

2002 Voluntary Ozone Reduction Program Summary



**Regional Air Quality Council
1445 Market Street, Suite 260
Denver, Colorado 80202
303-629-5450
www.raqc.org**

November 2002



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

Air Quality Control Commission

American Century Investments

Boulder County Health Department

CH2MHILL

City of Aurora

City and County of Denver, Employee Transportation Coordinator Network

Colorado Department of Public Health and Environment

Colorado Petroleum Association

Colorado Wyoming Petroleum Marketers Association

ConocoPhillips

DeWalt Industrial Tool Co. / Black & Decker

Denver Metro Chamber of Commerce

Denver Regional Council of Governments

Envirotest Systems Corporation

Frontier Oil

The Home Depot

Hunter Douglas

Metropolitan Area Local Governments

NAPA Auto Parts and the NAPA Auto Care Council Members

Penske

Sinclair Oil Corporation

South East Business Partnership

Standard & Poors

Texaco

Ultramar Diamond Shamrock Corporation

U.S. 36 Transportation Mobility Organization

Valero Energy Corporation

Westmoor Technology Park

Wild Oats Natural Marketplace

2002 Voluntary Ozone Reduction Program

The Regional Air Quality Council (RAQC) has concluded the fourth year of its Voluntary Ozone Reduction Program. The 2002 program, launched with numerous stakeholders from the Denver metropolitan area, worked with local governments, businesses, transportation organizations, and citizens to educate people in 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 (NO_x) 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 ozone levels.

Ozone levels were unusually high in 1998 making the 1999, 2000, 2001, and 2002 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 2002 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”;
- ❑ “Mow Down Pollution” lawnmower exchange where citizens traded in old, gasoline-powered equipment for discounts on zero-emission models;
- ❑ Partnered with the Boulder County Health Department and NAPA Auto Parts to test gas caps at an October Car Care Clinic;
- ❑ Targeted public service announcements in five metro-area movie theaters;
- ❑ A series of media and special events designed to highlight ozone pollution and strategies for reducing it;
- ❑ 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 2002 program was made possible through support from a federal Congestion Mitigation and Air Quality (CMAQ) grant

administered by the Denver Regional Council of Governments (DRCOG).

Additional support came from Envirotech Systems Corporation, NAPA Auto Parts, the Colorado Department of Public Health and Environment, Valero Energy Corporation, and local governments throughout the metropolitan area.

8-Hour and 1-Hour Ozone Standards

8-Hour Ozone Standard

In a landmark decision issued on February 27, 2001, the U.S. Supreme Court unanimously upheld the Environmental Protection Agency's (EPA) authority and process for establishing new health-based air quality standards for ozone and fine particulate matter (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 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.

Despite the Supreme Court's ruling, legal challenges to the 8-hour standard still remained. However, in March 2002 the D.C. Circuit Court dismissed all remaining legal challenges and ruled EPA could move forward with implementing the standard. EPA is in the process of finalizing an implementation plan that will be proposed early next year.

In an associated action, in November 2002 EPA entered into a settlement agreement with national environmental organizations regarding the time line for making nonattainment designations for the 8-hour standard. EPA committed to promulgate nonattainment designations by April 15, 2004. Governors must recommend designations by April 15, 2003.

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

When the EPA initially set the 8-hour ozone standard in 1997, it revoked the 1-hour standard. However, while the legality of the standards was tied up in court, the 8-hour standard was put on hold and the 1-hour standard was reinstated.

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, 2001.

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 1-hour ozone standard.

The federal 1-hour ozone standard is 0.12 parts per million (ppm) and a violation occurs when the 3-year average of exceedances is greater than one per year.



2002 Ozone Monitoring Data

Ozone levels during 2002 demonstrated compliance with the federal 8-hour ozone standard, however, some monitors around the region recorded values high enough to lower the allowable levels for next year. Consequently, the levels recorded at the NREL and Rocky Flats monitors during the 2003 ozone season will be crucial to ensuring the region's attainment status.

