FINAL

SUBSEQUENT
ENVIRONMENTAL IMPACT REPORT

AUTO CLUB SPEEDWAY
REVISED NOISE STANDARDS

COUNTY OF SAN BERNARDINO

SCH 2008081077

SEPTEMBER 2010

FINAL
SUBSEQUENT
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Lead Agency:

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SECTION FSEIR: FINAL SUBSEQUENT ENVIRONMENTAL IMPACT REPORT

FSEIR.1 INTRODUCTION AND SUMMARY

This Final Subsequent Environmental Impact Report (FSEIR) has been prepared in accordance with the California Environmental Quality Act (CEQA) as amended (Public Resources Code Section 21000 et seq.), *CEQA Guidelines* (California Administrative Code Section 15000 et seq.), and the County of San Bernardino CEQA procedures.

According to *CEQA Guidelines* §15132, the Final SEIR shall consist of the following:

a) The (Recirculated) Draft SEIR or a revision of the Draft;

b) Comments and recommendations received on the Draft EIR, either verbatim or in summary;

c) A list of persons, organizations, and public agencies commenting on the Draft EIR;

d) The responses of the Lead Agency to significant environmental points raised in the review and consultation process;

e) Any other information added by the Lead Agency.

In accordance with these requirements, the Final Auto Club Speedway Revised Noise Standards Subsequent EIR is comprised of the following:

- Recirculated Draft Subsequent Environmental Impact Report, Auto Club Speedway Revised Noise Standards (February 2010) (SCH No. 2008081077)
- This Final EIR document, dated September 2010, that incorporates the information required by §15132.

FSEIR.2 RE-CIRCULATION

The original DSEIR (SCH 2008081077) was circulated for public review from July 9 to August 24, 2009. All interested persons and organizations had an opportunity during this time to submit their written comments on the DSEIR to the County of San Bernardino. These comments along with their responses are located in Appendix G in the Recirculated Draft Subsequent Environmental Impact Report (RDSEIR). The original DSEIR addressed proposed revisions to noise standards contained in the approved Speedway Planned Development (PD). The proposed revisions to noise standards constituted proposed Revision #11 to the Speedway PD.

As the result of comments on the original DSEIR, the County's responses to those comments, and the tentative ruling of the Superior Court of the State of California for the County of San Bernardino issued in October 2009 that overturned the environmental documentation prepared for Revision #9 to the Speedway PD, the County of San Bernardino determined that the DSEIR for the Auto Club Speedway should be revised with additional evaluations and a modified project description and be recirculated for public review and comment.

The additions and changes in the proposed project resulted in new information that was not available for the public to review during the public review period of the original DSEIR. Although the changes in project description, environmental baseline, mitigation measures, and alternatives have not changed the conclusions contained in the original DSEIR with respect to significance after mitigation, the County decided that revisions to the original DSEIR warranted recirculation of a revised draft SEIR ("RDSEIR") for the proposed project. The RDSEIR was circulated for public review from March 23 to May 10, 2010. Pursuant to CEQA Guidelines Section 15088.5(f)(2), the County requested that reviewers limit their comments to the revised chapters or portions of the RDSEIR, as indicated by underline and strikeout. Revised Figures were indicated as such on the graphic. The original figures were included in Appendix H of the RDSEIR. In addition, Appendix E was revised and Appendices F, G, and H were new and comments were accepted on those appendices.

Upon completion of the public review period for the RDSEIR, the County responded to comments received during the public review period that relate to the chapters or portions of the DSEIR that were received and recirculated.

As the result of the environmental evaluations prepared for this SEIR, public comments on the DSEIR and RDSEIR, and the County's responses to those comments, the noise standard proposed for adoption incorporates the concept of a noise standard not exceeding 100 dBA Lmax during the 35 days per year (for a cumulative total of one hour per day for each of those days) that noise in excess of 85 dBA Lmax would be permitted as set forth in the modified "86 to 99 dBA Lmax Alternative" to meet the NIOSH standards that were provided in a comment letter on the RDSEIR. Specifically, the noise standard proposed for adoption provides the following limitations:

> "The cumulative duration of noise exceeding 85 dBA Lmax within any single day shall be limited to a maximum total of 60 minutes (one hour) with additional limitations on the cumulative duration of noise exceeding 85 dBA Lmax as follows:
>
> Level 3. 85.1 - 90.0 dBA Lmax: 50 minutes
> Level 2. 90.1 - 95.0 dBA Lmax: 9.5 minutes
> Level 1. 95.1 – 100.0 dBA Lmax: 30 seconds

By incorporating the concept of a noise standard not exceeding 100 dBA Lmax and substantially limiting the duration that peak noise levels not exceeding 100 dBA Lmax would be permitted, potential environmental impacts would be reduced, and no impacts other than those already addressed in the RDSEIR would result. Additionally, in response to comments received on the RDSEIR, information regarding air quality and air toxics, sound wall modeling, and environmental health has been evaluated and presented in the Final SEIR within the Response to Comments and attachments. This additional information further demonstrates the validity of the County's previous conclusions that significant impacts related to air quality, air toxics, and environmental health would not result from the proposed project, and further demonstrates that the proposed 20-foot height of the sound attenuation wall, is, in fact, the optimum height. None of the information presented in the Final SEIR contradicts the conclusions contained in the RDSEIR with respect to significance. Therefore, another recirculation of the SEIR is not required.

FSEIR.3 RESPONSE TO COMMENTS

This section contains responses to all comment letters received on the March 2010 Recirculated Draft Subsequent Environmental Impact Report (RDSEIR). Fifteen comment letters were received during the comment period. A copy of each letter with bracketed comment numbers on the right margin is followed by the response for each comment as indexed in the letter.

The comment letters are listed in Table FSEIR.3-1, *Comments Received on March 2010 Recirculated Draft Subsequent EIR.*

Table FSEIR.3-1 Comments Received on March 2010 Recirculated Draft Subsequent EIR			
Letter No.	**Commenter**	**Letter Date**	**Page No.**
1	Chatten-Brown & Carstens on behalf of Concerned Community Members and Parents of Redwod Elementary School Students (CCoMPRESS)	5/10/10	FSEIR-4
2	Communities for a Better Environment	5/10/10	FSEIR-225
3	Natural Resources Defense Council	5/10/10	FSEIR-229
4	Endangered Habitats League	5/10/10	FSEIR-235
5	Center for Community Action and Environmental Justice	5/6/10	FSEIR-237
6	Santa Ana Regional Water Quality Control Board (RWQCB)	5/6/10	FSEIR-240
7	City of Fontana	5/10/10	FSEIR-242
8	Steven W. Rogers	5/10/10	FSEIR-246
9	Fritz Koeing	5/9/10	FSEIR-256
10a	Salvador and Elizabeth Lopez	5/6/10	FSEIR-260
10b	Salvador and Elizabeth Lopez #2	5/10/10	FSEIR-269
11	Jim C. Crickon	5/6/10	FSEIR-290
12	Citizens for Fontana First	5/6/10	FSEIR-293
13	Mr. and Mrs. Gabe LaRosa	5/4/10	FSEIR-296
14	Redwood Elementary School	6/2/10	FSEIR-299
15	South Coast Air Quality Management District (SCAQMD)	6/3/10	FSEIR-301

Provided below are point-by-point responses to the environmental issues raised by the written comments. The following attachments are included following the Response to Comments section:

Attachment 1. Letter from Gordon Bricken and Associates, February 10, 2009
Attachment 2. La Croix Davis, LLC, *Technical Review of Health Effects – Auto Club Speedway Proposed Noise Standards*, August 4, 2010
Attachment 3. Yorke Engineering, LLC, *Air Quality Modeling Technical Study*, August 2010
Attachment 4. Noise Specification and Monitoring Protocol, August 2010

LETTER 1

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May 10, 2010

Via email (dferemenga@lusd.sbcounty.gov) and Overnight Express

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Re: Comments on Recirculated Draft Subsequent Environmental Impact Report for Auto Club Speedway, SCH 2008081077

Dear Mr. Feremenga:

On behalf of Concerned Community Members and Parents of Redwood
Elementary School Students (CCoMPRESS), we provide these comments on the Re-
Circulated Draft Subsequent Environmental Impact Report (RDSEIR) prepared for the
Auto Club Speedway proposal (Project). The Project includes the following: revision to
noise standards for the Auto Club Speedway (Speedway); permanent operation of a drag
1-1 strip on the north side of the Speedway property; elimination of a prohibition against race
activities on the north side of the Speedway property; and amendment of the County's
General Plan Noise Element to include noise contours for the Speedway. The Project
would significantly relax the noise restrictions placed upon the Speedway by allowing the
Speedway to produce maximum noise levels of 85 decibels (dBA) at residential property
at all times and 100 dBA 35 days per year, whereas all other uses in the County are
required to limit their maximum noise levels at residential property to 75 dBA for health,
safety, and welfare reasons.

CCoMPRESS is a public interest community organization composed of area
residents and business owners, as well as parents of students that attend Redwood
Elementary School and Live Oak Elementary School. CCoMPRESS is dedicated to
1-2 protecting the health and well being of community members and preserving the quality of
life in the Fontana area. Because this Project would result in detrimental impacts to the
community's health and well being, CCoMPRESS strongly opposes the proposed
relaxation of noise standards and relocation of the Speedway's drag strip. High noise

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1-2 cont. levels are not only unsafe for human hearing, but unsafe for cardiovascular health, mental health, societal well being, and child development. The impacts of the County's proposed noise standard allowing 85 dBA intermittent noise 16 hours a day may be felt most keenly by school children at bedtime, in school, and in religious services.

1-3 The proposed Project would have significant noise impacts that have not been adequately analyzed by the RDSEIR. The Project would also have significant air quality, traffic, land use, water quality, hazard and hazardous material, environmental justice, and public service impacts that the RDSEIR fails to study. Additionally, the County cannot approve the Project as proposed because there are feasible mitigation measures and alternatives that would reduce the Project's significant noise impacts, and because the Project would not result in a significant benefit.

1-4 The County has allowed the Speedway to operate a drag strip in violation of state environmental laws and the County's noise standards for nearly four years. Approving this Project, and allowing the Speedway to produce noise levels 25 decibels higher than any other use in the County, and far higher than is safe for human health, would reward the Speedway's continued lack of concern and consideration for the community located to the north of the Speedway's property.

1-5 To aid in the review of this lengthy letter, we have prepared the following list of the contents and pagination of the letter:

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I. Notices Should be Provided in Both Spanish and English

1-6 The ultimate purpose of CEQA is to involve and inform members of the public in making decisions that will affect the environment. (CEQA Guidelines § 15002 (a)(1).) An agency fails to involve and inform members of the public in decision, in violation of CEQA, when it fails to provide public notices and environmental documents in the languages spoken by persons who will be affected by a project.

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The Speedway property abuts and will directly impact residents of Fontana who belong to ethnic minority groups, many of whom do not speak English. The 2007 population demographics for Fontana estimate that 65% of the Fontana population is Hispanic or Latino. (http://www.fontanabusiness.org/demos.html, incorporated by reference.) Many Fontana residents may face a language barrier when trying to participate in the environmental decision making processes.

Although members of CCoMPRESS have repeatedly informed the County that projects at the Speedway property would impact large Latino populations in Fontana, the County has failed to provide notices for the Project in any language other than English. Consequently, non-English speaking residents are being shut out of the environmental decision making process, a violation of CEQA's mission to involve and inform members of the public (CEQA Guidelines § 15002(a)(1)), regardless of their primary language. In *El Pueblo Para El Aire y Agua Limpio v. County of Kings* (Sacramento Superior Court, 1991, No. 366045), the court found an EIR for a waste incineration project to be inadequate for not being translated into Spanish, the primary language of many of the members of the community. In so doing, the court declared, "meaningful involvement in the CEQA review process was effectively precluded by the absence of the Spanish translation" and further held that CEQA justified "the Spanish translation of an extended summary of the FSEIR, public meeting notices, and public hearing testimony." (Attachment 1, Sacramento Superior Court decision p. 10). In accordance with *El Pueblo Para El Aire y Agua Limpio*, the County should re-issue all necessary notices and provide a summary of the RDSEIR in Spanish as well as English. This will allow the County to demonstrate its commitment to ensuring equal access to an important public forum for all of its citizens and attain the CEQA goal of, "providing a decent home and satisfying living environment for every Californian." (CEQA Guidelines § 15021(d)).

1-6 cont.

In its response to comments on the August 2009 DSEIR, the County claims that there is no specific CEQA requirement to provide environmental notices in Spanish. This response fails to respond to the repeated assertion of CCoMPRESS that failing to provide notices in Spanish excluded many persons in the community impacted by the Speedway's project from participation in the environmental review process. Since the County has considered requests to provide notices in Spanish but decided against it, we can only conclude that the County's exclusion of Spanish speaking community members is intentional. We ask that you reconsider that decision, especially since severe adverse health impacts are at issue.

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II. Inadequate Scoping for the RDSEIR.

A. The Initial Study and NOP did not Determine the Scope of an EIR for Drag Strip Operation.

The RDSEIR is an EIR for a completely new project, not just a revision to the environmental document previously circulated. Moreover, the San Bernardino Superior Court's judgment in *Concerned Community Members and Parents of Redwood Elementary School Students v. County of San Bernardino*, case no. CIVRS 900104, required preparation of a new EIR, not recirculation of an existing EIR. (Attachment 2, judgment in *CCoMPRESS v. County of San Bernardino*.) Consequently, the RDSEIR should have been prepared with new scoping documents, including a Notice of Preparation and a revised Initial Study that assessed the potential significance of impacts resulting from drag strip relocation, relaxation of noise standards, removal of a previous mitigation measure, and the amendment of the General Plan's Noise Element.

1-7 Changes to the Project between the August 2009 DSEIR and the current RDSEIR are drastic enough that a new Notice of Preparation should have been circulated to allow agencies and the public an opportunity to comment on the scope of the EIR. Inclusion of not only the drag strip relocation and operation but also a general plan amendment and the removal of a previous mitigation measure necessitates consultation with additional agencies that may not have been notified during the scoping process for the August 2009 DSEIR. Has the County consulted with the South Coast Air Quality Management District, California Department of Toxic Substances Control, or Regional Water Quality Control Board in its preparation of the RDSEIR? Which responsible and trustee agencies were provided notice of the new Project?

The previous EIR assumed the drag strip relocation had already been approved, so it's Initial Study considered only the regulatory impacts of changing the noise standards. The Initial Study does not reflect the potential impacts of the Project's physical components, drag strip relocation and operation. To meet CEQA's strict procedural safeguards and provide appropriate scoping for the new EIR, the Initial Study must be revised and recirculated.

B. A Scoping Meeting is Required.

The County is required to hold a scoping meeting for the new EIR. A scoping
1-8 meeting is designed to determine the scope of an EIR, prior to drafting. Scoping meetings are required for projects of statewide, regional or areawide significance. (CEQA Guidelines § 15082(c).) CEQA defines a project as being of statewide, regional, or areawide significance if it includes a proposed local general plan amendment. (CEQA

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Guidelines § 15206(b)(1).) As the RDSEIR proposes an amendment to the Noise Element of the General Plan, the Project is one of statewide, regional, or areawide significance and thus required a scoping meeting. In accordance with CEQA Guidelines section 15082, the County must hold a scoping meeting and use the information obtained in that meeting to prepare a new, legally adequate EIR for the Project.

III. The RDSEIR is Inaccurate and Inadequate.

A. The RDSEIR Includes an Inadequate Project Description.

The RDSEIR fails to include a discussion of the method for fueling during drag racing events. Has a fueling station been put in place at the drag strip? Depending on the size and location (above or below-ground), security, and chemicals involved, fueling
1-9 stations may have significant adverse impacts on air quality, public safety, and water quality. The RDSEIR must disclose the methods for fueling during drag racing events so that the impacts can be evaluated and mitigation measures or conditions of approval can be put in place to reduce these impacts.

B. The RDSEIR Fails to Adequately and Accurately Analyze Noise Impacts.

The Project proposes to apply two noise standards to Speedway activities. In addition to drastically increasing the noise levels allowed in residential areas, the noise standards increase both the frequency and duration of allowable noise events. As currently approved, noise levels are only allowed to exceed 75 dBA for up to 6 oval track race events per year between the hours of 7 am and 10 pm.

1-10

The Project's proposed noise ordinance consists of two noise standards. The first standard, applicable to the 330 "standard operating days" per year, would allow noise levels to reach an 85 dBA Lmax (maximum noise level for any amount of time), as measured at 550 feet from the Speedway property line. (RDSEIR p. 3-5.) No L50 (the maximum noise level that can last for up to 30 cumulative minutes in a one hour period) is provided, so noise emissions of 85 dBA would be permitted for all Speedway activities at all times during the hours of operation of 7 am to 11 pm. (*Ibid.*) This would be perceived by the human ear as twice as loud as the existing limit of 75 dBA. The 16-hour (7 am to 11 pm) noise exposure is double the amount of time the World Health Organization (WHO) and Occupational Safety and Health Administration (OSHA)
1-11 recommend for exposures of 85 dBA in order to protect hearing. (Attachment 3, Excerpts of WHO, Guidelines for Community Noise, p. xv. The report is available in its entirety online at http://whqlibdoc.who.int/hq/1999/a68672.pdf.) The noise exposure exceeds OSHA recommendations even further, however, because the OSHA standard considers

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1-11 cont. only workdays, or approximately 260 days per year. This first noise standard will apply to 330 days of each year, and can be exceeded on the remaining 35 days of each year. As discussed below, health impacts, including hearing loss, are likely under this proposed standard.

1-12 The Project's second proposed noise standard will allow all activities at the Speedway to reach 100 dBA Lmax, as measured 550 feet from the Speedway property line. (RDSEIR p. 3-6.) As if 85 dBA was not loud enough, this second standard will expose neighbors to noise levels perceived as four times louder than those that are currently permitted. The second noise standard provides, "For each of those 35 days, the time that noise levels exceed 85 dB Lmax would be limited to the hours between 10 am and 7 pm over a cumulative maximum total of 60 minutes per day during the Speedway's permitted operating period." (*Ibid.*) Further complicating application of the second noise standard, the RDSEIR notes that it will not apply to emergencies, accidents, and activities such as fireworks and aircraft, rail, airship, and helicopter operations. (RDSEIR p. 4.2-12.)

1-13 CCoMPRESS objects to the proposed increase in allowed maximum noise levels because the health of residents, schoolchildren, employees, and parishioners is already adversely impacted by Speedway noise. Allowing levels of noise that are literally deafening is unconscionable. The RDSEIR fails to adequately assess the additional health impacts caused in several ways: by removing the L50 limit; by replacing the 75 dBA Lmax with 85 and 100 dBA; by extending the hours that the Speedway may operate until 11 pm; and by extending Speedway operations to 365 days per year. The standard limiting 100 dBA exposures to a cumulative hour per event day will not likely be followed because it is more confusing and difficult to measure, let alone enforce, than the existing noise limit it seeks to replace. Thus, the RDSEIR fails to assess the impacts of allowing up to 9 hours of 100 dBA exposures, 35 days per year, which will likely occur should the Project be approved.

1. A 100 dBA Lmax Noise Limit Would Result in Significant Public Health and Welfare Impacts

1-14 The new noise standards proposed for the Speedway have two objectives, one of which is "To provide for health-based noise standards for Speedway … in a manner consistent with protecting public health." (RDSEIR p. 3-1.) The proposed Project fails in this regard, however, because no noise standard that allows residential exposures to 85 dBA 16 hours per day, 365 days per year, or that *ever* allows residential noise exposures of 100 dBA can be "consistent with protecting human health." A WHO diagram showing pain levels associated with escalating noise levels demonstrates this fact. The diagram designates as "painful" any exposures to noises of 70 dBA, which are currently permitted

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1-14 cont. at the Speedway. (WHO, Sound Scale and Measurement, herein incorporated by reference, available at http://www.euro.who.int/Noise/Activities/20030724_1.) Noise levels of 90 dBA are considered "very painful." (*Ibid.*) Even so, the County is considering allowing noise levels to reach 100 dBA, which are perceived as twice the sound level of the "very painful" 90 dBA.

a. Hearing Damage Begins to Occur at Levels Below 100 dBA.

1-15 The RDSEIR refers to the new standard as a health based standard, apparently under the mistaken notion that hearing loss is the only health impact that can result from elevated noise levels. Because "residents exposed to sound generated by the Speedway at 550 feet or beyond would not be expected to experience hearing loss," the RDSEIR finds that no health impacts will result from the Project. (RDSEIR p. 4.2-19.) The RDSEIR is incorrect that noise levels of less than 100 dBA cannot cause hearing loss. The Environmental Protection Agency's Noise Effects Handbook states that Noise-Induced Permanent Threshold Shift, which "is a permanent shift in the hearing threshold of the ears [hearing loss] due to exposure to noise" can occur with exposure to noise levels of 87-102 dBA. (EPA Noise Effects Handbook, http://www.nonoise.org/library/handbook/handbook.htm, incorporated by reference.) Thus, hearing damage will likely occur as a result of the high intensity impulsive noises, ranging from 85 dBA to 100 dBA that the Speedway seeks to legalize with its new noise standard.

1-16 The National Institute for Occupational Safety and Health, a division of the U.S. Department of Health and Human Services, recommends a workplace noise standard of no more than an 8-hour time weighted average of 85 decibels. (Attachment 4, Excerpts from National Institute for Occupational Safety and Health and Center for Disease Control and Prevention, Criteria for a Recommended Standard, June 1998. The entire report is available online at http://nonoise.org/hearing/criteria/criteria.htm.) The agency finds, "Exposures *at or above* this level are hazardous." (*Ibid*, emphasis added.) At these noise levels alone, "NIOSH has found an 8% excess risk of developing occupational noise-induced hearing loss." (*Ibid.*) If NIOSH would not allow workers to be exposed to 85 dB for more than 8 hours per day, and only during a work week, why should the Speedway be allowed to expose the community to similar and higher noise levels for 16 hours per day, every day? NIOSH also "recommends a hearing loss prevention program (HLPP) that includes exposure assessment, engineering and administrative controls, proper use of hearing protectors, audiometric evaluation, education and motivation, recordkeeping, and program audits and evaluations" whenever noise levels will exceed 85 dBA. (*Ibid.*) They suggest industrial ear protection and regular hearing tests. By contrast, the Speedway will not ensure that residents and other community members have access to hearing protection measures or evaluations, even though they will be subjected to noise levels, *at home*, more than twice as often as NIOSH would recommend. As discussed further below, the Speedway has even refused to retrofit nearby homes with proven noise reduction measures, finding them "infeasible."

1-16 cont.

The NIOSH criteria are even more critical of noise exposures of 100 dBA or greater, for which it recommends no more than 15 minutes per day. (Attachment 4, Table 1.1, http://nonoise.org/hearing/criteria/criteria.htm.) The Speedway's noise standard proposes allowing up to 60 minutes of such noise levels, yet claims the standard is health-based.

b. The Proposed Noise Standards Assume Conditions That Do Not Exist.

The Speedway asserts that the Project's proposed noise standards are based on EPA standards. According to the RDSEIR,

> Review of the United States Environmental Protection Agency's (EPA) noise standards has shown that the EPA has promulgated criteria recommending an average noise level to protect a community from hearing loss, as a function of the duration of exposure during each year for a 40-year period. EPA's recommended average annual noise level to protect the community from hearing loss is 71.4 dBA Leq. (RDSEIR p. 3-2.)

1-17 The RDSEIR attempts to mislead the public when it claims that "The analysis above indicates that the proposed noise standard of 100 dBA Lmax would not exceed the EPA recommended health standard to prevent the community from hearing loss and no adverse health impacts are expected to occur." (RDSEIR p. 4.2-38.) One hundred dBA Lmax is not a standard recommended by the EPA. Counsel for CCoMPRESS contacted Kenneth Feith at the United States Environmental Protection Agency (EPA) regarding the proposed Project. Mr. Feith is a Senior Scientist with the EPA, serves as Senior Advisor to the Assistant Administrator for Air and Radiation (the section of the EPA tasked with enforcing the Noise Control Act of 1972), and is the co-head of the U.S. delegation to the United Nations, Economic Commission for Europe, World Forum for Harmonization of Vehicle Regulations. He is also head of the U.S. delegation to the UN/ECE Working Party of Experts on Vehicle Noise. (http://pdf.usaid.gov/pdf_docs/PNADM819.pdf, incorporated by reference.) In response to questions regarding whether a noise level limit of 100 dBA Lmax would have significant impacts, he stated that:

> You are correct that exposure to 100 dBA is unacceptable to 3rd parties who have no control over the noise being produced. The issue is public health and welfare, not just hearing loss. While the impact statement is essentially correct regarding potential hearing damage due to continuous

1-17 cont.

> human exposure, it apparently ignores the other equally important adverse health and welfare impacts, e.g. speech interference, sleep disturbance and stress related physiological effects. The EPA levels document identifies 55 dBA as the level requisite to the protection of public health and welfare with an adequate margin of safety in a residential community.

(Attachment 5, Email from Kenneth Feith to Amy Minteer, dated August 11, 2009.)

1-18

Moreover, the RDSEIR fails to disclose that the average of 71.4 dBA is based on an 8 hour employee exposure of less than 85 dBA (RDSEIR p. 3-2), followed by night and evening exposures to average community noise levels of 45-55 dBA that allow for recovery. (U.S. EPA, Information on levels of Environmental Noise Requisite to Protect Public Health and Welfare (March 1974), Appendix D http://nonoise.org/library/levels74/levels74.htm, incorporated by reference.) Thus, in order to meet this recommended average, Speedway noise levels should not reach or exceed 85 dBA for more than 8 hours per day (81 dBA per the RDSEIR p. 3-4), and community noise levels would need to be within the recommended 45 dBA (indoors) and 55 dBA (outdoors) for the remaining 16 hours of each day. As neither of these conditions is true for the areas surrounding the Speedway, the Project's proposed noise standard will likely expose the community to levels of noise that endanger hearing. First, the Speedway's proposed noise standards allow exposure to up to 85 dBA, 16 hours per day, 365 days per year. This is twice the amount of exposure to 85 dBA considered safe by American and International health agencies (WHO, EPA, NIOSH, and OSHA.) (Attachment 3, p. viii [noting 8 hours exposures of 75 dBA are considered safe]; EPA Noise Effects Handbook p. 2-16 http://www.nonoise.org/library/handbook/handbook.htm, incorporated by reference; Attachment 4, NIOSH Criteria for a Recommended Standard, June 1998, http://nonoise.org/hearing/criteria/criteria.htm; 29 CFR 1910.95 [OSHA Regulations for Noise Exposure, requiring employer testing of all employees whose 8 hour average noise exposures exceed 85 dBA].) Second, the community surrounding the Speedway experiences average noise levels that far exceed the 45 and 55 dBA recommendations, noise levels necessary to maintaining hearing with only 8 hours of daily exposure to 85 dBA. The Speedway's own studies have found that truck traffic, train traffic, and the area's industrial character produce average community noise levels of 59 dBA Ldn (weekend) and 63 dBA Ldn (weekday). (RDSEIR, Table 4.2-4.) Even without the Speedway, the L50 can exceed 60 dBA, and Lmax levels of up to 116 dBA have been recorded. (RDSEIR, Table 4.2-5.)

