3.0 addresses the required elements of an LMP.

This LMP serves as the second 10-year maintenance plan for the Las Vegas Valley CO maintenance area. It demonstrates how the area continues to attain the CO NAAQS and will remain in attainment of the standard through 2030.

2.0 DISCUSSION OF ATTAINMENT

Attainment of the CO NAAQS is demonstrated when monitoring data at each site show no more than one exceedance per year of the 8-hour (9 ppm) and 1-hour (35 ppm) standards. The Las Vegas Valley is currently a maintenance area for the CO NAAQS; it was redesignated to attainment in September 2010 based on 2008–2009 monitoring data and EPA's approval of the 2008 CO maintenance plan (75 FR 59090). The historic and recent air quality data provided in this section demonstrate how the area continues to meet the standard.

2.1 HISTORIC VALUES

The Las Vegas Valley has not exceeded or violated the 8-hour CO standard since 1998, and has never exceeded the 1-hour standard. Before 1998, the valley regularly exceeded the 8-hour standard during the winter months; Figure 2-1 shows the exceedances recorded in the Las Vegas Valley between 1981 and 1998. Since that time, the magnitude of observed CO concentrations has decreased dramatically due to the implementation of several control programs. Figure 2-2 illustrates the declining trend in maximum CO concentrations between 1981 and 2017.

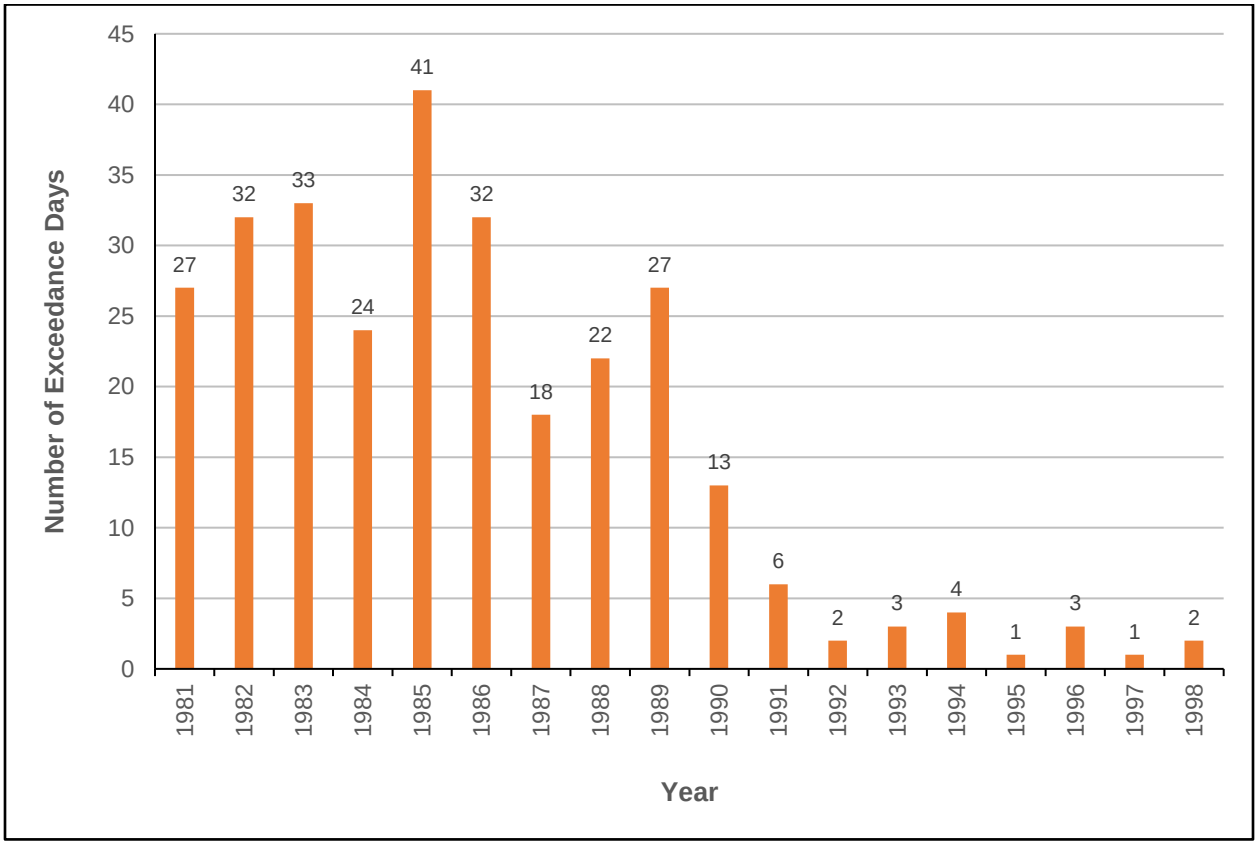

Figure 2-1. CO Exceedances in Las Vegas Valley (1981–1998).

