March 10, 2009

Laura Yoshii
Acting Regional Administrator
OAR-1, USEPA Region IX
75 Hawthorne Street
San Francisco, CA 94105

RE: Recommended Area Designations for the 2008 National Ambient Air Quality Standards for Ozone (73 FR16436, March 27, 2008)

Dear Ms. Yoshii:

On behalf of Governor Gibbons, as his appointed designee, pursuant to Section 107(d) of the 1990 Clean Air Act, I am submitting this letter to the U.S. Environmental Protection Agency (EPA) requesting that all counties in the State of Nevada, with the exception of Clark County, be designated attainment or unclassifiable for the 8-hour ozone standard. Nevada requests that the following counties (except for Indian Lands) be designated attainment/unclassifiable:

Carson City	Humboldt County	Pershing County
Churchill County	Lander County	Storey County
Douglas County	Lincoln County	Washoe County
Elko County	Lyon County	White Pine
Esmeralda County	Mineral County	
Eureka County	Nye County	

For Clark County (except for Indian Lands), we are requesting the following hydrographic areas (HA) be designated as nonattainment and the remainder of the county as attainment/unclassifiable:

- HAs 164A, 164B, 165, and 166 – Ivanpah Valley
- HA 167 – Eldorado Valley
- HA 212 – Las Vegas Valley
- HA 213 – Colorado River Valley
- HA 214 – Paiute Valley
- HAs 216 and 217 – Apex Valley
- HA 218 – Moapa Valley

Five hard copies each of the documentation supporting these designation recommendations is enclosed:

Attachment A. Nevada Division of Environmental Protection (NDEP) monitoring data for Carson City, Fallon and Lehman Caves sites.

Attachment B. Washoe County District Health Department Air Quality Management Division (AQMD) letter and monitoring data for six sites in Washoe County.

Attachment C. Nine-factor analysis for Nye County, "*Nevada Air Quality Designations and Boundary Determinations for the 2008 8-Hour Ozone NAAQS for Nye County*." (Electronic copy enclosed.

Attachment D. Nine-factor analysis for Clark County, "*Nevada Air Quality Designations and Boundary Recommendations for the 8-Hour Ozone NAAQS for Clark County, Nevada*." (Electronic copy enclosed.)

NDEP monitoring data for 2005-2007 is enclosed as Attachment A, and a nine-factor analysis to exclude Nye County from the nonattainment area boundary is enclosed as Attachment C.

The AQMD of the Washoe County District Health Department reviewed 2006-2008 data and determined that Washoe County is in attainment of the new 8-hour ozone standard. A copy of their letter and monitoring data is enclosed as Attachment B. In the letter, they note that the AQMD still intends to prepare an exceptional events case for the four 8-hour ozone exceedances which occurred in June and July 2008 as a result of impacts from the northern California wildfires.

Clark County's Department of Air Quality and Environmental Management (DAQEM) reviewed 2006-2008 data at the 13 monitoring sites in Clark County. DAQEM conducted a nine-factor analysis (Attachment D) to determine the boundary of the nonattainment area in Clark County. Their analysis supports the retention of the nonattainment area boundary set under the 1997 ozone standard. A copy of their cover letter to NDEP is also enclosed. In the letter, they note that transport of ozone from sources in southern California are an issue, as well as exceptional events (e.g., wildfire).

Please contact Michael Elges at (775) 687-9329 or Adele Malone on his staff (775-687-9356), if you have any questions.

Sincerely,

Leo M. Drozdoff, P.E.
Administrator

Enclosures

cc: Josh Hicks, Chief of Staff, Office of the Governor
Jodi Stephens, Legislative Director, Office of the Governor
Allen Biaggi, Director, DCNR
Colleen Cripps, Deputy Administrator, NDEP
Michael Elges, Chief, Bureau of Air Quality Planning, NDEP
Greg Remer, Chief, Bureau of Air Pollution Control
Andrew Goodrich, Director, AQMD, Washoe County District Health Department
Lewis Wallenmeyer, Director, Clark County DAQEM
Lisa Hanf, Chief, Planning Office, USEPA Region IX (AIR-2)
John Kelly, Planning Office, USEPA Region IX (AIR-2)

Certified Mail: 7008 1140 0004 4031 2041

ATTACHMENT A
March 10, 2009

NEVADA DIVISION OF ENVIRONMENTAL PROTECTION
OZONE MONITORING DATA, 2005-2007

3-year Average of Annual 4th Highest Daily Maximum Concentration					
Site ID	HA	2005 4th High	2006 4th High	2007 4th High	**3-year Avg.**
Lehman Caves* 32-033-0101 Snake Valley	195	0.073	0.072	0.075	**0.073**
Fallon 32-001-0002 Carson Desert	101	0.058	0.065	0.070	**0.064**
Carson City 32-510-0004 Eagle Valley	104	0.061	0.070	0.067	**0.066**

* The Lehman Caves ozone monitor, located at the Great Basin National Park in White Pine County, is part of the Inter-Agency Monitoring of Protected Visual Environments monitoring network and is operated by the National Park Service, not NDEP. The data is part of the EPA Air Quality System (AQS).

NOTE: In addition to the Carson City and Fallon monitoring sites, NDEP operates a monitoring site at Fernley, Nevada, which is also reported into the EPA AQS database. These data are not presented in this table because there are only two years of data; however, the 4th high for each of those two years is less than 0.075 ppm.

DISTRICT HEALTH DEPARTMENT
AIR QUALITY MANAGEMENT DIVISION

Public Health
Prevent. Promote. Protect.

February 9, 2009

RECEIVED
FEB 10 2009
ENVIRONMENTAL PROTECTION

Mr. Allen Biaggi, Administrator
Nevada Division of Environmental Protection
901 S. Stewart Street, Suite 4001
Carson City NV 89701

Re: Washoe County's Designation for the 8-Hour Ozone National Ambient Air Quality Standard (NAAQS)

Dear Mr. Biaggi:

Pursuant to Section 107(d) of the Clean Air Act, the governor of each state is to recommend area designations to the USEPA whenever a National Ambient Air Quality Standard (NAAQS) is revised. Based on guidance documents from Mr. Robert J. Meyers, Principal Deputy-Assistant Administrator for the USEPA and Mr. John S. Seitz, Director of the Office of Air Quality Planning and Standards, Washoe County's designation recommendation for the federal 8-hour ozone NAAQS must be made by March 27, 2009.

The Air Quality Management Division of the Washoe County Health District (AQMD) has reviewed historical Washoe County 8-hour ozone data and recommends that Washoe County be designated as an attainment area for the 8-hour ozone NAAQS. A summary of 8-hour ozone data for Washoe County for the calendar years 2006 through 2008 is enclosed to verify that Washoe County has not exceeded the 8-hour ozone NAAQS. The data have been summarized into three-year rolling averages of the 1st through 4th highest values and have been reported following the protocols defined in Appendix N to Part 50, Title 40 of the Code of Federal Regulations, and have been submitted to the EPA AQS database. The AQMD intends to prepare an exceptional events case for the four 8-hour ozone exceedances which occurred in June and July of 2008 as a result of emissions impacts from the Northern California wildfires.

If you have any questions regarding this matter, please feel free to call Duane Sikorski or me at (775) 784-7200.

Sincerely,

Andrew C. Goodrich, REM
Director

cc: Wayne Nastri, USEPA, Region IX
Colleen Cripps, Nevada DEP/BAQ
Duane Sikorski, Washoe County Health District AQMD

Enc: 2006-2008 8-hour ozone data summary

P.O. BOX 11130 Reno, NV 89520-0027 • 401 Ryland Street, Ste. 331 • (775) 784-7200 • FAX (775) 784-7225
www.washoecounty.us

ATTACHMENT B, Washoe County Monitoring Data

Ozone - 8 Hour Averages, ppm

Site	Year	1st High	Month/ Day	2nd High	Month/ Day	3rd High	Month/ Day	4th High*	Month/ Day
Incline**	**2006**	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	2007	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	2008	0.075	6/24	0.074	7/26	0.073	6/14	0.072	6/13
	3 Yr Avg	**0.075**		**0.074**		**0.073**		**0.072**	
Lemmon Valley	**2006**	0.076	7/20	0.073	5/5	0.072	6/18	0.072	8/3
	2007	0.075	8/13	0.074	6/19	0.073	5/9	0.073	9/27
	2008	0.096	6/24	0.084	7/10	0.081	6/25	0.078	6/13
	3 Yr Avg	**0.082**		**0.077**		**0.075**		**0.074**	
Reno3	**2006**	0.075	6/18	0.073	8/3	0.073	8/19	0.072	6/19
	2007	0.072	7/8	0.072	9/7	0.071	6/19	0.071	7/3
	2008	0.088	6/24	0.078	7/10	0.076	6/14	0.076	6/26
	3 Yr Avg	**0.078**		**0.074**		**0.073**		**0.073**	
South Reno	**2006**	0.077	6/18	0.077	6/19	0.074	7/19	0.074	8/19
	2007	0.074	7/3	0.072	5/27	0.072	7/8	0.072	7/9
	2008	0.079	7/10	0.072	6/24	0.071	7/26	0.067	6/26
	3 Yr Avg	**0.076**		**0.073**		**0.072**		**0.071**	
Sparks	**2006**	0.076	6/18	0.075	6/19	0.074	7/18	0.074	8/3
	2007	0.073	5/17	0.072	7/3	0.071	5/16	0.071	7/7
	2008	0.086	6/24	0.082	7/10	0.075	6/26	0.075	7/19
	3 Yr Avg	**0.078**		**0.076**		**0.073**		**0.073**	
Toll	**2006**	0.073	5/5	0.072	6/19	0.071	6/18	0.070	5/25
	2007	0.063	7/9	0.062	5/10	0.062	5/12	0.062	5/16
	2008	0.079	7/10	0.076	6/25	0.076	6/26	0.075	6/24
	3 Yr Avg	**0.071**		**0.070**		**0.069**		**0.069**	

*The primary & secondary ozone standards are met when the 3-year average of the annual fourth-highest daily maximum 8-hour average oz concentration is less than or equal to 0.075 ppm.

** Incline site temporarily closed from January 2006 until May 2008

Washoe County did not exceed the 8-hour NAAQS for Ozone during this period.

8 hr avg

ATTACHMENT C

NEVADA AIR QUALITY DESIGNATIONS AND BOUNDARY DETERMINATIONS FOR THE 2008 8-HOUR OZONE NAAQS FOR NYE COUNTY

Prepared by
BUREAU OF AIR QUALITY PLANNING
NEVADA DIVISION OF ENVIRONMENTAL PROTECTION

March 10, 2009

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1. INTRODUCTION

On December 4, 2008, EPA Headquarters issued guidance to regional EPA offices for states to use in developing area designation recommendations for the revised 2008 ozone NAAQS (*Area Designations for the 2008 Revised Ozone National Ambient Air Quality Standards*, R. Meyers). The guidance recommends that Core Based Statistical Areas (CBSAs) or Combined Statistical Areas (CSAs) associated with the violating monitor(s) serve as the "presumptive" boundary for evaluating the geographic boundaries of an ozone nonattainment area. CBSA refers to metropolitan (an urbanized area with a population of 50,000 or more) and micropolitan (an urban cluster of at least 10,000 and fewer than 50,000 people) statistical areas. A CSA consists of 2 or more CBSAs that have social and economic ties as measured by commuting (December 18, 2006, OMB Bulletin No. 07-01, Appendix, *"Metropolitan Statistical Areas, Metropolitan Divisions, Micropolitan Statistical Areas, Combined Statistical Areas, New England City and Town Areas, and Combined New England City and Town Areas"* http://www.whitehouse.gov/omb/bulletins/fy2007/b07-01.pdf). The CSA is the most expansive variant on the metropolitan area concept used by the U.S. Census Bureau.

EPA Region IX interprets the Headquarters guidance to mean that the presumptive boundary for any area with a violating monitor is the CSA in which the monitor is located. In Nevada, the only monitors showing a violation of the ozone NAAQS are located in Clark County. However, the CSA in which Clark County is located includes Nye County as well, i.e., the "Las Vegas – Paradise – Pahrump" CSA. Thus, Nevada was directed by Region IX to consider Clark and Nye Counties combined as the presumptive boundary for the Clark County ozone nonattainment area.

In order to adjust the "presumptive" boundary, a state must address nine criteria factors which are listed in the December 2008 guidance. These nine criteria factors are:

- Air Quality Data
- Emissions Data (location of sources and contribution to ozone concentrations)
- Population Density and Degree of Urbanization (including commercial development)
- Traffic and Commuting Patterns
- Growth Rates and Patterns
- Meteorology (weather/transport patterns)
- Geography/Topography (mountain ranges or other basin boundaries)
- Jurisdictional Boundaries (e.g., counties, air districts, existing nonattainment areas, Reservations, Metropolitan Planning Organizations (MPOs)
- Level of Control of Emission Sources

The State of Nevada used these factors in developing the recommended nonattainment boundaries for the revised 2008 ozone NAAQS. Two separate 9-factor analyses were conducted. The Nevada Division of Environmental Protection (NDEP) performed an analysis for the Nye County CBSA (microstatistical area), in relation to Clark County, and the Clark County Department of Air Quality & Environmental Management (DAQEM) performed an analysis to determine the boundary of the nonattainment area in Clark County. This document addresses only Nye County; the Clark County analysis is contained in "*Nevada Air Quality Designations*

and Boundary Recommendations for the 8-Hour Ozone NAAQS for Clark County, Nevada," March 5, 2009

2. CRITERIA ANALYSIS FOR NYE COUNTY

Based on the 9-factor analysis that follows, NDEP concludes that Nye County should be excluded from the nonattainment area boundary for the 2008 ozone NAAQS. There are no significant point sources of ozone precursors in Nye County. The town of Pahrump is Nye County's largest population center with about 82 percent of the county's population. Pahrump lies about 60 miles west of Las Vegas via State Route 160. Area and mobile source emissions associated with Pahrump comprise the most significant sources of ozone precursors in Nye County. However, NDEP's analysis demonstrates that ozone (or ozone precursor) emissions from Nye County are dwarfed by the emissions in Clark County.

Furthermore, the Pahrump Valley is geographically isolated from the Las Vegas Valley by the Spring Mountain Range with elevations as high as 11,918 feet. The major highway between Pahrump and Las Vegas, State Route 160, goes over a pass at 5,594 feet, a major barrier to transport. The emissions data, in conjunction with the topographical, geographical and meteorological differences between the two valleys, demonstrate that Nye County is not a source of ozone or ozone precursor pollution for Clark County, nor is Clark County a source of ozone or ozone precursor emissions for Nye County.

2.1 CRITERION #1 – AIR QUALITY DATA

No ozone monitoring has been conducted in Nye County. Ozone monitoring has never been required there, and the area is classified as attainment/unclassifiable. The population density of the county, as well as its largest town (Pahrump), is extremely low, there are no significant sources of ozone precursors, and it is isolated geographically and topographically from the Las Vegas Valley. These factors are discussed in the following sections.

In Clark County, DAQEM operates and maintains 13 ozone monitors located throughout the county. Table 2-1 presents 2006-2008 ozone monitoring data for Clark County. The data show exceedances of the 2008 ozone NAAQS at 9 of the sites. Figure 2-1 displays the location of ozone monitors operated and maintained by DAQEM.

TABLE 2-1

CLARK COUNTY OZONE MONITORING SITES, 2006-2008 DATA

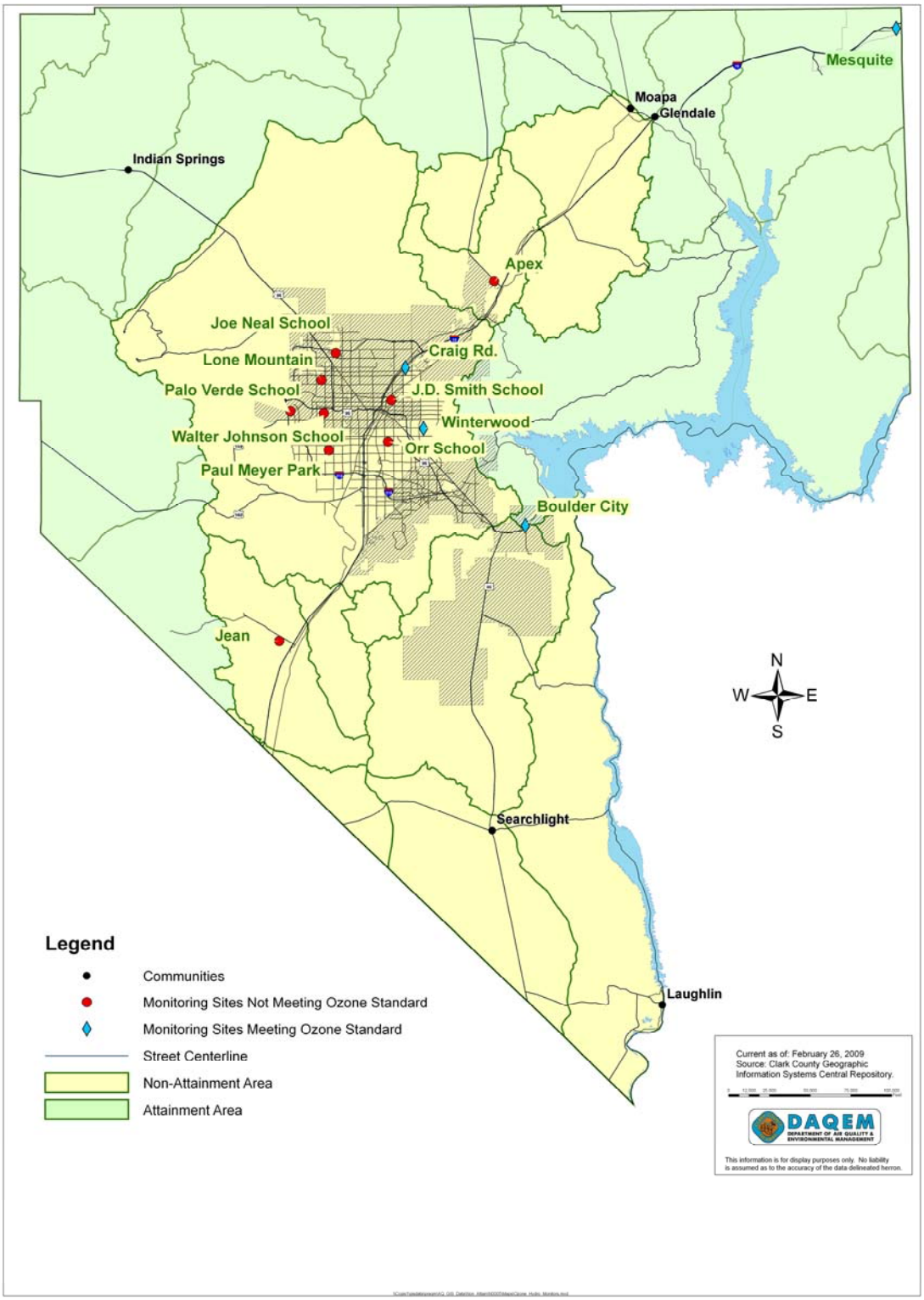
3-YEAR AVERAGE of 4TH HIGHEST DAILY MAXIMUM CONCENTRATION * 2008 OZONE NAAQS (8-HOUR) = 0.075 PPM					
SITE ID	Hydrographic Area	2006	2007	2008	3-year Average
Apex 32-003-0022 Garnet Valley	HA 216	0.082	0.081	0.071	**0.078**

3-YEAR AVERAGE of 4TH HIGHEST DAILY MAXIMUM CONCENTRATION * 2008 OZONE NAAQS (8-HOUR) = 0.075 PPM					
SITE ID	Hydrographic Area	2006	2007	2008	3-year Average
Boulder City 32-003-0601 Black Mt. Area	HA 215	0.074	0.076	0.071	**0.074**
Craig Road 32-003-0020 Las Vegas Valley	HA 212	0.079	0.075	0.071	**0.075**
J.D. Smith School 32-003-2002 Las Vegas Valley	HA 212	0.081	0.079	0.068	**0.076**
Jean 32-003-1019 Ivanpah Valley N.	HA 164A	0.079	0.083	0.074	**0.079**
Joe Neal Elem. 32-003-0075 Las Vegas Valley	HA 212	0.081	0.085	0.08	**0.082**
Lone Mountain 32-003-0072 Las Vegas Valley	HA 212	0.085	0.080	0.078	**0.081**
Mesquite 32-003-0023 Virgin River Valley	HA 222	0.069	0.064	0.069	**0.067**
Orr Middle School 32-003-1021 Las Vegas Valley	HA 212	0.085	0.080	0.074	**0.080**
Paul Meyer Park 32-003-0043 Las Vegas Valley	HA 212	0.083	0.081	0.077	**0.080**
Palo Verde High 32-003-0073 Las Vegas Valley	HA 212	0.084	0.080	0.074	**0.079**
Walter Johnson Jr. Hi. 32-003-0071 Las Vegas Valley	HA 212	0.085	0.080	0.076	**0.080**
Winterwood 32-003-0538 Las Vegas Valley	HA 212	0.078	0.077	0.071	**0.075**

* Data obtained from *Nevada Air Quality Designations and Boundary Recommendations for the 8-Hour Ozone NAAQS for Clark County, Nevada* (March 5, 2009))

FIGURE 2-1

LAS VEGAS VALLEY OZONE MONITORING NETWORK



Because there is no actual monitoring data for Nye County, ozone precursor emissions were evaluated as surrogates. Table 2-2 shows that Nye County's nitrogen oxide (NO_x) and volatile organic compound (VOC) emissions, the primary precursors to ozone formation, are orders of magnitude less than those that are produced in Clark County. In 2005, Nye County sources emitted only 1.4 percent of the total NO_x emissions from Clark County and only 2.9 percent of the total VOC emissions; emissions by source type are discussed in section 2.2.

TABLE 2-2

NO_x AND VOC EMISSIONS BY SOURCE IN TONS PER YEAR*

2002

SOURCE TYPE	NYE COUNTY		CLARK COUNTY	
	NO_x	VOC	NO_x	VOC
Point	147	94	40,962	2,625
Area	59	588	1,904	16,249
On-road Mobile	1,157	1,471	20,803	25,674
Non-road Mobile	86	No data	15,507	No data
TOTALS	1449	2153	79,176	44,548

2005

SOURCE TYPE	NYE COUNTY		CLARK COUNTY	
	NO_x	VOC	NO_x	VOC
Point	40	54	40,950	1,851
Area	59*	588*	3,536	19,868
On-road Mobile	967	648	33,399	19,815
Non-road Mobile	203	326	13,632	13,982
TOTALS	1,271	1,616	91,517	55,516

* With the exception of "area emissions" Nye County data is from NDEP's 2002 and 2005 National Emissions Inventory (NEI) submittals to EPA. NDEP did not submit "area emissions" as part of the 2002 NEI. Nye County 2002 area emissions for NO_x and VOC were extracted from the EPA website "Nonpoint Sector Data" (http://www.epa.gov/ttn/chief/net/2002inventory.html#inventorydata). 2002 "area emissions" for Nye County were used as an approximation for 2005, because 1) no area emissions were submitted to EPA by NDEP, and 2) no estimation was done by EPA for 2005 area sources. All Clark County data is from Clark County's 2002 and 2005 NEI submittals to EPA.

In addition to the fact that contributions of emissions to Clark County from Nye County are insignificant compared to the emissions generated in the Las Vegas Valley, the transport of emissions between the Las Vegas Valley and Pahrump Valley (the nearest populated area in Nye County) is significantly limited by meteorological, topographic and geographic characteristics, as discussed in sections 2.6 and 2.7. Based on this evidence, emissions generated in Nye County are assumed to not be impacting Clark County. This factor analysis supports the exclusion of Nye County from the recommended nonattainment area boundary for the 2008 ozone NAAQS.

2.2 CRITERION #2 – EMISSIONS DATA (LOCATION OF SOURCES AND CONTRIBUTION TO OZONE CONCENTRATION)

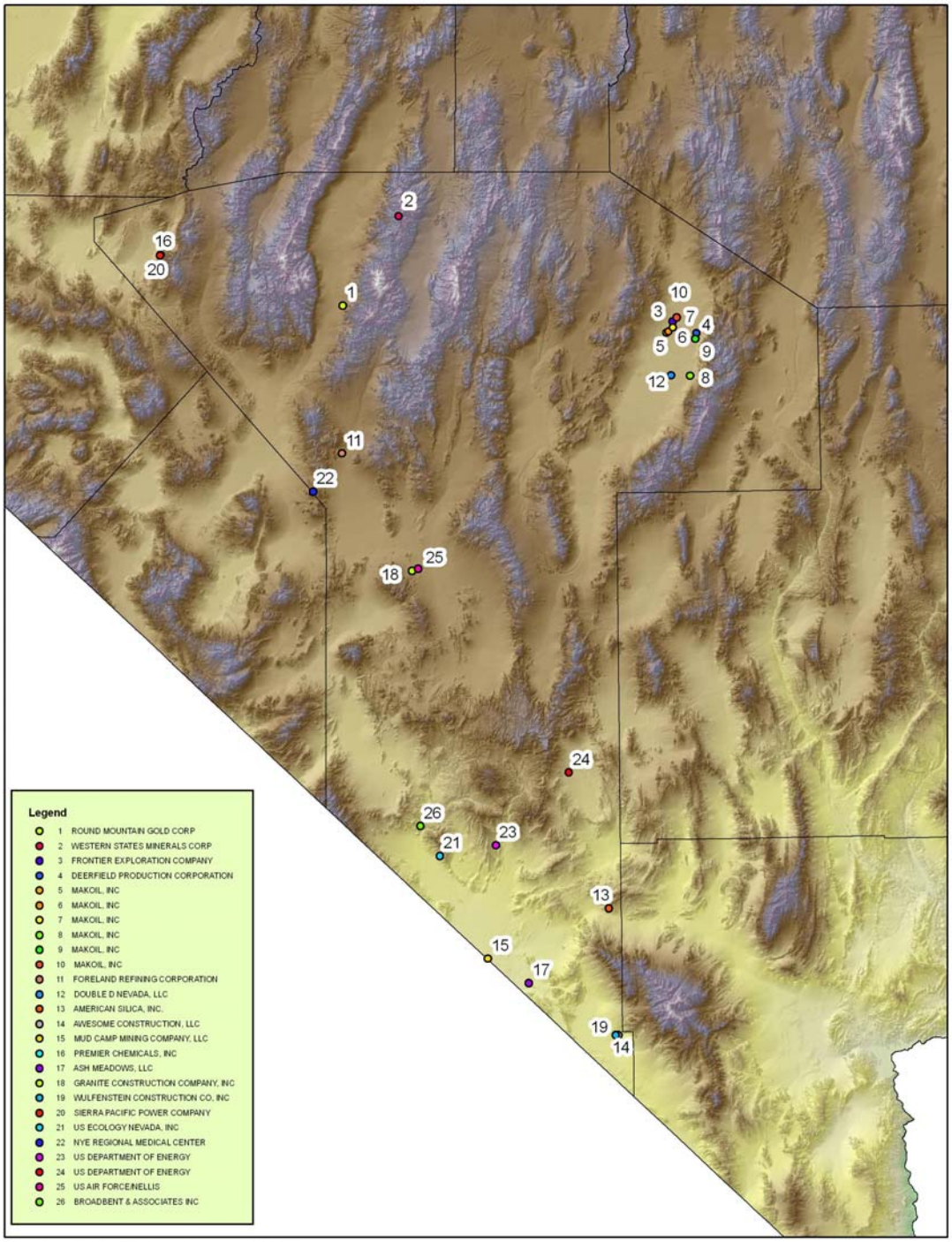
Table 2-2 shows NO_x and VOC emission data for 2002 and 2005 in Nye and Clark Counties by source category. On-road mobile sources account for the largest share of ozone precursor emissions in Nye County. Emissions of both NO_x and VOC from on-road vehicles decreased between 2002 and 2005. Mobile source emissions are associated primarily with urban areas and interstate transportation corridors. Traffic and commuting patterns between Nye County and Clark County are discussed in section 2.4.

Table 2-2 shows clearly that ozone precursor emissions generated in Nye County are dwarfed by the emissions generated in Clark County. In 2005, mobile source emissions of NO_x were less than 2.5 percent of those of Clark County and VOCs were less than 2.9 percent. Figure 2-2 shows the location of stationary sources of NO_x and VOCs in Nye County in 2005; Table 2-3 shows 2005 emissions data for these sources. These data show that emissions from point sources decreased between 2002 and 2005, particularly in Nye County, which showed a 70 percent reduction in NO_x and a 40 percent reduction in VOCs. In Clark County, NO_x emissions remained constant from 2002 to 2005, while there was a 30 percent reduction in VOCs. In 2005, point source emissions of NO_x and VOCs were the lowest of all source categories in Nye County. Point source emissions in Nye County are only about 0.2 percent of Clark County's NO_x and VOC point source emissions.

The emissions data support the conclusion that Nye County does not contribute to ozone pollution in Clark County. This factor analysis supports the exclusion of Nye County from the recommended nonattainment area boundary for the 2008 ozone NAAQS.

FIGURE 2-2

POINT SOURCES IN NYE COUNTY, 2005



Nye County facility locations as of 2005

February 25, 2009

TABLE 2-3

NYE COUNTY STATIONARY SOURCE NO_X AND VOC EMISSIONS
IN TONS PER YEAR, 2005

key	COMPANY NAME	FACILITY NAME	NOx	VOC
1	Round Mountain Gold Corp	CLASS 2 –Smoky Valley Common Operation	1.614	0.216
2	Western States Minerals Corp	CLASS 2 –Northumberland Mine	0.192	0.016
3	Frontier Exploration Company	CLASS 2 –Trap Spring #14-42 Tank Battery	0	0.280
4	Deerfield Production Corporation	CLASS 2 –Eagle Springs	0	1.722
5	Makoil, Inc.	CLASS 2 –Munson Ranch #2	0	5.976
6	Makoil, Inc.	CLASS 2 –Trap Springs A	0	0.965
7	Makoil, Inc.	CLASS 2 –Trap Springs B	0	2.747
8	Makoil, Inc.	CLASS 2 –Grant Canyon	0	2.932
9	Makoil, Inc.	CLASS 2 –Kate Springs	0	1.787
10	Makoil, Inc.	CLASS 2 –Munson Ranch #3	0	2.792
11	Foreland Refining Corporation	CLASS 2 –Tonopah Refinery	0	27.294
12	Double D Nevada, LLC	CLASS 3	0	1.263
13	American Silica, Inc.	CLASS 2	13.290	1.085
14	Awesome Construction, LLC	CLASS 3	0.015	0.001
15	Mud Camp Mining Company, LLC	CLASS 2 –DBA IMV Nevada – Amargosa Pit &	3.590	0.071
16	Premier Chemicals, Inc.	CLASS 2 –Gabbs	13.646	0.219
17	Ash Meadows, LLC	CLASS 2 –Ash Meadows Project	1.632	0.125
18	Granite Construction Company, Inc	CLASS 2 – General	0.689	0.401
19	Wulfenstein Construction Co, Inc.	CLASS 2	1.321	0.602
20	Sierra Pacific Power Company	CLASS 2 –Gabbs Substation	1.921	0.044
21	US Ecology Nevada, Inc.	CLASS 2 –Hazardous Waste Stabilization U	0.372	0.684
22	Nye Regional Medical Center	CLASS 3	0.767	0.027
23	US Department of Energy	CLASS 2 –Office of Repository Development	0.187	0.006
24	US Department of Energy	CLASS 2 –NTS Combined W/ UGTA, HAZMAT&	0.691	1.937
25	US Air Force Nellis Base	CLASS 1A –Consolidated Tonopah & Tolicha	0	0.402
26	Broadbent & Associates	CLASS 3 –Beatty Store	0.213	0.008
TOTALS			**40.140**	**53.603**

2.3 CRITERION #3 – POPULATION DENSITY AND DEGREE OF URBANIZATION (INCLUDING COMMERCIAL DEVELOPMENT)

Nye County is the largest county in Nevada and the third largest county in the whole United States. It comprises over 16 percent of the total acreage of Nevada. With a land area of 11,560,960 acres, Nye County is larger than the combined total area of Massachusetts, Rhode Island, New Jersey and Delaware. Of this vast land area, only 822,711 acres, or just over seven percent of the total, is private land; the majority of the county's land is owned by the federal government (see Figure 2-4 in section 2.5).

The total population of Nye County is approximately 47,370 (Nevada State Demographer, 2008 data). Population density is low throughout the county (see Figure 2-3). In fact, according to the U.S. Census Bureau, the county's Census Tract #9805, with a land area of 2,704,000 acres or almost one-quarter of the county and comprising the Nevada Test Site and Nye County's portion

of the Nevada Test and Training Range, is the largest census tract in the United States that has absolutely no resident population (as of the 2000 census).

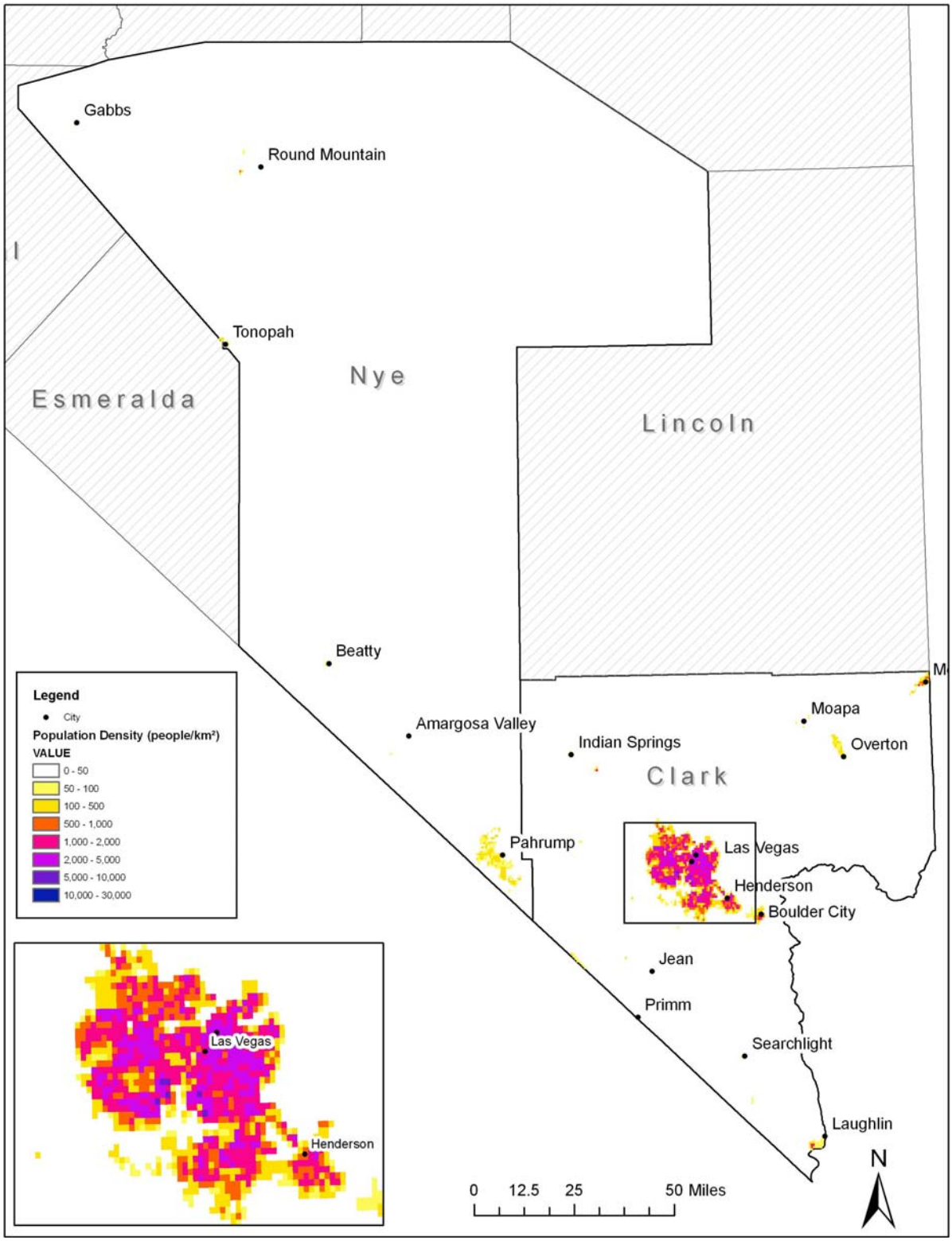
The population of Pahrump is approximately 38,882 people (Nevada State Demographer, 2008 data), but it is still a highly rural community. Figure 2-3 shows population density for Nye and Clark Counties based on 2000 Census data. The population density of Pahrump is 57.8 people per square mile (Pahrump Chamber of Commerce 2008 Business Activity Report, http://www.pahrumpchamber.com/images/p7-9_Demographics_Census_Tracts_Pahrump_Nye_Co.pdf), while the population density in the Las Vegas Valley is 1,241 people per square mile (Clark County Department of Comprehensive Planning). This is about 21 times the density of Pahrump. The population density for all of Nye County is 2.6 people per square mile. Figure 2-3 clearly shows that the population of Pahrump is insignificant compared to the Las Vegas Valley.

Commercial development and employment are two of the surrogate factors that may serve as an indicator of the levels of activities generating ozone precursor emissions. The major industries in Nye County are professional and business, government, and leisure and hospitality services, which do not produce significant amounts of ozone precursor emissions. Pahrump is considered a retirement community, which also affects the level of economic and subsequent emissions activity. The population of Nye County of residents over age 65 is approximately 9,074, with approximately 8,042 residing in Pahrump. The median age in Nye County is currently 42.8 years (44.3 in Pahrump), compared to 34 in Clark County and Las Vegas, and a statewide average of 35.2 years (2000 Census data).

The low population level, an economy dominated by business, government and leisure/hospitality services, and approximately 20 percent of the total population being age 65 or older, demonstrate that Nye County is not expected to be a contributing source of ozone pollution to the Clark County nonattainment area. This factor analysis supports the exclusion of Nye County from the recommended nonattainment area boundary for the 2008 ozone NAAQS.

FIGURE 2-3

POPULATION DENSITY, NYE AND CLARK COUNTIES, 2000 CENSUS DATA



2.4 CRITERION #4 – TRAFFIC AND COMMUTING PATTERNS

The annual vehicle miles traveled (AVMT) in Nye County for 2007, as determined by the Nevada Department of Transportation (NDOT), was approximately 385 million miles compared to approximately 14,562 million miles in Clark County – about 38 times more AVMT in Clark than Nye County. As mentioned earlier, Pahrump is the largest town in Nye County and the community closest to Clark County. It is primarily a retirement community and, therefore, work-related commuting between Pahrump and Las Vegas would be minimal.