1-19

The RDSEIR also does not disclose that the EPA standard does not provide absolute protection for human hearing. It is intended only to reduce hearing loss over a 40-year period to less than 5 dBA. (U.S. EPA, Information on levels of Environmental Noise Requisite to Protect Public Health and Welfare (March 1974), p. 8, http://nonoise.org/library/levels74/levels74.htm, incorporated by reference.) Additionally, studies have suggested that children are more susceptible to noise-induced hearing loss than adults. (Attachment 3, p. 41.) Thus, the County should set a noise standard that is more protective than one that allows hearing loss over time.

1-19 cont.

In order to be sufficiently protective of both human hearing and health, the Speedway should comply with the County noise ordinance. If the Speedway insists upon creating noise impacts at the expense of general health and welfare, the County must impose a new, lower maximum noise level that takes into account both the 16 daily hours of proposed operations and the high levels of existing community noise.

c. High Noise Levels Cause Cardiovascular and Other Chronic Ailments.

As noted by Mr. Feith, above, hearing loss is not the only health impact associated with increased noise levels, nor is it the most serious health impact. The RDSEIR downplays the impacts from "annoyance," but "[t]his 'annoyance' can have major consequences, primarily to one's overall health." (http://www.epa.gov/air/noise.html, incorporated by reference.) Annoyance and the resultant health impacts begin at average noise exposures much lower than the 71.4 dBA average noise level goal of the RDSEIR or the 70 dBA recommended by EPA. EPA's standard is intended to protect communities only from excessive hearing loss.

1-20

For community health, scientific consensus suggests an average noise level of closer to 50 or 55 dBA. Even so, the Project proposes a noise standard based on the EPA standard for hearing loss. The WHO and most other health agencies define health broadly. Per the WHO, health is a "state of complete physical, mental and social well-being and not merely the absence of disease or infirmity." (Attachment 3, Executive Summary, p. 20.) If the Speedway truly intends to apply a health based noise standard to its operations, it must be based on a truly healthy average noise level of 55 dBA or lower, not the 71.4 dBA proposed.

The EPA Noise Effects Handbook warns, "Exposure to such high noise levels is a health risk in that noise may contribute to the development and aggravation of stress related conditions such as high blood pressure, coronary disease, ulcers, colitis, and migraine headaches...Growing evidence suggests a link between noise and cardiovascular problems. There is also evidence suggesting that noise may be related to birth defects and low birth-weight babies. There are also some indications that noise exposure can increase susceptibility to viral infection and toxic substances." (EPA Noise Effects Handbook, http://www.nonoise.org/library/handbook/handbook.htm, incorporated by reference; see also EPA *Noise: A Health Problem*

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http://www.nonoise.org/library/epahlth/epahlth.htm#heart%20disease, incorporated by reference.) Fatigue is another common side-effect of noise exposure. (Attachment 3, p. 43.)

Potentially deadly cardiovascular impacts can be triggered by long-term average exposure to noise levels as low as 55 decibels. (WHO Media Centre, http://www.euro.who.int/eprise/main/WHO/MediaCentre/PR/2009/20091008_1?language [elevated blood pressure and heart attacks], incorporated by reference; http://whqlibdoc.who.int/hq/1999/a68672.pdf [finding demonstrated cardiovascular impacts, including ischemic heart disease and hypertension after long-term exposure to 24 hour average noise values of 65-70 dBA], incorporated by reference.) Exposure to even moderately high levels of noise during a single 8 hour period triggers the body's stress response. In turn, the body increases cortisol production, which stimulates vasoconstriction of blood vessels that results in a five to ten point increase in blood pressure. Over time, this noise-induced stress can result in hypertension and coronary artery disease, both of which increase the risk of heart attack death. (Attachment 3, p. x and pp. 47-48; *see also*, Maschke C (2003). "Stress Hormone Changes in Persons exposed to Simulated Night Noise". Noise Health 5 (17): 35–45. PMID 12537833. http://www.noiseandhealth.org/article.asp?issn=1463-1741;year=2002;volume=5;issue=17;spage=35;epage=45;aulast=Maschke, incorporated by reference; Attachment 6, Franssen EA, van Wiechen CM, Nagelkerke NJ, Lebret E (2004). "Aircraft noise around a large international airport and its impact on general health and medication use". Occup Environ Med 61 (5): 405–13. doi:10.1136/oem.2002.005488. PMID 15090660.) The standard proposed by the Project is for high, not moderate, noise, so impacts to the community surrounding the Speedway may be greater.

1-20 cont.

High levels of community noise may also accelerate and intensify existing mental disorders and the development of new ones, especially of neurosis. (Attachment 3, p. x. and pp. 48-49) Studies on the use of tranquilizers, sleeping pills, psychotropic drugs, and mental hospital admission rates suggest that high noise levels cause adverse impacts on mental health. (*Ibid.*)

The potential social impacts of high noise levels are also problematic and must be disclosed in the RSDEIR. Studies have found that noise above 80 dBA may reduce helping behavior and increase aggressive behavior in affected individuals. (Attachment 3, p. x.) These behavioral reactions are exacerbated by low frequency components and impulsive noise, both of which are common to Speedway noise. The repercussions of such reactions on families and in schools could be far-reaching, leading to greater adverse societal impacts that are better avoided.

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1-21 High noise levels also have dramatic developmental impacts on small children, many of whom reside and attend school near the Speedway. Children who are exposed to higher average noise levels have heightened sympathetic arousal, expressed by increased stress hormone levels, and elevated resting blood pressure. (Attachment 3, p. x.) These children also have heart rates that average 2 beats per minute faster than children exposed to less noise. (Goran, Belojevic, et. al. (2008). "Urban Road Traffic Noise and Blood Pressure and Heart Rate in Preschool Children". *Environment International* 34 (2): 226–231, available at http://www.ncbi.nlm.nih.gov/pubmed/17869340, incorporated by reference.) How this abnormality affects these children later in life is not yet known, but higher heart rates and resting blood pressure are known cardiovascular disease risk factors.

As proposed, the Project noise standards would expose community members to levels of noise that are not only unsafe for human hearing, but unsafe for cardiovascular health, mental health, societal well being, and child development.

d. Intermittent Noise May Cause Greater Impacts.

1-22 The RDSEIR relies heavily on the idea that, because Speedway noise is intermittent, average annual noise levels will not exceed 70 dBA. The noise standards thus allow emission of an additional 5 decibels that would not be allowed for continuous noise. (RDSEIR p. 3-2; EPA Noise Effects Handbook p. 2-16 http://www.nonoise.org/library/handbook/handbook.htm, incorporated by reference.) However, studies have shown that intermittent noise may have impacts on public health that are just as great, if not greater, than constant noise.

Several studies have indicated that impulsive noise produced greater hearing loss than predicted, based on total sound energy alone. (Attachment 4, NIOSH, Criteria for a Recommended Standard, section 3.4.1; all studies cited below are summarized in the NIOSH Criteria within section 3.4.1.) By contrast, the EPA standard, and consequently, the proposed Speedway standard, are based on the idea that total sound energy determines hearing loss, not high noise levels or impulsivity. Studies contradicting the "total energy" hypothesis upon which the Speedway rests include those performed by Passchier-Vermeer (1971), in which hearing loss in steel construction workers exposed to impulsive noise was higher than predicted; and Ceypek et al. (1973), Hamernik and Henderson (1976), and Nilsson et al. (1977), each of which found that continuous and impulsive noises have a synergistic rather than additive effect on hearing loss. In a follow-up study, Henderson and Hamernik (1986) determined that exposure to continuous and impulsive noises in combination may be more hazardous than exposure to continuous noise alone. A 1980 study of 81,000 Swedish construction workers exposed to the same 8 hour average sound level found that those exposed to impulsive noise had greater hearing loss than those exposed to continuous noise. (Voight et al.) Intermittent low-frequency noise appears to be most damaging. (See Sulkowski et al. (1983) [hammer men had substantially worse hearing than weavers exposed to the same average noise levels]; Thiery and Meyer-Bisch (1988) [finding that workers exposed to continuous and impulsive noise levels ranging from 87 to 90 dBA had greater hearing loss than those exposed to continuous noise levels of 95 dBA]; Starck et al. (1988) [finding shipyard workers exposed to intermittent noise had greater hearing loss than forest workers exposed to continuous chainsaw noise].)

1-22 cont. The NIOSH paper summarizes, "Noise energy does not appear to be the only factor that affects hearing. The amplitude, duration, rise time, number of impulses, repetition rate, and crest factor also appear to be involved [Henderson and Hamernik 1986; Starck and Pekkarinen 1987; Pekkarinen 1989]. The criteria for exposure to impulsive noise based on the interrelationships of these parameters await the results of further research." (Attachment 4, section 3.4.1.) Until the relationship between total sound energy and frequency of intermittent noise can be more reliably correlated with community hearing loss, the County must exercise caution in approving noise standards that do not account for the intermittent nature of drag strip noise. As concluded by NIOSH, "Whether the effects of combined exposure are additive or synergistic, exposure to these noises causes hearing loss; thus the contribution of impulse noise to the noise dose should not be ignored." (*Id.*, at section 3.4.3.)

The intermittent character of drag strip noise means that it is more disruptive than constant noise. (Attachment 3, p. 27, citing Bradley (1994) [noises that vary periodically to create a throbbing or pulsing sensation can be more disturbing]; Zwicker (1989).) Noises with sudden onsets, such as drag races, are also more disturbing than would otherwise be indicated by their recorded sound levels. (*Id.*, citing Berry (1995); Kerry et al. (1997).) While the increased disruption and annoyance will lead to increased stress impacts of noise, they also increase difficulties with verbal communication and concentration and reading comprehension. Sleep difficulties can also be expected, not only for individual who work night shifts and must sleep during the day, but also for individuals who sleep past 7 am or try to sleep before 11 pm. (Attachment 3, p. ix.) The WHO recommends against allowing individual noise events exceeding 45 dBA during normal sleep hours. The 85 dBA permitted by the proposed ordinance obviously exceeds a level protective of sleep. The greatest impacts of the County's proposed noise standard 16 hour allowance of 85 dBA intermittent noise may be felt by schoolchildren at bedtime.

2. Extending Hours of Operation to Allow 85 dBA from 7 a.m. to 11 p.m. Would Result in Severe Nuisance Impacts to the Surrounding Community.

The RDSEIR admits that the Project will have significant nuisance impacts:

> Because the proposed standard would allow for noise in excess of the levels currently determined to be an acceptable level of nuisance noise by the County Board of Supervisors and in excess of the current County Development Code noise limits for L-max and intermediate L-levels, a significant impact is identified for this issue area.

1-23 (RDSEIR p. 4.2-19.) The RDSEIR, however, fails to disclose what these nuisance impacts will be.

National and international health agencies agree noise levels of 85 dBA are always unacceptable in residential neighborhoods. These noise levels are even more inappropriate during early morning, evening, and late-night hours, during which residents and their children will be trying to sleep. The WHO has found that individual noise events above 45 dBA can disrupt individuals who are already sleeping. (Attachment 3, p. 61.) Recommended sound levels for the hours during which individuals are trying to fall asleep are significantly lower, 30 dBA for continuous noise. (*Ibid.*) People exposed to late evening noise may require non-prescribed sleep medication and sedatives to fall asleep. (Attachment 6, Aircraft Noise Around a large International Airport and its Impact on General Health and Medication Use, E.A.M Franssen et al. *Occup Environ Med* 61:405-413 (2004).) Many adults and nearly all children go to bed prior to 11 pm, and it is widely accepted that sleep disruptions at night translate into impaired daytime function, immune system dysfunction, growth problems in children, and especially learning difficulties in children. The proposed noise standards extend to weekends and holidays, as well. Intermittent noise reaching or exceeding 85 dBA can be expected during holiday events, church services, and during weekend hours that some individuals rely upon to catch up on sleep. For these reasons, and others too numerous to count, the proposed noise standard's allowance of 85 dBA from 7 am to 11 pm should not be approved by the County.

3. Increased Maximum Noise Levels Would Impact Numerous Residents and Elementary School Students.

1-24 It is well-established that high noise levels and intermittent noise are poor learning environments. The World Health Organization Community Noise Guidelines conclude, "It is clear…that daycare centres and schools should not be located near major noise sources." (Attachment 3, p. xii.) The Community Guidelines recommend that

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background sound levels in classrooms not exceed 35 dB during teaching sessions and that outdoor playgrounds not exceed 55 dB. (*Id.* p. xiii and p. 61.) These guidelines are meant to prevent the "critical effects of noise" in schools, which "are speech interference, disturbance of information extraction (e.g. comprehension and reading acquisition), message communication and annoyance."

Three schools are located within hearing distance of the Speedway: Redwood Elementary, Live Oak Elementary, and Sequoia Middle School. According to acoustics expert Ron Brown, if noise levels reach 100 dBA 550 feet from the Speedway, Redwood and Live Oak Elementary schools would be impacted by maximum noise levels of 96.2 dBA. These levels far exceed those recommended by the WHO. (Attachment 7, Review

1-24 cont. of Draft Subsequent Environmental Impact Report by acoustics expert Ron Brown.) The increased maximum noise levels would be allowed on weekdays, during school hours. This level of noise could cause severe distractions to students at the schools and result in physiological and psychological impacts to students and residents.

As would be expected, children who learn in classrooms with speech-interference levels of noise have a more difficult time understanding speech than those who learn in quieter settings. Speech-interference levels of noise (above 35 dB or 45 dB indoors) compromise auditory processing functions. This is a particular concern in schools such as Redwood and Live Oak Elementary Schools where English is a second language for many students. High levels of noise can also affect older students because speech perception is not fully developed until the teenage years. A 1993 Cornell University study found that children exposed to noise in learning environments experienced trouble with word discrimination as well as various cognitive developmental delays. (Wakefield, Julie (June 2002). "Learning the Hard Way". *Environmental Health Perspectives* 110 (6), p. A302, available at http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1240882/pdf/ehp0110-a00298.pdf, incorporated by reference.) Other cognitive effects of noise include impacts on reading, attention spans, problem solving, and memorization. (Attachment 3, p. x and pp. 49-50.) These problems may linger long after the noise has receded. The WHO found that "Children chronically exposed to aircraft noise under-perform in proof reading, in persistence on challenging puzzles, in tests of reading acquisition and in motivational capabilities." (Attachment 3, p. x.)

The RDSEIR also fails to acknowledge that the elevated noise levels would impact residences in addition to the one located nearest the Speedway property on Whittram Avenue. Although the RDSEIR now identifies the homes located north of Whittram Avenue (RDSEIR p. 4.2-10), it still fails to assess the noise impacts upon these

1-25 residences. Ron Brown found that noise levels of 100 dBA 550 feet from the Speedway would result in residential exposures of 98.7 dBA. (Attachment 7, Review of Draft Subsequent Environmental Impact Report by acoustics expert Ron Brown) This noise

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1-25 cont. level could cause hearing loss and the myriad other health problems discussed above.

4. Impacts to Drag Strip Spectators and Workers

1-26 The RDSEIR also fails to analyze the noise impacts of the increased allowable noise levels on drag strip spectators and workers. If the noise level is a maximum of 100 dBA at 550 feet noise of the Speedway property the noise level at the drag strip would be over 110 dBA. (Attachment 7, p. 2.) Although these levels are high enough to cause permanent hearing damage, higher noise levels have been recorded. Spectators and workers at the drag strip would be subjected to these excessive noise levels, which could result in hearing damage and other health impacts. (*Ibid.*) For reference, the WHO has determined that patrons should not attend events that will reach 100 dBA for more than four hours, any more than four times per year. (Attachment 3, p. xiv.) NIOSH limits 100 decibel exposures to only *15 minutes per day*. (Attachment 4, NIOSH Standards.) For louder noises, the WHO suggests a maximum noise level below 110 decibels to "avoid acute hearing impairment." (Attachment 3, p. xiv.) OSHA recommends protective gear and periodic testing for noise levels exceeding 85 dBA. (Attachment 4, NIOSH Standards.) Such hearing protection measures will not be provided to drag strip spectators, although they may be provided to workers. The WHO would further limit noise levels of even 85 dBA to 1 hour per day. The potential impacts on spectators and employees should be analyzed in the RDSEIR.

5. Noise Impacts From Fireworks, Aircraft, and Emergencies Should Not Be Exempt from County Noise Standards.

1-27 The noise standards exclude many noise sources that can be expected to exceed the proposed noise standards. These excluded sources include "emergencies, accidents, and activities such as fireworks and aircraft, rail, airship, and helicopter operations." (RDSEIR p. 4.2-12.) If these noise sources are attributable to Speedway operations, as fireworks, jet flyovers, and helicopter operations would likely be, there is no basis for excluding them from the Speedway noise standards. Not only are fireworks and jet flyovers extremely loud, but, if excluded from the standards, they will prevent any real assessment of the Speedway's noise impacts on the average daily noise exposure in the community. The Speedway claims that its noise standards are based on the 71.4 dBA average daily exposure recommended by the EPA for hearing loss prevention. This 71.4 dBA is an average of *all* noise to which a community member is exposed. In this community, that noise includes trains. If the Speedway is allowed to exclude its loudest noises from compliance with its noise standard, community members will likely be exposed to daily average noise levels greatly exceeding 71.4 dBA. As discussed above, even if the Speedway complied with the 71.4 average noise level significant health impacts would likely result as discussed above. Thus, if 71.4 dBA is greatly exceeded, the community's health is at great risk. If the Speedway wishes to exclude train noise and existing community noise from its noise standard, then a lower maximum noise level must be adopted, based on scientific and medical evidence. Additionally, under no circumstances should Speedway-produced noise, including fireworks, jet flyovers, and helicopters, be excluded from compliance with noise standards.

Another concern with allowing the Speedway to selectively apply the proposed noise standards is that this will allow the Speedway to attribute any "spikes" in its continuous noise monitoring to train, firework, or jet noise, which will result in the underreporting of Speedway noise. In fact, it appears that this might even be the Speedway's intention. The Technical Noise Analysis claims that this exclusion was provided so that "a single uncontrollable event at the Speedway, such as an emergency situation or accident; i.e., emergency vehicle sirens or engine blow-out, could skew the
1-27 cont. monitoring results." (RDSEIR Technical Noise Analysis, Appendix E, p. 4.) Contrary to what is stated in the technical analysis, such an uncontrollable event would not, in fact, "skew the analysis." Rather, it would provide accurate monitoring of the Speedway's true noise impacts. Although CCoMPRESS does not wish to prematurely accuse the Speedway of malfeasance, CCoMPRESS members have repeatedly documented the Speedway's lack of compliance with the County noise ordinance and mitigation measures thus far. The historical record of compliance with mitigation measures and other requirements is relevant in environmental analysis to analyzing the impact of a proposed project. *(Laurel Heights Imp Ass'n v. Regents of the University of California* (1988) 47 Cal. 3d 376, 420.)

Community members have also brought to our attention the fact the Speedway has recently begun setting off fireworks on the north side of the property, nearest to homes and businesses. In addition to incorporating fireworks and other exceptionally loud noise sources into the total noise standards, the Speedway should include a mitigation measure prohibiting fireworks from being set off on the north or east sides of the property. If at all, fireworks should be set off on the southern portion of the property or within the grandstand where they are further from homes and businesses.

6. The Speedway Should Not Be Allowed to Eliminate Analysis of L50 and Other Noise Levels Standards.

The Project removes the existing L50 noise limit of 55 dBA, which is necessary to protect human health and hearing, without adequate reason. The L50 should be retained.
1-28 The L50 is the maximum noise level the Speedway is allowed to reach for up to 30 cumulative minutes in a one hour period. Unlike the Lmax, which sets a maximum noise level, the L50 determines how frequently that maximum may be reached.

The RDSEIR implies that the L50 was removed for ease of enforcement, but the proposed standard will be more difficult to enforce. The Speedway claims the new noise standards are necessary, in part, "To provide an easily enforceable and consistent method of noise measurement…" (RDSEIR p. 3-1.) This implies that the existing standard, which allows a maximum noise level of 75 dBA and an L50 of 55 dBA is too complicated to measure and enforce. However, instead of proposing a clearer noise standard, the noise standards discussed in the RDSEIR are more complicated and difficult to enforce than the existing L50. The new standard states that for the 35 days that an Lmax of 100 dBA is allowed, "the time that noise levels exceed 85 dB Lmax would be limited to the hours between 10 am and 7 pm over a cumulative maximum total of 60 minutes per day during the Speedway's permitted operating period." (RDSEIR p. 4.2-12.) Like the L50, this noise standard will require continuous monitoring. If it is difficult to estimate and enforce an L50, then determining whether Speedway operations exceed 85 dBA more than one cumulative hour per operating day seems impossible. Thus, operational efficiency cannot be the reason the Speedway proposes to remove the L50.

1-28 cont.

It is more likely that the Speedway proposes to remove the L50 because Speedway operations under the Project will violate the existing standard by exceeding 55 dBA more than half of each operating hour at schools and many homes. They already do. (RDSEIR, Table 4.2-7.) This strategy was recommended by Gordon Bricken and Associates in its March 2006 analysis of drag strip noise. (Attachment 8, excerpts from March 2006 Gordon Bricken analysis p. 11 [recommending Lmax of 85 dBA, as measured 800 feet from the drag strip].)

The County cannot justify removal of a health-based noise standard just because a Project will violate it. This defeats the purpose for which the County instituted the noise ordinance. It also sends the message that the County places developer profits ahead of its residents' welfare.

The Lmax and the L50 standard are *both* needed to protect health and hearing and community wellbeing. The WHO notes that it is equally important to measure the Leq as the Lmax when setting standards to protect human health. (Attachment 3, pp. xii-xiii.) With only a maximum noise standard, as proposed, there will be no safeguards to prevent the Speedway from reaching the maximum noise level of 85 dBA from 7 am to 11 pm, 365 days per year. At a noise level of 85 dBA, 16 hours a day, the County will allow residential noise exposures at over twice what is recommended by EPA, OSHA, and NIOSH, and without the hearing loss prevention programs required by those agencies. Without an L50, the proposed noise standards do not protect hearing; they promote hearing loss.

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7. The RDSEIR fails to Analyze Noise Impacts from RV Generators

The relocation of the drag strip to the north side of the Speedway's property and the removal of the restrictions on parking lots 3-10 will allow recreational vehicles to
1-29 park and stay at these locations for the 3-4 days the drag racing events take place. These RVs use generators which increase noise levels, in particular during quiet nighttime hours. The RDSEIR fails to analyze these noise impacts on their own and cumulatively with other noises generated by the Project.

8. The RDSEIR Fails to Include the Analysis of Groundbourne Vibrations

The RDSEIR claims that based on a vibration analysis prepared for the Project, groundbourne vibrations would not be significant. However, this analysis is not included
1-30 in the RDSEIR or its appendices. (RDSEIR p. 4.2-24.) This analysis must be disclosed to both the public and County decisionmakers.

9. The RDSEIR Fails to Analyze Traffic Noise From Operation of the Drag Strip

Drag strip operations were previously limited to 24 weekends per year. This limit is removed under the Project, which will result in more frequent, if not greater, traffic noise impacts. Since the Project extends the hours during which noise levels may reach 85 dBA to 7 am to 11 pm, it can be assumed that spectator traffic entering and exiting
1-31 drag strip events will enter earlier and leave later than it does now. Any additional noise impacts on neighborhood residents will be exacerbated by the early morning and late-night hours at which they will occur. The Speedway has also recently opened the Calabash Avenue entrance to drag race spectators. None of these traffic-based noise impacts are addressed by the RDSEIR.

10. The Project Removes a Mitigation Measure for a Previous Project Approval.

In approving Revision 4 of the Speedway Development Plan, the County expressly prohibited race operations in parking lots 3-10 to prevent additional noise and air quality impacts on nearby residents. Now, however, the Speedway proposes to remove this prohibition without adequate findings or mitigation to prevent these undesired
1-32 neighborhood impacts. In *Lincoln Place Tenants' Association v. City of Los Angeles* (2005) 130 Cal.App.4th 1491, the court addressed a situation where in a developer failed to comply with mitigation measures previously placed on his property. The court determined, "Having placed these conditions on the demolition segment of the

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1-32 cont. redevelopment project, the city cannot simply ignore them." (*Id.* at p. 1508.) This is exactly what the Speedway proposes to do. The court continued, finding that the City could "modify or delete" a mitigation measure "if the measure has been found to be impractical or unworkable." (*Id.* at pp. 1508-1509.) However, "a governing body must state a legitimate reason for deleting an earlier adopted mitigation measure, and must support that statement of reason with substantial evidence." (*Napa Citizens for Honest Government v. Napa County Bd. of Supervisors* (2001) 91 Cal.App.4th 342, 358-359.) As the RDSEIR has done neither, the prohibition on racing operations in parking lots 3-10 must be retained.

11. The Project Would be Inconsistent with the County's General Plan Noise Element

1-33 The County's General Plan noise element states:

> Excessive and/or sustained noise can contribute to both temporary and permanent hearing loss, and may be associated with increased fatigue, stress, annoyance, anxiety, and other psychological reactions in humans. For the various elements of the society to coexist, noise levels need to be controlled and minimized to limit exposure to residential communities and noise-sensitive land uses. The control of noise, therefore, is an essential component in creating a safe, compatible, and productive environment.

(San Bernardino County General Plan Noise Element p. VII-1.) The Project ignores the requirements of the General Plan to eliminate not only noise impacts resulting in hearing loss, but also those that result in annoyance and associated health impacts. The proposed Project would also violate County General Plan Policies N1.3, which requires compliance with the County's noise standards (75 dBA Lmax) in noise sensitive areas, and N1.7, which prohibits the establishment of land uses that are incompatible with the surrounding area due to their excessive noise levels.

12. The RDSEIR Fails to Analyze the Project's Compliance with Interior Noise Level Standards.

1-34 The County's Development Code states "Interior noise levels in all single-family and multi-family residences and educational institutions shall not exceed 45 dBA Ldn emanating from sources outside of the residential building." (Development Code section 82.18.030 (b).) The RDSEIR fails to analyze whether the Project would comply with this requirement, however due to the excessive noise levels it proposes to allow, it is clear that it would not.

13. Cumulative Noise Impacts

1-35

The RDSEIR incorrectly claims that the Project would not cause a significant cumulative impact due to increased Ldn noise levels because the ambient noise level Ldn would only increase by .2 dBA due to operation of the drag strip at the proposed increased noise levels. (RDSEIR p. 6-5.) The Ldn is a 24-hour average noise level with a 10 dBA penalty added between 10:00 PM and 7:00 AM. (RDSEIR p. 3-2.)

Current ambient Ldn noise levels are estimated to be 72.1 dBA, whereas 65 dBA is the acceptable maximum Ldn noise level for residences. Because ambient noise levels already exceed acceptable Ldn noise levels for residential uses, any increase in that noise level should be considered a cumulatively significant impact. (*Los Angeles Unified School Dist. v. City of Los Angeles* (1997) 58 Cal.App.4th 1019, 1024.) In *Los Angeles Unified School Dist v. City of Los Angeles,* the court found that when ambient traffic noise levels at a school were already above Department of Health recommended maximum noise level of 70 dBA, any further increase is a cumulatively significant impact. (*Id.* at 1024-1027.)

C. The RDSEIR's Analysis of Air Quality Impacts is Inadequate.

1. RDSEIR Incorrectly Claims that Permanent Operation of Drag Strip Would not Generate New Pollutant Emissions.

1-36

The RDSEIR claims the operation of the relocated drag strip would not "generate new pollutant emissions" (RDSEIR p. 8-1), but provides no evidence to support that claim. Operation of the drag strip includes activities at the Speedway that are in addition to the activities at the oval track analyzed in the Speedway's 1995 EIR. Dragsters produce additional pollutants from their greater frequency of operation, use of different types of fuel, and their manner of operation (i.e. the heating of their tires and operation at very high speeds for a short duration).