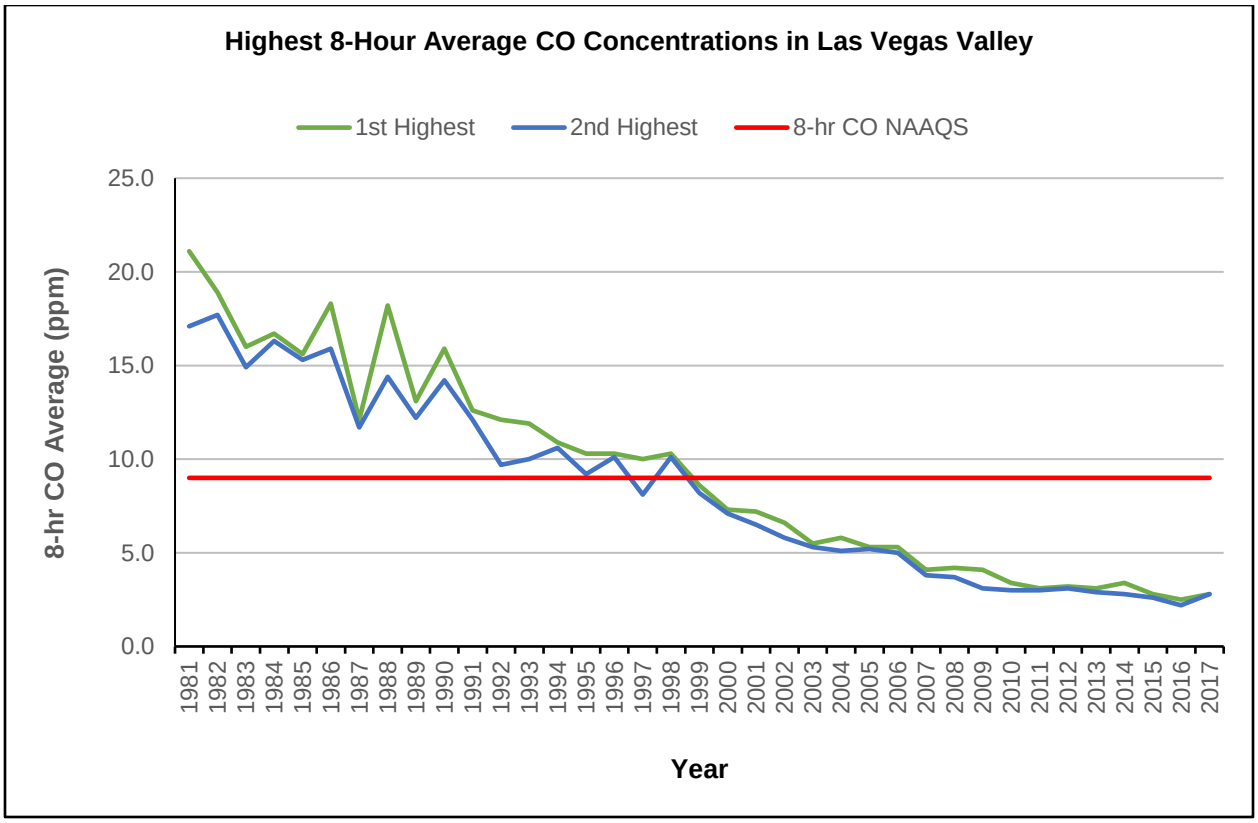

Figure 2-2. CO Air Quality Trends in Las Vegas Valley (1981–2017).

Table 2-1 contains the highest CO monitoring data for all active and inactive monitoring sites in operation from the submittal of the 2008 CO maintenance plan through 2015. All sites are located in the Las Vegas Valley CO maintenance area. As shown, monitors in the maintenance area have continued to record 1- and 8-hour maximum averages that are significantly below the CO NAAQS.

Table 2-1. Historic CO Values for the Las Vegas Valley (2008–2015)

Site Name AQS ID	Year	1-hour		8-hour	
		1st Max (ppm)	2nd Max (ppm)	1st Max (ppm)	2nd Max (ppm)
Winterwood[1] 32-003-0538	2008	3.8	3.8	2.9	2.9
	2009	3.8	3.7	3.0	2.8
	2010	3.0	2.9	2.6	2.5
	2011	3.4	2.9	2.4	2.4
	2012	3.0	2.9	2.5	2.2
	2013	3.2	3.1	2.8	2.4
	2014	3.1	3.1	2.9	2.4
East Sahara[2] 32-003-0539	2008	5.1	4.7	4.2	3.7
	2009	4.5	4.2	4.0	3.1
	2010	3.7	3.6	3.4	3.0

Site Name AQS ID	Year	1-hour		8-hour	
		1st Max (ppm)	2nd Max (ppm)	1st Max (ppm)	2nd Max (ppm)
Jerome Mack 32-003-0540	2011	3.2	3.1	2.6	2.6
	2012	3.2	3.2	2.8	2.8
	2013	3.6	3.5	3.1	2.5
	2014	3.8	3.3	3.3	2.7
	2015	2.6	2.5	2.4	2.3
Sunrise Acres 32-003-0561	2008	4.2	4.2	3.6	3.5
	2009	5.2	4.7	4.1	2.8
	2010	3.8	3.6	3.0	3.0
	2011	3.7	3.5	3.1	3.0
	2012	3.6	3.6	3.2	3.1
	2013	4.0	4.0	3.1	2.9
	2014	4.4	3.7	3.4	2.8
	2015	3.4	3.2	2.8	2.6
ORR[3] 32-003-1021	2008	3.2	3.2	2.6	2.6
	2009	3.4	3.2	2.8	2.6
	2010	3.2	3.0	2.7	2.7
J.D. Smith 32-003-2002	2008	4.2	3.6	2.5	2.5
	2009	3.3	3.2	2.4	2.4
	2010	3.0	3.0	2.3	2.3
	2011	2.9	2.9	2.4	1.9
	2012	3.1	3.0	2.1	2.1
	2013	3.3	3.0	2.4	2.4
	2014	3.2	3.2	2.7	2.2
	2015	3.0	2.6	1.8	1.8

Source: EPA's Air Quality System (AQS). Retrieved from https://www.epa.gov/aqs
[1] Site was shut down in October 2014.
[2] Site was shut down in April 2010.
[3] Site was shut down in April 2010.

2.2 RECENT AIR QUALITY VALUES

Table 2-2 shows the most recent CO monitoring data for all active and inactive monitoring sites in operation during 2016–2017. All sites are located in the Las Vegas Valley CO maintenance area. See Section 1.3.3 for more information on DAQ's current CO monitoring network.

