2001 Voluntary Ozone Reduction Program Summary

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REGIONAL AIR QUALITY COUNCIL

We would like to thank the following organizations for their efforts this summer to reduce ozone pollution. Without these partners, the RAQC's Voluntary Ozone Reduction Program would not have been possible.

Ball Corporation

Clean Cities

Colorado Department of Public Health and Environment

Colorado Petroleum Association

Colorado Wyoming Petroleum Marketers Association

Conoco

Denver Regional Council of Governments

Envirotest Systems Corporation

Frontier Oil

Hunter Douglas

Metropolitan Area Independent Emissions Testing Stations

Metropolitan Area Local Governments

NAPA Auto Parts and the NAPA Auto Care Council Members

Phillips Petroleum

Roche Colorado

Sinclair Oil

Texaco

Ultramar Diamond Shamrock

7-11, Inc.

2001 Voluntary Ozone Reduction Program

The Regional Air Quality Council (RAQC) has concluded the third year of its voluntary ozone reduction program. The 2001 program, launched with numerous stakeholders from the Denver metropolitan area, worked with local governments, businesses, transportation organizations and citizens to educate the Denver metropolitan area about ozone pollution and how to reduce it.

Ground-level ozone pollution is a summertime pollutant that occurs when volatile organic compounds (VOCs) and nitrogen oxides (NOx) react in the presence of sunlight.

Ozone pollution can cause breathing problems and respiratory infections in the elderly, young and those with pre-existing ailments. Even healthy people who exercise or work outdoors can experience breathing problems when exposed to elevated levels of ozone.

Ozone levels were unusually high in 1998 making the 1999, 2000 and 2001 summers critical for reducing ozone pollution.

It is imperative that the Denver metropolitan area maintain efforts to reduce ozone pollution not only to improve air quality and public health but also to keep levels low and reduce the amount of control measures that may have to be introduced to maintain federal standards.

The 2001 voluntary ozone reduction program aimed to reach as many people as possible to increase awareness about ground level ozone pollution. The program consisted of the following:

- ❏ Continuation of the ozone alert system, similar to the winter alert system, designed to warn people in advance of potential high ozone days and to encourage changes in ozone - contributing behaviors;
- ❏ Securing voluntary reductions in the Reid Vapor Pressure (volatility) of gasoline through a partnership with the petroleum refining industry;
- ❏ Reducing gasoline vapor emissions by working with the local petroleum marketers to distribute stickers for gasoline pumps that encourage individuals to “Stop at the Click”;
- ❏ Conoco’s Car Care for Cleaner Air Clinic;
- ❏ Targeted public service announcements on area radio stations;
- ❏ A series of media and special events designed to highlight ozone pollution and strategies for reducing it;
- ❏ An information campaign using interior and exterior RTD bus advertising;
- ❏ Continuation and expansion of the ”Put a Cap on Ozone” gas cap replacement program; and,
- ❏ Changes in operations by local governments to help reduce ozone-causing VOCs.

This 2001 program was made possible through support from a Congestion Mitigation Air Quality (CMAQ) grant from the federal government, administered by the Denver Regional Council of Governments (DRCOG).

Additional support came from Envirotest Systems Corporation, NAPA Auto Parts, Roche Colorado, Hunter Douglas, Ball Corporation, Clean Cities/National Renewable Energy Lab, the Colorado Department of Public Health and Environment, Conoco, Texaco, Ultramar Diamond Shamrock, 7-11 and local governments throughout the metropolitan area.

8-Hour and 1-Hour Ozone Standard Update

8-Hour Ozone Standard

In a landmark decision issued on February 27, 2001, the U.S. Supreme Court unanimously upheld EPA's authority and process for establishing new health-based air quality standards for ozone and $PM_{2.5}$.

The decision was in response to a 1999 U.S. Court of Appeals decision that overturned these standards in response to a lawsuit filed by the American Trucking Association et al.

The Supreme Court ruled that the Clean Air Act does not give the EPA lawmaking power in its standard-setting function, as the court of Appeals had determined. Instead, the Supreme Court determined EPA exercised its authority properly under the Clean Air Act in establishing the standards.