Nevada State Route 160 is the primary route connecting Pahrump with Las Vegas. It is classified as a rural major collector by the NDOT. The composition of vehicles on this type of road in Nevada for 2004 was: 12.94 percent truck, 87.06 percent passenger cars and 0.28 percent buses. Table 2-4 shows annual average daily vehicle travel over State Route 160 from 1998 to 2007. The traffic counter is located 15.6 miles west of the intersection of SR 160 and SR 159, in the Spring Mountain range between Pahrump and Las Vegas. The vehicle count includes traffic in both directions.

The data indicate that between the years 1998 and 2007, the increase in vehicle traffic over SR 160 was about 3,289 vehicles per day, only 52 percent rate of growth over nine years. From 2004 to 2007, the increase in daily vehicle traffic was less than 1,000. In fact, the data for 2006 and 2007 indicate that the growth rate has flattened out. By comparison, Federal Highway Administration data indicate that daily vehicle travel in Las Vegas is increasing at a rapid rate. Thus, NDEP concludes that vehicle traffic between Pahrump and Las Vegas is not significant compared to the traffic in the Las Vegas Valley and has a minimal impact on the generation of ozone precursor emissions in Clark County.

TABLE 2-4

ANNUAL AVERAGE DAILY TRAFFIC BETWEEN
PAHRUMP AND LAS VEGAS*

YEAR	Annual Average Daily Traffic
1998	6,360
1999	7,030
2000	7,235
2001	7,280
2002	7,720
2003	7,850
2004	8,661
2005	9,444
2006	9,649
2007	9,649

* Data obtained from NDOT Traffic Information Access web site (http://www.nevadadot.com/trina/) for portable traffic count station 003-3180, located on State Route 160, 15.6 miles west of State Route 159. The count includes both directions of traffic.

Traffic and commuting patterns in Clark County completely dwarf those of Nye County and indicate that mobile source emissions in Nye County are an insignificant source of ozone precursors. There are no communities in Nye County that are centers of commuter traffic to the Las Vegas area. This factor analysis supports the exclusion of Nye County from the recommended nonattainment area boundary for the 2008 ozone NAAQS.

2.5 CRITERION #5 – GROWTH RATE AND PATTERNS

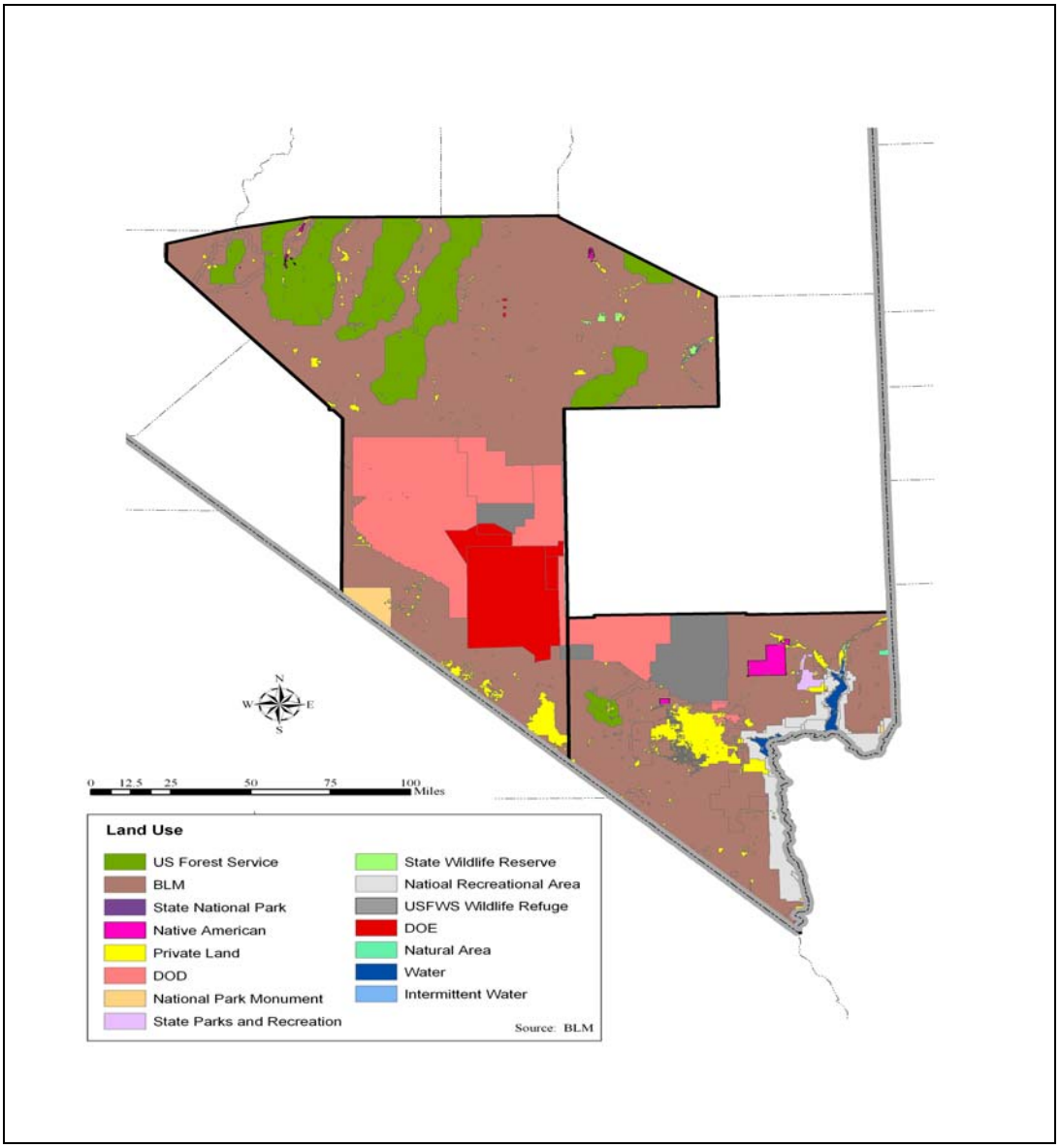
Projected population growth was reviewed for the period 2007 through 2014. The population growth rate in Nye County, between 2007 and 2014, is predicted to be 4.8 percent per year (calculated from Nevada State Demographer's Population Projections, 2007-2014). This growth rate would result in a county-wide increase of 17,920 residents over seven years. Clark County's current population of approximately 1,967,716 (Nevada State Demographer, 2008 data) is projected to grow at a rate of 2.7 percent, which would result in an estimated population increase of 430,000 over the next seven years. This represents significant growth compared to the projected population increase in Nye County.

Clark County's population is highly urbanized with the majority of the population located in the Las Vegas Valley. The growth in Clark County is expected to be very localized and confined to the existing urban area primarily due to the limited availability of private land. Figure 2-4 shows land ownership in Nye and Clark Counties. The federal government owns approximately 92 percent of the land in Nye County and just over 90 percent of the land in Clark County. Because of the large percentage of federally-owned land in Clark County, growth is limited to private lands primarily within the Las Vegas Valley. Additionally, there is a buffer of federal lands between Las Vegas and Pahrump of approximately 35 miles. Future development is constrained by the U.S. Bureau of Land Management disposal boundaries in both the Pahrump Valley and the Las Vegas Valley.

This factor analysis supports the exclusion of Nye County from the recommended nonattainment area boundary for the 2008 ozone NAAQS.

Figure 2-4

SOUTHERN NEVADA LAND USE MAP



2.6 CRITERION #6 – METEOROLOGY (WEATHER/TRANSPORT PATTERNS)

Meteorological patterns play a pivotal role in the formation of ozone. Topographically driven surface winds have an influence on the speed and direction of transport of ozone precursor emissions. From day to day, the meteorological variation dictates the days and locations that will experience elevated ozone levels.

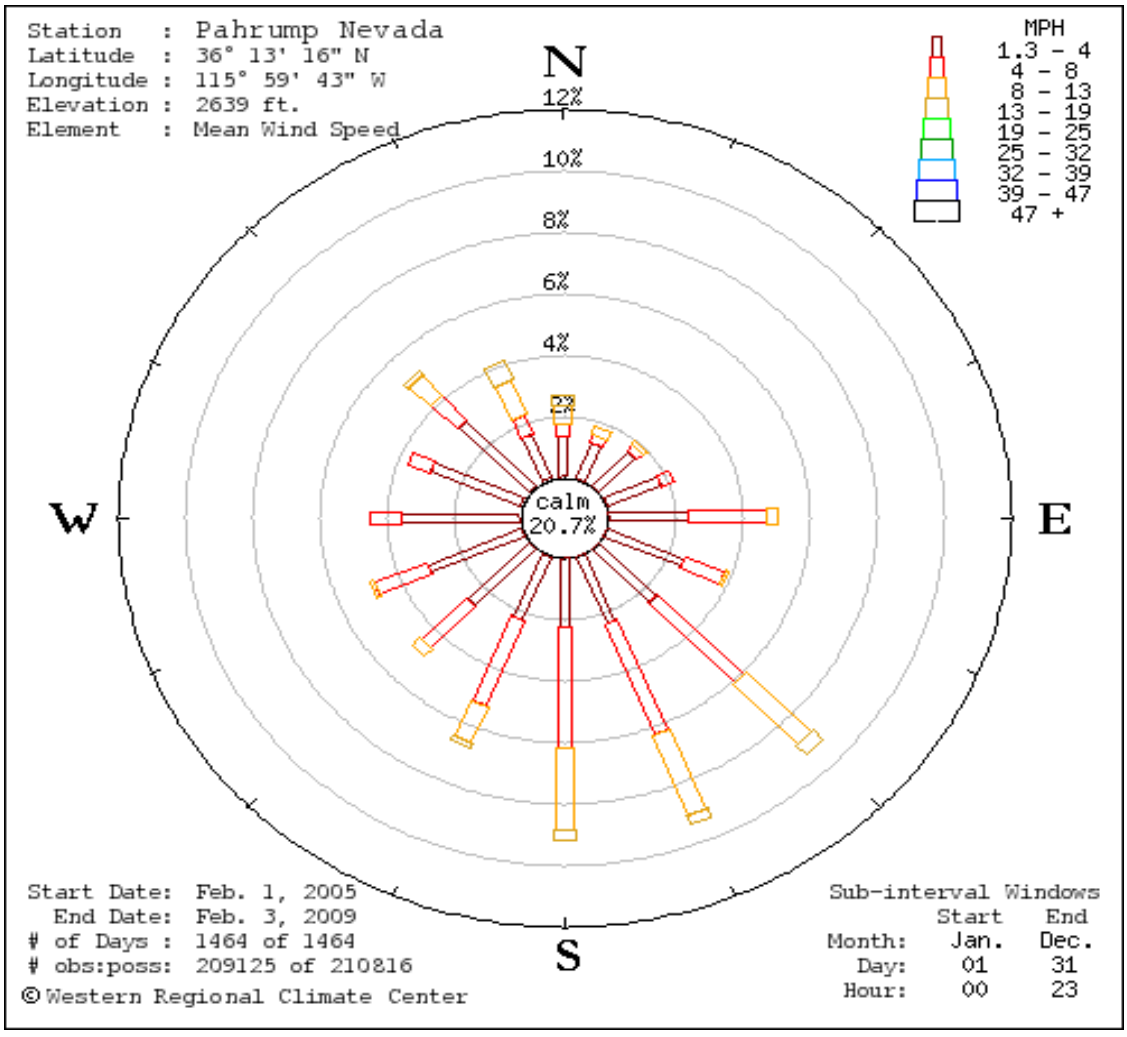
In southern Nye County, the predominant summertime wind pattern is from the southeast, which would preclude transport of ozone precursor emissions from Nye County into Clark County (see Figure 2-5). In the Las Vegas Valley, summertime winds are typically from the southwest. The

difference in wind direction between the Pahrump and Las Vegas Valleys can generally be explained by the configuration of the Spring Mountain Range with respect to the two valleys (see Figure 2-7). Winds coming into Nevada from the southwest would be split at the southernmost end of the range, turning any wind entering the Pahrump Valley to the northwest. Winds coming over the Cajon Pass in southern California into the Las Vegas Valley would continue their northeasterly direction through that valley and out onto the Colorado Plateau.

Based on the meteorological evidence, there is no reason to believe that ozone precursor emissions generated in Nye County are being transported into Clark County. This factor analysis supports the exclusion of Nye County from the recommended nonattainment area boundary for the 2008 ozone NAAQS.

FIGURE 2-5

WIND ROSE FOR PAHRUMP, NEVADA



2.7 CRITERION #7 – GEOGRAPHY/TOPOGRAPHY (MOUNTAIN RANGES OR OTHER AIR BASIN BOUNDARIES)

Nevada lies almost entirely within the Great Basin portion of the Basin and Range physiographic province. The Basin and Range is characterized by a series of generally north-trending mountain ranges separated by alluvial valleys. This topography was the basis for Nevada's decision to use hydrographic basins as the air quality management unit throughout the state. Nye County is geographically isolated from Clark County by the Spring Mountain Range, which separates Las Vegas Valley from the Pahrump Valley (see Figure 2-7).

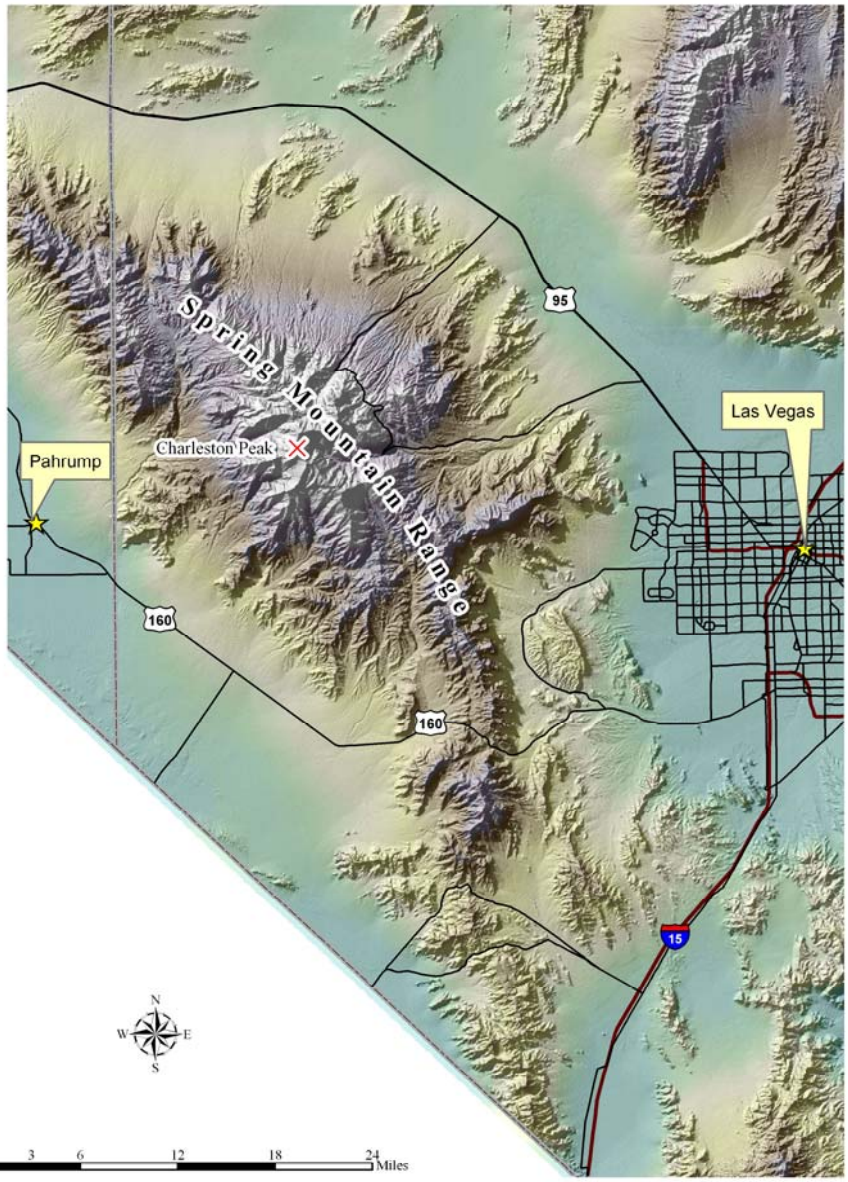
The Spring Mountains run generally northwest-southeast along the west side of Las Vegas and down to the border with California. The highest point is Mount Charleston, at 11,918 ft (3,633 m). The Spring Mountains divide the Pahrump Valley and Amargosa River basin from the Las Vegas Valley, which drains into the Colorado River. Thus, the mountains define part of the boundary of the Great Basin. Mountain ranges provide a natural barrier to the movement of air and pollutants between hydrographic basins. In the absence of major storm fronts, topography dictates the strength and direction of surface winds and would provide a barrier, in most cases, from the transport of pollutants between the two basins. The highway pass between the two hydrographic basins is 5,594 feet, a major barrier to transport.

With an area of about 857 square miles and a vertical range of nearly two miles, the Spring Mountains consist of multiple summits, including Mt. Charleston and its connecting ridges. Other major summits include Bonanza Peak, McFarland Peak, Mummy Mountain, Griffith Peak, Bridge Mountain, Mount Wilson, and Mount Potosi. Most of the land in the mountains is owned by the U.S. Forest Service and the U.S. Bureau of Land Management and managed as the Spring Mountains National Recreation Area and Red Rock Canyon National Conservation Area within the Humboldt-Toiyabe National Forest (see Figure 2-4). The distance between Pahrump and Las Vegas is about 60 miles, and the buffer of federally owned land between them is approximately 35 air miles wide, precluding development of any type in these areas.

This factor analysis supports the exclusion of Nye County from the recommended nonattainment area boundary for the 2008 ozone NAAQS.

FIGURE 2-6

TOPOGRAPHIC MAP OF PAHRUMP--LAS VEGAS AREA



2.8 CRITERION #8 – JURISDICTIONAL BOUNDARIES

Air quality management in Nye County is under the jurisdiction of NDEP. In Clark County, air quality managed by DAQEM, under the authority of the Clark County Board of County Commissioners. Because states have no jurisdiction over tribal lands, Nevada's recommended nonattainment area excludes all tribal lands.

On September 17, 2004 (69FR559566), EPA finalized the boundaries for the portion of Clark County that was designated nonattainment for the 1997 8-hour ozone NAAQS. This designation defined an area within the Las Vegas Valley as nonattainment, while finding the remainder of Clark County as "unclassifiable/attainment." More recently, the Clark County ambient air quality monitoring record shows exceedances and violations of the 2008 8-hour ozone NAAQS predominately within the vicinity of the urban core (see Table 2-1). Other violating monitors are located at various sites within the Clark County boundary.

Clark County's jurisdiction extends well beyond what is reasonably considered necessary to bring the Las Vegas area back into attainment. Controls in Nye County will not provide any additional ozone reductions in the Las Vegas Valley. Therefore, this factor analysis supports the exclusion of Nye County from the recommended nonattainment area boundary for the 2008 ozone NAAQS for Clark County.

2.9 CRITERION #9 – LEVEL OF CONTROL OF EMISSION SOURCES

All of the monitored violations of the new ozone NAAQS have occurred inside Clark County. Because Nye County lies adjacent to Clark County, NDEP has looked at possible sources of ozone precursors in Nye County and how they might contribute to the exceedances in Clark County.

NDEP has determined that sources in Nye County do not generate ozone precursor emissions in amounts that could reasonably be expected to have any affect on the level of ozone emissions in Clark County. Table 2-2 shows that ozone precursor emissions generated in Nye County are dwarfed by the emissions generated in Clark County. The emissions data, in conjunction with the topographical, geographical and meteorological differences between the two valleys, demonstrate that Nye County is not a source of ozone pollution for Clark County. Emissions generated in Nye County will not impact ozone emissions in the Las Vegas Valley nor in Clark County, generally.

There are several federally enforceable control measures, specifically gasoline engine and diesel engine standards, and fuel standards as well as state-wide application of New Source Review Regulations and existing Stationary Source Performance standards that provide adequate control for emission sources located in Nye County. This factor analysis supports the exclusion of Nye County from the recommended nonattainment area boundary for the 2008 ozone NAAQS.

3. CONCLUSION

In summary, Nye County is a sparsely populated rural county with a population density of 2.6 people per square mile. Pahrump is the largest population center in the county, comprising approximately 82 percent of the county's population, with a population density of 57.8 per square mile. The population density of the Las Vegas Valley is 1,241 people per square mile or 21 times more than that of Pahrump. Geographic and topographic features separate Pahrump from the recommended nonattainment area in Clark County, and meteorological evidence indicates that pollutants are not transported from Pahrump to Clark County. Moreover, NO_x and VOC emissions from Nye County are insignificant.

NDEP, therefore, concludes that there is no evidence that Nye County will impact the recommended nonattainment area in Clark County. Based on the 9 factors evaluated in this report, NDEP has determined that the boundary of the 2008 8-hour ozone NAAQS nonattainment area should exclude Nye County.

DAQEM

DEPARTMENT OF AIR QUALITY & ENVIRONMENTAL MANAGEMENT

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Lewis Wallenmeyer Director · Alan Pinkerton Assistant Director · Tina Gingras Assistant Director

March 5, 2009

Mr. Leo Drozdoff, Administrator
Nevada Division of Environmental Protection
901 So. Stewart St., Suite 4001
Carson City, NV 89501

RE: Transmittal of Ozone Monitoring Data and Recommendations on Nonattainment Designations for Clark County, Nevada

Dear Mr. Drozdoff:

This letter transmits the 2006-2008 quality assured eight-hour ozone monitoring data for Clark County, Nevada (Enclosure 1). It also provides recommendations on Clark County nonattainment area designations in support of the U.S. Environmental Protection Agency (EPA) process for implementing the 2008 Federal eight-hour ozone standard of 0.075 parts per million (ppm) (Enclosure 2).

Based on the monitoring data, Clark County does not meet the 2008 Federal eight-hour ozone standard of 0.075 ppm. Elevated ozone concentrations in Clark County are caused by local emissions of precursor pollutants and the transport of ozone and precursor pollutants from upwind areas into southern Nevada. Research and field studies indicate that transport of pollutants into southern Nevada can, in fact, be the dominating mechanism under certain meteorological regimes; the *California Interstate Transport State Implementation Plan* (revised September 2007) noted that technical studies suggested ozone concentrations in Clark County were affected by ozone transported from sources in California. In addition, exceptional events (e.g., wildfires) can lead to violations of the ozone standard in Clark County.

In July 2004, Clark County, with technical assistance from Nevada's Desert Research Institute, completed an 11-factor boundary analysis in developing recommendations for attainment and nonattainment areas under the 1997 ozone standard.[1] EPA in September 2004 concurred with the findings of that analysis. In conducting a new 9-factor analysis required by the EPA, Clark County finds that the conclusions and recommendations in the 2004 11-factor analysis remain valid, and the hydrographic areas that Clark County recommends for nonattainment under the 2008 ozone standard are identical to the areas EPA designated nonattainment under the 1997 standard.

[1] "Nevada Air Quality Designations, Boundary Recommendations for the 8-Hour Ozone NAAQS for Clark County, Nevada," prepared by Clark County Department of Air Quality and Environmental Management, July 2004.

These areas are:

- 164A, 164B, 165, and 166 – Ivanpah Valley
- 167 – Eldorado Valley
- 212 – Las Vegas Valley
- 213 – Colorado River Valley
- 214 – Paiute Valley
- 216 and 217 – Apex Valley
- 218 – Moapa Valley

The remaining hydrographic areas within Clark County should not be designated nonattainment, because technical studies completed since 2004 offer no evidence that these areas will impact the recommended nonattainment area. In addition, these areas are sparsely populated, with no significant man-made sources of pollutants, and are separated from the recommended nonattainment areas by geographic and topographic features.

Please contact John Koswan at (702) 455-1647 or William Cates at (702) 455-1650 if you have any questions. Thank you.

Sincerely,

L. Wallenmeyer

Lewis Wallenmeyer, Director

Enclosure:

1. 2006-2008 ozone monitoring data
2. Nevada Air Quality Designations and Boundary Recommendations for the 8-Hour Ozone NAAQS for Clark County, Nevada, February 2009

2006-2008 Ozone Monitoring Data for Clark County, NV (by station in parts per million)

E. Craig Road			**Site ID 32-003-0020**					
Year	*1st High*	*Date*	*2nd High*	*Date*	*3rd High*	*Date*	***4th High***	*Date*
2006	0.084	7/1/2006	0.081	5/12/2006	0.080	6/30/2006	0.079	7/18/2006
2007	0.081	6/16/2007	0.077	6/17/2007	0.076	6/28/2007	0.075	6/25/2007
2008	0.08	8/27/2008	0.077	8/14/2008	0.074	8/16/2008	0.071	5/30/2008
Average							***0.075***	
Apex			**Site ID 32-003-0022**					
Year	*1st High*	*Date*	*2nd High*	*Date*	*3rd High*	*Date*	***4th High***	*Date*
2006	0.087	5/12/2006	0.083	7/1/2006	0.083	6/20/2006	0.082	6/29/2006
2007	0.087	6/16/2007	0.086	6/27/2007	0.081	6/25/2007	0.081	5/10/2007
2008	0.076	5/30/2008	0.075	5/31/2008	0.073	5/29/2008	0.071	4/30/2008
Average							***0.078***	
Mesquite			**Site ID 32-003-0023**					
Year	*1st High*	*Date*	*2nd High*	*Date*	*3rd High*	*Date*	***4th High***	*Date*
2006	0.072	5/13/2006	0.070	6/11/2006	0.069	6/3/2006	0.069	7/25/2006
2007	0.078	6/16/2007	0.066	6/29/2007	0.066	6/17/2007	0.064	8/5/2007
2008	0.071	4/30/2008	0.071	5/11/2008	0.07	5/31/2008	0.069	4/30/2008
Average							***0.067***	
Paul Meyer			**Site ID 32-003-0043**					
Year	*1st High*	*Date*	*2nd High*	*Date*	*3rd High*	*Date*	***4th High***	*Date*
2006	0.091	7/1/2006	0.087	6/30/2006	0.083	7/18/2006	0.083	7/21/2006
2007	0.085	6/27/2007	0.084	6/16/2007	0.083	7/28/2007	0.081	6/28/2007
2008	0.082	7/7/2008	0.078	7/10/2008	0.078	8/27/2008	0.077	8/16/2008
Average							***0.080***	
Walter Johnson			**Site ID 32-003-0071**					
Year	*1st High*	*Date*	*2nd High*	*Date*	*3rd High*	*Date*	***4th High***	*Date*
2006	0.094	7/1/2006	0.094	6/30/2006	0.090	7/21/2006	0.085	6/22/2006
2007	0.089	7/28/2007	0.083	6/27/2007	0.083	6/16/2007	0.080	8/4/2007
2008	0.083	7/7/2008	0.078	7/10/2008	0.076	8/16/2008	0.076	8/27/2008
Average							***0.080***	
Lone Mountain			**Site ID 32-003-0072**					
Year	*1st High*	*Date*	*2nd High*	*Date*	*3rd High*	*Date*	***4th High***	*Date*
2006	0.098	6/30/2006	0.090	7/1/2006	0.088	7/21/2006	0.085	6/29/2006
2007	0.085	7/28/2007	0.081	6/27/2007	0.080	7/29/2007	0.080	6/17/2007
2008	0.081	8/27/2008	0.079	7/7/2008	0.078	7/10/2008	0.078	8/15/2008
Average							***0.081***	
Palo Verde			**Site ID 32-003-0073**					
Year	*1st High*	*Date*	*2nd High*	*Date*	*3rd High*	*Date*	***4th High***	*Date*
2006	0.093	6/30/2006	0.091	7/1/2006	0.085	7/28/2006	0.084	7/18/2006
2007	0.088	7/28/2007	0.082	6/16/2007	0.082	6/15/2007	0.080	8/4/2007
2008	0.079	7/10/2008	0.078	7/7/2008	0.078	8/27/2008	0.074	8/14/2008
Average							***0.079***	

2006-2008 Ozone Monitoring Data for Clark County, NV (by station in parts per million)

Joe Neal			**Site ID 32-003-0075**					
Year	*1st High*	*Date*	*2nd High*	*Date*	*3rd High*	*Date*	***4th High***	*Date*
2006	0.088	7/18/2006	0.085	7/25/2006	0.084	7/21/2006	0.081	7/23/2006
2007	0.088	6/17/2007	0.086	6/28/2007	0.086	6/27/2007	0.085	6/16/2007
2008	0.083	8/15/2008	0.082	8/16/2008	0.08	7/10/2008	0.08	7/18/2008
Average							***0.082***	
Winterwood			**Site ID 32-003-0538**					
Year	*1st High*	*Date*	*2nd High*	*Date*	*3rd High*	*Date*	***4th High***	*Date*
2006	0.084	5/12/2006	0.084	7/1/2006	0.080	7/25/2006	0.078	6/30/2006
2007	0.085	6/16/2007	0.081	6/27/2007	0.079	6/28/2007	0.077	6/25/2007
2008	0.075	8/14/2008	0.073	8/27/2008	0.072	8/16/2008	0.071	5/11/2008
Average							***0.075***	
Boulder City			**Site ID 32-003-0601**					
Year	*1st High*	*Date*	*2nd High*	*Date*	*3rd High*	*Date*	***4th High***	*Date*
2006	0.079	5/12/2006	0.077	7/25/2006	0.075	6/22/2006	0.074	5/7/2006
2007	0.087	6/16/2007	0.084	8/3/2007	0.078	6/27/2007	0.076	5/29/2007
2008	0.074	5/31/2008	0.073	5/30/2008	0.073	6/3/2008	0.071	4/22/2008
Average							***0.074***	
Jean			**Site ID 32-003-1019**					
Year	*1st High*	*Date*	*2nd High*	*Date*	*3rd High*	*Date*	***4th High***	*Date*
2006	0.083	5/12/2006	0.083	6/20/2006	0.079	6/21/2006	0.079	7/28/2006
2007	0.088	6/27/2007	0.087	6/16/2007	0.084	6/15/2007	0.081	6/28/2007
2008	0.078	5/11/2008	0.075	8/15/2008	0.074	5/3/2008	0.074	5/30/2008
Average							***0.078***	
Orr			**Site ID 32-003-1021**					
Year	*1st High*	*Date*	*2nd High*	*Date*	*3rd High*	*Date*	***4th High***	*Date*
2006	0.088	7/1/2006	0.087	7/21/2006	0.087	7/25/2006	0.085	6/30/2006
2007	0.084	8/3/2007	0.083	6/28/2007	0.082	6/27/2007	0.080	8/4/2007
2008	0.077	7/7/2008	0.077	8/14/2008	0.076	8/27/2008	0.074	8/16/2008
Average							***0.080***	
J.D. Smith			**Site ID 32-003-2002**					
Year	*1st High*	*Date*	*2nd High*	*Date*	*3rd High*	*Date*	***4th High***	*Date*
2006	0.091	7/1/2006	0.088	6/30/2006	0.083	7/18/2006	0.081	7/25/2006
2007	0.083	6/16/2007	0.081	6/28/2007	0.079	8/4/2007	0.079	6/27/2007
2008	0.069	5/30/2008	0.069	8/14/2008	0.069	8/27/2008	0.068	5/11/2008
Average							***0.076***	

Nevada Air Quality Designations and Boundary Recommendations for the 8-Hour Ozone NAAQS for Clark County, Nevada

Prepared by:

Clark County Department of Air Quality
and Environmental Management
Las Vegas, Nevada

March 5, 2009

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ACRONYMS AND ABBREVIATIONS

Acronyms

AFB	Air Force Base
AVMT	annual vehicle miles traveled
BART	Best Available Retrofit Technology
CAA	Clean Air Act
CBSA	Core-Based Statistical Area
CERR	Consolidated Emissions Reporting Rule
CSA	Combined Statistical Area
DAQEM	Clark County Department of Air Quality & Environmental Management
EPA	U.S. Environmental Protection Agency
FWS	U.S. Fish &Wildlife Service
GIS	Geographic Information System
GMT	Greenwich Mean Time
HA	hydrographic area
LUWG	Land Use Workgroup
NAAQS	National Ambient Air Quality Standards
NDEP	Nevada Division of Environmental Protection
NED	National Elevation Database
NEXRAD	Next Generation Radars
NO_x	nitrogen oxides
ORVR	Onboard Refueling Vapor Recovery (system)
RTC	Regional Transportation Commission of Southern Nevada
SNPLMA	Southern Nevada Public Lands Management Act
SNRPC	Southern Nevada Regional Planning Coalition
USGS	U.S. Geological Survey
UTC	Universal Time Coordinated
VMT	vehicle miles traveled
VOC	volatile organic compounds

Abbreviations

ppm	parts per million
tpy	tons per year

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1.0 INTRODUCTION

The U.S. Environmental Protection Agency (EPA) revised the National Ambient Air Quality Standard (NAAQS) for ozone on March 12, 2008 (73 FR 16436). The new primary ozone standard was lowered from 0.08 parts per million (ppm) to 0.075 ppm. At the same time, EPA strengthened the secondary ozone standard to provide increased protection against adverse public welfare effects, including impacts on vegetation and forested ecosystems. The secondary standard is now identical in all respects to the revised primary standard. Section 107(d) of the Clean Air Act (CAA) governs the process for area designations following the establishment of new or revised NAAQS. Because the 2008 revised primary and secondary ozone NAAQS are identical, EPA expects that each area will have the same designation and boundary for both standards.

Under CAA Section 107(d), states must submit recommendations on area designations to EPA not later than one year after the promulgation of a new or revised standard. If, after careful consideration, EPA decides to promulgate a designation that deviates from a state recommendation, the agency must notify the state at least 120 days prior to promulgating the final designation and provide an opportunity to demonstrate why the potential modification is inappropriate. The CAA requires EPA to complete the designation process within two years of promulgation of a new or revised NAAQS unless the Administrator has insufficient information to make these decisions; in that case, EPA may take up to an additional year to make the designations.

In a December 4, 2008 memo, EPA recommends that the Core-Based Statistical Area (CBSA), as defined by the U.S. Census Bureau, or the Combined Statistical Area (CSA), which includes two or more adjacent CBSAs, serve as the starting point or "presumptive" boundary for considering the geographic boundaries of an ozone nonattainment area. The Las Vegas-Paradise-Pahrump CBSA covers the Nevada counties of Clark and Nye. To avoid being directed to use a "presumptive" boundary, a state must address the following nine criteria listed in EPA guidance:

1. Air quality data.
2. Emissions data (i.e., location of sources and contribution to ozone concentrations).
3. Population density and degree of urbanization, including commercial development.
4. Traffic and commuting patterns.
5. Growth rates and patterns.
6. Meteorology (i.e., weather/transport patterns).
7. Geography/topography (e.g., mountain ranges or other air basin boundaries).
8. Jurisdictional boundaries (e.g., counties, air districts, existing nonattainment areas, reservations, metropolitan planning organizations).
9. Level of control of emission sources.

The state of Nevada and Clark County provide their rationale for establishing nonattainment boundary designations in the following sections of this report. Its objectives are:

1. State and evaluate data relevant to ozone nonattainment in Clark County.
2. Describe the results of a 9-factor analysis conducted in accordance with Meyers 2008.
3. Recommend an appropriate nonattainment boundary for the county.

2.0 BACKGROUND

Clark County is 8,091 square miles in land area, larger than the states of Connecticut (4,845 mi^2) and Delaware (1,954 mi^2) combined. It is the nation's 15th-largest county, yet its emissions and population are concentrated in the Las Vegas Valley: based on analyses from the mid-1990s, 95 percent of the population lives within the valley. Various agencies involved in planning activity, including the Clark County Department of Comprehensive Planning, the Clark County School District, the Regional Transportation Commission of Southern Nevada (RTC), the Southern Nevada Regional Planning Coalition (SNRPC), and the Southern Nevada Water Authority, support these population analyses. In the 2006-2008 monitoring period, ambient ozone (O_3) measurements in the Las Vegas area indicated nonattainment of the 8-hour NAAQS of 0.075 ppm (EPA 2008).

Clark County includes large expanses of federally-owned, undeveloped, nondevelopable desert; a small amount of agricultural development; and small, isolated rural communities that are not significant sources of ozone precursors. The entire county is characterized by basin and range topography, and since the passage of the CAA, the state has been divided into hydrographic areas for air quality management. Numerous mountain ranges separate the Las Vegas Valley and its ozone-producing sources from other hydrographic areas in Clark County.

Clark County air quality monitoring data shows that the violation of the 8-hour ozone standard happened within the Las Vegas Valley metropolitan area, located in central Clark County. This is the most heavily urbanized area of Clark County and contains most of the local sources of ozone precursors. Biogenic emissions of ozone precursors are distributed throughout the county, and other anthropogenic sources may be found around rural communities and industrial sources, but both sources are considered insignificant compared to the anthropogenic emissions from the Las Vegas Valley.

Land ownership patterns greatly influence development patterns in Clark County. Only 7.14 percent of county land is privately owned; federal, state and tribal lands create barriers to contiguous expansion of the urbanized core beyond the Southern Nevada Public Lands Management Act (SNPLMA) boundary. In addition, the Multiple Species Habitat Conservation Plan Incidental Take Permit from the U.S. Fish and Wildlife Service (FWS) has limited private development in the entire county to 145,000 total acres since 2001.

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3.0 INFORMATION SOURCES

This document uses available information to designate the 8-hour ozone nonattainment boundary. Data sets used include:

1. 2000 census data.
2. EPA national emissions inventory.
3. Land use and vegetation maps.
4. Topographic maps.
5. Hydrographic area boundaries.
6. Roadway and traffic information.
7. Data from the Clark County and Nevada state air quality networks.
8. Surface meteorological networks.
9. Upper air meteorological networks.
10. SNRPC Land Use Workgroup (LUWG).

Each of these items is described in detail in the following sections.

3.1 CENSUS DATA

The 2000 census provides the most recent nationwide population count. The smallest geographic entity the U.S. Census Bureau tabulates are known as "census blocks," and are typically bounded by streets, legal boundaries, and other features. Data from the *2000 Summary Population and Housing Characteristics* series (PHC-1, tape file 1A) is the primary source of census block population counts.