Operation of the relocated drag strip with more lenient noise standards, as proposed in the RDSEIR, would also generate additional pollutant emissions above those produced at the south side drag strip. Increasing noise standards would allow for an increased number of events, dragsters, and spectators. When the drag strip was located on the south side of the Speedway property, only street legal vehicles were allowed to race. Street legal vehicles are required to have mufflers and are required to comply with stricter emissions standards than dragsters that operate only on a drag strip. The Speedway would allow non-street legal gas powered dragsters, alcohol fueled dragsters, and top performing dragsters such as funny cars and nitromethane fueled cars. These types of dragsters produce new and additional pollutants beyond the pollutant types and

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levels emitted when the drag strip was operated on the south side of the Speedway property.

Additionally, drag racing was limited to approximately 24 weekends per year at the
1-36 cont. south side drag strip, whereas there is no limitation on the number of events per year at the relocated drag strip. It is estimated there will be approximately 40 events per year at the relocated drag strip, nearly twice as many events as previously allowed. These additional racing days increase the amount of pollutant emissions that would be generated by drag racing as well as by participants and spectators driving to the Speedway.

2. The RDSEIR Fails to Analyze Criteria Air Pollutants.

The EPA has designated the following as "criteria" pollutants: nitrogen oxides; sulfur oxides; lead; carbon monoxide; particulate matter; and ground level ozone. The EPA calls these pollutants "criteria" air pollutants because it regulates them by developing human health-based and/or environmentally-based criteria (science-based guidelines) for setting permissible levels. The set of limits based on human health is called primary standards. Another set of limits intended to prevent environmental and property damage is called secondary standards. In California, thresholds for these criteria pollutants are set
1-37 by regional Air Quality Management Districts. The South Coast Air Quality Management District (SCAQMD) has set threshold levels specific to the County of San Bernardino.

The RDSEIR fails to analyze whether the relocated drag strip would emit criteria pollutants at levels in excess of SCAQMD limits. These pollutants are produced by on-road vehicles traveling to drag racing events, off-road dragsters, fueling of race vehicles, electricity and natural gas consumption. (1995 EIR p. 4.5-18; see also County General Plan p. V-10 "Motor vehicle emissions and evaporation of various [volatile organic compounds] (i.e., solvents usage, fuels, etc.) are major contributors to regional [ozone] problems.) The County must analyze whether the amounts of the criteria pollutants produced at the relocated drag strip exceed thresholds that have been established by the SCAQMD.

3. The Air Quality Modeling Technical Study Fails to Provide Adequate Information.

The RDSEIR contains a short air quality modeling technical study (air quality study or study) with limited information on an air dispersion model and health risk
1-38 assessment prepared for the Project. The study fails to provide adequate support for its emissions calculations, relying on an assumption that drag racing vehicles emit similar pollutants to other vehicles. It also relies on an assumption that dragsters would produce four times the amount of pollutants as other cars. (RDSEIR Air Study p. 4.) Is that

assumption based on a factual calculation? If not, what is the basis for the assumption? The air quality study states that "[t]he final emissions used for the analysis are included in appendix to this report"; however, there is no appendix to the report included in the RDSEIR. (RDSEIR Air Study p. 4.) The County must make this appendix available to public agencies, in particular SCAQMD, and to the general public, so that they can fully analyze the adequacy of the report.

1-38 cont.

The emission calculations fail to analyze the emissions produced by alcohol fueled dragsters. The emission calculations also assumes that nitromethane fueled vehicles produce only trace levels of pollutant emissions, except for emissions of formaldehyde and ammonia, for which the air quality study was unable to determine an emission level. (RDSEIR Air Study p. 5.) What documentation does the air quality study rely upon to support its claims regarding emissions from nitromethane fueled vehicles?

The health risk assessment contained in the air quality study includes an equation for determining cancer risks for pollutants that would be produced by the drag strip and states "The cancer risk for each pollutant was found using the equation above. The resulting risks were summed to obtain the final" maximum individual cancer risk. (RDSEIR Air Study p. 9.) The air quality study fails to "show its work" for this analysis; the study does not contain the cancer risk findings for each pollutant, only the end summed result. The RDSEIR must contain the analysis for each individual pollutant to allow public agencies and the general public to assess whether the cancer risk from the drag strip has been adequately disclosed.

The health risk assessment also analyzes only inhalation impacts and not the potential for dermal absorption or ingestion of pollutants through contaminated water or food. Several residents north of the drag strip have fruit trees and the RDSEIR should analyze whether consumption of these fruits would remain safe. Further, what reference exposure level does the health risk assessment use to calculate the acute and chronic hazard indexes (non-carcinogenic health impacts from long and short term exposure) from the Project?

4. Methanol Levels Already Exceed Reference Exposure Levels.

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The SCAQMD tested for air pollutants during the Nostalgia Shootout weekend held at the Speedway's drag strip in April 2009. The report prepared by the SCAQMD showed Methanol levels that significantly exceeded both the acute and chronic reference exposure levels that are set by the California Office of Environmental Health Hazard Assessment to protect human health. (Attachment 9, SCAQMD June 4, 2009 letter regarding measured air pollutants.)

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These measurements of methanol in excess of reference exposure levels were taken when a prohibition on alcohol fueled dragsters was in place. If the noise standard is increased so that dragsters operating on alcohol fuels, such as methanol, would be
1-39 cont. allowed to race, methanol levels can be expected to increase even further. Additionally, methanol is often mixed with the substance applied to the drag strip for traction (VHT). (Article on use of VHT, www.competitionplus.com/index.php/drag-racing/news/13558-so-what-makes-vht-inappropriate, incorporated by reference.) Since measured levels are already so high that they could result in significant health impacts to the community, any additional methanol should be considered a significant impact.

5. Greenhouse Gases Emissions Must be Analyzed.

The burning of fossil fuels results in the accumulation of "greenhouse gases" such as carbon dioxide, methane and nitrous oxide in the atmosphere. It is that accumulation of gases which results in climate change. In California, the state government has acknowledged the global ramifications of greenhouse gas emission. On June 1, 2005, Governor Schwarzenegger issued Executive Order S-3-05, which notes that "California is particularly vulnerable to the impacts of climate change." This Executive Order also details the significant impacts increased greenhouse gas emissions will have on the state including threats to the Sierra snowpack, an exacerbation of existing air quality problems,
1-40 human health impacts from increase heat stress, rising sea level and threats to the state's water supply. The California legislature concurred in this recognition of the significant impacts of greenhouse gas emissions in its enacting of Health and Safety Code section 43018.5, which requires the Air Resource Board to "adopt regulations that achieve the maximum feasible and cost-effective reduction of greenhouse gas emissions from motor vehicles." There is new information about the significant impacts of greenhouse gases that was not available when the EIR was prepared for the Speedway Development Plan in 1995. The impact of greenhouse gas emissions from the Speedway has never been studied. The RDSEIR should study and mitigate the impacts of greenhouse gases produced by vehicles racing at the Speedway and by the vehicles of spectators traveling to the events. The RDSEIR refuses to analyze GHG emissions based on a mistaken claim that the amount of emissions would not be increased at the relocated drag strip. As discussed in section C.1 above, the relocated drag strip will increase the frequency and type of drag racing operations.

6. The RDSEIR Fails to Analyze Impacts from Offensive Odors.

The relocation of the drag strip to the north side of the Speedway property moves it
1-41 much closer to many homes, business, schools, and churches. Before each drag race, every dragster spins its tires on wet pavement to heat the tires so as to achieve faster race times. The heating of the tires results in burning rubber that forms large clouds of smoke.

1-41 cont. These clouds of smoke can then spread to the nearby neighborhoods. When the relocated drag strip was operating in violation of CEQA (from 2006 to the present), residents personally observed the objectionable odors from these large clouds of smoke smelling of burned oil, rubber and fuel during drag racing events; the clouds of smoke from burned rubber makes it difficult for community members to breath, causes their eyes to water, and makes them feel dizzy. The RDSEIR fails to analyze whether the relocated drag strip would produce any objectionable odors despite clear evidence that it would.

7. Cumulative Air Pollution Impacts.

1-42 The RDSEIR is completely devoid of analysis of cumulative air pollution impacts. Operation of the oval track already results in significant emissions of carbon monoxide, reactive organic gases (a precursor to ground level ozone), nitrous oxides, sulfur oxides, particulate matter, and lead. (1995 EIR p. 4.5-23.) Therefore, any increase in the levels produced, in particular due to the allowed co-operation of the drag strip and the oval track, would result in a significant impact that has not been analyzed or acknowledged. The RDSEIR also fails to analyze existing baseline air pollutant levels in the area. If the existing levels of any air pollutant are in excess of allowable standards, then even if the amount produced at the drag strip would not be considered significant on its own, it would be cumulatively significant. "One of the most important environmental lessons evident from past experience is that environmental damage often occurs incrementally from a variety of small sources…Perhaps the best example is air pollution, where thousands of relatively small sources of pollution cause a serious environmental health problem. (*Kings County Farm Bureau v. City of Hanford* (1990) 221 Cal.App.3d 692, 720.)

D. The RDSEIR Fails to Analyze Potentially Significant Adverse Impacts

The RDSEIR claims there is no possibility for significant impacts from the Project beyond potential noise impacts, and thus fails to analyze the Project's potentially significant traffic, land use, water quality, hazard/hazardous material, environmental justice, and public service impacts.

1. Traffic Impacts

a. The Proposed Project Changes Traffic Patterns.

1-43 The RDSEIR incorrectly claims that the relocated drag strip does not change points of entry for the Speedway. (RDSEIR p. 8-5.) Prior to the relocation of the drag strip to the north side of the Speedway property, the Speedway has never allowed entrance or exit to their property via Calabash Avenue. That changed recently when

events were simultaneously held at the oval track and the relocated drag strip. At the
conclusion of simultaneously held events in October 2009 and again in March 2010, the
1-43 Speedway directed all traffic from the drag strip event to exit the Speedway property via
cont. Calabash Avenue instead of Cherry Avenue. Area residents witnessed the use of the
Calabash Avenue exit on these dates and the great traffic burden this new exit strategy put
on the smaller streets located north of the Speedway property, in particular Whittram
Avenue. Neither the 1995 EIR, nor the 2003 Addendum, analyzed traffic impacts at the
intersection of Whittram Avenue and Calabash Avenue. The RDSEIR must analyze the
traffic impacts at this intersection and other intersections north of the Speedway property.

b. The Project Would Generate New Vehicle Trips.

A new traffic report must be prepared to analyze the traffic impacts associated
with operating the drag strip on the north side of the Speedway and greatly expanding
drag strip usage. The proposed Project would increase the number of spectators and
participants at the drag strip due to additional fans that attend events with non-street legal
dragsters. (RDSEIR, p. 9-8.) The number of days of use of the drag strip has also been
1-44 greatly expanded at the relocated drag strip, as set forth in section C.1 above.
Additionally, many of the participants in drag racing events arrive in large recreational
vehicles so they can camp out at the Speedway property for the duration of drag racing
events. For non-street legal events, dragsters must be hauled to the drag strip, requiring
the use of large trailers. The additional traffic, including oversized vehicle traffic,
generated by the relocated drag strip must be analyzed in a new traffic report. The new
traffic report should also analyze the cumulative impacts of operating the relocated drag
strip at the same time as the Speedway's oval track.

c. The 1995 EIR's Traffic Analysis Must be Revised.

The traffic analysis contained in the 1995 EIR must be revised due to significant
changes in circumstances. The analysis contained in this environmental document
assumed that approximately 9,000 spectators would use a Metrolink station adjacent to
1-45 the Speedway site to access Speedway events. (1995 EIR p. 2-17.) The traffic and
parking analysis for Speedway operations assumed a reduction in traffic and parking
impacts based on that Metrolink ridership. The Speedway halted its use of the Metrolink
station in October 2009, therefore the traffic and parking analysis for the Speedway must
be revised to consider and mitigate the impacts of the additional spectators now required
to drive to Speedway events.

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2. Land Use Impacts

1-46 As noted above, the Project is inconsistent with the County's General Plan. This significant land use impact was not evaluated in the RDSEIR.

3. Water Quality Impacts

The RDSEIR fails to analyze the potential runoff impacts from operation of the drag strip. The Hickory Basin is a County detention basin located at the northwest corner of the Speedway property, the Inland Empire Utilities Association began using it as a recycled water recharge site in 2006. (http://www.environmental-expert.com/Files%5C5306%5Carticles%5C8855%5C106.pdf, incorporated by reference.)
1-47 This site is operated by the San Bernardino Flood Control District. The starting line for the relocated drag strip is located less than 500 feet from the Hickory Basin. The starting line of the drag strip is the area where VHT, the compound used to increase traction at the drag strip, is applied. Water quality could be impacted by runoff contaminated by VHT, fuel, oil, and solvents associated with drag racing activities.

The Hickory Basin is owned by the San Bernardino County Flood Control District and used by the Inland Empire Utilities Association. The County should consult with these agencies regarding the potential impacts of the project on the Hickory Basin.

4. Hazard and Hazardous Material Impacts Must be Disclosed and Analyzed.

The RDSEIR must disclose whether a fueling station will be used at the relocated drag strip. If so, how large will fuel storage tanks be? What will they contain? Will they be aboveground storage tanks or underground storage tanks? If the relocated drag strip does not include a fueling station, how will refueling be accomplished during drag racing events? Has the County consulted with the Department of Toxic Substance Control regarding the use of a fueling station at the relocated drag strip?

1-48

The RDSEIR fails to analyze the safety hazards associated with allowing non-street legal dragsters to race. Unfortunately, there have been numerous lethal accidents associated with drag racing in recent years. (List of 38 drag racing fatalities between 2005 and 2009, http://dragstripdeaths.webs.com/200509.htm, incorporated by reference.) One such fatality occurred at the relocated drag strip last August. Non-street legal dragsters are able to achieve much higher speeds, which could increase the likelihood of accidents at the drag strip. The RDSEIR must analyze the safety of the drag strip and include a response plan in case an accident does occur.

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1-48 cont. The RDSEIR also states that "Top Fuel Dragster and Funny Car classes are not expected to run at the Speedway drag strip due to safety issues" (RDSEIR p. 4.2-17.) What safety issues is the RDSEIR referring to? If there are safety issues associated with the use of top fuel dragsters and funny cars, the RDSEIR must either analyze and mitigate any potential safety impacts, or include a mitigation measure prohibiting the operation of these dragsters. The Speedway recently held a drag racing event where funny cars were allowed to race, making analysis of safety impacts associated with these dragsters even more imperative. (Attachment 10, Article regarding funny car driver that was planning to race at the Speedway's NHRA Heritage Series event on April 23 to 25, 2010; CCoMPRESS members also documented announcements during this event that stated that funny cars were racing.)

5. Environmental Justice Impacts.

The RDSEIR is completely devoid of analysis of the Project's environmental justice impacts. The Project is located in a redevelopment area, requiring the County and Speedway to comply with additional requirements of the Community Redevelopment Law. Projects in redevelopment areas are prohibited from resulting in discrimination of any community on the basis of race, color, national origin (Health and Safety Code § 33050.) The Project would disparately impact a low income mainly Latino community by subjecting this community to much higher noise levels than any other community in the County, resulting in a violation of Community Redevelopment Law.

1-49 Additionally, if the Speedway or County has received any federal funding for the San Sevine Redevelopment Area, from stimulus funds or other federal funding sources, it is required to comply with the federal civil rights laws. Title VI of the Civil Rights Act of 1964 and its regulations prohibit both intentional discrimination based on race, color or national origin, and unjustified adverse disparate impacts for which there are less discriminatory alternatives. Title VI provides: "No person in the United States shall on the ground of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance." 42 U.S.C. § 2000d. The Fourteenth Amendment and 42 U.S.C. § 1983 also prohibit discrimination. Approval of the Project would fail to comply with the federal civil rights laws (if they are applicable) by failing to insure environmental quality and environmental justice, failing to provide the information necessary to understand the impact of the Project on all communities, and failing to allow full and fair public participation in the decision making process by failing to provide notices in Spanish despite repeated requests that the County do so.

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6. Public Services Impacts.

1-50 Operation of the drag strip increases the need for police, fire, and emergency services. Area residents have observed drag racing on city streets near the relocated drag strip prior to and after drag racing events. This illegal drag racing could result in accidents impacting the participants and community members using city streets and sidewalks. This is particularly dangerous now that the drag strip is located adjacent to residential, school, and church uses. Additional Police Department services are required to halt this illegal drag racing. The RDSEIR must devise a plan for eliminating the use of public streets for drag racing or contribute funding to the Police Department to cover the increased services required.

The RDSEIR should also evaluate the need for additional Fire Department and emergency services due to the potential for accidents discussed above. Additionally, one fire has already been caused by fireworks when they were set off on the north side of the Speedway property. Fireworks may be used on the north side of the Speedway property more frequently once the restrictions on noise producing activities on this area of the Speedway has been lifted by the proposed Project.

E. Mitigation of Noise Impacts is Inadequate.

1. Noise Level and Time Limits are Confusing and Unenforceable.

1-51 CEQA requires that mitigation measures "be fully enforceable through permit conditions, agreements, or other legally-binding instruments." (CEQA Guidelines § 15126.4(a)(2); see also *Lincoln Place Tenants Ass'n v. City of Los Angeles* (2005) 130 Cal.App.4th 1491, 1508 ["Mitigating conditions are not mere expressions of hope."]) "The purpose of these requirements is to ensure that feasible mitigation measures will actually be implemented… and not merely adopted and then neglected or disregarded." (*Federation of Hillside and Canyon Association v. City of Los Angeles* (2000) 83 Cal.App.4th 1252, 1261, italics omitted.)

The August 2009 DSEIR included mitigation measure 4.2-1, a confusing and complicated measure limiting the amount of time the Lmax can exceed 85 dBA to 35 days per year. On those days the Speedway cannot exceed the Lmax of 85 dBA for more than 60 cumulative minutes throughout the 16 hours the Speedway is operating. In the RDSEIR, the County has removed this mitigation measure, including the limitations as part of the project description instead. The RDSEIR has also added to the Project description a statement that the Speedway will only exceed 85 dBA Lmax between the hours of 10 a.m. and 7 p.m. Because the limitations are no longer a mitigation measure or condition of approval and are not included in the mitigation monitoring report, they are

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1-51 cont. not fully enforceable as required by CEQA.

Additionally, as set forth in CCoMPRESS's comments on the August 2009 DSEIR, the noise standards proposed are complicated and confusing, making enforcement of this standard difficult even there were included as a mitigation measure or condition of approval. It is a very specific standard that requires constant monitoring, but the RDSEIR does not provide a clear answer on how often monitoring would occur and whether the Speedway or the County would be responsible for monitoring. Despite the RDSEIR's repeated assurances that monitoring protocol are included in the Technical Noise Analysis, the protocol never addresses the 100 dBA standard. The following questions must be addressed:

Would the maximum noise levels be monitored constantly on the 35 days designated for noise levels in excess of 85 dBA?
1-52 If not, how could you calculate whether or not the maximum noise level is in excess of 85 dBA for more than 60 cumulative minutes?
Who would monitor the noise levels on the 35 days to measure the amount of time the noise levels are above 85 dBA Lmax?
What would happen if standard is exceeded for more than 60 cumulative minutes?
Who would fund the noise monitoring?
Is this solely a self-reporting measure?
Would the County independently confirm that the noise levels measured are correct?
Who would be responsible for monitoring on the 330 days when the standard is not 100 dBA Lmax?

2. The Noise Standards Set Out in the RDSEIR are Meaningless Because the Drag Strip Can Avoid Compliance

The specifications for measuring noise levels produced at the Speedway contained in the RDSEIR's technical noise report provides numerous ways for the Speedway to avoid complying with the increase noise standards. The specifications require that Speedway noise levels to be at least five decibels above ambient noise levels before noise
1-53 levels at the Speedway would be considered to be noncompliant. (RDSEIR Technical Noise Report Attachment 1, p. 7.) Additionally, the specifications state "in the event that the ambient sound cannot be suitably separated from the measurement recorded in conformance with the specification for a clean measurement of the project, the sound levels as that location shall be determined to be in compliance." (RDSEIR Technical Noise Report Attachment 1, p. 7.) Therefore, if ambient noise levels are high, the proposed project would allow the Speedway to produce noise levels above 100 dBA. The

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1-53 cont. Speedway will also be able to avoid compliance by simply claiming it was unable to separate out ambient noise levels. These specifications render even the extremely lax noise standards proposed in the RDSEIR to be nearly meaningless due to the Speedway's ability to avoid compliance.

3. Speedway Has Consistently Violated Previously Imposed Mitigation Measures and Standards.

1-54 The Speedway is continuing to operate the drag strip in violation of the applicable noise level limitations. All studies, including those prepared by the Speedway, show that drag racing produces maximum noise levels of more than 75 dBA at the residence nearest the drag strip, and at many other residences, in violation of legal limits. The information contained in the RDSEIR also shows some races at the oval track violate the noise level limits established for premiere racing events. (RDSEIR Figure 4.2-2.) Additionally, an area resident has measured numerous instances of maximum noise levels at the drag strip exceeding 100 dBA despite the current noise standard of 75 dBA.

The Speedway has also violated the conditions of approval placed on the invalidated approval of Revision #9 (which allowed operation of the relocated drag strip based on a mitigated negative declaration). The conditions prohibited the operation of non-gasoline powered dragsters at the drag strip. The Speedway continually violated this condition, allowing all types of dragsters to race. Most recently, alcohol and nitro-methane fueled dragsters and funny cars were included in an event held April 23-25, 2010. (Attachment 10; see article at www.nhrahotrodheritage.com/content/news.asp?articleid=40774&zoneid=148 showing use of A-Fuel dragster, which runs on nitro-methane [RDSEIR, p. 4.2-17], incorporated by reference; personal observations of CCoMPRESS members.) This is despite the RDSEIR's highly misleading claim that "Top Fuel Dragster and Funny Car classes are not expected to run at the Speedway drag strip due to safety issues." (RDSEIR, p. 4.2-17.) The Speedway's repeated non-compliance with existing noise levels and conditions of approval should not be rewarded by granting it more lenient noise standards than any other use in the County. This repeated non-compliance is instead evidence that it is unlikely the Speedway will comply with future mitigation measures and conditions placed upon it.

> Because an EIR cannot be meaningfully considered in a vacuum devoid of reality, a project proponent's prior environmental record is properly a subject of close consideration in determining the sufficiency of the proponent's promises in an EIR. Consideration, however, must also be given to measures the proponent proposes to take in the future, not just to the measures it took or failed to take in the past. In balancing a proponent's prior shortcomings and its promises for future action, a court should consider relevant factors including: the length, number, and severity of prior environmental errors and the harm caused; whether the errors were

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1-54 cont.

> intentional, negligent, or unavoidable; whether the proponent's environmental record has improved or declined; whether he has attempted in good faith to correct prior problems; and whether the proposed activity will be regulated and monitored by a public entity.

(Laurel Heights Imp Ass'n v. Regents of the University of California (1988) 47 Cal. 3d 376, 420.)

F. Necessary Findings for a Statement of Overriding Considerations Cannot be Made.

1-55

The Project would result in significant and unavoidable noise impacts (RDSEIR, p. 9-2), necessitating the preparation of a statement of overriding considerations. To adopt a statement of overriding considerations, findings must be made that the County has eliminated or substantially lessened all significant effects on the environment to the extent feasible, and has determined than any remaining significant effects are acceptable because of the Project's overriding benefits. (Pub. Res. Code § 21081; CEQA Guidelines § 15092(b).) The RDSEIR is required to describe feasible mitigation measures and alternatives that would lessen significant impacts, including those proposed by other agencies and the public. (CEQA Guidelines § 15126.4) If feasible mitigation measures or alternatives exist that would lessen the significant impacts, the County must reject the Project as proposed.

CEQA requires that the findings required for a statement of overriding considerations be made on the basis of substantial evidence. (CEQA Guidelines § 15093(b).) CEQA places the burden on a public agency to affirmatively show that a project with significant adverse impacts is approved only after all feasible mitigation measures and alternatives are found to be infeasible and only if the project's benefits outweigh its adverse impacts.

CEQA prohibits approval of projects with adverse environmental impacts if there are feasible alternatives that would reduce those impacts. (Pub. Res. Code § 21002; CEQA Guidelines § 15021(a)(2).) The CEQA Guidelines require an agency to "Disclose to the public the reasons why a governmental agency approved the project in the manner the agency chose if significant environmental effects are involved." In order to implement this policy, the CEQA Guidelines specify that:

> A public agency may approve a project even though the project would cause a significant effect on the environment if the agency makes a fully informed and publicly disclosed decision that:

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(a) *There is no feasible way to lessen or avoid the significant effect...*"

(CEQA Guidelines § 15043, emphasis added.)

1-55 cont.

Feasible is defined as "capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social, and technological factors." (Public Resources Code § 21061.1) Project alternatives can still be considered feasible "even if these alternatives would impede to some degree the attainment of the project objectives, or would be more costly." (CEQA Guidelines § 15126.6(b).)

1. The RDSEIR Improperly Rejects Potentially Feasible Mitigation Measures and Alternatives

a. Residential Retrofitting and Relocation

The RDSEIR does not include the required substantial evidence to reject mitigating noise impacts to residents through residential retrofitting. Residential retrofitting would reduce interior noise levels by up to 10 dBA, which would essentially cut in half the perceived loudness experienced by residents; a substantial lessening of the impact. (RDSEIR p. 4.2-35.)

1-56

The RDSEIR claims that even with retrofitting exterior noise levels would still be above 85 dBA Lmax. (RDSEIR p. 4.2-35.) However, with this mitigation measure in place, at least residents could find some relief from the extreme noise levels in their homes. To be considered feasible, a mitigation measure does not need to reduce an impact to a less than significant level, it need only substantially lessen the impact, which retrofitting clearly would do. The RDSEIR provides no economic analysis or other evidence to support a claim that this mitigation measure would be infeasible. There is also no evidence to support the document's claim that noise level reductions would be minimal for the home located nearest the drag strip on Whittram Avenue. Moreover, this resident has spoken to a company that specializes in the installation of soundproofing in homes who informed him that soundproofing would provide substantial noise level reductions at his home.

The RDSEIR also claims retrofitting of homes located near the drag strip would be inconsistent with these residences status as legal non-conforming residential uses. (RDSEIR, p. 4.2-35.) Although the County's Development Code does discourage the long-term continuance of legal non-conforming uses, it does so to protect the public health, safety, and welfare. Providing soundproofing for these homes would also serve to protect the health and welfare of area residents. Additionally, the Development Code

specifically allows for the modification of legal non-conforming residential uses without the need for a conditional use permit. (County Development Code section 84.17.080(e)(1).) Moreover, if the County truly wants to eliminate legal non-conforming residential uses in the area, the County Redevelopment Agency should purchase these
1-56 cont. homes and convert the area to industrial uses. The County Redevelopment Agency is allowed to purchase property containing legal non-conforming residential uses pursuant to the San Sevine Redevelopment Plan.

