ATTACHMENT E

PROCEDURE FOR CALCULATING
STATE 8-HOUR OZONE CONCENTRATIONS

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Similar to the federal procedure, the State 8-hour ozone averages are based on overlapping 8-hour averages, using the first hour as the start hour and assigning a date to the daily maximum 8-hour average. The first step in calculating a State 8-hour average is to truncate the hourly measurements to 3 decimal places, when expressed in parts per million (ppm). Next, the average of the truncated hourly measurements that are within the 8-hour period (provided there are at least 6 hourly measurements in the period) is calculated. The final step is to round the averaged value to 3 decimal places (consistent with the precision of the State 8-hour standard). Running 8-hour averages are calculated for each hour of the day. The highest 8-hour average for each day is recorded in the database as the 8-hour daily maximum.

ARB's truncation/rounding conventions are not the same as the U.S. EPA conventions, and therefore, can result in slightly different values for equivalent 8-hour periods. The U.S. EPA truncates both the hourly measurements <u>and</u> the resulting 8-hour averages, while ARB truncates the hourly observations but rounds the resulting 8-hour averages. Furthermore, the federal method for calculating 8-hour ozone substitutes a value of 0.0005 ppm (½ the detection limit) for missing hours when an 8-hour period includes fewer than 6 hourly values. This results in a *de minimis* 8-hour average that is considered valid for nonattainment purposes only, if the average exceeds the standard (this practice avoids the problem of non-designations when an area logically must have exceeded the standard). For State purposes, we disregard all 8-hour periods that include fewer than 6 hourly measurements. This approach is consistent with the Representativeness Criteria in Appendix 1 of the designation criteria and is consistent for all pollutants with State standards.

SAMPLE CALCULATION:

Here is a simple example of an 8-hour average calculation:

Hour 1 ozone value: *0.0517 ppm*   Hour 5 ozone value: *0.0906 ppm*
Hour 2 ozone value: *0.0658 ppm*   Hour 6 ozone value: *0.0847 ppm*
Hour 3 ozone value: *0.0761 ppm*   Hour 7 ozone value: *0.0743 ppm*
Hour 4 ozone value: *0.0823 ppm*   Hour 8 ozone value: *0.0615 ppm*

These measured values <u>truncate</u> to:

Hour 1: *0.051 ppm*	Hour 5: *0.090 ppm*
Hour 2: *0.065 ppm*	Hour 6: *0.084 ppm*
Hour 3: *0.076 ppm*	Hour 7: *0.074 ppm*
Hour 4: *0.082 ppm*	Hour 8: *0.061 ppm*

and produce an 8-hour average of:

(0.051 + 0.065 + 0.076 + 0.082 + 0.090 + 0.084 + 0.074 + 0.061) / 8

or:

0.072875 ppm

which <u>rounds</u> to:

0.073 ppm

<u>STATE DESIGNATION REQUIREMENTS</u>:

1. To be used for State regulatory purposes, an 8-hour average must be representative, as determined by Appendix 1 of the designation criteria. This means that an hourly measurement must be the result of at least 30 minutes of sampling to be considered representative, and there must be 6 or more representative hourly measurements within the 8-hour period.

2. For an 8-hour average to be used for State regulatory purposes, it must come from a representative day, as determined by Appendix 1 of the designation criteria. A day is representative when there are 6 or more representative hourly measurements in each third of the day (i.e., hour 0 through hour 7, hour 8 through hour 15, and hour 16 through hour 23), and there are no more than 2 consecutive hourly measurements missing within the day.

3. For designating areas as either "attainment" or "nonattainment-transitional," there must be a sufficient number of representative days during a year for the designation period to be considered complete, as defined by Appendix 3 of the designation criteria. A year is deemed complete when at least 75 percent of the days are representative during each of the high months.

To designate an area as "attainment," there must also be:

- 3 years of complete data when the maximum 8-hour average concentration for those 3 years (after excluding values affected by highly irregular or infrequent events) is between 75% and the level of the standard, or
- 2 years of complete data when the maximum 8-hour average concentration for those 2 years (after excluding values affected by highly irregular or infrequent events) is less than 75%, but at least 50%, of the standard, or
- 1 year of complete data when the maximum 8-hour average concentration for that year (after excluding values affected by highly irregular or infrequent events) is less than 50% of the standard.