In Clark County, the mean population per census block is approximately 85 people (Figure 3-1). Block population data is linked to the Census Bureau's TIGER/Line® block polygon shape files in ArcGIS, so areas for each block polygon can be calculated to estimate population density. Once the average population density for each polygon is calculated, the file can be converted to ESRI GRID format and gridded to a resolution of 1 km^2 in the ArcGIS Geographic Information System (GIS).

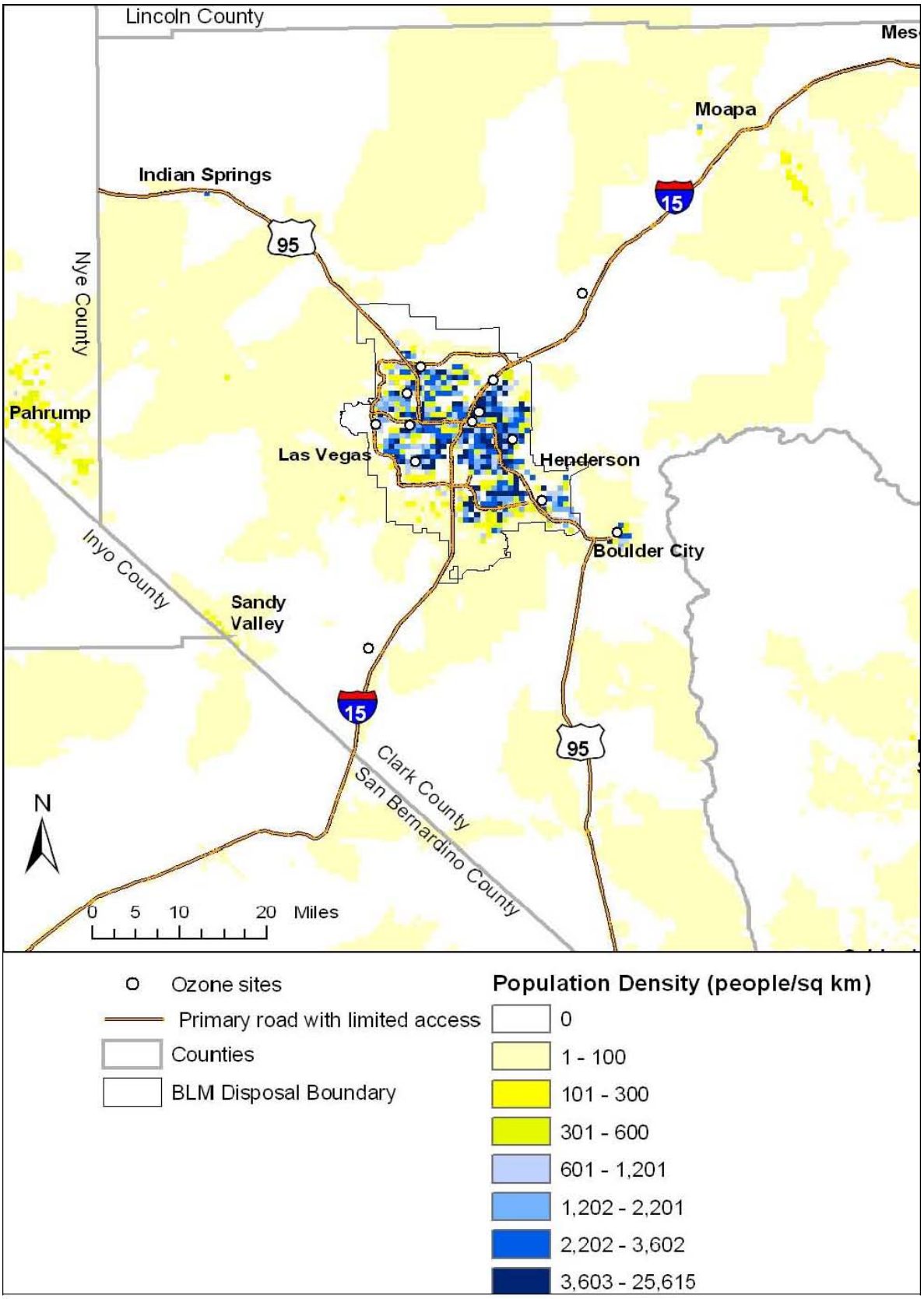


Figure 3-1. Population Density Based on 2000 Census Block Data.

3.2 EPA 2005 CONSOLIDATED EMISSIONS REPORTING RULE INVENTORY

The Clark County Department of Air Quality and Environmental Management (DAQEM) reports actual NO_x and VOC emissions from point, area, and mobile sources as part of the Consolidated Emissions Reporting Rule (CERR) submittal. The CERR does not contain emissions from coal-fired power plants permitted by the state, which are instead contained in the state's NEI submittal. Both are submitted in accordance with the CERR (67 FR 39602).

3.3 LAND USE AND VEGETATION

The National Land Cover Database provides the most recent and accurate depiction of land cover over the contiguous U.S. This database was derived from Landsat Thematic Mapper imagery (circa 1992) with a spatial resolution of 30 m, and supplemented by ancillary data. Processing involved identifying similar land use areas using a supervised clustering algorithm on the Landsat images. These land use clusters were then labeled using aerial photographs (Figure 3-2).

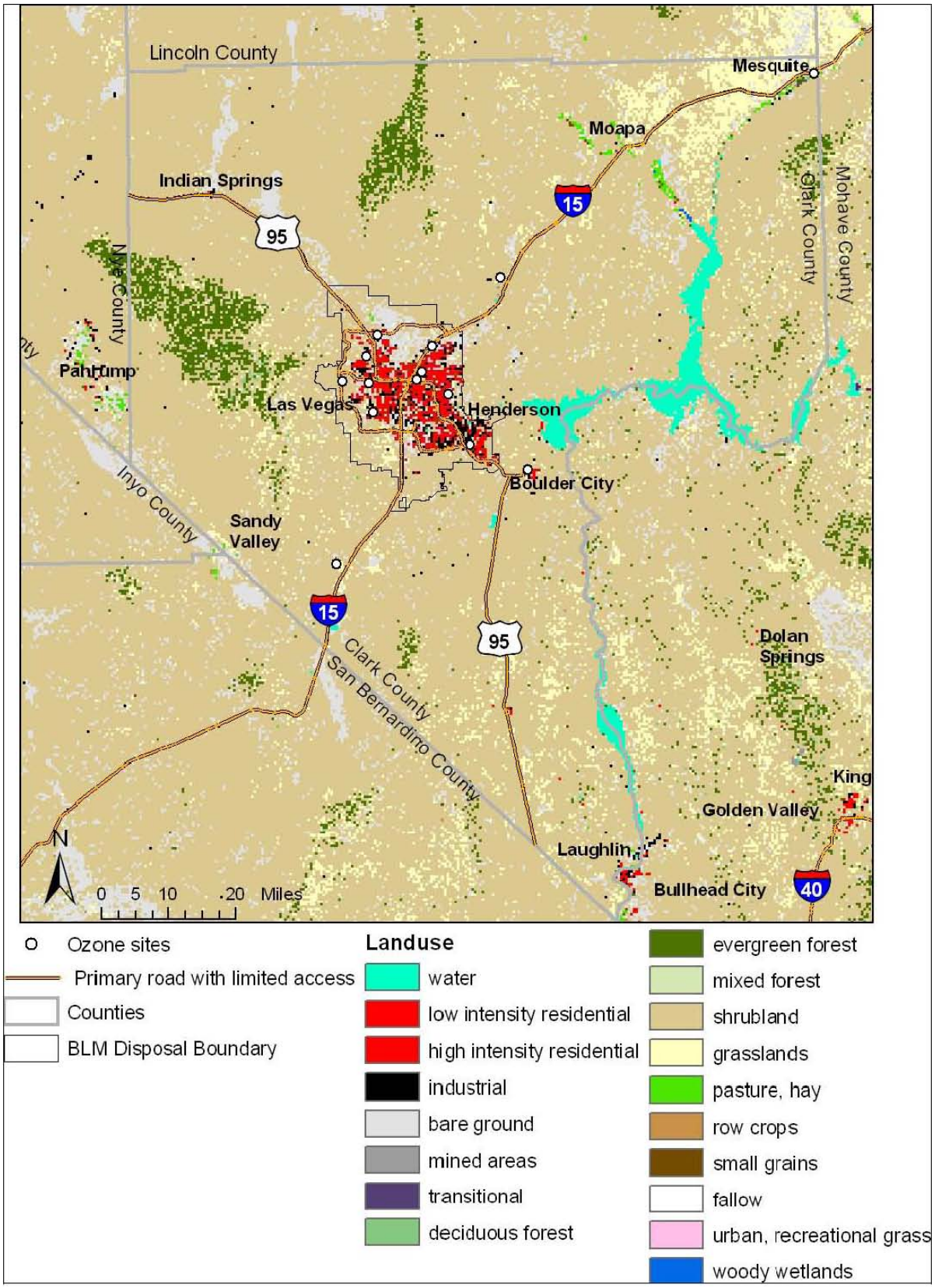


Figure 3-2. Clark County Land Use.

3.4 TOPOGRAPHY

The U.S. Geological Survey (USGS) has archived elevations throughout the United States at a 30-m resolution in the National Elevation Database (NED). The USGS Seamless Data Distribution System allows construction of shaded relief maps from the NED elevations (Figure 3-3).

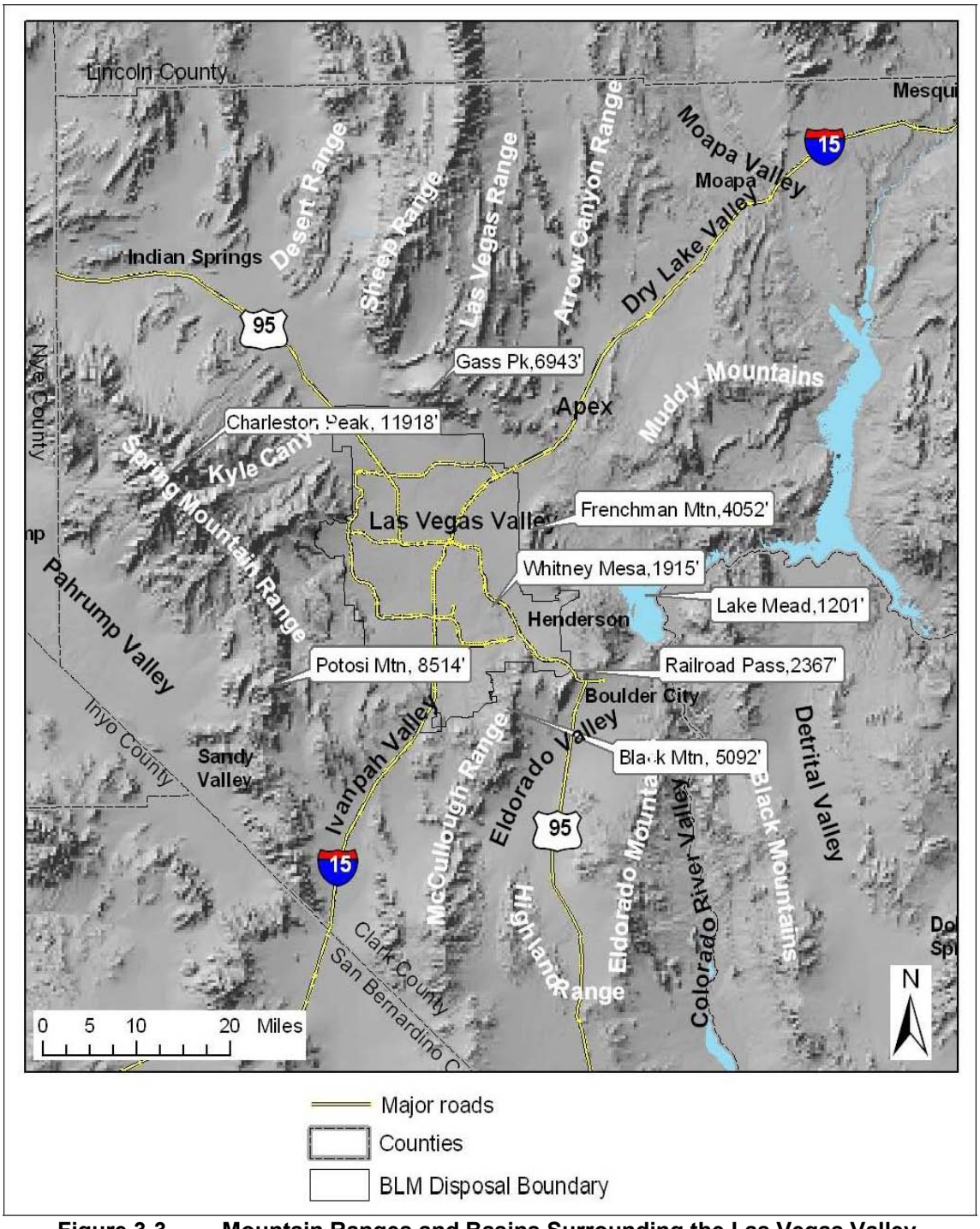


Figure 3-3. Mountain Ranges and Basins Surrounding the Las Vegas Valley.

3.5 HYDROGRAPHIC AREAS

Hydrographic areas (HAs) represent natural and man-made stream drainage areas or basins. Figure 3-4 shows the hydrographic areas and air quality regions within Clark County, excluding the portions of hydrographic areas outside the Nevada state boundary (67 FR 12474).

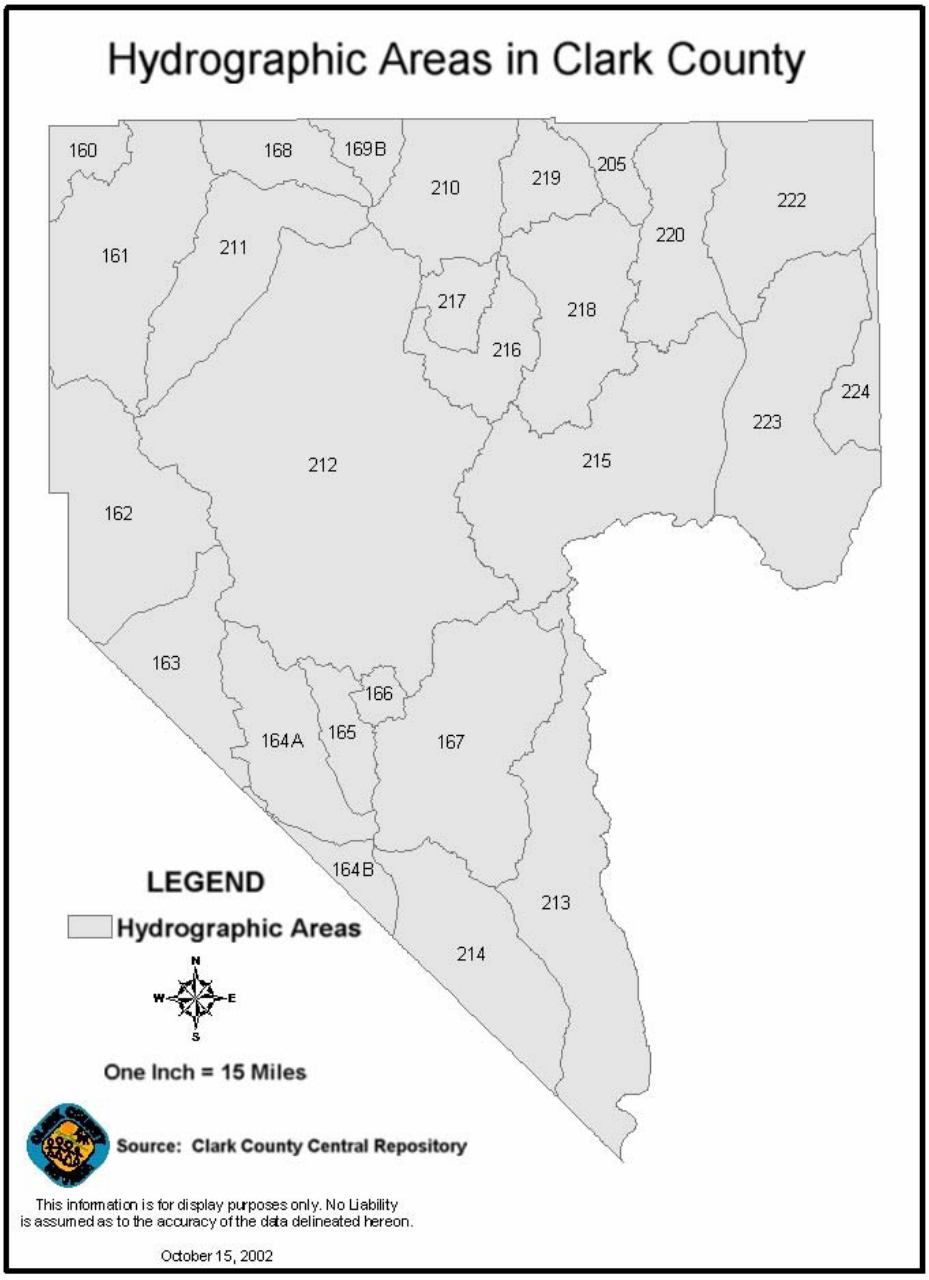


Figure 3-4. Clark County Hydrographic Areas.

3.6 ROADWAYS AND TRAFFIC

The RTC has published a comprehensive analysis of current and projected transportation needs (RTC 2008). Travel demand models were used to estimate trips and vehicle miles traveled between calendar years 2008 and 2030 (Figure 3-5 and Table 3-1). These data are summarized in written reports and available in files suitable for GIS analysis.

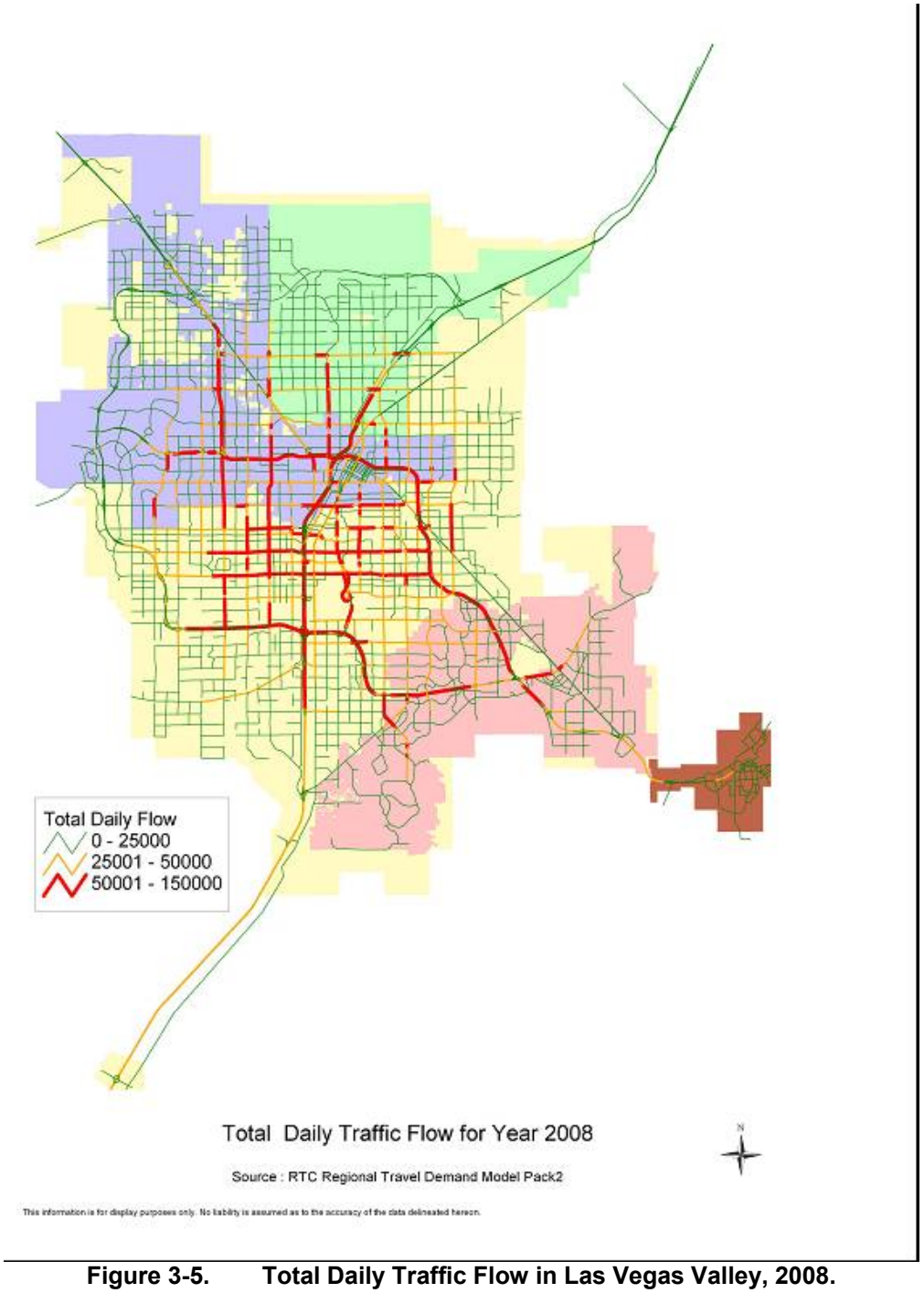


Figure 3-5. Total Daily Traffic Flow in Las Vegas Valley, 2008.

Table 3-1. Estimated Daily Vehicle Miles Traveled in the Las Vegas Metropolitan Area, 2008- 2030

Road Type	2008	2010	2020	2030
External links	607,755	631,693	789,029	957,758
System-to-system ramps	341,568	356,470	535,554	596,490
Minor roads	5,439,127	6,100,189	8,695,678	10,596,263
Major roads	15,356,117	16,623,022	19,182,320	20,900,273
Ramps	1,234,124	1,355,581	1,716,600	1,885,604
Interstates	10,529,327	11,359,075	15,700,354	19,148,610
Freeways	4,567,426	5,395,363	7,464,694	8,208,423
Expressways/beltways	198,762	193,598	7,652	12,316
Collectors	3,310,084	3,498,212	4,146,492	4,682,685
Centroid connectors	3,255,261	3,581,532	4,693,489	5,448,182
Local roads	15,271	15,632	15,818	16,854
HOV	243,363	486,752	1,160,461	1,173,322
Total	**45,098,185**	**49,597,119**	**64,108,141**	**73,626,781**

Source: RTC 2008.

3.7 CLARK COUNTY AIR QUALITY NETWORK

Table 3-2 identifies air quality monitoring locations within Clark County, and Figure 3-6 shows their locations.

Table 3-2. Site Codes and Locations for Ozone Monitoring Sites in Clark County

CAMS	EPA Site	Site Description	Street Address	City
22	32-003-0022	Apex	12101 U.S. Hwy. 93	Apex
23	32-003-0023	Mesquite	465 E. Old Mill Road	Mesquite
601	32-003-0601	Boulder City	1005 Industrial Road	Boulder City
1019	32-003-1019	Jean	1965 State Hwy. 161	Jean
20	32-003-0020	E. Craig Road	4701 Mitchell St.	Las Vegas
43	32-003-0043	Paul Meyer	4525 New Forest Dr.	Las Vegas
71	32-003-0071	Walter Johnson	7701 Ducharme Dr.	Las Vegas
72	32-003-0072	Lone Mountain	3525 N. Valdez St.	Las Vegas
73	32-003-0073	Palo Verde	333 Pavilion Center Dr.	Las Vegas
75	32-003-0075	Joe Neal	6651 West Azure Ave.	Las Vegas
538	32-003-0538	Winterwood	5483 Club House Dr.	Las Vegas
561	32-003-0561	Sunrise Acres	2501 S. Sunrise Ave.	Las Vegas
1021	32-003-1021	Orr	1562 E. Katie Ave. Suite D	Las Vegas
2002	32-003-2002	JD Smith	1301 E. Tonopah (B)	North Las Vegas

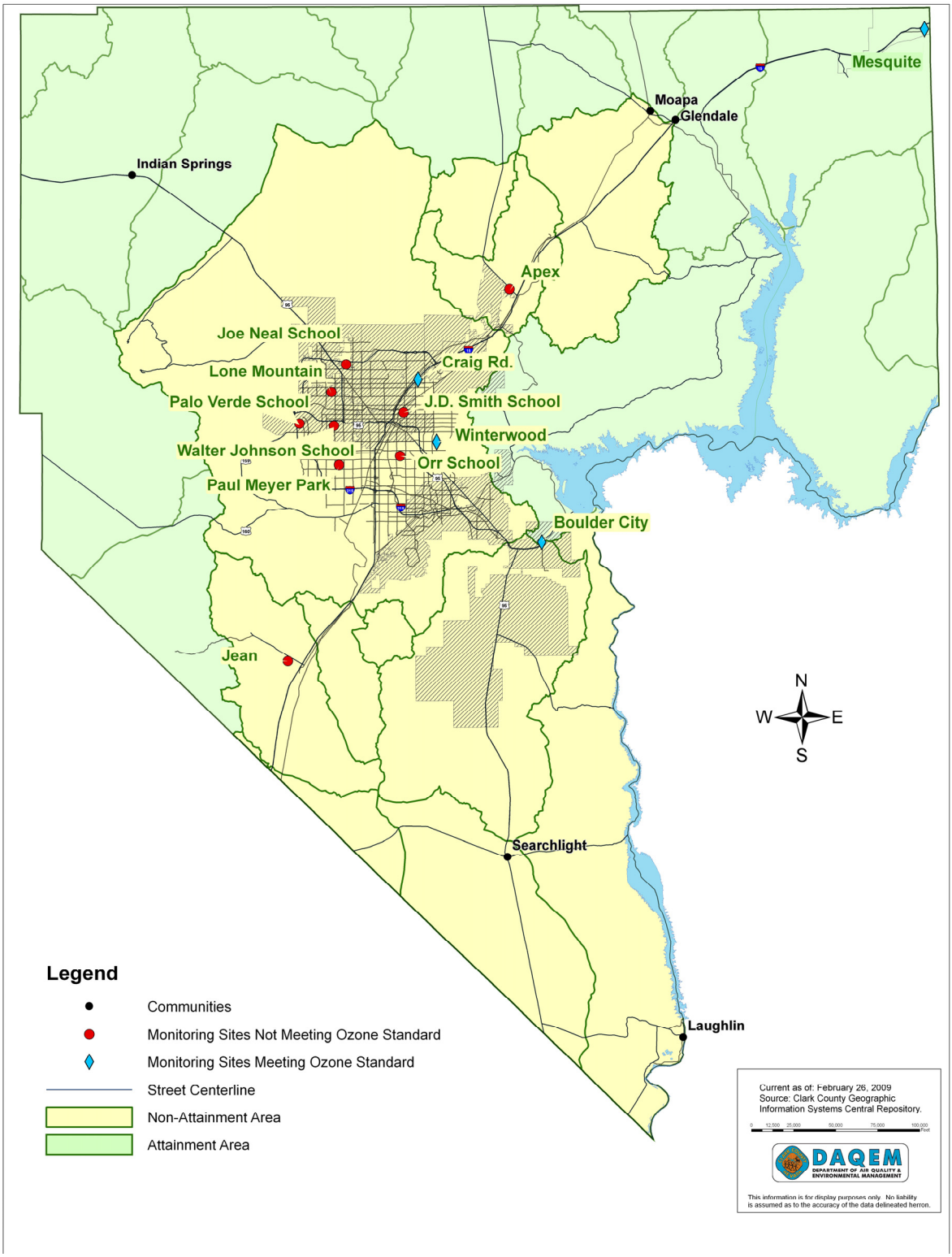


Figure 3-6. Clark County Air Quality Monitoring Stations Map.

3.8 SURFACE METEOROLOGY

Wind speed, direction, and temperature are measured on meteorological towers in a variety of networks within and around Clark County, as illustrated in Figure 3-7. These networks are operated by several organizations:

1. The Special Operations and Research Division (SORD) of the National Oceanic and Atmospheric Administration.
2. The U.S. Department of Energy (Nevada Test Site).
3. The Community Environmental Monitoring Program.
4. The National Weather Service.
5. The Federal Aviation Administration.
6. Remote Automatic Weather Stations.
7. DAQEM.
8. Las Vegas Regional Flood Control District.

Many of these data are available through the Western Regional Climate Center.

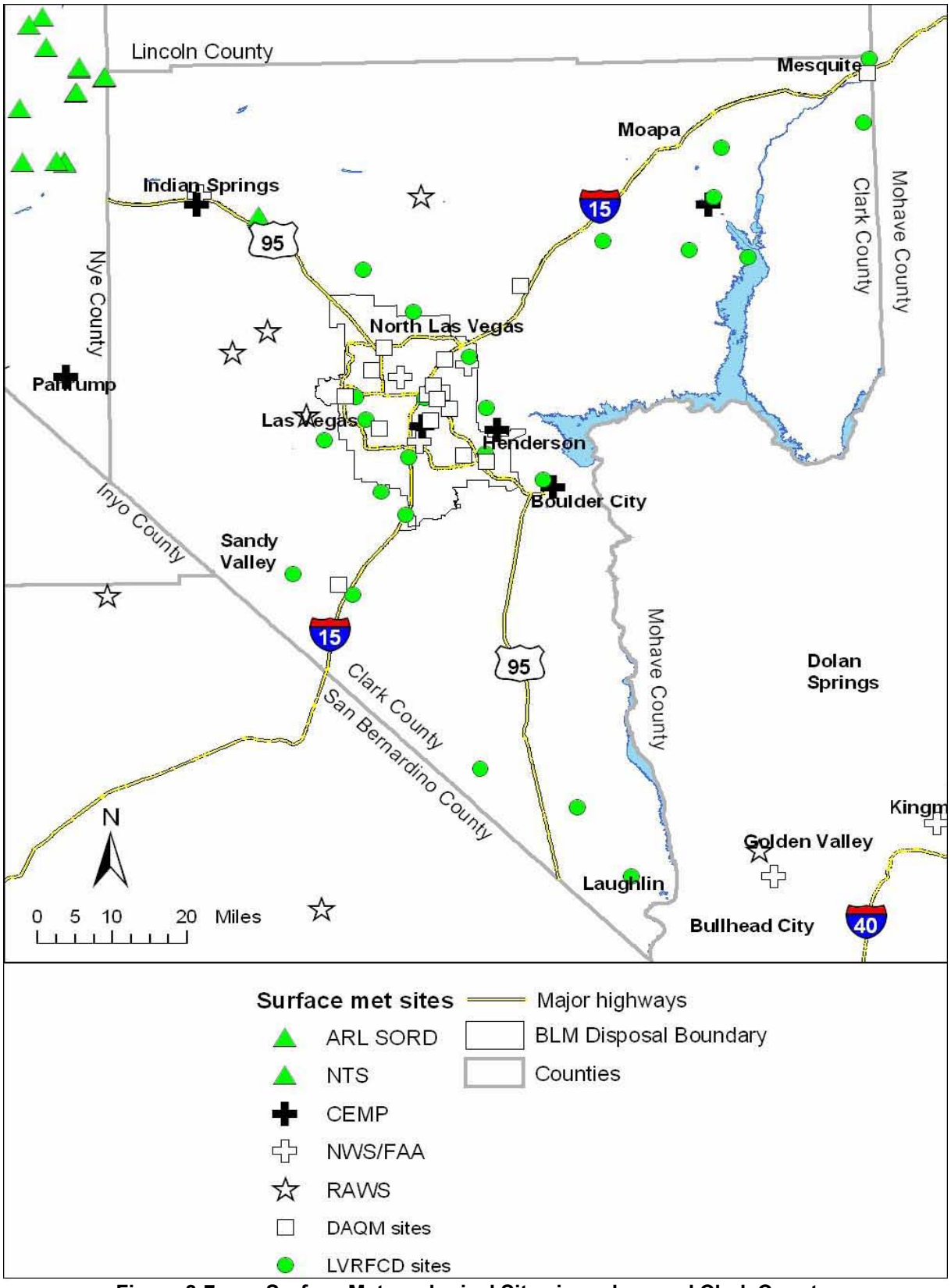


Figure 3-7. Surface Meteorological Sites in and around Clark County.

3.9 UPPER AIR METEOROLOGY

Figure 3-8 shows the locations of upper air monitoring stations, which can estimate flows aloft. These flows are important because they indicate the potential for, and directions of, transport of pollutants into and out of the Las Vegas Valley. Currently, the nearest upper air wind, temperature, and humidity measurements are collected twice daily at the Desert Rock Airport, approximately 70 km northwest of Las Vegas. SORD operates a radiosonde system at 00:00 and 12:00 Universal Time Coordinated (UTC)—4 p.m. and 4 a.m. Pacific Standard Time—at that site. Other radiosonde sites in the region are located in Reno, Flagstaff, San Diego, Phoenix, and Vandenberg Air Force Base (AFB).

The National Weather Service and the U.S. Department of Defense operate a network of 143 Next Generation Radars (NEXRAD) across the U.S. The closest NEXRAD measurements to Las Vegas are taken approximately 30 km south of Henderson and 17 km west of the Colorado River. Other NEXRAD stations in the southwest are located at Edwards AFB, Cedar City, Yuma, and Elko (Figure 3-8).

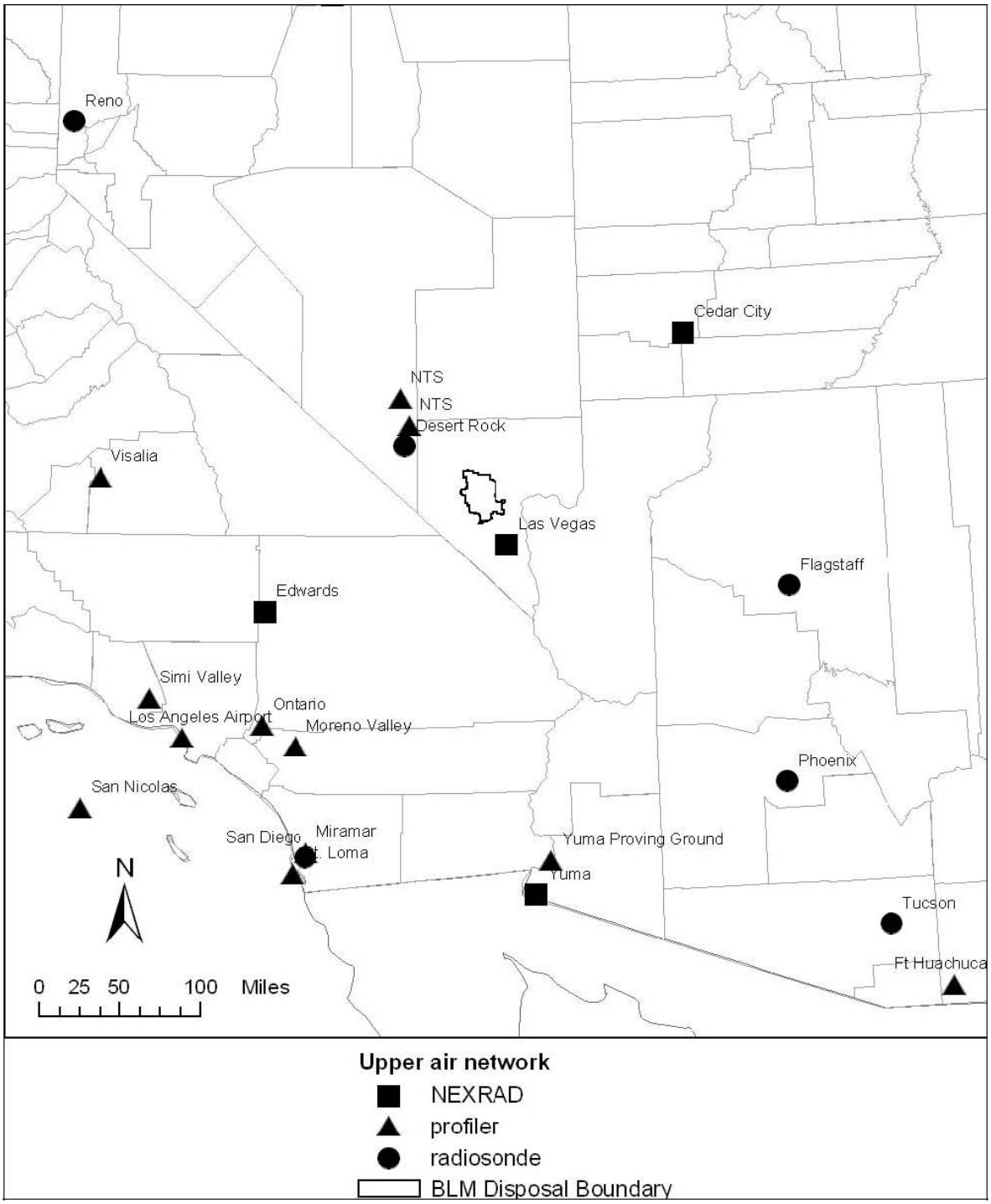


Figure 3-8. Operating Upper Air Monitoring Sites Surrounding Southern Nevada.

3.10 SOUTHERN NEVADA REGIONAL PLANNING COALITION LAND USE WORKGROUP

The SNRPC LUWG is composed of members representing the cities of Las Vegas, North Las Vegas, Henderson, urbanized Clark County, and the RTC. The LUWG was formed to develop a consensus-based process to define future land uses as part of RTC transportation planning. Based on the available vacant land in the Clark County assessor's 2006 closed roll parcel, the group created GIS data for planned land use development using the RTC/SNRPC definition. The LUWG plans future land uses in five-year increments by jurisdiction, covering the years from 2006 through 2030.

Table 3-3. Forecast Developed Acres, 2005-2030

Time Period	Forecast Growth Acres		
	Residential	Nonresidential[1]	Total
2006-2010	15,558	16,214	31,771
2010-2015	16,212	15,092	31,304
2015-2020	16,565	15,664	32,229
2020-2025	9,900	9,900	19,800
2025-2030	4,900	4,972	9,872
Total	**63,136**	**61,841**	**124,977**

[1]Includes open space.
Source: RTC 2008, Appendix IIA.

4.0 AIR QUALITY ANALYSIS

4.1 AIR QUALITY DATA

The data and information in this section clearly demonstrate the adequacy of the existing 8-hour ozone nonattainment boundary. The data show that all the exceedances in Clark County—in numbers, location, and severity—occur within the existing boundary, and that no exceedances are recorded outside that boundary.

