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TESTIMONY
BEFORE THE AIR RESOURCES BOARD

November 18, 1993

Hearing on October 1993 ARB Report on Ozone Designation Criteria

by Victoria A. Evans
Manager, Environmental Policy and Planning
Sonoma Technology, Inc., Santa Rosa, CA

I am Victoria A. Evans, Manager, Environmental Policy and Planning, Sonoma Technology Inc. (STI) and am appearing here today on behalf of the Monterey Bay Clean Air Coalition. The Clean Air Coalition is a partnership comprised of nearly every city, business and industry group in the Monterey Bay region. The Clean Air Coalition has dedicated itself to the task of analyzing ozone nonattainment management and planning in the Monterey Bay Unified Air Pollution Control District.

Staff scientists at STI have been providing technical assistance and educational information about air quality planning in the Monterey Bay Air District since the fall of 1992.

Attached to my testimony is a copy of a Technical Memorandum providing STI's review of the October 1993 report issued by ARB on Ozone Designation Criteria. I will only highlight those major points from our comments briefly here today.

Monterey Bay Coalition representatives appeared before the ARB Board on issues concerning long-range transport of ozone in August 1993. The primary issue voiced at that time was that of the use of Pinnacles monitoring data in the ozone design value calculation for the North Central Coast Air Basin (NCCAB), and elimination of days of significant long-range transport. We are awaiting ARB staff analysis on these Coalition points; I understand from ARB staff that their analysis will be available to us shortly.

However, Pinnacles data are also used for the ozone designation value, which determines state ozone attainment. STI has the same concerns about ARB including Pinnacles data for determining ozone designation values.

FINDINGS AND RECOMMENDATIONS

1. Exclusion of infrequent or extreme events

We support proposed ARB's amendment to the designation criteria for excluding infrequent or extreme events for instances where there are incomplete data sets.

2. Inclusion of Pinnacles ozone data for NCCAB in ARB Draft Staff Report

Finding. The ARB Staff Report does not reference ozone data collected at the Pinnacles site located within the NCCAB. Preliminarily, we believed that this omission meant ARB was responsive to the Coalition's concerns expressed in August 1993. However, according to informal conversations with ARB staff, Pinnacles data were used for this designation value determination, although these data were not shown in the report on page E-2 along with other NCCAB ozone data.

Recommendation. If data were included in the analysis, Pinnacles data should be provided in a revised Draft Report, before this ARB Draft Staff Report is finalized.

3. Pinnacles Ambient Ozone Monitoring in NCCAB

3.1 Finding. The location of the Pinnacles monitoring site is inconsistent with the EPA ambient monitoring and siting criteria used by ARB (SLAMS) for ambient ozone monitoring relative to federal and state ozone standards. The Pinnacles monitoring site is in a rural area and the data collected do not represent ozone that can be conclusively attributed to sources within the basin. The Pinnacles site does not meet the criteria for being near a populated area, so that data collected there do not represent ambient ozone conditions in an urban scale where people live.

MBUAPCD also recognizes that the Pinnacles site does not meet monitoring siting criteria for being in a populated area (pg 4-2, 1991 MBUAPCD AQMP). The MBUAPCD did not use data recorded at Pinnacles in their 1991 Air Quality Management Plan (AQMP), nor in their earlier 1989 AQMP (for meeting the federal ozone standard). Only data from four District operated air monitoring stations were used for comparison against the ambient air quality standards and for trends analyses.

The Pinnacles site does not meet all of the ARB/EPA criteria, but could qualify as a "special site", to be representative of ozone at a regional scale. Thus, Pinnacles data are expected to be primarily useful for assessing ozone transport conditions into the basin.

The ARB recently agreed with Bay Area Air Quality Management District (BAAQMD) to reclassify the District's Santa Cruz Mountain station as a "research monitoring station" since it does not fully meet the ARB/EPA siting criteria for ambient ozone monitors. Further, ARB gave BAAQMD approval to exclude data from this station to demonstrate federal ozone attainment in their submittal to EPA. Thus, ARB staff recently demonstrated that there are occasions when sites

can be designated as "special purpose stations", even though data indicating high levels of ozone were collected.

The Santa Cruz Mountain (Mt. Uminum) site and the Pinnacles site in the MBUAPCD are similar in that they are located at high elevations at mountaintops and data collected there represent the ozone concentrations that are aloft of ground level ozone conditions within populated areas.

3.2 Finding. The Pinnacles site does not meet ARB's criteria "data of record". The site does not meet the criteria since the monitoring data are "not collected by or under the auspices of the state board or the districts", however, data is collected by and the site operated by the National Park Service and their contractors.