In another part of the ruling, the high court agreed with the Court of Appeals that the Clean Air Act does not allow EPA to consider costs when establishing air standards to protect the public health.

The ruling upholds EPA's long standing position that the Clean Air Act requires it to set standards based solely on public health considerations. Plaintiffs had argued that EPA should consider costs of implementing the standards when determining the appropriate level of the standards.

The new ozone standard limits the allowable level of ozone to 0.08 parts per million averaged over eight hours. The previous ozone standard limited the pollutant to 0.12 parts per million over one hour.

When the EPA initially set the 8-hour ozone standard in 1997, it revoked the one-hour standard. However, while the legality of the standards was tied up in court, the 8-hour standard was put on hold and the one-hour standard was reinstated.

Although the EPA won a significant victory on how it sets air quality standards with the U.S. Supreme Court ruling, legal challenges remain. The high court invalidated the EPA's implementation plan for the 8-hour ozone standard and sent the case back to the Court of Appeals for further action. The EPA now must revise its plan to implement the new standard, consistent with provisions of the Clean Air Act.

In addition, legal challenges to the appropriate levels of the standards still exist before the Court of Appeals as part of the original lawsuit. Industry and state opponents of the standards have renewed their arguments seeking to overturn the standards on the grounds that EPA did not consider whether its standards were more stringent than necessary to protect public health.

While the issues continue in court, actual implementation of the new standards remain on hold. Although it is clear that the tougher ozone standard likely will become part of the air quality landscape, it still may be a matter of years before the implementation issues are finally resolved and the Denver metropolitan area knows where it stands relative to the new standard.

In the meantime, it is important to continue our efforts to keep ozone levels in check so the region stays below the new standard and does not get into a nonattainment situation.

1-Hour Ozone Standard

EPA approved the Denver Region's 1-Hour Ozone Redesignation Request and Maintenance Plan in the Federal Register on September 11, 2001 and the attainment redesignation became effective on October 11.

The maintenance plan details strategies to keep the region in attainment of National Ambient Air Quality Standards (NAAQS) for ozone and also requests that the EPA redesignate the metropolitan Denver area to attainment status for ozone. The region has gone 13 years without any violations of the one-hour ozone standard.

The federal 1-hour ozone standard is 120 ppb and a violation occurs when the 3 year average of exceedances is greater than 1 per year.

2001 Ozone Monitoring Data

Ozone levels during 2001 demonstrated compliance with the federal 8-hour ozone standard and were consistent with historical levels monitored during most of the 1990's.

The basis for the federal 8-hour ozone standard is the 4th maximum concentration at each monitor. In 2001, no monitors recorded a 4th maximum above the federal monitored limit of 85 ppb, while two monitors at NREL and Rocky Flats had 4th maximum readings of 81 and 82 ppb, respectively. All other monitors had 4th maximum concentrations of less than 80 ppb.

Compliance with the 8-hour standard is judged using the three-year rolling average of the 4th maximum concentrations at each monitor. For the three-year period 1999-2001, no monitors in the Denver region recorded three-year averages greater than the federal limit of 85 ppb. Two monitors – NREL and Rocky Flats – have three-year averages of 81 ppb, below the federal standard. All other monitors recorded values well below 80 ppb.

While the Denver region maintained compliance with the 8-hour standard, there were still several days during the summer when 8-hour ozone levels were above 80 ppb. Most elevated ozone levels were recorded during a nine day stretch in early July and a two-day period in early August.

Two days, July 5 and August 4, had ozone readings above 85 parts per billion (ppb) at one or more monitors around the region. On both days, elevated ozone levels were

widespread throughout the region, with four monitors recording values above 80 ppb on July 5 and five monitors recording such levels on August 4.

Readings above 80 ppb were also recorded during five additional days during the summer season.

No monitors recorded values approaching EPA's existing 1-hour standard. The highest 1-hour reading was 115 recorded at NREL on July 1st, which is well below the federal limit of 125 ppb.

Ozone monitoring data for the 2001 and previous seasons are contained in tables in Appendix A.