4.1.1 Monitoring Network

The current ozone ambient air monitoring network in Clark County consists of thirteen stations (Figure 4.1-1); although shown, City Center is not operating at this time. Nine are located inside the Las Vegas Valley, and four—Jean, Apex, Boulder City, and Mesquite—operate outside the valley. As Figure 4.1-2 shows, twelve of the thirteen are located within the existing 8-hour ozone nonattainment boundary.

4.1.2 Equipment Type

The network employs API 400 Series Monitors, which use ultraviolet absorption to monitor ozone. The design is based on the 1-hour ozone standard in effect when it was built, which is now used to calculate 8-hour rolling average values for comparison to the 8-hour ozone NAAQS.

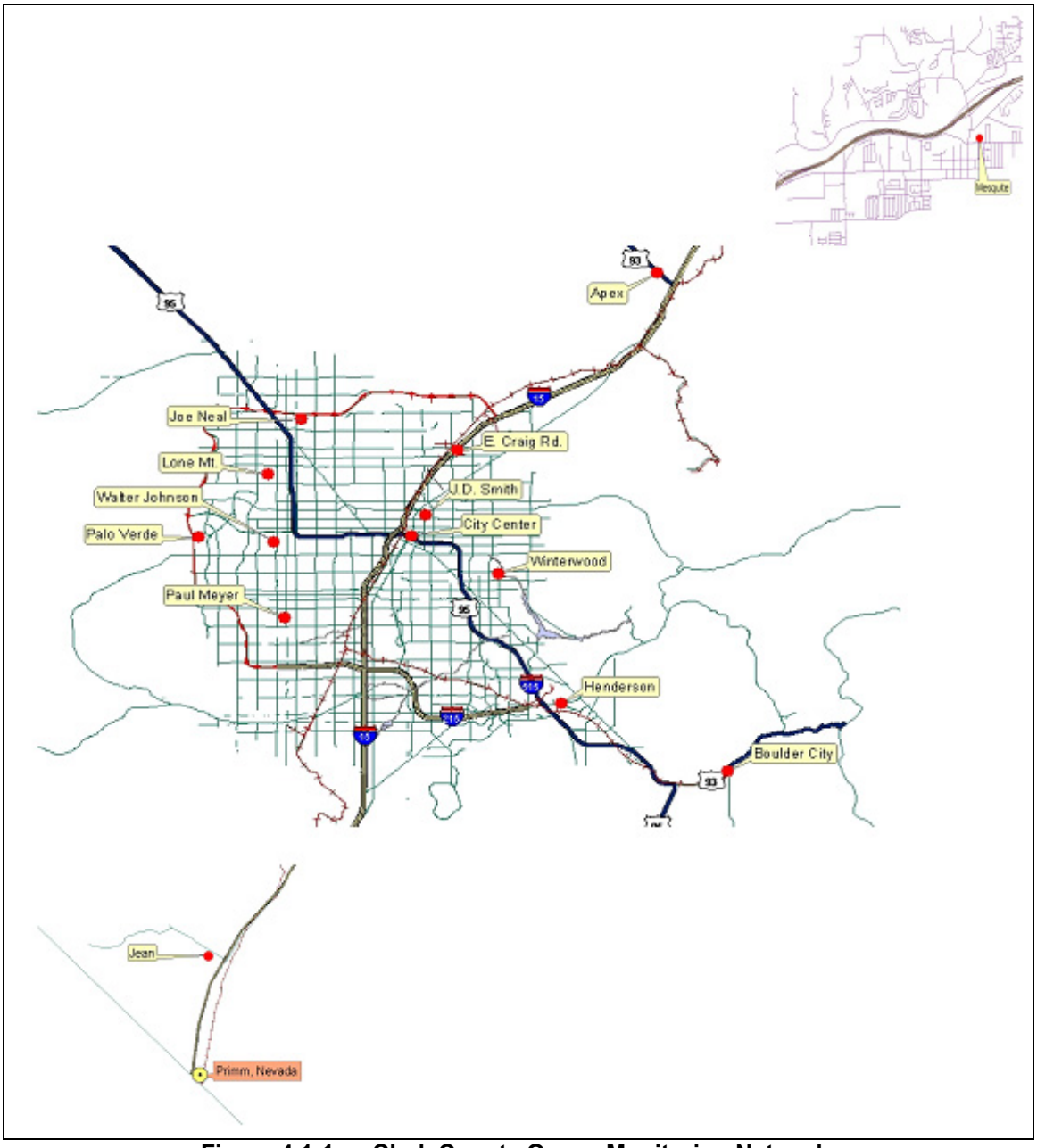


Figure 4.1-1. Clark County Ozone Monitoring Network.

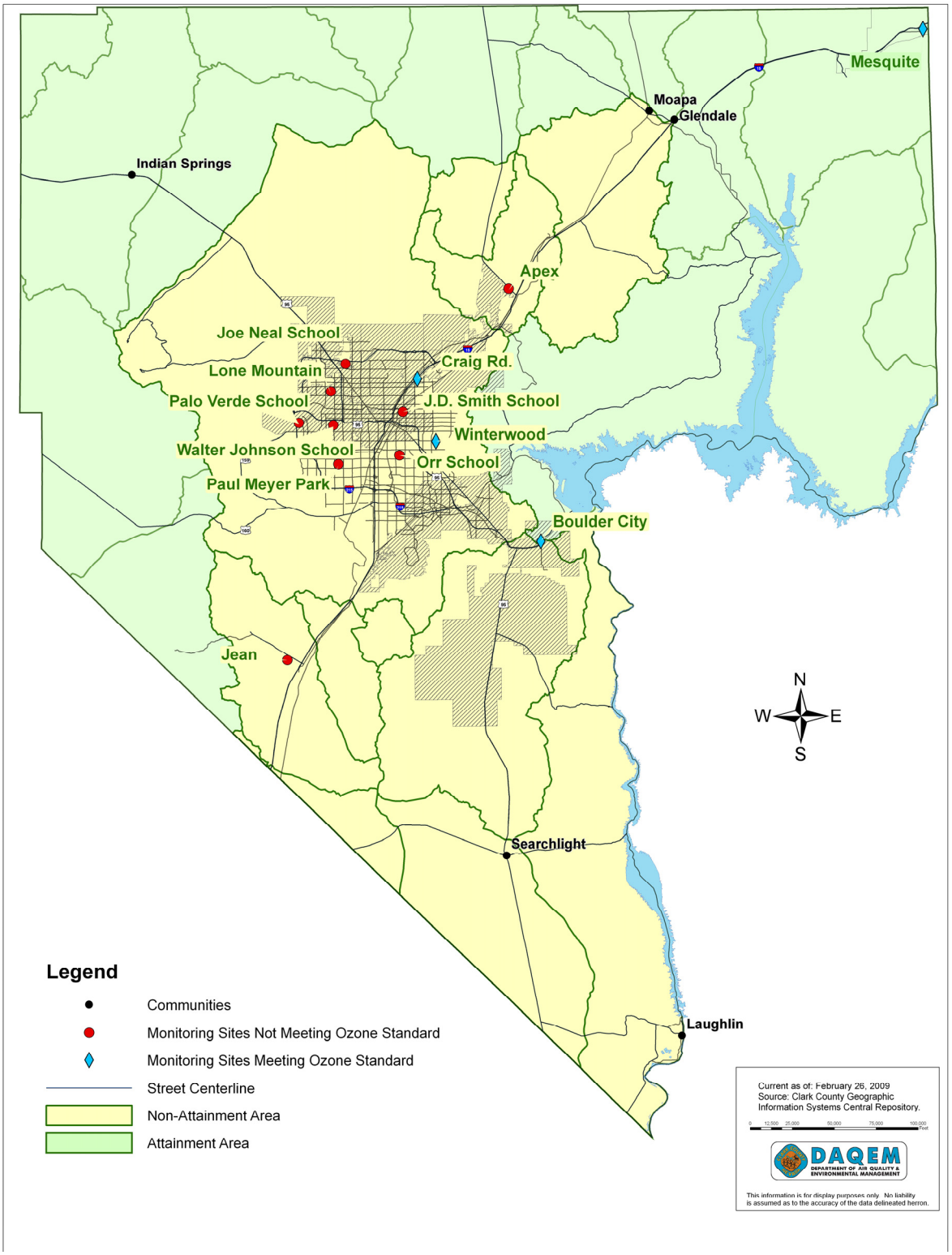


Figure 4.1-2. Location of Ozone Monitoring Stations in Relationship to the Current Ozone Nonattainment Boundary.

4.1.3 Current 8-Hour Ozone Data

Table 4.1-1 contains the current three-year average of the fourth-highest daily maximum 8-hour average ozone concentrations for all monitoring sites within Clark County.

Table 4.1-1. 3-Year Average of Fourth-Highest Daily Maximum 8-Hour Average Ozone Concentrations

	1st High	2nd High	3rd High	4th High	Design Value
E. Craig Rd (20[1])					
2006	0.084[2] 7/1/2006	0.081 5/12/2006	0.080 6/30/2006	0.079 7/18/2006	
2007	0.081 6/16/2007	0.077 6/17/2007	0.076 6/28/2007	0.075 6/25/2007	
2008	0.08 8/27/2008	0.077 8/14/2008	0.074 8/16/2008	0.071 5/30/2008	
Average				**0.075**	**0.075**
Apex (22)					
2006	0.087 5/12/2006	0.083 7/1/2006	0.083 6/20/2006	0.082 6/29/2006	
2007	0.087 6/16/2007	0.086 6/27/2007	0.081 6/25/2007	0.081 5/10/2007	
2008	0.076 5/30/2008	0.075 5/31/2008	0.073 5/29/2008	0.071 4/30/2008	
Average				**0.078**	**0.078**
Mesquite (23)					
2006	0.072 5/13/2006	0.070 6/11/2006	0.069 6/3/2006	0.069 7/25/2006	
2007	0.078 6/16/2007	0.066 6/29/2007	0.066 6/17/2007	0.064 8/5/2007	
2008	0.071 4/30/2008	0.071 5/11/2008	0.07 5/31/2008	0.069 4/30/2008	
Average				**0.067**	**0.067**
Paul Meyer (43)					
2006	0.091 7/1/2006	0.087 6/30/2006	0.083 7/18/2006	0.083 7/21/2006	
2007	0.085 6/27/2007	0.084 6/16/2007	0.083 7/28/2007	0.081 6/28/2007	
2008	0.082 7/7/2008	0.078 7/10/2008	0.078 8/27/2008	0.077 8/16/2008	
Average				**0.080**	**0.080**
Walter Johnson (71)					
2006	0.094 7/1/2006	0.094 6/30/2006	0.090 7/21/2006	0.085 6/22/2006	
2007	0.089 7/28/2007	0.083 6/27/2007	0.083 6/16/2007	0.080 8/4/2007	
2008	0.083 7/7/2008	0.078 7/10/2008	0.076 8/16/2008	0.076 8/27/2008	
Average				**0.080**	**0.080**

Table 4.1-1. 3-Year Average of Fourth-Highest Daily Maximum 8-Hour Average Ozone Concentrations (cont.)

	1st High	2nd High	3rd High	4th High	Design Value
Lone Mountain(72)					
2006	0.098 6/30/2006	0.090 7/1/2006	0.088 7/21/2006	0.085 6/29/2006	
2007	0.085 7/28/2007	0.081 6/27/2007	0.080 7/29/2007	0.080 6/17/2007	
2008	0.081 8/27/2008	0.079 7/7/2008	0.078 7/10/2008	0.078 8/15/2008	
Average				**0.081**	**0.081**
Palo Verde (73)					
2006	0.093 6/30/2006	0.091 7/1/2006	0.085 7/28/2006	0.084 7/18/2006	
2007	0.088 7/28/2007	0.082 6/16/2007	0.082 6/15/2007	0.080 8/4/2007	
2008	0.079 7/10/2008	0.078 7/7/2008	0.078 8/27/2008	0.074 8/14/2008	
Average				**0.079**	**0.079**
Joe Neal (75)					
2006	0.088 7/18/2006	0.085 7/25/2006	0.084 7/21/2006	0.081 7/23/2006	
2007	0.088 6/17/2007	0.086 6/28/2007	0.086 6/27/2007	0.085 6/16/2007	
2008	0.083 8/15/2008	0.082 8/16/2008	0.08 7/10/2008	0.08 7/18/2008	
Average				**0.082**	**0.082**
Winterwood (538)					
2006	0.084 5/12/2006	0.084 7/1/2006	0.080 7/25/2006	0.078 6/30/2006	
2007	0.085 6/16/2007	0.081 6/27/2007	0.079 6/28/2007	0.077 6/25/2007	
2008	0.075 8/14/2008	0.073 8/27/2008	0.072 8/16/2008	0.071 5/11/2008	
Average				**0.075**	**0.075**
Boulder City (601)					
2006	0.079 5/12/2006	0.077 7/25/2006	0.075 6/22/2006	0.074 5/7/2006	
2007	0.087 6/16/2007	0.084 8/3/2007	0.078 6/27/2007	0.076 5/29/2007	
2008	0.074 5/31/2008	0.073 5/30/2008	0.073 6/3/2008	0.071 4/22/2008	
Average				**0.074**	**0.074**
Jean (1019)					
2006	0.083 5/12/2006	0.083 6/20/2006	0.079 6/21/2006	0.079 7/28/2006	
2007	0.088 6/27/2007	0.087 6/16/2007	0.084 6/15/2007	0.081 6/28/2007	
2008	0.078 5/11/2008	0.075 8/15/2008	0.074 5/3/2008	0.074 5/30/2008	
Average				**0.078**	**0.078**

Table 4.1-1. 3-Year Average of Fourth-Highest Daily Maximum 8-Hour Average Ozone Concentrations (cont.)

	1st High	2nd High	3rd High	4th High	Design Value
Orr (1021)					
2006	0.088 7/1/2006	0.087 7/21/2006	0.087 7/25/2006	0.085 6/30/2006	
2007	0.084 8/3/2007	0.083 6/28/2007	0.082 6/27/2007	0.080 8/4/2007	
2008	0.077 7/7/2008	0.077 8/14/2008	0.076 8/27/2008	0.074 8/16/2008	
Average				**0.080**	**0.080**
J.D. Smith (2002)					
2006	0.091 7/1/2006	0.088 6/30/2006	0.083 7/18/2006	0.081 7/25/2006	
2007	0.083 6/16/2007	0.081 6/28/2007	0.079 8/4/2007	0.079 6/27/2007	
2008	0.069 5/30/2008	0.069 8/14/2008	0.069 8/27/2008	0.068 5/11/2008	
Average				**0.076**	**0.076**

[1]Station ID number.
[2]All values are in parts per million (ppm).

Nine of the thirteen monitoring stations exceed the 2008 NAAQS, and four do not. All of the violating stations are located within the current 1997 8-hour ozone nonattainment boundary. Mesquite, which is outside the boundary, remains in attainment of the 2008 NAAQS with a large safety margin (0.08 ppm). Boulder City, Winterwood, and E. Craig Road also remain in attainment of the 2008 ozone NAAQS. As in 2004, Joe Neal remains the site with the highest readings and is the design value site at 0.082 ppm. Table 4.1-2 summarizes the number of days on which O_3 concentrations exceeded 0.075 ppm at sites in the monitoring network.

Table 4.1-2. Days Ozone Monitoring Values Exceeded 0.075 PPM from January 1, 2006 to December 31, 2006

DATE	E. Craig	Apex	Mesquite	Paul Meyer	Walter Johnson	Lone Mountain	Palo Verde	Joe Neal	Winter-wood	Boulder City	Jean	Orr	J.D. Smith	COUNT
5/3/06				1					1		1			**3**
5/7/06	1	1							1					**3**
5/8/06		1												**1**
5/12/06	1				1		1	1	1	1	1		1	**8**
5/13/06	1	1							1					**3**
6/2/06											1			**1**
6/10/06		1		1	1						1			**4**
6/11/06				1	1	1	1				1			**5**
6/17/06						1								**1**
6/20/06		1		1	1	1	1				1		1	**7**
6/21/06		1			1	1	1				1			**5**
6/22/06		1			1	1	1				1	1	1	**7**
6/23/06		1		1	1	1	1						1	**6**
6/24/06				1										**1**
6/25/06				1	1		1							**3**
6/27/06											1			**1**
6/28/06		1												**1**
6/29/06	1	1			1	1							1	**5**
6/30/06	1	1		1	1	1	1	1	1		1	1	1	**11**
7/1/06	1	1		1	1	1	1		1			1	1	**9**
7/2/06		1			1	1								**3**
7/8/06					1									**1**
7/10/06		1												**1**
7/14/06		1												**1**
7/16/06				1	1	1	1	1						**5**
7/18/06	1			1	1	1	1	1				1	1	**8**

Table 4.1-2. Days Ozone Monitoring Values Exceeded 0.075 PPM from January 1, 2006 to December 31, 2006 (cont.)

DATE	E. Craig	Apex	Mesquite	Paul Meyer	Walter Johnson	Lone Mountain	Palo Verde	Joe Neal	Winter-wood	Boulder City	Jean	Orr	J.D. Smith	COUNT
7/21/06				1	1	1	1	1				1	1	**7**
7/23/07					1	1	1	1				1	1	**6**
7/25/06		1		1	1	1	1	1	1	1		1	1	**10**
7/28/06				1	1	1	1	1	1		1			**7**
8/17/06				1	1		1	1	1		1	1	1	**8**
8/26/06				1	1		1					1	1	**5**
9/14/06											1			**1**
Total 2006	*7*	*16*	*0*	*16*	*21*	*16*	*17*	*9*	*9*	*2*	*13*	*9*	*13*	***148***
5/10/07		1		1					1		1			**4**
5/12/07											1			**1**
5/26/07											1			**1**
5/28/07											1			**1**
5/29/07				1							1			**2**
6/15/07				1	1	1	1	1			1			**6**
6/16/07	1	1			1	1	1	1		1	1		1	**9**
6/17/07				1	1	1	1	1					1	**6**
6/18/07											1			**1**
6/21/07					1	1								**2**
6/25/07		1		1	1	1		1					1	**6**
6/27/07		1		1	1	1	1	1	1	1	1	1	1	**11**
6/28/07				1	1	1		1	1		1	1	1	**8**
6/29/07		1								1				**2**
7/5/07					1	1		1						**3**
7/28/07				1	1	1	1	1						**5**
7/29/07		1		1	1	1	1	1						**6**

Table 4.1-2. Days Ozone Monitoring Values Exceeded 0.075 PPM from January 1, 2006 to December 31, 2006 (cont.)

DATE	E. Craig	Apex	Mesquite	Paul Meyer	Walter Johnson	Lone Mountain	Palo Verde	Joe Neal	Winter-wood	Boulder City	Jean	Orr	J.D. Smith	COUNT
8/3/07										1		1		**2**
8/4/07		1		1	1	1	1	1		1			1	**8**
8/21/07	1	1		1	1			1	1		1		1	**8**
8/22/07														**0**
8/31/07				1	1	1	1	1				1	1	**7**
9/2/07					1		1							**2**
Total 2007	*2*	*8*	*0*	*12*	*14*	*12*	*9*	*12*	*4*	*5*	*11*	*4*	*8*	***101***
5/11/08											1			**1**
5/30/08		1						1						**2**
7/7/08				1	1	1	1	1				1		**6**
7/8/08				1										**1**
7/10/08				1	1	1	1	1						**5**
7/18/08								1						**1**
8/14/08	1					1		1				1		**4**
8/15/08						1		1						**2**
8/16/08				1	1			1						**3**
8/27/08	1			1	1	1	1	1				1		**7**
Total 2008	*2*	*1*	*0*	*5*	*4*	*5*	*3*	*8*	*0*	*0*	*1*	*3*	*0*	***32***
TOTAL	**11**	**25**	**0**	**33**	**39**	**33**	**29**	**29**	**13**	**7**	**25**	**16**	**21**	**281**

Table 4.1-2 shows that Mesquite, the far downwind site, not only was in compliance with the ozone NAAQS, but also recorded no values exceeding 0.075 ppm from 2006 to 2008. During the same period, the upwind site at Jean recorded 25 exceedances of 0.075 ppm; Joe Neal, the design value site, recorded 29. The table also shows the spatial relationship of the 8-hour ozone values. The western side of the valley experiences the highest readings, as well as the most frequent high readings, even though few sources are located there. The eastern side of the valley experiences the lowest concentrations and fewest exceedances, while containing the greatest number of sources. And while the downwind site at Apex experienced similar concentrations and numbers of exceedances as the upwind site at Jean, the concentration diminishes, so no exceedances occurred at the far downwind site located in Mesquite.

The data was further analyzed for ozone exceedance day trends (Table 4.1-3). Both Table 4.1-3 and Figure 4.1-3 demonstrate a declining trend in the total number of exceedance days per year and the number of stations exceeding on any one day.

Table 4.1-3. Exceedance Dates

	Dates	Number of Monitors Exceeding
1	6/30/2006	11
2	7/25/2006	10
3	8/17/2006	8
4	6/16/2007	9
5	6/27/2007	11
6	8/4/2007	8
7	7/7/2008	6
8	7/10/2008	5
9	8/27/2008	7

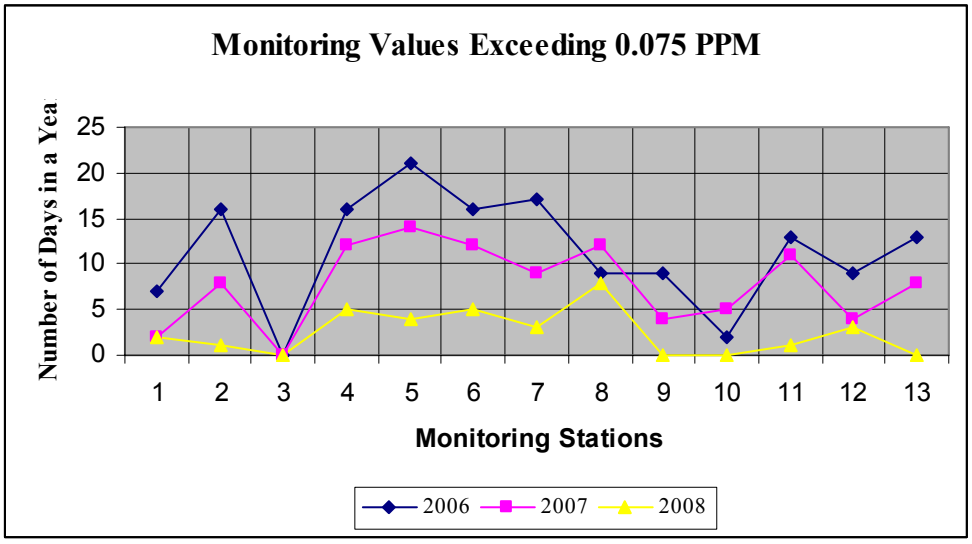


Figure 4.1-3. Days when Ozone Monitoring Values exceeded 0.075 ppm at Clark County Monitoring Stations from 2006 to 2008.

Tables 4.1-4 to 4.1-12 and Figures 4.1-4 to 4.1-12 compare hourly ozone concentrations on exceedance days from 2006 to 2008 at the Clark County ozone monitoring stations.

Table 4.1-4. Ozone Monitoring Values Exceeding 0.075 ppm—June 30, 2006

Hour	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Station																								
20	0.017	0.021	0.027	0.035	0.044	0.052	0.059	0.065	0.069	0.074	0.078	0.080	0.080	0.078	0.075	0.072	0.068	0.062	0.055	0.048	0.041	0.035	0.029	0.025
22	0.040	0.042	0.046	0.050	0.053	0.058	0.063	0.068	0.071	0.074	0.075	0.076	0.077	0.077	0.075	0.072	0.067	0.062	0.057	0.052	0.045	0.040	0.037	0.037
23	0.023	0.026	0.032	0.039	0.046	0.053	0.059	0.064	0.067	0.067	0.067	0.065	0.064	0.063	0.060	0.059	0.056	0.053	0.048	0.043	0.039	0.036	0.032	0.028
43	0.027	0.028	0.031	0.037	0.044	0.053	0.060	0.067	0.076	0.083	0.086	0.087	0.086	0.083	0.080	0.074	0.068	0.063	0.057	0.051	0.045	0.040	0.036	0.033
71	0.033	0.034	0.037	0.042	0.049	0.057	0.064	0.072	0.081	0.088	0.092	0.094	0.092	0.089	0.084	0.078	0.071	0.064	0.057	0.050	0.046	0.042	0.039	0.038
72	0.034	0.035	0.038	0.043	0.051	0.059	0.068	0.075	0.084	0.090	0.095	0.098	0.096	0.091	0.087	0.081	0.074	0.065	0.057	0.050	0.044	0.042	0.038	0.036
73	0.038	0.039	0.042	0.046	0.052	0.059	0.067	0.075	0.081	0.087	0.092	0.093	0.092	0.088	0.084	0.078	0.071	0.063	0.055	0.049	0.045	0.042	0.040	0.038
75	0.024	0.025	0.029	0.034	0.040	0.048	0.055	0.063	0.069	0.075	0.078	0.080	0.078	0.075	0.072	0.067	0.062	0.057	0.050	0.043	0.038	0.034	0.030	0.027
538	0.030	0.031	0.036	0.040	0.045	0.050	0.057	0.063	0.068	0.074	0.077	0.078	0.076	0.075	0.073	0.072	0.068	0.062	0.057	0.052	0.047	0.041	0.037	0.033
601	0.052	0.052	0.054	0.056	0.059	0.062	0.066	0.069	0.071	0.072	0.072	0.072	0.070	0.069	0.067	0.064	0.062	0.060	0.058	0.057	0.055	0.054	0.053	0.052
1019	0.060	0.062	0.064	0.065	0.068	0.071	0.073	0.075	0.076	0.076	0.075	0.075	0.073	0.071	0.068	0.063	0.060	0.058	0.055	0.052	0.050	0.048	0.046	0.046
1021	0.019	0.020	0.023	0.025	0.032	0.040	0.049	0.059	0.068	0.077	0.083	0.085	0.082	0.079	0.076	0.072	0.067	0.060	0.054	0.048	0.044	0.039	0.035	0.031
2002	0.012	0.017	0.023	0.031	0.041	0.051	0.060	0.068	0.077	0.083	0.088	0.088	0.084	0.080	0.078	0.074	0.068	0.061	0.054	0.049	0.048	0.043	0.037	0.033

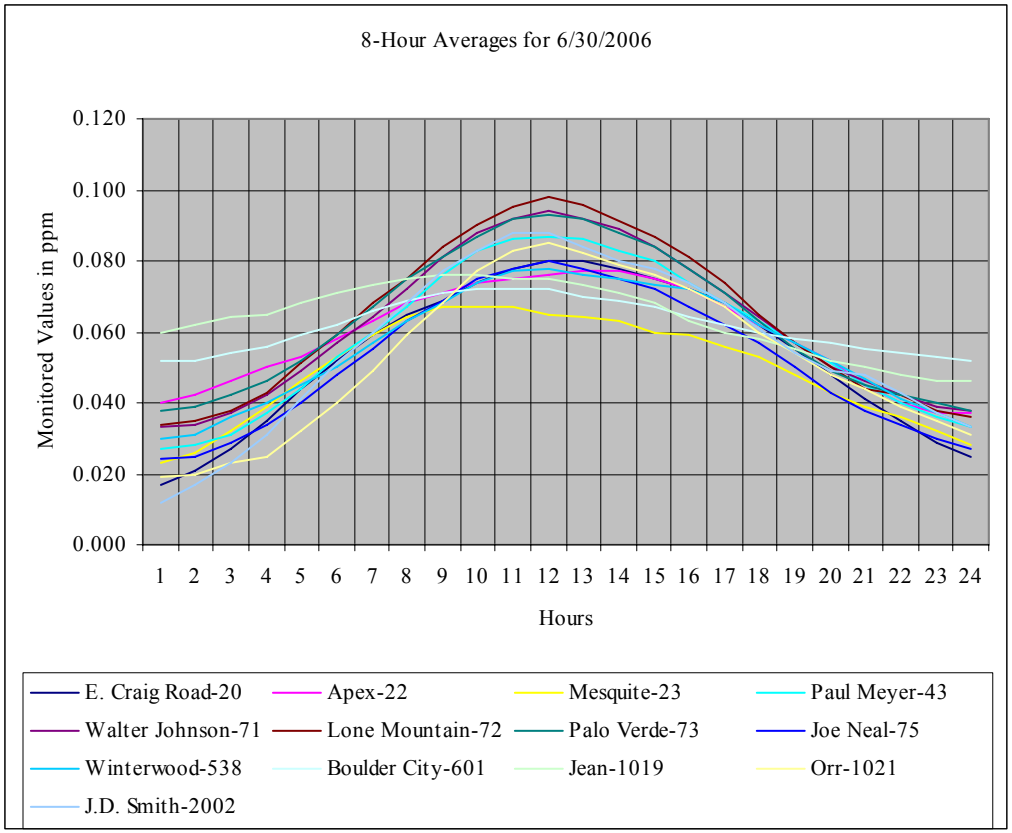


Figure 4.1-4. Ozone Monitoring Values Exceeding 0.075 ppm on June 30, 2006.

Table 4.1-5. Ozone Monitoring Values Exceeding 0.075 ppm—July 25, 2006

Hour	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Station																								
20	0.016	0.022	0.027	0.034	0.041	0.05	0.061	0.069	0.072	0.068	0.065	0.06	0.053	0.045	0.035	0.029	0.025	0.022	0.021	0.021	0.022	0.025	0.026	0.028
22	0.036	0.039	0.042	0.048	0.055	0.061	0.067	0.073	0.076	0.077	0.076	0.073	0.068	0.061	0.057	0.049	0.045	0.043	0.041	0.04	0.039	0.042	0.042	0.044
23	0.021	0.019	0.023	0.03	0.037	0.047	0.056	0.062	0.068	0.068	0.069	0.068	0.063	0.057	0.053	0.048	0.042	0.035	0.028	0.025	0.025	0.024	0.023	0.024
43	0.021	0.025	0.03	0.037	0.049	0.063	0.072	0.079	0.083	0.082	0.08	0.075	0.068	0.059	0.054	0.051	0.046	0.041	0.035	0.03	0.028	0.026	0.023	0.02
71	0.03	0.034	0.04	0.049	0.059	0.07	0.078	0.084	0.081	0.081	0.078	0.073	0.064	0.056	0.052	0.048	0.042	0.037	0.032	0.029	0.029	0.027	0.022	0.02
72	0.028	0.031	0.036	0.043	0.051	0.062	0.07	0.077	0.08	0.079	0.077	0.072	0.064	0.054	0.047	0.04	0.035	0.031	0.028	0.027	0.027	0.027	0.027	0.029
73	0.032	0.03	0.036	0.045	0.054	0.065	0.073	0.079	0.082	0.08	0.078	0.073	0.066	0.059	0.058	0.054	0.051	0.046	0.041	0.039	0.039	0.036	0.033	0.031
75	0.036	0.039	0.044	0.05	0.057	0.066	0.074	0.081	0.085	0.084	0.081	0.076	0.068	0.057	0.048	0.04	0.036	0.033	0.03	0.029	0.03	0.032	0.033	0.035
538	0.02	0.027	0.03	0.036	0.043	0.052	0.064	0.074	0.08	0.078	0.074	0.071	0.065	0.06	0.052	0.045	0.04	0.039	0.037	0.036	0.037	0.036	0.037	0.037
601	0.053	0.055	0.056	0.058	0.061	0.064	0.068	0.071	0.075	0.077	0.076	0.074	0.072	0.069	0.066	0.063	0.059	0.056	0.053	0.052	0.051	0.05	0.05	0.049
1019	0.042	0.046	0.05	0.054	0.057	0.062	0.066	0.069	0.07	0.069	0.068	0.066	0.061	0.056	0.052	0.049	0.046	0.044	0.042	0.041	0.042	0.043	0.045	0.045
1021	0.024	0.025	0.031	0.038	0.047	0.06	0.074	0.085	0.09	0.085	0.081	0.075	0.068	0.059	0.048	0.042	0.037	0.032	0.027	0.026	0.027	0.028	0.028	0.028
2002	0.025	0.03	0.035	0.04	0.047	0.057	0.07	0.078	0.081	0.078	0.074	0.069	0.062	0.052	0.04	0.031	0.024	0.019	0.017	0.017	0.018	0.019	0.022	0.026

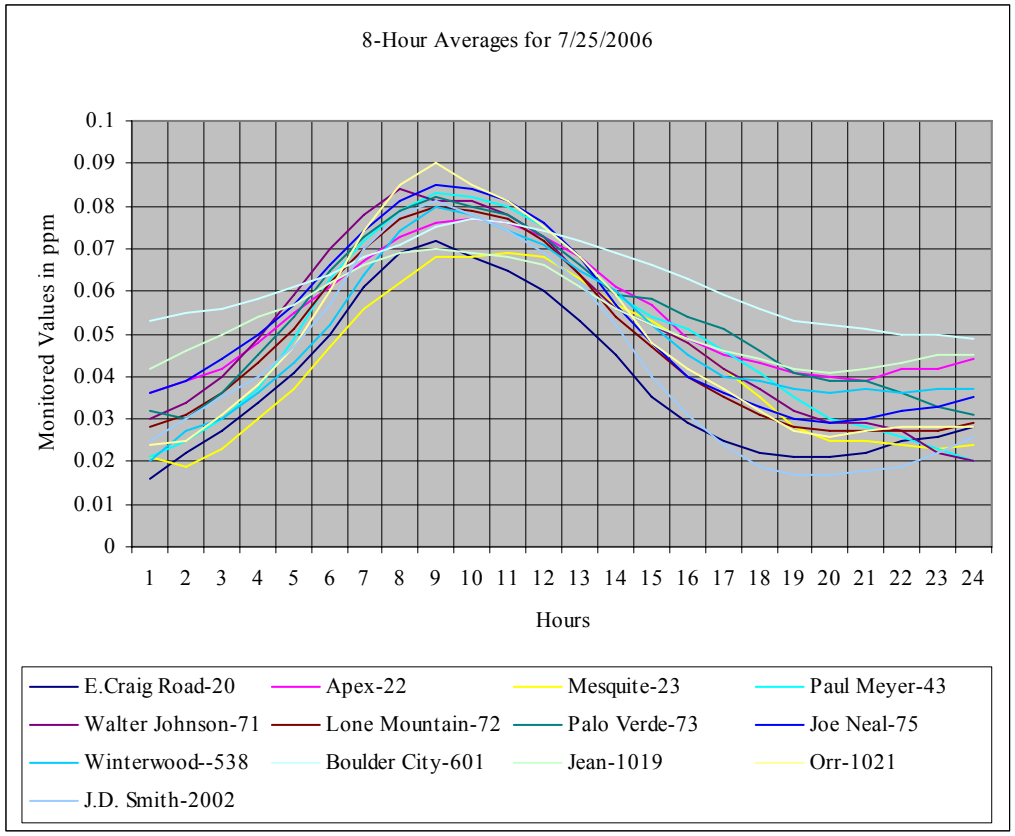


Figure 4.1-5. Ozone Monitoring Values Exceeding 0.075 ppm on July 25, 2006.

Table 4.1-6. Ozone Monitoring Values Exceeding 0.075 ppm—August 17, 2006

Hour	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Station																								
20	0.022	0.027	0.031	0.036	0.041	0.048	0.057	0.064	0.068	0.07	0.07	0.067	0.061	0.055	0.048	0.039	0.03	0.024	0.02	0.015	0.015	0.014	0.013	0.014
22	0.03	0.034	0.038	0.042	0.047	0.052	0.06	0.065	0.067	0.069	0.069	0.068	0.064	0.06	0.056	0.052	0.048	0.044	0.042	0.04	0.036	0.034	0.033	0.033
23	0.018	0.018	0.02	0.022	0.027	0.033	0.038	0.043	0.046	0.048	0.048	0.047	0.045	0.041	0.036	0.032	0.028	0.025	0.021	0.018	0.017	0.017	0.018	0.019
43	0.056	0.058	0.059	0.061	0.062	0.064	0.07	0.076	0.079	0.079	0.079	0.079	0.077	0.073	0.068	0.063	0.056	0.05	0.043	0.037	0.033	0.027	0.022	0.019
71	0.036	0.037	0.04	0.043	0.047	0.054	0.062	0.071	0.075	0.078	0.078	0.077	0.076	0.075	0.072	0.067	0.062	0.059	0.057	0.055	0.052	0.049	0.044	0.043
72	0.023	0.018							0.075	0.075	0.075	0.074	0.073	0.071	0.065	0.058	0.051	0.045	0.039	0.036	0.032	0.026	0.023	0.023
73	0.052	0.051	0.051	0.053	0.055	0.058	0.062	0.069	0.075	0.079	0.08	0.079	0.079	0.079	0.077	0.073	0.07	0.066	0.064	0.062	0.059	0.054	0.05	0.046
75	0.02	0.022	0.027	0.033	0.041	0.049	0.059	0.067	0.075	0.079	0.08	0.078	0.075	0.071	0.068	0.065	0.06	0.055	0.049	0.044	0.042	0.043	0.042	0.043
538	0.037	0.039	0.042	0.047	0.051	0.055	0.062	0.07	0.074	0.077	0.077	0.074	0.068	0.064	0.059	0.051	0.042	0.033	0.024	0.018	0.015	0.01	0.005	0.004
601	0.051	0.051	0.05	0.052	0.053	0.055	0.056	0.057	0.057	0.057	0.057	0.056	0.055	0.054	0.054	0.055	0.056	0.058	0.059	0.061	0.063	0.064	0.065	0.064
1019	0.057	0.059	0.062	0.066	0.069	0.073	0.076	0.078	0.079	0.079	0.078	0.078	0.077	0.076	0.074	0.071	0.068	0.066	0.064	0.061	0.059	0.056	0.055	0.054
1021	0.049	0.054	0.058	0.062	0.065	0.069	0.072	0.077	0.08	0.08	0.079	0.077	0.074	0.068	0.062	0.056	0.048	0.039	0.032	0.026	0.021	0.018	0.014	0.012
2002	0.026	0.03	0.034	0.039	0.045	0.055	0.065	0.073	0.077	0.078	0.078	0.075	0.069	0.062	0.053	0.044	0.036	0.027	0.018	0.011	0.008	0.005	0.004	0.004

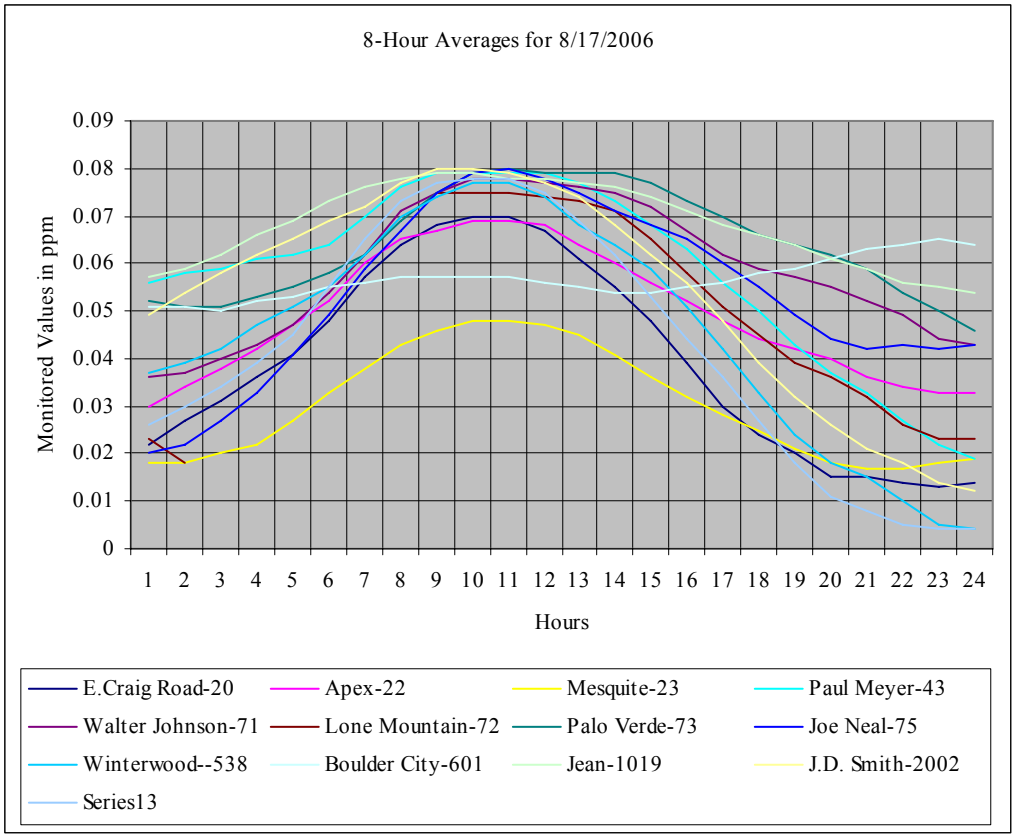


Figure 4.1-6. Ozone Monitoring Values Exceeding 0.075 ppm on August 17, 2006.