Recommendations. Since Pinnacles does not meet the EPA/ARB criteria for siting ambient ozone monitors or ARB's criteria for "data of record", we recommend that the Pinnacles monitoring site be reclassified as a "special purpose station" and designated as a "research station". Further, we understand that Pinnacles ozone data will be excluded from determinations of ozone designations and design values. We recommend that data from Pinnacles as a "research station" should be used in ozone and ozone precursor transport analyses only.

Once Pinnacles data are excluded, a review of NCCAB ozone data from a single monitoring site should be made to determine whether the District should remain designated as moderate for state ozone nonattainment, or be redesignated as nonattainment transitional.

4. Discrepancies in Pinnacles data reported

Findings. Pinnacles data are important to understanding regional ozone levels and ozone transport into the NCCAB. The Pinnacles site routinely records high levels though it is located in a remote, unpopulated area. It is well recognized that many of these higher readings are due to overwhelming transport into the Basin.

We noted differences in Pinnacles data reported by the MBUAPCD and EPA. Since ARB does not report this data, we reviewed data reported by the District in their AQMP and the EPA AIRS system.

Recommendations. A review is needed to reconcile District-reported Pinnacles data with that data reported by the EPA AIRS system.

Sonoma Technology, Inc.

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TECHNICAL MEMORANDUM

DATE: November 17, 1993

TO: Charles Eadie, City of Watsonville Planning Department

Jorge Rifa, Assistant City Manager, City of Salinas

Lee Haskin, Martinelli & Co., Watsonville

FROM: Victoria A. Evans, Manager, Environmental Policy and Planning, STI

SUBJECT: Review of October 1993 ARB Report on Ozone Designation Criteria

PROJECT: Monterey Bay Clean Air Coalition, STI Reference No. 93440

This Technical Memorandum provides STI's review of the October 1993 report issued by ARB on Ozone Designation Criteria. This document is the subject of a public hearing on November 18, 1993 and comments are due on that date to the ARB.

Monterey Bay Coalition representatives appeared before the ARB Board on issues concerning long-range transport of ozone in August 1993. The primary issue voiced at that time was that of the use of Pinnacles monitoring data in the ozone design value calculation for the North Central Coast Air Basin (NCCAB), and elimination of days of long-range transport. We are awaiting ARB staff analysis on these Coalition points; I understand from ARB staff that their analysis will be available to us shortly. However, Pinnacles data are also used for the ozone designation value, which determines state ozone attainment. STI has the same concerns about ARB including Pinnacles data for determining ozone designation values.

REVIEW OF OCTOBER 1993 ARB REPORT ON OZONE DESIGNATION CRITERIA FOR NONATTAINMENT AND ATTAINMENT AREAS

BACKGROUND

This ARB report discusses the basis for the criteria used by ARB for designation of areas as state attainment and nonattainment, including criteria for ozone nonattainment. Designation criteria are used to establish an ozone designation value, or the level of ozone which determines whether an air district is in attainment of the state ozone

standard. To calculate the ozone designation value, all of the data of record for ambient ozone levels are used by ARB. The ozone designation value calculation is based upon a 1-in-1 year recurrence rate for ozone concentrations.

The California ambient ozone standard is established as a 1-hour average ambient reading of 0.09 parts per million (ppm). The state ozone standard of 0.09 ppm is more stringent than the federal standard of 0.12 ppm. The background level of ozone from natural sources is considered to be about 0.03 ppm. This ARB report indicates that the ozone designation value for NCCAB is 0.10 ppm.

FINDINGS AND RECOMMENDATIONS

1. Exclusion of infrequent or extreme events.

   Finding. ARB's proposed amendment to the designation criteria would exclude data affected by infrequent or extreme events, for incomplete data sets (one or two years of data). This proposed amendment demonstrates policy consistency between the approach used for transport determinations in ozone design values and for ozone designation values.

   Recommendation. We support proposed ARB's amendment to the designation criteria for excluding infrequent or extreme events.

2. Inclusion of Pinnacles ozone data for NCCAB in ARB Draft Staff Report.

   Finding. The ARB Staff Report does not reference ozone data collected at the Pinnacles site located within the NCCAB. The Pinnacles ozone monitoring site is operated by the National Park Service. Preliminarily, we believed that this omission meant ARB was responsive to the Monterey Bay Coalition's concerns expressed on August 13, 1993, requesting exclusion of the Pinnacles site as an ambient ozone monitoring site for the data to excluded from calculation of ozone designation and design values.