Residential retrofitting and/or County Redevelopment Agency purchase of legal non-conforming residential uses are feasible mitigation measures that should be required as part of any project to increase noise levels experienced by residential communities near the Speedway. As part of any retrofitting, installation of energy efficient air conditioner units should be required. This would allow residents in retrofitted homes to keep their windows closed during racing activities so that they can experience the most noise reduction.

b. The Height of the Sound Wall Should be Increased.

Acoustics expert Ron Brown has previously submitted comments to the County stating that a 30 foot tall sound wall would be required to provide significant sound attenuation. (Attachment 7, Ron Brown comments on DSEIR.) The RDSEIR provides inadequate support for its claim that a sound wall taller than 20 feet would not provide any additional noise level reduction. The RDSEIR fails to address whether this shorter
1-57 wall would be ineffective because it could allow low frequency sounds, such as those produced by drag racing, which would refract around and over. The RDSEIR also fails to provide support for its claim that it would be infeasible to construct a taller sound wall due to wind loads and seismic concerns. How do wind loads and seismic concerns limit the height of the sound wall? Do these concerns make it infeasible or just more expensive to construct a taller wall?

The RDSEIR fails to disclose the sound attenuation that would be achieved for the residents living closest to the drag strip, stating only that attenuation of 9-10 dBA would be achieved for "legally zoned uses." (RSDEIR, p. 4.2-31.) What noise reduction would the sound wall accomplislh for legal non-conforming residential uses?

c. The County Should Not Allow Simultaneous Operation of Drag Strip and Oval Track

To reduce significant noise impacts, as well as air quality and traffic impacts the
1-58 RDSEIR fails to acknowledge, the Speedway should be prohibited from allowing simultaneous operation of the drag strip and the oval track.

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d. 85 dBA Lmax Alternative

The 85 dBA Lmax alternatives (both with and without a sound wall) are improperly rejected by the RDSEIR, based on a claim that it does not fully meet the Project objective of allowing a full range of racing activities because some types of dragsters would be prohibited from racing under this alternative. (RDSEIR, pp. 9-5, 9-6 to 9-7.)

To be considered feasible, a project alternative needs only to meet most of the project objectives; it does not need to fully meet each one. "If there are feasible alternatives or feasible mitigation measures that would accomplish most of the objectives of a project and substantially lessen the significant environmental effects of a project subject to CEQA, the project may not be approved without incorporating those measures." (*Center for Biological Diversity, Inc. v. FPL Group, Inc.* (2008) 166 Cal.App.4th 1349, 1371 fn 19, citation to (Pub. Resources Code §§ 21000(g), 21002; CEQA Guidelines § 15091.) California courts have recently elaborated on the significant restrictions on a project proponent's ability to use project objectives to dictate what constitutes a feasible project alternative, finding that an EIR could not reject a smaller alternative that would have met all project objectives except for size and would have had
1-59 the added benefit of preserving a historic building on site. (*Preservation Action Council v City of San Jose* (2006) 141 Cal App. 4th 1336, 1355.)

The only type of dragsters that would be prohibited from racing under the 85 dBA Lmax alternatives are those using alcohol fuels, nitromethane and jet powered engines. (RDSEIR p. 4.2-17.) The RDSEIR has stated that these dragsters would only constitute 5% of the races held at the dragstrip. Thus, 95% of drag races and all NASCAR and other races would be allowed to operate under this environmentally superior alternative. (RDSEIR p. 9-19.) The RDSEIR claims dragsters using alcohol fuels, nitromethane and jet powered engines are the most popular races that generate the most attendance, but this is inadequate evidence to support a claim that the 85 dBA Lmax alternative is economically infeasible. It would allow higher noise levels and more drag races than were allowed at the drag strip when it operated on the south side of the Speedway property. The 85 dBA Lmax alternatives are thus a feasible alternative because it meets more than 95% of the Project objectives.

The proposed Project cannot be approved because the 85 dBA Lmax alternatives are feasible and would significantly reduce noise impacts. Every 10 decibel increase is a doubling in the perceived loudness, thus the noise impacts would be more than double under the proposed 100 dBA Lmax project than they would be under the environmentally superior 85 dBA Lmax alternative.

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e. The RDSEIR Should Analyze a Street Legal Only Drag Strip.

1-60 The RDSEIR should analyze the alternative of allowing only street legal vehicles to race at the drag strip. This alternative would significantly reduce noise impacts as street legal vehicles are the quietest type of dragsters. Allowing only street legal dragsters would mean that noise standards would not need to be increased to 100 dBA Lmax, and may not require an increase to 85 dBA Lmax. It would also be economically viable to limit the drag strip to street legal only dragsters as the drag strip was able to operate on the south side of the Speedway property with this restriction in place.

f. Alternative On-Site Location Should Not be Excluded Because Speedway Proceeded at its Own Risk.

1-61 The RDSEIR claims that locating the drag strip on the south side of the Speedway property is an infeasible alternative because there is a Midway area located in the south side drag strip's previous location. (RDSEIR p. 9-4.) The Speedway relocated the drag strip to the north side of its property in 2006 prior to getting any approvals or environmental clearance for the relocated drag strip. The drag strip was relocated to an area of the Speedway's property where racing activities were specifically prohibited. The Speedway also constructed an enlarged Midway area at the location previously occupied by the approved drag strip, before receiving any approvals or environmental clearance for a relocated drag strip. The Speedway proceeded at its own risk when constructing the Midway on the south side without obtaining approvals for the north side drag strip. (*Bakersfield Citizens for Local Control v. City of Bakersfield* (2004) 124 Cal.App.4th 1184, 1203.) It cannot now use that Midway as support for rejecting an alternative south side location for the drag strip. The Speedway could move the drag strip back to the south side of its property and relocate the Midway to the north side. This would reduce noise impacts to a less than significant level, potentially eliminating the need to increase the noise standards at the Speedway. The RDSEIR should carefully consider this alternative.

g. Drag Strip Operations Should be Required to End at 7 p.m.

1-62 The RDSEIR should also mitigate the noise impacts from the Speedway by requiring all operations at the drag strip to end by 7 p.m. Noise levels after this time are particularly impactful to residents, which is why most jurisdictions include more restrictive noise level limits after 7 p.m. The County acknowledges that noise impacts are more significant in the evening and night time hours. It adds a 5 decibel penalty between the hours of 7 p.m. and 10 p.m. and a 10 decibel penalty after 10 p.m. when measuring the community noise equivalent level. Requiring drag strip operations to end by 7 p.m.

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1-62 cont. would allow community members the quiet enjoyment of their homes in the evenings and the ability to sleep before 11 p.m.

2. Project Benefits Would Not Outweigh the Significant Impacts.

1-63 As stated above in section B.1, excessive noise levels can cause severe impacts on the public's health and welfare. The RDSEIR fails to provide evidence that any benefits from the Project would outweigh these significant impacts. In order to adopt a statement of overriding considerations, the record must contain substantial evidence that shows the Project would have benefits that outweigh its significant impacts. The only change in operations at the Speedway that would result from the Project would be that additional types of dragsters would be allowed to operate at the drag strip, those using alcohol fuels, nitromethane and jet engines. These dragsters would only constitute 5% of the races held at the drag strip. The RDSEIR claims without any evidentiary support that races including these dragsters are the most popular, but fails to meet the burden of demonstrating that there are "specific economic, legal, social, technological, or other benefits" that would outweigh the significant impact the increased noise levels would have on the public health and welfare. (CEQA Guidelines § 15093.)

CONCLUSION

For all of the reasons set forth above, the current RDSEIR is inadequate. The document must be revised and recirculated. Additionally, the Project cannot be approved as proposed because feasible mitigation measures and alternatives exist. Thank you for your time and consideration in this matter.

Sincerely,

Amy Minteer
Michelle Black

cc: CCoMPRESS
Citizens for Fontana First
Center for Community Action and Environmental Justice
Natural Resources Defense Council
Communities for a Better Environment

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Attachments:

1-64 1. *El Pueblo Para El Aire y Agua Limpio v. County of Kings* (Sacramento Superior Court, 1991, No. 366045).
1-65 2. San Bernardino Superior Court judgment in *CCoMPRESS v. County of San Bernardino*.
1-66 3. World Health Organization Guidelines for Community Noise.
1-67 4. National Institute for Occupational Safety and Health and Center for Disease Control and Prevention, Criteria for a Recommended Standard, June 1998.
1-68 5. Email from Kenneth Feith to Amy Minteer, dated August 11, 2009.
1-69 6. Franssen EA, van Wiechen CM, Nagelkerke NJ, Lebret E (2004). "Aircraft noise around a large international airport and its impact on general health and medication use". Occup Environ Med 61 (5): 405–13. doi:10.1136/oem.2002.005488. PMID 15090660.
1-70 7. Review of Draft Subsequent Environmental Impact Report by acoustics expert Ron Brown.
1-71 8. Excerpts from March 2006 Gordon Bricken analysis.
1-72 9. SCAQMD June 4, 2009 letter regarding measured air pollutants.
1-73 10. Article regarding April 23-25, 2010 NHRA Event at Speedway.

ATTACHMENT 1

12/30/91

50,348
F
14pp.
1016568

EIR must be in Spanish to reflect community + satisfy particip requirements

IN THE SUPERIOR COURT OF THE STATE OF CALIFORNIA

IN AND FOR THE COUNTY OF SACRAMENTO

EL PUEBLO PARA EL AIRE Y AGUA LIMPIO, an unincorporated association; AUSCENCIO AVILA, ANGELA CARRILLO, JOSE CUEVAS, ANASTASIO FERNANDEZ, ENRIQUE GARZA, MARY LOU MARES, RAMON MARES, ESPERANZA MAYA, JOE MAYA and MANUEL MIRANDA; CITIZEN ACTION, Petitioners, v. COUNTY OF KINGS, BOARD OF SUPERVISORS OF THE COUNTY OF KINGS, Respondents. WASTE MANAGEMENT, INC., CHEMICAL WASTE MANAGEMENT, INC., Real Parties in Interest.	No. 366045 Dept. 14 <u>RULING ON SUBMITTED MATTER</u>

The petition for a writ of mandate in the above-entitled proceeding came on regularly for hearing on October 1, 1991, before the Honorable Jeffrey L Gunther, Judge of the Superior Court. Ralph Santiago Abascal, Luke W. Cole and Sharon Duggan appeared for petitioners. Michael H. Remy and J. William

Yeates appeared for respondents. Sanford Svetcov and Anthony Garvin appeared for real parties in interest. Following oral argument, the matter was submitted. The Court now rules.

In this mandate proceeding, petitioners challenge a decision of the Kings County Board of Supervisors ("board") granting a conditional use permit for the construction and operation of a hazardous waste incinerator by Chemical Waste Management, Inc. ("CWM") at CWM's existing hazardous waste treatment, storage and disposal facility in the Kettleman Hills area of southwest Kings County. The board's decision affirmed determinations by the Kings County Planning Commission that (1) the environmental impact report prepared on the incinerator project adequately complied with the requirements of the California Environmental Quality Act ("CEQA"; Pub. Resources Code § 21000 et seq.) and (2) the incinerator project was consistent with the Kings County General Plan and Zoning Ordinance. Petitioners contend that these determinations, and the board's grant of a conditional use permit based on the determinations, are invalid.

NONCOMPLIANCE WITH CEQA

For each of the reasons specified below, the Court finds that the Final Subsequent Environmental Impact Report ("FSEIR") on CWM's proposed incinerator project was inadequate as an informational document under CEQA.

Analysis of Air Quality Impacts and Mitigation

Data and analysis in the FSEIR indicated initially that emissions from the operation of the incinerator project would contribute to air pollution in the San Joaquin air basin:

incinerator emissions would include nitrogen oxides -- the precursors of ozone -- and particulate matter under 10 micrometers in diameter ("PM-10"). The FSEIR indicated that ozone and PM-10 levels in the San Joaquin air basin already exceeded ambient air quality standards under federal and state clean air acts, and as a result, the basin was designated as a nonattainment area pursuant to the federal and state laws.

Further data and analysis in the FSEIR indicated that the nitrogen oxide and PM-10 emissions from operation of the incinerator project would be mitigated to a level of insignificance by air pollution control measures required by the federal and state clean air acts. These control measures would include the use of the best available air pollution control technology ("BACT") in the incinerator, the use of emission offsets purchased from the Beacon Oil Refinery in Hanford, and the reduction of incinerator operations so that PM-10 emissions would not exceed the offsets.

This FSEIR analysis is misleading and inaccurate. the use of BACT and emission offsets would avoid further violation of ambient air quality standards for ozone and PM-10 and would produce a net air quality benefit in the San Joaquin air basin within the technical meaning of the federal and state clean air acts. However, the use of BACT and emission offsets would not produce compliance with ambient air quality standards and would not eliminate or reduce the estimated actual emissions of nitrogen oxide and PM-10 from the incinerator. Rather, the offsets would permit the incinerator to emit approximately one-half of the nitrogen oxide and PM-10 previously emitted by

Beacon and would not prevent an adverse impact by these emissions on air quality either in the vicinity of the incinerator or in the San Joaquin air basin. For purposes of CEQA, mitigation of the environmental impacts of the incinerator's estimated actual emissions would not occur. (See Pub. Resources Code §§ 21002, 21002.1, 21081, 21100; 14 Cal. Code Regs. § 15370.)

Thus the FSEIR inaccurately reasoned under CEQA that the air quality impacts of emissions from incinerator operations would be mitigated to a level of insignificance through the use of BACT and emission offsets under the federal and state clean air acts. The FSEIR did not identify or consider measures that would actually eliminate or reduce the emissions within the contemplation of CEQA. Nor did the FSEIR consider whether the incinerator's emissions of ozone precursors and PM-10, though one-half of Beacon's emissions and though minor relative to the overall ozone and PM-10 levels in the air basin, should be considered significant in light of the serious problem with these pollutants in the air basin. (See Kings County Farm Bureau v. City of Hanford (1990) 221 Cal.App.3d 692, 718.)

The analysis of air quality impacts and their mitigation was, accordingly, inadequate under CEQA. The planning commission, affirmed by the board, erroneously relied on this inadequate analysis in determining that the FSEIR complied with CEQA requirements. (See Kings County Planning Commission, Resolution No. 1146 (December 11, 1990), Finding No. 6; Kings County Board of Supervisors, Resolution No. 91-001 (January 3, 1991).)

Analysis of Agricultural Impacts

The FSEIR concluded that air pollutants emitted during operation of the incinerator would have an insignificant effect on agriculture and livestock grazing in the vicinity of the incinerator. This conclusion was based on a study by Robert F. Brewer, Ph.D., which determined that the nitrogen oxide emissions from the incinerator would be expected to increase crop loss from ozone less than 0.3 percent under normal conditions and less than 3.0 percent under worst case conditions. Dr. Brewer 's study also determined that lead emissions from the incinerator would be deposited on nearby rangelands in concentrations too low to be injurious to livestock grazing there.

Both Dr. Brewer's study and the FSEIR noted studies showing crop losses in the San Joaquin Valley as a result of ozone levels exceeding ambient air quality standards and significant increases in crop yields when ambient ozone was reduced to air quality standards. Dr. Brewer reasoned, however, that nitrogen oxide emissions from the incinerator project would increase ambient ozone and resulting crop losses by very low levels which were "both insignificant and almost impossible to measure." Neither Dr. Brewer nor the FSEIR analyzed whether the very low, almost immeasurable additions to ambient ozone and crop losses of 0.3 to 3.0 percent should be considered significant and subject to CEQA mitigation requirements in light of the serious extent of crop loss attributable to ambient ozone in the area. (See Kings County Farm Bureau v. City of Hanford, supra, 221 Cal.App.3d at

p. 718.) Contrary to CEQA requirements, neither Dr. Brewer nor the FSEIR analyzed the significance of the additions to ambient ozone and crop losses from incinerator emissions in the environmental setting of the incinerator. (Ibid.; 14 Cal. Code Regs. § 15064, subd. (b).)

In addition, Dr. Brewer's study was based on an estimated rate of lead emissions from the incinerator of 0.221 pounds per hour. FSEIR data indicated that the estimated rate of lead emissions would be 0.44 pounds per hour, approximately twice the rate used by Dr. Brewer. The FSEIR failed to address whether this discrepancy undercut Dr. Brewer's conclusions about the levels and seriousness of lead concentrations on agricultural and grazing lands as a result of emissions from the incinerator.

The analysis of the significance of agricultural impacts was, accordingly, inadequate under CEQA. The planning commission, affirmed by the board, erroneously relied on this inadequate analysis in determining that the FSEIR complied with CEQA requirements. (See Kings County Planning Commission, Resolution No. 1146 (December 11, 1990), Finding No. 9; Kings County Board of Supervisors, Resolution No. 91-001 (January 3, 1991).)

Analysis of Cumulative Air Quality Impacts

The FSEIR indicated that nitrogen oxide, PM-10 and other criteria pollutants emitted during incinerator operations would contribute cumulatively to similar pollutants emitted in the San Joaquin air basin by existing and anticipated future stationary sources. The FSEIR concluded, however, the incinerator's cumulative impact would be insignificant because the incinerator's emissions would constitute so small a proportion of the emissions in the air basin -- approximately 0.25 percent of the total basin emissions in 1985 -- that the incinerator's emissions would not significantly worsen the air quality problems in the basin.

The use of such reasoning in an analysis of a project's cumulative air quality impacts under CEQA was specifically rejected in Kings County Farm Bureau v. City of Hanford, supra, 221 Cal.App.3d at p. 721. The appellate court in that case determined that such reasoning "avoids analyzing the severity of the problem and allows the approval of projects which, when taken in isolation, appear insignificant, but when viewed together, appear startling.... [t]he greater the overall problem, the less significance a project has in a cumulative impacts analysis." The appellate court explained that this "ratio" theory of cumulative impacts analysis "improperly focuse[s] upon the individual project's relative effects and omit[s] facts relevant to the analysis of the collective effect this and other sources will have upon air quality." (Ibid.; see 14 Cal. Code Regs. § 15355.)

The cumulative impacts analysis in the FSEIR focused only on the relative effect of the incinerator's emissions upon the air quality of the San Joaquin air basin and did not, as required by CEQA, assess the collective or combined effect of emissions from the incinerator and other sources. In addition, the cumulative impacts analysis in the FSEIR expressly omitted post-1985 data on emissions from new or anticipated sources, emissions from mobile sources (including emissions from the vehicular traffic of the 50 persons employed at the incinerator), and emissions from facilities annually emitting less than 25 tons of criteria pollutants. The FSEIR analysis relied almost exclusively on 1985 data from the California Air Resources Board on stationary sources emitting 25 tons or more of criteria pollutants targeted by the clean air acts and, apparently, did not incorporate post-1985 data obtained from air pollution control districts in the San Joaquin air basin. No effort appears to have been made in conjunction with the FSEIR analysis to secure and incorporate information about stationary sources emitting less than 25 tons of criteria pollutants annually; there was no indication in the record that the emissions from such sources would be cumulatively insignificant and no indication that such information about such sources was unavailable. Data submitted by Citizens for a Healthy Environment during the CEQA public comment period, including information about additional emission sources, were not given serious consideration.

The cumulative air quality impacts analysis was, accordingly, inadequate under CEQA. The planning commission, affirmed by the board, erroneously relied on this inadequate analysis in determining that the FSEIR complied with CEQA requirements. (See Kings County Planning Commission, Resolution No. 1146 (December 11, 1990), Finding No. 10; Kings County Board of Supervisors, Resolution No. 91-001 (January 3, 1991).)

Analysis of Project Alternatives

The FSEIR analyzed a number of alternatives to the construction and operation of an incinerator at the CWM's Kettleman Hills Facility, including a no-project alternative, an alternative employing hazardous waste management methods other than incineration, and alternatives siting the incinerator on CWM property in Bakersfield, the Casmalia Resources facility in Santa Maria, and other unidentified locations in California. The FSEIR analysis rejected all alternatives to the incineration project at Kettleman Hills, concluding that incineration as a method of hazardous wastes disposal would be required as a result of federal and state laws banning land disposal and that none of the site alternatives were practical or superior environmentally.

The FSEIR analysis of project alternatives necessarily relied on previous FSEIR analysis and conclusions regarding the significance of the project's impacts on air quality and agriculture and the project's cumulative air quality impacts. Because, as outlined above, the previous FSEIR analysis and conclusions were inadequate for purposes of CEQA, the analysis of project alternatives was flawed and premature. Until the air quality impacts of constructing and operating the incinerator project at Kettleman Hills were properly defined, the comparative merits of the project and its alternatives could not be properly evaluated. (See 14 Cal. Code Regs. § 15126, subd. (d).)

The FSEIR's analysis of project alternatives was, accordingly, inadequate under CEQA. The planning commission, affirmed by the board, erroneously relied on this inadequate analysis in determining that the FSEIR complied with CEQA requirements. (See Kings County Planning Commission, Resolution No. 1146 (December 11, 1990), Finding No. 11; Kings County Board of Supervisors, Resolution No. 91-001 (January 3, 1991).)

Public Participation and Access

The Court finds that the strong emphasis in CEQA on environmental decisionmaking by public officials which involves and informs members of the public would have justified the Spanish translation of an extended summary of the FSEIR, public meeting notices, and public hearing testimony in this case. The residents of Kettleman City, almost 40 percent of whom were monolingual in Spanish, expressed continuous and strong interest in participating in the CEQA review process for the incinerator project at the CWM's Kettleman Hills Facility, just four miles from their homes. Their meaningful involvement in the CEQA review process was effectively precluded by the absence of the Spanish translation.

The Court, however, does not find that the FSEIR was written in a manner incomprehensible to interested laypersons among the public. The text of the FSEIR perhaps contained a significant amount of technical matter which could have been better placed in appendices, but the text was readable. The inadequacies in the analysis, not the readability of the text, constituted the significant deficiency of the FSEIR.

INCONSISTENCY WITH GENERAL PLAN AND ZONING ORDINANCE

The board affirmed the planning commission's approval of a conditional use permit for the construction and operation of a hazardous waste disposal incinerator at the CWM's Kettleman Hills Facility. This approval was based on determinations by the planning commission that the construction and operation of the incinerator was consistent with the Kings County General Plan and Zoning Ordinance, including the siting criteria of the Kings County Hazardous Waste Management Plan. These consistency determinations relied heavily on analysis and conclusions in the FSEIR that all significant environmental effects of the incinerator would be mitigated to levels of insignificance. (See, e.g., Findings Nos. 10, 12, 13, and 27 (pursuant to Section 1908b) of Kings County Planning Commission, Resolution No. 1146 (December 11, 1990).)

Because the FSEIR analysis and conclusions have been determined to be inadequate, a substantial portion of the reasoning and information underlying the consistency determinations has been invalidated. The planning commission and board must, accordingly, reconsider the consistency determinations on the basis of accurate analyses of the environmental effects of constructing and operating an incinerator at Kettleman Hills.

THE BOARD AS IMPARTIAL DECISIONMAKER

The Court rejects petitioners' contention that the Kings County Board of Supervisors could not impartially adjudicate their appeal from the planning commission's approval of a conditional use permit for an incinerator at CWM's Kettleman

Hills Facility. Petitioners have not established that the board's authority to increase county revenues by taxing the gross revenues from the incinerator's operations under Health and Safety Code section 25149.5 unfairly biased the board and caused it to affirm the planning commission's approval of the conditional use permit for the incinerator.

The FSEIR analysis of project alternatives recognized that, without the construction and operation of the incinerator, county tax revenues would be reduced. This recognition, however, may have merely reflected the CEQA provisions requiring the analysis of project alternatives to include a determination of whether the alternatives can be "feasibly accomplished in a successful manner" considering the economic, environmental, social and technological factors involved. (Citizens of Goleta Valley v. Board of Supervisors (1990) 52 Cal.3d 553, 566.)

Similarly, the board's determinations of whether the incinerator was consistent with the county's general plan and zoning ordinance required the board to consider and balance a variety of health, safety, environmental and fiscal or economic factors. The board's responsibility for the county budget and revenues was necessarily balanced by the board's responsibility for the county's health, safety and environmental welfare.

Petitioners have presented no evidence that the board was personally tempted by a financial interest to approve the conditional use permit for the incinerator at Kettleman Hills. Petitioners have not overcome the presumption of the board's impartiality in affirming the approval of the use permit by the

-12-

planning commission. (See Schweiker v. McClure, 456 U.S. 188, 196.)

For the reasons stated above, the Court grants the petition for a writ of mandate and orders the issuance of a writ compelling respondents to set aside the decision certifying the adequacy of the FSEIR and approving a conditional use permit for the construction and operation of a hazardous waste incinerator at CWM's Kettleman Hills Facility. Petitioners are directed to prepare, serve on all parties, and submit to the Court a proposed judgement and writ of mandate in accordance with this decision.

DATED: DEC 30 1991

JEFFREY L. GUNTHER
JUDGE OF THE SUPERIOR COURT

DECLARATION OF MAILING

I hereby certify that I am not a party to the within action, and that I deposited a copy of this document in sealed envelopes with first class postage prepaid addressed to each party or the attorney of record in the U.S. Mail at 720 Ninth Street, Sacramento, California.

DATED: 12-30-91 K. Saenz
Deputy Clerk K. SAENZ

CC:

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ATTACHMENT 2

COPY

FILED-Rancho Cucamonga District
SUPERIOR COURT
SAN BERNARDINO COUNTY

FEB - 5 2010

By Roxanne R. Rea
Deputy

SUPERIOR COURT OF THE STATE OF CALIFORNIA

FOR THE COUNTY OF SAN BERNARDINO, WEST END DISTRICT

CONCERNED COMMUNITY MEMBERS AND PARENTS OF REDWOOD ELEMENTARY SCHOOL STUDENTS Petitioner, v. COUNTY OF SAN BERNARDINO, Respondent. THE CALIFORNIA SPEEDWAY CORPORATION; THE AUTO CLUB SPEEDWAY; and DOES 1 to 10, Real Parties in Interest.	CASE NO.: CIVRS 900104 (California Environmental Quality Act, Pub. Res. Code §21000 et seq.) **[Proposed] JUDGMENT** Hearing: October 23, 2009 Time: 1:30 p.m. Department: R-9

[Proposed] JUDGMENT

TO ALL PARTIES AND THEIR ATTORNEYS OF RECORD:

On October 23, 2009, this matter came for hearing, the Honorable Barry L. Plotkin presiding. Attorneys Amy C. Minteer and Michelle N. Black were present for Petitioner Concerned Community Members and Parents of Redwood Elementary School Students (Petitioner). Deputy County Counsel Bart W. Brizzee appeared on behalf of Respondent County of San Bernardino (County). Attorneys Charles H. Pomeroy and Brendan W. Brandt appeared on behalf of Real Parties in Interest The California Speedway Corporation and The Auto Club Speedway (Real Parties in Interest). At the hearing, the Court detailed the basis for its tentative ruling. All parties submitted on the tentative ruling without argument and the Court adopted its tentative ruling.

The Court having fully considered all of the briefs of the parties and the contents of the administrative record, rules as follows:

Real Parties in Interest's request for judicial notice is denied.

Petitioner's Writ of Mandate—properly characterized as a traditional writ of mandate under Section 1085 of the Code of Civil Procedure—is granted because the Court finds the appropriate standard of review is whether there is substantial evidence that supports a fair argument that the Revision #9 to the California Speedway Development Plan may have a significant effect on the environment and because there is substantial credible evidence to support a fair argument that Revision #9 may result in significant effect on the environment as to noise only, requiring preparation of an environmental impact report (EIR) instead of a mitigated negative declaration (MND).