Table 4.1-7. Ozone Monitoring Values Exceeding 0.075 ppm—June 16, 2007

Hour	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Station																								
20	0.026	0.033	0.04	0.047	0.057	0.062	0.069	0.076	0.079	0.081	0.08	0.079	0.078	0.074	0.069	0.066	0.064	0.061	0.059	0.058	0.057	0.057	0.059	0.059
22	0.044	0.047	0.051	0.055	0.059	0.065	0.072	0.078	0.082	0.084	0.086	0.086	0.084	0.082	0.081	0.077	0.074	0.072	0.069	0.067	0.065	0.063	0.062	0.062
23	0.024	0.026	0.029	0.033	0.038	0.044	0.049	0.056	0.062	0.066	0.071	0.073	0.075	0.076	0.076	0.075	0.07	0.064	0.058	0.052	0.047	0.042	0.038	0.035
43	0.05	0.051	0.053	0.056	0.059	0.066	0.074	0.08	0.084	0.086	0.086	0.085	0.085	0.084	0.083	0.082	0.08	0.079	0.077	0.076	0.074	0.071	0.067	0.065
71	0.043	0.042	0.046	0.052	0.059	0.066	0.073	0.078	0.083	0.085	0.084	0.084	0.083	0.082	0.081	0.08	0.078	0.076	0.074	0.072	0.068	0.065	0.062	0.06
72	0.031	0.035	0.04	0.045	0.05	0.059	0.066	0.072	0.076	0.079	0.08	0.081	0.081	0.079	0.076	0.069	0.063	0.057	0.051	0.045	0.042	0.035	0.03	0.028
73	0.02	0.023	0.027	0.033	0.042	0.051	0.06	0.067	0.072	0.076	0.077	0.075	0.07	0.064	0.06	0.058	0.056	0.054	0.053	0.052	0.051	0.049	0.046	0.041
75	0.033	0.038	0.045	0.051	0.058	0.063	0.07	0.076	0.08	0.081	0.08	0.079	0.078	0.077	0.076	0.075	0.074	0.071	0.068	0.066	0.063	0.06	0.057	0.054
538	0.031	0.037	0.042	0.047	0.053	0.061	0.07	0.076	0.08	0.082	0.082	0.08	0.079	0.077	0.074	0.072	0.069	0.067	0.066	0.065	0.065	0.064	0.062	0.061
601	0.008	0.013	0.019	0.025	0.031	0.04	0.049	0.058	0.065	0.069	0.07	0.069	0.067	0.064	0.06	0.055	0.051	0.045	0.042	0.039	0.039	0.04	0.04	0.039
1019	0.052	0.052	0.052	0.054	0.057	0.06	0.064	0.067	0.07	0.072	0.075	0.076	0.074	0.071	0.067	0.063	0.059	0.056	0.053	0.051	0.05	0.049	0.047	0.046
1021																								
2002	0.031	0.038	0.043	0.049	0.059	0.069	0.075	0.078	0.081	0.083	0.082	0.082	0.08	0.078	0.076	0.074	0.072	0.069	0.068	0.067	0.065	0.062	0.06	0.057

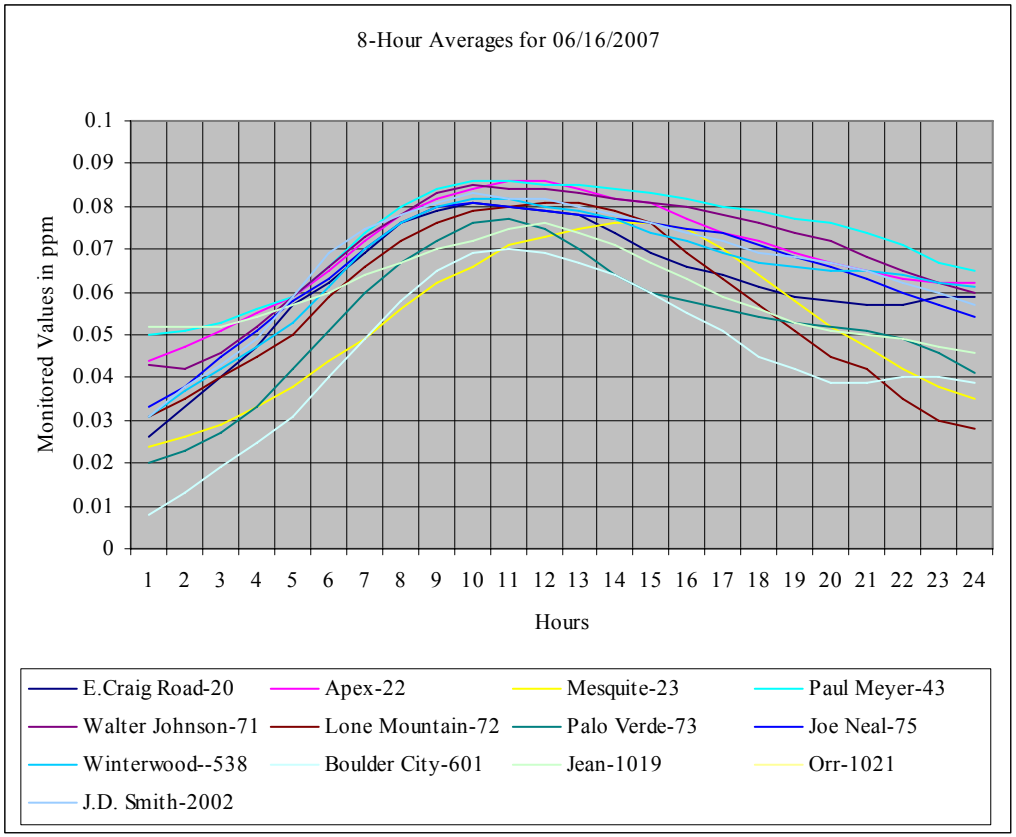


Figure 4.1-7. Ozone Monitoring Values Exceeding 0.075 ppm on June 16, 2007.

Table 4.1-8. Ozone Monitoring Values Exceeding 0.075 ppm—June 27, 2007

Hour	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Station																								
20	0.006	0.01	0.016	0.025	0.033	0.042	0.05	0.058	0.064	0.069	0.071	0.07	0.068	0.063	0.059	0.054	0.046	0.037	0.029	0.022	0.016	0.012	0.007	0.004
22	0.044	0.051	0.057	0.061	0.066	0.07	0.076	0.082	0.083	0.084	0.085	0.085	0.083	0.077	0.072	0.068	0.065	0.06	0.055	0.05	0.045	0.041	0.038	0.034
23	0.018	0.018	0.021	0.026	0.032	0.039	0.045	0.051	0.057	0.058	0.061	0.063	0.062	0.056	0.049	0.045	0.04	0.036	0.031	0.026	0.022	0.021	0.021	0.019
43	0.031	0.037	0.04	0.044	0.049	0.058	0.068	0.076	0.08	0.084	0.086	0.087	0.086	0.085	0.083	0.081	0.074	0.063	0.055	0.048	0.045	0.039	0.031	0.024
71	0.043	0.043	0.047	0.051	0.059	0.066	0.072	0.076	0.08	0.082	0.084	0.085	0.081	0.079	0.076	0.073	0.068	0.061	0.054	0.047	0.045	0.039	0.035	0.034
72	0.031	0.035	0.04	0.045	0.05	0.059	0.066	0.072	0.076	0.079	0.08	0.081	0.081	0.079	0.076	0.069	0.063	0.057	0.051	0.045	0.042	0.035	0.03	0.028
73	0.038	0.034	0.035	0.039	0.045	0.055	0.065	0.074	0.075	0.075	0.078	0.079	0.08	0.079	0.078	0.075	0.072	0.068	0.065	0.061	0.059	0.057		
75	0.033	0.038	0.045	0.051	0.058	0.063	0.07	0.076	0.08	0.081	0.08	0.079	0.078	0.077	0.076	0.075	0.074	0.071	0.068	0.066	0.063	0.06	0.057	0.054
538	0.017	0.018	0.021	0.028	0.037	0.047	0.058	0.069	0.07	0.075	0.078	0.078	0.077	0.075	0.072	0.069	0.064	0.058	0.05	0.046	0.037	0.029	0.022	0.015
601												0.059	0.06	0.06	0.061	0.062	0.063	0.064	0.064	0.064	0.064	0.064	0.064	0.065
1019	0.056	0.058	0.06	0.062	0.064	0.068	0.072	0.075	0.078	0.08	0.081	0.083	0.083	0.082	0.08	0.077	0.074	0.071	0.068	0.066	0.062	0.06	0.058	0.057
1021	0.031	0.032	0.036	0.039	0.042	0.046	0.056	0.064	0.071	0.075	0.076	0.077	0.076	0.073	0.068	0.063	0.057	0.052	0.048	0.041	0.033	0.027	0.023	0.02
2002	0.004	0.008	0.015	0.024	0.033	0.043	0.052	0.062	0.071	0.077	0.08	0.079	0.078	0.076	0.07	0.062	0.052	0.042	0.032	0.023	0.015	0.008	0.005	0.004

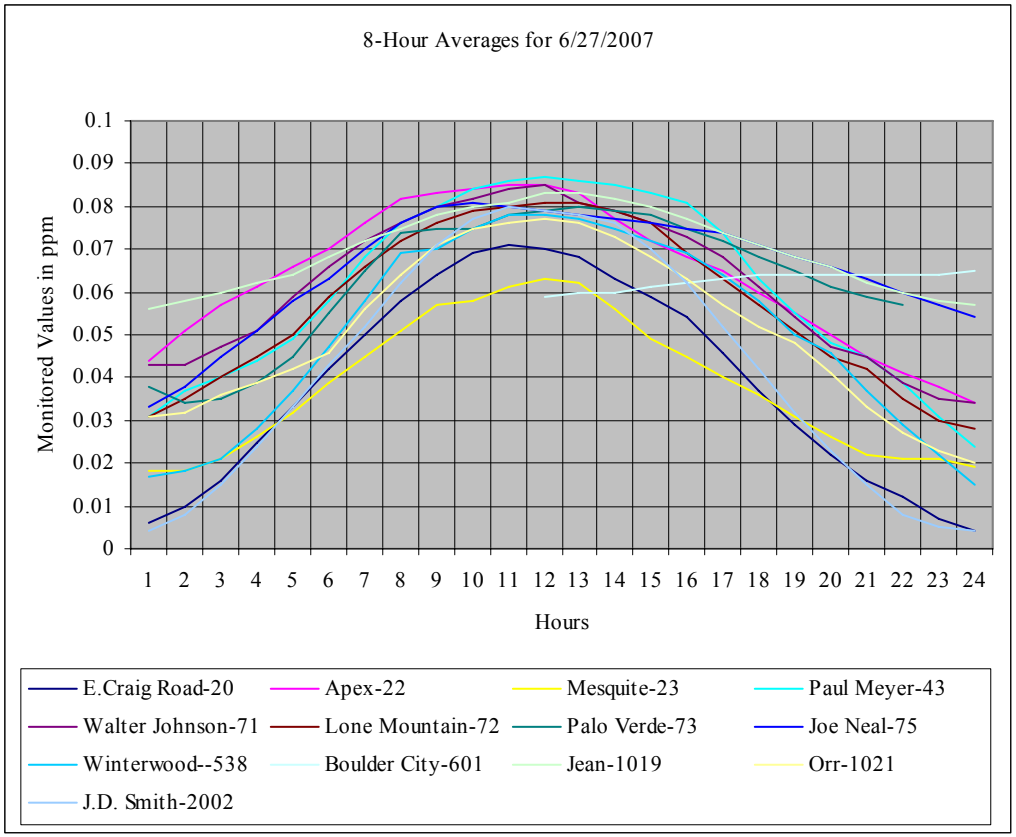


Figure 4.1-8. Ozone Monitoring Values Exceeding 0.075 ppm on June 27, 2007.

Table 4.1-9. Ozone Monitoring Values Exceeding 0.075 ppm—August 4, 2007

Hour	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Station																								
20	0.008	0.014	0.021	0.03	0.04	0.049	0.058	0.065	0.071	0.073	0.073	0.069	0.064	0.059	0.051	0.045	0.037	0.03	0.027	0.026	0.026	0.027	0.031	0.033
22	0.035	0.037	0.04	0.042	0.046	0.052	0.058	0.064	0.069	0.072	0.074	0.076	0.075	0.071	0.067	0.063	0.058	0.051	0.047	0.041	0.037	0.035	0.034	0.033
23	0.018	0.02	0.024	0.029	0.034	0.039	0.046	0.052	0.055	0.059	0.06	0.061	0.059	0.058	0.056	0.055	0.051	0.047	0.044	0.041	0.04	0.039	0.035	0.032
43	0.031	0.037	0.04	0.044	0.049	0.058	0.068	0.076	0.08	0.084	0.086	0.087	0.086	0.085	0.083	0.081	0.074	0.063	0.055	0.048	0.045	0.039	0.031	0.024
71	0.031	0.032	0.035	0.041	0.049	0.058	0.067	0.072	0.076	0.08	0.082	0.079	0.076	0.071	0.067	0.066	0.064	0.062	0.061	0.062	0.062	0.063	0.063	0.061
72	0.02	0.023	0.027	0.033	0.042	0.051	0.06	0.067	0.072	0.076	0.077	0.075	0.07	0.064	0.06	0.058	0.056	0.054	0.053	0.052	0.051	0.049	0.046	0.041
73	0.037	0.039	0.04	0.044	0.051	0.058	0.065	0.071	0.075	0.078	0.079	0.078	0.075	0.071	0.068	0.066	0.064	0.063	0.063	0.063	0.063	0.063	0.062	0.062
75	0.022	0.026	0.032	0.038	0.046	0.053	0.061	0.068	0.073	0.077	0.079	0.077	0.072	0.067	0.062	0.057	0.052	0.047	0.044	0.042	0.04	0.038	0.036	0.036
538	0.008	0.013	0.019	0.025	0.031	0.04	0.049	0.058	0.065	0.069	0.07	0.069	0.067	0.064	0.06	0.055	0.051	0.045	0.042	0.039	0.039	0.04	0.04	0.039
601	0.052	0.052	0.052	0.054	0.057	0.06	0.064	0.067	0.07	0.072	0.075	0.076	0.074	0.071	0.067	0.063	0.059	0.056	0.053	0.051	0.05	0.049	0.047	0.046
1019	0.044	0.045	0.048	0.052	0.055	0.059	0.062	0.067	0.071	0.073	0.073	0.072	0.07	0.066	0.063	0.06	0.057	0.055	0.053	0.052	0.051	0.052	0.052	0.051
1021	0.005	0.009	0.015	0.023	0.033	0.043	0.052	0.06	0.067	0.073	0.074	0.073	0.069	0.064	0.059	0.056	0.053	0.049	0.046	0.043	0.042	0.042	0.043	0.042
2002	0.003	0.008	0.015	0.024	0.034	0.044	0.054	0.063	0.072	0.077	0.078	0.077	0.073	0.069	0.062	0.057	0.053	0.05	0.047	0.045	0.043	0.041	0.043	0.044

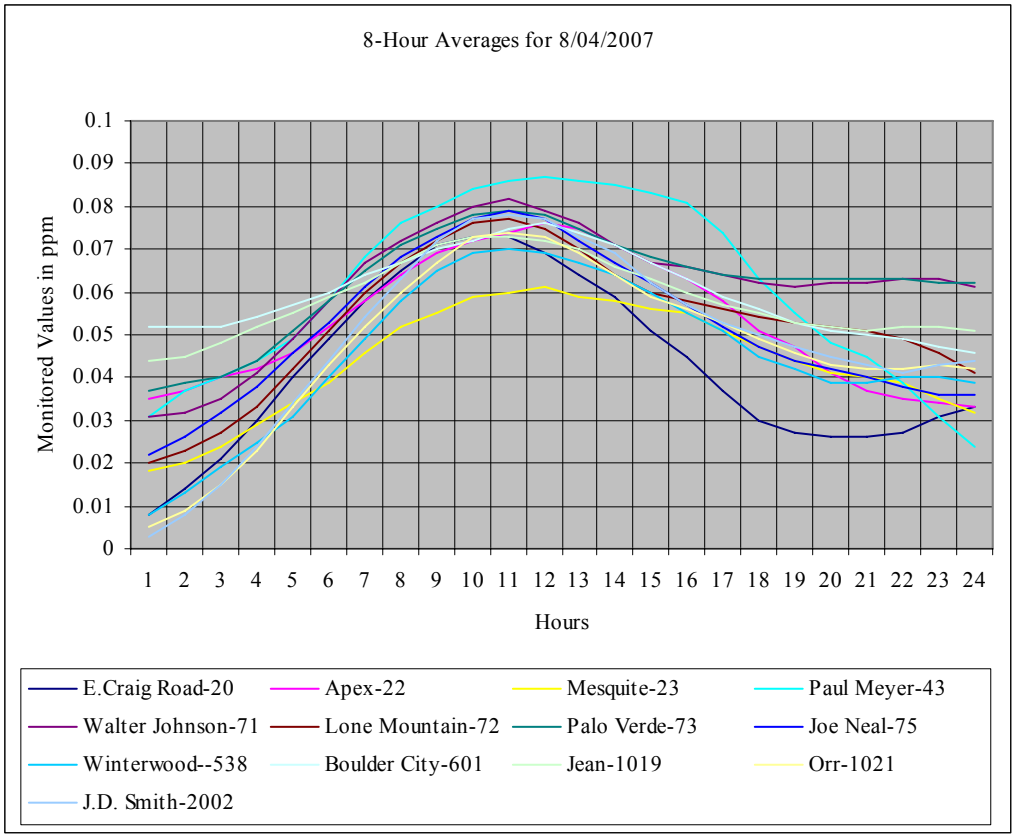


Figure 4.1-9. Ozone Monitoring Values Exceeding 0.075 ppm on August 4, 2007.

Table 4.1-10. Ozone Monitoring Values Exceeding 0.075 ppm—July 7, 2008

Hour	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Station																								
20	0.02	0.021	0.022	0.025	0.03	0.037	0.045	0.054	0.059	0.062	0.065	0.067	0.067	0.062	0.055	0.046	0.04	0.035	0.028	0.021	0.016	0.014	0.015	0.015
22	0.034	0.035	0.037	0.04	0.044	0.048	0.054	0.057	0.06	0.062	0.064	0.065	0.064	0.06	0.056	0.054	0.05	0.043	0.04	0.034	0.031	0.031	0.027	0.026
23	0.034	0.034	0.036	0.037	0.041	0.045	0.049	0.052	0.054	0.055	0.056	0.055	0.053	0.051	0.047	0.041	0.037	0.032	0.027	0.022	0.019	0.016	0.014	0.015
43	0.025	0.028	0.032	0.039	0.048	0.059	0.062	0.064	0.071	0.076	0.08	0.082	0.08	0.075	0.071	0.065	0.059	0.052	0.044	0.037	0.032	0.031	0.028	0.028
71	0.031	0.032	0.035	0.039	0.044	0.054	0.064	0.068	0.07	0.076	0.081	0.083	0.083	0.077	0.072	0.065	0.06	0.054	0.049	0.044	0.041	0.038	0.034	0.033
72	0.023	0.026	0.03	0.033	0.039	0.046	0.055	0.063	0.068	0.073	0.076	0.079	0.078	0.074	0.069	0.064	0.057	0.049	0.042	0.034	0.029	0.025	0.023	0.02
73	0.032	0.033	0.035	0.038	0.043	0.049	0.057	0.063	0.067	0.071	0.075	0.078	0.077	0.074	0.069	0.065	0.061	0.057	0.053	0.049	0.046	0.045	0.042	0.038
75	0.029	0.031	0.035	0.041	0.049	0.058	0.062	0.063	0.068	0.072	0.076	0.078	0.078	0.073	0.068	0.064	0.06	0.056	0.051	0.045	0.042	0.041	0.042	0.041
538	0.021	0.022	0.022	0.023	0.03	0.038	0.046	0.053	0.059	0.062	0.065	0.067	0.066	0.062	0.055	0.047	0.038	0.03	0.02	0.012	0.006	0.003	0.002	0.002
601	0.041	0.041	0.042	0.043	0.045	0.047	0.049	0.052	0.054	0.056	0.057	0.059	0.059	0.058	0.058	0.057	0.056	0.054	0.052	0.05	0.048	0.047	0.045	0.043
1019	0.037	0.039	0.042	0.047	0.052	0.057	0.058	0.06	0.064	0.066	0.069	0.071	0.069	0.067	0.065	0.062	0.059	0.055	0.052	0.047	0.046	0.045	0.044	0.042
1021	0.031	0.032	0.034	0.037	0.041	0.047	0.054	0.06	0.067	0.071	0.075	0.077	0.076	0.068	0.06	0.054	0.047	0.037	0.027	0.017	0.01	0.009	0.008	0.006
2002	0.019	0.021	0.024	0.028	0.034	0.043	0.054	0.056	0.057	0.06	0.063	0.065	0.062	0.056	0.048	0.04	0.032	0.024	0.015	0.008	0.004	0.003	0.003	0.004

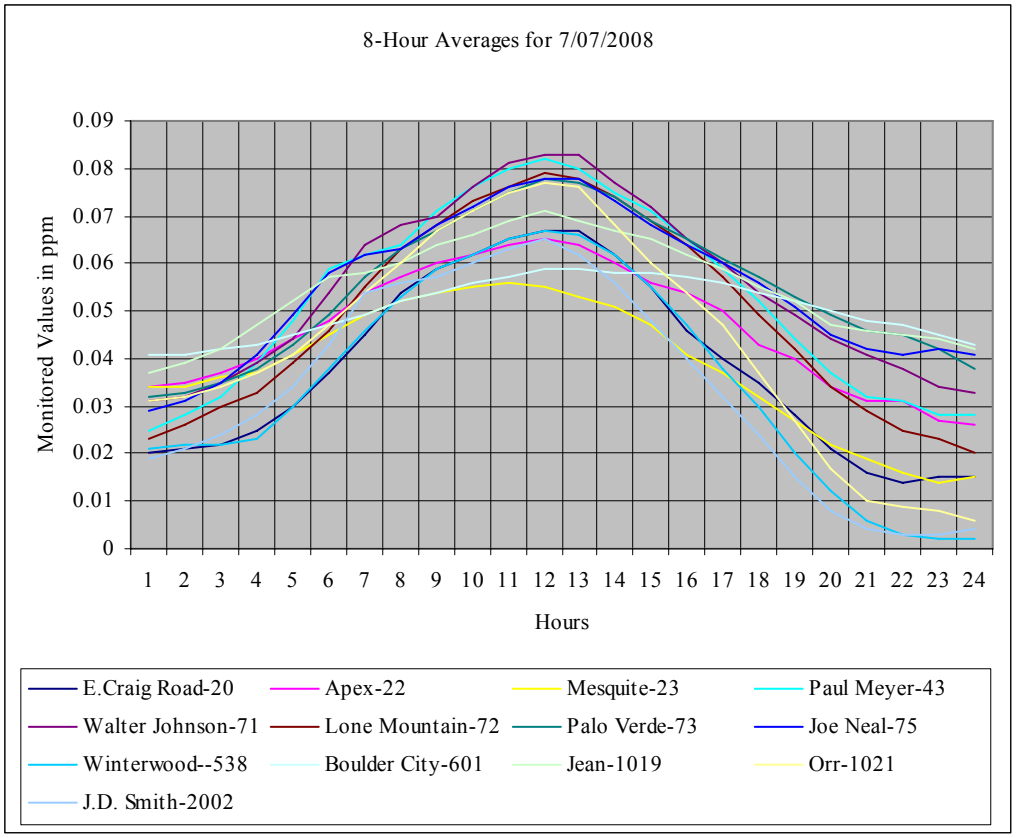


Figure 4.1-10. Ozone Monitoring Values Exceeding 0.075 ppm on July 7, 2008.

Table 4.1-11. Ozone Monitoring Values Exceeding 0.075 ppm—July 10, 2008

Hour	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Station																								
20	0.024	0.027	0.031	0.035	0.039	0.044	0.05	0.053	0.057	0.061	0.061	0.06	0.059	0.058	0.055	0.053	0.048	0.045	0.044	0.043	0.043	0.041	0.04	0.039
22	0.047	0.049	0.05	0.05	0.051	0.053	0.055	0.056	0.058	0.06	0.061	0.061	0.061	0.058	0.057	0.055	0.053	0.051	0.049	0.049	0.048	0.048	0.047	0.047
23	0.019	0.022	0.026	0.029	0.034	0.04	0.045	0.051	0.054	0.056	0.057	0.057	0.056	0.056	0.055	0.054	0.052	0.051	0.05	0.05	0.049	0.048	0.047	0.046
43	0.028	0.029	0.032	0.036	0.042	0.048	0.055	0.062	0.071	0.077	0.078	0.077	0.073	0.069	0.065	0.061	0.056	0.053	0.052	0.051	0.051	0.049	0.046	0.045
71	0.03	0.032	0.034	0.039	0.044	0.049	0.055	0.063	0.072	0.076	0.078	0.076	0.072	0.069	0.065	0.06	0.054	0.05	0.049	0.048	0.048	0.046	0.044	0.043
72	0.033	0.035	0.039	0.043	0.048	0.053	0.059	0.065	0.073	0.078	0.077	0.076	0.072	0.068	0.064	0.06	0.054	0.049	0.048	0.047	0.046	0.045	0.044	0.043
73	0.035	0.035	0.037	0.041	0.046	0.052	0.06	0.068	0.075	0.079	0.079	0.078	0.075	0.07	0.064	0.058	0.053	0.05	0.048	0.047	0.046	0.045	0.043	0.042
75	0.039	0.041	0.045	0.049	0.053	0.057	0.063	0.069	0.076	0.08	0.08	0.079	0.075	0.071	0.067	0.062	0.056	0.05	0.048	0.047	0.046	0.046	0.045	0.044
538	0.033	0.035	0.036	0.037	0.039	0.046	0.052	0.055	0.058	0.059	0.06	0.059	0.059	0.057	0.056	0.053	0.05	0.048	0.047	0.047	0.046	0.046	0.046	0.046
601	0.049	0.048	0.047	0.048	0.048	0.049	0.05	0.052	0.054	0.055	0.056	0.056	0.056	0.056	0.055	0.054	0.053	0.053	0.052	0.052	0.051	0.051	0.05	0.05
1019	0.045	0.046	0.048	0.051	0.053	0.056	0.059	0.06	0.061	0.061	0.061	0.059	0.058	0.056	0.055	0.054	0.052	0.051	0.051	0.051	0.051	0.051	0.05	0.05
1021	0.005	0.01	0.017	0.024	0.031	0.038	0.046	0.054	0.06	0.063	0.062	0.061	0.059	0.057	0.055	0.052	0.048	0.047	0.047	0.046	0.046	0.045	0.044	0.042
2002				0.033	0.036	0.038	0.046	0.052	0.057	0.059	0.059	0.058	0.056	0.054	0.052	0.049	0.046	0.043	0.043	0.042	0.042	0.041	0.041	0.041

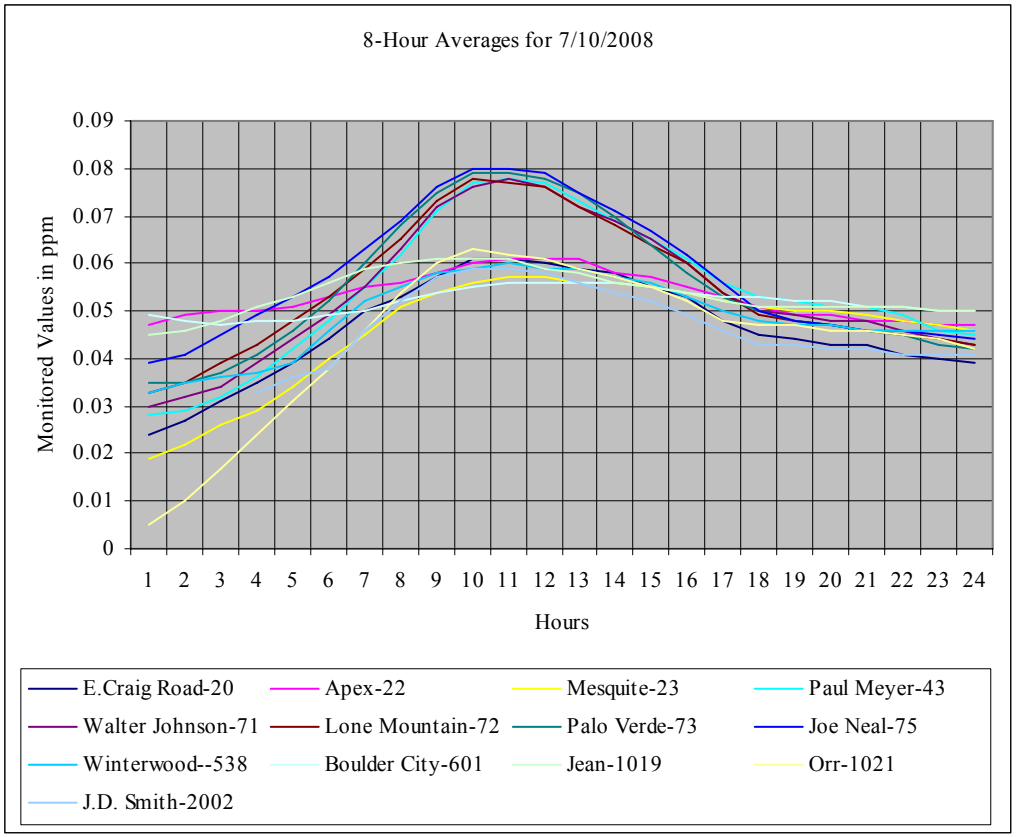


Figure 4.1-11. Ozone Monitoring Values Exceeding 0.075 ppm on July 10, 2008.

Table 4.1-12. Ozone Monitoring Values Exceeding 0.075 ppm—August 27, 2008

Hour	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Station																								
20	0.024	0.027	0.031	0.035	0.039	0.044	0.05	0.053	0.057	0.061	0.061	0.06	0.059	0.058	0.055	0.053	0.048	0.045	0.044	0.043	0.043	0.041	0.04	0.039
22	0.038	0.039	0.04	0.042	0.044	0.047	0.051	0.054	0.057	0.059	0.063	0.064	0.062	0.061	0.057	0.051	0.045	0.039	0.033	0.029	0.027	0.024	0.021	0.021
23	0.019	0.022	0.026	0.029	0.034	0.04	0.045	0.051	0.054	0.056	0.057	0.057	0.056	0.056	0.055	0.054	0.052	0.051	0.05	0.05	0.049	0.048	0.047	0.046
43	0.031	0.032	0.033	0.036	0.041	0.047	0.055	0.063	0.07	0.075	0.078	0.078	0.075	0.072	0.067	0.062	0.056	0.05	0.045	0.042	0.039	0.035	0.03	0.027
71	0.033	0.034	0.035	0.037	0.042	0.047	0.054	0.061	0.068	0.073	0.076	0.076	0.074	0.071	0.068	0.063	0.057	0.05	0.044	0.043	0.04	0.036	0.032	0.029
72	0.034	0.035	0.037	0.039	0.044	0.051	0.059	0.065	0.072	0.078	0.081	0.081	0.077	0.072	0.064	0.057	0.047	0.04	0.036	0.034	0.033	0.03	0.029	0.029
73	0.032	0.033	0.036	0.038	0.042	0.048	0.057	0.064	0.071	0.075	0.078	0.076	0.074	0.071	0.067	0.061	0.055	0.049	0.045	0.043	0.042	0.039	0.036	0.032
75	0.039	0.041	0.045	0.049	0.053	0.057	0.063	0.069	0.076	0.08	0.08	0.079	0.075	0.071	0.067	0.062	0.056	0.05	0.048	0.047	0.046	0.046	0.045	0.044
538	0.029	0.028	0.027	0.03	0.034	0.042	0.054	0.066	0.068	0.069	0.073	0.072	0.069	0.062	0.052	0.042	0.033	0.023	0.015	0.009	0.004	0.002	0.002	0.002
601	0.041	0.04	0.04	0.042	0.045	0.048	0.053	0.057	0.058	0.058	0.059	0.059	0.058	0.057	0.056	0.054	0.053	0.051	0.049	0.048	0.047	0.046	0.045	0.043
1019	0.038	0.038	0.039	0.042	0.045	0.05	0.054	0.059	0.062	0.064	0.064	0.064	0.063	0.061	0.059	0.057	0.054	0.051	0.048	0.045	0.042	0.04	0.037	0.036
1021	0.017	0.016	0.018	0.023	0.031	0.041	0.055	0.068	0.071	0.072	0.076	0.076	0.072	0.066	0.06	0.052	0.042	0.032	0.025	0.019	0.015	0.012	0.007	0.005
2002	0.015	0.014	0.015	0.019	0.024	0.032	0.04	0.049	0.057	0.065	0.069	0.068	0.064	0.057	0.05	0.04	0.03	0.02	0.012	0.008	0.007	0.006	0.004	0.004

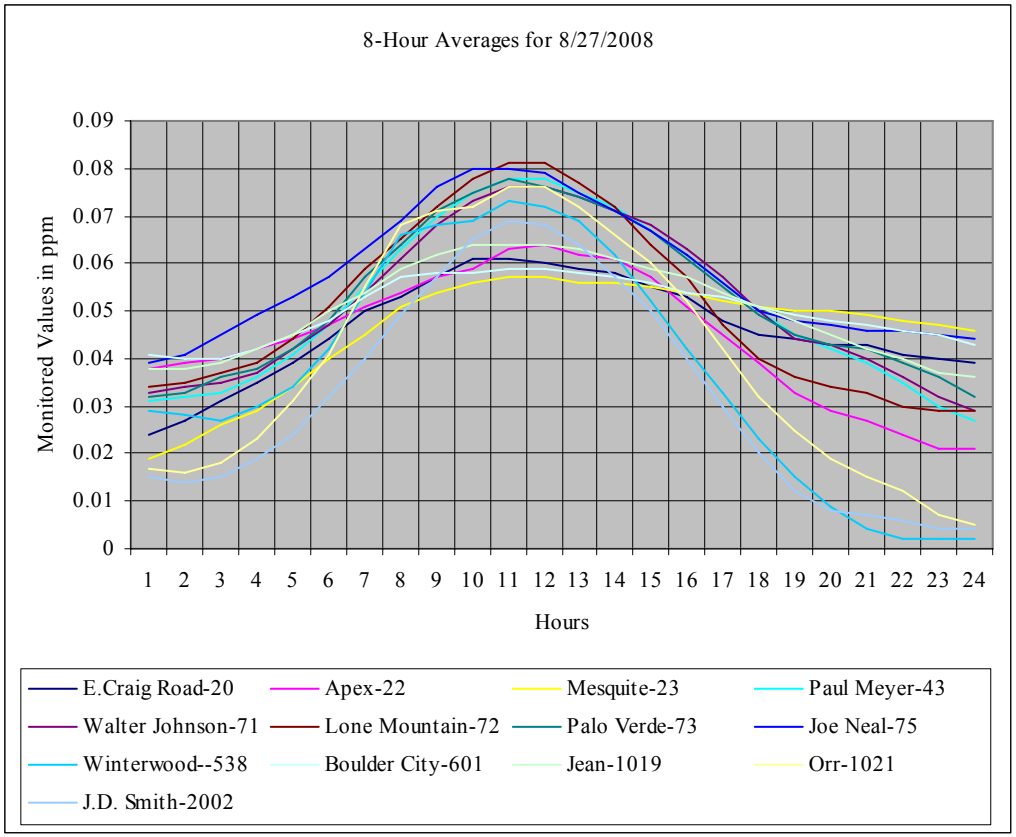


Figure 4.1-12. Ozone Monitoring Values Exceeding 0.075 ppm on August 27, 2008.

Tables 4.1-4 to 4.1-12 and Figures 4.1-4 to 4.1-12 show how closely the hourly data from each monitoring station tracks. Ozone concentrations rise and fall temporally together throughout the system. The data also show that while there is some variance in the magnitude of ozone concentrations from station to station and from day to day, Mesquite remains free of exceedances and consistently reads lower than the monitoring stations on the west side of the Las Vegas Valley. While stations within the current nonattainment area may record lower concentrations, Mesquite consistently records overall lower concentrations throughout the ozone season.