   However, according to informal conversations with ARB staff, Pinnacles data were used for this designation value determination, although Pinnacles data were not shown in the report on page E-2 with other NCCAB ozone data.

   Recommendation. If data are to be included, Pinnacles data should be provided in a revised Draft Report, before this ARB Draft Staff Report is finalized.

3. Pinnacles Ambient Ozone Monitoring in NCCAB

   3.1 Finding. The location of the Pinnacles monitoring site is inconsistent with ARB and EPA ambient monitoring and siting criteria for ambient ozone

monitoring relative to federal and state ozone standards. The Pinnacles monitoring site is not near a populated area so that data collected there do not represent ambient conditions.

Discussion. The federal government operates an ambient ozone monitoring station in the MBUAPCD located at Pinnacles National Monument, between Hollister and King City. This monitoring site has been operated by the National Park Service (NPS) at this location since 1987.

STI made similar findings and recommendations regarding the Pinnacles data and site in STI's February 1993 Report. This report was entitled "Ozone Nonattainment Policy and Planning Issues Affecting Local Jurisdictions and Businesses in the Monterey Bay Unified Air Pollution Control District". STI's report was submitted to and reviewed by both the Air District and ARB earlier this year.

Siting Criteria. The ARB and local districts use the siting and quality assurance procedures developed by the EPA. California also uses EPA's general monitoring objectives and criteria to site monitoring stations. These include criteria for locating State and Local Air Monitoring Stations (SLAMS), and for evaluating the adequacy of the network. Monitoring stations are located to meet a minimum of four basic objectives: 1) determine the highest concentrations expected to occur in the area, 2) determine representative concentrations in areas with high population density, 3) determine the impact on ambient pollution levels of significant sources or source categories, and 4) determine general background concentration levels.

The Code of Federal Regulations (CFR) at 40 CFR Part 58, Appendix D, Sec. 3, includes locational criteria for air monitoring stations providing data used for measuring ambient air pollutant concentrations relative to federal standards. The CFR states:

> "The criterion for selecting locations for ozone NAMS is any urbanized area having a population of more than 200,000."
> (40 CFR 1 Sec. 4.4)

This criterion is based on population exposed, and inclusion of areas where most of the ozone precursors originate. Further, the CFR states:

> "The principal spatial scales for SLAMS purposes based on the monitoring objectives are neighborhood, urban, regional, and to a lesser extent, middle scale."
> (40 CFR Part 58, Appendix D, Sec. 2.5)

Sites representative of a regional scale are also defined:

> "This scale of measurement... will be useful for assessing the ozone that is transported into an urban area. Data from such stations may be useful in accounting for the ozone that cannot be reduced by control strategies in that urban area."
> (40 CFR Pt. 58, Appendix D, Sec. 2.5)

Pinnacles Site vs. Criteria. The site at Pinnacles meets only the first and fourth criteria. The Pinnacles site does not meet all of the ARB/EPA criteria, but could qualify as a "special site", to be representative of ozone at a regional scale. Thus, Pinnacles data are expected to be primarily useful for assessing ozone transport conditions into the basin. EPA monitoring criteria are interpreted as simply minimum criteria and nothing in the regulations precludes data collection at additional, "special" sites.

MBUAPCD also recognizes that the Pinnacles site does not meet monitoring siting criteria. The MBUAPCD did not use data recorded at Pinnacles in their 1991 Air Quality Management Plan (AQMP), nor in their earlier 1989 AQMP (for meeting the federal ozone standard). Only data from four District operated air monitoring stations were used for comparison against the ambient air quality standards and for trends analyses. In its 1991 AQMP, the District contended the following about data from Pinnacles.

> "....it is useful to point out that data from the Pinnacles National Monument air monitoring station are analyzed separately. Although this station is classified as ambient, it is not located in a populated area and is not operated by the District."
> (pg 4-2, 1991 MBUAPCD AQMP)

Reclassification of Pinnacles Site. The ARB recently agreed with Bay Area Air Quality Management District (BAAQMD) to reclassify the District's Santa Cruz Mountain station as a "research monitoring station" since it does not fully meet the ARB/EPA siting criteria for ambient ozone monitors. Further, ARB gave BAAQMD approval to exclude data from this station to demonstrate federal ozone attainment in their submittal to EPA. Thus, ARB staff recently demonstrated that there are occasions when sites can be designated as "special purpose stations", even though data indicating high levels of ozone were collected.