Petitioner exhausted its administrative remedies with regard to its claim that the County improperly segmented review of Revision #9 (drag strip relocation) to the California Speedway Development Plan from Revision #11 (noise standards modification) to the California Speedway Development Plan.

Petitioner's traditional Writ of Mandate is granted because the County failed to proceed in a manner required by law when it improperly segmented its environmental review of Revision #9 from Revision #11.

The County failed to proceed in the manner required by law because it failed to adopt a mandatory mitigation monitoring or reporting program for the noise control condition of approval for Revision #9.

For the reasons set forth in the Court's Tentative Ruling (Exhibit 1) and as further explained by the Court at the October 23, 2009 hearing, **IT IS HEREBY ORDERED, ADJUDGED, AND DECREED** that:

1. A traditional Writ of Mandate shall issue commanding the County to set aside and vacate (a) its adoption of a Mitigated Negative Declaration for the Revision #9 to the Speedway Development Plan; and (b) its approval of the Revision #9 to the Speedway Development Plan.

2. The traditional Writ of Mandate shall also enjoin the County and Real Parties in Interest and their respective agents, officers, employees, and all persons acting on their behalf or in concert with them from taking any action to operate the relocated drag strip previously approved by Revision #9 unless and until a lawful approval is obtained from the County after the preparation and consideration of a new, single, legally adequate EIR for Revision #9 and Revision #11, together with compliance with Public Resources Code section 21081.6.

3. Petitioner, as the prevailing party, is entitled to costs pursuant to Code of Civil Procedure Section 1033.5 in the sum of $_______ [to be determined].

4. Petitioner, as prevailing party, is entitled to apply for attorneys' fees through appropriate noticed motions after entry of this Judgment. This Court retains jurisdiction to hear such motions and determine the amount of such fees, if any, pursuant to them. If such a motion is granted, this judgment will be amended to

award the amount of $________ [to be determined] in attorneys' fees pursuant to Code of Civil Procedure Section 1021.5.

5. The Court shall retain jurisdiction over this action to oversee compliance with the traditional Writ of Mandate. A return shall be filed within 45 days after the date on which the Judgment is deemed enforceable.

IT IS FURTHER ORDERED, ADJUDGED, AND DECREED THAT ENFORCEMENT OF THIS JUDGMENT (INCLUDING ENFORCEMENT OF THE AFOREMENTIONED TRADITIONAL WRIT OF MANDATE) BE TEMPORARILY STAYED PURSUANT TO SECTION 918(A) OF THE CODE OF CIVIL PROCEDURE UNTIL 60 DAYS AFTER NOTICE OF ENTRY OF JUDGMENT IS SERVED. THE REASON FOR THE STAY IS THAT THIS JUDGMENT'S INJUNCTION AGAINST THE REAL PARTIES IN INTEREST'S OPERATION OF THE RELOCATED DRAG STRIP IS MANDATORY IN SUBSTANCE, ALTHOUGH PROHIBITORY IN FORM, AND WOULD BE STAYED ON APPEAL AND BECAUSE PETITIONER'S CHALLENGE TO THE USE OF A MITIGATED NEGATIVE DECLARATION IS MORE PROPERLY CHARACTERIZED AS A TRADITIONAL WRIT OF MANDATE AND THEREFORE NOT SUBJECT TO GOVERNMENT CODE SECTION 1094.5(G).

IT IS SO ORDERED:

Dated: FEB 05 2010

BARRY L. PLOTKIN
Barry L. Plotkin
Judge of the Superior Court

///

///

///

3 [Proposed] JUDGMENT

APPROVED AS TO FORM AND CONTENT:

Dated: January 19, 2010

CHATTEN-BROWN & CARSTENS

By: ______________________
Amy C. Minteer
Michelle N. Black

Counsel for Petitioner,
CONCERNED COMMUNITY MEMBERS AND PARENTS OF REDWOOD ELEMENTARY SCHOOL STUDENTS

Dated: January ___, 2010

SAN BERNARDINO COUNTY COUNSEL

By: ______________________
Bart W. Brizzee

Counsel for Respondent,
COUNTY OF SAN BERNARDINO

Dated: January ___, 2010

VARNER & BRANDT, LLP
McKENNA LONG & ALDRIDGE LLP

By: ______________________
Brendan W. Brandt

Counsel for Real Party-in-Interest,
THE CALIFORNIA SPEEDWAY CORPORATION; THE AUTO CLUB SPEEDWAY

SD:22177207.1

4

[Proposed] JUDGMENT

APPROVED AS TO FORM AND CONTENT:

Dated: January___, 2010

CHATTEN-BROWN & CARSTENS

By:________________________
Amy C. Minteer
Michelle N. Black

Counsel for Petitioner,
CONCERNED COMMUNITY MEMBERS AND PARENTS OF REDWOOD ELEMENTARY SCHOOL STUDENTS

Dated: January 20, 2010

SAN BERNARDINO COUNTY COUNSEL

By: [signature]
Bart W. Brizzee

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4 [Proposed] JUDGMENT

ATTACHMENT 3

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GUIDELINES
FOR
COMMUNITY NOISE

Edited by

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This WHO document on the *Guidelines for Community Noise* is the outcome of the WHO-expert task force meeting held in London, United Kingdom, in April 1999. It bases on the document entitled "Community Noise" that was prepared for the World Health Organization and published in 1995 by the Stockholm University and Karolinska Institute.

World Health Organization, Geneva
Cluster of Sustainable Development and Healthy Environment (SDE)
Department for Protection of the Human Environment (PHE)
Occupational and Environmental Health (OEH)

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Foreword

Noise has always been an important environmental problem for man. In ancient Rome, rules existed as to the noise emitted from the ironed wheels of wagons which battered the stones on the pavement, causing disruption of sleep and annoyance to the Romans. In Medieval Europe, horse carriages and horse back riding were not allowed during night time in certain cities to ensure a peaceful sleep for the inhabitants. However, the noise problems of the past are incomparable with those of modern society. An immense number of cars regularly cross our cities and the countryside. There are heavily laden lorries with diesel engines, badly silenced both for engine and exhaust noise, in cities and on highways day and night. Aircraft and trains add to the environmental noise scenario. In industry, machinery emits high noise levels and amusement centres and pleasure vehicles distract leisure time relaxation.

In comparison to other pollutants, the control of environmental noise has been hampered by insufficient knowledge of its effects on humans and of dose-response relationships as well as a lack of defined criteria. While it has been suggested that noise pollution is primarily a "luxury" problem for developed countries, one cannot ignore that the exposure is often higher in developing countries, due to bad planning and poor construction of buildings. The effects of the noise are just as widespread and the long term consequences for health are the same. In this perspective, practical action to limit and control the exposure to environmental noise are essential. Such action must be based upon proper scientific evaluation of available data on effects, and particularly dose-response relationships. The basis for this is the process of risk assessment and risk management.

The extent of the noise problem is large. In the European Union countries about 40 % of the population are exposed to road traffic noise with an equivalent sound pressure level exceeding 55 dB(A) daytime and 20 % are exposed to levels exceeding 65 dB(A). Taking all exposure to transportation noise together about half of the European Union citizens are estimated to live in zones which do not ensure acoustical comfort to residents. More than 30 % are exposed at night to equivalent sound pressure levels exceeding 55 dB(A) which are disturbing to sleep. The noise pollution problem is also severe in cities of developing countries and caused mainly by traffic. Data collected alongside densely travelled roads were found to have equivalent sound pressure levels for 24 hours of 75 to 80 dB(A).

The scope of WHO's effort to derive guidelines for community noise is to consolidate actual scientific knowledge on the health impacts of community noise and to provide guidance to environmental health authorities and professional trying to protect people from the harmful effects of noise in non-industrial environments. Guidance on the health effects of noise exposure of the population has already been given in an early publication of the series of Environmental Health Criteria. The health risk to humans from exposure to environmental noise was evaluated and guidelines values derived. The issue of noise control and health protection was briefly addressed.
At a WHO/EURO Task Force Meeting in Düsseldorf, Germany, in 1992, the health criteria and guideline values were revised and it was agreed upon updated guidelines in consensus. The essentials of the deliberations of the Task Force were published by Stockholm University and

Karolinska Institute in 1995. In an recent Expert Task Force Meeting convened in April 1999 in London, United Kingdom, the Guidelines for Community Noise were extended to provide global coverage and applicability, and the issues of noise assessment and control were addressed in more detail. This document is the outcome of the consensus deliberations of the WHO Expert Task Force.

Dr Richard Helmer
Director, Department of Protection of the Human Environment
Cluster Sustainable Development and Healthy Environments

Preface

Community noise (also called environmental noise, residential noise or domestic noise) is defined as noise emitted from all sources except noise at the industrial workplace. Main sources of community noise include road, rail and air traffic, industries, construction and public work, and the neighbourhood. The main indoor sources of noise are ventilation systems, office machines, home appliances and neighbours. Typical neighbourhood noise comes from premises and installations related to the catering trade (restaurant, cafeterias, discotheques, etc.); from live or recorded music; sport events including motor sports; playgrounds; car parks; and domestic animals such as barking dogs. Many countries have regulated community noise from road and rail traffic, construction machines and industrial plants by applying emission standards, and by regulating the acoustical properties of buildings. In contrast, few countries have regulations on community noise from the neighbourhood, probably due to the lack of methods to define and measure it, and to the difficulty of controlling it. In large cities throughout the world, the general population is increasingly exposed to community due to the sources mentioned above and the health effects of these exposures are considered to be a more and more important public health problem. Specific effects to be considered when setting community noise guidelines include: interference with communication; noise-induced hearing loss; sleep disturbance effects; cardiovascular and psycho-physiological effects; performance reduction effects; annoyance responses; and effects on social behaviour.

Since 1980, the World Health Organization (WHO) has addressed the problem of community noise. Health-based guidelines on community noise can serve as the basis for deriving noise standards within a framework of noise management. Key issues of noise management include abatement options; models for forecasting and for assessing source control action; setting noise emission standards for existing and planned sources; noise exposure assessment; and testing the compliance of noise exposure with noise immission standards. In 1992, the WHO Regional Office for Europe convened a task force meeting which set up guidelines for community noise. A preliminary publication of the Karolinska Institute, Stockholm, on behalf of WHO, appeared in 1995. This publication served as the basis for the globally applicable *Guidelines for Community Noise* presented in this document. An expert task force meeting was convened by WHO in March 1999 in London, United Kingdom, to finalize the guidelines.

The *Guidelines for Community Noise* have been prepared as a practical response to the need for action on community noise at the local level, as well as the need for improved legislation, management and guidance at the national and regional levels. WHO will be pleased to see that these guidelines are used widely. Continuing efforts will be made to improve its content and structure. It would be appreciated if the users of the *Guidelines* provide feedback from its use and their own experiences. Please send your comments and suggestions on the WHO *Guidelines for Community Noise – Guideline document* to the Department of the Protection of the Human Environment, Occupational and Environmental Health, World Health Organization, Geneva, Switzerland (Fax: +41 22-791 4123, e-mail: schwelad@who.int).

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Executive Summary

1. Introduction

Community noise (also called environmental noise, residential noise or domestic noise) is defined as noise emitted from all sources except noise at the industrial workplace. Main sources of community noise include road, rail and air traffic; industries; construction and public work; and the neighbourhood. The main indoor noise sources are ventilation systems, office machines, home appliances and neighbours.

In the European Union about 40% of the population is exposed to road traffic noise with an equivalent sound pressure level exceeding 55 dB(A) daytime, and 20% are exposed to levels exceeding 65 dB(A). When all transportation noise is considered, more than half of all European Union citizens is estimated to live in zones that do not ensure acoustical comfort to residents. At night, more than 30% are exposed to equivalent sound pressure levels exceeding 55 dB(A), which are disturbing to sleep. Noise pollution is also severe in cities of developing countries. It is caused mainly by traffic and alongside densely-travelled roads equivalent sound pressure levels for 24 hours can reach 75–80 dB(A).

In contrast to many other environmental problems, noise pollution continues to grow and it is accompanied by an increasing number of complaints from people exposed to the noise. The growth in noise pollution is unsustainable because it involves direct, as well as cumulative, adverse health effects. It also adversely affects future generations, and has socio-cultural, esthetic and economic effects.

2. Noise sources and measurement

Physically, there is no distinction between sound and noise. Sound is a sensory perception and the complex pattern of sound waves is labeled noise, music, speech etc. Noise is thus defined as unwanted sound.

Most environmental noises can be approximately described by several simple measures. All measures consider the frequency content of the sounds, the overall sound pressure levels and the variation of these levels with time. Sound pressure is a basic measure of the vibrations of air that make up sound. Because the range of sound pressures that human listeners can detect is very wide, these levels are measured on a logarithmic scale with units of decibels. Consequently, sound pressure levels cannot be added or averaged arithmetically. Also, the sound levels of most noises vary with time, and when sound pressure levels are calculated, the instantaneous pressure fluctuations must be integrated over some time interval.

Most environmental sounds are made up of a complex mix of many different frequencies. Frequency refers to the number of vibrations per second of the air in which the sound is propagating and it is measured in Hertz (Hz). The audible frequency range is normally considered to be 20–20 000 Hz for younger listeners with unimpaired hearing. However, our hearing systems are not equally sensitive to all sound frequencies, and to compensate for this various types of filters or frequency weighting have been used to determine the relative strengths of frequency components making up a particular environmental noise. The A-weighting is most commonly used and weights lower frequencies as less important than mid- and higher-frequencies. It is intended to approximate the frequency response of our hearing system.

The effect of a combination of noise events is related to the combined sound energy of those events (the equal energy principle). The sum of the total energy over some time period gives a level equivalent to the average sound energy over that period. Thus, LAeq,T is the energy average equivalent level of the A-weighted sound over a period T. LAeq,T should be used to measure continuing sounds, such as road traffic noise or types of more-or-less continuous industrial noises. However, when there are distinct events to the noise, as with aircraft or railway noise, measures of individual events such as the maximum noise level (LAmax), or the weighted sound exposure level (SEL), should also be obtained in addition to LAeq,T. Time-varying environmental sound levels have also been described in terms of percentile levels.

Currently, the recommended practice is to assume that the equal energy principle is approximately valid for most types of noise and that a simple LAeq,T measure will indicate the expected effects of the noise reasonably well. When the noise consists of a small number of discrete events, the A-weighted maximum level (LAmax) is a better indicator of the disturbance to sleep and other activities. In most cases, however, the A-weighted sound exposure level (SEL) provides a more consistent measure of single-noise events because it is based on integration over the complete noise event. In combining day and night LAeq,T values, night-time weightings are often added. Night-time weightings are intended to reflect the expected increased sensitivity to annoyance at night, but they do not protect people from sleep disturbance.

Where there are no clear reasons for using other measures, it is recommended that LAeq,T be used to evaluate more-or-less continuous environmental noises. Where the noise is principally composed of a small number of discrete events, the additional use of LAmax or SEL is recommended. There are definite limitations to these simple measures, but there are also many practical advantages, including economy and the benefits of a standardized approach.

3. Adverse health effects of noise

The health significance of noise pollution is given in chapter 3 of the *Guidelines* under separate headings according to the specific effects: noise-induced hearing impairment; interference with speech communication; disturbance of rest and sleep; psychophysiological, mental-health and performance effects; effects on residential behaviour and annoyance; and interference with intended activities. This chapter also considers vulnerable groups and the combined effects of mixed noise sources.

Hearing impairment is typically defined as an increase in the threshold of hearing. Hearing deficits may be accompanied by tinnitus (ringing in the ears). Noise-induced hearing impairment occurs predominantly in the higher frequency range of 3 000–6 000 Hz, with the largest effect at 4 000 Hz. But with increasing LAeq,8h and increasing exposure time, noise-induced hearing impairment occurs even at frequencies as low as 2 000 Hz. However, hearing impairment is not expected to occur at LAeq,8h levels of 75 dB(A) or below, even for prolonged occupational noise exposure.

Worldwide, noise-induced hearing impairment is the most prevalent irreversible occupational hazard and it is estimated that 120 million people worldwide have disabling hearing difficulties.

In developing countries, not only occupational noise but also environmental noise is an increasing risk factor for hearing impairment. Hearing damage can also be caused by certain diseases, some industrial chemicals, ototoxic drugs, blows to the head, accidents and hereditary origins. Hearing deterioration is also associated with the ageing process itself (presbyacusis).

The extent of hearing impairment in populations exposed to occupational noise depends on the value of LAeq,8h, the number of noise-exposed years, and on individual susceptibility. Men and women are equally at risk for noise-induced hearing impairment. It is expected that environmental and leisure-time noise with a LAeq,24h of 70 dB(A) or below will not cause hearing impairment in the large majority of people, even after a lifetime exposure. For adults exposed to impulse noise at the workplace, the noise limit is set at peak sound pressure levels of 140 dB, and the same limit is assumed to be appropriate for environmental and leisure-time noise. In the case of children, however, taking into account their habits while playing with noisy toys, the peak sound pressure should never exceed 120 dB. For shooting noise with LAeq,24h levels greater than 80 dB(A), there may be an increased risk for noise-induced hearing impairment.

The main social consequence of hearing impairment is the inability to understand speech in daily living conditions, and this is considered to be a severe social handicap. Even small values of hearing impairment (10 dB averaged over 2 000 and 4 000 Hz and over both ears) may adversely affect speech comprehension.

Speech intelligibility is adversely affected by noise. Most of the acoustical energy of speech is in the frequency range of 100–6 000 Hz, with the most important cue-bearing energy being between 300–3 000 Hz. Speech interference is basically a masking process, in which simultaneous interfering noise renders speech incapable of being understood. Environmental noise may also mask other acoustical signals that are important for daily life, such as door bells, telephone signals, alarm clocks, fire alarms and other warning signals, and music.

Speech intelligibility in everyday living conditions is influenced by speech level; speech pronunciation; talker-to-listener distance; sound level and other characteristics of the interfering noise; hearing acuity; and by the level of attention. Indoors, speech communication is also affected by the reverberation characteristics of the room. Reverberation times over 1 s produce loss in speech discrimination and make speech perception more difficult and straining. For full sentence intelligibility in listeners with normal hearing, the signal-to-noise ratio (i.e. the difference between the speech level and the sound level of the interfering noise) should be at least 15 dB(A). Since the sound pressure level of normal speech is about 50 dB(A), noise with sound levels of 35 dB(A) or more interferes with the intelligibility of speech in smaller rooms. For vulnerable groups even lower background levels are needed, and a reverberation time below 0.6 s is desirable for adequate speech intelligibility, even in a quiet environment.

The inability to understand speech results in a large number of personal handicaps and behavioural changes. Particularly vulnerable are the hearing impaired, the elderly, children in the process of language and reading acquisition, and individuals who are not familiar with the spoken language.

Sleep disturbance is a major effect of environmental noise. It may cause primary effects during sleep, and secondary effects that can be assessed the day after night-time noise exposure. Uninterrupted sleep is a prerequisite for good physiological and mental functioning, and the primary effects of sleep disturbance are: difficulty in falling asleep; awakenings and alterations of sleep stages or depth; increased blood pressure, heart rate and finger pulse amplitude; vasoconstriction; changes in respiration; cardiac arrhythmia; and increased body movements. The difference between the sound levels of a noise event and background sound levels, rather than the absolute noise level, may determine the reaction probability. The probability of being awakened increases with the number of noise events per night. The secondary, or after-effects, the following morning or day(s) are: reduced perceived sleep quality; increased fatigue; depressed mood or well-being; and decreased performance.

For a good night's sleep, the equivalent sound level should not exceed 30 dB(A) for continuous background noise, and individual noise events exceeding 45 dB(A) should be avoided. In setting limits for single night-time noise exposures, the intermittent character of the noise has to be taken into account. This can be achieved, for example, by measuring the number of noise events, as well as the difference between the maximum sound level and the background sound level. Special attention should also be given to: noise sources in an environment with low background sound levels; combinations of noise and vibrations; and to noise sources with low-frequency components.

Physiological Functions. In workers exposed to noise, and in people living near airports, industries and noisy streets, noise exposure may have a large temporary, as well as permanent, impact on physiological functions. After prolonged exposure, susceptible individuals in the general population may develop permanent effects, such as hypertension and ischaemic heart disease associated with exposure to high sound levels. The magnitude and duration of the effects are determined in part by individual characteristics, lifestyle behaviours and environmental conditions. Sounds also evoke reflex responses, particularly when they are unfamiliar and have a sudden onset.

Workers exposed to high levels of industrial noise for 5–30 years may show increased blood pressure and an increased risk for hypertension. Cardiovascular effects have also been demonstrated after long-term exposure to air- and road-traffic with LAeq,24h values of 65–70 dB(A). Although the associations are weak, the effect is somewhat stronger for ischaemic heart disease than for hypertension. Still, these small risk increments are important because a large number of people are exposed.

Mental Illness. Environmental noise is not believed to cause mental illness directly, but it is assumed that it can accelerate and intensify the development of latent mental disorders. Exposure to high levels of occupational noise has been associated with development of neurosis, but the findings on environmental noise and mental-health effects are inconclusive. Nevertheless, studies on the use of drugs such as tranquillizers and sleeping pills, on psychiatric symptoms and on mental hospital admission rates, suggest that community noise may have adverse effects on mental health.

Performance. It has been shown, mainly in workers and children, that noise can adversely affect performance of cognitive tasks. Although noise-induced arousal may produce better performance in simple tasks in the short term, cognitive performance substantially deteriorates for more complex tasks. Reading, attention, problem solving and memorization are among the cognitive effects most strongly affected by noise. Noise can also act as a distracting stimulus and impulsive noise events may produce disruptive effects as a result of startle responses.

Noise exposure may also produce after-effects that negatively affect performance. In schools around airports, children chronically exposed to aircraft noise under-perform in proof reading, in persistence on challenging puzzles, in tests of reading acquisition and in motivational capabilities. It is crucial to recognize that some of the adaptation strategies to aircraft noise, and the effort necessary to maintain task performance, come at a price. Children from noisier areas have heightened sympathetic arousal, as indicated by increased stress hormone levels, and elevated resting blood pressure. Noise may also produce impairments and increase in errors at work, and some accidents may be an indicator of performance deficits.

Social and Behavioural Effects of Noise; Annoyance. Noise can produce a number of social and behavioural effects as well as annoyance. These effects are often complex, subtle and indirect and many effects are assumed to result from the interaction of a number of non-auditory variables. The effect of community noise on annoyance can be evaluated by questionnaires or by assessing the disturbance of specific activities. However, it should be recognized that equal levels of different traffic and industrial noises cause different magnitudes of annoyance. This is because annoyance in populations varies not only with the characteristics of the noise, including the noise source, but also depends to a large degree on many non-acoustical factors of a social, psychological, or economic nature. The correlation between noise exposure and general annoyance is much higher at group level than at individual level. Noise above 80 dB(A) may also reduce helping behaviour and increase aggressive behaviour. There is particular concern that high-level continuous noise exposures may increase the susceptibility of schoolchildren to feelings of helplessness.

Stronger reactions have been observed when noise is accompanied by vibrations and contains low-frequency components, or when the noise contains impulses, such as with shooting noise. Temporary, stronger reactions occur when the noise exposure increases over time, compared to a constant noise exposure. In most cases, LAeq,24h and L_{dn} are acceptable approximations of noise exposure related to annoyance. However, there is growing concern that all the component parameters should be individually assessed in noise exposure investigations, at least in the complex cases. There is no consensus on a model for total annoyance due to a combination of environmental noise sources.

Combined Effects on Health of Noise from Mixed Sources. Many acoustical environments consist of sounds from more than one source, i.e. there are mixed sources, and some combinations of effects are common. For example, noise may interfere with speech in the day and create sleep disturbance at night. These conditions certainly apply to residential areas heavily polluted with noise. Therefore, it is important that the total adverse health load of noise be considered over 24 hours, and that the precautionary principle for sustainable development be applied.

Vulnerable Subgroups. Vulnerable subgroups of the general population should be considered when recommending noise protection or noise regulations. The types of noise effects, specific environments and specific lifestyles are all factors that should be addressed for these subgroups. Examples of vulnerable subgroups are: people with particular diseases or medical problems (e.g. high blood pressure); people in hospitals or rehabilitating at home; people dealing with complex cognitive tasks; the blind; people with hearing impairment; fetuses, babies and young children; and the elderly in general. People with impaired hearing are the most adversely affected with respect to speech intelligibility. Even slight hearing impairments in the high-frequency sound range may cause problems with speech perception in a noisy environment. A majority of the population belongs to the subgroup that is vulnerable to speech interference.

4. Guideline values

In chapter 4, guideline values are given for specific health effects of noise and for specific environments.

Specific health effects.

Interference with Speech Perception. A majority of the population is susceptible to speech interference by noise and belongs to a vulnerable subgroup. Most sensitive are the elderly and persons with impaired hearing. Even slight hearing impairments in the high-frequency range may cause problems with speech perception in a noisy environment. From about 40 years of age, the ability of people to interpret difficult, spoken messages with low linguistic redundancy is impaired compared to people 20–30 years old. It has also been shown that high noise levels and long reverberation times have more adverse effects in children, who have not completed language acquisition, than in young adults.

When listening to complicated messages (at school, foreign languages, telephone conversation) the signal-to-noise ratio should be at least 15 dB with a voice level of 50 dB(A). This sound level corresponds on average to a casual voice level in both women and men at 1 m distance. Consequently, for clear speech perception the background noise level should not exceed 35 dB(A). In classrooms or conference rooms, where speech perception is of paramount importance, or for sensitive groups, background noise levels should be as low as possible. Reverberation times below 1 s are also necessary for good speech intelligibility in smaller rooms. For sensitive groups, such as the elderly, a reverberation time below 0.6 s is desirable for adequate speech intelligibility even in a quiet environment.

Hearing Impairment. Noise that gives rise to hearing impairment is by no means restricted to occupational situations. High noise levels can also occur in open air concerts, discotheques, motor sports, shooting ranges, in dwellings from loudspeakers, or from leisure activities. Other important sources of loud noise are headphones, as well as toys and fireworks which can emit impulse noise. The ISO standard 1999 gives a method for estimating noise-induced hearing impairment in populations exposed to all types of noise (continuous, intermittent, impulse) during working hours. However, the evidence strongly suggests that this method should also be used to calculate hearing impairment due to noise exposure from environmental and leisure time activities. The ISO standard 1999 implies that long-term exposure to LAeq,24h noise levels of up to 70 dB(A) will not result in hearing impairment. To avoid hearing loss from impulse noise exposure, peak sound pressures should never exceed 140 dB for adults, and 120 dB for children.

Sleep Disturbance. Measurable effects of noise on sleep begin at LAeq levels of about 30 dB. However, the more intense the background noise, the more disturbing is its effect on sleep. Sensitive groups mainly include the elderly, shift workers, people with physical or mental disorders and other individuals who have difficulty sleeping.

Sleep disturbance from intermittent noise events increases with the maximum noise level. Even if the total equivalent noise level is fairly low, a small number of noise events with a high maximum sound pressure level will affect sleep. Therefore, to avoid sleep disturbance, guidelines for community noise should be expressed in terms of the equivalent sound level of the noise, as well as in terms of maximum noise levels and the number of noise events. It should be noted that low-frequency noise, for example, from ventilation systems, can disturb rest and sleep even at low sound pressure levels.

