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## Report:

### 1999 Summer Ozone Reduction Campaign

#### November 16, 1999

Ozone is a summer time pollutant that causes lung irritation and difficulty in breathing. It can cause even healthy people to have trouble breathing and can cause more serious problems for people who already suffer from respiratory difficulty. The summer of 1998 was a record for high ozone levels in the Denver metropolitan areas.

Because of a longstanding outreach effort regarding winter air pollutants, such as carbon monoxide and particulate matter, the Denver-area public is well aware of winter air pollution. No similar outreach has been done to educate the public regarding summer ozone pollution, its causes, impacts and what can be done to decrease it. With the high ozone readings in 1998, the RAQC and the Colorado Department of Public Health and Environment (CDPHE) launched an outreach and education effort. During the spring and summer of 1999, the RAQC and CDPHE worked in cooperation with numerous stakeholders to promote awareness about the effects of summer ozone pollution.

The ozone campaign consisted of 6 elements which included:

1. [Establishing a new ozone advisory system](#), similar to the current winter alert system, designed to warn people in advance of potential high ozone days and to potentially change ozone contributing behaviors;
2. [Securing voluntary reductions in the Reid Vapor Pressure](#) (RVP) (volatility) of gasoline through a partnership with the petroleum refining industry;
3. [Reducing gasoline vapor emissions](#) by working with the local petroleum marketers to distribute stickers to encourage individuals to "stop at the click";
4. [Conducting a series of structured meetings](#) with staff of local governments to educate them regarding ways to reduce ozone;
5. [Presenting a series of media events](#) designed to help the media understand ozone pollution, what was being done about it and the meaning of the new ozone advisory system; and
6. [Using a variety of other outreach tools](#) such as distribution of flyers, participation at related events such as Bike to Work Day, the Boulder Creek Festival, appearance on local cable access television, etc.

## 1. Ozone Advisory Program

### Description

The Air Pollution Control Division technical services staff developed a system to forecast imminent meteorological conditions that support the development of ozone concentrations above 75 parts per billion (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. The APCD coordinated the advisory calls with the local media, put the advisories on their web page and set up a hotline for responses to citizen requests for information.

Based on the advisory calls made by the APCD, the RAQC provided a fax announcement of the advisory to 33 cities, counties and local agencies between 3:30 and 5:00 p.m. on the day of the call. This was intended to allow local agencies to respond to the call by making changes in operational behavior designed to reduce volatile organic compounds. Additionally, the local governments provided information to the citizens through local cable programming and signs in public buildings.

## Results

The Division accurately predicted ozone levels for 98 of the 107 day season (92% accuracy). There were 9 missed calls. Of the 9 missed calls, 2 were called red (and should not have been called red) and 7 were not called red (and should have been called red). Therefore, of the 13 days with ozone levels above 75 ppb, six were correctly identified (46% accuracy). (See [Table 4](#))

In the lower ranges of high ozone days (around 80 ppb) it is difficult to make an accurate prediction. In order to capture all high ozone days with an advisory in the future, the Division will be required to err on the conservative side and potentially over-predict. Given the closeness of the region to violating the ozone standard, the Division has indicated that they may have to call more red days next summer.

Historical data is provided in several [tables](#).

## 2. Voluntary Reductions in Reid Vapor Pressure

### Description

The Air Pollution Control Division, the Regional Air Quality Council and the Air Quality Control Commission worked with the Colorado Petroleum Association and other refiners servicing the metro area to voluntarily reduce the Reid Vapor Pressure (and hence reduce the volatility) of the gasoline sold in this region. The reduction was from the 9.0 pounds per square inch (psi) (10 psi for ethanol fuels, approximately 5% to 10% of the market) allowed by the current waiver, to 8.5 psi (9.5 psi for ethanol) for the summer season. The refiners agreed to make the reduction from Memorial Day through Labor Day. The APCD staff estimated, depending on temperature, a 5% to 8% reduction in mobile source-related emissions could be expected from this 0.5 psi reduction.

Letters were received committing to the 0.5 psi reduction for the summer season, June through August, from Equilon Enterprise LLC (Shell & Texaco Working Together), Sinclair, Ultramar Diamond Shamrock and Philips Petroleum. Conoco committed to the 0.5 psi reduction through mid-September, and Frontier promised to make their best effort to comply with the 0.5 psi reduction through mid-September.

## Results

The APCD staff randomly sampled the fuel at metro area gasoline stations and reported that the average RVP was approximately 8.15 psi. It is assumed that this level provided at least the 0.5 psi reduction anticipated.

