AIR POLLUTION CONTROL DISTRICT
COUNTY OF SAN DIEGO

DATE: April 19, 1994

TO: Air Pollution Control Board

SUBJECT: Adoption of New Rule 67.24 (Bakery Ovens)

SUMMARY:

New Rule 67.24 regulates emissions of volatile organic compounds (VOC) from bakery ovens. VOC (ethanol) is formed as a result of fermenting sugars in the dough of yeast-leavened breads, and is emitted to the atmosphere during baking. There are more than 100 bakeries in San Diego County. Only four will be subject to the proposed rule: two large bakeries with VOC emissions over the federal major source threshold of 25 tons per year, and two smaller ones with emissions under 10 tons per year. The two small bakeries will only be subject to annual recordkeeping requirements. Emission testing of one large bakery showed it is a federal major source and is therefore required to apply reasonably available control technology (RACT). The other large bakery has annual emissions estimated to be above the federal major source threshold. This bakery will be required to apply RACT, if emissions testing shows it is a federal major source.

The proposed rule will reduce emissions by approximately 81 tons per year if only one bakery is subject to the rule's emission control requirements and 103 tons per year if both are required to apply RACT.

The proposed rule is consistent with the Board's direction of February 2, 1993, regarding implementation of new or revised rules because the 1990 Federal Clean Air Act mandates RACT level rules for major VOC emission sources. The rule also satisfies the requirements of the California Clean Air Act to apply all feasible VOC control measures as expeditiously as possible. In addition, in January 1993, the Environmental Protection Agency (EPA) notified the District that failure to submit Rule 67.24 by July 15, 1994, requiring major source bakeries to apply RACT, will result in imposition of federal sanctions including a 2 to 1 emission offset ratio for new and modified businesses and withholding up to $75 million in federal transportation funds.

A socioeconomic impact assessment of the proposed rule concluded there will be no significant impact on employment or the economy of the region. District staff met frequently with affected businesses and made many changes to minimize adverse socioeconomic impacts.

Issue

Should the Board adopt new Rule 67.24 (Bakery Ovens) to reduce volatile organic compound emissions from bakery ovens in San Diego County?

Recommendation

AIR POLLUTION CONTROL OFFICER

1. Set June 7, 1994 at 2:00 p.m., as the date and time for public hearing to consider the resolution adopting new Rule 67.24 into the Rules and Regulations of the San Diego County Air Pollution Control District.

2. Direct the Clerk of the Board to notice the Hearing pursuant to Section 40725 of the State Health and Safety Code.

3. Following the hearing: (a) adopt the resolution adopting Rule 67.24, and (b) make appropriate findings:

   (i) of necessity, authority, clarity, consistency, non-duplication and reference as required by Section 40727 of the State Health and Safety Code;

   (ii) that new Rule 67.24 will alleviate a problem and promote attainment of ambient air quality standards (Section 40001 of the State Health and Safety Code);

   (iii) that an assessment of the socioeconomic impact of new Rule 67.24 has been prepared and has been made available for public review and comment, and that the socioeconomic impacts of the proposed rule have been actively considered and the District has made a good faith effort to minimize adverse socioeconomic impacts; and

   (iv) that there is no reasonable possibility that the new rule may have a significant adverse effect on the environment, and that adoption of new Rule 67.24 is categorically exempt from the provisions of the California Environmental Quality Act pursuant to California Code of Regulations, Title 14, Sections 15300 and 15308, as an action taken to assure the maintenance or protection of the environment and where the regulatory process involves procedures for protection of the environment.

Advisory Statement

The Air Pollution Control Advisory Committee recommended adopting the proposed Rule 67.24 at its March 30, 1994 meeting.

Fiscal Impact

Adopting the proposed rule will have no fiscal impact on the District.

Alternatives

Not adopt Rule 67.24. The requirements of the federal Clean Air Act to adopt rules reflecting RACT for major VOC emission sources and the requirements of the California Clean Air Act to adopt all feasible VOC control measures (Health and Safety Code Section 40914) would not be met under this alternative. Also, EPA notified the District that it must submit a RACT rule for major VOC source bakery ovens to EPA before July 15, 1994 or EPA will impose

federal sanctions (2 to 1 emission offset ratio for new and expanding major industrial sources and withholding up to $75 million in federal transportation funds) on San Diego County if Rule 67.24 is not submitted to EPA before July 15, 1994. Accordingly, this alternative is not recommended.

BACKGROUND:

Rule 67.24 is a new rule developed to comply with federal and state law. The federal Clean Air Act requires all major sources of volatile organic compounds (VOC's) emitting 25 tons per year or more, to meet reasonably available control technology (RACT) requirements. EPA advised the District that it must submit RACT rules for bakery ovens that are major VOC sources by July 15, 1994 or EPA will impose federal sanctions (2 to 1 emission offset ratio for new and expanding major industrial sources and withholding up to $75 million in federal transportation funds) on San Diego County. In addition, the California Clean Air Act requires adopting all feasible VOC control measures.

Rule 67.24 regulates volatile organic compound (VOC) emissions from bakery operations. Volatile organic compounds, primarily ethanol, are formed from the fermentation process, induced by yeast metabolizing sugar in the dough of yeast-leavened breads. Ethanol remains in the dough until it is exposed to high temperatures when the bread is baked, and is emitted from the oven stacks.

There are more than 100 bakeries in San Diego County. They emit approximately 144 tons of VOC's per year. About 80 percent of these emissions (115 tons per year) come from the two largest wholesale bakeries. The remaining 20 percent is emitted by 30 smaller wholesale and retail bakeries and 75 in-store retail bakeries, mostly in supermarkets.

Bakeries emitting 25 tons of VOC's per year or more are required to reduce emissions by 90 percent. This efficiency can be achieved by using catalytic or thermal incineration or water scrubbing. These are readily available, technically and economically feasible control technologies used on bakeries of similar size in California and other parts of the country. Therefore, this level of control is considered RACT for bakeries.

There are four bakeries subject to the rule. Two smaller bakeries will only be required to keep yearly production and product records necessary to determine VOC emissions from their operations. One of the largest two bakeries emits 90 tons per year of VOC's, confirmed by a source test conducted by the District, and will be required to install RACT. The other large bakery has estimated emissions over 25 tons per year major source threshold, and will be required to apply RACT, if the emissions testing shows it is a federal major source.

The rule provides a compliance schedule for installing control equipment within 12 months after rule adoption. A new facility or a facility installing a new oven must be in compliance with the emission control requirements by the date its operation starts. All bakeries subject to the rule are required to keep records necessary to determine VOC emissions.

It should be noted that a possible emerging technology for VOC emission control on bakery ovens was recently brought to the District's attention, and the vendor requested that provisions be included in Rule 67.24 allowing its use. Because the technology has neither been demonstrated in the field nor in the laboratory, the District is concerned that it may not achieve the emission reductions claimed by the vendor and, as a result, may not meet the control level currently specified by EPA as RACT for bakeries. Accordingly, it is recommended that Rule 67.24 be adopted as currently proposed. The District will continue to monitor the progress of

this new technology and, if its performance is verified, will propose appropriate amendments to the rule.

Section 40001 of the State Health and Safety Code requires the District to determine, prior to adopting any rule to reduce emissions of criteria pollutants, that the rule will alleviate a problem and promote the attainment or maintenance of state or federal air quality standards. San Diego County does not attain the state or federal ambient air quality standard for ozone. The proposed rule will reduce emissions of volatile organic compounds (ozone precursors) by 81 to 103 tons per year. Therefore, it will help to alleviate San Diego County's ozone non-attainment problem by promoting the attainment of the state and federal ozone standards.

On February 2, 1993, the Air Pollution Control Board directed that, with the exception of a regulation requested by business or a regulation for which a socioeconomic impact assessment is not required, no new or revised regulation shall be implemented unless specifically required by federal or state law. Proposed new Rule 67.24 is mandated by the federal Clean Air Act which requires that all major sources of VOC emissions be controlled by rules reflecting RACT. Failure to submit such a rule for bakery ovens to EPA before July 15, 1994, will result in the imposition of federal sanctions on San Diego County. Rule 67.24 also complies with the California Clean Air Act requirements to adopt all feasible control measures. Accordingly, Rule 67.24 is consistent with the February 2, 1993, Board direction.

Socioeconomic Impact Assessment

Section 40728.5 of the State Health and Safety Code requires the District to perform a socioeconomic impact assessment (SIA) for rules and regulations significantly affecting air quality or emission limitations. Rule 67.24 imposes new emission limitations on sources. Accordingly, a SIA was prepared by the District and made available for public comments at the January 20, 1994 workshop.

Overall, the cost-effectiveness of Rule 67.24 will range from $1.50 to $2.75 per pound. This is comparable to the cost-effectiveness of other VOC control measures adopted by the District. The rule will not have a significant adverse affect on any small business, and will not have a significant impact on the region's economy or employment.

The SIA concluded that the rule will result in a total compliance cost to affected industry of up to $366,000 per year. The total annual compliance cost for the two large bakeries will be approximately $240,000 and $124,000 per year, respectively, assuming both will be subject to RACT requirements. The annual recordkeeping cost for all four bakeries will be an additional $600 each. It is estimated that the average cost increase of a pound of bread as a result of adopting Rule 67.24 will be approximately one-half cent. Since the increase in the cost of a pound of bread will be negligible, it is expected that the affected large bakeries will likely be able to pass the cost of rule compliance on to their customers. If emission testing of the second large bakery shows its emissions are under 25 tons per year, the impact of the rule will be significantly less than predicted.

California Environmental Quality Act

The California Environmental Quality Act requires an environmental review for certain actions. However, no significant adverse impacts on the environment have been suggested to result from the proposed rule, and no such impacts are reasonably possible.

SUBJECT: Adoption of New Rule 67.24 (Bakery Ovens)

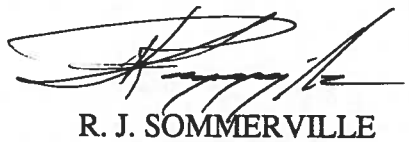
The adoption of the proposed new Rule 67.24 will not have a significant effect on the environment and therefore is categorically exempt from the provision of the California Environmental Quality Act pursuant to California Code of Regulations, Title 14, Sections 15300 and 15308, as an action taken to assure the maintenance or protection of the environment where the regulatory process involves procedures for protection of the environment.