Ozone Advisory Program

Description

The Technical Services staff of the Air Pollution Control Division (APCD) developed a system to forecast imminent meteorological conditions that support the development of ozone concentrations above 75 ppb.

APCD staff meteorologists used national and local weather data and an array of national predictive models to make the advisory calls, effective at 4:00 p.m. each day for the following 24-hour period.

Using the APCD's advisory calls, the RAQC faxed and e-mailed ozone action alerts to the media, local governments, businesses and citizens when the conditions were right for high ozone days.

The RAQC faxed ozone action alerts to 42 local government representatives, 27 media outlets and e-mailed alerts to 218 people representing business, government and private citizens. This year, the RAQC and the CDPHE had the ozone alerts translated into Spanish and faxed them to two Spanish television stations.

The ozone alerts allowed local governments to make changes in operational behavior to reduce volatile organic compounds. It was also an opportunity for them to inform their citizens of the high ozone day through signs, web site updates and cable television updates.

The alerts provided the media with information to broadcast the high ozone potential and to encourage changes in ozone-causing behaviors.

Results

Thirteen alerts were called during the 2001 ozone season including one in June, eight in July and four in August (see Table 1 in Appendix A for details). Last season, 26 alerts were issued.

Alert forecasts improved this year as CDPHE meteorologists refined their forecasting tools and weather models provided additional information.

Conoco's Car Care Clinic for Cleaner Air

Description

The RAQC and its partners kicked off the 2001 Voluntary Ozone Reduction Campaign on June 9 with Conoco's Car Care for Cleaner Air Clinic at the Pepsi Center.

This clinic gave motorists an opportunity to learn about ways to improve their vehicle's performance, reduce emissions and improve air quality. Proper car maintenance increases gas mileage and helps maintain the metropolitan area's gains in air quality.

Highlights of the clinic included the following:

- Free visual inspection by a certified NAPA technician
- Free gas cap testing
- Information distributed on ozone pollution and ways citizens can reduce it

At the June 9th car care clinic, motorists drove past the Smart Sign, which takes an instantaneous reading of the vehicle's emissions. The sign displayed whether the vehicle was in "Good," "Fair" or "Poor" running condition.

After the reading, motorists drove over to the inspection area where a NAPA certified technician performed a free, visual inspection of each vehicle including, but not limited to:

- measuring tire pressure
- checking the air filter
- inspecting fan belts and hoses
- examining engine fluid levels

NAPA technicians tested for faulty gas caps. If a cap tested faulty, it was replaced for free. If the correct gas cap was not available, the motorist was given a coupon for $5.00 off the purchase of a new cap at their nearest NAPA Auto Parts store.

Finally, after each car was inspected, clinic organizers handed each motorist information about the Denver metropolitan area's air quality issues and answered motorists' questions about how car maintenance and air quality are connected.

Results

Unfortunately, the date of the clinic unexpectedly coincided with Game 7 of the Stanley Cup Finals, which made access to the Pepsi Center clinic site very difficult.

NAPA Auto Care technicians inspected 30 vehicles and later reported that they received many phone calls and e-mails from people who said they tried to get to the clinic but were deterred by the hockey traffic.

Despite these troubles, NAPA technicians expressed an interest in future car care clinics at more accessible sites, such as suburban malls.

"Put a Cap on Ozone" Gas Cap Replacement Program

Description

From June 1 through September 15, 2001, the RAQC, in conjunction with the Colorado Department of Public Health and Environment (CDPHE), Envirotest Systems Corporation, independent emissions testing stations and NAPA Auto Parts, continued the "Put a Cap on Ozone" gas cap replacement program that was so successful in 2000.

In 2001, the RAQC expanded the program to test gas caps of employees at major employer sites.

Put a cap on ozone!

Evaporative gasoline emissions can account for up to 6 percent of volatile organic compound (VOC) emissions on any given day in the Denver metropolitan area. This amounts to nearly three tons of air pollution per day. In the summertime, a faulty gas cap can allow one gallon of gas to evaporate every 15 days. Pollutants in evaporative emissions are a key ingredient in ground-level ozone formation.