On-road and off-road gas vehicles and equipment, and Stage I gas station refilling represent 36% of the Volatile Organic Compound (VOC) inventory. The reduction in RVP attained this season is estimated to achieve an approximate 3% reduction in total VOCs. ([See chart.](#))

## 3. Outreach to Petroleum Marketers

### Description

One source of the hydrocarbons that contributes to ozone is spilled and evaporated fuel. By eliminating the overfilling of the fuel tank, small fuel spills, drips and excess evaporation are eliminated. The RAQC and CDPHE worked closely with the Colorado-Wyoming Petroleum Marketers Association (CWPMA) and major refiners to provide stickers designed to educate the public about the need to "stop at the click." Stopping at the click reduces spills and evaporation. In addition, overfilling can disable emissions equipment.

### Results

The CWPMA helped distribute stickers that were placed on gasoline pumps, to gasoline vendors throughout the metro region. Texaco, Amoco, Conoco, Phillips 66, Sinclair, Royal Crest Dairy and many other independent retailers participated in the "stop at the click" program. Approximately 6,000 stickers were distributed. Follow-up calls were made by RAQC staff to remind people to use the stickers.

There remains an ongoing need to continue to work with petroleum companies to secure assistance in distributing the stickers and seeing that they are actually placed on the pumps. A few companies did not respond to our attempts to get them to participate in this program. The RAQC staff needs to continue to work on getting participation in this program.

## 4. Local Government Outreach

## Description

The Regional Air Quality Council's staff scheduled ozone workshops that included the metro region's larger local governments, as well as the smaller ones who have indicated an interest in air quality issues. Eighteen metro-area local governments participated in the ozone workshops. These included: Adams County, Arapahoe County, Arvada, Aurora, City of Boulder, Boulder County, Brighton, Commerce City, Denver, Douglas County, Englewood, Golden, Jefferson County, Lakewood, Littleton, Northglenn, Thornton, and Westminster.

Local governments were encouraged to bring staff to the workshop from Parks and Open Space, Facility Management, Fleets, Building Maintenance, Public Works, Purchasing and Public Information. The workshop covered sources of ozone for the metro region and strategies for reducing volatile organic compounds (a significant component of ozone) that come from local government operations. Workshop participants were asked to take the information received at the workshop back to their respective departments for discussion and to report to the RAQC regarding strategies that would be implemented.

During the workshops the RAQC provided materials that included:

- Stop at the click stickers;
- Flyers;
- Sample newsletter article;
- Resources on low VOC products;
- Background information on ozone and its sources;
- Large signs for posting in public places to alert people to the flyers; and
- Small reversible signs for posting in public buildings to let people know if it is a high or low ozone day.

## Results

The following is a summary of the trends in responses to the workshops and the need to make voluntary reductions in VOCs. In each workshop there were positive results and local governments agreed to make changes in one or several behaviors that contribute to ozone pollution.

Some of the pollution reduction strategies which were presented to the local governments are already being practiced for reasons unrelated to ozone. Other strategies were part of new information that the local government staff had not yet considered. Some of these changes, such as putting "stop at the click" stickers on local government fuel pumps, were simple and easy to comply with. Others were more difficult and required additional thought in implementing. These included refueling after dark and avoiding using 2 stroke engines on high ozone days.

Some of the ozone reduction strategies already being practiced by local governments include:

- **Vehicle/Equipment Tuning.** Most local governments have vehicles and other small engine equipment on a schedule of regular maintenance including vehicle tuning.
- **Best Management Practices Related to Solvent Waste.** Many local governments have switched to water-based paints. This has had the impact of reducing the VOCs from the paint and reducing the need for solvents to be used in clean up and the disposal of and emissions from solvent-contaminated rags and equipment. Additionally, some local governments have switched to non-solvent based cleaning supplies, ink and other low VOC products.

New strategies that most local governments agreed to undertake include:

- Fueling after dark or as late in the day as possible;
- Continued staff education to reduce fuel spillage, including regular reminders in employee training and "stop at the click stickers" as reminders;
- Avoiding excessive idling and linking trips whenever possible, especially on high ozone days; and
- Making ozone education a part of ongoing citizen education in a variety of ways.

Strategies that were more difficult for local governments to accomplish in the short-term but that will be continually examined as part of a long-term ozone reduction strategy include:

- **Avoiding the use of lawn equipment on high ozone days and/or replacing inefficient engines.** Most of the local governments have such a tight schedule for grounds maintenance that there is little flexibility. Additionally, in the middle of the fiscal year, few local governments have the flexibility to retire old lawn maintenance equipment and make new purchases. We were able to secure commitments from local governments to look at their operations and prioritize the use of machinery in order of VOC emissions so that, if possible, diesel engines were used first, then 4 stroke engines, then 2 stroke engines, on high ozone days. Additionally, as budgets are prepared, the replacement of pre-1997 engines will become part of the local priorities.
- **Using alternative fueled vehicles.** At least three local governments mentioned that they use low emitting vehicles as part of an ozone reduction strategy. This strategy will impact only those governments with enough alternatively fueled vehicles to make this option practical. However, as more and more cities convert to alternative fueled vehicles, this can become a more significant ozone control strategy for the region.