Public workshops on proposed Rule 67.24 were held on November 5, 1992 and January 20, 1994. The workshop reports and Socioeconomic Impact Assessment are attached.

Concurrence:

DAVID E. JANSSEN
Chief Administrative Officer

Respectfully submitted,



R. J. SOMMERVILLE
Air Pollution Control Officer

AIR POLLUTION CONTROL BOARD
AGENDA ITEM
INFORMATION SHEET

SUBJECT: Adoption of New Rule 67.24 (Bakery Ovens)

SUPV DIST.: All

TD 4/6/94.

COUNTY COUNSEL APPROVAL: Form and Legality [X] Yes [ ] N/A
[ ] Standard Form [ ] Ordinance [X] Resolution

AUDITOR APPROVAL: [X] N/A [ ] Yes **4 VOTES:** [ ] Yes [X] No

FINANCIAL MANAGEMENT REVIEW: [ ] Yes [X] No

CONTRACT REVIEW PANEL: [ ] Approved _____ [ ] N/A

CONTRACT NUMBER(S): N/A

PREVIOUS RELEVANT BOARD ACTION:

BOARD POLICIES APPLICABLE:

CITIZEN COMMITTEE STATEMENT: The Air Pollution Control District Advisory Committee recommended adoption of proposed Rule 67.24 at its March 30, 1994 meeting.

CONCURRENCES: N/A

ORIGINATING DEPARTMENT: Air Pollution Control District County of San Diego

CONTACT PERSON: Richard J. Smith, Deputy Director 750-3303 MS: 0-176

R.J. SOMMERVILLE
DEPARTMENT AUTHORIZED REPRESENTATIVE

APRIL 19, 1994
MEETING DATE

FINDINGS OF THE SAN DIEGO COUNTY AIR POLLUTION CONTROL BOARD IN RESPECT TO ADOPTION OF NEW RULE 67.24 (BAKERY OVENS)

A. Pursuant to section 40727 of the Health and Safety Code, the Air Pollution Control Board of the San Diego County Air Pollution Control District makes the following findings:

1. (Necessity) The adoption of the proposed new District Rule 67.24 is necessary for the District to satisfy the requirements of section 182(a)(1)(A) of the federal Clean Air Act requiring adoption of rules relating to reasonably available control technology for new or modified stationary sources, and California Health and Safety Code sections 40914 requiring adoption of all feasible measures for reducing emissions of volatile organic compounds and 40919 requiring application of best available retrofit control technology to existing stationary sources.

2. (Authority) The adoption of the new proposed rule is authorized by Health and Safety Code sections 40001, 40702 and 40914.

3. (Clarity) The proposed new rule is written so that its meaning can be easily understood by persons directly affected by the rule.

4. (Consistency) The proposed rule is in harmony with, and not in conflict with or contrary to, existing statutes, court decisions, and State law and Federal regulations.

5. (Nonduplication) The proposed rule does not impose the same requirements as an existing state or federal regulation.

6. (Reference) The adoption of the proposed new rule implements section 182(a)(1)(A) of the federal Clean Air Act [42 U.S.C. section 7511a(a)(1)(A)], and California Health and Safety Code sections 40914 and 40919.

B. The Air Pollution Control Board further finds that an assessment of socioeconomic impacts of the proposed rule was performed and made available for public comment and review pursuant to Health and Safety Code section 40728.5, and that the socioeconomic impacts of the proposed rule have been actively considered and the District has made a good faith effort to minimize adverse socioeconomic impacts.

C. The Air Pollution Control Board further finds that there is no reasonable possibility that the proposed rule may have a significant effect on the environment, and that the adoption of the proposed rule is categorically exempt from the provisions of the California Environmental Quality Act pursuant to California Code of Regulations, title 14, sections 15300 and 15308, as an action taken to assure the protection of the environment which will not have a significant effect on the environment and where the regulatory process involves procedures for protection of the environment.

D. The Air Pollution Control Board further finds in accordance with Health and Safety Code section 40001 that the adoption of the proposed rule is necessary to satisfy federal and state law, and that the proposed rule will promote the attainment of state and federal ambient air quality standards.

APCD Meeting 6/7/94
Agenda Item #4

OFFICIAL RECORD
Clerk of the Board of Supervisors
Exhibit No. _____ Agenda No. 4
Meeting Date JUN 7 1994
Presented by _____
Document No. 759973
THOMAS J. PASTUSZKA
Clerk of the Board of Supervisors

NEW ADDED RULE

Reso 94-201

Re Rules and Regulations of the)
Air Pollution Control District)
of San Diego County . . . . .)

TUESDAY, JUNE 7, 1994

**RESOLUTION ADDING RULE 67.24
TO REGULATION IV
OF THE RULES AND REGULATIONS OF THE
SAN DIEGO COUNTY AIR POLLUTION CONTROL DISTRICT**

On motion of Member MacDonald, seconded by Member Bilbray the following resolution is adopted:

WHEREAS, the San Diego County Air Pollution Control Board, pursuant to Section 40702 of the Health and Safety Code, adopted Rules and Regulations of the Air Pollution Control District of San Diego County; and

WHEREAS, said Board now desires to amend said Rules and Regulations; and

WHEREAS, notice has been given and a public hearing has been had relating to the amendment of said Rules and Regulations pursuant to Section 40725 of the Health and Safety Code,

NOW THEREFORE IT IS RESOLVED AND ORDERED by the San Diego County Air Pollution Control Board that the Rules and Regulations of the Air Pollution Control District of San Diego County be and hereby are amended as follows:

Proposed new Rule 67.24 is to read as follows:

RULE 67.24. BAKERY OVENS

(a) **APPLICABILITY**

Except as provided in Section (b), this rule is applicable to bakery ovens which emit volatile organic compounds (VOC's) during the baking of yeast-leavened products.

Bakery ovens subject to this rule shall not be subject to Rule 66.

(b) **EXEMPTIONS**

(1) The provisions of this rule shall not apply to bakery ovens which are located at a stationary source where the combined rated heat input capacity of all bakery ovens is less than 2 million British Thermal Units (BTU) per hour.

It shall be the responsibility of any person claiming the exemption in Subsection (b)(1) to provide information necessary for the District to determine the combined rated heat

input capacity of all bakery ovens. Such information may include oven or burner manufacturer specifications, or may include fuel or energy consumption rates for oven start-up period(s) in cases where manufacturer specifications are unavailable.

(2) The provisions of this rule shall not apply to ovens used exclusively for the baking of products leavened chemically without yeast.

(3) The provisions of Sections (d) and (g) of this rule shall not apply to bakery ovens which are located at a stationary source where the uncontrolled emissions of VOC's from all bakery ovens combined is less than 25 tons per calendar year.

(c) DEFINITIONS

For the purposes of this rule, the following definitions shall apply:

(1) **"Bakery Oven"** means an oven which bakes yeast-leavened products, including but not limited to breads, buns, and rolls.

(2) **"Combustion Stack"** means a stack on a bakery oven which emits exclusively combustion exhaust gases which do not pass through the oven's baking chamber.

(3) **"Comfort Hood Vent"** means a vent or hood used to control air flow outside the entrance or exit of a bakery oven.

(4) **"Exempt Compound"** means any of the following compounds or classes of compounds: 1,1,1-trichloroethane, methylene chloride, trichlorofluoromethane (CFC-11), dichlorodifluoromethane (CFC-12), trifluoromethane (HFC-23), trichlorotrifluoroethane (CFC-113), dichlorotetrafluoroethane (CFC-114), chloropentafluoroethane (CFC-115), chlorodifluoromethane (HCFC-22), dichlorotrifluoroethane (HCFC-123), dichlorofluoroethane (HCFC-141b), 1,1,1,2-tetrafluoroethane (HFC-134a), 1,1,2,2-tetrafluoroethane (HFC-134), chlorodifluoroethane (HCFC-142b), 2-chloro-1,1,1,2-tetrafluoroethane (HCFC-124), pentafluoroethane (HFC-125), 1,1,1-trifluoroethane (HFC-143a), 1,1-difluoroethane (HFC-152a), and the following four classes of perfluorocarbon (PFC) compounds:

(i) cyclic, branched, or linear, completely fluorinated alkanes;

(ii) cyclic, branched, or linear, completely fluorinated ethers with no unsaturations;

(iii) cyclic, branched, or linear, completely fluorinated tertiary amines with no unsaturations; and

(iv) sulfur containing perfluorocarbons with no unsaturations and with sulfur bonds only to carbon and fluorine.

(5) **"Fermentation Time"** means the elapsed time between adding yeast to dough or sponge and placing the dough or sponge into a bakery oven, excluding retardation time, expressed in hours.

(6) **"Purge Stack"** means a bakery oven stack used exclusively for evacuation of residual gases from the bakery oven during burner ignition.

(7) **"Retardation Time"** means any portion(s) of the elapsed time between adding yeast to dough or sponge and placing the dough or sponge into a bakery oven, where the dough or sponge is refrigerated at temperatures of less than 10° C (50° F), for the specific purpose of retarding the fermentation process.

(8) **"Stationary Source"** means the same as defined in Rule 20.1.

(9) **"Uncontrolled VOC Emissions"** means VOC emissions from a bakery oven, before application of add-on air pollution control equipment or process modification.

(10) **"Volatile Organic Compound (VOC)"** means any compound of carbon, which may be emitted to the atmosphere during bakery oven operations, except methane, carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, ammonium carbonate, and exempt compounds.

(11) **"Yeast Percentage"** means the pounds of yeast added to a hundred pounds of total flour in the recipe.

(d) **STANDARDS**

(1) No person shall operate a bakery oven subject to this rule, unless uncontrolled VOC emissions are reduced by at least 90 percent by weight.

(2) A person may comply with the requirements of Subsection (d)(1) of this rule by using an air pollution control system which:

(i) has been installed in accordance with an Authority to Construct; and

(ii) includes an emission collection system(s) which ducts the exhaust gases from all stacks, except purge stacks, combustion stacks, and comfort hood vents, on all bakery ovens to VOC emission control device(s). Such ducting shall be maintained so as to be free of visible holes, breaks, openings or separations between adjoining components from which VOC's may be emitted to the atmosphere; and

(iii) has one or more VOC emission control devices, each with reduction efficiency of at least 90 percent by weight.