The $100,000 program was made possible by support from a Congestion Mitigation and Air Quality (CMAQ) Grant, Envirotest Systems Corporation, Roche Colorado, Hunter Douglas, Ball Corporation and Clean Cities. NAPA Auto Parts provided all the gas caps at cost.

"Put a Cap on Ozone" gave free gas caps to any motorist whose vehicle failed its emission test because of a faulty or missing gas cap. All Air Care Colorado testing stations and independent testing stations participated.

Testing stations issued a voucher for a $5 credit toward the purchase of a new gas cap at any NAPA store in the metropolitan area to drivers whose vehicles required unusual or specialized gas caps not readily available at the testing facility.

The "Put a Cap on Ozone" program educated thousands of motorists about the health and regulatory benefits of properly-working gas caps as an ozone pollution control strategy.

Results

At the end of the ozone season, the "Put a Cap on Ozone" program had replaced approximately 12,000 gas caps and distributed over 2,000 gas cap vouchers, with over 700 redeemed. This is estimated to reduce VOC emissions by 762 pounds per day.

The RAQC successfully tested gas caps at 5 employer sites, including:

- **Roche Colorado** (April 17), tested 50 gas caps and replaced 5.
- **Hunter Douglas** (April 26), tested 43 gas caps and replaced 4.
- **Ball Corporation** (June 15), tested 95 gas caps and replaced 15.
- **Colorado Department of Public Health and Environment Cherry Creek Campus** (August 15), tested 181 gas caps and replaced 32.
- **Clean Cities/National Renewable Energy Laboratory** (August 22), tested 108 gas caps and replaced 26.

The RAQC plans to conduct additional gas cap fairs at employer sites next spring.

Voluntary Reductions in the Reid Vapor Pressure

Description

For the third consecutive summer, local gasoline suppliers voluntarily reduced the Reid Vapor Pressure (RVP) of the gasoline sold in this region. The RVP measures volatility in gasoline, meaning the higher the volatility, the more VOCs are released when it is used or evaporated.

The voluntary reduction goal lowered the RVP from 9.0 pounds per square inch (psi) to 8.5 psi for non-ethanol fuels and from 10.0 psi to 9.5 psi for ethanol for the summer season. The refiners agreed to make the reduction from Memorial Day through September 15.

Refiners who participated in the program included: Conoco, Frontier Oil, Sinclair, Ultramar Diamond Shamrock and Phillips Petroleum. These five refiners supply nearly all the gasoline in the Denver market.

Results

The APCD staff randomly sampled fuel supplies at metro area gas stations during the 2001 season. For non-ethanol fuel, the RVP was reduced from 9.0 to 8.1 psi. For ethanol-blended fuels, the RVP was reduced from 10.0 to 9.3 psi.

About 30 percent of gasoline sold in the summer of 2001 was blended with ethanol. Therefore, the weighted average reduction in RVP was 0.8 psi, exceeding the 0.5 goal.

Outreach to Petroleum Marketers

Description

One source of the hydrocarbons that contribute to ozone pollution production is spilled and evaporated fuel. Overfilling fuel tanks, small fuel spills, drips, and excess evaporation also disables emissions equipment.

The RAQC worked closely with the Colorado Wyoming Petroleum Marketers Association (CWPMA) and the Colorado Petroleum Association to provide stickers to gas retailers that educate the public about the need to "Stop at the Click." Stopping at the click reduces spills and evaporation.

Results

The CWPMA helped distribute more than 840 additional gasoline pump stickers to gasoline vendors throughout the metro region. Many independent and corporate retailers have participated during the three years of the voluntary program, including Royal Crest Dairy, BP Amoco, Texaco, Sinclair, Ultramar Diamond Shamrock, Xcel Energy, 7-11 Corporation, Silco Oil and numerous independent retailers.

Local governments throughout the region also placed the stickers on their own pumps for fueling government-owned vehicles.

In addition to their involvement with the "Stop at the Click" stickers, several petroleum marketers also participated in a public service announcement campaign on area radio stations that urged folks to stop at the click. The "Targeted Radio Promotions" section of this report provides more details on this campaign.