The basis for the federal 8-hour ozone standard is the 4th maximum concentration at each monitor. In 2002, the Rocky Flats monitor recorded a 4th maximum value of 88 ppb, which is above the federal monitored limit of 85

ppb. In addition, monitors at NREL and Chatfield had 4th maximum readings of 81 and 83 ppb, respectively. All other monitors had 4th maximum concentrations 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 2000-2002, no monitors in the Denver region recorded three-year averages greater than the federal limit of 85 ppb. However, three monitors – Chatfield, NREL, and Rocky Flats – have three-year averages of 80, 82, and 84 ppb. All other monitors recorded averages below 80 ppb.

While the Denver region maintained compliance with the 8-hour standard, there were still three days in July when 8-hour ozone levels were above 90 ppb and several other days that 8-hour levels were above 80 ppb. Most of the elevated ozone levels were recorded in late June and throughout July.

Three days, July 1, 19, and 20, recorded ozone readings above 90 ppb at one or more monitors around the region. In addition, four days, June 8, 9, 29, and 30, recorded ozone readings above 85 ppb at one or more monitors around the region.

Readings above 80 ppb at one or more monitors 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 ppb recorded at the Carriage monitor on June 25, closely followed by a reading of 114 ppb at the Rocky Flats monitor on the same day. Both are well below the federal limit of 125 ppb (0.0125 ppm). Ozone monitoring data for the 2002 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, which take effect daily at 4:00 p.m. The advisories remain in effect 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 five local government representatives, 37 media outlets, and e-mailed alerts to 264 people representing business, government, private citizens, and media. The RAQC and the CDPHE continued to fax Spanish ozone alerts to two Spanish television stations.

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

The alerts provided the media with information to broadcast the potential of

high ozone and to encourage changes in ozone-causing behaviors.

Results

Twenty alerts were called during the 2002 ozone season including nine in June and 11 in July (see Table 1 in Appendix A for details). Last season, 13 alerts were issued.

The accuracy of the ozone alert system was hard to monitor this season due to the unusual fire situation. There were several days, mostly in June, that the metro area was blanketed in smoke from several fires burning close to the metro area. APCD meteorologists do not know for sure the effect smoke has on ozone levels. APCD meteorologists think that through a complex chemical process, fresh smoke could actually scavenge ozone, therefore, reducing levels at monitors around the region. The APCD will continue to research relationship between smoke and ozone pollution.



"Mow Down Pollution" Lawnmower Exchange Event

Description

The RAQC, The Home Depot, and Black & Decker kicked off the 2002 Voluntary Ozone Reduction Program on May 4 and 5, 2002 with the "Mow Down Pollution" lawnmower exchange event.



The lawnmower exchange offered citizens discounts on the purchase of selected Black & Decker zero-emission lawnmowers and weed trimmers when they retired gasoline-powered lawn equipment.

The event took place at six Denver metro area Home Depot stores in Arvada, Aurora, Denver, Golden, Parker, and Thornton. RAQC staff enlisted the help of local government representatives to staff the events, which ran from 9 a.m. to 4 p.m. each day.



Citizens disposed of their lawn equipment at each Home Depot store where they were collected by event staff and stored in Waste Management bins until the Monday following the event. ET Technologies safely drained the oil and gas from the lawn equipment before Waste Management collected the mowers and trimmers and recycled the scrap metal.

Gasoline-powered lawn equipment – such as lawnmowers, weed trimmers, and leaf blowers – cause approximately 10 percent of the summertime ozone pollution in the metro Denver area. Gas-powered lawn equipment emits VOCs, which combine with NO_x in the presence of sunlight to form ground-level ozone. Not only did the “Mow Down Pollution” lawnmower exchange reduce summer ozone pollution, but it educated hundreds of citizens about the contribution of lawn equipment to summertime ozone.

Results

The public education campaign that accompanied the “Mow Down Pollution” event consisted in the placement of radio spots on 850 KOA during the morning drive time one week prior to the event. Also, radio spots aired on 630 KHOW

during morning and afternoon drive times one week prior to the event.



The RAQC distributed press releases announcing the event to media, local governments, local newspapers, and radio and television stations. This resulted in the placement of several stories in the Denver Post, Rocky Mountain News, and local papers in Arvada, Aurora, Denver, Golden, Lakewood, Parker, and Thornton.