(3) A person subject to the requirements of Subsection (d)(2) shall submit an Operation and Maintenance Plan for the proposed emission control device and emission collection system to the Air Pollution Control Officer for approval, and receive such approval prior to the operation of the control equipment. Thereafter, the plan can be modified, with Air Pollution Control Officer approval, as necessary to ensure compliance. Such plan shall:

(i) identify all key system operating parameters. Key system operating parameters are those necessary to ensure compliance with Subsection (d)(2)(iii) such as temperature, pressure, and/or flow rate; and

(ii) include proposed inspection schedules and anticipated ongoing maintenance regarding the key system operating parameters.

(4) A person subject to the requirements of Subsection (d)(3) shall implement the plan upon approval of the Air Pollution Control Officer, and shall comply with the provisions of the approved plan thereafter.

(e) RECORDKEEPING

After (*six months after date of adoption*), a person operating a bakery oven(s) subject to this rule shall maintain records in accordance with the following:

(1) Maintain current records necessary to determine VOC emissions for all bakery ovens including, but not limited to, type of each yeast-leavened baked product, yeast percentage for each product, and fermentation time for each product; and

(2) Maintain annual records based on calendar year production rates, by weight, of finished baked product for each yeast-leavened product.

(3) For control equipment, maintain daily records of key system operating parameters specified in Subsection (d)(3)(i), which will demonstrate continuous operation and compliance of the emission control device during periods of emission producing activities.

Records maintained in accordance with Subsection (e)(2) are subject to District verification after 60 days following the end of a calendar year. These records shall be maintained on site for at least three years and shall be made available to the District upon request.

(f) TEST METHODS

(1) For the purposes of determining the total annual uncontrolled VOC emissions from a stationary source, VOC emission factors for each yeast-leavened bakery product shall be determined in accordance with both Table 67.24 and the following formula:

$$EF = 0.95\ Y_i + 0.19\ t_i - 0.51S - 0.86\ t_s + 1.90$$

where Y_i = initial yeast percentage

t_i = total fermentation time

S = second (spiking) yeast percentage, if applicable

t_s = fermentation time for second yeast percentage, if applicable, and

EF = emission factor, pounds of VOC emissions per ton of baked product

Annual uncontrolled emission rates shall be calculated by multiplying emission factors and the annual production rate for each yeast-leavened finished bakery product. The highest of the two calculated emission rates for a stationary source shall be used for the purposes of this rule. In cases where annual emissions for a stationary source, as determined using the highest emission rate, exceed 80 percent of the annual emissions specified in Subsection (b)(3), or other cases as deemed appropriate by the Air Pollution Control Officer, emission factors shall instead be determined in accordance with Subsection (f)(2).

Instead of using calculated emission factors, an owner or operatior may elect to use VOC emission factors determined according to Subsection (f)(2).

(2) VOC emission factors for yeast-leavened bakery products may be determined by EPA Methods 18, 25, and/or 25A (40 CFR 60) as they exist on (*date of adoption*), together with exhaust flow rates and oven throughputs. Test procedures shall be performed in accordance with a protocol approved by the Air Pollution Control Officer. An alternative test method may be used provided such method has been approved, in advance, by the Air Pollution Control Officer, ARB and EPA.

(3) Measurement of emission control device reduction efficiency subject to Subsection (d)(2)(iii) of this rule shall be conducted in accordance with EPA Methods 18, 25, and/or 25A (40 CFR 60) as they exist on (*date of adoption*). Test procedures shall be performed in accordance with a protocol approved by the Air Pollution Control Officer.

(g) COMPLIANCE SCHEDULE

A person operating a bakery oven(s) subject to Subsection (d)(2) of this rule shall meet the following increments of progress:

(1) For an oven which commenced operation prior to (*date of adoption*), or for a replacement of such an oven:

(i) By (*six months after date of adoption*), submit to the Air Pollution Control Officer any necessary application for Authority to Construct and Permit to Operate an air pollution control system meeting the requirements of Subsection (d)(2);

(ii) By (*twelve months after date of adoption*), install an air pollution control system pursuant to Subsection (d)(2).

(2) For an oven which commences operation on or after (*date of adoption*), be in compliance with Subsection (d)(1) by the date of commencement of oven operation.

(3) For an existing stationary source having a calculated annual emission rate pursuant to Subsection (f)(1) exceeding 80 percent of the emission rate specified in Subsection (b)(3), by (*two months after date of adoption*), submit to the Air Pollution Control Officer for approval a plan for emissions testing pursuant to Subsection (f)(2). Such plan shall provide for emissions testing to be completed, and test report(s) submitted, by (*six months after date of adoption*).

Stationary sources electing to comply with Subsections (d)(2) and (g)(1) shall not be subject to Subsection (g)(3).

TABLE 67.24

Yt*	Emission Factor**	Yt*	Emission Factor**	Yt*	Emission Factor**
1.0	0.8488	11.0	5.2947	21.0	9.7405
1.5	1.0711	11.5	5.5170	21.5	9.9628
2.0	1.2934	12.0	5.7393	22.0	10.1851
2.5	1.5157	12.5	5.9616	22.5	10.4074
3.0	1.7380	13.0	6.1839	23.0	10.6297
3.5	1.9603	13.5	6.4061	23.5	10.8520
4.0	2.1826	14.0	6.6284	24.0	11.0743
4.5	2.4049	14.5	6.8507	24.5	11.2966
5.0	2.6272	15.0	7.0730	25.0	11.5189
5.5	2.8495	15.5	7.2953	25.5	11.7412
6.0	3.0718	16.0	7.5176	26.0	11.9635
6.5	3.2941	16.5	7.7399	26.5	12.1857
7.0	3.5163	17.0	7.9622	27.0	12.4080
7.5	3.7386	17.5	8.1845	27.5	12.6303
8.0	3.9609	18.0	8.4068	28.0	12.8526
8.5	4.1832	18.5	8.6291	28.5	13.0749
9.0	4.4055	19.0	8.8514	29.0	13.2972
9.5	4.6278	19.5	9.0737	29.5	13.5195
10.0	4.8501	20.0	9.2959	30.0	13.7418
10.5	5.0724	20.5	9.5182		

*Yt = (Yeast Percentage) x (Fermentation Time)

If yeast is added in two steps,
Yt = (percentage of initial yeast addition) x (time from initial yeast addition to placement in oven)
+ (percentage of second yeast addition) x (time from second yeast addition to placement in oven)

** Emission Factor = pounds of VOC per ton of finished baked product

IT IS FURTHER RESOLVED AND ORDERED that the subject addition of Rule 67.24 to Regulation IV shall take effect upon adoption.

PASSED AND ADOPTED by the Air Pollution Control Board of the San Diego County Air Pollution Control District, State of California, this 7th day of June, 1994 by the following votes:

AYES: Bilbray, Jacob, MacDonald
NOES: None
ABSENT: Slater, Williams

APPROVED AS TO FORM AND LEGALITY
COUNTY COUNSEL
BY _____
DEPUTY

STATE OF CALIFORNIA)ss.
County of San Diego)

I hereby certify that the foregoing is a full, true, and correct copy of the Original Resolution which is now on file in my office.

THOMAS J. PASTUSZKA
Clerk of the Air Pollution Control Board

By Maritza C Steele
Maritza C. Steele, Deputy

Resolution No. 94-201
No. 4 (APCB)
6/7/94
MCS

AIR POLLUTION CONTROL DISTRICT
COUNTY OF SAN DIEGO

RULE 67.24 - BAKERY OVENS

1ST WORKSHOP REPORT

A workshop notice was mailed to all companies that operate bakeries in San Diego County. Notices were also mailed to all Chambers of Commerce in San Diego County, all Economic Development Corporations, the U.S. Environmental Protection Agency (EPA), the California Air Resources Board (ARB), and other interested parties.

The workshop was held on November 5, 1992, and was attended by 11 persons. Written comments were also received. The workshop comments and District responses are as follows:

1. WORKSHOP COMMENT:

Rule 67.24 requires that all process information records be kept on site and made available to the District upon request. Will these records be maintained as confidential information, or are they subject to public disclosure?

DISTRICT RESPONSE:

In general, the records will be subject to public disclosure. However, any facility which considers its records to be "trade secret" should submit a request for confidentiality, as stipulated in District Rule 176.

2. WORKSHOP COMMENT:

Rule 1153 of the South Coast Air Quality Management District (SCAQMD) for bakery ovens allows the use of equivalent test methods if they are approved by that District. Rule 67.24 should provide the same flexibility.

DISTRICT RESPONSE:

The District disagrees. The use of equivalent test methods in general must also be reviewed and approved by ARB and EPA. This approval is a very lengthy process, and should only be used if the standard test methods are not adequate for a specific purpose. The EPA reference test methods specified in Rule 67.24 have been successfully used for determination of VOC emissions from bakery ovens in California and other states.

3. WORKSHOP COMMENT:

How often would the District conduct source tests to determine efficiency of emission control devices?

DISTRICT RESPONSE:

Once the emission control system is installed, the District will require an initial source test to be conducted verifying the emission reduction efficiency. Thereafter, daily compliance with the rule will be ensured by monitoring and recording key system operating parameters such as temperature, pressure or flow rates. Initial re-testing may be annual. Depending on the reliability of the control equipment and its performance, testing thereafter may be less frequent or less extensive.

4. WORKSHOP COMMENT:

The South Coast AQMD Rule 1153 provides for a one year postponement of compliance schedule dates if a bakery elects to install a new 'replacement' oven within one year after the rule adoption. Rule 67.24 should contain such a provision.

DISTRICT RESPONSE:

The District does not agree that a one year postponement of the final compliance date is necessary if a bakery elects to replace an existing oven. While SCAQMD Rule 1153 provides a one year postponement for the implementation of emission control in such cases, it requires a bakery to submit a compliance plan for the oven replacement within one year of the rule adoption. Proposed Rule 67.24 provides a bakery a one year period after rule adoption to apply for an Authority to Construct to install an air pollution control system, or replace the old oven with a new oven with necessary emission controls, and then two more years to demonstrate compliance with the rule.