When noise is continuous, the equivalent sound pressure level should not exceed 30 dB(A) indoors, if negative effects on sleep are to be avoided. For noise with a large proportion of low-frequency sound a still lower guideline value is recommended. When the background noise is low, noise exceeding 45 dB LAmax should be limited, if possible, and for sensitive persons an even lower limit is preferred. Noise mitigation targeted to the first part of the night is believed to be an effective means for helping people fall asleep. It should be noted that the adverse effect of noise partly depends on the nature of the source. A special situation is for newborns in incubators, for which the noise can cause sleep disturbance and other health effects.

Reading Acquisition. Chronic exposure to noise during early childhood appears to impair reading acquisition and reduces motivational capabilities. Evidence indicates that the longer the exposure, the greater the damage. Of recent concern are the concomitant psychophysiological changes (blood pressure and stress hormone levels). There is insufficient information on these effects to set specific guideline values. It is clear, however, that daycare centres and schools should not be located near major noise sources, such as highways, airports, and industrial sites.

Annoyance. The capacity of a noise to induce annoyance depends upon its physical characteristics, including the sound pressure level, spectral characteristics and variations of these properties with time. During daytime, few people are highly annoyed at LAeq levels below 55 dB(A), and few are moderately annoyed at LAeq levels below 50 dB(A). Sound levels during the evening and night should be 5–10 dB lower than during the day. Noise with low-frequency components require lower guideline values. For intermittent noise, it is emphasized that it is necessary to take into account both the maximum sound pressure level and the number of noise events. Guidelines or noise abatement measures should also take into account residential outdoor activities.

Social Behaviour. The effects of environmental noise may be evaluated by assessing its interference with social behavior and other activities. For many community noises, interference with rest/recreation/watching television seem to be the most important effects. There is fairly consistent evidence that noise above 80 dB(A) causes reduced helping behavior, and that loud noise also increases aggressive behavior in individuals predisposed to aggressiveness. In schoolchildren, there is also concern that high levels of chronic noise contribute to feelings of helplessness. Guidelines on this issue, together with cardiovascular and mental effects, must await further research.

Specific environments.

A noise measure based only on energy summation and expressed as the conventional equivalent measure, LAeq, is not enough to characterize most noise environments. It is equally important to measure the maximum values of noise fluctuations, preferably combined with a measure of the number of noise events. If the noise includes a large proportion of low-frequency components, still lower values than the guideline values below will be needed. When prominent low-frequency components are present, noise measures based on A-weighting are inappropriate. The difference between dB(C) and dB(A) will give crude information about the presence of low-frequency components in noise, but if the difference is more than 10 dB, it is recommended that a frequency analysis of the noise be performed. It should be noted that a large proportion of low-frequency components in noise may increase considerably the adverse effects on health.

In Dwellings. The effects of noise in dwellings, typically, are sleep disturbance, annoyance and speech interference. For bedrooms the critical effect is sleep disturbance. Indoor guideline values for bedrooms are 30 dB LAeq for continuous noise and 45 dB LAmax for single sound events. Lower noise levels may be disturbing depending on the nature of the noise source. At night-time, outside sound levels about 1 metre from facades of living spaces should not exceed 45 dB LAeq, so that people may sleep with bedroom windows open. This value was obtained by assuming that the noise reduction from outside to inside with the window open is 15 dB. To enable casual conversation indoors during daytime, the sound level of interfering noise should not exceed 35 dB LAeq. The maximum sound pressure level should be measured with the sound pressure meter set at "Fast".

To protect the majority of people from being seriously annoyed during the daytime, the outdoor sound level from steady, continuous noise should not exceed 55 dB LAeq on balconies, terraces and in outdoor living areas. To protect the majority of people from being moderately annoyed during the daytime, the outdoor sound level should not exceed 50 dB LAeq. Where it is practical and feasible, the lower outdoor sound level should be considered the maximum desirable sound level for new development.

In Schools and Preschools. For schools, the critical effects of noise are speech interference, disturbance of information extraction (e.g. comprehension and reading acquisition), message communication and annoyance. To be able to hear and understand spoken messages in class rooms, the background sound level should not exceed 35 dB LAeq during teaching sessions. For hearing impaired children, a still lower sound level may be needed. The reverberation time in the classroom should be about 0.6 s, and preferably lower for hearing impaired children. For assembly halls and cafeterias in school buildings, the reverberation time should be less than 1 s. For outdoor playgrounds the sound level of the noise from external sources should not exceed 55 dB LAeq, the same value given for outdoor residential areas in daytime.

For preschools, the same critical effects and guideline values apply as for schools. In bedrooms in preschools during sleeping hours, the guideline values for bedrooms in dwellings should be used.

In Hospitals. For most spaces in hospitals, the critical effects are sleep disturbance, annoyance, and communication interference, including warning signals. The LAmax of sound events during the night should not exceed 40 dB(A) indoors. For ward rooms in hospitals, the guideline values indoors are 30dB LAeq, together with 40 dB LAmax during night. During the day and evening the guideline value indoors is 30 dB LAeq. The maximum level should be measured with the sound pressure instrument set at "Fast".

Since patients have less ability to cope with stress, the LAeq level should not exceed 35 dB in most rooms in which patients are being treated or observed. Attention should be given to the sound levels in intensive care units and operating theaters. Sound inside incubators may result in health problems for neonates, including sleep disturbance, and may also lead to hearing impairment. Guideline values for sound levels in incubators must await future research.

Ceremonies, Festivals and Entertainment Events. In many countries, there are regular ceremonies, festivals and entertainment events to celebrate life periods. Such events typically

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produce loud sounds, including music and impulsive sounds. There is widespread concern about the effect of loud music and impulsive sounds on young people who frequently attend concerts, discotheques, video arcades, cinemas, amusement parks and spectator events. At these events, the sound level typically exceeds 100 dB LAeq. Such noise exposure could lead to significant hearing impairment after frequent attendances.

Noise exposure for employees of these venues should be controlled by established occupational standards; and at the very least, the same standards should apply to the patrons of these premises. Patrons should not be exposed to sound levels greater than 100 dB LAeq during a four-hour period more than four times per year. To avoid acute hearing impairment the LAmax should always be below 110 dB.

Headphones. To avoid hearing impairment from music played back in headphones, in both adults and children, the equivalent sound level over 24 hours should not exceed 70 dB(A). This implies that for a daily one hour exposure the LAeq level should not exceed 85 dB(A). To avoid acute hearing impairment LAmax should always be below 110 dB(A). The exposures are expressed in free-field equivalent sound level.

Toys, Fireworks and Firearms. To avoid acute mechanical damage to the inner ear from impulsive sounds from toys, fireworks and firearms, adults should never be exposed to more than 140 dB(lin) peak sound pressure level. To account for the vulnerability in children when playing, the peak sound pressure produced by toys should not exceed 120 dB(lin), measured close to the ears (100 mm). To avoid acute hearing impairment LAmax should always be below 110 dB(A).

Parkland and Conservation Areas. Existing large quiet outdoor areas should be preserved and the signal-to-noise ratio kept low.

Table 1 presents the WHO guideline values arranged according to specific environments and critical health effects. The guideline values consider all identified adverse health effects for the specific environment. An adverse effect of noise refers to any temporary or long-term impairment of physical, psychological or social functioning that is associated with noise exposure. Specific noise limits have been set for each health effect, using the lowest noise level that produces an adverse health effect (i.e. the critical health effect). Although the guideline values refer to sound levels impacting the most exposed receiver at the listed environments, they are applicable to the general population. The time base for LAeq for "daytime" and "night-time" is 12–16 hours and 8 hours, respectively. No time base is given for evenings, but typically the guideline value should be 5–10 dB lower than in the daytime. Other time bases are recommended for schools, preschools and playgrounds, depending on activity.

It is not enough to characterize the noise environment in terms of noise measures or indices based only on energy summation (e.g., LAeq), because different critical health effects require different descriptions. It is equally important to display the maximum values of the noise fluctuations, preferably combined with a measure of the number of noise events. A separate characterization of night-time noise exposures is also necessary. For indoor environments, reverberation time is also an important factor for things such as speech intelligibility. If the noise includes a large proportion of low-frequency components, still lower guideline values should be applied. Supplementary to the guideline values given in Table 1, precautions should be taken for vulnerable groups and for noise of certain character (e.g. low-frequency components, low background noise).

Table 1: Guideline values for community noise in specific environments.

Specific environment	Critical health effect(s)	L_{Aeq} [dB(A)]	Time base [hours]	L_{Amax} fast [dB]
Outdoor living area	Serious annoyance, daytime and evening Moderate annoyance, daytime and evening	55 50	16 16	- -
Dwelling, indoors Inside bedrooms	Speech intelligibility & moderate annoyance, daytime & evening Sleep disturbance, night-time	35 30	16 8	 45
Outside bedrooms	Sleep disturbance, window open (outdoor values)	45	8	60
School class rooms & pre-schools, indoors	Speech intelligibility, disturbance of information extraction, message communication	35	during class	-
Pre-school bedrooms, indoor	Sleep disturbance	30	sleeping-time	45
School, playground outdoor	Annoyance (external source)	55	during play	-
Hospital, ward rooms, indoors	Sleep disturbance, night-time Sleep disturbance, daytime and evenings	30 30	8 16	40 -
Hospitals, treatment rooms, indoors	Interference with rest and recovery	#1		
Industrial, commercial shopping and traffic areas, indoors and outdoors	Hearing impairment	70	24	110
Ceremonies, festivals and entertainment events	Hearing impairment (patrons:<5 times/year)	100	4	110
Public addresses, indoors and outdoors	Hearing impairment	85	1	110
Music and other sounds through headphones/ earphones	Hearing impairment (free-field value)	85 #4	1	110
Impulse sounds from toys, fireworks and firearms	Hearing impairment (adults) Hearing impairment (children)	- -	- -	140 #2 120 #2
Outdoors in parkland and conservations areas	Disruption of tranquillity	#3		

#1: As low as possible.
#2: Peak sound pressure (not LAF, max) measured 100 mm from the ear.

#3: Existing quiet outdoor areas should be preserved and the ratio of intruding noise to natural background sound should be kept low.
#4: Under headphones, adapted to free-field values.

5. Noise Management

Chapter 5 is devoted to noise management with discussions on: strategies and priorities in managing indoor noise levels; noise policies and legislation; the impact of environmental noise; and on the enforcement of regulatory standards.

The fundamental goals of noise management are to develop criteria for deriving safe noise exposure levels and to promote noise assessment and control as part of environmental health programmes. These basic goals should guide both international and national policies for noise management. The United Nation's Agenda 21 supports a number of environmental management principles on which government policies, including noise management policies, can be based: the principle of precaution; the "polluter pays" principle; and noise prevention. In all cases, noise should be reduced to the lowest level achievable in the particular situation. When there is a reasonable possibility that the public health will be endangered, even though scientific proof may be lacking, action should be taken to protect the public health, without awaiting the full scientific proof. The full costs associated with noise pollution (including monitoring, management, lowering levels and supervision) should be met by those responsible for the source of noise. Action should be taken where possible to reduce noise at the source.

A legal framework is needed to provide a context for noise management. National noise standards can usually be based on a consideration of international guidelines, such as these *Guidelines for Community Noise*, as well as national criteria documents, which consider dose-response relationships for the effects of noise on human health. National standards take into account the technological, social, economic and political factors within the country. A staged program of noise abatement should also be implemented to achieve the optimum health protection levels over the long term.

Other components of a noise management plan include: noise level monitoring; noise exposure mapping; exposure modeling; noise control approaches (such as mitigation and precautionary measures); and evaluation of control options. Many of the problems associated with high noise levels can be prevented at low cost, if governments develop and implement an integrated strategy for the indoor environment, in concert with all social and economic partners. Governments should establish a "National Plan for a Sustainable Noise Indoor Environment" that applies both to new construction as well as to existing buildings.

The actual priorities in rational noise management will differ for each country. Priority setting in noise management refers to prioritizing the health risks to be avoided and concentrating on the most important sources of noise. Different countries have adopted a range of approaches to noise control, using different policies and regulations. A number of these are outlined in chapter 5 and Appendix 2, as examples. It is evident that noise emission standards have proven insufficient and that the trends in noise pollution are unsustainable.

The concept of environmental an environmental noise impact analysis is central to the philosophy of managing environmental noise. Such an analysis should be required before implementing any project that would significantly increase the level of environmental noise in a community (typically, greater than a 5 dB increase). The analysis should include: a baseline description of the existing noise environment; the expected level of noise from the new source; an assessment of the adverse health effects; an estimation of the population at risk; the calculation of exposure-response relationships; an assessment of risks and their acceptability; and a cost-benefit analysis.

Noise management should:

1. Start monitoring human exposures to noise.
2. Have health control require mitigation of noise immissions, and not just of noise source emissions. The following should be taken into consideration:
    - specific environments such as schools, playgrounds, homes, hospitals.
    - environments with multiple noise sources, or which may amplify the effects of noise.
    - sensitive time periods such as evenings, nights and holidays.
    - groups at high risk, such as children and the hearing impaired.
3. Consider the noise consequences when planning transport systems and land use.
4. Introduce surveillance systems for noise-related adverse health effects.
5. Assess the effectiveness of noise policies in reducing adverse health effects and exposure, and in improving supportive "soundscapes".
6. Adopt these *Guidelines for Community Noise* as intermediary targets for improving human health.
7. Adopt precautionary actions for a sustainable development of the acoustical environments.

Conclusions and recommendations

In chapter 6 are discussed: the implementation of the guidelines; further WHO work on noise; and research needs are recommended.

Implementation. For implementation of the guidelines it is recommended that:

- Governments should protection the population from community noise and consider it an integral part of their policy of environmental protection.
- Governments should consider implementing action plans with short-term, medium-term and long-term objectives for reducing noise levels.
- Governments should adopt the *Health Guidelines for Community Noise* values as targets to be achieved in the long-term.
- Governments should include noise as an important public health issue in environmental impact assessments.
- Legislation should be put in place to allow for the reduction of sound levels.
- Existing legislation should be enforced.
- Municipalities should develop low noise implementation plans.

- Cost-effectiveness and cost-benefit analyses should be considered potential instruments for meaningful management decisions.
- Governments should support more policy-relevant research.

Future Work. The Expert Task Force worked out several suggestions for future work for the WHO in the field of community noise. WHO should:

- Provide leadership and technical direction in defining future noise research priorities.
- Organize workshops on how to apply the guidelines.
- Provide leadership and coordinate international efforts to develop techniques for designing supportive sound environments (e.g. "soundscapes").
- Provide leadership for programs to assess the effectiveness of health-related noise policies and regulations.
- Provide leadership and technical direction for the development of sound methodologies for environmental and health impact plans.
- Encourage further investigation into using noise exposure as an indicator of environmental deterioration (e.g. black spots in cities).
- Provide leadership and technical support, and advise developing countries to facilitate development of noise policies and noise management.

Research and Development. A major step forward in raising the awareness of both the public and of decision makers is the recommendation to concentrate more research and development on variables which have monetary consequences. This means that research should consider not only dose-response relationships between sound levels, but also politically relevant variables, such as noise-induced social handicap; reduced productivity; decreased performance in learning; workplace and school absenteeism; increased drug use; and accidents.

In Appendices 1–6 are given: bibliographic references; examples of regional noise situations (African Region, American Region, Eastern Mediterranean Region, South East Asian Region, Western Pacific Region); a glossary; a list of acronyms; and a list of participants.

1. Introduction

Community noise (also called environmental noise, residential noise or domestic noise) is defined as noise emitted from all sources, except noise at the industrial workplace. Main sources of community noise include road, rail and air traffic, industries, construction and public work, and the neighbourhood. Typical neighbourhood noise comes from premises and installations related to the catering trade (restaurant, cafeterias, discotheques, etc.); from live or recorded music; from sporting events including motor sports; from playgrounds and car parks; and from domestic animals such as barking dogs. The main indoor sources are ventilation systems, office machines, home appliances and neighbours. Although many countries have regulations on community noise from road, rail and air traffic, and from construction and industrial plants, few have regulations on neighbourhood noise. This is probably due to the lack of methods to define and measure it, and to the difficulty of controlling it. In developed countries, too, monitoring of compliance with, and enforcement of, noise regulations are weak for lower levels of urban noise that correspond to occupationally controlled levels (>85 dB LAeq,8h; Frank 1998). Recommended guideline values based on the health effects of noise, other than occupationally-induced effects, are often not taken into account.

The extent of the community noise problem is large. In the European Union about 40% of the population is exposed to road traffic noise with an equivalent sound pressure level exceeding 55 dBA daytime; and 20% is exposed to levels exceeding 65 dBA (Lambert & Vallet 19 1994). When all transportation noise is considered, about half of all European Union citizens live in zones that do not ensure acoustical comfort to residents. At night, it is estimated that more than 30% is exposed to equivalent sound pressure levels exceeding 55 dBA, which are disturbing to sleep. The noise pollution problem is also severe in the cities of developing countries and is caused mainly by traffic. Data collected alongside densely traveled roads were found to have equivalent sound pressure levels for 24 hours of 75–80 dBA (e.g. National Environment Board Thailand 19 1990; Mage & Walsh 19 1998).

(a) In contrast to many other environmental problems, noise pollution continues to grow, accompanied by an increasing number of complaints from affected individuals. Most people are typically exposed to several noise sources, with road traffic noise being a dominant source (OECD-ECMT 19 1995). Population growth, urbanization and to a large extent technological development are the main driving forces, and future enlargements of highway systems, international airports and railway systems will only increase the noise problem. Viewed globally, the growth in urban environmental noise pollution is unsustainable, because it involves not simply the direct and cumulative adverse effects on health. It also adversely affects future generations by degrading residential, social and learning environments, with corresponding economical losses (Berglund 1998). Thus, noise is not simply a local problem, but a global issue that affects everyone (Lang 1999; Sandberg 1999) and calls for precautionary action in any environmental planning situation.

The objective of the World Health Organization (WHO) is the attainment by all peoples of the highest possible level of health. As the first principle of the WHO Constitution the definition of 'health' is given as: "A state of complete physical, mental and social well-being and not merely the absence of disease or infirmity". This broad definition of health embraces the concept of well-being and, thereby, renders noise impacts such as population annoyance, interference with communication, and impaired task performance as 'health' issues. In 1992, a WHO Task Force also identified the following specific health effects for the general population that may result from community noise: interference with communication; annoyance responses; effects on sleep, and on the cardiovascular and psychophysiological systems; effects on performance, productivity, and social behavior; and noise-induced hearing impairment (WHO 1993; Berglund & Lindvall 1995; *cf.* WHO 1980). Hearing damage is expected to result from both occupational and environmental noise, especially in developing countries, where compliance with noise regulation is known to be weak (Smith 1998).

Noise is likely to continue as a major issue well into the next century, both in developed and in developing countries. Therefore, strategic action is urgently required, including continued noise control at the source and in local areas. Most importantly, joint efforts among countries are necessary at a system level, in regard to the access and use of land, airspace and seawaters, and in regard to the various modes of transportation. Certainly, mankind would benefit from societal reorganization towards healthy transport. To understand noise we must understand the different types of noise and how we measure it, where noise comes from and the effects of noise on human beings. Furthermore, noise mitigation, including noise management, has to be actively introduced and in each case the policy implications have to be evaluated for efficiency.

This document is organized as follows. In Chapter 2 noise sources and measurement are discussed, including the basic aspects of source characteristics, sound propagation and transmission. In Chapter 3 the adverse health effects of noise are characterized. These include noise-induced hearing impairment, interference with speech communication, sleep disturbance, cardiovascular and physiological effects, mental health effects, performance effects, and annoyance reactions. This chapter is rounded out by a consideration of combined noise sources and their effects, and a discussion of vulnerable groups. In Chapter 4 the Guideline values are presented. Chapter 5 is devoted to noise management. Included are discussions of: strategies and priorities in the management of indoor noise levels; noise policies and legislation; environmental noise impact; and enforcement of regulatory standards. In Chapter 6 implementation of the WHO Guidelines is discussed, as well as future WHO work on noise and its research needs. In Appendices 1–6 are given: bibliographic references; examples of regional noise situations (African Region, American Region, Eastern Mediterranean Region, South East Asian Region, Western Pacific Region); a glossary; a list of acronyms; and a list of participants.

3. Adverse Health Effects Of Noise

3.1. Introduction

The perception of sounds in day-to-day life is of major importance for human well-being. Communication through speech, sounds from playing children, music, natural sounds in parklands, parks and gardens are all examples of sounds essential for satisfaction in every day life. Conversely, this document is related to the adverse effects of sound (noise). According to the International Programme on Chemical Safety (WHO 1994), an adverse effect of noise is defined as a change in the morphology and physiology of an organism that results in impairment of functional capacity, or an impairment of capacity to compensate for additional stress, or increases the susceptibility of an organism to the harmful effects of other environmental influences. This definition includes any temporary or long-term lowering of the physical, psychological or social functioning of humans or human organs. The health significance of noise pollution is given in this chapter under separate headings, according to the specific effects: noise-induced hearing impairment; interference with speech communication; disturbance of rest and sleep; psychophysiological, mental-health and performance effects; effects on residential behaviour and annoyance; as well as interference with intended activities. This chapter also considers vulnerable groups and the combined effects of sounds from different sources. Conclusions based on the details given in this chapter are given in Chapter 4 as they relate to guideline values.

3.2. Noise-Induced Hearing Impairment

Hearing impairment is typically defined as an increase in the threshold of hearing. It is assessed by threshold audiometry. Hearing handicap is the disadvantage imposed by hearing impairment sufficient to affect one's personal efficiency in the activities of daily living. It is usually expressed in terms of understanding conventional speech in common levels of background noise (ISO 1990). Worldwide, noise-induced hearing impairment is the most prevalent irreversible occupational hazard. In the developing countries, not only occupational noise, but also environmental noise is an increasing risk factor for hearing impairment. In 1995, at the World Health Assembly, it was estimated that there are 120 million persons with disabling hearing difficulties worldwide (Smith 1998). It has been shown that men and women are equally at risk of noise-induced hearing impairment (ISO 1990; Berglund & Lindvall 1995).

Apart from noise-induced hearing impairment, hearing damage in populations is also caused by certain diseases; some industrial chemicals; ototoxic drugs; blows to the head; accidents; and hereditary origins. Deterioration of hearing capability is also associated with the aging process *per se* (presbyacusis). Present knowledge of the physiological effects of noise on the auditory system is based primarily on laboratory studies on animals. After noise exposure, the first morphological changes are usually found in the inner and outer hair cells of the cochlea, where the stereocilia become fused and bent. After more prolonged exposure, the outer and inner hair cells related to transmission of high-frequency sounds are missing. See Berglund & Lindvall (1995) for further discussion.

The ISO Standard 1999 (ISO 1990) gives a method for calculating noise-induced hearing impairment in populations exposed to all types of noise (continuous, intermittent, impulse) during working hours. Noise exposure is characterized by LAeq over 8 hours (LAeq,8h). In the Standard, the relationships between LAeq,8h and noise-induced hearing impairment are given for frequencies of 500–6 000 Hz, and for exposure times of up to 40 years. These relations show that noise-induced hearing impairment occurs predominantly in the high-frequency range of 3 000–6 000 Hz, the effect being largest at 4 000 Hz. With increasing LAeq,8h and increasing exposure time, noise-induced hearing impairment also occurs at 2 000 Hz. But at LAeq,8h levels of 75 dBA and lower, even prolonged occupational noise exposure will not result in noise-induced hearing impairment (ISO 1990). This value is equal to that specified in 1980 by the World Health Organization (WHO 1980a).

The ISO Standard 1999 (ISO 1990) specifies hearing impairment in statistical terms (median values, and percentile fractions between 0.05 and 0.95). The extent of noise-induced hearing impairment in populations exposed to occupational noise depends on the value of LAeq,8h and the number of years of noise exposure. However, for high LAeq,8h values, individual susceptibility seems to have a considerable effect on the rate of progression of hearing impairment. For daily exposures of 8–16 h, noise-induced hearing impairment can be reasonably well estimated from LAeq,8h extrapolated to the longer exposure times (Axelsson et al. 1986). In this adaptation of LAeq,8h for daily exposures other than 8 hours, the equal energy principle is assumed to be applicable. For example, the hearing impairment due to a 16 h daily exposure is equivalent to that at LAeq,8h plus 3 dB (LAeq,16h = LAeq,8h + $10*\log_{10}(16/8)$ = LAeq,8h + 3 dB. For a 24 h exposure, LAeq,24h = LAeq,8h + $10*\log_{10}(24/8)$ = LAeq,8h + 5 dB).

Since the calculation method specified in the ISO Standard 1999 (ISO 1990) is the only universally adopted method for estimating occupational noise-induced hearing impairment, attempts have been made to assess whether the method is also applicable to hearing impairment due to environmental noise, including leisure-time noise. There is ample evidence that shooting noise, with LAeq,24h values of up to 80 dB, induces the same hearing impairment as an equivalent occupational noise exposure (Smoorenburg 1998). Moreover, noise-induced hearing impairment studies from motorbikes are also in agreement with results from ISO Standard 1999 (ISO 1990). Hearing impairment in young adults and children 12 years and older has been assessed by LAeq on a 24 h time basis, for a variety of environmental and leisure-time exposure patterns (e.g. Passchier-Vermeer 1993; HCN 1994). These include pop music in discotheques and concerts (Babisch & Ising 1989; ISO 1990); pop music through headphones (Ising et al. 1994; Struwe et al. 1996; Passchier-Vermeer et al. 1998); music played by brass bands and symphony orchestras (van Hees 1992). The results are in agreement with values predicted by the ISO Standard 1999 method on the basis of adjusted time.

In the publications cited above, exposure to noise with known characteristics, such as duration and level, was related to hearing impairment. In addition to these publications, there is also an extensive literature showing hearing impairment in populations exposed to specific types of non-occupational noise, although these exposures are not well characterized. These noises originate from shooting, motorcycling, snowmobile driving, playing in arcades, listening to music at concerts and through headphones, using noisy toys, and fireworks (e.g. Brookhouser et al. 1992; see also Berglund & Lindvall 1995). Although the characteristics of these exposures are to a certain extent unknown, the details in the publications suggest that LAeq,24h values of these exposures exceed 70 dB.

In contrast, epidemiological studies failed to show hearing damage in populations exposed to an LAeq,24h of less than 70 dB (Lindemann et al. 1987). The data imply that even a lifetime exposure to environmental and leisure-time noise with an LAeq,24h <70 dBA would not cause hearing impairment in the large majority of people (over 95%). Overall, the results of many studies strongly suggest that the method from ISO Standard 1999 can also be used to estimate hearing impairment due to environmental and leisure-time noise, in addition to estimating the effects of occupational noise exposure.

Although the evidence suggests that the calculation method from ISO Standard 1999 (ISO 1990) should also be accepted for environmental and leisure time noise exposures, large-scale epidemiological studies of the general population do not exist to support this proposition. Taking into account the limitations of the studies, care should be taken with respect to the following aspects:

a. Data from animal experiments indicate that children may be more vulnerable in acquiring noise-induced hearing impairment than adults.

b. At very high instantaneous sound pressure levels, mechanical damage to the ear may occur (Hanner & Axelsson 1988). Occupational limits are set at peak sound pressure levels of 140 dB (EU 1986a). For adults exposed to environmental and leisure-time noise, this same limit is assumed to be valid. In the case of children, however, taking into account their habits while playing with noisy toys, peak sound pressure levels should never exceed 120 dB.

c. For shooting noise with LAeq,24h over 80 dB, studies on temporary threshold shift suggest the possibility of an increased risk for noise-induced hearing impairment (Smoorenburg 1998).

d. Risk for noise-induced hearing impairment may increase when the noise exposure is combined with exposure to vibrations, the use of ototoxic drugs, or some chemicals (Fechter 1999). In these circumstances, long-term exposure to LAeq,24h of 70 dBA may induce small hearing impairments.

e. It is uncertain whether the relationships between hearing impairment and noise exposure given in ISO Standard 1999 (ISO 1990) are applicable for environmental sounds of short rise time. For example, in the case of military low-altitude flying areas (75–300 m above ground) LAmax values of 110–130 dB occur within seconds after the onset of the sound.

