

EXECUTIVE OFFICER HEARING

STATE OF CALIFORNIA

AIR RESOURCES BOARD

JOE SERNA, JR. BUILDING

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

SIERRA HEARING ROOM, SECOND FLOOR

1001 I STREET

SACRAMENTO, CALIFORNIA

MONDAY, NOVEMBER 3, 2009

9:00 A.M.

TIFFANY C. KRAFT, CSR, RPR
CERTIFIED SHORTHAND REPORTER
LICENSE NUMBER 12277

APPEARANCES

STAFF

Mr. Bart Croes, Acting Executive Officer

Mr. Bob Jenne, Assistant Chief Counsel

Mr. Dongmin Luo, Air Quality and Climate Science Section,
RD

Ms. Claudia Nagy, Staff Counsel

Mr. Ralph Propper, Staff Air Pollution Specialist, Air
Quality and Climate Science Section, Research Division

Ms. Carla Takemoto, Technical Evaluation Section,
Stationary Source Division

1 PROCEEDINGS

2 ACTING EXECUTIVE OFFICER CROES: Good morning.
3 Let's go ahead and get started. The November 3rd, 2009,
4 public hearing of the Air Resources Board Executive
5 Officer will come to order.

6 My name is Bart Croes. I'm the Chief of the
7 Research Division. ARB's Executive Officer, James
8 Goldstone, has delegated to me the authority to conduct
9 this public hearing to consider the proposed amendments to
10 the tables of maximum incremental reactivity, or MRI,
11 values.

12 After today's hearing, I will recommend a final
13 decision to the Executive Officer on the staff proposal
14 based upon the testimony and the other material in the
15 record.

16 In June 2000, the Board approved amendments to
17 the regulations for reducing the ozone formed from aerosol
18 coating products and proposed tables of maximum
19 incremental reactivity values. The main component of the
20 rulemaking was to establish reactivity limits for a 36
21 categories based on the MIR scale. The amendments became
22 legally effective on July 18th, 2001.

23 In Resolution 00-22, the Board approved the
24 rulemaking action. The Board directed the Executive
25 Officer to review the MIR values 18 months after the

1 effective date of amendments -- such as July 18th, 2001,
2 was supposed to be the first review -- and every 18 months
3 thereafter to determine if modifications to the MIR values
4 are warranted. This is because the chemical information
5 used to calculate the MIR values is evolving and improving
6 as new information becomes available. Updates to the
7 chemical information will ensure that our regulations are
8 based on up-to-date atmospheric science.

9 Since the changes to the MIR values are technical
10 in nature, the Board delegated to the Executive Officer
11 the authority to adopt regulatory amendments to the tables
12 of MIR values, and to conduct public hearings and take
13 other appropriate actions to make such amendments. This
14 delegation of authority allows the Executive Officer to
15 conduct these activities on behalf of our Board as
16 provided in Health and Safety Code Sections 39515 and
17 39516.

18 Upon this delegation of authority, an Executive
19 Officer hearing was held on December 3rd, 2003, which led
20 to the adoption of amendments to tables of MIR values that
21 became legally effective on June 7th, 2004. That
22 rulemaking added about 100 new compounds with associated
23 MIR values and updated MIR values for 14 compounds.

24 I thanked Dr. Carter from the University of
25 California Riverside for his technical support of that

1 work in 2003, and I would like to thank him again for his
2 technical work in support of this rulemaking in 2009.

3 With that, I'd like to turn the microphone over
4 to Ralph Propper from our Air Quality and Climate Science
5 Section to make the staff presentation. Ralph.

6 (Thereupon an overhead presentation was
7 presented as follows.)

8 STAFF AIR POLLUTION SPECIALIST PROPPER: Thank
9 you, Mr. Croes.

10 Today, we are proposing for your consideration
11 amendments to the Tables of Maximum Incremental
12 Reactivity, MIR, values.

13 --o0o--

14 STAFF AIR POLLUTION SPECIALIST PROPPER: My
15 presentation will follow this agenda.

16 First, I will provide the background and
17 scientific basis for our proposal and describe our
18 development process.

19 Then I will discuss the proposed amendments to
20 the Tables of MIR values and their impacts on the
21 environment, economy, and aerosol coating manufacturers.