4.1.4 Conclusion

An analysis of air quality data from 2006 to 2008, the location of the monitoring network, and the configuration of the current 8-hour ozone nonattainment boundary clearly reiterates the adequacy of the 1997 ozone nonattainment boundary. All of the ozone monitors recording an exceedance are located within the 1997 boundary; areas outside the nonattainment area (e.g., Mesquite) have never recorded an exceedance; the trends of ozone concentrations track closely from monitoring site to monitoring site; and the highest-reading monitors, as well as the design value monitor, are located within the nonattainment boundary, which is where the greatest density of population and emission sources exist.

4.2 EMISSIONS DATA

Because urbanized land use in Clark County is concentrated in the Las Vegas Valley (HA 212), the highest area and mobile source emissions are generated there, creating the greatest O_3 impact on human health.

DAQEM's 2005 CERR submittal listed 91,517 tpy of NO_x emissions and 40,322 tpy of VOC emissions. It was a comprehensive and much improved emissions inventory; specifically, the area source category was more inclusive. The Nevada Division of Environmental Protection (NDEP) submitted the following data to EPA for statewide emissions in 2005: 68,122 tpy of NO_x and 14,491 tpy of VOC. NDEP did not submit any data for the area source category.

As Table 4.2-1 shows, mobile and area sources are a significant contributor to VOC; mobile and point sources are significant contributors for NO_x.

Table 4.2-1. NO_x and VOC Emissions Summary

Sources	NO_x		VOC	
	tpy	%	tpy	%
On-road mobile	33,399	36	19,815	36
Non-road mobile	13,632	15	13,982	25
Area	3,536	4	19,868	36
Point[1]	40,950	45	1,851	3
Clark County	**91,517**	**100**	**55,516**	**100**

[1]The point source category includes emissions from airports in Clark County.

Figures 4.2-1 and 4.2-2 show the distribution of 2008 NO_x and VOC emissions. All significant sources of NO_x and VOC are located within the proposed ozone nonattainment area.

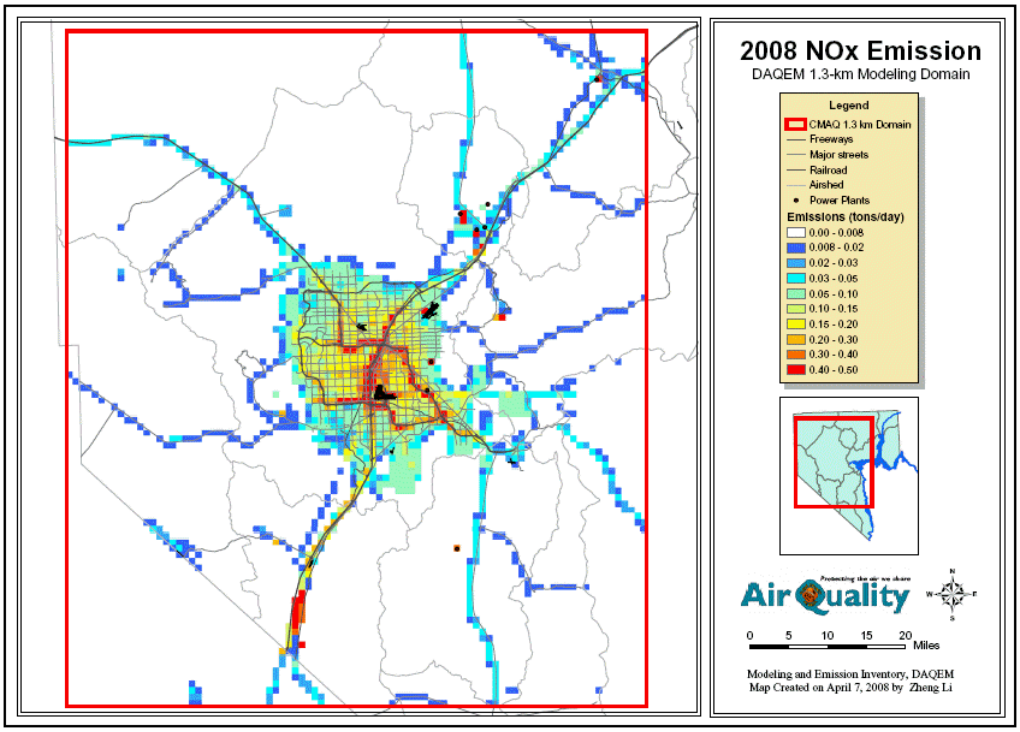


Figure 4.2-1. NO_x Emissions.

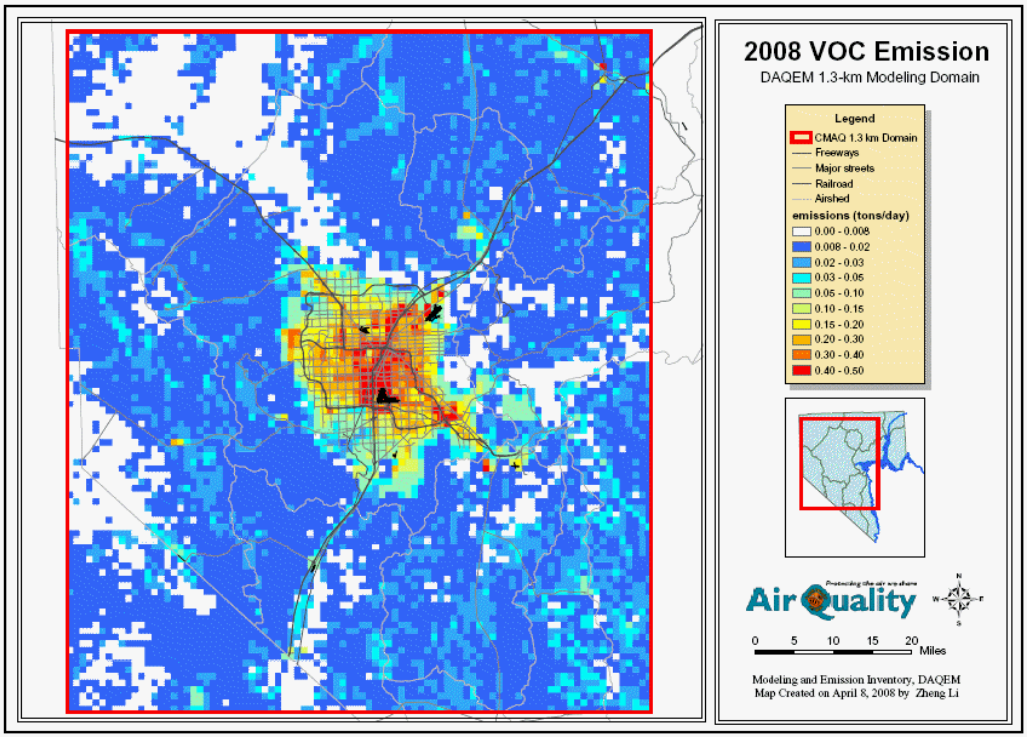


Figure 4.2-2. VOC Emissions.

4.2.1 Point Sources

4.2.1.1 NO_x Sources

Figure 4.2-3 shows the locations of major NO_x emission sources in Clark County.

- The Reid Gardner generating station near Moapa accounts for 9,161 tpy of NO_x.
- The largest point source NO_x emitter in the Las Vegas Valley is the Clark generating station, with 2,591 tpy of NO_x.
- Chemical Lime Apex in the Apex Valley emits 1,566 tpy of NO_x.
- McCarran International Airport generates 3,516 tpy of NO_x.
- J.R. Simplot emits 150 tpy of NO_x.
- Eldorado Energy emits 138 tpy of NO_x.

The Kinder Morgan CalNev pipeline, Nevada Power Sunrise Station, Saguaro Power Company, TIMET, Republic Dumpco, BPB Gypsum Blue Diamond, Nevada Cogeneration Associates No. 1, and Georgia Pacific are within or on the periphery of the Las Vegas urbanized area.

The Mohave generating station accounts for 20,011 tpy of NO_x. This station ceased operating in 2006, in accordance with a Consent Decree, but its operational status might change in the future.

4.2.1.2 VOC Sources

Figure 4.2-4 shows the locations of major VOC emission sources in Clark County.

- McCarran International Airport is the biggest emitter of VOC in Clark County, accounting for 719 tpy of VOC.
- The North Las Vegas Airport emits 233 tpy of VOC.
- The Mohave generating station accounts for 138 tpy.
- Kinder Morgan CalNev Pipeline emits 84 tpy of VOC.

All other point sources combined emit 677 tpy of VOC.

4.2.2 Area Sources

The area source category includes numerous stationary sources whose 2005 emissions are smaller than the point source thresholds. The area sources category includes subcategories such as graphic arts, auto body refinishing, dry cleaning, industrial surface coating, degreasing, and gasoline distribution, among others.

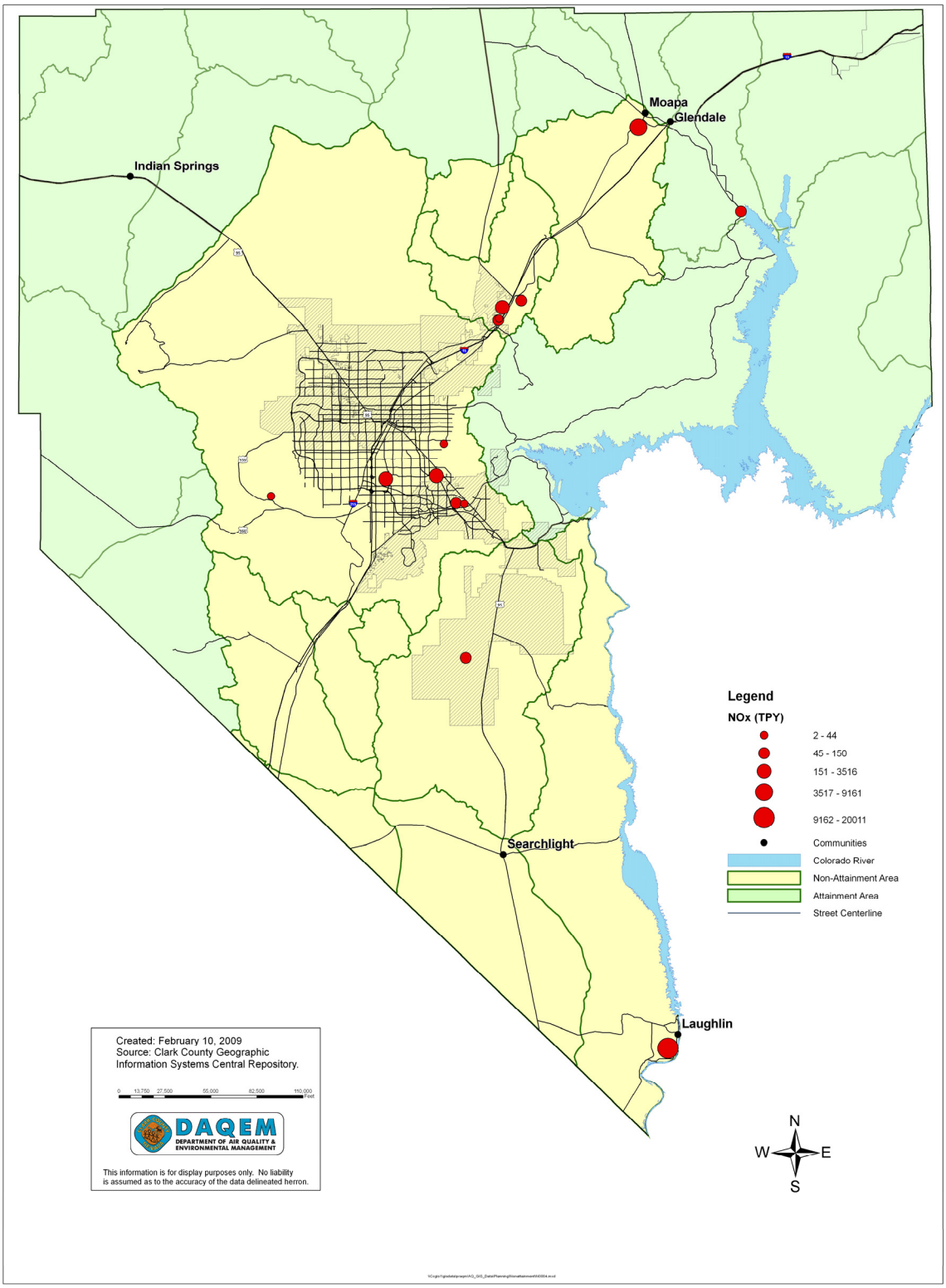


Figure 4.2-3. Locations of Major NO_x Emitters in Clark County.

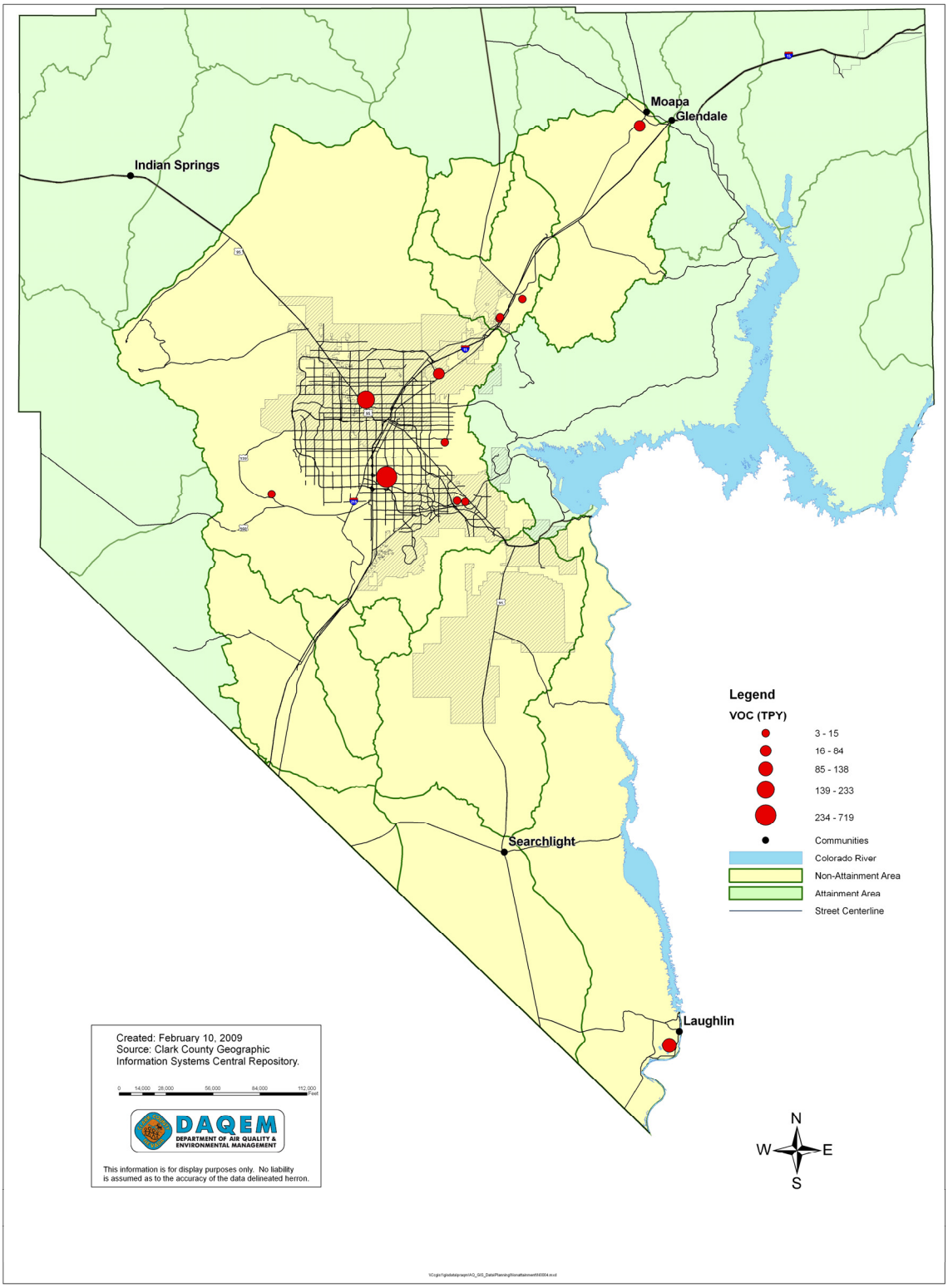


Figure 4.2-4. Locations of Major VOC Emitters in Clark County.

4.2.3 Future Development and Emission Trends

Future economic development and expansion in Clark County will take place mostly in the Las Vegas Valley (HA 212). This urbanized area has the infrastructure to support economic growth in Clark County. Tables 4.2-2, 4.2-3, and 4.2-4 show projected emissions for the four major source groups in 2008, 2013, and 2018.

Despite large expected population growth, overall NO_x and VOC emissions will decrease slightly because:

- Point source emissions are a significant contributor to overall NO_x emissions, but a very small fraction of overall VOC emissions. Point source NO_x emissions are estimated to decrease slightly from 2002 to 2008, then increase to about 2002 levels in 2018.

- Area source emissions are a significant contributor to VOC emissions, especially in the summer, when temperatures are higher. Area source VOC emissions are projected to increase from 2002 to 2018, since they are primarily associated with population increases and most of the area sources are uncontrolled.

- On-road mobile sources are a significant contributor to all ozone precursor inventories, but their contribution is decreasing over time despite large increases in activity as older vehicles are retired and replaced by newer vehicles that meet much stricter federal emissions standards.

- Non-road mobile sources are also a significant contributor to all ozone precursor inventories, but their contribution is also decreasing over time on both an absolute and relative basis. Activity will be increasing, but most non-road sources are now covered under federal non-road engine and equipment standards that phase in over time.

Table 4.2-2. Emission Projections for 2008

Sources	NO_X		VOC	
	tpy	%	tpy	%
On-road Mobile	28,965	36	19,103	35
Non-road Mobile	12,547	16	12,003	22
Area	2,129	3	20,378	38
Point	36,684	46	2,907	5
Clark County	**80,325**	**100**	**54,391**	**100**

Table 4.2-3. Emission Projections for 2013

Sources	NOX		VOC	
	tpy	%	tpy	%
On-road Mobile	17,982	24	15,193	28
Non-road Mobile	10,310	14	11,033	21
Area	2,355	3	23,665	44
Point	44,209	59	3,562	7
Clark County	**74,856**	**100**	**53,453**	**100**

Table 4.2-4. Emission Projections for 2018

Sources	NO_x		VOC	
	tpy	%	tpy	%
On-road Mobile	11,293	16	12,799	24
Non-road Mobile	7,619	11	10,880	20
Area	2,589	4	26,452	49
Point	47,207	69	4,187	8
Clark County	**68,708**	**100**	**54,318**	**100**

4.3 POPULATION DENSITY AND DEGREE OF URBANIZATION

Most of the population in Clark County is concentrated in the Las Vegas Valley. Table 4.3-1, based on the southern Nevada consensus population estimate of July 2008, shows that more than 95 percent of the county's population lives within the valley. These population figures demonstrate that the highest human exposure to excessive pollutant levels will occur in the Las Vegas Valley.

Table 4.3-1. 2008 Population Estimates for Clark County, Nevada

Place / Community	Total Population	% of Total Population
Clark County	1,986,146	100
Las Vegas Valley urban area	1,916,436	96.5
Outlying areas	69,709	4.5

Source: *Southern Nevada Consensus Population Estimate,* July 2008.

Future-year land use forecasts are created by the SNRPC LUWG, composed of members representing the cities of Las Vegas, North Las Vegas, Henderson, urbanized Clark County, and the RTC. The LUWG was formed to develop a consensus-based process to define future land uses for RTC transportation planning. Based on the available vacant land of the Clark County assessor's 2006 closed roll parcel, the group created GIS data of planned land development using the RTC/SNRPC definition. Table 4.3-2 lists the forecast for developed acres from 2005 to 2030, and Table 4.3-3 lists the forecasts for population and dwelling units.

Table 4.3-2. Developed Acres Forecast, 2005-2030

Time Period	Forecast Growth Acres		
	Residential	Nonresidential[1]	Total
2006-2010	15,558	16,214	31,771
2010-2015	16,212	15,092	31,304
2015-2020	16,565	15,664	32,229
2020-2025	9,900	9,900	19,800
2025-2030	4,900	4,972	9,872
Total	**63,136**	**61,841**	**124,977**

[1]Includes open space.
Source: *Planning Variable Development and Methodology*, RTC 2008.

Table 4.3-3. Population and Dwelling Unit Forecast, 2005-2030

	2005	2008	2013	2020	2030
Population	1,769,532	2,022,523	2,431,048	2,877,544	3,230,493
Dwelling units	686,226	780,260	938,335	1,120,702	1,233,422

Source: RTC staff.

Figure 3-1 puts these numbers into a spatial perspective using census tracts and population densities for Clark and surrounding counties. In Clark County there are 16,258 census block units, with a mean population density of 2,409 people per km^2. In Nevada, mean population density is approximately 5 people per km^2, using the 2000 census blocks. As Table 4.3-4 demonstrates, the densities within and outside the Las Vegas Valley are starkly different: the density inside the valley is more than 110 times greater than in the rest of the county.

Table 4.3-4. Population Densities in Clark County

	Las Vegas Valley (Hydrographic Area 212)	Remainder of County
Population	1,914,622	71,483
Land Area (mi^2)	1,543	6,548
Population Density (people/mi^2)	1240.84	10.92

Source: Clark County Department of Comprehensive Planning.

There is also substantial variability in population density within the Las Vegas metropolitan area. Some densities in the city will increase as vacant areas are filled in, but most increases are anticipated on the periphery of the metropolitan area. The current nonattainment area boundary encompasses all the anticipated expansion of the populated area and includes all the anticipated emissions and pollutant exposures in the new neighborhoods. Public land boundaries, identified in Section 4.5 (Figure 4.5-1), and the mountains surrounding the Las Vegas valley, shown in Figure 3-3, effectively limit the spatial extent of the urbanized area. Water availability and other environmental and economic concerns also add constraints to spatial growth.

4.4 TRAFFIC AND COMMUTING PATTERNS

Because Las Vegas has been one of the fastest-growing urban areas in the nation, traffic volumes have increased every year in the Las Vegas Valley. Figure 4.4-1 shows the roadway network and total daily flows on the major arterials within the metropolitan area.

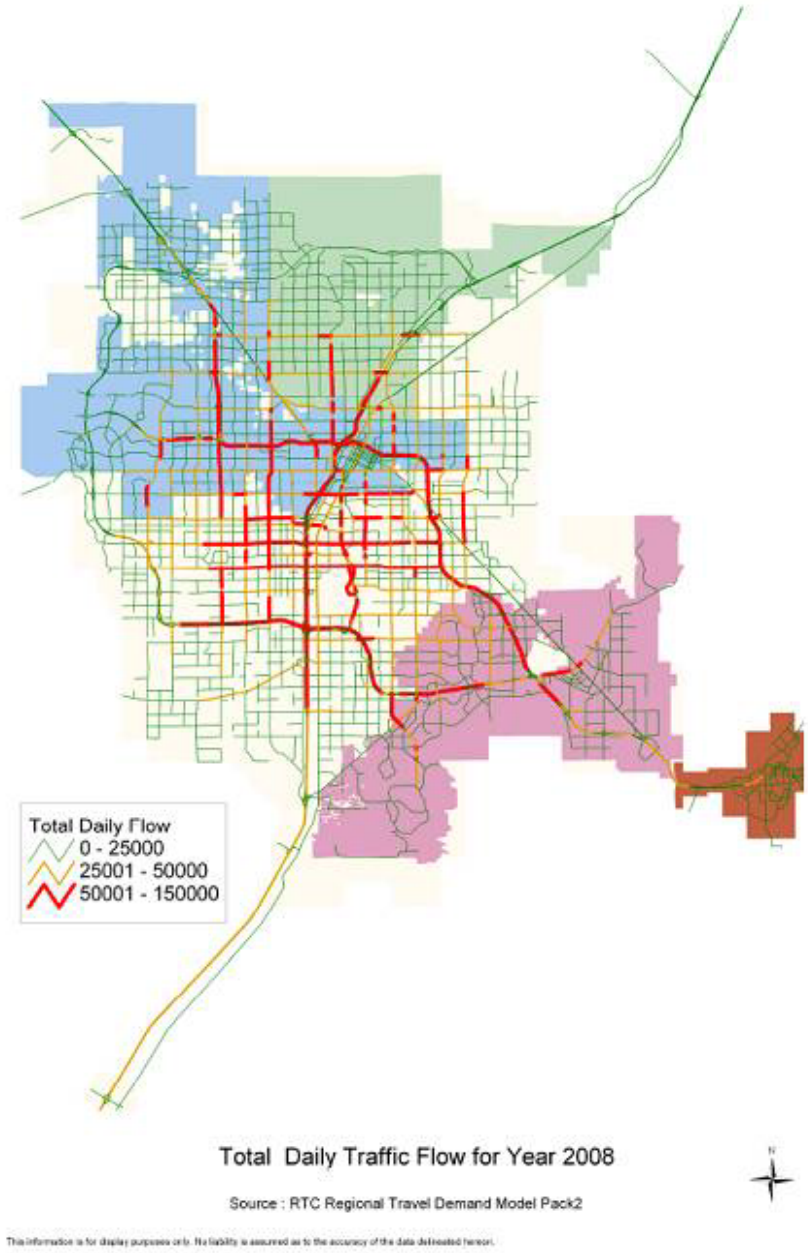


Figure 4.4-1. Total Daily Traffic Flow for 2008.

Table 4.4-1 estimates the total number of vehicle miles traveled (VMT), and Table 4.4-2 estimates average weekday vehicle trips through 2030. Both VMT and average weekday vehicle

trips are estimated to increase over 61 percent by 2030, reflecting the continued population and employment growth projections for the Las Vegas Valley.

Table 4.4-1. Daily Vehicle Miles Traveled, 2008-2030

Road Type	2008	2010	2020	2030
External links	607,755	631,693	789,029	957,758
System-to-system ramps	341,568	356,470	535,554	596,490
Minor roads	5,439,127	6,100,189	8,695,678	10,596,263
Major roads	15,356,117	16,623,022	19,182,320	20,900,273
Ramps	1,234,124	1,355,581	1,716,600	1,885,604
Interstates	10,529,327	11,359,075	15,700,354	19,148,610
Freeways	4,567,426	5,395,363	7,464,694	8,208,423
Expressways/beltways	198,762	193,598	7,652	12,316
Collectors	3,310,084	3,498,212	4,146,492	4,682,685
Centroid connectors	3,255,261	3,581,532	4,693,489	5,448,182
Local roads	15,271	15,632	15,818	16,854
HOV	243,363	486,752	1,160,461	1,173,322
Total	**45,098,185**	**49,597,119**	**64,108,141**	**73,626,781**

Source: RTC staff.

Table 4.4-2. Average Vehicle Trips in the Las Vegas Valley, 2005-2030

Trip Purpose	Average Weekday Vehicle Trips					
	2005	2006	2008	2010	2020	2030
Auto trips	4,465,602	4,696,208	5,156,575	5,616,529	6,798,258	7,499,605
External trips	159,738	171,941	191,504	199,445	239,153	278,860
Truck trips	183,137	183,184	209,974	227,865	299,642	340,631
Taxi trips	192,944	197,681	207,155	216,630	285,565	363,664
Total Vehicle Trips	**5,001,421**	**5,249,014**	**5,765,208**	**6,260,470**	**7,622,618**	**8,482,760**

Source: RTC staff.

In 2007, the Nevada Department of Transportation estimated total annual vehicle miles traveled (AVMT) for Clark County at 14,561 million. Table 4.4-3 shows approximately 12,861 million AVMT per year within the Las Vegas Valley, which is more than 88 percent of total county AVMT. Much of the remainder occurs along the I-15 and U.S. 95 corridors.

Table 4.4-3. AVMT in Clark County, 2007

Functional Class (FC)	% AVMT	Total AVMT	Miles
Interstate - rural	6.01	875,545,575	85
Principal arterial - other - rural	3.14	456,722,967	168
Minor arterial - rural	0.36	52,060,534	19
Major collector - rural	1.10	159,590,341	227

Table 4.4-3. AVMT in Clark County in 2007 (cont.)

Functional Class (FC)	% AVMT	Total AVMT	Miles
Minor collector - rural	0.19	28,164,042	95
Local - rural	0.88	128,859,848	1863
Subtotal - Rural	**11.68**	**1,700,943,307**	**2457**
Principal arterial - interstate - urban	19.29	2,808,994,740	70
Principal arterial - urban	9.85	1,434,144,860	40
Principal arterial - other - urban	11.48	1,671,199,804	126
Minor arterial - urban	24.72	3,600,032,997	402
Collector - urban	7.14	1,039,237,910	280
Local - urban	15.85	2,307,393,826	3119
Subtotal - Urban	**88.32**	**12,861,004,137**	**4037**
Total, Clark County	***100.00***	***14,561,947,444***	***6494***

Source: Nevada Department of Transportation.

Table 4.4-4 lists the purpose and number of average weekday trips, projected to 2030. Since 88 percent of all AVMT in Clark County are driven in Las Vegas, and more than 95 percent of the county's population lives within the urban core of the Las Vegas Valley, understanding trip purpose is useful in addressing commuting patterns. Total resident trips comprise over 91 percent of the Average Weekday Person Trips taken in the Las Vegas Valley; visitor trips comprise the rest. Based on trip purpose data, the commuting pattern comprises 16 percent home to work, 7.5 percent home to school, 9 percent home to shopping, 38 percent home to other, 29 percent non-home-based trips, and 0.22 percent residence air trips. This leads to the conclusion that most vehicle trips inside the Las Vegas Valley are fairly well distributed along the roadway network.

Table 4.4-4. Person-Trips in the Las Vegas Valley, 2013-2030

Trip Purpose	Average Weekday Person Trips		
	2013	2020	2030
Home-based work	1,341,000	1,631,301	1,901,401
Home-based school	624,633	738,044	860,949
Home-based shopping	747,698	880,765	1,019,160
Other home-based	3,152,269	3,696,292	4,246,291
Non-home-based	2,397,000	2,837,200	3,278,900
Residence air	18,066	21,577	18,066
Total Resident Trips	**8,280,666**	**9,805,179**	**11,324,767**
Multi-day visitor trips	645,982	758,839	809,912
Visitor airport based trips	142,011	170,180	193,164
Total Visitor Trips	**787,993**	**929,019**	**1,003,076**
Total Person Trips	***9,068,659***	***10,734,198***	***12,327,843***

Source: RTC staff.

Figure 4.4-2 displays freeways, major streets, and roadway congestion in the Las Vegas Valley. The arterial road system evolved from the Public Land Survey System grid, which divides Western states into square miles. These roads are supplemented by other roads that began as connec-

tors to outlying communities, including Las Vegas Boulevard. The worst congestion is in the dense urban core surrounding the resort corridor, i.e., South Las Vegas Boulevard. According to the Texas Transportation Institute, travel times during the peak (or rush hour) periods have remained constant in recent years. This means the RTC has been successful in reducing traffic congestion.

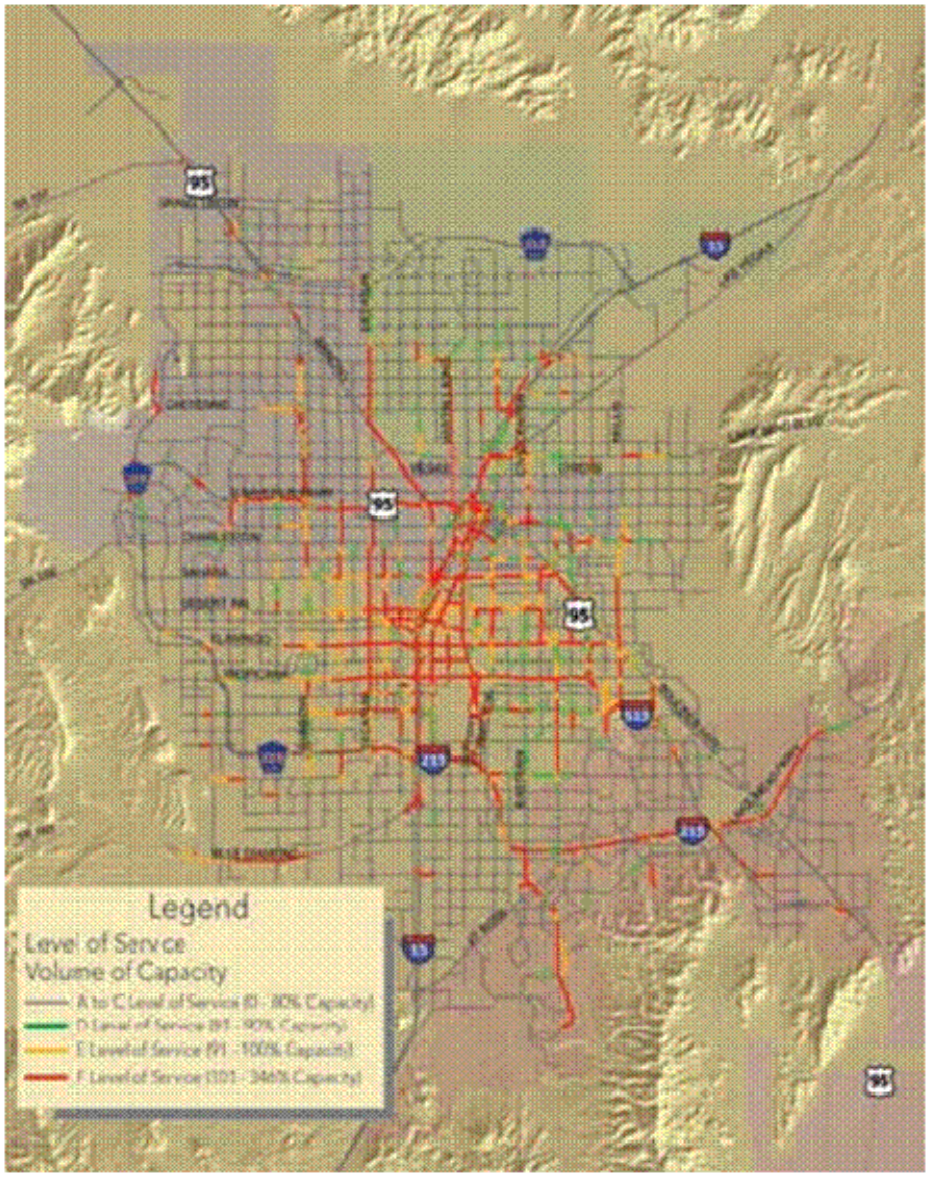


Figure 4.4-2. Roadway Congestion in the Las Vegas Valley.

4.5 GROWTH RATES AND PATTERNS

Based on the population forecast in Table 4.5-1, substantial population growth is expected in Clark County between 2008 and 2030.

Table 4.5-1. Estimated Population Projections for Clark County and the Las Vegas Metropolitan Area, Projected from 2008 to 2030

Year	Clark County Population
2008	1,912,655
2010	2,286,019
2015	2,725,139
2020	3,056,026
2025	3,305,369
2030	3,511,888
Source: RTC 2008, Appendix IIA.	

Because more than 90 percent of the land in Clark County is under federal control, most of the population growth will occur in the Las Vegas Valley. Figure 4.5-1 shows land ownership within Clark County and the surrounding areas.

The SNPLMA limits the amount of federal land that may be sold to private interests and requires an act of Congress to expand or change the boundary. This limit means less than 10 percent of the land in the county is privately held. The development of privately held land is further limited by the Multiple Species Habitat Conservation Plan Incidental Take Permit from the U.S. Fish and Wildlife Service (FWS), which has limited private development in the entire county to 145,000 total acres since 2001. Due to existing county ordinances and agreements, much of any new industrial development will occur in the Apex Valley, northeast of the Las Vegas Valley, but little if any residential development can take place in Apex.

Figures 4.5-2 through 4.5-6 show projected growth patterns for 2006 through 2030. The majority of growth will occur on the fringes of the currently developed urban area of the Las Vegas Valley, where the greatest amount of privately held vacant land is located. The largest areas of undeveloped, privately held vacant land are located in the northwest, northeast, and southwest parts of the SNPLMA disposal boundary. Because of these factors, the primary ozone impact on human health occurs and will continue to occur in HA 212, the Las Vegas Valley.

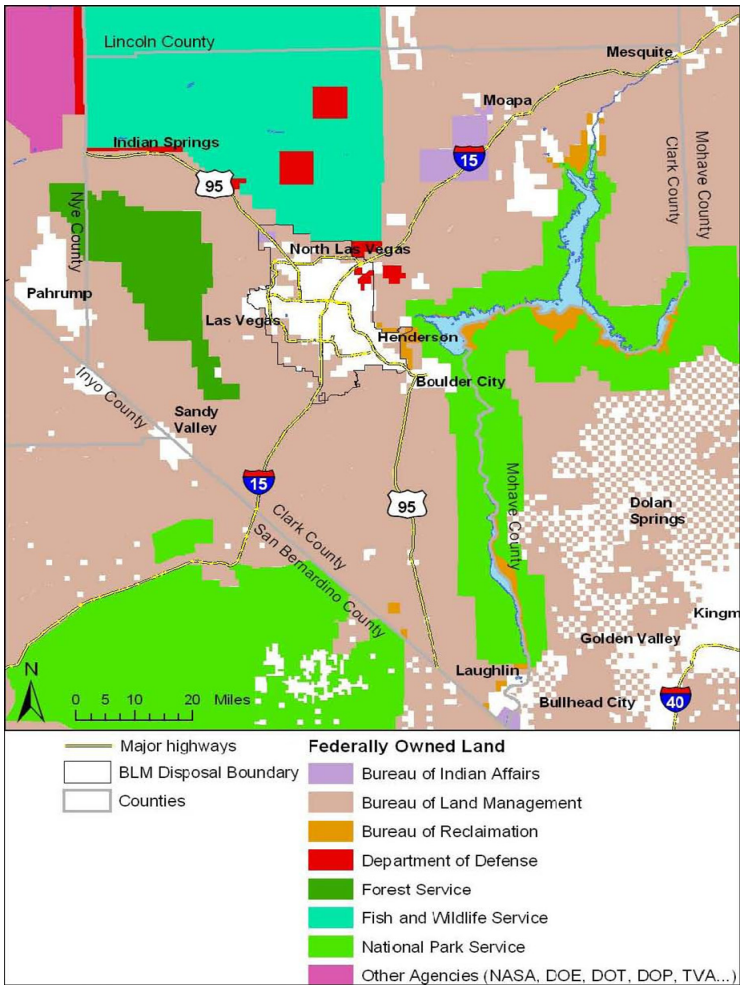


Figure 4.5-1. Land Ownership in Clark County and Surrounding Areas. (Private lands are not shaded.)