## 5. Media Events

### Description

For several years, CDPHE and the Regional Air Quality Council have been working to let the public know about winter time air pollution, particularly from carbon monoxide and particulate matter. The

message of winter-time air pollution and the need to limit driving, reduce wood burning, etc., now is one with which most Denver area residents are familiar.

Because high ozone readings in the Denver metro area are a relatively recent phenomenon, the same type of public education has not yet been done around ozone, what it is, how to reduce it, and the potential for high ozone readings during the summer months. Therefore, the CDPHE and the Regional Air Quality Council together undertook an effort to educate the public, through a media campaign, about summer ozone.

The media campaign had 4 elements:

1. A media seminar for press and public information officers;
2. A press conference announcing the efforts of the petroleum industry to reduce the volatility of gasoline (RVP);
3. Media announcements regularly during high ozone days; and
4. An end-of-season media release describing the results of the high ozone season.

## Results

- **Media seminar** - The media seminar on summer ozone was held on May 26, 1999. Approximately 45 people attended the seminar. The purpose of the seminar was to acquaint the press and public information officers of local communities with summer time ozone and the upcoming high ozone season. The seminar provided background information on the ozone standard, the upcoming ozone advisory system, the health effects of ozone, the difference between tropospheric and stratospheric ozone, and ways to reduce ozone. The Rocky Mountain News, the Denver Post, the Boulder Daily Camera and a host of smaller papers ran stories on the high ozone season. Several local government public information officers included stories on ozone in their local government employee and/or citizen newsletters.
- **RVP Campaign Kick-Off press conference** - The refineries in the metro region agreed to voluntarily lower the RVP of gasoline during the high ozone season. This strategy is estimated to reduce mobile source VOC emissions by about 5% to 8%. At a press conference on June 1, 1999, representatives from the RAQC, CDPHE, Conoco (the host of the press conference), the Colorado Wyoming Petroleum Marketers and Convenience Store Association and the Colorado Petroleum Association unveiled this new air quality initiative, estimated to reduce total VOC emissions by just under 3%. Both the Rocky Mountain News and the Denver Post as well as local television news gave favorable press coverage to this initiative. However, the Post later ran an editorial calling for a study of the measure to determine its effectiveness.
- **Media announcement of high ozone days** - CDPHE developed a system for alerting the media to potential high ozone days. The RAQC followed the CDPHE lead and faxed the advisory to local governments. This led to several days of successful coverage by radio, print and television media. As part of the media announcement of a potential high ozone day, the media often

announced strategies that individuals could undertake to do their part to reduce ozone. The first high ozone day of the season received a particularly heavy amount of media coverage, and subsequent announcements of predicted high-ozone days received coverage throughout the summer. The Colorado Department of Public Health and Environment, in conjunction with the RAQC, provided the media with an end-of-season press release to sum up the results of the summer monitoring of ozone. This release focused on the combined efforts of CDPHE, the RAQC, local governments and industry.

## 6. Miscellaneous Outreach Activities

### Description

As part of the effort to educate the public about summer ozone, the RAQC staff participated in or assisted with various public events, provided copy for inclusion in newsletters, and distributed flyers at places of high public traffic.

### Results

The RAQC staff undertook the following activities as part of the ozone public education:

- Made a presentation to the Boulder County Clean Air Consortium;
- Staffed a booth with the Metro Home Builders Association at the Business to Business Expo;
- Staffed a booth at the Boulder Creek Festival over Memorial Day Weekend;
- Provided information to the City of Boulder staff for newspaper ads and a cable TV spot;
- Provided information to the Colorado Association of Commerce and Industry for its newsletter;
- Provided information to Colorado State University for its horticulture newsletter and brochures;
- Provided 4,000 flyers to Envirotest for distribution at AirCare Colorado testing stations;
- Distributed 700 ozone flyers to site coordinators of Bike to Work Day;
- Taped an interview for Northglenn Cable Access Television; and
- Staffed a booth at the American Lung Association's Clean Air Challenge.

### Future Plans

There remains a considerable amount that can be done both to improve the public outreach effort and to refine the forecasting. The RAQC staff will need to continue to work with local governments, reminding them of strategies that can be used to reduce summer ozone. In addition, there are sectors of the economy such as building and lawn maintenance companies, the painting industry, and others where public outreach may produce results. Staff of the APCD and the RAQC should begin in the late fall of 1999 to plan for next summer's voluntary ozone reduction efforts.

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