Table 2-2. Current CO Values for Las Vegas Valley (2016–2017)

Site Name AQS ID	Year	1-hour		8-hour	
		1st Max (ppm)	2nd Max (ppm)	1st Max (ppm)	2nd Max (ppm)
Jerome Mack 32-003-0540	2016	2.7	2.6	2.2	2.2
	2017	2.9	2.9	2.5	2.5
Sunrise Acres 32-003-0561	2016	3.0	2.9	2.5	2.2
	2017	3.5	3.2	2.8	2.8
J.D. Smith[1] 32-003-2002	2016	3.1	2.9	2.3	2.0
	2017	2.8	2.5	2.1	1.9
Rancho & Teddy[2] 32-003-1501	2017	1.9	1.8	1.5	1.5

Source: EPA's Air Quality System. Retrieved from https://www.epa.gov/aqs
[1] Site was shut down in December 2017.
[2] Site began monitoring CO in January 2017.

2.2.1 Design Value

Methods for determining an area's CO design value are outlined in EPA's "Ozone and Carbon Monoxide Design Value Calculations" guidance.[3] The design value is the highest of the second maximum 8-hour concentrations observed at any site in the area using the two most recent years of data. Based on the 2016–2017 monitoring data in Table 2-2, the Las Vegas Valley's current 8-hour average CO design value is 2.8 ppm, well below the 8-hour NAAQS of 9 ppm and the CO LMP eligibility threshold of 7.65 ppm (85 percent of the CO NAAQS). Figure 2-3 illustrates the declining trend in CO design values in the Las Vegas Valley between 2000 and 2017.

[3] Laxton, W.G. 1990. "Ozone and Carbon Monoxide Design Value Calculations." Memorandum from William G. Laxton, Technical Support Division, dated 6/18/90. Washington, D.C.: U.S. Environmental Protection Agency.

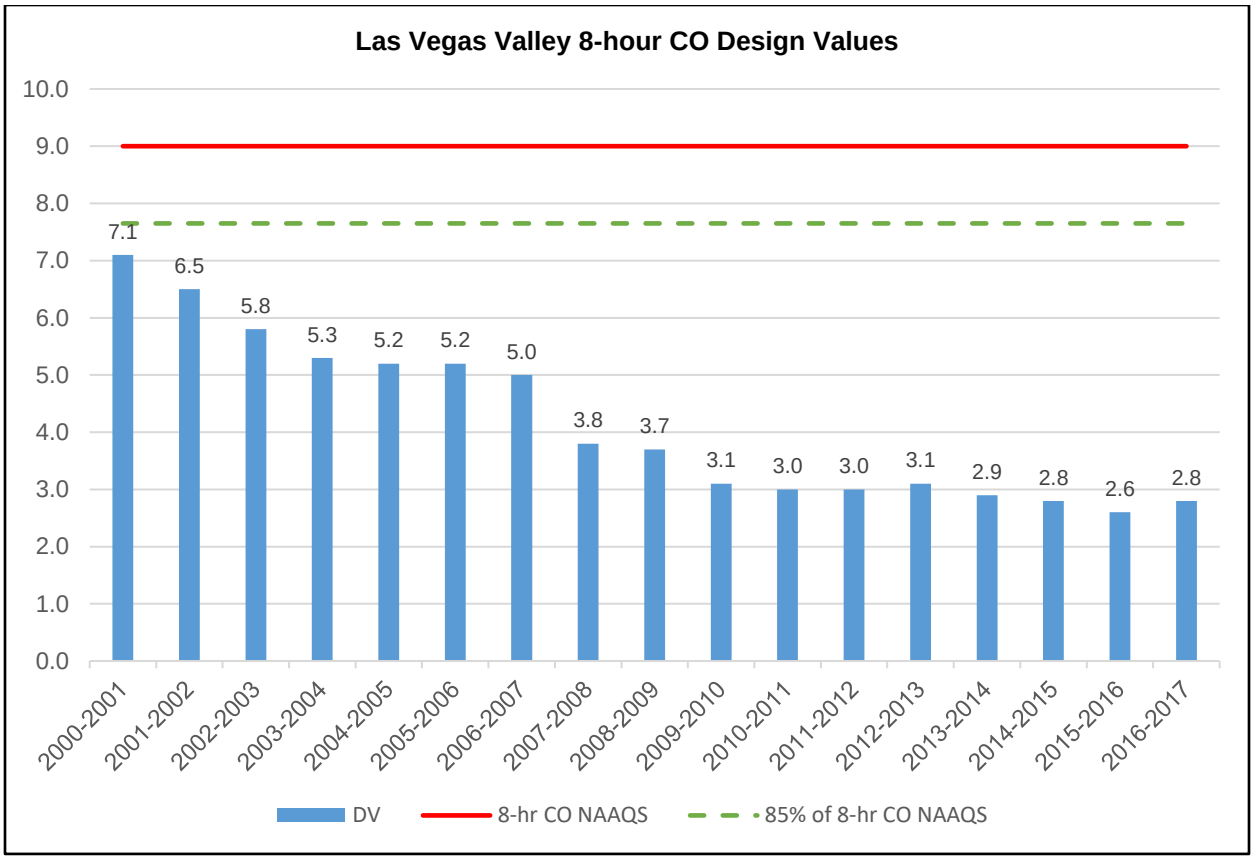

Figure 2-3. CO Design Value Trends for Las Vegas Valley (2000–2017).

3.0 LIMITED MAINTENANCE PLAN

This plan addresses the following core provisions required in an LMP, and outlines the regulatory and control measures in place to ensure continued compliance with the CO NAAQS over the second 10-year period (through 2030):

- Attainment Inventory
- Maintenance Demonstration
- Monitoring Network/Verification of Continued Attainment
- Contingency Plan
- Conformity Determinations

3.1 ATTAINMENT INVENTORY

The LMP should contain an attainment emissions inventory that identifies a level of CO emissions in the area that is sufficient to attain the CO NAAQS, and should represent "typical winter day" CO emissions for the time period associated with the monitoring data showing attainment (Paisie 1995). This inventory contains estimates of how much CO is emitted by all source categories in the area. Under the LMP option, there is no requirement to project emissions over the maintenance period.