Essentially, both rules require that within a year of adoption, a facility must make a decision on how to comply with the rule. It should be noted that in order to make an informed decision, the facility should conduct a technical and economic feasibility analysis of available options. Once such an analysis is completed and a decision is made, most information necessary to apply for the District's Authority to Construct is available. Two more years as provided in the rule should be sufficient time either to install air pollution control equipment on the old oven, or to install a new oven and air pollution control equipment, since new ovens can be installed as a package with air pollution control equipment included. The rule has been revised to clarify this.

5. WRITTEN COMMENT:

The cost-effectiveness of this rule, projected at $3.14 to $3.45 per pound of VOC's, is significantly higher than $1.38/lb for the Bay Area Air Quality Management District (BAAQMD), or $0.85/lb for the SCAQMD.

DISTRICT RESPONSE:

The cost-effectiveness values cited were contained in the tactic for bakeries included in the District's 1991 Regional Air Quality Strategy (RAQS). Those projections were based on now outdated EPA emission factors. The District has now calculated cost-effectiveness values using emission factors derived from the new EPA formula as well as recent District source testing. They are $1.10 to $2.00 per lb of VOC reduced and are consistent with those of the BAAQMD and SCAQMD.

6. WRITTEN COMMENT:

A bakery should not be subject to the control requirements of Rule 67.24 if it reduces its emissions below 25 tons per year through process modifications and/or production cutbacks before the rule goes into effect.

DISTRICT RESPONSE:

The 1990 Federal Clean Air Act Amendments require the District to adopt rules reflecting Reasonably Available Control Technology (RACT) for major stationary sources. For San Diego County, identified as a "severe" federal ozone non-attainment area, a major source is a facility which emits 25 tons per year or more of VOC's. For existing sources, EPA considers a facility which emitted 25 tons per year or more of VOC's in 1990 or after a major source. However, if actual VOC emissions from such a source are below 25 tons per year at the time the rule is adopted, the source could agree to accept

federally enforceable permit terms and conditions limiting its potential to emit to less than 25 tons per year. Such limitations must be subject to a public notice, a public comment period, and a 45-day federal EPA review period.

7. WRITTEN COMMENT:

Recent technology shows the potential for process changes which, alone or in combination with control equipment, could provide 90 percent VOC emission reduction. The rule should be revised to allow this possibility.

DISTRICT RESPONSE:

The District agrees. The rule has been revised to require 90 percent reduction of VOC emissions, and to provide for the option of achieving this by using air pollution control equipment.

8. WRITTEN COMMENT:

The compliance schedule in the rule requires a facility to apply for an Authority to Construct two years before the final compliance date and to issue purchase orders fifteen months before the final compliance date. This schedule is too restrictive to allow facilities to take advantage of any improved technology that may become available before the final compliance date.

DISTRICT RESPONSE:

The District agrees. The compliance schedule has been revised to delete the requirement to issue purchase orders for equipment. This change will provide a facility the flexibility to choose the most recent technology, in a time frame allowed by the final compliance date. If a facility finds alternative technology after submitting an application or receiving an Authority to Construct, the operator can request an amendment to the application or Authority to Construct to reflect this alternative technology.

9. WRITTEN COMMENT:

The requirements for an Operation and Maintenance plan involve the District in counter-productive micro-management of emission control equipment. This subsection should be deleted.

DISTRICT RESPONSE:

The District disagrees. The Operation and Maintenance plan is one of the tools used to ensure continued compliance with Rule 67.24. All District rules containing a requirement for add-on control equipment have provisions for Operation and Maintenance Plans.

10. WRITTEN COMMENT:

The definition of "Fermentation Time" should exclude time in which the dough or sponge is refrigerated to retard the fermentation process, and therefore VOC formation.

DISTRICT RESPONSE:

The District agrees. The "Fermentation Time" definition has been modified, and a definition for "Retardation Time" has been added.

11. WRITTEN COMMENT:

The definition for "Volatile Organic Compound" should be modified to exclude ethane.

DISTRICT RESPONSE:

The District disagrees. ARB has determined that ethane is a photochemically reactive organic compound, i.e. a VOC. In addition, the amount of ethane emissions from a properly operating bakery oven is negligible, and should have little or no impact on the total calculated amount of VOC emissions from a facility.

12. WRITTEN COMMENT:

Rated heat input capacity is not a useful indicator of bakery oven emissions. The rule exemption of 2 million BTU/hr combined heat capacity should be deleted, and all facilities with less than 25 tons per year emissions should be exempt from the entire rule.

DISTRICT RESPONSE:

The District disagrees. If the suggested exemption based on the amount of emissions were adopted, all bakeries, regardless of size, would be required to keep records necessary to calculate their annual VOC emissions.

On the other hand, extensive data gathered in other air districts on emissions from bakery ovens showed that the VOC emissions from ovens with a rated heat capacity less than 2 million BTU/hr are not significant. Therefore, the exemption based on the oven rated heat capacity in the proposed rule will relieve small sources from unnecessary recordkeeping requirements.

13. WRITTEN COMMENT:

The rule requirement to keep separate records for each oven is unnecessary.

DISTRICT RESPONSE:

The District agrees. The rule has been revised to only require records for the facility as a whole, not each oven.

14. WRITTEN COMMENT:

The records for current recipe parameters, i.e. yeast percentage and fermentation time, should be kept monthly to match production rates.

DISTRICT RESPONSE:

The District disagrees. Although production rates are expected to fluctuate, recipe parameters may never change. If they do change, such changes need to be kept current by recording them when they occur. Also it should be noted that the revised rule requires annual instead of monthly recordkeeping.

15. WRITTEN COMMENT:

EPA has approved BAAQMD Rule 42, which allows bakeries to control emissions from the oven stack having the highest emission rate. This acknowledges that stacks such as purge stacks and comfort hood vents do not have significant emissions. Rule 67.24 should contain these provisions.

DISTRICT RESPONSE:

The current BAAQMD Rule 42 requires controls on all regular oven stacks. However, purge stacks and comfort hood vents are expected to have negligible emissions and proposed Rule 67.24 has been revised to exclude these stacks from control requirements.

16. WRITTEN COMMENT:

BAAQMD Rule 42 exempts ovens used exclusively for products other than breads, buns, and rolls. Such an exemption should be included in Rule 67.24.

DISTRICT RESPONSE:

The District disagrees. There is no information available to the District which demonstrates that ovens used for baking yeast leavened products other than breads, buns, and rolls have lower VOC emissions than ovens baking these products.

17. WRITTEN COMMENT:

The table in Rule 67.24 uses emission factors derived from the equation developed by the American Institute of Baking (AIB). The EPA recently published the Alternative Control Technology (ACT) Document which contains another equation for determining emission factors, developed by EPA with new source test data. Rule 67.24 should provide for the use of both equations.

DISTRICT RESPONSE:

The District disagrees. These equations cannot be used interchangeably because in many cases they result in significantly different emission estimates. In addition, EPA has recently disapproved the BAAQMD test method for determination of VOC emissions from bakery ovens because it contained serious experimental flaws. This invalidates the AIB equation since the BAAQMD test method was used in the determination of the AIB emission factors.

The equation suggested in the ACT document was derived based on the emission data obtained using EPA approved test methods. However, the coefficients in this equation were determined solely by regression analysis, and the equation's usefulness for predicting accurate emission factors was never verified using another independent set of emission data.

The District recently conducted a source test for one of the bakeries in San Diego County. Emission factors determined from the test results deviated significantly from those predicted by the ACT formula. Based on the results of the source test and the above considerations, Rule 67.24 has been significantly revised. The table based on AIB emission factors has been deleted. Subsection (b)(3) now requires that EPA's ACT equation be used for the calculation of VOC emissions from bakery ovens. However, if the calculated emissions for a facility are 20 or more tons per year, which represents 80 percent of the rule threshold for the application of add-on control technology, the facility must conduct source testing to verify calculated emission rates.

18. PRE-WORKSHOP COMMENT:

Some bakery ovens are extremely old, and determining the combined rated heat input capacity in these cases may be difficult.

DISTRICT RESPONSE:

If burner rating specifications for ovens are unavailable from the manufacturer, a fuel consumption rate derived from the utility meter readings during the oven start-up period can be used for determination of combined oven capacity. The rule has been revised to include such a provision.

19. PRE-WORKSHOP COMMENT:

The emission factors in Rule 67.24, which were based on the study by the American Institute of Baking (AIB), may not provide accurate emission estimates for sweet goods. The BAAQMD rule exempts sweet goods such as sweet rolls, croissants, and danishes. Rule 67.24 should do the same.

DISTRICT RESPONSE:

The District disagrees. Upon examination of BAAQMD Rule 42, an exemption for ovens baking sweet goods could not be found. Additionally, Rule 67.24 has been revised to require the use of EPA's ACT formula. The ACT formula may not predict accurate emission factors for the baking of sweet goods. However, for the few bakeries in San Diego County which specialize in sweet goods, emission estimates using the ACT formula are far below the proposed 20 tons per year source testing threshold. Therefore, the accuracy of these estimates should be sufficient for purposes of Rule 67.24.

20. PRE-WORKSHOP COMMENT:

What types of records required by the rule will be acceptable to the District Compliance Division?

DISTRICT RESPONSE:

The revised rule requires annual recordkeeping based on a calendar year. For annual recordkeeping, production records based upon individual product batch records or sales records could be compiled at the end of the calendar year. This information will essentially be the same as submitted for the District survey of early 1992.

21. PRE-WORKSHOP COMMENT:

Would the weight of dried fruit, such as raisins in raisin bread, count as part of the weight of finished baked product, in using the emission factors for Rule 67.24?

DISTRICT RESPONSE:

No, the weight of dried fruit would not count toward the weight of finished baked product in the use of emission factors for Rule 67.24. The District recommends excluding weight of fruit from such products when reporting production rates.

22. ARB COMMENT:

The District should consider requiring 95 percent emission reduction for ovens emitting more than 13 tons per year, as required by SCAQMD Rule 1153. Requirements less stringent than 95 percent reduction may not satisfy the requirements of the California Clean Air Act.

DISTRICT RESPONSE:

The California Clean Air Act requires that the District's rules applicable to non-attainment pollutants and their precursors contain the Best Available Retrofit Control Technology (BARCT). The BARCT Guidance Documents for VOC and NOx sources are being developed by statewide Technical Review Group committees which include representatives of the ARB, the EPA and local districts. However, the BARCT determination for bakery ovens has not yet been developed.