The RAQC and its partners permanently prevented 2,240 pounds of VOCs from entering the Denver region’s air by selling 700 zero-emission mowers and trimmers at the two-day event. Two hundred of these sales involved lawnmower exchanges, where citizens retired their old, gas-powered equipment when they purchased the zero-emission models.



The “Mow Down Pollution” lawnmower exchange event was highly successful and both The Home Depot and Black & Decker expressed an interest in conducting another lawnmower exchange next summer, should additional funding be available.

“Put a Cap on Ozone” Gas Cap Replacement Program

Description

From early spring through fall of 2002, the RAQC, in conjunction with the Colorado Department of Public Health and

Environment (CDPHE), Envirotest Systems Corporation, and NAPA Auto Parts, continued the “Put a Cap on Ozone” gas cap replacement program by conducting employer gas cap fairs around the region.

RAQC expanded the program to test gas caps of employees at major employer sites around the region in 2001 by hosting five employer gas cap fairs. This year the RAQC stepped up its efforts by conducting seven employer gas cap fairs and hosting two public gas cap fairs.

Put a cap on ozone!

Evaporative gasoline emissions can account for up to six percent of VOC emissions on any given day in the Denver metro 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, three-year program was made possible by support from a Congestion Mitigation and Air Quality

(CMAQ) Grant and Envirotest Systems Corporation. NAPA Auto Parts provided all the gas caps at cost.

“Put a Cap on Ozone” gave free gas caps to any motorist whose vehicle either failed the test or had a missing gas cap.

The RAQC issued a voucher for a \$5 credit toward the purchase of a new gas cap at any NAPA Auto Parts store in the

metropolitan area to drivers whose vehicles required unusual or specialized gas caps.

In addition, 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” tested a total of 469 gas caps at employer and public gas cap fairs. Of the 469 tested, 61 gas caps were replaced and 48 gas cap vouchers were awarded. This is estimated to reduce VOC emissions by 762 pounds per day.

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

- ✓ **American Century Investments**
tested 60 gas caps and replaced 4
- ✓ **CH2MHILL**
tested 52 gas caps and replaced 7
- ✓ **City of Aurora**
tested 82 gas caps and replaced 11
- ✓ **Denver Metro Chamber of Commerce**
tested 9 gas caps and replaced 3
- ✓ **Denver Regional Council of Governments**
tested 42 gas caps and replaced 5
- ✓ **Standard & Poors**
tested 88 gas caps and replaced 12
- ✓ **Westmoor Technology Park**
tested 44 gas caps and replaced 4

In addition, the RAQC successfully tested gas caps at two public gas cap fairs, including:

✓ **Boulder's Car Care Clinic**
tested 72 gas caps and replaced 13

✓ **Wild Oats Natural Marketplace**
tested 20 gas caps and replaced 2

The RAQC plans to conduct additional gas cap fairs at employer sites beginning next spring and continuing throughout the fall.

Voluntary Reductions in the Reid Vapor Pressure

Description

For the fourth 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-blended fuels for the summer season. The refiners agreed to make the reduction from June 1 through September 15.

Refiners who participated in the program included ConocoPhillips, Frontier Oil, Sinclair Oil Corporation, and Valero Energy Corporation. These 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 2002 season. For non-ethanol fuel, the RVP was reduced from 9.0 to 8.2 psi. For ethanol-blended fuels, the RVP was reduced from 10.0 to 9.4 psi.

About 20 percent of gasoline sold in the summer of 2002 was blended with ethanol. Therefore, the weighted average was 8.4 psi, exceeding the 0.5 reduction goal. This resulted in an estimated seven tons per day reduction in VOC emissions, based on EPA's MOBILE6 emissions model.

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 (CPA) 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 RAQC distributed 1,889 gasoline pump stickers to gasoline vendors throughout the metro region. Many independent and corporate retailers have participated during the four 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.