22 I will close with a summary and a recommendation.

23 --o0o--

24 STAFF AIR POLLUTION SPECIALIST PROPPER: I will
25 now provide some background on the Tables of MIR values

1 and their scientific basis.

2 --o0o--

3 STAFF AIR POLLUTION SPECIALIST PROPPER: VOCs can
4 differ dramatically in the extent to which they contribute
5 to ozone smog. Reactivity refers to the quantification of
6 how different VOCs contribute to the formation of
7 tropospheric ozone.

8 The MIR concept was developed about 20 years ago
9 by Dr. Bill Carter, a research chemist at U.C. Riverside.
10 Ratios of ozone precursors that are most sensitive to
11 changes in VOC emissions are referred to as "maximum
12 incremental reactivity" conditions.

13 The MIR scale has been used in several VOC
14 control regulations, including aerosol coatings, at both
15 the State and national levels.

16 --o0o--

17 STAFF AIR POLLUTION SPECIALIST PROPPER: Dr.
18 Carter is an expert in atmospheric chemistry. In 2003,
19 the Institute of Scientific Information recognized him as
20 one of the world's most "Highly Cited Researchers." In
21 2005, he received the Haagen-Smit Clean Air Award for air
22 pollution research.

23 Over the years, Dr. Carter has used a smog
24 chamber to conduct over a thousand experiments on VOCs and
25 ozone formation. The results, along with other literature

1 data, allowed him to develop the SAPRC-07 chemical
2 mechanism, which includes several modifications to the
3 prior SAPRC-99 version that was used to derive the MIR
4 values for VOCs that are currently in regulation.

5 Dr. Carter has greatly increased the number of
6 mechanisms unique to particular VOCs. He has also
7 improved other components of the overall SAPRC mechanism,
8 such as for aromatic hydrocarbons and developed new
9 mechanisms for chlorinated organic compounds. Reactivity
10 values for VOCs are obtained by application of the
11 chemical mechanisms.

12 --o0o--

13 STAFF AIR POLLUTION SPECIALIST PROPPER: Dr.
14 Carter's research results were used to develop the tables
15 of MIR values that were originally approved by the Board
16 in June 2000. These values are contained in two sections
17 of the California Code of Regulations. Based on that
18 rulemaking, Section 94700 specified MIR values for over
19 600 individual VOCs or mixtures.

20 Section 94701 specifies MIR values for 24 bins of
21 hydrocarbon solvents. The calculation of MIR values for
22 hydrocarbon solvents requires approximations, because they
23 are complex mixtures that may have uncertain compositions.
24 Therefore, we grouped hydrocarbon solvents into bins based
25 on similar characteristics, such as boiling range.

1 Executive Officer hearing was held in December 2003 to
2 update the MIR values. As a result, the ARB added about a
3 hundred new compounds with their MIR values into Section
4 94700 and updated the MIR values for 14 existing
5 compounds.

6 Staff recommended these changes after receiving
7 updated analyses from Dr. Carter.

8 No change was made to Section 94700 at that time,
9 because the impact of the updated and new MIR values on
10 the bin MIR values was not significant.

11 --o0o--

12 STAFF AIR POLLUTION SPECIALIST PROPPER: So why
13 do we propose to amend the Tables of MIR values again?

14 Our Board requires us to review the Tables
15 periodically to ensure continuous use of the best science
16 in our regulations.

17 To meet this requirement, the ARB sponsored
18 research by Dr. Carter to update the chemical mechanism
19 for ozone formation. As I mentioned, the resulting
20 SAPRC-07 mechanism contains significant improvements over
21 the previous version.

22 Based on SAPRC-07, the MIR values for many VOCs
23 have changed substantially. In addition, hundreds of new
24 compounds now have derived MIR values.

25 Dr. Carter also developed an alternative method

1 to estimate MIR values for hydrocarbon solvent bins. This
2 was based on new information on hydrocarbon solvent
3 composition and the availability of MIR values for many
4 new compounds derived from use of the SAPRC-07 mechanism.