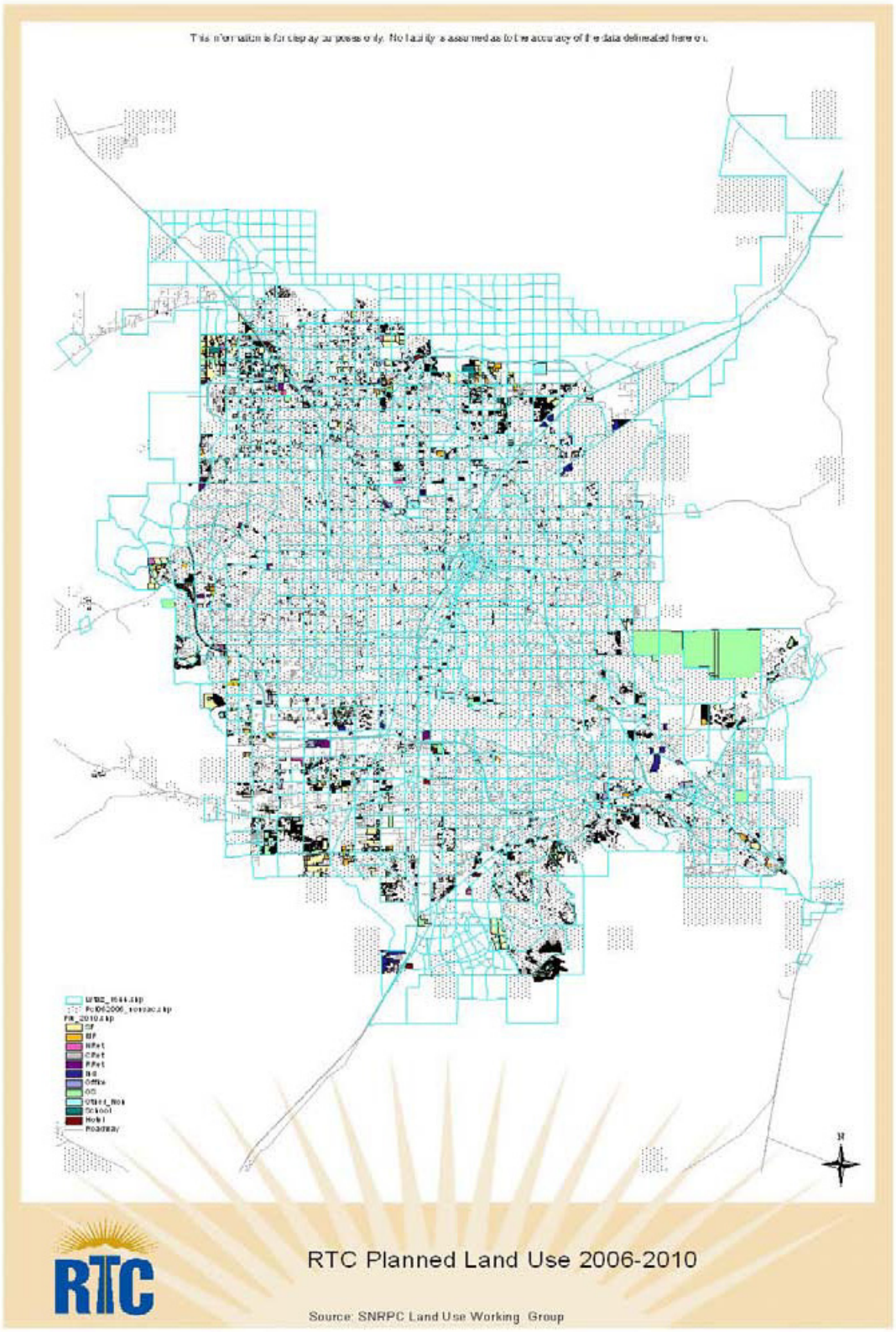


Figure 4.5-2. Planned Land Use, 2006-2010.

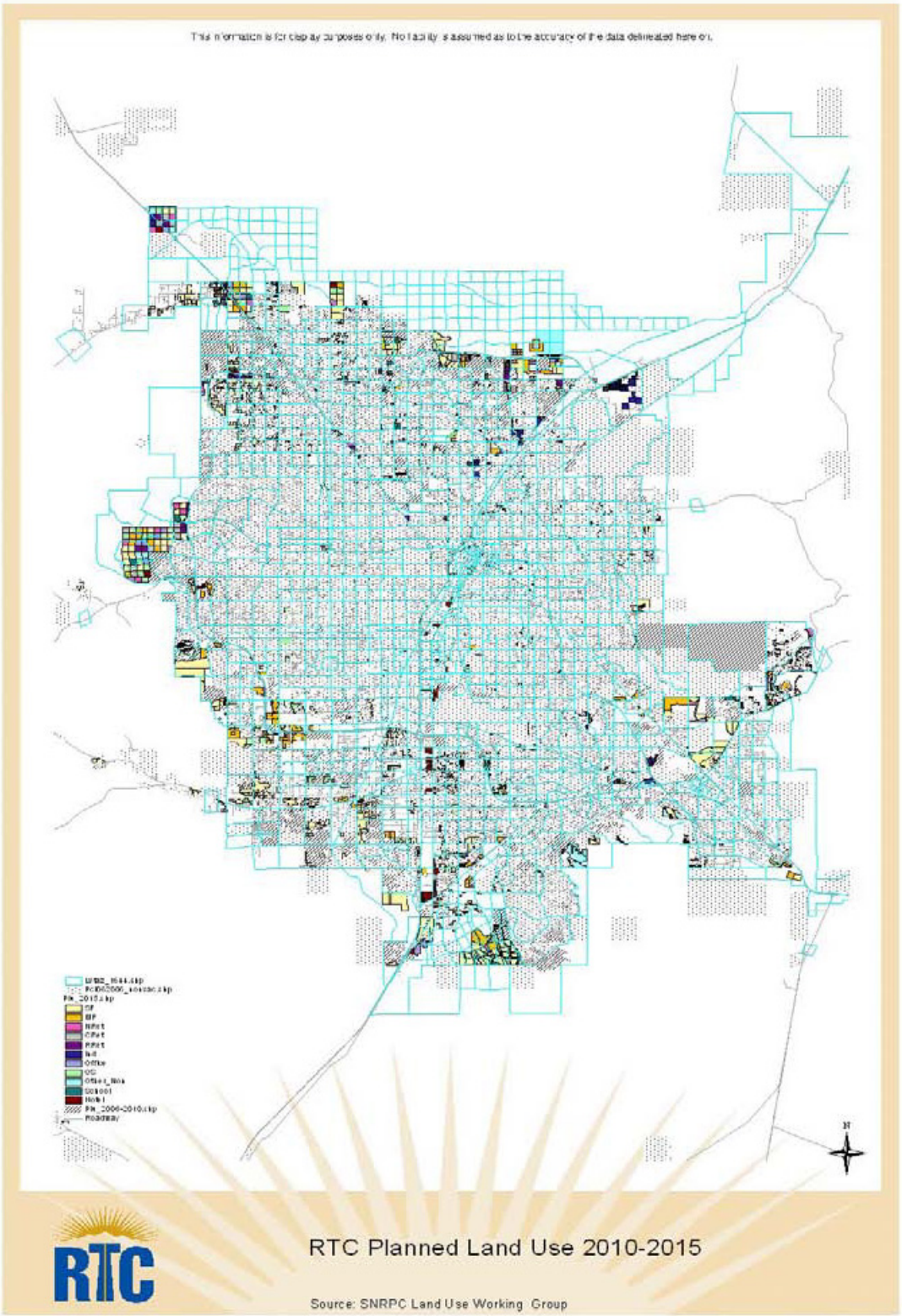


Figure 4.5-3. Planned Land Use, 2010-2015.

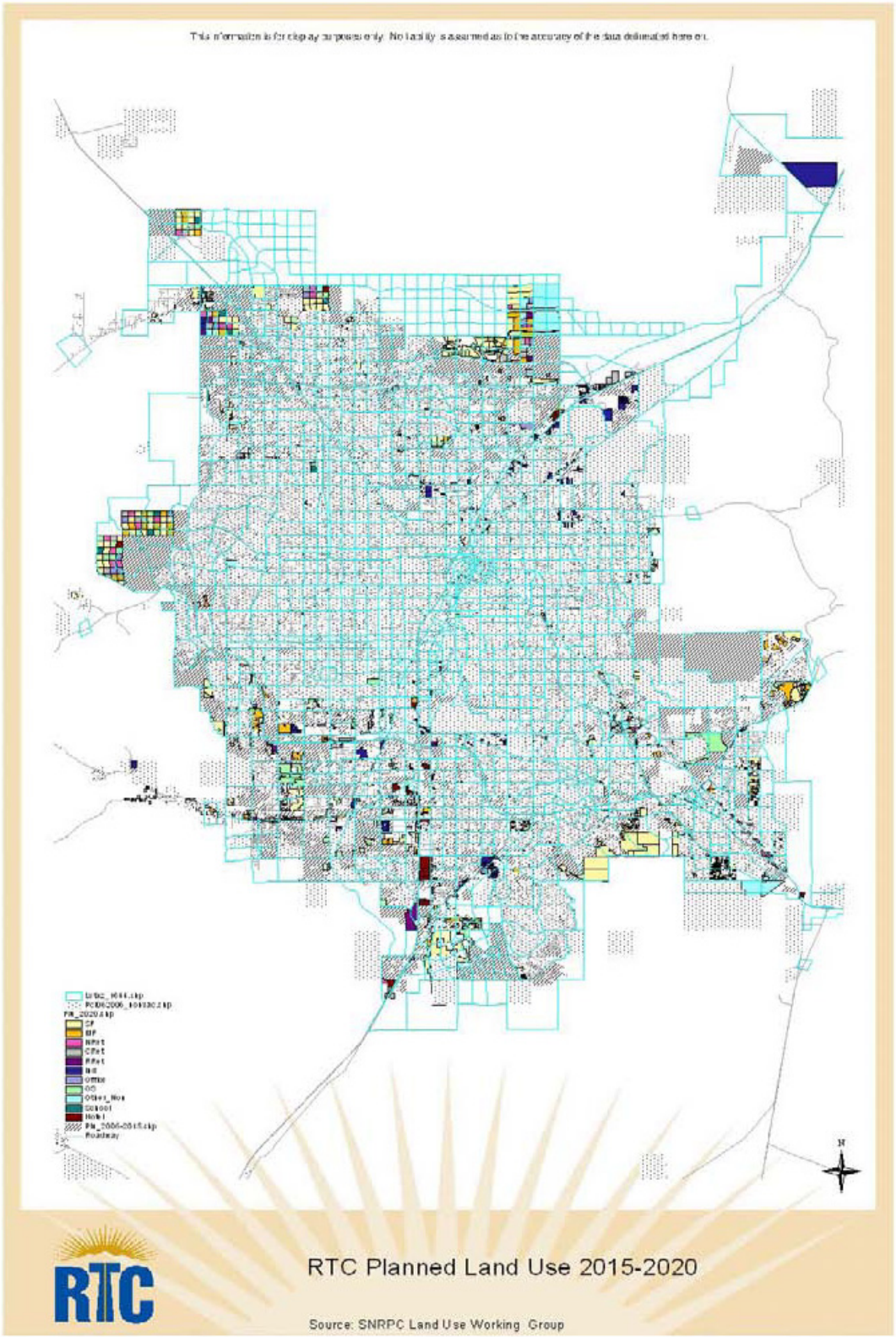


Figure 4.5-4. Planned Land Use, 2015-2020.

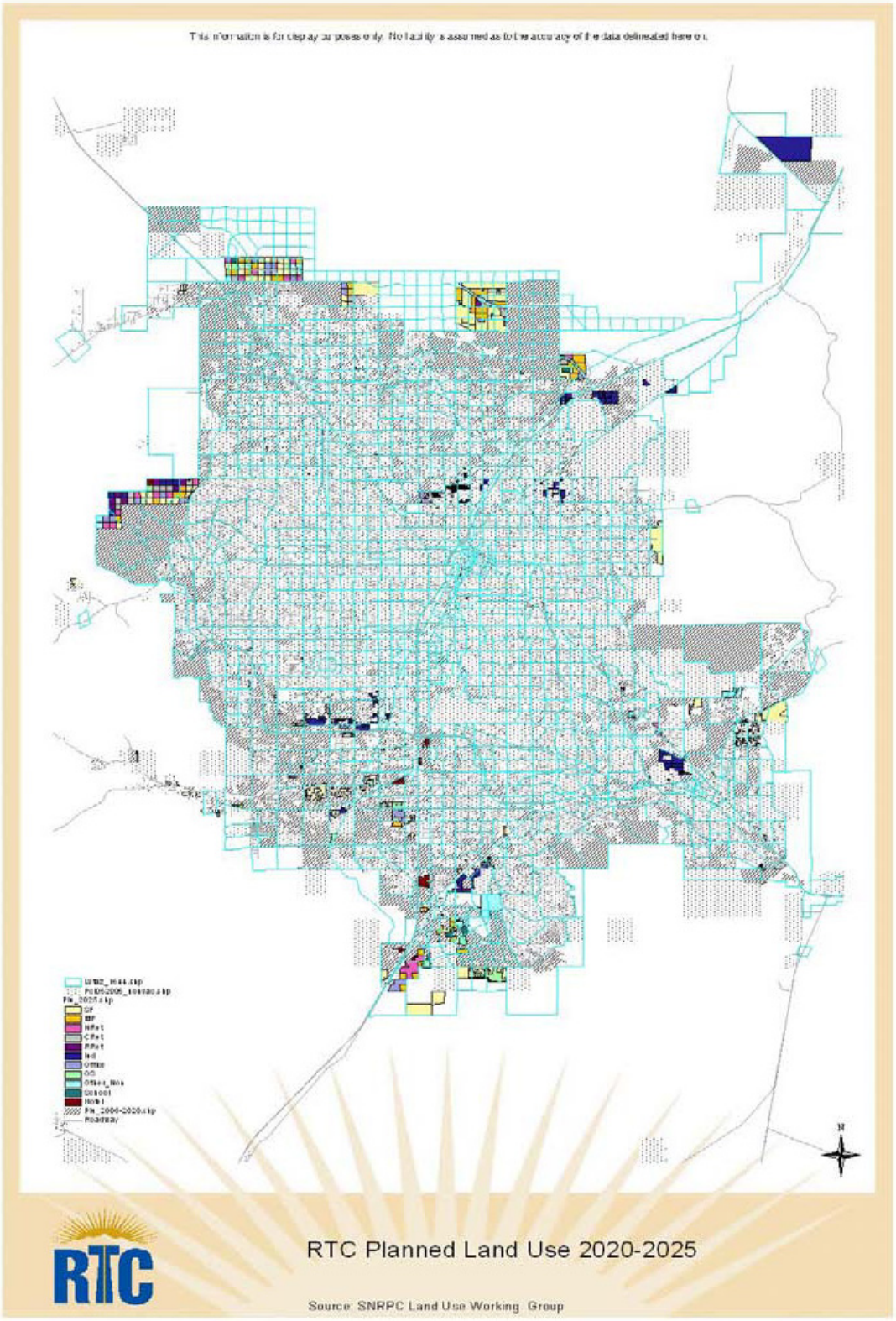


Figure 4.5-5. Planned Land Use, 2020-2025.

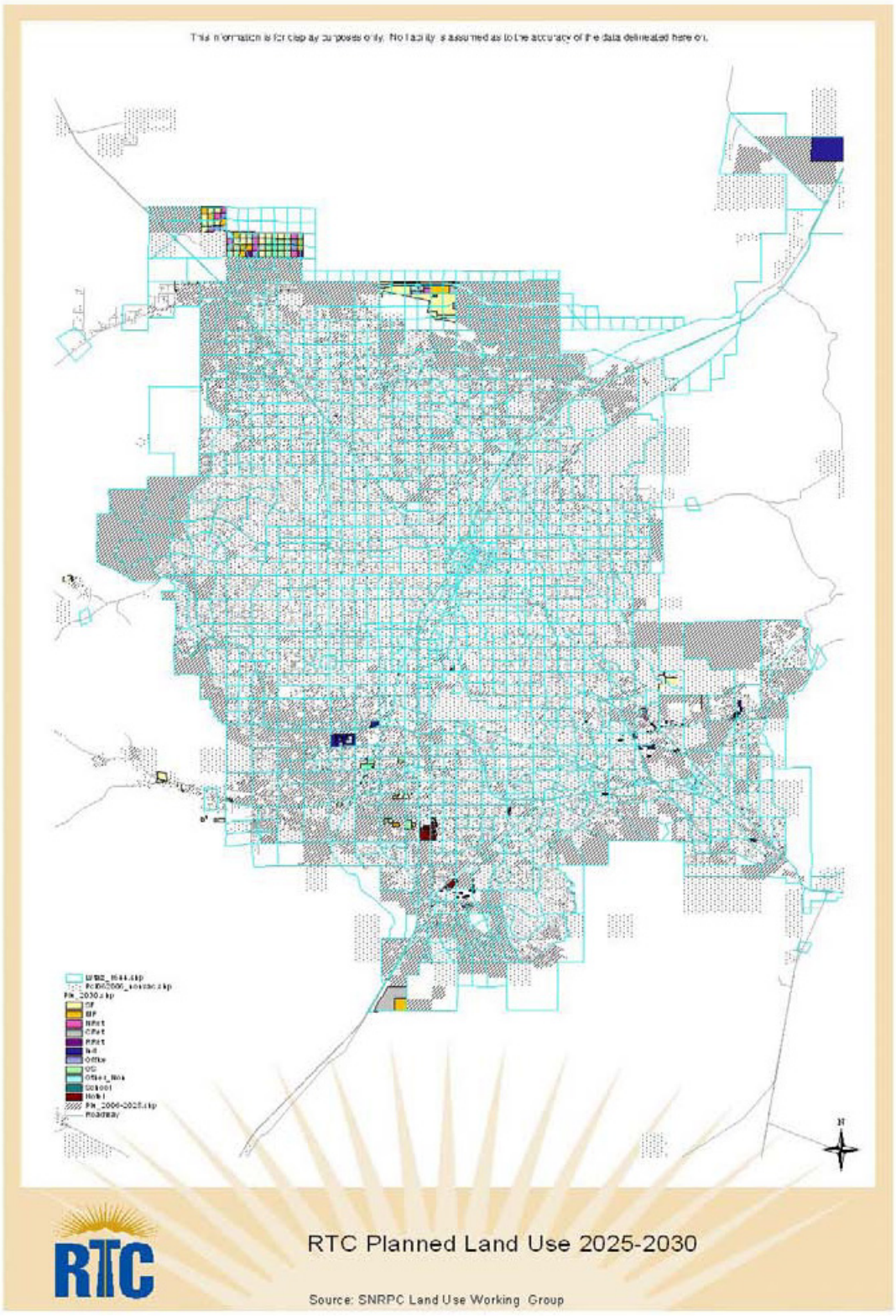


Figure 4.5-6. Planned Land Use, 2025-2030.

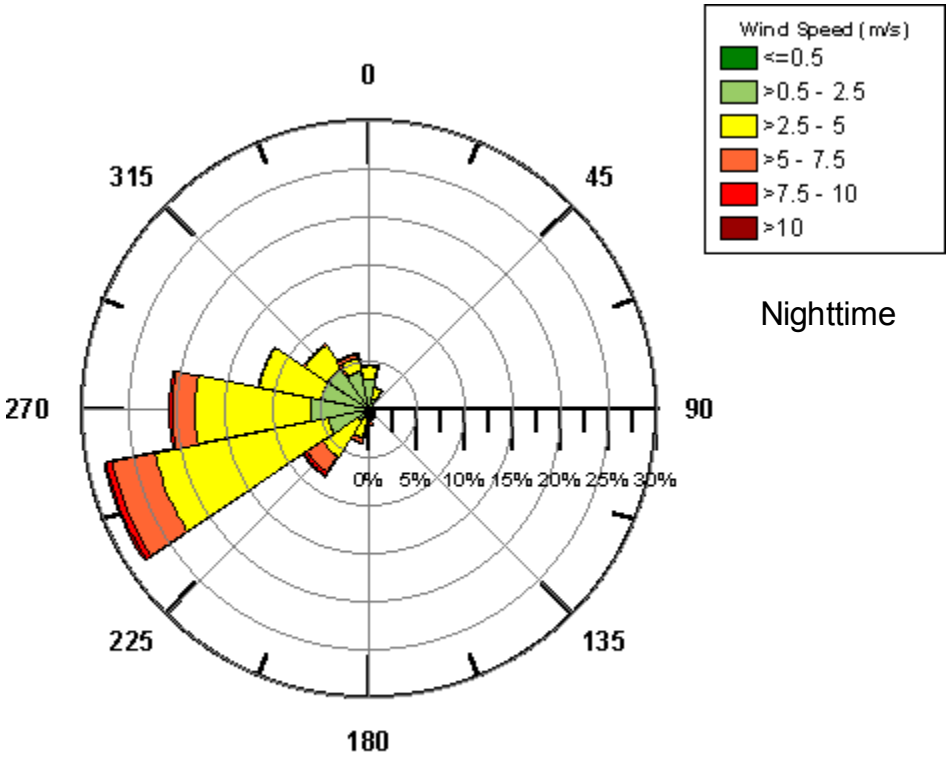
4.6 METEOROLOGY

This section summarizes local meteorology and regional scale systems affecting Clark County ozone air quality. The meteorological information in this section supports recommendations that nonattainment designations made under the 1997 ozone NAAQS should be maintained under the revised 2008 ozone NAAQS.

Surface winds in Clark County are controlled by local terrain features superimposed on larger-scale weather patterns and regional wind fields. Slope and valley wind systems are local, thermally-driven flow circulations that form in complex terrain areas. These processes directly affect pollutant transport and dispersion.

At night in Clark County, local drainage flows dominate in the lower elevations. Within the Las Vegas Valley, the flow appears to follow the longitudinal axis of the valley towards Lake Mead. The surface flow pattern during the stable nighttime period is clearly decoupled from stronger winds aloft, as seen from measurements at higher elevations around the valley. By mid-morning, drainage flows cease and, due to solar-induced terrain heating, shift to an upslope flow, most frequently to the west and northwest. By mid-afternoon and continuing into evening, a rather uniform, moderately strong southwest wind field prevails as flows at all levels become strongly coupled. There appears to be a steady flux into the valley from the southwest.

As Figures 4.6-1 and 4.6-2 illustrate, wind roses for the Palo Verde and Jean air quality monitoring sites show distinct diurnal variations (top panels show nighttime winds; bottom panels show daytime winds). The winds at Palo Verde are dominated by local terrain-driven features. During the day, winds are primarily up-valley (from the southeast). At night, the prevailing wind is more westerly due to strong downslope flow influence from the ridges that define the western boundary of the Las Vegas Valley; this influence is reinforced by the prevailing southwest regional winds. The observed winds at Jean are very different from those seen within the Las Vegas Valley: the overwhelming occurrence of winds from the west observed at night is what would be expected from West Coast wind climatology.



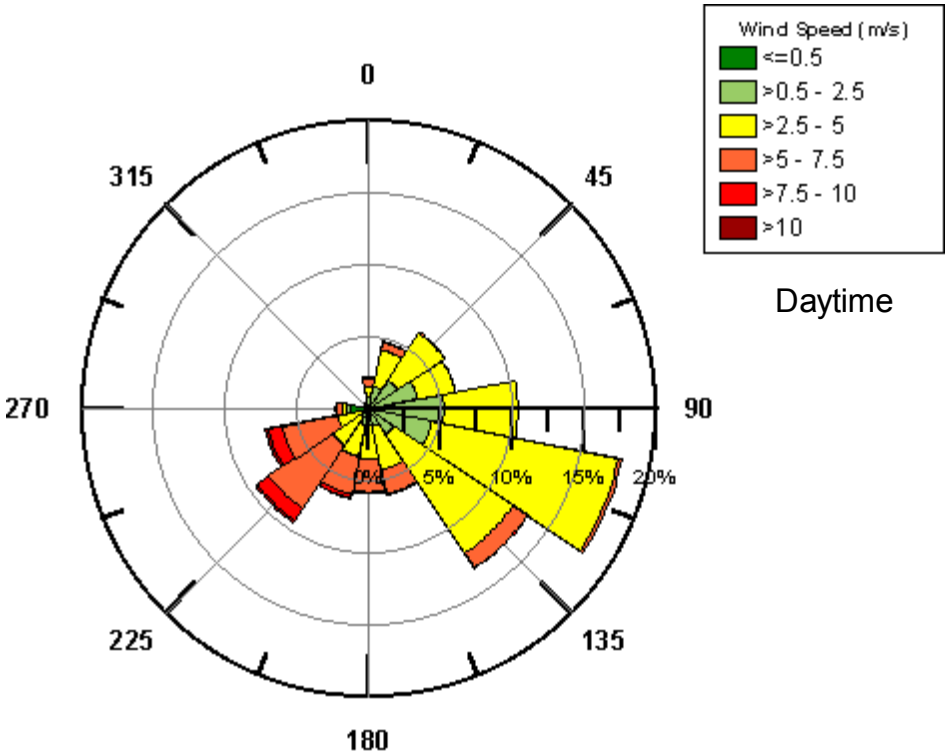


Figure 4.6-1. Wind Rose Diagrams for the Palo Verde Site (May through September, 2002-2003).

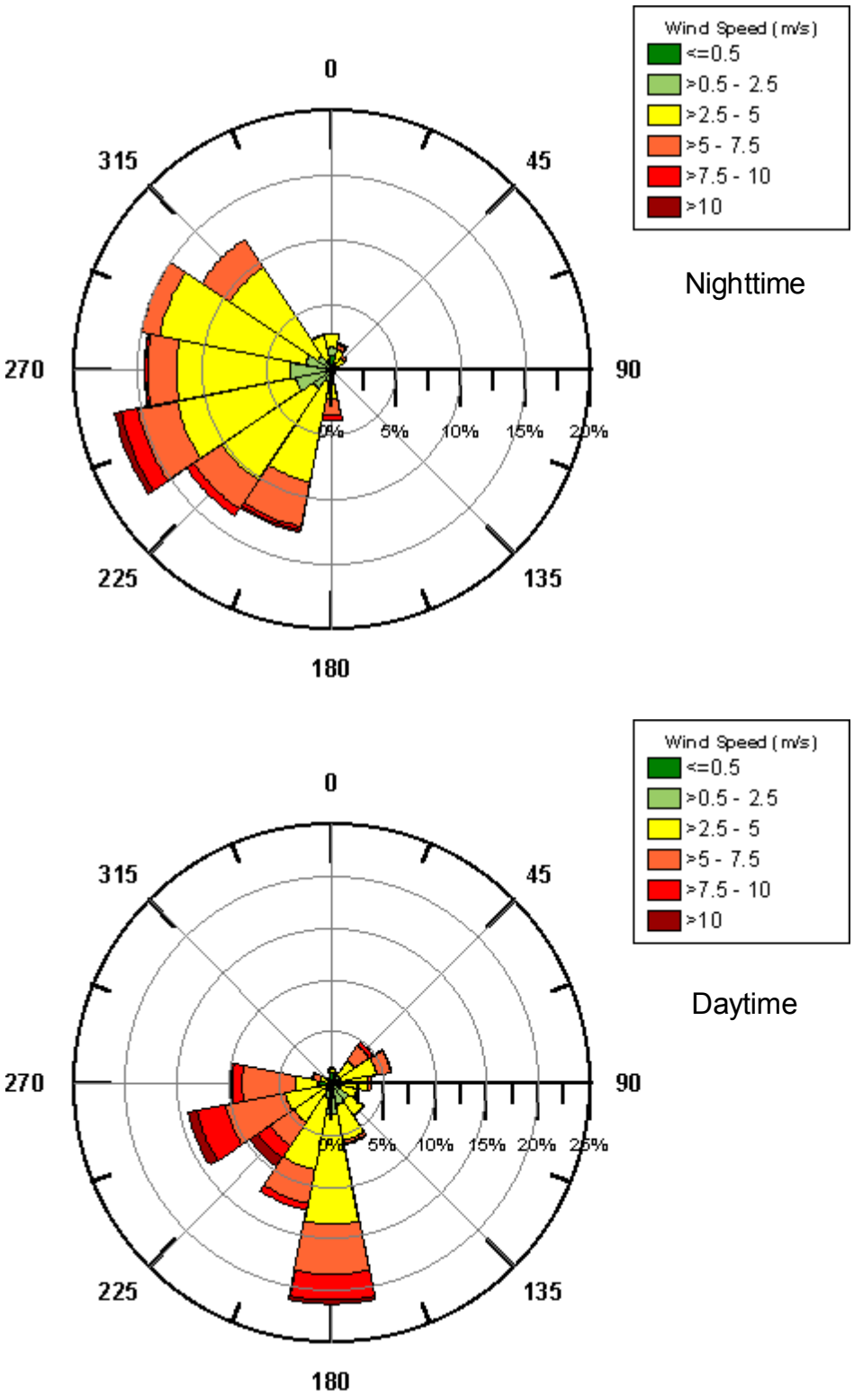


Figure 4.6-2. Wind Rose Diagrams for the Jean Site (May through September, 2001-2003).

The prevailing southwest regional winds in southern Nevada during the summer months are important in defining the transport routes of pollutants into southern Nevada and in determining area designations under the revised 2008 ozone NAAQS. State recommendations for Clark County area designations submitted to EPA in 2004, under the 1997 ozone NAAQS, included a report illustrating pollutant transport routes through HYSPLIT trajectory modeling. More recent technical studies on ozone concentrations and associated meteorology (DAQEM 2006a, b; DAQEM 2008) validate the 2004 findings and recommendations. The key elements of these more recent technical studies are briefly summarized below.

An ozone characterization study in January 2006 identified five synoptic scale weather patterns affecting ozone concentrations in southern Nevada:

1. Pacific Trough (PT).
2. Interior Trough (IT).
3. Pacific Ridge (PR).
4. Interior Ridge (IR).
5. Flat Ridge (FR).

The premise of the classification scheme is that synoptic scale weather patterns, as depicted by the 500 mb constant pressure patterns, affect the onset and duration of elevated ozone concentrations in the Las Vegas Valley and surrounding areas. Table 4.6-1 presents the frequency of each type of weather pattern for each month of the ozone season from 2001 through 2003. Table 4.6-2 depicts the frequency of synoptic weather patterns with elevated ozone concentrations equal to or greater than 0.08 ppm for 2001 through 2003.

Table 4.6-1. Monthly Frequency of Weather Types, 2001-2003

Month	PT	IT	PR	IR	FR
May	40	58	24	37	26
June	20	37	18	52	51
July	26	13	5	103	38
August	38	24	23	46	53
Total	124	132	70	238	168

Table 4.6-2. Frequency of Weather Types versus Daily Maximum 8-Hour Ozone Concentrations, 2001-2003

Maximum 8-hr Avg	PT	IT	PR	IR	FR	Total
>0.08 ppm	8	3	18	40	29	98
% high ozone cases	8.1	3.1	18.4	40.8	29.6	
% of type cases	6.5	2.3	25.7			

Table 4.6-2 also lists the percentage of total occurrences of a given type associated with elevated ozone concentrations. Two weather types are associated with each day, one for the early morning (12:00 Greenwich Mean Time) and one for the afternoon (00:00 GMT). Most of the high ozone days are associated with ridges (nearly 90 percent), with approximately 40 percent of the high ozone days occurring during interior ridging. These synoptic weather patterns are instructive on

the role of pollutant transport into southern Nevada, which is frequently the dominating cause of elevated ozone concentrations, and the less frequent instances when local sources of ozone precursors are primarily responsible for ozone NAAQS violations.

More importantly, with respect to recommendations on area designations under the 2008 ozone NAAQS, these weather patterns demonstrate the validity of existing boundaries. Areas within Clark County currently designated nonattainment under the 1997 ozone NAAQS encompass both the location of man-made sources of ozone precursor pollutants (i.e., the Las Vegas Valley) and the areas that technical studies indicate are the primary transport routes of ozone and ozone precursor pollutants from upwind areas to the west and southwest of the Las Vegas Valley. By focusing on meteorological processes and the location of point and area sources of pollutants within Clark County, these technical studies demonstrate that existing nonattainment area boundaries are appropriate for air quality planning and regulatory programs under the more stringent 2008 ozone NAAQS of 0.075 ppm.

4.6.1 Clark County Regional Ozone and Precursor Study (2005)

During the 2005 ozone season, Clark County, with technical assistance from Technical & Business Systems, Inc., conducted an intensive sampling program as part of the Clark County Regional Ozone and Precursor Study (CCROPS) (DAQEM 2006a). CCROPS field studies included saturation sampling for both ozone air quality and meteorology at the surface and aloft. Supplementary sites were added to the existing surface network of meteorological and air quality monitoring sites. Upper-air ozone and meteorology were measured through aircraft operations, SODAR, and balloon-borne sampling equipment. Saturation sampling at the surface and aloft was activated when elevated ozone concentrations were anticipated. This section discusses ozone NAAQS violations on July 2 and 18, since they are classic examples of a transport scenario and a local contribution scenario, respectively. These scenarios also demonstrate that existing boundary classifications remain valid for the more stringent 2008 ozone NAAQS.

On July 2, 2005, the Jean air quality monitoring site was the only site in the network to report an exceedance (0.085 ppm) of the 1997 ozone NAAQS. Southwest winds were dominant during this period, and since Jean lies upwind of the Las Vegas Valley, elevated ozone concentrations were not associated with the urban plume from its population centers. However, the California deserts had experienced elevated ozone concentrations exceeding the ozone NAAQS the previous day. Maximum 8-hour ozone concentrations on July 2 were only seen at the western edge of the CCROPS monitoring network, as illustrated in Figure 4.6-3. Figure 4.6-4 shows the back-trajectory analysis for the day, indicating that the strong southwesterly flow transported high ozone concentrations into southern Nevada.

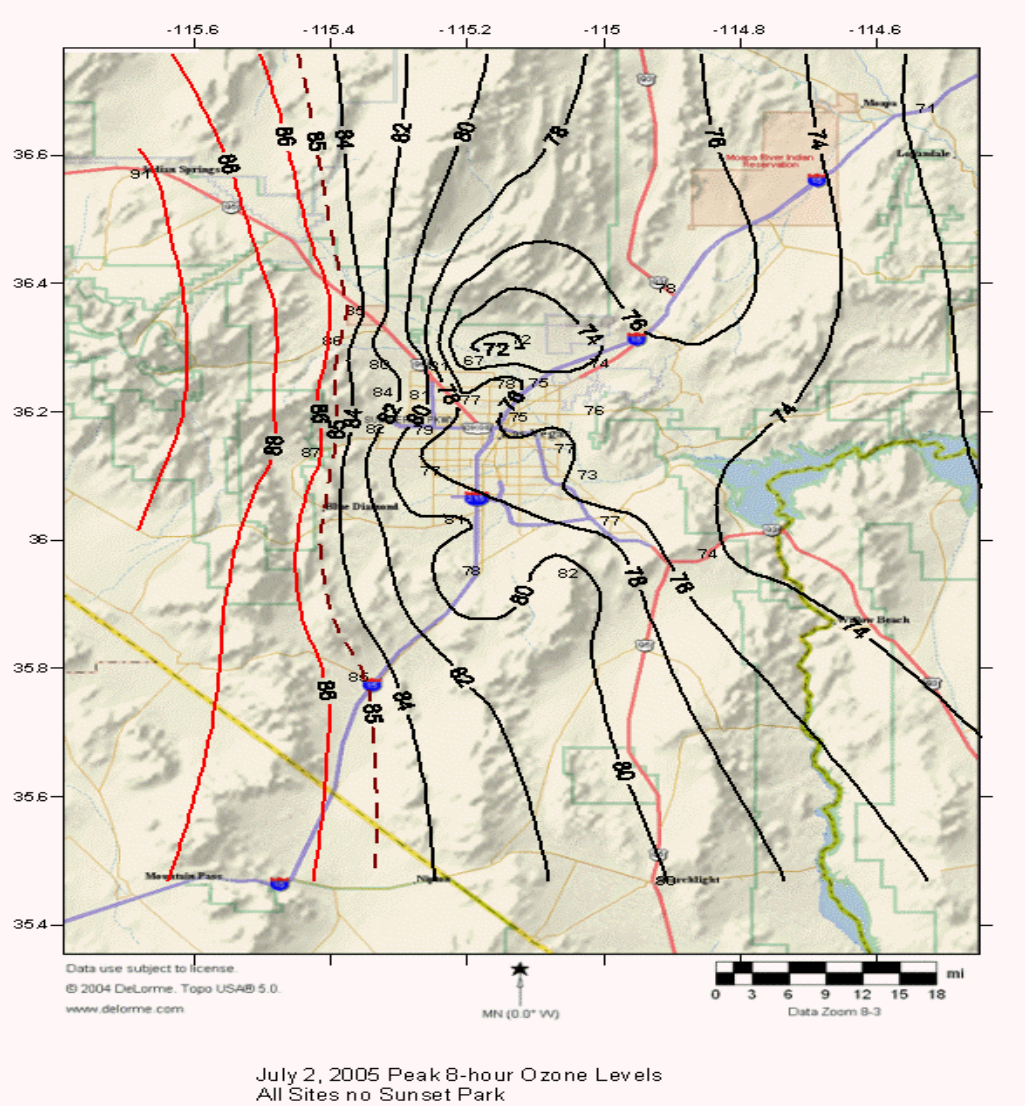


Figure 4.6-3. Maximum 8-Hour Ozone Concentrations on July 2, 2005.