Targeted Radio Promotions

Description

RAQC staff put together proposals to companies to sponsor public education messages for radio. 7- 11, Inc., Ultramar Diamond Shamrock and Texaco purchased radio promotion spots with different messages on how to reduce ozone pollution in the summertime.

Radio public service announcements were developed to target the public at key moments - at the top of the hour with their favorite radio host. By reaching people with a short, direct message, the RAQC was able to educate citizens about air quality.

Results

The following radio promotion spots ran on 4 different weeks on KOA.

"This hour of KOA is brought to you by 7-11 and the Regional Air Quality Council who urge you to stop at the click, because spillage from overfilling your gas tank contributes to ozone pollution."

"This hour of KOA is brought to you by Ultramar Diamond Shamrock and the Regional Air Quality Council who urge you to maintain your car, because an unmaintained vehicle can pollute up to 25 times more than a well- maintained one."

"This hour of KOA is brought to you by Texaco and the Regional Air Quality Council who urge you to maintain your car, because an unmaintained vehicle can pollute up to 25 times more than a well- maintained one."

Media

Description

As part of its effort to educate the general public about ozone reduction tools and strategies, the RAQC participated in, or initiated, a variety of media events to let the public know more about ozone's health effects and ways to reduce ozone pollution.

The RAQC hosted a media briefing on June 6 for reporters interested in learning more about Conoco's June 9th Car Care for Cleaner Air Clinic.

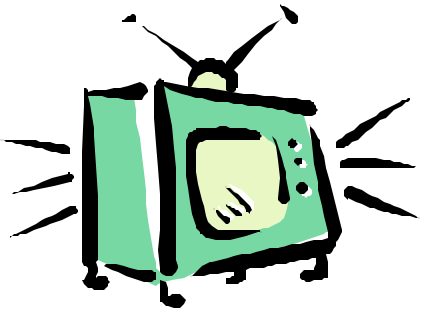
The RAQC also issued a press release on May 31 announcing the start of ozone season. Throughout the summer, the media highlighted ozone alerts in response to RAQC-issued press releases that forecast high ozone days.

Results

The media broadcast numerous television stories and ozone alert announcements during the 2001 ozone season. WB2, News 4, 7 News and 9 News all aired stories.

Clear Channel Radio and Metro Network Radio stations also conducted radio coverage and interviews.

Last year, the Greater Metro Telecommunications Consortium (GMTC), which broadcasts *Metro Voices*, a quarterly program on issues of concern for residents in the metropolitan area, produced and aired *Metro Voices: The Air We Breathe*. The program provided ozone information through cable access television.



Many in the GMTC membership re-aired the program during the 2001 ozone season. Commerce City developed and aired a new program on ozone pollution.

Public Outreach

Description

The public outreach effort of the voluntary ozone reduction program expanded on the accomplishments of the previous years. RAQC staff made presentations, staffed booths at special events and festivals, and disseminated information about ozone

pollution. The RAQC mailed and distributed ozone alert signs to hundreds of contacts.

The RAQC web site, *www.raqc.org*, contained information about ozone pollution with much of it downloadable. RAQC staff was responsible for faxing and e-mailing ozone action alerts to local governments, local English and Spanish language television stations, businesses and citizens.

The RAQC also teamed up with RTD to reach more people about ozone pollution and air quality through bus advertising.

Results

RAQC staff presented information about ozone pollution to several organizations, including the Golf Course Superintendents Association and the Air Quality Control Commission, among others. The RAQC distributed more than 9,800 brochures and 2,000 flyers to businesses and organizations and at special events.

Ozone articles placed in local government and other newsletters reached thousands of households, including those in Aurora, Denver, Englewood, Golden, Greenwood Village, Lakewood, Longmont, and Westminster.

The RAQC placed interior ads on 100 RTD buses urging riders to reduce ozone pollution. The RAQC also developed an exterior ad, which RTD printed for 25 buses, that urges people to improve air quality. This partnership with RTD was a great way to get the message out about ways to improve air quality.

Local Government Operational Changes

Description

Metropolitan area local governments have been a significant partner in the ozone reduction effort. Many local governments coordinated with Public Works, Parks and Recreation and Public Information departments to change operations and to get the word out about ozone pollution and ways to reduce it.