Usually noise-induced hearing impairment is accompanied by an abnormal loudness perception which is known as loudness recruitment (*cf.* Berglund & Lindvall 1995). With a considerable loss of auditory sensitivity, some sounds may be perceived as distorted (paracusis). Another sensory effect that results from noise exposure is tinnitus (ringing in the ears). Commonly, tinnitus is referred to as sounds that are emitted by the inner ear itself (physiological tinnitus). Tinnitus is a common and often disturbing accompaniment of occupational hearing impairment (Vernon and Moller 1995) and has become a risk for teenagers attending pop concerts and discotheques (Hetu & Fortin 1995; Passchier-Vermeer et al. 1998; Axelsson & Prasher 1999). Noise-induced tinnitus may be temporary, lasting up to 24 hours after exposure, or may have a more permanent character, such as after prolonged occupational noise exposure. Sometimes tinnitus is due to the sound produced by the blood flow through structures in the ear.

The main social consequence of hearing impairment is an inability to understand speech in daily living conditions, which is considered a severe social handicap. Even small values of hearing impairment (10 dB averaged over 2 000 and 4 000 Hz, and over both ears) may have an effect on the understanding of speech. When the hearing impairment exceeds 30 dB (again averaged over 2 000 and 4 000 Hz and both ears) a social hearing handicap is noticeable (*cf.* Katz 1994; Berglund & Lindvall 1995).

In the past, hearing protection has mainly emphasized occupational noise exposures at high values of LAeq,8h, or situations with high impulsive sounds. The near-universal adoption of an LAeq,8h value of 85 dB (or lower) as the limit for unprotected occupational noise exposure, together with requirements for personal hearing protection, has made cases of severe unprotected exposures more rare. This is particularly true for developed countries. However, monitoring of compliance and enforcement action for sound pressure levels just over the limits may be weak, especially in non-industrial environments in developed countries (Franks 1998), as well as in occupational and urban environments in developing countries (Smith 1998). Nevertheless, regulations for occupational noise exposure exist almost worldwide and exposures to occupational noise are to a certain extent under control.

On the other hand, environmental noise exposures due to a number of noisy activities, especially those during leisure-time activities of children and young adults, have scarcely been regulated. Given both the increasing number of noisy activities and the increasing exposure duration, such as loud music in cars and the use of Walkmen and Discmen, regulatory activities in this field are to be encouraged. Dose-response data are lacking for the general population. However, judging from the limited data for study groups (teenagers, young adults and women), and the assumption that time of exposure can be equated with sound energy, the risk for hearing impairment would be negligible for LAeq,24h values of 70 dBA over a lifetime. To avoid hearing impairment, impulse noise exposures should never exceed 140 dB peak sound pressure in adults, and 120 dB peak sound pressure in children.

3.3. Interference with Speech Communication

Noise interference with speech comprehension results in a large number of personal disabilities, handicaps and behavioural changes. Problems with concentration, fatigue, uncertainty and lack of self-confidence, irritation, misunderstandings, decreased working capacity, problems in human relations, and a number of stress reactions have all been identified (Lazarus 1998). Particularly vulnerable to these types of effects are the hearing impaired, the elderly, children in the process of language and reading acquisition, and individuals who are not familiar with the spoken language (e.g., Lazarus 1998). Thus, vulnerable persons constitute a substantial proportion of a country's population.

Most of the acoustical energy of speech is in the frequency range 100–6 000 Hz, with the most important cue-bearing energy being between 300–3 000 Hz. Speech interference is basically a masking process in which simultaneous, interfering noise renders speech incapable of being understood. The higher the level of the masking noise, and the more energy it contains at the most important speech frequencies, the greater will be the percentage of speech sounds that become indiscernible to the listener. Environmental noise may also mask many other acoustical signals important for daily life, such as door bells, telephone signals, alarm clocks, fire alarms and other warning signals, and music (e.g., Edworthy & Adams 1996). The masking effect of interfering noise in speech discrimination is more pronounced for hearing-impaired persons than for persons with normal hearing, particularly if the interfering noise is composed of speech or babble.

As the sound pressure level of an interfering noise increases, people automatically raise their voice to overcome the masking effect upon speech (increase of vocal effort). This imposes an additional strain on the speaker. For example, in quiet surroundings, the speech level at 1 m distance averages 45–50 dBA, but is 30 dBA higher when shouting. However, even if the interfering noise is moderately loud, most of the sentences during ordinary conversation can still be understood fairly well. Nevertheless, the interpretation required for compensating the masking effect of the interfering sounds, and for comprehending what was said, imposes an additional strain on the listener. One contributing factor could be that speech spoken loudly is more difficult to understand than speech spoken softly, when compared at a constant speech-to-noise ratio (*cf.* Berglund & Lindvall 1995).

Speech levels vary between individuals because of factors such as gender and vocal effort. Moreover, outdoor speech levels decrease by about 6 dB for a doubling in the distance between talker and listener. Speech intelligibility in everyday living conditions is influenced by speech level, speech pronunciation, talker-to-listener distance, sound pressure levels, and to some extent other characteristics of interfering noise, as well as room characteristics (e.g. reverberation). Individual capabilities of the listener, such as hearing acuity and the level of attention of the listener, are also important for the intelligibility of speech. Speech communication is affected also by the reverberation characteristics of the room. For example, reverberation times greater than 1 s produce loss in speech discrimination. Longer reverberation times, especially when combined with high background interfering noise, make speech perception more difficult. Even in a quiet environment, a reverberation time below 0.6 s is desirable for adequate speech intelligibility by vulnerable groups. For example, for older hearing-handicapped persons, the optimal reverberation time for speech intelligibility is 0.3–0.5 s (Plomp 1986).

For complete sentence intelligibility in listeners with normal hearing, the signal-to-noise ratio (i.e. the difference between the speech level and the sound pressure level of the interfering noise) should be 15–18 dBA (Lazarus 1990). This implies that in smaller rooms, noise levels above 35 dBA interferes with the intelligibility of speech (Bradley 1985). Earlier recommendations suggested that sound pressure levels as high as 45 dBA would be acceptable (US EPA 1974). With raised voice (increased vocal effort) sentences may be 100% intelligible for noise levels of up to 55 dBA; and sentences spoken with straining vocal effort can be 100% intelligible with noise levels of about 65 dBA. For speech to be intelligible when listening to complicated messages (at school, listening to foreign languages, telephone conversation), it is recommended that the signal-to-noise ratio should be at least 15 dBA. Thus, with a speech level of 50 dBA, (at 1 m distance this level corresponds to a casual speech level of both women and men), the sound pressure level of interfering noise should not exceed 35 dBA. For vulnerable groups even lower background levels are needed. If it is not possible to meet the strictest criteria for vulnerable persons in sensitive situations (e.g. in classrooms), one should strive for as low background levels as possible.

3.4. Sleep Disturbance

Uninterrupted sleep is known to be a prerequisite for good physiological and mental functioning of healthy persons (Hobson 1989); sleep disturbance, on the other hand, is considered to be a major environmental noise effect. It is estimated that 80-90% of the reported cases of sleep disturbance in noisy environments are for reasons other than noise originating outdoors. For example, sanitary needs; indoor noises from other occupants; worries; illness; and climate (e.g. Reyner & Horne 1995). Our understanding of the impact of noise exposure on sleep stems mainly from experimental research in controlled environments. Field studies conducted with people in their normal living situations are scarce. Most of the more recent field research on sleep disturbance has been conducted for aircraft noise (Fidell et al. 1994 1995a,b 1998; Horne et al. 1994 1995; Maschke et al. 1995 1996; Ollerhead et al. 1992; Passchier-Vermeer 1999). Other field studies have examined the effects of road traffic and railway noise (Griefahn et al. 1996 1998).

The primary sleep disturbance effects are: difficulty in falling asleep (increased sleep latency time); awakenings; and alterations of sleep stages or depth, especially a reduction in the proportion of REM-sleep (REM = rapid eye movement) (Hobson 1989). Other primary physiological effects can also be induced by noise during sleep, including increased blood pressure; increased heart rate; increased finger pulse amplitude; vasoconstriction; changes in respiration; cardiac arrhythmia; and an increase in body movements (cf. Berglund & Lindvall 1995). For each of these physiological effects, both the noise threshold and the noise-response relationships may be different. Different noises may also have different information content and this also could affect physiological threshold and noise-response relationships (Edworthy 1998).

Exposure to night-time noise also induces secondary effects, or so-called after effects. These are effects that can be measured the day following the night-time exposure, while the individual is awake. The secondary effects include reduced perceived sleep quality; increased fatigue; depressed mood or well-being; and decreased performance (Öhrström 1993a; Passchier-Vermeer 1993; Carter 1996; Pearsons et al. 1995; Pearsons 1998).

Long-term effects on psychosocial well-being have also been related to noise exposure during the night (Öhrström 1991). Noise annoyance during the night-time increased the total noise annoyance expressed by people in the following 24 h. Various studies have also shown that people living in areas exposed to night-time noise have an increased use of sedatives or sleeping pills. Other frequently reported behavioural effects of night-time noise include closed bedroom windows and use of personal hearing protection. Sensitive groups include the elderly, shift workers, persons especially vulnerable to physical or mental disorders and other individuals with sleeping difficulties.

Questionnaire data indicate the importance of night-time noise on the perception of sleep quality. A recent Japanese investigation was conducted for 3 600 women (20–80 years old) living in eight roadside zones with different road traffic noise. The results showed that four measures of perceived sleep quality (difficulty in falling asleep; waking up during sleep; waking up too early; feelings of sleeplessness one or more days a week) correlated significantly with the average traffic volumes during night-time. An in-depth investigation of 19 insomnia cases and their matched controls (age,work) measured outdoor and indoor sound pressure levels during sleep (Kageyama et al. 1997). The study showed that road traffic noise in excess of 30 dB LAeq for nighttime induced sleep disturbance, consistent with the results of Öhrström (1993b).

Meta-analyses of field and laboratory studies have suggested that there is a relationship between the SEL for a single night-time noise event and the percentage of people awakened, or who showed sleep stage changes (e.g. Ollerhead et al. 1992; Passchier-Vermeer 1993; Finegold et al. 1994; Pearsons et al. 1995). All of these studies assumed that the number of awakenings per night for each SEL value is proportional to the number of night-time noise events. However, the results have been criticized for methodological reasons. For example, there were small groups of sleepers; too few original studies; and indoor exposure was estimated from outdoor sound pressure levels (NRC-CNRC 1994; Beersma & Altena 1995; Vallet 1998). The most important result of the meta-analyses is that there is a clear difference in the dose-response curves for laboratory and field studies, and that noise has a lower effect under real-life conditions (Pearsons et al. 1995; Pearsons 1998).

However, this result has been questioned, because the studies were not controlled for such things as the sound insulation of the buildings, and the number of bedrooms with closed windows. Also, only two indicators of sleep disturbance were considered (awakening and sleep stage changes). The meta-analyses thus neglected other important sleep disturbance effects (Öhrström 1993b; Carter et al. 1994a; Carter et al. 1994b; Carter 1996; Kuwano et al. 1998). For example, for road traffic noise, perceived sleep quality is related both to the time needed to fall asleep and the total sleep time (Öhrström & Björkman 1988). Individuals who are more sensitive to noise (as assessed by different questionnaires) report worse sleep quality both in field studies and in laboratory studies.

A further criticism of the meta-analyses is that laboratory experiments have shown that habituation to night-time noise events occurs, and that noise-induced awakening decreases with increasing number of sound exposures per night. This is in contrast to the assumption used in the meta-analyses, that the percentage of awakenings is linearly proportional to the number of night-time noise events. Studies have also shown that the frequency of noise-induced awakenings decreases for at least the first eight consecutive nights. So far, habituation has been shown for awakenings, but not for heart rate and after effects such as perceived sleep quality, mood and performance (Öhrström and Björkman 1988).

Other studies suggest that it is the difference in sound pressure levels between a noise event and background, rather than the absolute sound pressure level of the noise event, that determines the reaction probability. The time interval between two noise events also has an important influence of the probability of obtaining a response (Griefahn 1977; *cf.* Berglund & Lindvall 1995). Another possible factor is the person's age, with older persons having an increased probability of awakening. However, one field study showed that noise-induced awakenings are independent of age (Reyner & Horne 1995).

For a good sleep, it is believed that indoor sound pressure levels should not exceed approximately 45 dB LAmax more than 10–15 times per night (Vallet & Vernet 1991), and most studies show an increase in the percentage of awakenings at SEL values of 55–60 dBA (Passchier-Vermeer 1993; Finegold et al. 1994; Pearsons et al. 1995). For intermittent events that approximate aircraft noise, with an effective duration of 10–30 s, SEL values of 55–60 dBA correspond to a LAmax value of 45 dB. Ten to 15 of these events during an eight-hour night-time implies an LAeq,8h of 20–25 dB. This is 5–10 dB below the LAeq,8h of 30 dB for continuous night-time noise exposure, and shows that the intermittent character of noise has to be taken into account when setting night-time limits for noise exposure. For example, this can be achieved by considering the number of noise events and the difference between the maximum sound pressure level and the background level of these events.

Special attention should also be given to the following considerations:

a. Noise sources in an environment with a low background noise level. For example, night-traffic in suburban residential areas.

b. Environments where a combination of noise and vibrations are produced. For example, railway noise, heavy duty vehicles.

c. Sources with low-frequency components. Disturbances may occur even though the sound pressure level during exposure is below 30 dBA.

If negative effects on sleep are to be avoided the equivalent sound pressure level should not exceed 30 dBA indoors for continuous noise. If the noise is not continuous, sleep disturbance correlates best with LAmax and effects have been observed at 45 dB or less. This is particularly true if the background level is low. Noise events exceeding 45 dBA should therefore be limited if possible. For sensitive people an even lower limit would be preferred. It should be noted that it should be possible to sleep with a bedroom window slightly open (a reduction from outside to inside of 15 dB). To prevent sleep disturbances, one should thus consider the equivalent sound pressure level and the number and level of sound events. Mitigation targeted to the first part of the night is believed to be effective for the ability to fall asleep.

3.5. Cardiovascular and Physiological Effects

Epidemiological and laboratory studies involving workers exposed to occupational noise, and general populations (including children) living in noisy areas around airports, industries and noisy streets, indicate that noise may have both temporary and permanent impacts on physiological functions in humans. It has been postulated that noise acts as an environmental stressor (for a review see Passchier-Vermeer 1993; Berglund & Lindvall 1995). Acute noise exposures activate the autonomic and hormonal systems, leading to temporary changes such as increased blood pressure, increased heart rate and vasoconstriction. After prolonged exposure, susceptible individuals in the general population may develop permanent effects, such as hypertension and ischaemic heart disease associated with exposures to high sound pressure levels (for a review see Passchier-Vermeer 1993; Berglund & Lindvall 1995). The magnitude and duration of the effects are determined in part by individual characteristics, lifestyle behaviours and environmental conditions. Sounds also evoke reflex responses, particularly when they are unfamiliar and have a sudden onset.

Laboratory experiments and field quasi-experiments show that if noise exposure is temporary, the physiological system usually returns - after the exposure terminates - to a normal (pre-exposure) state within a time in the range of the exposure duration. If the exposure is of sufficient intensity and unpredictability, cardiovascular and hormonal responses may appear, including increases in heart rate and peripheral vascular resistance; changes in blood pressure, blood viscosity and blood lipids; and shifts in electrolyte balance (Mg/Ca) and hormonal levels (epinephrine, norepinephrine, cortisol). The first four effects are of interest because of noise-related coronary heart disease (Ising & Günther 1997). Laboratory and clinical data suggest that noise may significantly elevate gastrointestinal motility in humans.

By far the greatest number of occupational and community noise studies have focused on the possibility that noise may be a risk factor for cardiovascular disease. Many studies in occupational settings have indicated that workers exposed to high levels of industrial noise for 5–30 years have increased blood pressure and statistically significant increases in risk for hypertension, compared to workers in control areas (Passchier-Vermeer 1993). In contrast, only a few studies on environmental noise have shown that populations living in noisy areas around airports and on noisy streets have an increased risk for hypertension. The overall evidence suggests a weak association between long-term environmental noise exposure and hypertension (HCN 1994; Berglund & Lindvall 1995; IEH 1997), and no dose-response relationships could be established.

Recently, an updated summary of available studies for ischaemic heart disease has been presented (Babisch 1998a; Babisch 1998b; Babisch et al. 1999; see also Thompson 1996). The studies reviewed include case-control and cross-sectional designs, as well as three longitudinal studies. However, it has not yet been possible to conduct the most advanced quantitative integrated analysis of the available studies. Relative risks and their confidence intervals could be estimated only for the classes of high noise levels (mostly >65 dBA during daytime) and low levels (mostly <55 dBA during daytime), rather than a range of exposure levels. For methodological reasons identified in the meta-analysis, a cautious interpretation of the results is warranted (Lercher et al. 1998).

Prospective studies that controlled for confounding factors suggest an increase in ischaemic heart disease when the noise levels exceed 65–70 dB for LAeq (6–22). (For road traffic noise, the difference between LAeq (6-22h) and LAeq,24h usually is of the order of 1.5 dB). When orientation of the bedroom, window opening habits and years of exposure are taken into account, the risk of heart disease is slightly higher (Babisch et al. 1998; Babisch et al. 1999). However, disposition, behavioural and environmental factors were not sufficiently accounted for in the analyses carried out to date. In epidemiological studies the lowest level at which traffic noise had an effect on ischaemic heart disease was 70 dB for LAeq,24h (HCN 1994).

The overall conclusion is that cardiovascular effects are associated with long-term exposure to LAeq,24h values in the range of 65–70 dB or more, for both air- and road-traffic noise. However, the associations are weak and the effect is somewhat stronger for ischaemic heart disease than for hypertension. Nevertheless, such small risks are potentially important because a large number of persons are currently exposed to these noise levels, or are likely to be exposed in the future. Furthermore, only the average risk is considered and sensitive subgroups of the populations have not been sufficiently characterized. For example, a 10% increase in risk factors (a relative risk of 1.1) may imply an increase of up to 200 cases per 100 000 people at risk per year. Other observed psychophysiological effects, such as changes in stress hormones, magnesium levels, immunological indicators, and gastrointestinal disturbances are too inconsistent for conclusions to be drawn about the influence of noise pollution.

3.6. Mental Health Effects

Mental health is defined as the absence of identifiable psychiatric disorders according to current norms (Freeman 1984). Environmental noise is not believed to be a direct cause of mental illness, but it is assumed that it accelerates and intensifies the development of latent mental disorder. Studies on the adverse effects of environmental noise on mental health cover a variety of symptoms, including anxiety; emotional stress; nervous complaints; nausea; headaches; instability; argumentativeness; sexual impotency; changes in mood; increase in social conflicts, as well as general psychiatric disorders such as neurosis, psychosis and hysteria. Large-scale population studies have suggested associations between noise exposure and a variety of mental health indicators, such as single rating of well-being; standard psychological symptom profiles; the intake of psychotropic drugs; and consumption of tranquilizers and sleeping pills. Early studies showed a weak association between exposure to aircraft noise and psychiatric hospital admissions in the general population surrounding an airport (see also Berglund & Lindvall 1995). However, the studies have been criticized because of problems in selecting variables and in response bias (Halpern 1995).

Exposure to high levels of occupational noise has been associated with development of neurosis and irritability; and exposure to high levels of environmental noise with deteriorated mental health (Stansfeld 1992). However, the findings on environmental noise and mental health effects are inconclusive (HCN 1994; Berglund & Lindvall 1995; IEH 1997). The only longitudinal study in this field (Stansfeld et al. 1996) showed an association between the initial level of road traffic noise and minor psychiatric disorders, although the association for increased anxiety was weak and non-linear. It turned out that psychiatric disorders are associated with noise sensitivity,

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rather than with noise exposure, and the association was found to disappear after adjustment for baseline trait anxiety. These and other results show the importance of taking vulnerable groups into account, because they may not be able to cope sufficiently with unwanted environmental noise (e.g. Stansfeld 1992). This is particularly true of children, the elderly and people with preexisting illnesses, especially depression (IEH 1997). Despite the weaknesses of the various studies, the possibility that community noise has adverse effects on mental health is suggested by studies on the use of medical drugs, such as tranquilizers and sleeping pills, on psychiatric symptoms and on mental hospital admission rates.

3.7. The Effects of Noise on Performance

It has been documented in both laboratory subjects and in workers exposed to occupational noise, that noise adversely affects cognitive task performance. In children, too, environmental noise impairs a number of cognitive and motivational parameters (Cohen et al. 1980; Evans & Lepore 1993; Evans 1998; Hygge et al. 1998; Haines et al. 1998). However, there are no published studies on whether environmental noise at home also impairs cognitive performance in adults. Accidents may also be an indicator of performance deficits. The few field studies on the effects of noise on performance and safety showed that noise may produce some task impairment and increase the number of errors in work, but the effects depend on the type of noise and the task being performed (Smith 1990).

Laboratory and workplace studies showed that noise can act as a distracting stimulus. Also, impulsive noise events (e.g. sonic booms) may produce disruptive effects as a result of startle responses. In the short term, noise-induced arousal may produce better performance of simple tasks, but cognitive performance deteriorates substantially for more complex tasks (i.e. tasks that require sustained attention to details or to multiple cues; or tasks that demand a large capacity of working memory, such as complex analytical processes). Some of the effects are related to loss in auditory comprehension and language acquisition, but others are not (Evans & Maxwell 1997). Among the cognitive effects, reading, attention, problem solving and memory are most strongly affected by noise. The observed effects on motivation, as measured by persistence with a difficult cognitive task, may either be independent or secondary to the aforementioned cognitive impairments.

Two types of memory deficits have been identified under experimental noise exposure: incidental memory and memory for materials that the observer was not explicitly instructed to focus on during a learning phase. For example, when presenting semantic information to subjects in the presence of noise, recall of the information content was unaffected, but the subjects were significantly less able to recall, for example, in which corner of the slide a word had been located. There is also some evidence that the lack of "helping behavior" that was noted under experimental noise exposure may be related to inattention to incidental cues (Berglund & Lindvall 1995). Subjects appear to process information faster in working memory during noisy performance conditions, but at a cost of available memory capacity. For example, in a running memory task, in which subjects were required to recall in sequence letters that they had just heard, subjects recalled recent items better under noisy conditions, but made more errors farther back into the list.

Experimental noise exposure consistently produces negative after-effects on performance (Glass & Singer 1972). Following exposure to aircraft noise, schoolchildren in the vicinity of Los Angeles airport were found to be deficient in proofreading, and in persistence with challenging puzzles (Cohen et al. 1980). The uncontrollability of noise, rather than the intensity of the noise, appears to be the most critical variable. The only prospective study on noise-exposed schoolchildren, designed around the move of the Munich airport (Hygge et al. 1996; Evans et al. 1998), confirmed the results of laboratory and workplace studies in adults, as well the results of the Los Angeles airport study with children (Cohen et al. 1980). An important finding was that some of the adaptation strategies for dealing with aircraft noise, such as tuning out or ignoring the noise, and the effort necessary to maintain task performance, come at a price. There is heightened sympathetic arousal, as indicated by increased levels of stress hormone, and elevation of resting blood pressure (Evans et al. 1995; Evans et al. 1998). Notably, in the airport studies reported above, the adverse effects were larger in children with lower school achievement.

For aircraft noise, it has been shown that chronic exposure during early childhood appears to impair reading acquisition and reduces motivational capabilities. Of recent concern are concomitant psychophysiological changes (blood pressure and stress hormone levels). Evidence indicates that the longer the exposure, the greater the damage. It seems clear that daycare centers and schools should not be located near major sources of noise, such as highways, airports and industrial sites.

3.8. Effects of Noise on Residential Behaviour and Annoyance

Noise annoyance is a global phenomenon. A definition of annoyance is "a feeling of displeasure associated with any agent or condition, known or believed by an individual or group to adversely affect them" (Lindvall & Radford 1973; Koelega 1987). However, apart from "annoyance", people may feel a variety of negative emotions when exposed to community noise, and may report anger, disappointment, dissatisfaction, withdrawal, helplessness, depression, anxiety, distraction, agitation, or exhaustion (Job 1993; Fields et al. 1997 1998). Thus, although the term annoyance does not cover all the negative reactions, it is used for convenience in this document.

Noise can produce a number of social and behavioural effects in residents, besides annoyance (for review see Berglund & Lindvall 1995). The social and behavioural effects are often complex, subtle and indirect. Many of the effects are assumed to be the result of interactions with a number of non-auditory variables. Social and behavioural effects include changes in overt everyday behaviour patterns (e.g. closing windows, not using balconies, turning TV and radio to louder levels, writing petitions, complaining to authorities); adverse changes in social behaviour (e.g. aggression, unfriendliness, disengagement, non-participation); adverse changes in social indicators (e.g. residential mobility, hospital admissions, drug consumption, accident rates); and changes in mood (e.g. less happy, more depressed).

Although changes in social behaviour, such as a reduction in helpfulness and increased aggressiveness, are associated with noise exposure, noise exposure alone is not believed to be sufficient to produce aggression. However, in combination with provocation or pre-existing anger or hostility, it may trigger aggression. It has also been suspected that people are less willing to help, both during exposure and for a period after exposure. Fairly consistent evidence shows that noise above 80 dBA is associated with reduced helping behaviour and increased aggressive behaviour. Particularly, there is concern that high-level continuous noise exposures may contribute to the susceptibility of schoolchildren to feelings of helplessness (Evans & Lepore 1993)

The effects of community noise can be evaluated by assessing the extent of annoyance (low, moderate, high) among exposed individuals; or by assessing the disturbance of specific activities, such as reading, watching television and communication. The relationship between annoyance and activity disturbances is not necessarily direct and there are examples of situations where the extent of annoyance is low, despite a high level of activity disturbance. For aircraft noise, the most important effects are interference with rest, recreation and watching television. This is in contrast to road traffic noise, where sleep disturbance is the predominant effect (Berglund & Lindvall 1995).

A number of studies have shown that equal levels of traffic and industrial noises result in different magnitudes of annoyance (Hall et al. 1981; Griffiths 1983; Miedema 1993; Bradley 1994a; Miedema & Vos 1998). This has led to criticism (e.g. Kryter 1994; Bradley 1994a) of averaged dose-response curves determined by meta-analysis, which assumed that all traffic noises are the same (Fidell et al. 1991; Fields 1994a; Finegold et al. 1994). Schultz (1978) and Miedema & Vos (1998) have synthesized curves of annoyance associated with three types of traffic noise (road, air, railway). In these curves, the percentage of people highly or moderately annoyed was related to the day and night continuous equivalent sound level, L_{dn}. For each of the three types of traffic noise, the percentage of highly annoyed persons in a population started to increase at an L_{dn} value of 42 dBA, and the percentage of moderately annoyed persons at an L_{dn} value of 37 dBA (Miedema & Vos 1998). Aircraft noise produced a stronger annoyance response than road traffic, for the same L_{dn} exposure, consistent with earlier analyses (Kryter 1994; Bradley 1994a). However, caution should be exercised when interpreting synthesized data from different studies, since five major parameters should be randomly distributed for the analyses to be valid: personal, demographic, and lifestyle factors, as well as the duration of noise exposure and the population experience with noise (Kryter 1994).