The control requirements in SCAQMD Rule 1153 do not necessarily represent BARCT. In addition, for control equipment such as catalytic oxidizers, the 90 percent control efficiency is more realistic than 95 percent on an ongoing basis.

The present exemption level (25 tons per year of VOC emissions) in Rule 67.24 reflects the requirements of the Federal Clean Air Act Amendments of 1990. Any possible future changes to the exemption level will be determined based on the economic feasibility and the cost-effectiveness of control technology required as part of the statewide BARCT determination process.

23. ARB COMMENT:

Section (b)(3) in the rule should reference a test method for determining annual VOC emissions for the 25 tons per year exemption.

DISTRICT RESPONSE:

The rule has been revised to include the methods for determination of annual VOC emissions from bakery ovens.

24. ARB COMMENT:

The rule should contain a provision for verifying and quantifying the presence of perfluorocarbon exempt compounds.

DISTRICT RESPONSE:

The District disagrees. Although perfluorocarbons are manufactured compounds which may be present in coating materials, they will not be present in bakery oven emissions, nor will anyone claim them to be.

25. EPA COMMENTS:

The EPA Region IX had no comments at this time but reserved the right to make future comments on any changes or modifications to the rule.

PC/jo

San Diego Air Pollution Control District
9150 Chesapeake Drive, San Diego, CA 92123

ID No.
FOR APCD USE ONLY

1991 and 1990 BAKERY EMISSIONS INVENTORY

Complete this form for locations that produce yeast-leavened bakery products. Please duplicate this form, as necessary, to use for additional baked products.

Address:

Bakery Name: _____ _____

dba (if different) _____ _____

Phone Number: _____ _____

Oven ID	Baked Product	Yeast Percentage		Fermentation Time		Annual Production	
		Step 1	Step 2	Step 1	Step 2	in 1991	in 1990

Oven ID - any bakery reference used; for example, Oven 1, Oven 2, etc.

Baked Product - brief description; for example, wheat loaves, white buns, etc.

Yeast Percentage - expressed as percent of total flour (baker's %). If yeast is added in 2 steps, please list separately

Fermentation Time - if yeast is added in 2 steps, please list separately the time for each step (in hours). Total time should equal time from initial yeast addition to entrance into oven.

Annual Production - (in 1000's of pounds of final baked product) for 1991 and 1990 calendar years.

Do any ovens have air pollution control equipment for ethanol emissions? Yes: ☐ No: ☐

"The information herewith submitted is based on records for actual 1990 and 1991 production for this facility. Where records were not available, estimates have been made based on sound judgment."

Contact Name: Signature: Date:

_____ _____ _____

AIR POLLUTION CONTROL DISTRICT
COUNTY OF SAN DIEGO

RULE 67.24 - BAKERY OVENS

2ND WORKSHOP REPORT

A workshop notice was mailed to all companies that operate bakeries in San Diego County. Notices were also mailed to all Chambers of Commerce in San Diego County, all Economic Development Corporations, the U.S. Environmental Protection Agency (EPA), the California Air Resources Board (ARB), and other interested parties.

The proposed rule and Socioeconomic Impact Assessment (SIA) were presented for public comment. The workshop was held on January 20, 1994, and was attended by six people. Written comments were also received. The workshop comments and District responses are as follows:

1. WORKSHOP COMMENT:

If San Diego County's classification as a federal ozone nonattainment area is changed from 'severe' to 'serious', the federal major source threshold will change from 25 tons to 50 tons per year. Would the exemption level for emission control requirements in Subsection (b)(3) be changed accordingly?

DISTRICT RESPONSE:

No. In addition to federal requirements, the District must also meet California Clean Air Act requirements and implement all technically and economically feasible emission control measures. Such measures included in the District's 1991 Regional Air Quality Strategy (RAQS) are expected to be cost-effective for bakeries emitting 25 tons of VOC's per year or more. Therefore, an increased exemption level in Subsection (b)(3) would not meet state requirements.

2. WORKSHOP COMMENT:

Subsection (b)(1) exempts a bakery which has a combined rated capacity of all its ovens of less than two million BTU per hour. Would the District expect this exemption level to be changed in the future?

DISTRICT RESPONSE:

No. The Subsection (b)(1) exemption level is based on extensive data gathered in other air districts which showed that VOC emissions from ovens with a rated capacity less than two million BTU per hour are significantly less than 25 tons per year.

3. WORKSHOP COMMENT:

What purpose does the definition for 'purge stack' in Subsection (c)(5) serve?

DISTRICT RESPONSE:

Purge stacks are specifically exempt from the emission control requirements of the proposed rule in response to a comment received at the first workshop. The definition is needed to clarify this exemption.

4. WORKSHOP COMMENT:

Proposed Rule 67.24 requires 90 percent emission reduction from bakery ovens. The District maintains that this control level represents Reasonably Available Control Technology (RACT), and is mandated by EPA for VOC sources not subject to the existing or projected Control Technique Guideline (CTG) documents. However, regulations proposed in other states such as Texas and Arizona require emission reduction significantly less than 90 percent.

DISTRICT RESPONSE:

The Texas Office of Air Quality has confirmed that a proposed bakery rule requiring 30 percent emission reduction will be adopted in a few months. However, EPA Region VI informed the District that the rule is expected to be disapproved because it does not meet federal RACT requirements. A proposed bakery rule being developed in Arizona for the Phoenix area may not need to meet federal RACT requirements, as there may be no bakeries which are federal major sources. The Phoenix area is a 'moderate' ozone nonattainment area, and its major source threshold is therefore 100 tons per year of VOC's.

5. WORKSHOP COMMENT:

Why has Rule 67.24 been revised to replace the equation for emission factors developed by the American Institute of Baking (AIB) with the new equation published in EPA's Alternative Control Technology (ACT) document?

DISTRICT RESPONSE:

The AIB emission factors were based on the results of source tests conducted by the Bay Area Air Quality Management District (BAAQMD) using the test method developed by that District. EPA cited serious concerns with this method at the time of the proposed Rule 67.24 revision. Therefore, the District decided to use emission factors from the equation in the EPA ACT document, which was based on results of source tests conducted using the standard EPA test methods. Since the second workshop, however, EPA has approved the BAAQMD test method, thus Rule 67.24 has been revised to incorporate both equations.

It should be noted that these equations are based only on a regression analysis of a limited amount of source test data (not on the comprehensive theory of baking processes) and are not independently verified. As a result, the emission factors calculated from these equations can differ significantly, sometimes by as much as a factor of three. Therefore, Rule 67.24 specifies that if VOC emissions from a facility calculated by both equations are significantly different, the highest emissions estimate must be used for the facility. For facilities where the highest emissions estimate exceeds 20 tons per year (80% of the federal major source threshold), the rule requires that a source test be conducted. The rule also specifies EPA standard test methods, however other EPA approved test methods such as BAAQMD Method ST-32 can be used provided that they are also approved by the District.

6. WORKSHOP COMMENT:

Were the EPA methods specified in Section (f) used in the emissions testing that the District performed recently at one of the large bakeries?

DISTRICT RESPONSE:

Yes. The tests were performed using EPA Methods 18 and 25A.

7. WORKSHOP COMMENT:

Will the District pay for the emissions testing at the other large bakery that has not yet been tested?

DISTRICT RESPONSE:

No. Emission testing was conducted at one large bakery as part of the rule development process when it became evident that the emission factors predicted by the EPA and AIB equations for this bakery differed significantly. New emission factors obtained from the test have been used to calculate annual VOC emissions for this bakery. The result was not consistent with estimates predicted by either the AIB or EPA equation, and was interpreted as evidence that both empirical equations do not always reflect the actual variations in emission factors from baking processes. Based on this result, Rule 67.24 was revised as discussed earlier to require emission testing in certain cases. Such emission testing should typically be performed at the expense of the affected facility.

In addition, the rule has been revised to specify that if a facility elects to comply with Subsections (d)(2) and (g)(1) with the installation of emission controls, it would not be required to provide for emissions testing under Subsection (g)(3).

8. WORKSHOP COMMENT:

Do the test methods in Section (f) address specific aspects of the testing that the District performed recently at one of the large bakeries, such as the number of baked products tested, and the resulting extrapolation of emission factors for the other product lines at the bakery?

DISTRICT RESPONSE:

No. EPA Methods 18, 25, and 25A, specified in Subsection (f), are standard test methods for determining VOC emission rates from any point source, e.g. a stack. The result(s) obtained from such tests are mass emission rates, e.g. pounds per hour of VOC's. The EPA test procedures do not generally include any specific characteristics of the processes being tested for VOC stack emissions, such as the number of products tested in a bakery operation. The number of products tested would be determined based on best technical judgment considering, where possible, economic and time constraints, the selection of products that represent a majority of bakery production and/or emissions, and restrictions in the bakery's production schedules.

The extrapolation of emission factors to estimate emissions from the other product lines at the bakery was performed based on the District test results, and based on available test information from the American Institute of Baking (AIB) and EPA studies.

9. WORKSHOP COMMENT:

The four baked products tested for emission factors at the large bakery may not be a representative sampling of that bakery's many product lines. The new EPA equation was developed through an extensive testing process, and should be used to determine emission factors for the other product lines.

DISTRICT RESPONSE:

The equation in EPA's ACT document was derived based on emission data obtained from testing at four bakeries, and included test runs on 18 product lines (i.e. four or five products for each bakery)

with either a one-step or a two-step yeast addition. This equation was determined solely by statistical analysis, and its usefulness for predicting accurate emission factors was never verified using another independent set of emission data. In the absence of such verification, there is no basis for rejecting emission factors based on specific source test results for this bakery in favor of emission factors based on a general industry correlation.

A statistical analysis of the emission factor parameters for the affected bakery's products showed that the resulting annual emissions estimate remains above 50 tons per year within a 95 percent confidence interval. Therefore, the added expense associated with additional emissions testing to improve the accuracy of the extrapolation may not be justified, since the applicability of Rule 67.24 for the affected facility would not change.

10. WORKSHOP COMMENT:

What type of daily records are required to be collected and retained according to Subsection (e)(3)?

DISTRICT RESPONSE:

Subsection (e)(3) requires daily records of control system operating parameters. For example, the temperature of the exhaust from a catalytic oxidizer may need to be recorded. This is often accomplished by automated 'strip chart' recorders, but it may also be accomplished by reading from a calibrated temperature gauge and manually entering the reading into a written log or a computer. The raw data, whether on strip charts, log sheets, or computer printouts, should be retained for at least three years.