5 --o0o--

6 STAFF AIR POLLUTION SPECIALIST PROPPER: Along
7 with the development of the new SAPRC-07 chemical
8 mechanism, Dr. Carter provided a list of hundreds of new
9 compounds with their respective MIRs that are not
10 currently contained in Section 94700.

11 According to his review of the existing compounds
12 in regulation, their MIR values declined by an average of
13 14 percent. He also found that for 70 percent of the
14 compounds, MIR values changed by more than ten percent,
15 and that for 67 compounds, the MIR values changed by more
16 than 30 percent.

17 Although the MIR values for some of the aromatic
18 solvent bins did not change significantly, the MIR values
19 for some non-aromatic bins declined by as much as 40
20 percent. Because of these significant changes, we decided
21 to develop a proposal to amend the Tables of MIR values
22 for both sections.

23 --o0o--

24 STAFF AIR POLLUTION SPECIALIST PROPPER: The
25 ARB's Research Division staff worked closely with staff

1 from the Stationary Source Division during the proposal
2 development process, which I will discuss next.

3 --o0o--

4 STAFF AIR POLLUTION SPECIALIST PROPPER: As with
5 the scientific portion of any proposed rule, the ARB is
6 required to conduct an external scientific peer review.
7 To assess this mandate for reactivity, the Board created
8 the Reactivity Scientific Advisory Committee, or RSAC, in
9 1996. The Board appointed six distinguished scientists to
10 the RSAC, which has been chaired by Professor John
11 Seinfeld from Caltech.

12 --o0o--

13 STAFF AIR POLLUTION SPECIALIST PROPPER: After
14 Dr. Carter gave us his final report for SAPRC-07 and the
15 resulting MIR values, we arranged for peer review by four
16 internationally-respected experts in the field. In
17 January, they found that the SAPRC-07 mechanism represents
18 a significant improvement in prediction of ozone levels
19 from VOC precursors. We distributed Dr. Carter's report
20 and the results of the peer reviews to the RSAC members.
21 When the RSAC met in March, they concluded that the
22 updated MIR values were arrived at in an appropriate
23 scientific manner.

24 --o0o--

25 STAFF AIR POLLUTION SPECIALIST PROPPER: To

1 facilitate stakeholder input on the proposed amendments,
2 we held two Reactivity Research Advisory Committee, or
3 RRAC, meetings.

4 In 2007, Dr. Carter summarized the SAPRC-07
5 mechanism, and we discussed amending the Tables of MIR
6 values based on SAPRC-07.

7 Earlier this year, Dr. Carter spoke about the
8 RSAC review of SAPRC-07 and updated MIRs and his
9 alternative method to derive MIR values for hydrocarbon
10 solvent bins. We added that ARB would hold a public
11 hearing later in the year to consider amendments to the
12 Tables of MIR values.

13 At a public workshop in August, we presented our
14 proposal for updating the MIR values for VOCs and our plan
15 to use Dr. Carter's method to derive MIR values for
16 solvent bins.

17 Based on stakeholder input, several new compounds
18 were added to the proposed Tables, and the new tabular
19 format was improved.

20 --o0o--

21 STAFF AIR POLLUTION SPECIALIST PROPPER: Now I
22 will describe the proposed amendments.

23 --o0o--

24 STAFF AIR POLLUTION SPECIALIST PROPPER: We
25 propose to add 383 new compounds with their associated MIR

1 values to Section 94700 and to update the MIR values for
2 the currently listed compounds. This proposal would
3 provide MIR values for over eleven hundred VOCs and
4 mixtures.

5 We propose to have two columns of MIR values,
6 providing the current and new values respectively.

7 Based on suggestions by stakeholders, we also
8 propose changes to the section's tabular format to help
9 locate VOCs. This includes a number index for compounds
10 and regrouping by compound class, such as alkanes and
11 aromatics.

12 --o0o--

13 STAFF AIR POLLUTION SPECIALIST PROPPER: As I
14 mentioned, Dr. Carter developed an alternative method to
15 estimate MIR values for hydrocarbon solvent bins. We
16 propose to use his method and adopt the MIR values that
17 result from its use.

18 Also, based on input from stakeholders, we
19 decided to retain our 24-bin system. The proposed
20 regulation has two columns; one showing the current MIR
21 values, and a new column showing the proposed MIR values
22 for the bins.