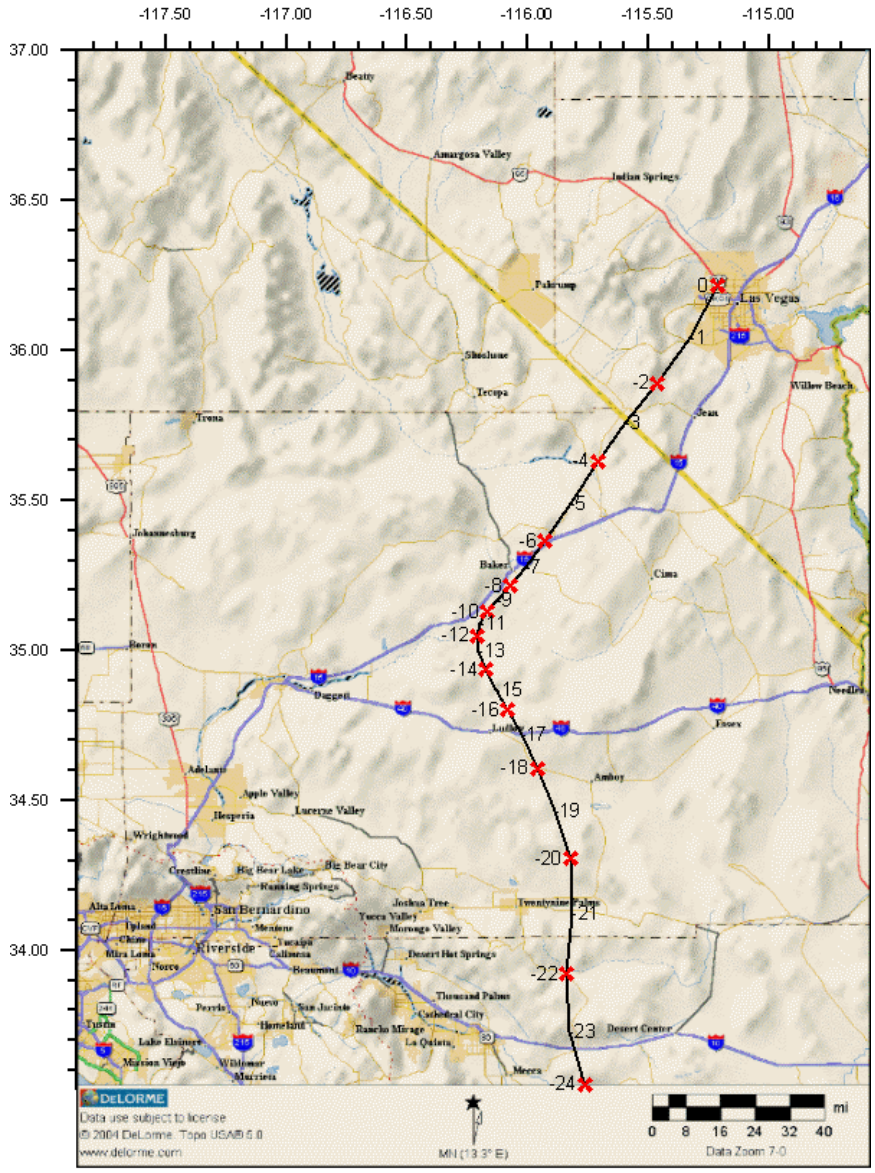


Figure 4.6-4. Back-Trajectory Analysis for July 2, 2005.

On July 18, 2005, air-mass trajectories indicated an extremely stagnant air mass that precluded interbasin transport as an important contributor to exceedances at all 13 sites in the Las Vegas Valley. However, the peak ozone level at Jean was only 0.067 ppm. Concentrations of biogenic compounds were lower at Jean than at the Joe Neal and J.D. Smith sites in the Las Vegas Valley. The entire period from July 12 through July 21 was characterized by a persistent, strong, long-wave, high-pressure ridge that remained centered over the interior west for more than ten days. Figure 4.6-5 shows the maximum 8-hour ozone contours for July 18th, which are characterized by a plume of higher concentrations pushed to the northwest by daytime up-valley winds. This is a classic local-contribution scenario.

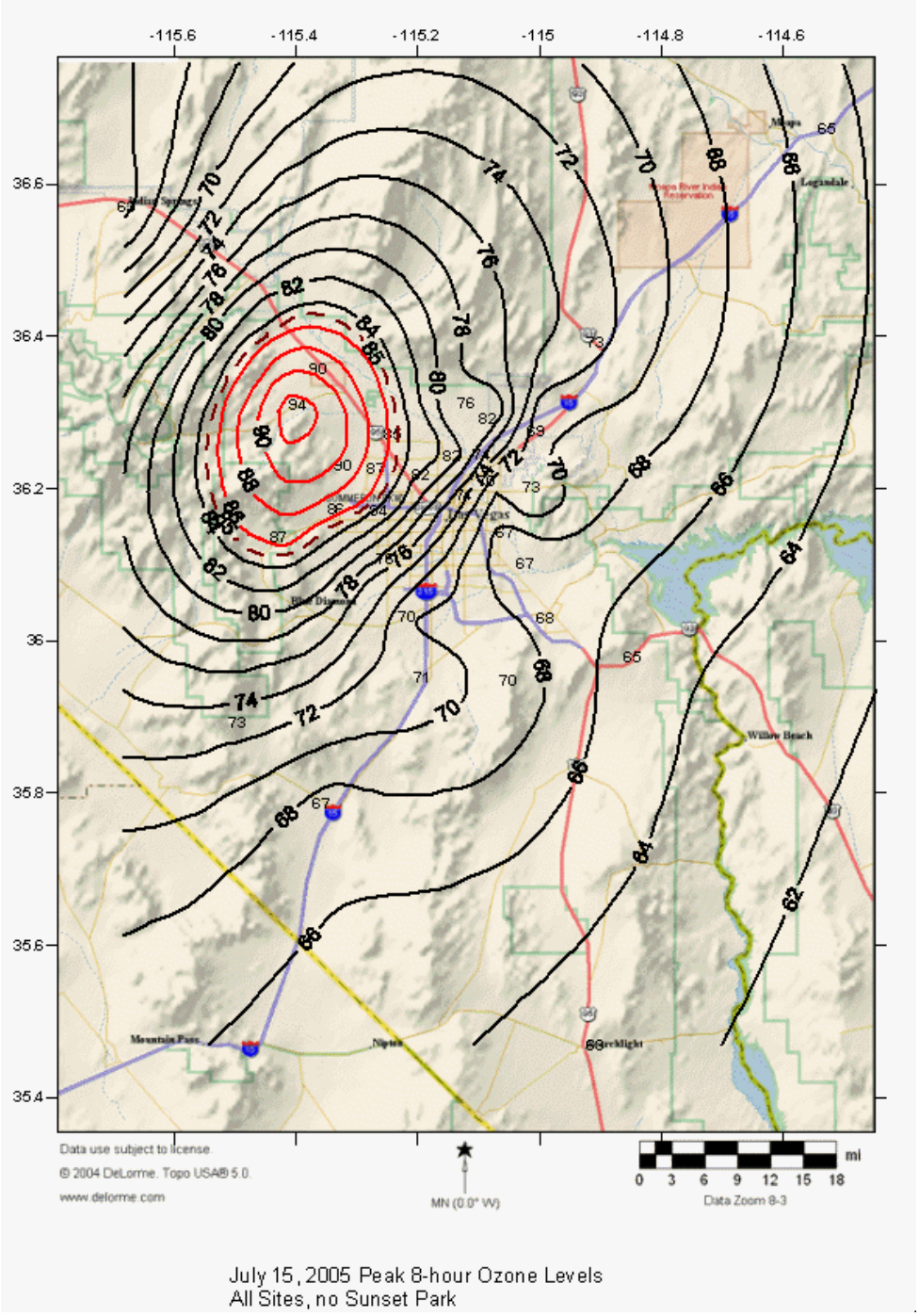


Figure 4.6-5. Maximum 8-Hour Ozone Levels for July 18, 2005.

4.6.2 Southwest Desert/Las Vegas Ozone Transport Study (2007)

Technical studies carried out during the 2007 ozone season also demonstrate that existing ozone nonattainment area boundaries are appropriate for the revised 2008 ozone NAAQS. During the 2007 summer season, Clark County, with technical assistance from Technical & Business Systems, Inc., conducted field research for the Southwest Desert/Las Vegas Ozone Transport Study (SLOTS) (DAQEM 2008). Field work included saturation sampling at the surface and aloft in Clark County and southern California.

On June 27, 2007, all ozone air quality monitoring sites in Clark County exceeded the 2008 ozone NAAQS, with the sole exception of Mesquite. The synoptic weather pattern during this period included a southwesterly to south-southwesterly flow pattern that was established over the region by June 26 and continued through June 28. This steering flow was the result of a persistent quasi-stationary trough that extended from the Pacific Northwest into northern California, in tandem with a flat ridge of higher pressure in the interior Southwest. Figure 4.6-6 illustrates 24-hour back trajectories for the period from June 16 through June 27. Flow trajectories indicate that air arriving in southern Nevada originated from urban areas in southern California. Although the mixing flow over this time frame was not consistently from southern California, there was enough volume of air flow from that area to enable transport of pollutants into Clark County.

In summary, meteorology associated with elevated ozone concentrations demonstrates that existing area boundary designations under the 1997 ozone NAAQS remain valid and appropriate for designations under the revised 2008 ozone NAAQS. Backward wind trajectories illustrate that the Las Vegas Valley is essentially downwind of southern California. It is important to note that the community of Mesquite, located in an attainment area northeast of Las Vegas at the border of Nevada and Arizona, remains in attainment with the 2008 ozone NAAQS based on the three-year period 2006 to 2008. The Las Vegas Valley, where over 95 percent of Clark County's population resides and where commerce and industry are centered, should remain designated nonattainment along with HAs on the east side of the valley, which would accommodate the Apex Industrial Park and areas that may be affected by the urban plume from southern California and the Las Vegas Valley. Existing nonattainment areas extending south of the Las Vegas Valley to the California border should remain non-attainment to accommodate pollutant transport pathways from southern California.

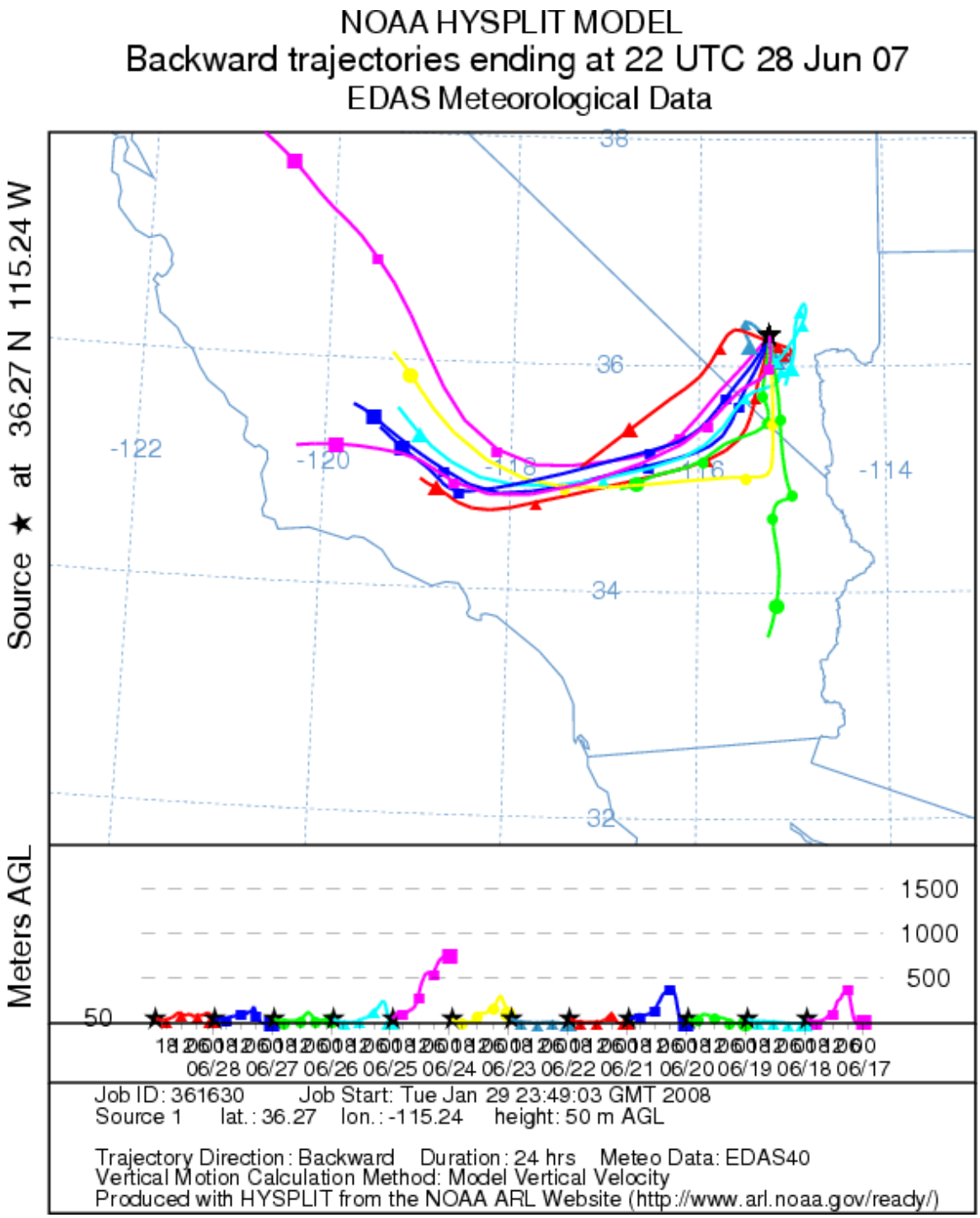


Figure 4.6-6. Daily 24-Hour Back-Trajectories—June 16 through June 27, 2007.

4.7 GEOGRAPHY AND TOPOGRAPHY

The geography in southern Nevada is characterized by basin and range topography. This was the basis for Nevada's decision to use HAs as the air quality management unit throughout the state. Mountain ranges separating 256 HAs provide channeling and barriers to air pollution transport. Figure 3-3 shows the topography surrounding the Las Vegas Valley. Mountain ranges separate Las Vegas Valley from the following adjacent HAs:

- Spring Mountain Range to the west.
- McCullough Range to the south.
- Desert, Sheep, and Las Vegas Ranges to the north.
- Frenchman and Sunrise Mountains to the east.

The Las Vegas Valley opens to the north-northwest in the direction of Indian Springs, to the northeast in the direction of Apex, and from the south in the direction of the Ivanpah Valley. These terrain features contain and channel local flows within, into, and out of neighboring HAs. The major roadways of I-15 and U.S. 95 follow the lowlands and continue through natural passes between the Las Vegas Valley and neighboring valleys. The I-15 corridor, especially the portion southwest of the Las Vegas Valley into California, can be a large source of NO_x and VOC, the precursors to O_3. It is most likely that channeled flows along this natural topographic corridor will result in exchanges in both directions between the Ivanpah and Las Vegas Valleys, and between the Las Vegas and Apex Valleys.

4.8 JURISDICTIONAL BOUNDARIES

Figure 4.5-1 depicts land ownership within Clark County and the surrounding areas. Most land is under the control of several U.S. government agencies: the Bureau of Land Management has the largest holdings, including the Red Rock National Conservation Area west of Las Vegas. Most of the Spring Mountain Range, including Mt. Charleston, is within the boundaries of the Toiyabe National Forest, administered by the U.S. Forest Service. The National Park Service administers the Lake Meade Recreational Area; the U.S. Fish and Wildlife Service administers the wildlife refuge in the Sheep Mountains; and the U.S. Department of Defense administers the Nellis and Creech Air Force Bases, along with some other facilities. Less than 10 percent of the county is privately owned land. Federal, state, and tribal lands create barriers to contiguous expansion of the urbanized core in the Las Vegas Valley.

On April 15, 2004, the EPA used the presumptive default nonattainment areas of metropolitan statistical areas (MSAs) created by the U.S. Census Bureau to designate the Las Vegas MSA, which covered Clark and Nye counties in Nevada and Mojave County in Arizona, in nonattainment of the 1997 ozone NAAQS. Following the April 2004 designation, the state of Nevada submitted additional information and a request to reconsider the boundaries of the nonattainment designation for Clark County. In cooperation with Nevada's Desert Research Institute, Clark County carried out an assessment of ozone air quality in Clark County through extensive data analysis and review of other relevant information. In a report to EPA, the state recommended more appropriate nonattainment boundaries based on an evaluation of numerous scientific crite-

ria. EPA accepted Nevada's recommendations for nonattainment area boundaries and issued a final rule in September 2004 delineating those boundaries, which include:

- Ivanpah Valley (HAs 164A, 164B, 165, and 166).
- Eldorado Valley (HA 167).
- Las Vegas Valley (HA 212).
- Colorado River Valley (HA 212).
- Paiute Valley (HA 214).
- Apex Valley (H As 216 and 217).
- A portion of Moapa Valley (HA 218).

The Clark County ozone nonattainment area coincides with the jurisdictional boundary of the air quality management authorities in Nevada and Clark County. Pursuant to Nevada Revised Statutes § 445B.500, the governor has delegated regulatory authority for air quality management to the Clark County Board of County Commissioners, to be administered by DAQEM. However, tribal lands are not within the jurisdiction of state or Clark County air quality management authority. Therefore, tribal jurisdictional boundaries do not impact the 8-hour ozone nonattainment boundary designations.

4.9 LEVEL OF CONTROL OF EMISSION SOURCES

Several emission reduction programs and activities implemented within Clark County, within the southern California/southern Nevada region, and at the national level should result in emissions reductions over the coming decade.

4.9.1 Local Control Measures

Clark County's current air regulations and proposed revisions to its New Source Review regulations are as strict as, or stricter than, federal requirements. As applicable, sources in Clark County are also subject to New Source Performance Standards, Maximum Achievable Control Technology requirements, and National Emission Standards for Hazardous Air Pollutants. Clark County also has Stage 1 and Stage 2 vapor recovery requirements for gasoline dispensing facilities. Emission sources within Clark County are required to comply with all existing rules and regulations through federally enforceable state implementation plan regulations.

Vehicles are subject to the requirements of the Inspection and Maintenance Program, which includes Onboard Diagnostic testing. Several federally enforceable control measures (specifically for gasoline and diesel vehicle engines) and fuel standards are in place in Clark County.

More modern technologies are being incorporated into the on-road fleet, with greater reductions and longevity associated with emission control devices. Onboard Refueling Vapor Recovery

(ORVR) is a vehicle emission control system that captures fuel vapors from the vehicle gas tank during refueling. In 2007, 64.1 percent of vehicles in the Clark County fleet were equipped with ORVR.

4.9.2 Federal Control Measures

The following federal control measures and programs are in place in Clark County.

4.9.2.1 National Low Emission Vehicles

Auto manufacturers will comply with tailpipe standards that are more stringent than EPA can mandate prior to model year 2004.

4.9.2.2 Tier II

Beginning in 2004, tailpipe standards were set at an average standard of 0.07 grams per mile of NO_x for all classes of passenger vehicles. Vehicles weighing less than 6,000 lbs. were phased in to this standard between 2004 and 2007. Beginning in 2004, refiners and importers had the flexibility to manufacture gasoline with a range of sulfur levels, as long as all their production was capped at 300 ppm. Starting in 2006, refiners met a 30-ppm average sulfur level, with a maximum cap of 80 ppm.

4.9.2.3 Heavy-Duty Engine Standard

A PM emissions standard of 0.01 grams per brake-horsepower-hour for new heavy-duty engines took full effect in the 2007 model year. In addition, refiners started producing diesel fuel with a sulfur content of no more than 15 ppm for use in highway vehicles on June 1, 2006.

4.9.2.4 Phase I & II Engine Standards

Phase I emission standards for non-road, handheld, and nonhandheld engines operating at or below 19 kW took effect in model year 1997. Phase II standards for non-road, nonhandheld Class I and II engines operating at or below 19 kW were phased in beginning in model year 2002, and were completed by 2007.

4.9.2.5 Standards for Diesel-Powered Engines

A three-tiered process, beginning in 1996 and continued through 2008, increased emissions standards for non-road diesel-powered engines used for a variety of purposes, including construction and agriculture.

4.9.2.6 Standards for Gasoline-Powered Marine Engines

Outboard engine standards began in 1998 and were phased in through 2006. Inboard standards were set in 2000. Auxiliary marine engines that operate at less than 25 hp were subject to emission standards beginning in 1997. A second phase of emission standards for these engines was

phased in between 2001 and 2005. Auxiliary engines that operate above 25 hp will have to meet the requirements for the same-sized land-based non-road spark-ignition engines.

4.9.2.7 Standards for Large Gasoline-Powered Engines

A two-tiered standard, with Tier 1 beginning in 2004 and Tier 2 in 2007, regulates non-road gasoline-powered engines rated over 19 kW.

4.9.2.8 Standards for Locomotive Engines

A three-tiered emission standard for new or remanufactured locomotive engines was implemented in 1973, 2002, and 2005.

4.9.3 Regional and National Control Measures

Other programs managed by jurisdictions outside of Clark County will contribute to reduced ozone nonattainment area in Clark County.

- Several local agencies in California—the South Coast Air Basin and San Joaquin Valley, among others—are implementing control strategies outlined in their SIPs, which most likely will result in some reduction in ozone levels transported into the Clark County ozone nonattainment area.

- The Regional Haze rule mandates emission reductions to achieve natural visibility levels in mandatory Class I areas by 2064. Most of these measures will address light scattering and absorbing aerosols, but there will be co-benefits as NO_x and VOC reductions are sought to reduce ammonium nitrate levels. Best Available Control Technology will be installed on older units to significantly reduce NO_x and VOC emissions.

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5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 CONCLUSIONS

The state of Nevada and Clark County recommend that EPA maintain the nonattainment boundary for the 8-hour ozone NAAQS of April 15, 2004, and extend it to the 2008 8-hour ozone designation of nonattainment. Nevada recommends that EPA designate a portion of Clark County as nonattainment for the 2008 8-hour ozone NAAQS consisting of the following areas: the Ivanpah Valley (HAs 164A, 164B, 165, and 166), Eldorado Valley (HA 167), Las Vegas Valley (HA 212), Colorado River Valley (HA 213), Paiute Valley (HA 214), Apex Valley (HAs 216 and 217), and a portion of Moapa Valley (HA 218). The rest of the HAs in Clark County are rural, sparsely populated, insignificant sources of ozone precursors, and geographically isolated from the Las Vegas Valley—which is both the source and receptor of O_3 and O_3 precursors. There is little transport of O_3 precursors to the remainder of Clark County, and other HAs are not affected by the O_3 produced in Clark County's urban core.

The only condition that has significantly changed with the 2008 revised 8-hour ozone NAAQS is the lowering of the nonattainment level from 0.080 ppm to 0.075 ppm. In its *Technical Support Document: The Las Vegas 8-Hour Ozone Nonattainment Area, September 8, 2004*, addressing the requirements for the 1997 8-hour ozone NAAQS, EPA found the following:

> **Factor 1: Emissions and air quality in adjacent areas (including adjacent C/MSAs)**
>
> The areas excluded from the state's recommended nonattainment area have few sources and are separated from Las Vegas by topography. Areas adjacent to the nonattainment area proposed by the state do not violate the 8-hour ozone NAAQS. The border of the nonattainment area is at least the following distances from the violating monitor at Joe Neal (all mileages are approximate): 20 miles from upwind areas to the northwest, 42 miles from upwind areas to the southwest, 85 miles from upwind areas to the south, 14 miles from upwind or downwind areas to the east, 42 miles from downwind areas to the northeast.
>
> The state's 11-factor shows that the nonattainment area shows that the stationary sources in the unclassifiable/attainment portions of Clark County account for less than 3 percent of the total NOx emissions inventory and less than 1 percent of the VOC in the County. Further, the excluded areas are in Nevada Hydrographic Area 215, which is separated from Las Vegas by the River Mountains, Black Hill and Sunrise Mountain which inhibits transport to or from this area[5].
>
> EPA believes that the state's recommended nonattainment area includes the sources of emissions that cause or contribute to ozone in Las Vegas as well as both downwind and upwind adjacent areas which are emitters and receptors. EPA also believes that the state's recommended nonattainment area includes all areas with monitored ozone violations.

Factor 2: Population density and degree of urbanization including commercial development (significant difference from surrounding areas)

The areas the state recommended excluded from the nonattainment area are rural and/or uninhabited. The 11-factor analysis submitted by the state of Nevada shows that the recommended nonattainment area contains the densely populated areas of Las Vegas. All the urbanized areas of Las Vegas are contained in the nonattainment area as well as 98% of Clark County's population. The population density of some of the urban portions of Las Vegas is greater than 1300 persons per square mile, is greater than 300 persons per square mile in the nonattainment area as a whole and in the area excluded area is less than 10 persons per square mile.

Thus, there is a significant difference in population density and degree of urbanization between the nonattainment and unclassifiable/attainment areas. EPA believes that the state's recommended nonattainment area appropriately includes the densely populated portions of the Las Vegas area as well as a large area subject to possible commercial growth owing to the expansion of population and commerce in Las Vegas. EPA also believes that the areas the state recommended be excluded are areas that are mostly uninhabited, with little commercial development, almost no stationary sources and are separated from Las Vegas by mountains, distance and desert and that this is appropriate.

Factor 3: Monitoring data representing ozone concentrations in local areas and larger areas (urban or regional scale)

The state-recommended nonattainment area includes all violating monitors in the Las Vegas MSA. The MSA has only one violating monitor, referred to as the Joe Neal site, which is located in northwest Las Vegas. Design values decrease rapidly to the east from the Joe Neal monitor and approximate background levels at Mesquite. The boundary of the nonattainment area contains all the monitors with design values of 80 ppb or more and contains many monitors with values in the 70-80 ppb range.

Factor 4: Location of emissions sources (emissions sources and nearby receptors should generally be included in the same nonattainment area)

The areas excluded from the state's recommended nonattainment area have few sources and are separated from Las Vegas by topography.

Areas adjacent to the nonattainment area proposed by the state do not violate the 8-hour ozone NAAQS. The border of the nonattainment area is at least the following distances from the violating monitor at Joe Neal (all mileages are approximate): 20 miles from upwind areas to the northwest, 42 miles from upwind areas to the southwest, 85 miles from upwind areas to the south, 14 miles from upwind or downwind areas to the east, 42 miles from downwind areas to the northeast.

The state's 11-factor shows that the nonattainment area shows that the stationary sources in the unclassifiable/attainment portions of Clark County account for less than 3 percent of the total NOx emissions inventory and less than 1 percent of the VOC in the County. Further, the excluded areas are in Nevada Hydrographic Area 215, which is separated from Las Vegas by mountains which inhibits transport to or from this area.

EPA believes that the state's recommended nonattainment area includes the sources of emissions that cause or contribute to ozone in Las Vegas as well as both downwind and upwind adjacent areas which are emitters and receptors. EPA also believes that the state's recommended nonattainment area includes all areas with monitored ozone violations.

Factor 5: Traffic and commuting patterns

The 11-factor analysis submitted by the state of Nevada shows that the recommended nonattainment area contains most roadways and traffic in the Las Vegas MSA. The areas the state recommended be excluded from the nonattainment area are mostly rural and have little traffic compared to the urban portions of Las Vegas with nearly all routes outside the recommended nonattainment area having less than 25,000 vehicles per day each, which is far below traffic levels experienced in the urban areas of Las Vegas.

Factor 6: Expected growth (including extent, pattern and rate of growth)

The recommended nonattainment area contains the areas of expected growth and development associated with and impacting Las Vegas Ozone. The 11-factor analysis submitted by the state of Nevada shows that Las Vegas is experiencing significant growth; however the recommended nonattainment area includes most of the population growth (which is centered in the Las Vegas Valley, Nevada Hydrographic Area 212) and the industrial growth, some of which has been in the non-tribal lands of the Apex Valley.

Factor 7: Meteorology (weather/transport patterns)

The area recommended by the state of Nevada includes nearly all upwind and downwind areas in the state or County's jurisdiction. The 11-factor analysis submitted by the state of Nevada uses wind trajectory models to show transport to and from Las Vegas. The backward wind trajectories submitted for the 8-hour ozone exceedance periods show that Las Vegas is essentially downwind of Southern California. The forward wind trajectories show that predominant downwind areas are to the northeast of Las Vegas. Mesquite, to the northeast of Las Vegas and at the border of Nevada and Arizona, has a 2-year average of fourth highest values of 71 ppb (based on 2002 to 2003 only), which the state recommendation indicates is the approximate regional background level. This monitoring data sug-

gests that transport does not extend far from Las Vegas. EPA data show that areas outside Las Vegas as well as areas outside the nonattainment area are not violating the 8-hour ozone standard. The design values are somewhat lower to the east than in Las Vegas (Craig Road, east of Las Vegas, has a design value of 76 ppb and Apex, northeast of Las Vegas, has a design value of 78 ppb) with a less precipitous decline to the southwest, where Jean has a design value of 81 ppb, Jean's design value is comparatively higher than values at a similar distance in other directions from Las Vegas. This higher value is attributed to transport from Southern California. The recommendation also states that during periods of high ozone in Las Vegas, the predominant pattern is from the southwest to the northeast. The recommended nonattainment area contains the upwind areas contributing to Las Vegas ozone concentrations (this area extends all the way to the California border in the southwest direction). The area also extends to the east to include areas that are downwind during ozone episodes, although these areas have not violated the standard and have somewhat lower design values than Las Vegas's urban areas. The recommended area to the south extends to the southern tip of the County, approximately 80 miles from Las Vegas and includes areas contributing to Las Vegas ozone when the wind is from the south.

The area recommended by the state of Nevada includes nearly all upwind and downwind areas in the state that could contribute to a monitored air quality standard violation, review of this factor indicates that the recommended area is appropriate.

Factor 8: Geography/topography (mountain ranges or other air basin boundaries)

The recommended nonattainment area includes not only the Las Vegas valley, but also contributing upwind, adjacent basins as well as downwind areas which may experience some local effects, although no adjacent areas experience violations. The 11-factor analysis submitted by the state of Nevada shows that the Las Vegas area is surrounded by mountains separating adjacent hydrographic basins. Although this limits transport to some extent, low lying portions of said mountains can act to channel NOx from one basin to another, however the area affected by this transport is included in the nonattainment area. The report states that the I-15 corridor to the southwest is one such area where transport is significant (this significant transportation corridor is the route between Los Angeles and Las Vegas) and much of this area is included in the nonattainment area.

The Las Vegas area's surrounding mountains are: Spring Mountain Range (to the west); Desert, Sheep and Las Vegas Ranges (to the north); Arrow Canyon and Muddy Mountain Ranges (to the east and northeast); Black Mountains, Eldorado Mountains, and McCullough Range (to the south).

Factor 9: Jurisdictional boundaries (e.g., counties, air districts, existing 1-hour nonattainment areas, Reservations, etc.)

Clark County is, "for all practical purposes...administered by DAQEM". The urban areas of Las Vegas and surrounding areas of potential growth are within the boundaries of the recommended nonattainment area and with the exception of Federal Land (BLM, USFS, NPS, DOD and others) are within the same jurisdiction.

Factor 10: Level of control of emission sources

There is presently some control of emissions from stationary and mobile sources in Clark County. The state recommended area includes nearly all emissions sources within the County and sources that may cause or contribute to ozone in Las Vegas. Thus, there are no areas with emissions being excluded from the Las Vegas nonattainment area that are causing or contributing to ozone in the Las Vegas area.

Factor 11: Regional emission reductions (e.g., NOx SIP call or other enforceable regional strategies)

Nevada's 11-factor analysis states that, "Several emissions reduction activities are being undertaken within Clark County, within the southern California/southern Nevada region, and at the national level that will result in emissions reductions over the coming decade." EPA concludes that there are currently some local emission reductions planned in the future within Clark County but no reliance on such reductions was given in determining the appropriate nonattainment boundary.

Therefore, based on the previous finding of EPA, the current findings of this document and lack of changed conditions, the state of Nevada and Clark County recommend the following 8-Hour Ozone NAAQS Nonattainment Boundary for Clark County, Nevada.

5.2 RECOMMENDED 8-HOUR OZONE NAAQS NONATTAINMENT BOUNDARY

The recommended nonattainment area is smaller than the boundary of Clark County. However, this boundary meets the definition in CAA § 107(d)(1)(A)(i) and addresses the criteria identified in EPA's December 2008 guidance.

Considering the examination of all nine factors in Section 4, the nonattainment area specified in Figure 5-1 is recommended. This consists of the following HAs:

- 164A, 164B, 165, and 166 – Ivanpah Valley.
- 167 – Eldorado Valley.

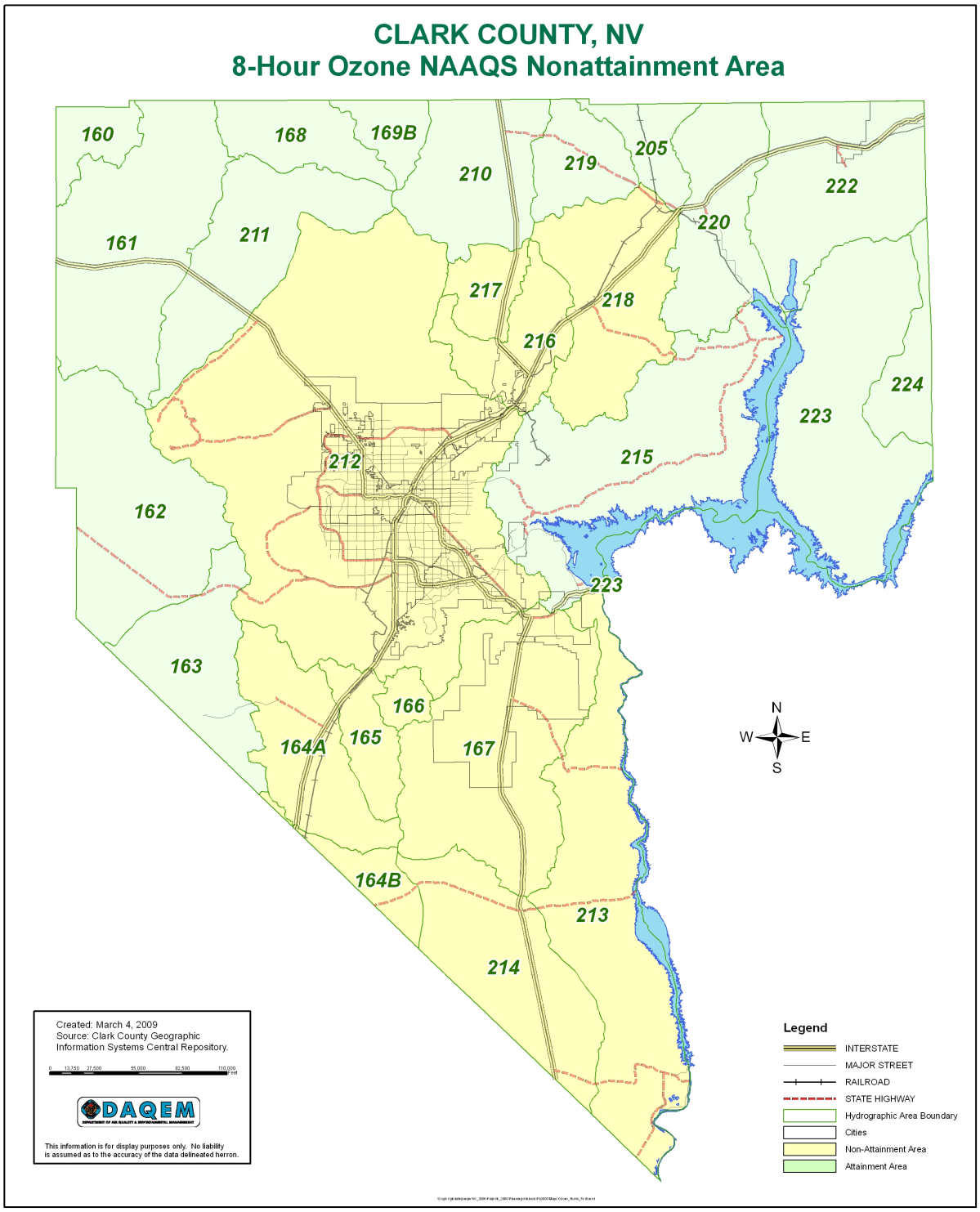

Figure 5-1. Recommended 8-Hour Ozone NAAQS Nonattainment Area.

- 212 – Las Vegas Valley.
- 213 – Colorado River Valley.
- 214 – Paiute Valley.
- 216 and 217 – Apex Valley.
- 218 – Moapa Valley.

The Ivanpah Valley should be included in the nonattainment area due to mobile source emissions along the I-15 corridor and emissions from major point sources. In addition, prevailing wind direction and high O_3 readings at Jean are evidence of transport from southern California.

The Eldorado Valley should be included in the nonattainment area due to emissions from the Eldorado Energy power plant and transport from the Mohave power plant, when operating.

The Las Vegas Valley must be included because it contains most of the emissions, the highest O_3 concentrations, evidence of local O_3 generation, and the major population exposure. This area will be the major focus of emission reduction activities.

The Colorado River Valley should be included in the nonattainment area due to emissions from the Mohave power plant, when operating.

The Paiute Valley should be included in the nonattainment area due to transport from the Mohave power plant, when operating.

The Apex Valley should be included in the nonattainment area due to emissions from point sources and mobile source emissions along the I-15 corridor. There is transport from the Las Vegas Valley to Apex Valley and from the Reid-Gardner power station to Apex Valley. Furthermore, the Apex Valley had exceedances of the 8-hour ozone NAAQS in 2006, 2007, and 2008. Because of its close proximity to the Las Vegas Valley, emissions from major point sources and mobile source emissions along the I-15 corridor may impact the Las Vegas Valley with wind shifts.

HA 218, in the Moapa Valley, should be included in the nonattainment area due to emissions from the Reid-Gardner power plant and mobile source emissions along the I-15 corridor. Because of its close proximity to the Las Vegas Valley, and because there are no geographic barriers adjoining the Apex Valley, transport emissions from major point sources and mobile source emissions along the I-15 corridor may impact a southwest portion of HA 218.

The remaining HAs in Clark County should not be included in the nonattainment area for the following reasons:

- They are sparsely populated, with less than 2 percent of the total county population.
- There is no evidence these areas will impact the recommended nonattainment area.
- They contain insignificant point and mobile source emissions.
- Geographic and topographic features separate these areas from the recommended nonattainment area.
- Owing to regional O_3 levels measured at Mesquite, northeastern basins beyond those designated are excluded from the nonattainment area.

The recommended area excludes the Las Vegas Paiute Tribal Community and the Moapa Band of the Paiute tribal lands.

6.0 REFERENCES

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73 FR 16436. National Ambient Air Quality Standards for Ozone; Final Rule.

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