3.1.1 Emission Inventory Type Categories

The inventories for CO emissions were derived from estimates developed for the following source categories: point, nonpoint, aviation, onroad mobile, and nonroad mobile. The following sections provide a brief description of each source category and the methodologies and emission factors used to calculate their estimated emissions.

3.1.1.1 Point Sources

Point sources are industrial, commercial, or institutional stationary sources that emit criteria and/or hazardous air pollutants (HAP). Major point sources have the potential to emit 100 tons per year or more of any criteria pollutant and/or have the potential to emit 10 tons per year or more of any single HAP or 25 tons or more of a combination of HAPs. For this inventory, DAQ has included all facilities in the Clark County Title V operating permit program that are located in the Las Vegas Valley CO maintenance area (HA 212). DAQ staff reviewed the 2017 emissions reported by each facility for quality assurance purposes. Emissions estimates for each facility were calculated using a variety of emission estimation methods, including continuous emission monitors, stack test data, mass balance, manufacturer's specifications, or EPA emission factors.

These point sources are also required to provide monthly or quarterly throughput data in their semiannual compliance reports. When available, this throughput data was used to allocate emissions for the CO season (December, January, and February). Seasonal emissions were then divided by the three months (90 days) representing the CO season to obtain tons per day (tpd) emissions. Table 3-1 shows estimated CO emissions for point sources in HA 212 in 2017.

Table 3-1. 2017 HA 212 Point Source CO Emission Estimates

Facility ID	Facility Name	Annual 2017 Emissions (tons)	CO Season Allocation (%)	CO Season Emissions (tpd)
00004	Certainteed Gypsum Manufacturing	49.13	25	0.14
00007	Clark Generating Station	66.86	1	0.01
00013	Calnev Pipe Line LLC	0.14	25	<0.01
00019	Titanium Metals Corporation	57.59	25	0.16
00095	EMD Acquisition LLC	38.30	24	0.10
00114	Nellis Air Force Base	11.42	25	0.03
00257	Caesars Consolidated Properties	16.15	25	0.04
00329	Las Vegas Generating Station	8.06	25	0.02
00372	Aggregate Industries Sloan Quarry	19.29	24	0.05
00393	Saguaro Power Company	15.91	26	0.05
00423	Sun Peak Generating Station	6.11	2	<0.01
00825	MGM Resorts International	75.94	25	0.21
15033	Sunrise Municipal Solid Waste Landfill	21.33	28	0.07
16304	Switch LTD	4.34	25	0.01
17286	Blue Diamond Hill Gypsum	17.51	23	0.04
	Total:	**408.08**		**0.93**

3.1.1.2 Nonpoint Sources

Nonpoint sources are stationary sources that are too small or numerous to be treated as individual point sources. These generally consist of commercial, small-scale industrial, and residential operations whose emissions fall below point source reporting levels. According to EPA, the 2017 National Emissions Inventory (NEI) for nonpoint sources will not be available until early 2020. DAQ therefore used nonpoint data from EPA's 2016 modeling platform (alpha version) as a surrogate for 2017. The department believes the differences between 2016 and 2017 are insignificant, considering the uncertainties in the emission estimates. DAQ ran the Sparse Matrix Operator Kernel Emissions (SMOKE) model using nonpoint data in three different sectors: residential wood combustion, railroad, and other stationary nonpoint sources. For practical purposes, DAQ ran the SMOKE model for the month of January to represent typical wintertime weekday CO emissions. Table 3-2 shows the average wintertime weekday CO emission estimates from nonpoint sectors in Clark County for 2017.

Table 3-2. 2017 Clark County Wintertime Nonpoint Source CO Emission Estimates

Nonpoint Sources	CO Emissions (tpd)
Residential wood combustion	34.93
Railroad	0.27
Other nonpoint sources	8.28
Total:	**43.48**

3.1.1.3 Aviation

McCarran International Airport, Henderson Executive Airport, and North Las Vegas Airport are the three commercial airports located in HA 212. DAQ also included the military airport (Nellis Air Force Base) in the CO emissions inventory. 2014 CO emissions for the airports in HA 212 were obtained from NEI data. Airport operations data for 2014 and 2017 were obtained from the Federal Aviation Administration's Air Traffic Activity System and Terminal Area Forecast databases. The difference in airport operations between 2014 and 2017 was expressed as a ratio, which was then multiplied by the 2014 NEI to estimate annual CO emissions for 2017. Assuming a flat temporal profile, these annual emissions were divided by 365 days to obtain the average CO season emissions in tpd. Table 3-3 shows estimated CO emissions for the aviation sector in HA 212 in 2017.

Table 3-3. 2017 HA 212 Aviation CO Emission Estimates

Airport Name	Annual 2017 CO Emissions (tons)	CO Season Emissions (tpd)
Henderson Executive Airport	207.59	0.57
McCarran International Airport	3633.03	9.95
Nellis Air Force Base	210.45	0.58
North Las Vegas Airport	523.50	1.43
Total:	**4574.57**	**12.53**

3.1.1.4 Onroad Mobile Sources

DAQ has developed onroad mobile source emissions estimates for 2017 using MOVES2014b, the latest release of EPA's MOVES model. Onroad mobile sources from MOVES include emissions from the 13 source types listed in Table 3-4.

Table 3-4. MOVES Source Use Type

Source Type ID	MOVES Source Type Name
11	Motorcycle
21	Passenger Car
31	Passenger Truck
32	Light Commercial Truck
41	Intercity Bus
42	Transit Bus
43	School Bus
51	Refuse Truck
52	Single Unit Short-haul Truck
53	Single Unit Long-haul Truck
54	Motor Home
61	Combination Short-haul Truck
62	Combination Long-haul Truck

3.1.1.4.1 MOVES Inputs

DAQ developed county-specific MOVES input data for 2017 using the latest information. The MOVES County Database for Clark County was generated for 2017 and submitted to EPA on January 15, 2019, as part of the Air Emissions Reporting Requirements process.