Targeted Movie Theater Promotions

Description

In the past years, radio has been the media of choice to air ozone public service announcements. This year, the RAQC took a different approach to run slides in movie theatres throughout the region. The slide, which is shown below, listed three things people can do to help reduce vehicle-related emissions, which form ground-level ozone pollution.



These movie theatre public service announcements were developed to target the summer movie-going public at the five largest theatres in the Denver area. The slides ran 20 minutes before each movie and were shown between

three and four times before the movie began. By reaching people with a short, direct message that they saw up to four times, the RAQC was able to educate thousands of citizens about air quality.

Results

The movie slides were shown at the following movie theatres during the summer:

✓ **AMC Westminster Promenade**
24 screens, June 21 – August 2

✓ **AMC Highlands Ranch**
18 screens, June 21 – August 2

✓ **AMC Flatiron Crossing**
14 screens, June 21 – August 2

✓ **United Artists Denver Pavilions**
15 screens, June 21 – July 25

✓ **United Artists Denver West**
12 screens, June 21 – July 25

It is estimated that approximately 550,000 people attended movies in the 56 AMC theatres during the weeks that the public service announcement ran. In addition, approximately 204,000 people attended movies in the 27 United Artists theatres during the weeks that the public service announcement ran. Therefore, approximately 754,000 people attended movies in the above theatres during the five – seven week period.

This ozone promotion was made possible by contributions from Valero Energy Corporation and a federal Congestion Mitigation and Air Quality (CMAQ) grant.

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 May 2 for reporters interested in learning more about the May 4 and 5 "Mow Down Pollution" lawnmower exchange. Local elected officials from Arvada, Aurora, Denver, Golden, Parker, and Thornton were invited to participate in a lawnmower race to showcase the zero-emission mowers and trimmers and to show support for ozone reduction programs.



After the event, the RAQC issued a press release announcing the success of the event, which included the pounds of VOCs that were reduced.

The RAQC also issued a press release on May 28 announcing the start of ozone season. Throughout the summer, the media highlighted ozone alerts in response to advisories issued by the CDPHE and released by the RAQC.

Results

Media broadcast numerous television stories and ozone alert announcements during the 2002 ozone season. Several stations – including WB2 News, News 4,

7 News and 9 News – all aired ozone-related stories.



In addition, Clear Channel Radio, Jefferson Pilot, and Metro Network Radio stations also conducted radio coverage and interviews.

Also, ozone-related stories were printed in *The Denver Post*, *The Denver Rocky Mountain News*, *The Daily Camera*, the Denver Metro Chamber of Commerce's *Business Matters*, and other local community newspapers.

This year, the RAQC added a virtual press room to its web site – www.raqc.org – where media can easily access press releases, fact sheets, contact information, and information about the RAQC.

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.

Results

RAQC staff presented information about ozone pollution to several organizations, including the Colorado Air Quality Control Commission, the U.S. 36 Transportation Mobility Organization, the South East Business Partnership, and the Denver Employee Transportation Coordinator Network.

The RAQC redesigned and rewrote “The Air We Breathe in Denver and Throughout Colorado” brochure. The brochure, along with an ozone fact sheet, was distributed to more than 4,000 businesses, citizens, and organizations, and special events.

This year, the RAQC created two bookmarks with tips to reduce ozone pollution. The first bookmark focuses on reducing ozone pollution that stems from car-related activities. The second bookmark focuses on reducing ozone pollution from lawn-related activities. Over 6,500 bookmarks were distributed to all metro-area libraries and at special events.



Also this year, the RAQC distributed over 1,000 small, key chain tire gauges with the message “Do Your Share for Cleaner Air.” When a vehicle’s tires are not properly inflated, the vehicle does not run as efficiently, and therefore, emits more pollution.

Ozone articles placed in local government and other newsletters, on web sites and cable access television stations, and in utility bill inserts reached thousands of households, including

those in Aurora, Arvada, Denver, Golden, Lakewood, Parker, and Thornton.

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, Fleet Maintenance, Environmental Services, Facility Maintenance, and Public Information departments to make changes in operational procedures and to get the word out about ozone pollution and ways to reduce it.