Results

After three years of working with metro-area local governments on ozone awareness and ozone reduction activities, most have started to integrate ozone reduction activities into summertime operations.

Many local government employees now:

- stop at the click when refueling vehicles,
- limit the use of gas-powered lawn equipment, and
- avoid idling.

Metro area local governments also e-mailed employees on ozone alert days, displayed ozone alert signs, published newsletter articles and pursued other avenues to tell citizens about ozone pollution.

Summary

The 2001 Voluntary Ozone Reduction Program complemented and expanded on the efforts of the previous two years.

The RAQC conducted outreach not only with local governments but also with businesses, transportation management organizations and other concerned groups. This enabled the RAQC to reach a broader audience with the ozone pollution reduction message.

The RAQC also cultivated relationships with the media to ensure accurate and pertinent coverage. This helped deliver a consistent message to audiences across the metropolitan area.

While air quality data through the 2001 season demonstrates compliance with EPA's new 8-hour ozone standard, it is apparent that the Denver region will need to continue to pay attention to summertime ozone in order to prevent future nonattainment.

Future Plans

Because the metropolitan Denver region's ozone levels remain just below the 8-hour standard, the RAQC will continue its Voluntary Ozone Reduction Program in the summer 2002.

In particular, the 2002 program will:

- ❏ Continue the ozone alert system;
- ❏ Secure voluntary reductions in the Reid Vapor Pressure of gasoline;
- ❏ Reduce gasoline vapor emissions through continuation of the "Stop at the Click" campaign;
- ❏ Replace gas caps through "Put a Cap on Ozone" employer fairs;
- ❏ Develop targeted public service announcements to educate citizens about ways they can minimize ozone pollution ; and
- ❏ Highlight the impact of lawn equipment on ozone through a series of "Mow Down Pollution" lawnmower exchanges conducted in partnership with The Home Depot and local governments.

The success of previous Voluntary Ozone Reduction Programs has been dependent upon partnerships with local governments, state and regional agencies, and businesses in the metro Denver region. The RAQC looks forward to continuing and expanding these partnerships in 2002.

For additional information about the 2001 Voluntary Ozone Reduction Program, contact the RAQC, 303-629-5450 or www.raqc.org.

Appendix A

Map of the Denver Metropolitan Ozone
Attainment/Maintenance Area and Monitoring Sites