The key MOVES inputs include vehicle activity data, fleet age distribution, fuel parameters, and inspection and maintenance (I/M) programs. DAQ conducted a vehicle classification study, completed in June 2018, that used 2014–2016 traffic count data collected by the Nevada Department of Transportation and included an onroad license plate survey at selected roadway locations. The collected license plate numbers were matched to vehicle identification numbers and decoded to obtain vehicle attributes that allowed DAQ's contractor to differentiate between cars and light-duty trucks. The primary products of the vehicle classification study were a vehicle miles traveled (VMT) mix and temporal profiles, which were incorporated into the 2017 MOVES input database.

The Nevada Department of Motor Vehicles (DMV) provided DAQ with the vehicle registration data for Clark County by model year and vehicle type, which were used to generate vehicle population and vehicle age distribution inputs. The age distributions for 2017 were based on the vehicle registration data from DMV for light-duty vehicle types, while age distributions for heavy-duty vehicle types were exported from MOVES2014b's default database. However, a better source of data for age distribution is the vehicle identification number decoding of 2017 registration data, which is currently under development by EPA and will be used in the 2016 modeling platform.

Vehicle speed distribution is a crucial component for onroad emission inventories, and the Coordinated Research Council has sponsored a number of projects aimed at improving the onroad portion of the NEI. For the Clark County 2017 MOVES database, average vehicle speed distributions by 16 MOVES speed bins for each vehicle type were based on council-sponsored Project A-100, which used StreetLight Vehicle Telematics Data.

Activity data for each vehicle type, such as VMT and vehicle population, are required inputs for MOVES. The VMT data used for 2017 were derived from the Nevada Department of Transportation's annual Highway Performance Monitoring System reports for 2017. The MOVES model requires annual or daily VMT by vehicle type. Using the VMT mix information developed from the Clark County Vehicle Classification Study mentioned earlier, DAQ generated annual VMT for each vehicle or source type. Table 3-5 shows annual VMT by source type for 2017.

Table 3-5. 2017 Clark County Annual VMT by Vehicle Type

Source Type ID	Source Type Name	Annual VMT
11	Motorcycle	106,386,954
21	Passenger car	9,208,010,383
31	Passenger truck	7,407,161,693
32	Light commercial truck	792,674,327
41	Intercity bus	58,489,698
42	Transit bus	28,032,592
43	School bus	23,000,000
51	Refuse truck	14,183,328
52	Single unit short-haul truck	229,675,451
53	Single unit long-haul truck	20,871,686
54	Motor home	1,933,403
61	Combination short-haul truck	170,417,334
62	Combination long-haul truck	252,543,847
	Total:	**18,313,380,695**

The vehicle type population data were primarily derived from DMV's vehicle registration database. Adjustments were made based on further data obtained from the Regional Transportation Commission of Southern Nevada for transit buses and local refuse haulers. The school bus populations were based on reports from the online magazine *School Bus Fleet* (www.schoolbusfleet.com). Vehicle population estimates for combination short-haul and long-haul trucks were based on the MOVES default database. Table 3-6 shows the Clark County vehicle population data used in the MOVES modeling effort.

Table 3-6. 2017 Clark County Vehicle Population

Source Type ID	Source Type Name	Vehicle Population
11	Motorcycle	42,492
21	Passenger car	714,907
31	Passenger truck	557,168
32	Light commercial truck	59,625
41	Intercity bus	374
42	Transit bus	797
43	School bus	1,957
51	Refuse truck	632
52	Single unit short-haul truck	16,395
53	Single unit long-haul truck	1,160
54	Motor home	910
61	Combination short-haul truck	5,660
62	Combination long-haul truck	6,336
	Total:	**1,408,413**

Information regarding vehicle I/M programs is another important input for the MOVES model. In the Las Vegas Valley, the state I/M program requires an annual two-speed idle test for 1995 and

older vehicles and onboard diagnostics checks (exhaust and evaporative) for 1996 and newer vehicles. This information was incorporated into MOVES modeling. Since classic vehicles in Clark County can be exempted from I/M tests, the DMV's classic vehicle data were also factored into the Clark County MOVES database. The fuel parameters from the MOVES2014b default database for Clark County were used.

3.1.1.4.2 Onroad Mobile Emission Estimates

Table 3-7 shows the average weekday CO emissions estimates in Clark County in 2017 by MOVES source type. These CO emissions are January weekday averages; for practical purposes, DAQ ran MOVES2014b only for the month of January to represent typical wintertime weekday onroad CO emissions. As shown, the highest CO emission is from the Passenger Truck category, followed by the Passenger Car category. Total estimated CO emissions from onroad mobile sources are 278.18 tpd.

Table 3-7. 2017 Clark County Wintertime Weekday Onroad CO Emission Estimates

Source Type ID	Source Type Name	CO Emissions (tpd)
11	Motorcycle	4.386
21	Passenger car	94.526
31	Passenger truck	149.620
32	Light commercial truck	17.164
41	Intercity bus	0.554
42	Transit bus	0.459
43	School bus	0.442
51	Refuse truck	0.122
52	Single unit short-haul truck	6.497
53	Single unit long-haul truck	0.300
54	Motor home	0.162
61	Combination short-haul truck	0.876
62	Combination long-haul truck	3.070
	Total:	**278.18**

3.1.1.5 Nonroad Mobile Sources

Nonroad mobile equipment encompasses a wide variety of equipment types that either move under their own power or are capable of being moved from site to site. DAQ generated nonroad mobile emission inventories for 2017 using the nonroad module of the latest MOVES model, MOVES2014b, which was released in August 2018. MOVES2014b improves on nonroad engine population growth rates, nonroad Tier 4 engine emissions rates, and the sulfur levels of nonroad diesel fuels.