Results

After four 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 currently:

- ✓ stop at the click when refueling both city and private vehicles;
- ✓ limit the use of gas-powered lawn equipment; and
- ✓ avoid vehicle idling.

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

Summary

The 2002 Voluntary Ozone Reduction Program complemented and expanded on the efforts of the previous three years.

The RAQC conducted outreach not only with local governments but also with businesses, transportation management organizations, employee transportation networks, citizens, 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 media to ensure accurate and pertinent coverage. This helped deliver a consistent message to audiences across the metropolitan area.

Future Plans

While air quality data through the 2002 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.

The RAQC will continue its past efforts and increase future efforts as part of the 2003 Voluntary Ozone Reduction Program.

In particular, the 2003 program will:

- Continue the ozone alert system;

- Continue voluntary reductions in the Reid Vapor Pressure of gasoline;
- Host a Car Care Clinic for Cleaner Air with NAPA;
- Host a Regional Public Information breakfast to educate regional communicators on what ozone is, ways to reduce it, and how to communicate ozone issues to the public;
- Launch a public information web site where regional communicators can download ready-to-insert articles for newsletters, web sites, and cable television stations;
- Reduce gasoline vapor emissions through continuation of the "Stop at the Click" campaign;
- Replace gas caps through "Put a Cap on Ozone" employer and public fairs;
- Develop targeted public service announcements to educate citizens about ways they can minimize ozone pollution;
- Launch a "Citizens Choose Clean Air" campaign (3CA) to emphasize that there are many choices people can make to reduce ozone pollution;
- Form a partnership with the Colorado Department of Transportation to announce high ozone days on a public advisory radio station and the COTRIP web site;
- Implement a High-Emitting/Smoking Vehicles Identification and Repair Pilot Program;
- Use the Smart Sign at I-25 and Speer Boulevard to identify hydrocarbon emissions;

- Work with retailers and paint suppliers to voluntarily restrict the availability of solvent-based paints in June and July and encourage the use of low-VOC, water-based paint products;
- Promote a gas can changeout program that will replace portable gas containers with lower-polluting cans and nozzles;
- Increase media advertising to reach more citizens with information about ozone pollution and potential actions;
- Conduct additional promotional events to target specific sources and increase public education;
- Conduct an Ozone Reduction Program awareness survey to gauge the success of education efforts;
- Work with the oil and gas industry to voluntarily reduce emissions from oil and gas development; and
- Develop an ozone research plan.

The success of the Voluntary Ozone Reduction Program over the past few years 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 2003.

For additional information about the 2002 Voluntary Ozone Reduction Campaign, contact RAQC staff at 303-629-5450 or staff@raqc.org.