11. WORKSHOP COMMENT:

Subsection (c)(1) defines a bakery oven, in part, as a 'convection oven'. However, in some of the newer bakery ovens the heat transfer occurs not by convection, but by radiation. Does the District intend to exclude these ovens from requirements of Rule 67.24?

DISTRICT RESPONSE:

No. This is not the intent of the District, and proposed Rule 67.24 has been revised to apply to any bakery oven, regardless of the heat transfer mechanism involved.

12. WORKSHOP COMMENT:

Some bakery ovens are indirectly fired, i.e. the combustion exhaust stream does not pass through the oven baking chamber. Is Rule 67.24 intended to require the combustion exhaust from such ovens to be ducted to an air pollution control device?

DISTRICT RESPONSE:

No. This is not the intent of the District, and proposed Rule 67.24 has been revised to exclude combustion exhaust stacks on indirectly fired ovens from VOC emission control requirements.

13. WORKSHOP COMMENT:

Does the air pollution control equipment currently available to bakeries achieve 90 percent emission reduction?

DISTRICT RESPONSE:

Yes. Thermal and catalytic oxidizers often achieve greater than 95 percent efficiency. However, for catalytic oxidizers 90 percent efficiency will be more realistic to achieve than 95 percent on an ongoing basis.

14. WRITTEN COMMENT:

Ethanol, the primary VOC emitted from bakery ovens, has low photochemical reactivity and therefore contributes little to ozone nonattainment. District regulations should instead require automobile fuels to be converted to natural gas, thereby reducing emissions of more photochemically reactive VOC's.

DISTRICT RESPONSE:

The District disagrees. The VOC definition in District rules complies with federal requirements and does not distinguish between organic compounds of different degrees of reactivity.

15. WRITTEN COMMENT:

Rule 67.24 should provide bakeries flexibility in achieving VOC emission reductions from sources other than the ovens, such as conversion of bakery fleet vehicles to natural gas.

DISTRICT RESPONSE:

The District disagrees. State and federal requirements such as those for 'clean fuel' vehicles continue to increase, and such measures are included in the District's 1991 Regional Air Quality Strategy (RAQS). These requirements apply in addition to the federal RACT requirements, not in lieu of them.

16. WRITTEN COMMENT:

New technologies involving heat exchangers are being developed to make bakery ovens more energy efficient. They can reduce ethanol emissions by approximately 70 percent through condensation while avoiding the energy consumption, nitrogen oxides emissions, and high capital and operating expenses associated with catalytic oxidizers. Rule 67.24 should allow flexibility to use such new technologies.

DISTRICT RESPONSE:

Rule 67.24 does not specify that any particular method of compliance be used. As discussed earlier, the 90 percent emission reduction standard in proposed Rule 67.24 meets current federal requirements as RACT for bakeries. This standard is based upon proven add-on emissions control technology which has been applied in the field, e.g. catalytic oxidation.

In the future, emerging technologies which may achieve less than 90 percent emission reduction but which nevertheless can provide benefits over conventional technologies could be addressed by the District as source-specific SIP revision(s) subject to EPA approval.

17. ARB COMMENT:

Subsection (d)(2)(ii) refers to 'fugitive' VOC's. A definition for fugitive VOC's should be included.

DISTRICT RESPONSE:

The term 'fugitive' is not essential here, and for clarity it has been deleted from Subsection (d)(2)(ii).

18. ARB COMMENT:

Subsection (e)(2) refers to a 'calendar year'. To avoid confusion with a fiscal year, a definition for 'calendar year' should be included.

DISTRICT RESPONSE:

The District considers the term 'calendar year' to be sufficiently self-defining as the period from January 1 to December 31. The District also considers the term as being easily distinguishable from the term 'fiscal year'.

19. EPA COMMENT:

The recordkeeping requirements of Section (e) require all bakeries subject to the rule to keep records. However, the workshop notice describes the emission control requirements for major sources, and then indicates that the rule "... will also require moderate-sized bakeries that are not federal major sources to keep yearly records." Furthermore, the SIA states that "... Only the two smaller bakeries will be required to keep yearly [records]." Is the rule intended to apply recordkeeping requirements differently to the larger bakeries?

DISTRICT RESPONSE:

All bakeries subject to the rule are subject to the same annual recordkeeping requirements for production and recipe parameters. Any indication to the contrary in the workshop notice was unintentional.

20. EPA COMMENT:

Subsection (e)(3) specifies a requirement to maintain daily records of key system operating parameters for emissions control equipment. This subsection should include additional wording specifying that records sufficient to document continuous compliance be kept.

DISTRICT RESPONSE:

Subsection (e)(3) has been revised as suggested.

COMMENTS REGARDING THE SOCIOECONOMIC IMPACT ASSESSMENT

21. WORKSHOP COMMENT:

The Socioeconomic Impact Assessment (SIA) for Rule 67.24 indicates that the annual cost of compliance is estimated to be greater than ten percent of the annual Return on Equity (ROE) for the affected bakeries, thus exceeding an ARB criterion for significant economic impact. What effect does this have on proposed Rule 67.24?

DISTRICT RESPONSE:

State law requires that the District prepare SIA's to evaluate socioeconomic impacts for certain proposed rules and make a good faith effort to minimize adverse impacts. However, the efforts to minimize the economic impacts of a rule cannot be to the extent that the rule no longer meets the minimum statutory requirements.

ARB notes that its 'percent of ROE' guidance does not consider that compliance costs might be passed on to the customers of the affected business. As indicated in the SIA, the estimated cost of compliance would result in a cost increase of about 0.5¢ per pound of bread. It seems likely that bakeries will be able to pass on this cost to their customers and will not have to absorb all costs themselves. (See also the responses to Comments 22 and 23).

22. WORKSHOP COMMENT:

On what basis did the District conclude that the bakeries will likely be able to pass on cost increases?

DISTRICT RESPONSE:

As indicated in the SIA, general cost increases much larger than compliance costs which would result from Rule 67.24 have typically been passed on to supermarkets and convenience stores. These past price increases were verified by the District with the managers of such stores. The price increases were in turn passed on to consumers.

23. WORKSHOP COMMENT:

Bakeries that typically can pass on cost increases are those that bake the 'white bread' products sold to supermarkets. However, for bakeries which produce the more specialized whole grain products and/or which contract to sell products to businesses such as 'fast food' restaurant chains or 'warehouse' club chains, pricing is much more competitive, and it may be difficult to pass on any cost increase.

DISTRICT RESPONSE:

The District contacted local fast food restaurant chains, warehouse club chains, and the economics faculty at San Diego State University. This investigation showed that, although the general claim stated above may be valid for substantial price increases, it will not be true for a cost increase as small as 0.5¢ per pound.

In addition, in order to avoid passed on Rule 67.24 compliance costs, bakery customers would have to switch to other suppliers. The District's investigation has indicated that alternative suppliers will

be primarily from the South Coast air district, where bakeries are currently installing emissions control equipment and are expected to pass on similar compliance costs.

24. WORKSHOP COMMENT:

What sources of information were used by the District to calculate estimates for the cost of air pollution control equipment?

DISTRICT RESPONSE:

Cost estimations were calculated using methods published in EPA's OAQPS Control Cost Manual, and in the South Coast Air Quality Management District's Rule 1153 Staff Report. Where differences in the methods occurred, the District chose the higher, more conservative cost estimate.

25. WORKSHOP COMMENT:

A small local bakery which is not part of a nationwide corporation may not be able to put forth $800,000 of initial capital cost for control equipment. If financing is obtained, the term of the loan may be as short as three years, which would cause difficulty in passing on a gradual cost increase.

DISTRICT RESPONSE:

As indicated in the SIA, a company defined as a federal 'SBA small business' can qualify for a seven year loan from the State 'CLEAN' loan program. If a business is too large to qualify as an SBA small business, there are still loan assistance programs available from agencies such as the California Pollution Control Financing Authority (CPCFA) which works with the affected business to determine eligibility on a case-by-case basis.

PC:jo
3/8/94

SOCIOECONOMIC IMPACT ASSESSMENT

PROPOSED RULE 67.24 - BAKERY OVENS

San Diego County
Air Pollution Control District

April 1994

SOCIOECONOMIC IMPACT ASSESSMENT

PROPOSED RULE 67.24 - BAKERY OVENS

INTRODUCTION

Section 40728.5 of the State Health and Safety Code requires the Air Pollution Control District (District) to perform a socioeconomic impact assessment for any new or amended rules and regulations that will significantly affect air quality or emission limitations. This report contains the District's assessment of the socioeconomic impacts of proposed District Rule 67.24 - Bakery Ovens.

Rule 67.24 is a new rule developed to control volatile organic compounds (VOC's) emissions from bakery operations. Volatile organic compounds, primarily ethanol, are formed as a result of the fermentation process, induced by yeast metabolizing sugar in the dough of yeast-leavened breads. Ethanol remains in the dough until it is exposed to high temperatures during the bread baking process and is emitted from the oven stacks. Ethanol, when emitted to the atmosphere, participates in the photochemical reactions that form photochemical oxidant (ozone). The San Diego Air Basin exceeds both federal and state ambient air quality standards for ozone.

There are more than 100 bakeries in San Diego County. They emit approximately 144 tons of VOC's per year. About 80 percent of these emissions (115 tons per year) come from the two largest wholesale bakeries. The remaining 20 percent is emitted by 30 smaller wholesale and retail bakeries and 75 in-store retail bakeries, mostly in supermarkets.

Rule 67.24 applies to bakeries having ovens with a combined rated heat input capacity of more than 2 million British Thermal Units (BTU) per hour. The rule requirements are as follows:

- Bakeries emitting 25 tons per year or more of VOC are required to reduce their VOC emissions by 90%. If the reduction is achieved by installing air pollution control equipment, the facility must submit an operation and maintenance plan, which includes a proposed inspection schedule for the emission control system, and the anticipated maintenance for key control system operating parameters.

- The rule provides a compliance schedule for the installation of control equipment. An existing facility must install an air pollution control system within twelve months after rule adoption. A new facility or a facility installing a new oven must be in compliance with the emission control requirements by the date its operation starts.