The nonroad module of MOVES includes both emission factors and default county-level population and activity data. The model estimates emissions and can be post-processed to generate emission factors. It includes more than 80 basic and 260 specific types of nonroad equipment, but does not include commercial marine, and aircraft emissions. The model does, however, estimate

emissions from railroad yard maintenance equipment. Equipment information is arranged into the following categories or sectors:

- Recreational vehicles, such as all-terrain vehicles and off-road motorcycles
- Construction equipment, such as graders and backhoes
- Industrial equipment, such as forklifts and sweepers
- Residential and commercial lawn and garden equipment, such as leaf and snow blowers
- Agricultural equipment, such as tractors, combines, and balers
- Commercial equipment
- Logging equipment, such as shredders and large chain saws
- Airport ground support, such as terminal tractors
- Underground mining equipment
- Oil field equipment
- Pleasure craft, such as power boats
- Railroad yards

MOVES incorporates default estimates, variables, and factors for use in calculations. All data are stored in MySQL database tables, and can be changed if data more appropriate to the local area are available. Due to limited time and resources, DAQ used MOVES2014b's default input database to estimate nonroad CO emissions in 2017.

Table 3-8 shows MOVES2014b CO emissions estimates for Clark County by sector. Emissions from the Airport Ground Support sector were zeroed out, since they were estimated as part of the airport emission inventories. The emissions from the Oil Field and Pleasure Craft sectors were also zeroed out because these source activities occur outside the Clark County CO nonattainment area (HA 212). DAQ ran MOVES2014b for the month of January to represent wintertime nonroad emissions.

Table 3-8. 2017 Clark County Wintertime Nonroad CO Emission Estimates

Sector Name	CO (tpd)
Recreational	2.379
Construction	42.695
Industrial	1.662
Lawn/garden	43.768
Agriculture	0.006
Commercial	23.305
Logging	0
Airport support	0
Underground mining	0
Oil field	0
Pleasure craft	0
Railroad	0.025
Total:	**113.84**

3.1.2 Summary of Emission Inventories

Table 3-9 summarizes the estimated tons of CO emitted in Clark County per winter day in 2017 by source category. Due to limitations in modeling, and because a majority of the population resides and travels within HA 212, estimated emissions for nonpoint, onroad mobile, and nonroad mobile sources include Clark County in its entirety, as opposed to just the Las Vegas Valley CO maintenance area. This is a more conservative approach that likely over projects CO emissions within the maintenance area itself, but provides an adequate representation of CO emissions for these source categories. All emission inventory estimates represent a typical weekday during the wintertime season (December through February).

Table 3-9. Summary of 2017 Average Winter Weekday CO Emissions

Source Category	CO (tpd)
Point	0.93
Nonpoint	43.48
Aviation	12.53
Onroad mobile	278.18
Nonroad mobile	114.35
Total:	**448.96**

Figure 3-1 illustrates the contributions emission sources make to daily winter CO emissions. It shows that mobile sources are the leading contributor of wintertime CO emissions, with onroad sources representing 62 percent of total CO emissions and nonroad sources representing 25 percent.

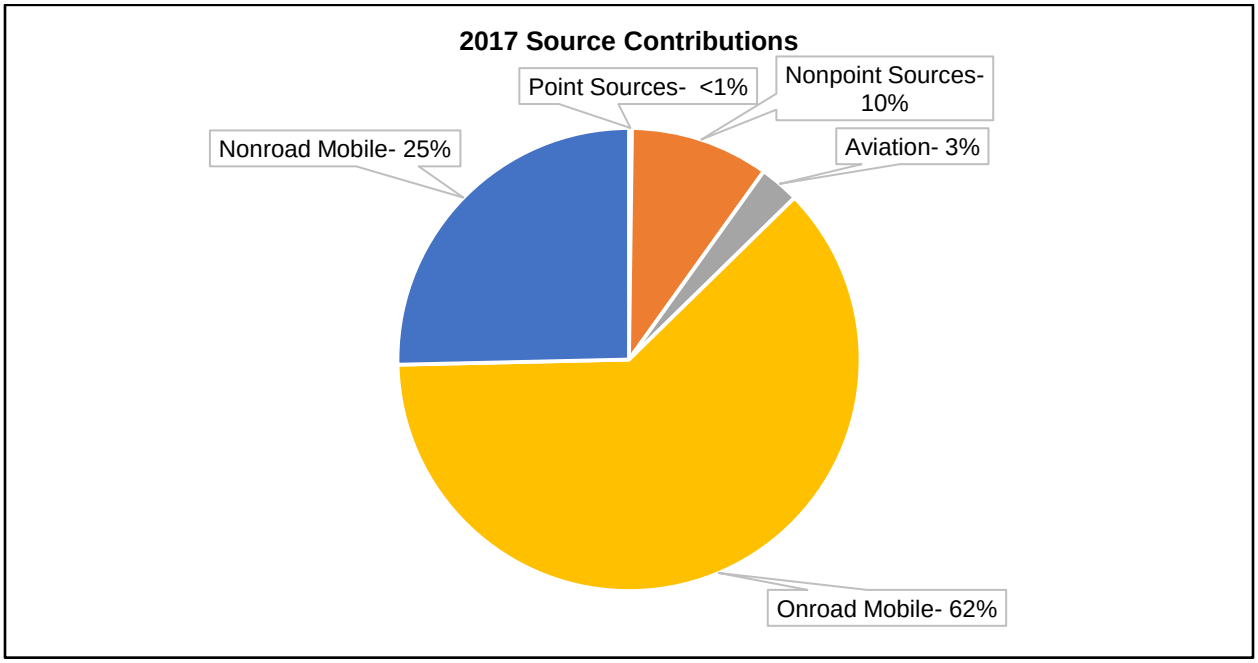

Figure 3-1. 2017 Winter CO Emission Sources.