The Santa Cruz Mountain (Mt. Umunum) site and the Pinnacles site in the MBUAPCD are similiar in that they are located at high elevations at mountaintops and data collected there represent the ozone concentrations that are aloft of ground level ozone conditions within populated areas.

3.2 Finding. The Pinnacles site does not meet ARB's criteria "data of record". The site does not meet the criteria since the monitoring data are "not collected by or under the auspices of the state board or the districts", however, data is collected by and the site operated by the National Park Service and their contractors.

"Data of record", as defined by the ARB are:

"those data collected by or under the auspices of the state board or the districts for the purpose of measuring ambient air quality, and which the executive officer has determined comply with the siting and quality assurance procedures..." [CCR, Title 17, Section 70301(a)].

Recommendations. Since Pinnacles does not meet the EPA/ARB criteria for siting ambient ozone monitors or ARB's criteria for "data of record", we recommend that the Pinnacles monitoring site be reclassified as a "special purpose station" and designated as a "research station". Further, we recommend that Pinnacles ozone data be excluded from determinations of ozone designations and design values. We recommend that data from Pinnacles as a "research station" should be used in ozone and ozone precursor transport analyses only.

Once Pinnacles data are excluded, a review of NCCAB ozone data from a single monitoring site should be made to determine whether the District should remain designated as moderate for state ozone nonattainment, or be redesignated as nonattainment transitional.

4. Discrepancies in Reporting Pinnacles data.

Findings. Pinnacles data are important to understanding regional ozone levels and ozone transport into the NCCAB. The Pinnacles site routinely records high levels though it is located in a remote, unpopulated area. It is well recognized that many of these higher readings are due to overwhelming transport into the Basin.

We noted differences in Pinnacles data reported by the MBUAPCD and EPA. Since ARB does not report this data, we reviewed data reported by the District and the EPA AIRS system. Data cited by these two sources for exceedances disagree (see Table 1). In addition, our review of the Pinnacles data also indicates multiple day gaps in the data and other peculiarities. And, during 1987 almost four times as many exceedance days occurred as in subsequent years.

For 1988-1992 data capture for the ozone season is acceptable at 90%; however, missing data days occur most frequently on Wednesday, also the day when most exceedances occur. Our analysis indicates that ozone exceedances occur least

frequently on weekends, and most frequently midweek, whether 1987 data are included or excluded. If exceedance days were normally distributed each day would account for about 14% of the total. Almost one-fourth of all exceedance days occur on Wednesday; Sunday exceedances account for only about one-half of exceedance days. Explaining the high number of occurrences on Wednesday is problematic; strong multi-day build up of ozone on Wednesday may begin on Monday. However, why the build up does not continue, since ozone exceedances taper off on Friday and Saturday, needs further investigation.

Roberts et. al. (1992) recently found that high ozone exceedances occurred at Pinnacles under three scenarios, varying by the time of day. As precursor emission sources in the local area are negligible, the high ozone readings at Pinnacles are most likely due to transport from upwind sources. Based on recent studies of transport conducted by STI, the station at Pinnacles is thought to be impacted primarily by aloft ozone transport contributions from the southern portion of the San Francisco Bay Area (Roberts et al., 1992).

Recommendations. A review is needed to reconcile District-reported Pinnacles data with that data reported by the EPA AIRS system. Examination of the daily emission inventory for both the MBUAPCD and the Bay Area Air Quality Management District could provide insight on why Wednesday ozone exceedances are predominant at Pinnacles. Also the time of day of ozone exceedances, should be examined along with the day of the week, and compared to recent study results.

Table 1. Comparison of state ozone exceedances at Pinnacles

Year	EPA AIRS	MBUAPCD reported
1987	34	35[a]
1988	11	12[a]
1989	8	8[a]
1990	8	9[a]
1991	11	4[b]
1992	7	7[b,c]

[a] 1991 AQMP
[b] Monthly MBUAPCD data summaries.
[c] First 6 months of 1992

5. Potential additional transport trajectories.

Findings. The Bay Area Air Quality Management District's (BAAQMD) ambient ozone monitor in the Santa Cruz mountains (Mt. Umunum) is estimated at about five miles over the mountain from the recently installed NCCAB monitor at Scotts Valley. High levels of ozone, even exceeding the federal ozone standard, have been recorded there. Recent ozone data collected in 1993 at Scotts Valley has indicated spikes in ground level ozone conditions. Ozone transport over the Santa Cruz Mountains may be a possible avenue for contributions of high levels pollutants from Mt. Umunum.