- All bakeries subject to the rule are required to keep current records necessary to determine VOC emissions. This includes the type of each yeast-leavened baked product, yeast percentage and fermentation time for each product, and annual production records for each finished yeast-leavened product.

- Bakeries having ovens with less than 2 million BTU per hour combined heat input capacity and bakeries baking chemically leavened products are exempt from all rule requirements.

- Annual uncontrolled VOC emissions will be calculated using an estimation method developed by the Environmental Protection Agency (EPA) and the American Institute of Baking (AIB). If calculated annual emissions exceed 80 percent of the 25 tons per year threshold, emissions source testing will be required to more accurately determine annual emissions.

There are four bakeries in San Diego County which will be subject to the rule. The two smaller bakeries will be required only to keep yearly production and product formula records necessary to determine the amount of VOC emissions from their operations. One of the largest two bakeries emits more than 25 tons per year of VOC's, as calculated and confirmed by a source test conducted

by the District, and will be required to install emission control equipment. The other large bakery has estimated emissions greater than 80 percent of the 25 tons per year threshold, and will be required to conduct a source test to determine applicability of the rule's emission control requirements.

Because of this uncertainty, the socioeconomic impact assessment of proposed Rule 67.24 was conducted for the 'worst-case' situation, i.e. assuming that the latter bakery emits at least 25 tons per year of VOC's and is required to install add-on control equipment. If the source test shows that the VOC emissions from this bakery are less than the threshold limit, then the impact of the rule on the economy and employment of the region will be significantly less than predicted.

THE NECESSITY OF ADOPTING RULE 67.24

The 1990 Federal Clean Air Act Amendments require the District to adopt rules reflecting Reasonably Available Control Technology (RACT) for major stationary sources of ozone precursors. For San Diego County, identified as a "severe" federal ozone non-attainment area, a major source is defined as any stationary source which directly emits or has a potential to emit 25 tons per year or more of VOC's or NOx.

RACT is defined as the lowest emission limit that a particular emission source is capable of meeting by the application of air pollution control technology that is readily available considering technological and economic feasibility. Rule 67.24 VOC emission control requirements specify a reduction efficiency of 90%. This efficiency can be achieved by using catalytic or thermal incineration or water scrubbing. These are VOC control technologies which are readily available and technically and economically feasible, and have been used on bakeries of similar size in California and other parts of the country. Therefore, this level of control can be considered RACT for bakeries.

Additionally, a VOC control measure for bakery ovens was included in the District's 1991 Regional Air Quality Strategy (RAQS) developed to comply with the California Clean Air Act. The Act requires the District to adopt the RAQS control measures as expeditiously as possible in order to attain the state and national ambient air quality standard for ozone.

Therefore, both federal and state laws necessitate the adoption of Rule 67.24.

IMPACT ASSESSMENT

As specified in the Health and Safety Code, "socioeconomic impact" means the following:

(1) The type of industries or business, including small business, affected by the rule or regulation.

(2) The range of probable costs, including costs to industry or business, including small business, of the rule or regulation.

(3) The impact of the rule or regulation on employment and the economy of the region affected by the adoption of the rule or regulation.

(4) The availability and cost-effectiveness of alternatives to the rule or regulation being proposed or amended.

(5) The emission reduction potential of the rule or regulation.

(6) The necessity of adopting, amending, or repealing the rule or regulation in order to attain state and federal ambient air standards.

Item 6 is discussed in the preceding section. The remaining items are discussed below.

Types of Industries Affected by Rule 67.24

The adoption of proposed Rule 67.24 will directly affect wholesale bakeries (SIC Code 2051). It may indirectly affect grocery stores (SIC Code 5411) and eating and drinking establishments (SIC Code 5812) which purchase products from the bakeries for resale, because any increase in the cost of bread produced may be passed on by the wholesale bakeries to their business customers.

In 1990, there were 1663 wholesale bakeries in the U.S., with 212 in California.[1] In San Diego County, about 20 bakeries sell wholesale. There are no data on bread products sales trends for San Diego County. However, the latest nationwide data show that the 1991 sales for wholesale breads, buns, and rolls increased by 0.9% to 3.2% over 1990 levels, and further increases are expected for 1992.[2] The industry also anticipates a boost from a recent U.S. Department of Agriculture determination of 'Dietary Guidelines' that recommend eating significant amounts of bakery products. It can be assumed that these national trends will be reflected in San Diego County.

Table 1 shows the number of employees and annual gross sales estimates for the affected bakeries.

TABLE 1
General Economic Characteristics of Affected Bakeries in San Diego County

Bakery	Number of Employees	1991 Estimated Gross Sales
A	170	$27 million
B	100	$11 million
C	85	$ 6 million
D	180	*$17 million

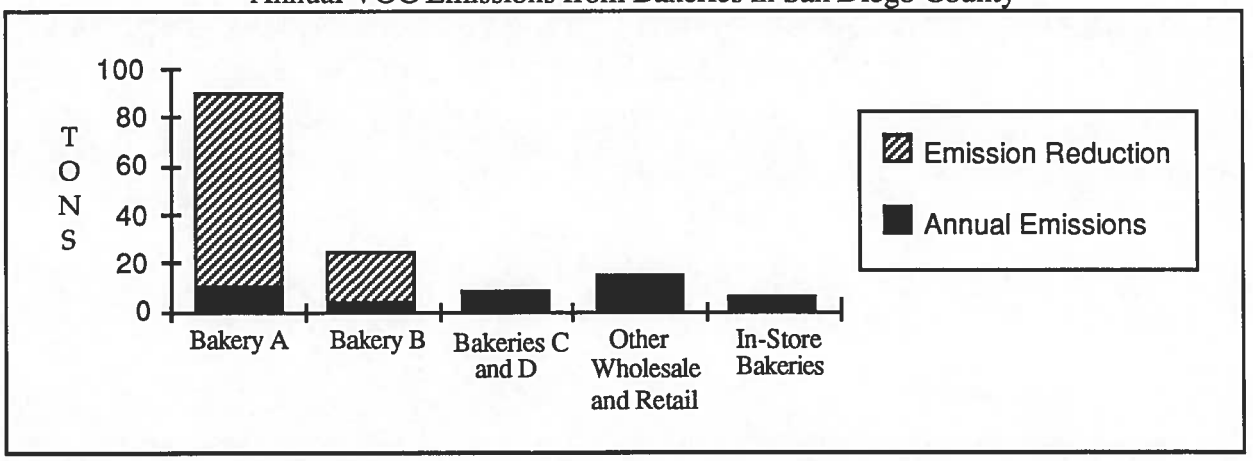
* Note: Some Bakery production from facility D is not yeast-leavened (i.e., does not produce VOCs).

The California Health and Safety Code Section 42323 defines a small business as any small business defined under the federal Small Business Act (SBA) which also has fewer than 100 employees. Since facilities A and D have more than 100 employees, and facilities B and C are part of corporations which are not small businesses under the SBA definition, proposed Rule 67.24 will not affect small businesses as defined in the Health and Safety Code.

The affected facilities' 535 employees account for about 50% of the 1100 bakery employees in San Diego County, and about 0.1% of San Diego County's total civilian work force of 728,000.[3]

Figure 1 illustrates the VOC emission distribution for the bakeries in San Diego County. The figure indicates current estimates for annual emissions and anticipated emission reductions with implementation of proposed Rule 67.24.

FIGURE 1
Annual VOC Emissions from Bakeries in San Diego County



As indicated previously, the estimates in Figure 1 for bakery B will be more accurately known after source testing. If the testing indicates annual emissions greater than 25 tons per year, the corresponding estimate for emission reduction will be greater. Conversely, if emissions are indicated as less than 25 tons per year, bakery B will be exempt from emission reduction requirements. Bakeries C and D would be subject to recordkeeping requirements only.

Range of Probable Costs in Adopting Rule 67.24

a. Cost of implementation of emission control requirements.

Several VOC control technologies were considered for implementation at the affected bakeries. The VOC particular to bakery oven emissions, ethanol, can present operational problems for carbon adsorption emission control systems. Although ethanol emissions are favorable for control by water scrubbing, the lack of dependable water supplies in Southern California can present problems here in San Diego. Thermal and catalytic oxidation technologies have been determined to be practicable, and catalytic oxidation has been determined the most cost-effective choice. Table 2 shows cost estimates for the installation and operation of catalytic oxidizers at facilities A and B.

TABLE 2
Costs for Control Equipment for Affected Bakeries in San Diego County

Bakery	Initial Capital Cost	Annual Operating Costs	Total Annualized Cost	Cost-Effectiveness (per lb VOC reduced)
A	$820,000	$110,000	$240,000	$1.50
B	$385,000	$ 63,000	$124,000	$2.75

Initial capital cost estimates include the cost of the control device, cost of all ancillary equipment, and all costs associated with delivery, installation, and start-up. Installation cost estimates include considerations for the retrofit of bakery ovens with this control equipment. Operating cost estimates include all costs associated with general maintenance, utilities, and catalyst replacement. For facility B, initial costs include estimated cost for emissions source testing. The cost-effectiveness estimate for bakery B is a 'worst-case' estimate. Actual cost-effectiveness, if applicable, will be more accurately known after source testing.

b. Cost of recordkeeping requirements

Compilation of annual records for the bakeries is estimated to entail about 20 staff-hours per year labor for each. Assuming $15 per hour labor cost,[4] and an equal amount for overhead, these costs are estimated to be $600 per year per facility.

c. Costs to indirectly affected facilities

The bakeries may pass the cost of compliance with the emission control and recordkeeping requirements of Rule 67.24 on to their business customers. This cost is estimated to be 0.3¢ to 0.6¢ per pound of baked product for facilities A and B, and 0.01¢ per pound for facilities C and D. These indirectly affected businesses, such as grocery stores and eating and drinking establishments, may then pass this cost on to consumers.

d. Cost to consumers

Bread consumption is assumed to be about one loaf per week, or 52 pounds per year, for each of about two million county consumers. Thus, the increased cost which may be passed on to consumers due to Rule 67.24 would be 18¢ per consumer per year. This is approximately 0.001 percent of the $16,000 per capita average annual income in San Diego County.

Economic Impacts in Adopting Rule 67.24

a. Impact on facilities subject to emission control requirements of Rule 67.24.