Appendix A

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

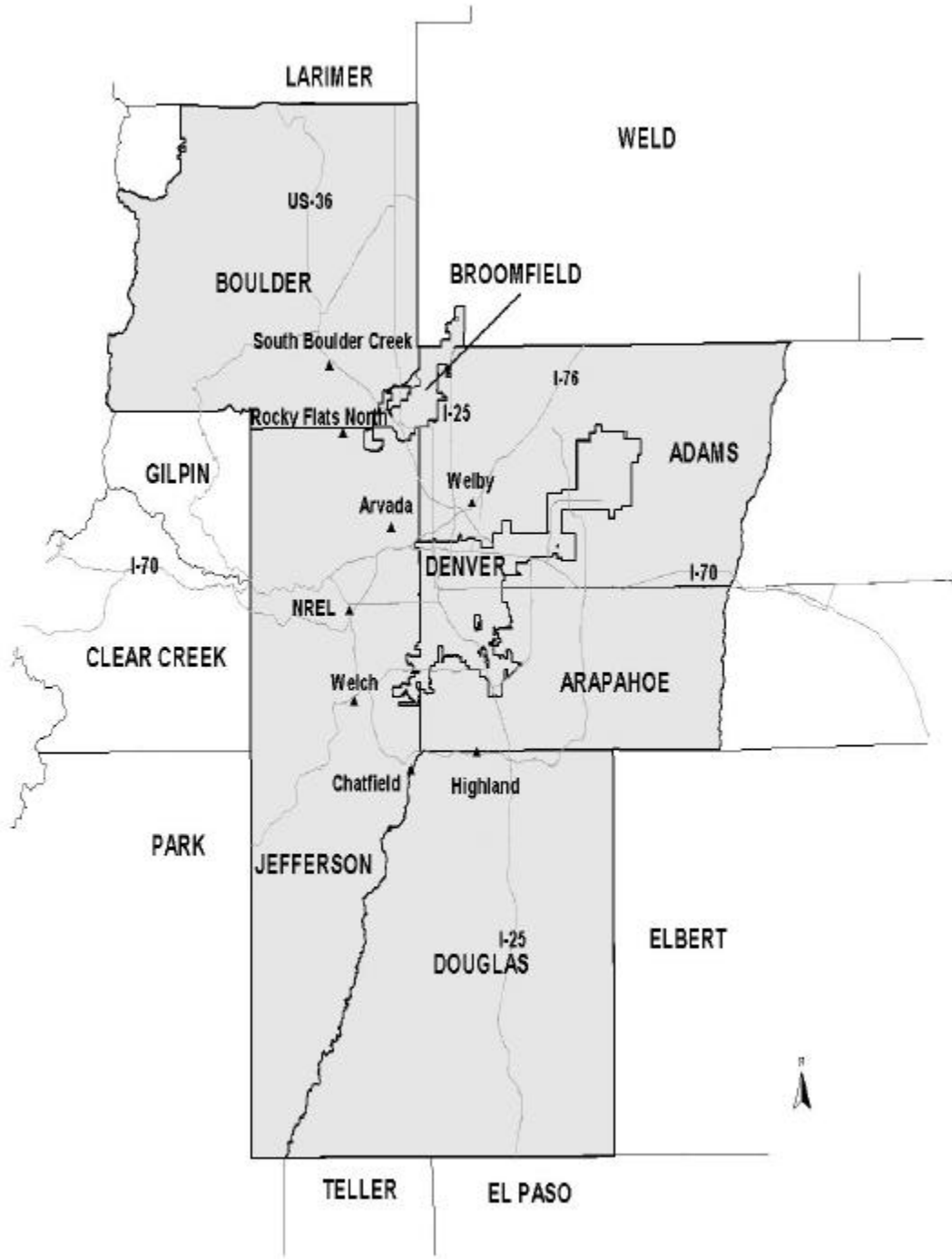


Table 1
2002 Ozone Alerts

Alert Day*	Maximum 8-hour Reading (ppb)	Monitor (Date of Reading)	Maximum 1-hour Reading (ppb)	Monitor (Date of Reading)
June 9/10	88	Rocky Flats (9-June)	86	NREL (9-June)
June 17/18	75	Highland (17-June)	91	NREL (17-June)
June 18/19	71	NREL (18-June)	74	NREL/S. Bldr (18-June)
June 24/25	80	Rocky Flats (25-June)	115	Carriage (25-June)
June 25/26	80	Rocky Flats (25-June)	93	NREL (26-June)
June 26/27	79	Chatfield (26-June)	87	S. Boulder (27-June)
June 27/28	81	Chatfield (28-June)	98	Chatfield (28-June)
June 28/29	83	Chatfield (28-June)	96	RFlats/NREL (29-Jun)
June 29/30	89	Rocky Flats (29-June)	104	Rocky Flats (29-June)
June 30/July 1	88	Rocky Flats (30-June)	101	Chat/NREL (1-July)
July 1/2	94	Chatfield (1-July)	109	NREL (1-July)
July 7/8	81	Rocky Flats (7-July)	96	NREL (8-July)
July 8/9	78	Rocky Flats (8-July)	98	Chatfield (9-July)
July 9/10	81	Chatfield (9-July)	88	NREL (10-July)
July 10/11	70	NREL (10-July)	85	Chatfield (11-July)
July 12/13	70	NREL (12-July)	74	Chatfield (12-July)
July 14/15	72	Rocky Flats (15-July)	87	Rocky Flats (15-July)
July 15/16	76	Rocky Flats (15-July)	90	Rocky Flats (16-July)
July 19/20	92	Rocky Flats (19-July)	109	NREL (19-July)
July 20/21	92	NREL (20-July)	93	NREL (21-July)