In addition, after the fires in southern California, other STI technical staff observed a plume of smoke traveling from Pacific Palisades to the Monterey region. Since smoke is a good tracer of trajectories for air pollutants, this indicated the possibility of an additional trajectory for consideration for the Monterey region.

Recommendation. We encourage ARB staff to examine these possible routes of transport of ozone precursors and ozone into the NCCAB.

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BROWNING-FERRIS INDUSTRIES

PACIFIC REGION

Board Secretary
California Air Resources Board
2020 L Street
Sacramento, California 95812

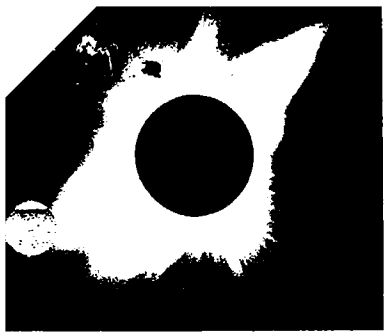
Re: Proposed Amendments to the Criteria for Designating Areas of California as Nonattainment, Attainment, or Unclassified and to the Area Designations for State Ambient Air Quality Standards (Cal. Reg. Notice Register 93, No. 40-Z, p. 1216)

Dear Sir or Madam:

Browning-Ferris Industries, Inc. ("BFI") appreciates the opportunity to comment on the above-referenced proposal. BFI strongly supports the amendments to Appendices 3 and 4. The modifications will provide better methods of determining air quality in an air basin. Likewise, we believe that the proposed area designations are consistent with the Federal criteria and reflect the improvement in air quality that has occurred in many areas of the State. The proposed amendments should be promulgated.

Very truly yours,

Marc A. Aprea
Director, Government Affairs
915 L Street, Suite 1140
Sacramento, California 95814



"TOTALITY" - San Jose del Cabo - July 11, 1991

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STATE OF CALIFORNIA
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Air Resources Board Secretary
P.O. Box 2815
Sacramento, CA 95812

November 5, 1993

Dear Board Secretary:

Re: Criteria for designating areas as "non-attainment".

In my opinion, the current techniques used for defining, designating, and addressing the issues of air pollution are severely lacking, and that their use does not help in identifying problems. More importantly, it does not help prioritize the use of limited resources to improve the environment and the air we all breathe.

The various air districts currently monitor air quality, report data, and are classified only by the raw data (some adjustments for transport and unusual conditions are allowed). I believe that using the existing data, adjusting for dose exposures and rating on the basis of an exposed population is a lot more meaningful and useful for allocation of limited resources.

In brief, the measure of air quality should be a dose exposure - the difference between a measured pollutant level and a threshold level times an exposure duration - hours at a level. This dose value would then be extended by an exposed population.

An example: Ozone - 1 hr. at 13 parts per hundred million
1 hr. at 12 parts per hundred million
2 hr. at 11 parts per hundred million
2 hr. at 10 parts per hundred million

= (13-9)*1 + (12-9)*1 + (11-9)*2 + (10-9)*2
= 13 parts per hundred million-hours - dose exposure.

If the exposed population is 250,000, multiply 13*250,000 to get an exposure index of 3,250,000.

Both the dose exposure and the exposure index can be useful in making area comparisons.

This can be compared to an exposure of:

Ozone - 1 hr at 22 parts per hundred million
2 hr at 21 parts per hundred million
2 hr at 20 parts per hundred million
2 hr at 19 parts per hundred million
2 hr at 18
2 hr at 17
2 hr at 16
2 hr at 15
2 hr at 14
2 hr at 13
2 hr at 12
2 hr at 11
2 hr at 10

= 13+24+22+20+18+16+14+12+10+8+6+4+2 = 169 dose exposure.

If the exposed population is small, only 15,000, the total exposure index would be only 2,535,000.

Finally a comparison to a large population exposed at low levels would be represented as:

Ozone - 1 hr at 11
3 hr at 10

= 2+3 = 5 exposure dose.

But if the exposed population exceeded 750,000, the total exposure index would be measured as being 5*750,000 = 3,750,000.

This technique would prioritize the low exposure of a large population vs. the higher exposure of a much smaller population.

I believe that the development of an exposure dose and a population exposure index of this type would be beneficial in evaluating air basins and sub basins, and useful in addressing strategies and priorities for required air quality improvement.

The designating of areas for improvement via "non-attainment" criteria should be determined only <u>after</u> an analysis of the existing air districts using these types of indices.

Sincerely,

Gene A Huber

Gene A. Huber
President

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