3.2 MAINTENANCE DEMONSTRATION

Under the LMP option, the maintenance demonstration requirement is considered to be satisfied if monitoring data show that an area is meeting the air quality criteria for limited maintenance areas (i.e., a design value at or below 7.65 ppm, or 85 percent of the CO NAAQS) and the area continues to meet this level through the effective date of plan approval (Paisie 1995). Further, EPA believes the continued applicability of prevention of significant deterioration requirements, any control measures already in the SIP, and federal measures should provide adequate assurance of maintenance over the 10-year maintenance period (Paisie 1995). The following sections describe how DAQ satisfies these requirements.

3.2.1 Air Quality Criteria

As described in Section 2.2.1, the Las Vegas Valley CO maintenance area has a current 8-hour CO design value of 2.8 ppm, which is substantially lower than the 7.65 ppm air quality criteria value required for an LMP. The area has remained well below the 85 percent LMP threshold since 2007, with design values under 50 percent of the NAAQS.

3.2.2 Control Measures

The following permanent and enforceable emission reduction control measures identified in the 2008 CO maintenance plan will continue into the second 10-year maintenance period: Federal Motor Vehicle Emissions Control Program (FMVECP), State Vehicle I/M Program, Oxygenated Gasoline Program, and State Technician Training and Certification Program. These measures have contributed to bringing the Las Vegas Valley into attainment of the CO NAAQS and will help keep the area in attainment of the standard through the 2030 maintenance year.

3.2.2.1 Federal Motor Vehicle Emissions Control Program

DAQ will continue to rely on the FMVECP as a primary control measure for maintaining the CO NAAQS. This program has dramatically reduced CO emissions by continually requiring manufacturers to produce new vehicles that meet increasingly tighter emission standards. Requirements include emission standards for new light- and medium-duty cars and trucks, as well as standards for heavy-duty onroad and nonroad vehicles. Emission reductions mandated by the FMVECP have been primarily responsible for the large decrease in CO concentrations in the Las Vegas Valley. As newer, cleaner vehicles replace older, dirtier ones, these standards will have an increasing role in reducing CO emissions.

3.2.2.2 State Vehicle Inspection/Maintenance Program

DAQ will continue to rely on the State's I/M program as a primary control measure for maintaining the CO NAAQS. Emission reductions since the program's inception have been central to decreasing CO concentrations in the Las Vegas Valley. The program is governed under the provisions of Chapter 445B of the Nevada Revised Statutes and Nevada Administrative Code. Adopted in 1978 and administered by the DMV, these regulations establish annual testing procedures for 1968 or newer gasoline-powered vehicles, regardless of size, and for diesel-

powered vehicles with a manufacturer's gross vehicle weight rating of up to 14,000 pounds. On-board diagnostic testing procedures are used for 1996 and newer vehicles, while older vehicles are tested with a two-speed idle test. The program includes waiver provisions for motorists who spend $450 on emission-related repairs. No waivers are allowed for vehicles that emit visible smoke.

The I/M program also allows exemptions from emissions testing for new vehicles on their first and second registration; new hybrid-electric vehicles for the first five model years; alternative fuel vehicles; vehicles registered as Classic Rods, Classic Vehicles, or Old Timer and driven 5,000 miles or less per year; and vehicles registered as Replica Vehicles.

3.2.2.3 Oxygenated Gasoline Program

DAQ will continue to rely on its Oxygenated Gasoline Program as a primary control measure for maintaining the CO NAAQS. This program, implemented under Section 53 of the Clark County Air Quality Regulations, requires that all fuel during the winter season (October 1 to March 31) contain 3.5 percent oxygenate by weight. The area of applicability includes the hydrographic areas containing the Las Vegas, Eldorado, and Ivanpah valleys; the Boulder City limits; and any area within three miles of these hydrographic areas that is within Clark County.

The use of oxygenated gasoline was originally mandated under the 1990 CAA amendments, which required gasoline sold in areas that did not meet the CO NAAQS to contain 2.7 percent oxygen content by weight. Clark County's program is considerably more stringent than that minimum: 3.5 percent oxygen content by weight or 10 percent by volume. Ethanol is the principal oxygenate used in Clark County.

3.2.2.4 State Technician Training and Certification Program

DAQ will continue to rely on the State's Technician Training and Certification Program as a primary control measure for maintaining the CO NAAQS. 40 CFR Part 51.367 requires that state I/M inspectors be trained and certified; Chapter 445B of the Nevada Revised Statutes and Nevada Administrative Code set forth the state regulations governing technician training and certification. The DMV is responsible for administering these regulations.

The general requirements to become a class 1 approved inspector include submittal of a certificate of competence from an exhaust gas analyzer manufacturer; successful completion of a training course and written exam; and a practical demonstration of the procedures for testing motor vehicles prescribed by the DMV. Requirements for becoming a class 2 approved inspector include establishment of proper qualifications; demonstration of the ability to test motor vehicles and to diagnose, repair, and service a device for controlling exhaust emissions; successful completion of a written test; and submittal of a current certification from the National Institute for Automotive Service Excellence as an advanced engine performance specialist.

3.3 MONITORING NETWORK/VERIFICATION OF CONTINUED ATTAINMENT

To verify the attainment status of an area over the maintenance period, an LMP should contain provisions for the continued operation of an appropriate, EPA-approved air quality monitoring network, in accordance with 40 CFR Part 58 (Paisie 1995).