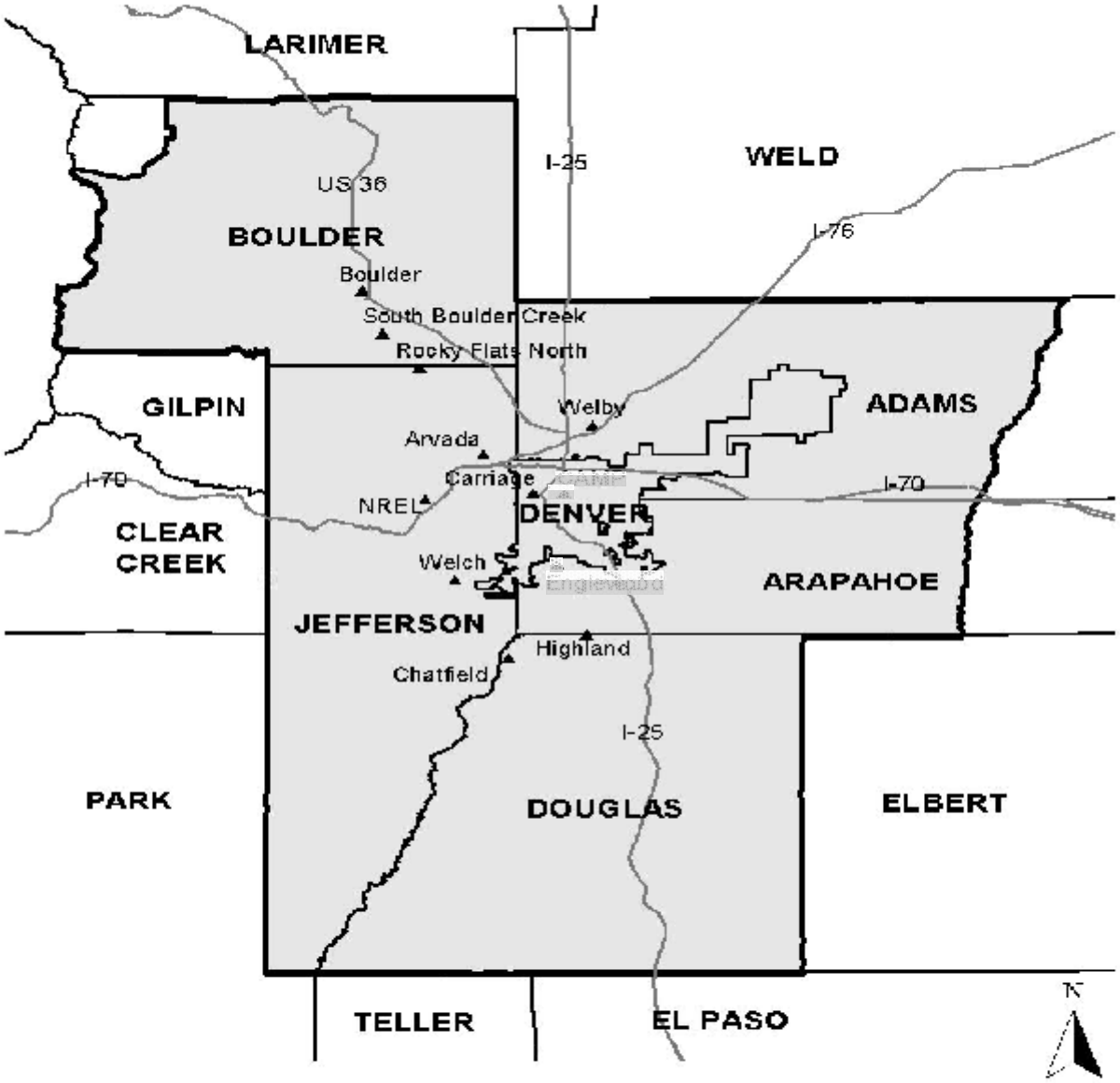


Table 1
2001 Ozone Alerts

Alert Day*	**Maximum 8-hour Reading** (ppb)	**Monitor (Date of Reading)**	**Maximum 1-hour Reading** (ppb)	**Monitor (Date of Reading)**
June 17th/18th	74	Chatfield (*June 18th*)	82	Chatfield (*June 18th*)
July 1st/2nd	81	NREL (*July 1st*)	115	NREL (*July 1st*)
July 3rd/4th	81	Rocky Flats (*July 4th*)	104	Arvada (*July 4th*)
July 4th/5th	89	Chatfield (*July 5th*)	114	Chatfield (*July 5th*)
July 5th/6th	78	NREL (*July 6th*)	101	NREL (*July 6th*)
July 6th/7th	83	NREL (*July 7th*)	102	NREL (*July 7th*)
July 7th/8th	83	NREL (*July 7th*)	80	Highlands Reservoir (*July 7th*)
July 10th/11th	79	NREL (*July 10th*)	98	NREL (*July 10th*)
July 21st/22nd	70	Arvada (*July 22nd*)	86	Arvada (*July 22nd*)
August 4th/5th	90	NREL (*Aug. 4th*)	103	NREL (*Aug. 4th*)
August 5th/6th	73	NREL (*Aug. 5th*)	98	Carriage (*Aug.6th*)
August 7th/8th	76	Highlands Reservoir/Chatfield (*Aug. 8th*)	88	Carriage (*Aug. 8th*)
August 12th/13th	79	NREL (*Aug. 12th*)	104	Carriage (*Aug.12th*)

**Alerts begin at 4:00 p.m. of the first day and continue until 4:00 pm on the second day.*

Table 2

2001 4 Highest Ozone Values (ppb)
Annual 4th Maximum 8-Hour Ozone Values (ppb)
3 Year Average and 2002 Allowable
All CDPHE Sites