**The alerts are issued at 4:00 p.m. on the first day and remain in effect until 4:00 p.m. on the second day.*

Table 2
 2002 4 Highest Ozone Values (ppb)
 Annual 4th Maximum 8-Hour Ozone Values (ppb)
 2000-2002 3-Year Average and 2003 Allowable
 All CDPHE Sites

Monitor	2002			2002	2001	2000	2000-2002	2003
	1 st Max	2 nd Max	3 rd Max	4 th Max	4 th Max	4 th Max	Ave.	Allow.*
NREL	20-July	1-July	19-July	18-July	5-July			
	92	91	91	81	81	83	82	92
Rocky Flats	19-	29-	8-June	9-	3-Aug			
	92	89	88	88	82	81	84	84
Chatfield	1-July	19-July	28-June	20-July	9-July			
	94	89	83	83	77	80	80	94
Highland Reservoir	1-July	19-July	28-June	28-June	12-Aug			
	86	86	77	76	77	76	76	101
Arvada	19-July	20-July	8-June	1-July	7-July			
	84	81	74	73	74	76	74	107
So. Boulder Creek	19-July	30-June	9-June	29-June	4-Aug			
	86	80	79	78	71	72	74	105
Carriage	19-July	20-July	1-July	26-June	5-July			
	83	82	77	73	72	71	72	109
Welch	1-July	20-July	19-July	30-June	7-Aug			
	75	72	70	69	64	68	67	121
Welby	19-July	20-July	12-June	26-June	4-Aug			
	74	71	69	68	64	62	65	122

NOTE: The 2002 ozone season ended August 31; data has not been fully quality assured at this time.
 * 4th maximum allowable in 2003 to still maintain the standard.

Table 3
 2002 4 Highest 1-Hour Ozone Values (ppb)
 All CDPHE Sites

Site	1st Max	2nd Max	3rd Max	4th Max
NREL	25-June	1-July	19-July	20-July
	109	109	109	102
Arvada	25-June	1-July	19-July	29-June
	101	99	99	91
Rocky Flats	25-June	19-July	29-June	8-June
	114	105	104	102
Chatfield	19-July	1-July	20-July	28-June
	111	105	100	98
Highland Reservoir	19-July	1-July	28-June	20-July
	105	98	91	91
Carriage	25-June	1-July	19-July	8-June
	115	101	98	92
So. Boulder Creek	19-July	25-June	30-June	29-June
	101	94	93	91
Welch	19-July	1-July	20-July	25-June
	89	84	82	80
Welby	1-June	3-July	19-July	8-June
	96	92	86	85

Table 4
Historical 8-hour Ozone Levels

	1993*	1994*	1995	1996	1997	1998	1999	2000	2001	2002
Monitor	4th Max	4th Max	4th Max	4th Max	4th Max	4th Max	4th Max	4th Max	4th Max	4th Max
NREL										
20th & Quaker, Golden	83	83	79	82	75	95	80	83	81	81
Rocky Flats North										
16600 W. Highway 128	84	79	80	83	76	92	81	81	82	88
Chatfield										
11500 N. Roxborough	-	-	73	79	75	81	76	80	77	83
Highlands Reservoir										
8100 S. University Blvd.	70	75	68	73	65	84	75	76	77	76
Arvada										
9101 W. 57th	68	72	71	73	70	89	72	76	74	73
Carriage										
23rd & Julian St.	63	64	68	68	66	85	68	71	72	73
S. Boulder Creek										
1405 ½ S. Foothills	83	72	74	75	72	89	75	72	71	78
Welch										
12400 W. Hwy. 285	72	72	70	69	68	80	66	68	64	69
Welby										
3174 E. 78th Ave.	68	69	71	74	71	83	71	62	64	68

*4th maximum values for 1993/94 recently were made available by the Air Pollution Control Division. Data for 1993/94 have been analyzed previously for the 3rd maximum values.