DAQ commits to continue operating an air quality monitoring network in accordance with 40 CFR Part 58 to verify continued attainment of the CO NAAQS. With monitoring data used as the triggering mechanism, DAQ will continue to track CO concentrations and verify continued attainment via the approved monitoring network operated in accordance with 40 CFR Part 58. Additionally, if measured mobile source parameters (e.g., VMT or fleet mix) change over time, DAQ will conduct studies to determine whether additional or re-sited monitors are necessary. The air quality monitoring network will be reviewed annually in accordance with 40 CFR Part 58.10 to determine whether the network continues to meet the monitoring objectives in 40 CFR Part 58, Appendix D. Any monitor shutdowns or relocations will be made with EPA approval. See Section 1.3.3 for details on DAQ's current CO monitoring network.

3.4 CONTINGENCY PLAN

Section 175A(d) of the CAA requires that a maintenance plan include contingency provisions to assure prompt correction of any violation of the CO NAAQS after redesignation. According to EPA guidance, the contingency plan does not need to contain fully adopted contingency measures; however, it is considered an enforceable part of the SIP and should ensure contingency measures are adopted expeditiously once they are triggered by a specified event (Paisie 1995). LMP guidance requires that the contingency plan address the following elements: (1) measures to be adopted; (2) tracking and triggering mechanisms to determine when contingency measures are needed; and (3) a schedule and procedure for implementing these measures.

3.4.1 Contingency Measures

For this LMP, DAQ is retaining the Reduced Reid Vapor Pressure (RVP) Gasoline Program contingency measure from its 2008 CO maintenance plan.

3.4.1.1 Reduced Reid Vapor Pressure Gasoline Program

As part of the 2008 CO maintenance plan, DAQ proposed relaxing the RVP for wintertime fuels sold in Clark County (October 1 through March 31) from 9 pounds per square inch (psi) to 13.5 psi to coincide with the specification guides contained in Standard D4814-01a, Volume 05.02, of the *2002 Annual Book of ASTM Standards* (ASTM 2006). Relaxation of the RVP for wintertime fuels has a positive impact on gasoline supplies to the Las Vegas Valley because it no longer precludes the distribution and sale of conventional and reformulated gasoline, which is sold throughout the rest of the southwestern United States during the winter season.

EPA approved this request (75 FR 59091) based on its finding that relaxation of the RVP standard would not interfere with continued maintenance of the CO standard and the Nevada Department of Agriculture's commitment to seek reinstatement of the Low RVP Rule (Section 590.065 of the

Nevada Administrative Code) if called upon to do so. DAQ will seek reinstatement and tightening of the RVP standard back to 9.0 psi as a contingency measure if future CO exceedances occur.

3.4.2 Triggering Mechanisms and Implementation Schedule

DAQ's primary tracking mechanism is continuous monitoring of CO levels through its CO monitoring network (Section 1.3.3). The department will continue to maintain CO monitors in accordance with 40 CFR Part 58. To ensure that future violations of the CO NAAQS do not occur, ambient air quality monitoring data will be examined to determine if additional contingency measures are needed. A NAAQS violation occurs when the second highest reading at the same monitoring site over two consecutive years is greater than or equal to 9.5 ppm. Any verified exceedance over 9 ppm during the CO season (October 1 through March 31) will trigger an automatic review to determine which contingency measure(s) should be adopted if another exceedance occurs at the same monitor.

DAQ must review and verify monitoring data within three months of an exceedance and recommend contingency measures within six months. DAQ may recommend local, voluntary measures to prevent a second exceedance; however, action would not be mandated. The only federally enforceable trigger for mandatory implementation of contingency measures is a violation of the 8-hour CO NAAQS.

If a second exceedance occurs at the same monitoring site within a consecutive two-year period, DAQ will recommend contingency measures to the BCC. If the contingency measures described in Section 3.4.1 are not adequate to prevent future exceedances, DAQ will recommend more stringent contingency measures and/or additional CO reduction measures. Within three months of the second exceedance, DAQ will verify and evaluate the monitoring data; within six months, the department will determine what contingency measures should be implemented and make recommendations to the BCC. Contingency measures will be implemented six to twelve months after BCC approval, depending on the time needed to put the measures in place.

3.5 CONFORMITY DETERMINATIONS

EPA's transportation and general conformity rules apply to nonattainment and maintenance areas operating under maintenance plans. Under either rule, one means of demonstrating conformity of federal actions is to show that expected emissions from planned actions are consistent with the emissions budget for the area (Paisie 1995). According to EPA guidance, emissions budgets in limited maintenance areas may be treated as essentially not constraining for the length of the maintenance period because it is unreasonable to expect an area will experience so much growth in that period that a violation of CO NAAQS would occur (Paisie 1995). Under the LMP option, an area can demonstrate conformity without submitting an emissions budget; as a result, emissions do not need to be capped, nor a regional emissions analysis conducted.

In areas with approved LMPs, federal actions requiring conformity determinations under the transportation or general conformity rules may be considered to satisfy the "budget test" required in the respective rules (Paisie 1995). Approval of this LMP does not relieve transportation partners of the other transportation conformity requirements outlined in 40 CFR Part 93.109(b).

Transportation plan revisions and transportation improvement program conformity determinations must satisfy all other applicable requirements of the transportation conformity rule, and hot-spot requirements must be satisfied for transportation projects under 40 CFR Part 93.109(e). DAQ will continue to consult with affected jurisdictions and interested parties to meet these requirements.

4.0 CONCLUSION

DAQ has shown that the Las Vegas Valley CO maintenance area meets the requirements for an LMP. The area's current design value is 2.8 ppm, significantly lower than the 7.65 ppm threshold. CO levels in the Las Vegas Valley have stayed well below the CO NAAQS since the area's redesignation to attainment in 2010. An attainment inventory for 2017 has been provided. The emission controls DAQ has adopted and implemented to maintain the standard continue to be permanent and enforceable. DAQ has committed to continue operating a CO monitoring network that would identify any violations of the NAAQS, and has a contingency plan to address such violations. Having fulfilled the criteria for a second 10-year maintenance plan, DAQ asks EPA to approve this second 10-year LMP for the Las Vegas Valley CO maintenance area.