Monitor	2001			2001	2000	1999	1999-2001	2002
	1st Max	2nd Max	3rd Max	4th Max	4th Max	4th Max	Ave.	Allow.*
NREL	4-Aug	7-July	1-July	5-July				
	90	**83**	**81**	**81**	83	80	81	91
Rocky Flats	5-July	9-July	16-June	3-Aug				
	87	**84**	**83**	**82**	81	80	81	92
Chatfield	5-July	4-Aug	6-July	9-July				
	89	**83**	77	77	80	75	77	98
Highland Reservoir	4-Aug	5-July	3-Aug	12-Aug				
	82	80	77	77	76	75	76	102
Arvada	4-Aug	5-July	4-July	7-July				
	83	78	77	74	76	72	74	105
So. Boulder Creek	3-Aug	18-Jun	7-July	4-Aug				
	76	**73**	71	71	71	75	72	113
Carriage	4-Aug	7-July	4-July	5-July				
	78	73	72	72	71	68	70	112
Welch	4-Aug	12-Aug	18-May	7-Aug				
	80	68	65	64	68	66	66	123
Welby	4-July	9-July	22-July	4-Aug				
	66	65	65	64	62	71	66	129

NOTE: 2001 ozone season ends September 15th; data has not been fully quality assured at this time.
** 4th maximum allowable in 2002 to still maintain the standard.*

Table 3

2001 4 Highest 1-Hour Ozone Values (ppb)

All CDPHE Sites

Site	*1st Max*	*2nd Max*	*3rd Max*	*4th Max*
NREL	*1-July*	*5-July*	*4-Aug*	*7-July*
	115	*103*	*103*	*102*
Arvada	*1-July*	*4-July*	*5-July*	*6-Aug*
	106	104	99	97
Rocky Flats	*5-July*	*4-July*	*16-June*	*1-July*
	112	99	97	97
Chatfield	*5-July*	*12-Aug*	*4-July*	*4-*Aug
	114	104	98	96
Highland Reservoir	*5-July*	*9-July*	*1-Aug*	*12-Aug*
	107	*92*	*92*	*92*
Carriage	*6-Aug*	*4-July*	*1-July*	*4-Aug*
	98	*96*	*94*	*91*
So. Boulder Creek	*5-July*	*16-June*	*7-July*	*3-Aug*
	93	*88*	*85*	*85*
Welch	*4-Aug*	*12-Aug*	*1-July*	*9-July*
	91	89	86	83
Welby	*4-July*	*9-July*	*8-Aug*	1-July
	85	83	80	78

Table 4
Historical 8-hour Ozone Levels

Monitor	1993* 3rd Max	1994* 3rd Max	1995 4th Max	1996 4th Max	1997 4th Max	1998 4th Max	1999 4th Max	2000 4th Max	2001 4th Max
NREL *20th & Quaker, Golden*	*84*	*84*	*79*	*82*	*75*	*95*	*80*	*83*	*81*
Rocky Flats North *16600 W. Highway 128*	*88*	*81*	*80*	*83*	*75*	*92*	*80*	*81*	*81*
Chatfield *11500 N.Roxborough*	*-*	*-*	*74*	*79*	*75*	*81*	*75*	*80*	*77*
Highlands Reservoir *8100 S.University Blvd.*	*74*	*76*	*68*	*73*	*65*	*84*	*75*	*76*	*77*
Arvada *9101 W. 57th*	*69*	*72*	*71*	*73*	*70*	*89*	*72*	*76*	*74*
Carriage *23rd & Julian St.*	*66*	*64*	*68*	*68*	*66*	*85*	*68*	*71*	*72*
S. Boulder Creek *1405 ½ S. Foothills*	*85*	*75*	*74*	*75*	*72*	*89*	*75*	*71*	*71*
Welch *12400 W. Hwy. 285*	*72*	*70*	*70*	*69*	*68*	*80*	*66*	*68*	*63*
Welby *3174 E. 78th Ave.*	*68*	*69*	*71*	*74*	*71*	*83*	*71*	*62*	*63*

**Data for 1993/94 have been analyzed previously for the 3rd maximum.*