Two economic criteria were considered in the evaluation of the economic impact of proposed Rule 67.24 on facilities A and B, "Value Added" and "Return on Equity." These criteria have been used by EPA,[5] ARB,[6] and other air districts[7] to determine potential negative effects of proposed environmental regulations on the economic viability of affected companies. Value Added (VA) can be defined as a company's total gross revenue less the total cost of raw materials. Return on Equity (ROE) is a general indicator of profitability and is determined as a company's net profit after taxes, often expressed as a percentage of the company's equity.

Table 3 below presents the estimated economic impacts of proposed Rule 67.24 calculated as a ratio of its annual compliance costs to the annual VA and ROE values. Considering that facility B is part of a large corporation, and facility A has other affiliates, ROE was estimated for two scenarios - for each facility as a separate entity, and for each facility as part of a larger business. VA and ROE were calculated for affected facilities by using nationwide industry average data[8, 9] since proprietary data for specific companies could not be obtained.

TABLE 3
Economic Impact for Facilities A and B

	Annual Cost of Compliance	Percent of VA for Facility	Percent of ROE for Facility	Percent of ROE for Corp. or Including Affiliates
Facility A	$240,000	1.4%	29%	14%
Facility B	$124,000	1.7%	36%	0.3%

The annual compliance costs of the proposed rule are relatively low in comparison to value added for both companies (less than 2%). They also seem reasonable as percentages of ROE for both companies if they are considered to be parts of larger entities. However, these costs seem high in comparison with the annual ROE values calculated for each facility.

The California Air Resources Board considers that an annual compliance cost of a regulation exceeding 10% of ROE may constitute a significant economic impact on the affected company, i.e. such a regulation would significantly reduce the company's profitability. However, the ARB notes that the impact on profitability will be reduced if the compliance cost of a regulation can be passed on to consumers. In the past, bakeries have successfully passed on cost increases for their products of as much as 10¢ per pound.[10] It is estimated that the implementation of Rule 67.24 would increase the cost of a pound of bread by approximately 0.5¢. It seems likely that such a cost increase will be passed on, and that it would not affect the competitiveness of the two affected bakeries.

The initial capital expenditures will be the most significant economic impact on these facilities. Securing financing should not be difficult for facility B. It is part of a larger corporation that is already installing similar control equipment at its bakeries in another California air district.

Securing financing may be difficult for facility A. Since it is a major emission source, it does not qualify for the small business environmental compliance assistance program outlined in the 1990 federal Clean Air Act Amendments. If facility A can claim federal 'SBA small business' classification, it can qualify for a seven-year loan from the State CLEAN Program (California Loans for Environmental Assistance Now).[11]

b. Impact on facilities subject to the recordkeeping requirements of Rule 67.24.

The recordkeeping costs are less than 0.1 percent of value added estimates for the affected facilities, and are comparable to costs which would not normally affect even small businesses to a significant extent.

c. Impact on facilities indirectly affected by Rule 67.24

Facilities such as grocery stores and eating and drinking establishments would likely accept a passed on cost increase only to an extent which they could in turn pass on to their retail customers. Otherwise they would seek alternative wholesale suppliers. However, such suppliers would likely be from the South Coast district which has a regulation similar to Rule 67.24 and compliance schedules ahead of those in Rule 67.24. There is a possibility that supplies could come from Imperial County or Arizona, however because of transportation costs such supplies may not represent a cost-effective alternative.

d. Impact on consumers in San Diego County

If compliance costs are passed on to San Diego County consumers, the additional consumer cost is estimated to be 18¢ per person per year. This cost is not expected to have a measurable economic impact in the County.

Employment Impacts in Adopting Rule 67.24

a. Impact on facilities subject to emission control requirements of Rule 67.24.

If the compliance cost cannot be passed on to consumers, the affected facilities may reduce their existing work forces, or may shut down or relocate the bakery.

Of five bakeries in a northern California air district that were directly affected by emission control requirements, four are presently in compliance with these requirements, and one bakery shut down. As may be expected, the extent to which impending control costs contributed to the shut down is difficult to specify. A brief phone survey of affected facilities in that district indicates that these impending costs may have been the 'last straw' causing the closure of a marginally profitable operation. The survey also found that the other affected bakeries did not reduce their own work forces. Only a few of the displaced workers from the closed facility were hired by the remaining bakeries. Lastly, the survey indicated that most of the displaced business from the closure went to the remaining bakeries in that district, though a neighboring district with no present bakery regulation may also have picked up some of this business.

According to the latest information, three bakeries in the South Coast district, two of which are affiliated with facility B in San Diego County and one of which is affiliated with facility A in San Diego County, are proceeding with plans to install emission control equipment, and are apparently not planning to shut down or relocate.

Since additional operation and maintenance work associated with the control equipment can be performed by existing site personnel,[12] any increase in employment due to this factor would be limited to not more than one employee per facility.

b. Impact on employment in San Diego County.

If local contractors are hired, there may be a temporary increase in local employment associated with the design and installation of emission control equipment required by Rule 67.24. However, with at most only two affected facilities, it is not anticipated that such increases will create new permanent jobs in the County.

Availability and Cost-Effectiveness of Alternatives to Rule 67.24

There are three alternatives to Rule 67.24: not adopt the rule, adopt a less stringent rule, or adopt a more stringent rule.

Alternative A: Not adopt Rule 67.24

This is not a viable option. It is inconsistent with the federal Clean Air Act Amendments of 1990, which require air pollution control districts to adopt rules reflecting reasonably available control technology for major sources emitting more than 25 tons per year of VOC's by November 15, 1992. On January 15, 1993, EPA notified the District of a finding of failure to submit RACT rules for several major sources of VOC emissions. EPA stated that this failure would result in the imposition of federal sanctions, such as withholding of federal highway and transportation funds to the region and severe restrictions on industrial expansion, unless the required rules are adopted within 18 months of the finding, i.e. by July 15, 1994. Failure to adopt RACT rules within two years of such a finding could also result in promulgation of a Federal Implementation Plan. Rule 67.24 should be adopted as expeditiously as possible to fulfill the requirements of the federal Clean Air Act.

Additionally, a tactic containing the emissions control measures required by proposed Rule 67.24 is included in the 1991 Regional Air Quality Strategy which was adopted by the Air Pollution Control Board on June 30, 1992. Therefore, not adopting Rule 67.24 would be inconsistent with the RAQS and with the California Clean Air Act which requires the District to adopt all feasible VOC control strategies.

Alternative B: Adopt a less stringent Rule 67.24

This is also not a viable option. The proposed rule contains a technologically and economically feasible emission control measure which represents RACT. A less stringent rule would not comply with the 1990 Federal Clean Air Act Amendments which require the District to adopt rules implementing RACT. Alternative B would also result in lower emission reductions than required by the Regional Air Quality Strategy adopted by the District Board in accordance with the California Clean Air Act.

Alternative C: Adopt a more stringent Rule 67.24

The rule could be made more stringent by requiring installation of add-on control equipment on bakery ovens with VOC emissions less than 25 tons per year, such as facilities C and D. The economic estimates presented in Table 4 below for these facilities show that this alternative has cost-effectiveness values beyond the bounds of currently adopted District control measures. Under Alternative C, the facilities would incur capital and operational costs of a magnitude which could cause these smaller bakeries to close or move from San Diego County. This would result in lost jobs for the region. At the same time, the incremental amount of emissions reduced by applying add-on control to these two bakeries will be 5 tons per year, or less than 5% of the total VOC emissions from all bakeries.

TABLE 4
Cost of Control Equipment for Bakeries to Comply with Alternative C

Facility	Initial Capital Cost	Annual Operating Costs	Total Annualized Cost	Cost-Effectiveness
C	$212,000	$28,000	$62,000	$ 6.80 per lb
D	$263,000	$36,000	$79,000	$55.00 per lb

The cost-effectiveness of application of emission controls to facilities smaller than those considered in Table 4 would be comparable or even higher, and emission reductions would be lower. Thus, a rule more stringent than presently proposed may not be economically or environmentally justified.

Minimization of Adverse Socioeconomic Impacts

The District has worked closely with the affected companies to minimize economic impacts which may result from Rule 67.24 to the extent allowed by state and federal requirements. Industry representatives were consulted during the rule development process in two formal workshops, numerous additional meetings, and other written and telephone contacts. This effort resulted in changes to the initially proposed rule. The compliance schedule was revised to provide greater flexibility for bakeries installing add-on air pollution control systems. Recordkeeping frequency was reduced to the minimum necessary for rule enforceability, and also rule exemptions were included to

minimize associated recordkeeping requirements. Definitions were added and the rule clarified to provide for easier compliance. Emission factors in the rule were revised based on industry comments, and on emissions testing which was conducted and funded by the District.

Benefits and Emission Reduction Potential in Adopting Rule 67.24

Annual VOC emissions from bakeries in San Diego County are estimated to be about 144 tons. Implementation of Rule 67.24 would result in annual VOC emission reduction of about 103 tons, or about 71 percent. Implementation of Rule 67.24 will contribute to the attainment of the ambient air quality standards for ozone in San Diego County.

REFERENCES

1 EPA Draft Alternative Control Technology Document, Bakery Oven Emissions, October, 1992.

2 Bakery Production and Marketing, June, 1992, "Wholesale Trends '92."

3 San Diego Association of Governments, "Regional Growth Forecasts: Preliminary Series 8 Region wide Forecast (1990-2015)," October 25, 1991.

4 EPA, Office of Air Quality Planning and Standards, Control Cost Manual.

5 EPA, The Small Business Sector Study, "Impacts of Environmental Regulations on Small Business."

6 California Air Resources Board, Technical Support Document to Draft Staff Report, "Proposed Control Measure for Metal Melting Processes," August, 1992.

7 "Socioeconomic Analysis of Proposed Regulation 9: Rule 9, Nitrogen Oxides from Stationary Gas Turbines" (prepared for Bay Area Air Quality Management District) January 21, 1993.

8 U.S. Bureau of Census, 1987 federal Economic Census.

9 Dun & Bradstreet, "Industry Norms and Key Business Ratios 1992-93."

10 Discussion with local store managers, Vons Companies, Inc. and Seven-Eleven Food Stores Div. of Southland Corp.

11 Discussion with California Department of Commerce- Business, Transportation, and Housing Agency.

12 Discussion with Plant Engineering, Continental Bakery, San Francisco, CA.