23 --o0o--

24 STAFF AIR POLLUTION SPECIALIST PROPPER: Staff is
25 proposing a modification to the original proposal.

1 gasoline regulations also use MIR tables and rely on Dr.
2 Carter's data. Therefore, when those regulations are
3 amended, their tables will be similarly updated. Possible
4 environmental and economic impacts on the affected
5 industries would be assessed at this time.

6 Also, the revised MIR values could be used in
7 future rulemaking for other source categories.

8 --o0o--

9 STAFF AIR POLLUTION SPECIALIST PROPPER: The
10 reactivity limits in the aerosol coatings regulation are
11 based on the MIR values adopted by the Board in 2000. In
12 order to maintain the ozone reduction benefits from
13 continued use of these reactivity limits, manufacturers
14 must continue to use these MIR values to calculate the
15 reactivity of their products. However, manufacturers can
16 use any new substance added to the rulemaking, along with
17 its MIR, as soon as the rulemaking becomes legally
18 effective.

19 Manufacturers are not required to reformulate and
20 would only do so only if they determine a more
21 cost-effective approach to compliance.

22 ARB staff plan to use the amended MIR values when
23 we next propose to amend the aerosol coatings regulation.
24 Any potential impacts would be evaluated at that time.

25 --o0o--

1 STAFF AIR POLLUTION SPECIALIST PROPPER: Now I
2 will give our summary and recommendations.

3 --o0o--

4 STAFF AIR POLLUTION SPECIALIST PROPPER: We
5 recommend adoption of this proposal to amend the Tables of
6 MIR values that are contained in Sections 94700 and 94701.
7 We make this recommendation based on Dr. Carter's work,
8 the peer review, the RSAC approval, and the comments from
9 RRAC members and workshop participants.

10 We conclude that adopting this proposal will help
11 ensure that ARB's reactivity regulations are based on
12 sound, up-to-date science, while providing more
13 flexibility to aerosol coating manufacturers and other
14 potential stakeholders.

15 --o0o--

16 STAFF AIR POLLUTION SPECIALIST PROPPER: This
17 concludes my presentation. Please let me know if you have
18 any questions.

19 ACTING EXECUTIVE OFFICER CROES: Thank you,
20 Ralph.

21 Apparently, we have no witnesses signed up to
22 talk on this item.

23 We do have a letter of support letter from
24 Michael Bailey that will be part of the rulemaking record.

25 So I have no ex parte communications on this

1 item.

2 And we'll now close the record on this agenda
3 item. However, the record will be reopened when the
4 15-day notice of public availability is issued.

5 Written or oral comments received after this
6 hearing date, but before the 15-day notice is issued, will
7 not be accepted as part of the official record on this
8 agenda item.

9 When the record is reopened for a 15-day comment
10 period, the public may submit written comments on the
11 proposed changes which will be considered and responded to
12 in the final statement of reasons for the regulations.

13 As mentioned previously, I will consider the
14 entire record of this proceeding and recommend a final
15 decision on the regulations to the Executive Officer.

16 I'd like to close by thanking Ralph and Dr. Luo
17 as well as Dr. Carter who worked so hard on this item, as
18 well as our peer reviewers, RSAC, RRAC members, and other
19 stakeholders who strengthened the proposal.

20 The November 3rd, 2009, public hearing is now
21 adjourned.

22 (Thereupon the California Air Resources Board
23 Public Hearing adjourned at 9:18 a.m.)

24

25

1 CERTIFICATE OF REPORTER

2 I, TIFFANY C. KRAFT, a Certified Shorthand
3 Reporter of the State of California, and Registered
4 Professional Reporter, do hereby certify:

5 That I am a disinterested person herein; that the
6 foregoing hearing was reported in shorthand by me,
7 Tiffany C. Kraft, a Certified Shorthand Reporter of the
8 State of California, and thereafter transcribed into
9 typewriting.

10 I further certify that I am not of counsel or
11 attorney for any of the parties to said hearing nor in any
12 way interested in the outcome of said hearing.

13 IN WITNESS WHEREOF, I have hereunto set my hand
14 this 12th day of November, 2009.

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