Annoyance in populations exposed to environmental noise varies not only with the acoustical characteristics of the noise (source, exposure), but also with many non-acoustical factors of social, psychological, or economic nature (Fields 1993). These factors include fear associated with the noise source, conviction that the noise could be reduced by third parties, individual noise sensitivity, the degree to which an individual feels able to control the noise (coping strategies), and whether the noise originates from an important economic activity. Demographic variables such as age, sex and socioeconomic status, are less strongly associated with annoyance. The correlation between noise exposure and general annoyance is much higher at the group level than at the individual level, as might be expected. Data from 42 surveys showed that at the group level about 70% of the variance in annoyance is explained by noise exposure characteristics, whereas at the individual level it is typically about 20% (Job 1988).

When the type and amount of noise exposure is kept constant in the meta-analyses, differences between communities, regions and countries still exist (Fields 1990; Bradley 1996). This is well demonstrated by a comparison of the dose-response curve determined for road-traffic noise

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(Miedema & Vos 1998) and that obtained in a survey along the North-South transportation route through the Austrian Alps (Lercher 1998b). The differences may be explained in terms of the influence of topography and meteorological factors on acoustical measures, as well as the low background noise level on the mountain slopes.

Stronger reactions have been observed when noise is accompanied by vibrations and contains low frequency components (Paulsen & Kastka 1995; Öhrström 1997; for review see Berglund et al. 1996), or when the noise contains impulses, such as shooting noise (Buchta 1996; Vos 1996; Smoorenburg 1998). Stronger, but temporary, reactions also occur when noise exposure is increased over time, in comparison to situations with constant noise exposure (e.g. HCN 1997; Klæboe et al. 1998). Conversely, for road traffic noise, the introduction of noise protection barriers in residential areas resulted in smaller reductions in annoyance than expected for a stationary situation (Kastka et al. 1995).

To obtain an indicator for annoyance, other methods of combining parameters of noise exposure have been extensively tested, in addition to metrics such as LAeq,24h and L_{dn}. When used for a set of community noises, these indicators correlate well both among themselves and with LAeq,24h or L_{dn} values (e.g. HCN 1997). Although LAeq,24h and L_{dn} are in most cases acceptable approximations, there is a growing concern that all the component parameters of the noise should be individually assessed in noise exposure investigations, at least in the complex cases (Berglund & Lindvall 1995).

3.9. The Effects of Combined Noise Sources

Many acoustical environments consist of sounds from more than one source. For these environments, health effects are associated with the total noise exposure, rather than with the noise from a single source (WHO 1980b). When considering hearing impairment, for example, the total noise exposure can be expressed in terms of LAeq,24h for the combined sources. For other adverse health effects, however, such a simple model most likely will not apply. It is possible that some disturbances (e.g. speech interference, sleep disturbance) may more easily be attributed to specific noises. In cases where one noise source clearly dominates, the magnitude of an effect may be assessed by taking into account the dominant source only (HCN 1997). Furthermore, at a policy level, there may be little need to identify the adverse effect of each specific noise, unless the responsibility for these effects is to be shared among several polluters (*cf.* The Polluter Pays Principle in Chapter 5, UNCED 1992).

There is no consensus on a model for assessing the total annoyance due to a combination of environmental noise sources. This is partly due to a lack of research into the temporal patterns of combined noises. The current approach for assessing the effects of "mixed noise sources" is limited to data on "total annoyance" transformed to mathematical principles or rules of thumb (Ronnebaum et al. 1996; Vos 1992; Miedema 1996; Berglund & Nilsson 1997). Models to assess the total annoyance of combinations of environmental noises may not be applicable to those health effects for which the mechanisms of noise interaction are unknown, and for which different cumulative or synergistic effects cannot be ruled out. When noise is combined with different types of environmental agents, such as vibrations, ototoxic chemicals, or chemical odours, again there is insufficient knowledge to accurately assess the combined effects on health

(Berglund & Lindvall 1995; HCN 1994; Miedema 1996; Zeichart 1998; Passchier-Vermeer & Zeichart 1998). Therefore, caution should be exercised when trying to predict the adverse health effects of combined factors in residential populations.

The evidence on low-frequency noise is sufficiently strong to warrant immediate concern. Various industrial sources emit continuous low-frequency noise (compressors, pumps, diesel engines, fans, public works); and large aircraft, heavy-duty vehicles and railway traffic produce intermittent low-frequency noise. Low-frequency noise may also produce vibrations and rattles as secondary effects. Health effects due to low-frequency components in noise are estimated to be more severe than for community noises in general (Berglund et al. 1996). Since A-weighting underestimates the sound pressure level of noise with low-frequency components, a better assessment of health effects would be to use C-weighting.

In residential populations heavy noise pollution will most certainly be associated with a combination of health effects. For example, cardiovascular disease, annoyance, speech interference at work and at home, and sleep disturbance. Therefore, it is important that the total adverse health load over 24 hours be considered and that the precautionary principle for sustainable development is applied in the management of health effects (see Chapter 5).

3.10. Vulnerable Groups

Protective standards are essentially derived from observations on the health effects of noise on "normal" or "average" populations. The participants of these investigations are selected from the general population and are usually adults. Sometimes, samples of participants are selected because of their easy availability. However, vulnerable groups of people are typically underrepresented. This group includes people with decreased personal abilities (old, ill, or depressed people); people with particular diseases or medical problems; people dealing with complex cognitive tasks, such as reading acquisition; people who are blind or who have hearing impairment; fetuses, babies and young children; and the elderly in general (Jansen 1987; AAP 1997). These people may be less able to cope with the impacts of noise exposure and be at greater risk for harmful effects.

Persons with impaired hearing are the most adversely affected with respect to speech intelligibility. Even slight hearing impairments in the high-frequency range may cause problems with speech perception in a noisy environment. From about 40 years of age, people typically demonstrate an impaired ability to understand difficult, spoken messages with low linguistic redundancy. Therefore, based on interference with speech perception, a majority of the population belongs to the vulnerable group.

Children have also been identified as vulnerable to noise exposure (see Agenda 21: UNCED 1992). The evidence on noise pollution and children's health is strong enough to warrant monitoring programmes at schools and preschools to protect children from the effects of noise. Follow up programmes to study the main health effects of noise on children, including effects on speech perception and reading acquisition, are also warranted in heavily noise polluted areas (Cohen et al. 1986; Evans et al. 1998).

The issue of vulnerable subgroups in the general population should thus be considered when developing regulations or recommendations for the management of community noise. This consideration should take into account the types of effects (communication, recreation, annoyance, etc.), specific environments (*in utero*, incubator, home, school, workplace, public institutions, etc.) and specific lifestyles (listening to loud music through headphones, or at discotheques and festivals; motor cycling, etc.).

4. Guideline Values

4.1. Introduction

The human ear and lower auditory system continuously receive stimuli from the world around us. However, this does not mean that all the acoustical inputs are necessarily disturbing or have harmful effects. This is because the auditory nerve provides activating impulses to the brain that enable us to regulate the vigilance and wakefulness necessary for optimal performance. On the other hand, there are scientific reports that a completely silent world can have harmful effects, because of sensory deprivation. Thus, both too little sound and too much sound can be harmful. For this reason, people should have the right to decide for themselves the quality of the acoustical environment they live in.

Exposure to noise from various sources is most commonly expressed as the average sound pressure level over a specific time period, such as 24 hours. This means that identical average sound levels for a given time period could be derived from either a large number of sound events with relatively low, almost inaudible levels, or from a few events with high sound levels. This technical concept does not fully agree with common experience on how environmental noise is experienced, or with the neurophysiological characteristics of the human receptor system.

Human perception of the environment through vision, hearing, touch, smell and taste is characterized by a good discrimination of stimulus intensity differences, and by a decaying response to a continuous stimulus (adaptation or habituation). Single sound events cannot be discriminated if the interval between events drops below a threshold value; if this occurs, the sound is interpreted as continuous. These characteristics are linked to survival, since new and different stimuli with low probability and high information value indicate warnings. Thus, when assessing the effects of environmental noise on people it is relevant to consider the importance of the background noise level, the number of events, and the noise exposure level independently.

Community noise studies have traditionally considered noise annoyance from single specific sources such as aircraft, road traffic or railways. In recent years, efforts have been made to compare the results from road traffic, aircraft and railway surveys. Data from a number of sources show that aircraft noise is more annoying than road traffic noise, which, in turn, is more annoying than railway noise. However, there is not a clear understanding of the mechanisms that create these differences. Some populations may also be at greater risk for the harmful effects of noise. Young children (especially during language acquisition), the blind, and perhaps fetuses are examples of such populations. There are no definite conclusions on this topic, but the reader should be alerted that guidelines in this report are developed for the population at large; guidelines for potentially more vulnerable groups are addressed only to a limited extent.

In the following, guideline values are summarized with regard to specific environments and effects. For each environment and situation, the guideline values take into consideration the identified health effects and are set, based on the lowest levels of noise that affect health (critical health effect). Guideline values typically correspond to the lowest effect level for general populations, such as those for indoor speech intelligibility. By contrast, guideline values for annoyance have been set at 50 or 55 dBA, representing daytime levels below which a majority of the adult population will be protected from becoming moderately or seriously annoyed, respectively.

In these *Guidelines for Community Noise* only guideline values are presented. These are essentially values for the onset of health effects from noise exposure. It would have been preferred to establish guidelines for exposure-response relationships. Such relationships would indicate the effects to be expected if standards were set above the WHO guideline values and would facilitate the setting of standards for sound pressure levels (noise immission standards). However, exposure-response relationships could not be established as the scientific literature is very limited. The best-studied exposure-response relationship is that between L_{dn} and annoyance (WHO 1995a; Berglund & Lindvall 1995; Miedema & Vos 1998). Even the most recent relationships between integrated noise levels and the percentage of highly or moderately annoyed people are still being scrutinized. The results of a forthcoming meta-analysis are expected to be published in the near future (Miedema, personal communication).

4.2. Specific Effects

4.2.1. Interference with communication

Noise tends to interfere with auditory communication, in which speech is a most important signal. However, it is also vital to be able to hear alarming and informative signals such as door bells, telephone signals, alarm clocks, fire alarms etc., as well as sounds and signals involved in occupational tasks. The effects of noise on speech discrimination have been studied extensively and deal with this problem in lexical terms (mostly words but also sentences). For communication distances beyond a few metres, speech interference starts at sound pressure levels below 50 dB for octave bands centered on the main speech frequencies at 500, 1 000 and 2 000 Hz. It is usually possible to express the relationship between noise levels and speech intelligibility in a single diagram, based on the following assumptions and empirical observations, and for speaker-to-listener distance of about 1 m:

a. Speech in relaxed conversation is 100% intelligible in background noise levels of about 35 dBA, and can be understood fairly well in background levels of 45 dBA.

b. Speech with more vocal effort can be understood when the background sound pressure level is about 65 dBA.

A majority of the population belongs to groups sensitive to interference with speech perception. Most sensitive are the elderly and persons with impaired hearing. Even slight hearing impairments in the high-frequency range may cause problems with speech perception in a noisy environment. From about 40 years of age, people demonstrate impaired ability to interpret difficult, spoken messages with low linguistic redundancy, when compared to people aged 20–30 years. It has also been shown that children, before language acquisition has been completed, have more adverse effects than young adults to high noise levels and long reverberation times.

For speech outdoors and for moderate distances, the sound level drops by approximately 6 dB for a doubling of the distance between speaker and listener. This relationship is also applicable to indoor conditions, but only up to a distance of about 2 m. Speech communication is affected also by the reverberation characteristics of the room, and reverberation times beyond 1 s can produce a loss in speech discrimination. A longer reverberation time combined with background noise makes speech perception still more difficult.

Speech signal perception is of paramount importance, for example, in classrooms or conference rooms. To ensure any speech communication, the signal-to-noise relationship should exceed zero dB. But when listening to complicated messages (at school, listening to foreign languages, telephone conversation) the signal-to-noise ratio should be at least 15 dB. With a voice level of 50 dBA (at 1 m distance this corresponds on average to a casual voice level in both women and men), the background level should not exceed 35 dBA. This means that in classrooms, for example, one should strive for as low background levels as possible. This is particularly true when listeners with impaired hearing are involved, for example, in homes for the elderly. Reverberation times below 1 s are necessary for good speech intelligibility in smaller rooms; and even in a quiet environment a reverberation time below 0.6 s is desirable for adequate speech intelligibility for sensitive groups.

4.2.2. Noise-induced hearing impairment

The ISO Standard 1999 (ISO 1990) gives a method of calculating noise-induced hearing impairment in populations exposed to all types of occupational noise (continuous, intermittent, impulse). However, noise-induced hearing impairment is by no means restricted to occupational situations alone. High noise levels can also occur in open-air concerts, discotheques, motor sports, shooting ranges, and from loudspeakers or other leisure activities in dwellings. Other loud noise sources, such as music played back in headphones and impulse noise from toys and fireworks, are also important. Evidence strongly suggests that the calculation method from ISO Standard 1999 for occupational noise (ISO 1990) should also be used for environmental and leisure time noise exposures. This implies that long term exposure to LAeq,24h of up to 70 dBA will not result in hearing impairment. However, given the limitations of the various underlying studies, care should be taken with respect to the following:

a. Data from animal experiments indicate that children may be more vulnerable in acquiring noise-induced hearing impairment than adults.

b. At very high instantaneous sound pressure levels mechanical damage to the ear may occur (Hanner & Axelsson 1988). Occupational limits are set at peak sound pressure levels of 140 dBA (EU 1986a). For adults, this same limit is assumed to be in order for exposure to environmental and leisure time noise. In the case of children, however, considering their habits while playing with noisy toys, peak sound pressure levels should never exceed 120 dBA.

c. For shooting noise with LAeq,24h over 80 dB, studies on temporary threshold shift suggest there is the possibility of an increased risk for noise-induced hearing impairment (Smoorenburg 1998).

d. The risk for noise-induced hearing impairment increases when noise exposure is combined with vibrations, ototoxic drugs or chemicals (Fechter 1999). In these circumstances, long-term exposure to LAeq,24h of 70 dB may induce small hearing impairments.

e. It is uncertain whether the relationships in ISO Standard 1999 (ISO 1990) are applicable to environmental sounds having a short rise time. For example, in the case of military low-altitude flying areas (75–300 m above ground) LAmax values of 110–130 dB occur within seconds after onset of the sound.

In conclusion, dose-response data are lacking for the general population. However, judging from the limited data for study groups (teenagers, young adults and women), and on the assumption that time of exposure can be equated with sound energy, the risk for hearing impairment would be negligible for LAeq,24h values of 70 dB over a lifetime. To avoid hearing impairment, impulse noise exposures should never exceed a peak sound pressure of 140 dB peak in adults, and 120 dB in children.

4.2.3. Sleep disturbance effects

Electrophysiological and behavioral methods have demonstrated that both continuous and intermittent noise indoors lead to sleep disturbance. The more intense the background noise, the more disturbing is its effect on sleep. Measurable effects on sleep start at background noise levels of about 30 dB LAeq. Physiological effects include changes in the pattern of sleep stages, especially a reduction in the proportion of REM sleep. Subjective effects have also been identified, such as difficulty in falling asleep, perceived sleep quality, and adverse after-effects such as headache and tiredness. Sensitive groups mainly include elderly persons, shift workers and persons with physical or mental disorders.
Where noise is continuous, the equivalent sound pressure level should not exceed 30 dBA indoors, if negative effects on sleep are to be avoided. When the noise is composed of a large proportion of low-frequency sounds a still lower guideline value is recommended, because low-frequency noise (e.g. from ventilation systems) can disturb rest and sleep even at low sound pressure levels. It should be noted that the adverse effect of noise partly depends on the nature of the source. A special situation is for newborns in incubators, for which the noise can cause sleep disturbance and other health effects.

If the noise is not continuous, LAmax or SEL are used to indicate the probability of noise-induced awakenings. Effects have been observed at individual LAmax exposures of 45 dB or less. Consequently, it is important to limit the number of noise events with a LAmax exceeding 45 dB. Therefore, the guidelines should be based on a combination of values of 30 dB LAeq,8h and 45 dB LAmax. To protect sensitive persons, a still lower guideline value would be preferred when the background level is low. Sleep disturbance from intermittent noise events increases with the maximum noise level. Even if the total equivalent noise level is fairly low, a small

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number of noise events with a high maximum sound pressure level will affect sleep.

Therefore, to avoid sleep disturbance, guidelines for community noise should be expressed in terms of equivalent sound pressure levels, as well as LAmax/SEL and the number of noise events. Measures reducing disturbance during the first part of the night are believed to be the most effective for reducing problems in falling asleep.

4.2.4. Cardiovascular and psychophysiological effects

Epidemiologial studies show that cardiovascular effects occur after long-term exposure to noise (aircraft and road traffic) with LAeq,24h values of 65–70 dB. However, the associations are weak. The association is somewhat stronger for ischaemic heart disease than for hypertension. Such small risks are important, however, because a large number of persons are currently exposed to these noise levels, or are likely to be exposed in the future. Other possible effects, such as changes in stress hormone levels and blood magnesium levels, and changes in the immune system and gastro-intestinal tract, are too inconsistent to draw conclusions. Thus, more research is required to estimate the long-term cardiovascular and psychophysiological risks due to noise. In view of the equivocal findings, no guideline values can be given.

4.2.5. Mental health effects

Studies that have examined the effects of noise on mental health are inconclusive and no guideline values can be given. However, in noisy areas, it has been observed that there is an increased use of prescription drugs such as tranquilizers and sleeping pills, and an increased frequency of psychiatric symptoms and mental hospital admissions. This strongly suggests that adverse mental health effects are associated with community noise.

4.2.6. Effects on performance

The effects of noise on task performance have mainly been studied in the laboratory and to some extent in work situations. But there have been few, if any, detailed studies on the effects of noise on human productivity in community situations. It is evident that when a task involves auditory signals of any kind, noise at an intensity sufficient to mask or interfere with the perception of these signals will also interfere with the performance of the task. A novel event, such as the start of an unfamiliar noise, will also cause distraction and interfere with many kinds of tasks. For example, impulsive noises such as sonic booms can produce disruptive effects as the result of startle responses; and these types of responses are more resistant to habituation.

Mental activities involving high load in working memory, such as sustained attention to multiple cues or complex analysis, are all directly sensitive to noise and performance suffers as a result. Some accidents may also be indicators of noise-related effects on performance. In addition to the direct effects on performance, noise also has consistent after-effects on cognitive performance with tasks such as proof-reading, and on persistence with challenging puzzles. In contrast, the performance of tasks involving either motor or monotonous activities is not always degraded by noise.

Chronic exposure to aircraft noise during early childhood appears to damage reading acquisition. Evidence indicates that the longer the exposure, the greater the damage. Although there is insufficient information on these effects to set specific guideline values, it is clear that day-care centres and schools should not be located near major noise sources, such as highways, airports and industrial sites.

4.2.7. Annoyance responses

The capacity of a noise to induce annoyance depends upon many of its physical characteristics, including its sound pressure level and spectral characteristics, as well as the variations of these properties over time. However, annoyance reactions are sensitive to many non-acoustical factors of social, psychological or economic nature, and there are also considerable differences in individual reactions to the same noise. Dose-response relations for different types of traffic noise (air, road and railway) clearly demonstrate that these noises can cause different annoyance effects at equal LAeq,24h values. And the same type of noise, such as that found in residential areas around airports, can also produce different annoyance responses in different countries.

The annoyance response to noise is affected by several factors, including the equivalent sound pressure level and the highest sound pressure level of the noise, the number of such events, and the time of day. Methods for combining these effects have been extensively studied. The results are not inconsistent with the simple, physically based equivalent energy theory, which is represented by the LAeq noise index.

Annoyance to community noise varies with the type of activity producing the noise. Speech communication, relaxation, listening to radio and TV are all examples of noise-producing activities. During the daytime, few people are seriously annoyed by activities with LAeq levels below 55 dB; or moderately annoyed with LAeq levels below 50 dB. Sound pressure levels during the evening and night should be 5–10 dB lower than during the day. Noise with low-frequency components require even lower levels. It is emphasized that for intermittent noise it is necessary to take into account the maximum sound pressure level as well as the number of noise events. Guidelines or noise abatement measures should also take into account residential outdoor activities.

4.2.8. Effects on social behaviour

The effects of environmental noise may be evaluated by assessing the extent to which it interferes with different activities. For many community noises, interference with rest, recreation and watching television seem to be the most important issues. However, there is evidence that noise has other effects on social behaviour: helping behaviour is reduced by noise in excess of 80 dBA; and loud noise increases aggressive behavior in individuals predisposed to aggressiveness. There is concern that schoolchildren exposed to high levels of chronic noise could be more susceptible to helplessness. Guidelines on these issues must await further research.

4.3. Specific Environments

Noise measures based solely on LAeq values do not adequately characterize most noise environments and do not adequately assess the health impacts of noise on human well-being. It is also important to measure the maximum noise level and the number of noise events when deriving guideline values. If the noise includes a large proportion of low-frequency components, values even lower than the guideline values will be needed, because low-frequency components in noise may increase the adverse effects considerably. When prominent low-frequency components are present, measures based on A-weighting are inappropriate. However, the difference between dBC (or dBlin) and dBA will give crude information about the presence of low-frequency components in noise. If the difference is more than 10 dB, it is recommended that a frequency analysis of the noise be performed.

4.3.1. Dwellings

In dwellings, the critical effects of noise are on sleep, annoyance and speech interference. To avoid sleep disturbance, indoor guideline values for bedrooms are 30 dB LAeq for continuous noise and 45 dB LAmax for single sound events. Lower levels may be annoying, depending on the nature of the noise source. The maximum sound pressure level should be measured with the instrument set at "*Fast*".

To protect the majority of people from being seriously annoyed during the daytime, the sound pressure level on balconies, terraces and outdoor living areas should not exceed 55 dB LAeq for a steady, continuous noise. To protect the majority of people from being moderately annoyed during the daytime, the outdoor sound pressure level should not exceed 50 dB LAeq. These values are based on annoyance studies, but most countries in Europe have adopted 40 dB LAeq as the maximum allowable level for new developments (Gottlob 1995). Indeed, the lower value should be considered the maximum allowable sound pressure level for all new developments whenever feasible.

At night, sound pressure levels at the outside façades of the living spaces should not exceed 45 dB LAeq and 60 dB LAmax, so that people may sleep with bedroom windows open. These values have been obtained by assuming that the noise reduction from outside to inside with the window partly open is 15 dB.

4.3.2. Schools and preschools

For schools, the critical effects of noise are on speech interference, disturbance of information extraction (e.g. comprehension and reading acquisition), message communication and annoyance. To be able to hear and understand spoken messages in classrooms, the background sound pressure level should not exceed 35 dB LAeq during teaching sessions. For hearing impaired children, an even lower sound pressure level may be needed. The reverberation time in the classroom should be about 0.6 s, and preferably lower for hearing-impaired children. For assembly halls and cafeterias in school buildings, the reverberation time should be less than 1 s. For outdoor playgrounds, the sound pressure level of the noise from external sources should not exceed 55 dB LAeq, the same value given for outdoor residential areas in daytime.

For preschools, the same critical effects and guideline values apply as for schools. In bedrooms in preschools during sleeping hours, the guideline values for bedrooms in dwellings should be used.

4.3.3. Hospitals

For most spaces in hospitals, the critical effects of noise are on sleep disturbance, annoyance and communication interference, including interference with warning signals. The LAmax of sound events during the night should not exceed 40 dB indoors. For wardrooms in hospitals, the guideline values indoors are 30 dB LAeq, together with 40 dB LAmax during the night. During the day and evening the guideline value indoors is 30 dB LAeq. The maximum level should be measured with the instrument set at "*Fast*".

Since patients have less ability to cope with stress, the equivalent sound pressure level should not exceed 35 dB LAeq in most rooms in which patients are being treated or observed. Particular attention should be given to the sound pressure levels in intensive care units and operating theatres. Sound inside incubators may result in health problems, including sleep disturbance, and may lead to hearing impairment in neonates. Guideline values for sound pressure levels in incubators must await future research.

4.3.4. Ceremonies, festivals and entertainment events

In many countries, there are regular ceremonies, festivals and other entertainment to celebrate life events. Such events typically produce loud sounds including music and impulsive sounds. There is widespread concern about the effect of loud music and impulse sounds on young people who frequently attend concerts, discotheques, video arcades, cinemas, amusement parks and spectator events, etc. The sound pressure level is typically in excess of 100 dB LAeq. Such a noise exposure could lead to significant hearing impairment after frequent attendance.

Noise exposure for employees of these venues should be controlled by established occupational standards. As a minimum, the same standards should apply to the patrons of these premises. Patrons should not be exposed to sound pressure levels greater than 100 dB LAeq during a 4-h period, for at most four times per year. To avoid acute hearing impairment the LAmax should always be below 110 dB.

4.3.5. Sounds through headphones

To avoid hearing impairment in both adults and children from music and other sounds played back in headphones, the LAeq,24h should not exceed 70 dB. This implies that for a daily one-hour exposure the LAeq should not exceed 85 dB. The exposures are expressed in free-field equivalent sound pressure levels. To avoid acute hearing impairment, the LAmax should always be below 110 dB.

4.3.6. Impulsive sounds from toys, fireworks and firearms

To avoid acute mechanical damage to the inner ear, adults should never be exposed to more than 140 dB peak sound pressure. To account for the vulnerability in children, the peak sound pressure level produced by toys should not surpass 120 dB, measured close to the ears (100 mm). To avoid acute hearing impairment, LAmax should always be below 110 dB.

4.3.7. Parkland and conservation areas

Existing large quiet outdoor areas should be preserved and the signal-to-noise ratio kept low.

4.4. WHO Guideline Values

The WHO guideline values in Table 4.1 are organized according to specific environments. When multiple adverse health effects are identified for a given environment, the guideline values are set at the level of the lowest adverse health effect (the critical health effect). An adverse health effect of noise refers to any temporary or long-term deterioration in physical, psychological or social functioning that is associated with noise exposure. The guideline values represent the sound pressure levels that affect the most exposed receiver in the listed environment.

The time base for LAeq for "daytime" and "night-time" is 16 h and 8 h, respectively. No separate time base is given for evenings alone, but typically, guideline value should be 5 –10 dB lower than for a 12 h daytime period. Other time bases are recommended for schools, preschools and playgrounds, depending on activity.

The available knowledge of the adverse effects of noise on health is sufficient to propose guideline values for community noise for the following:

a. Annoyance.
b. Speech intelligibility and communication interference.
c. Disturbance of information extraction.
d. Sleep disturbance.
e. Hearing impairment.

The different critical health effects are relevant to specific environments, and guideline values for community noise are proposed for each environment. These are:

a. Dwellings, including bedrooms and outdoor living areas.
b. Schools and preschools, including rooms for sleeping and outdoor playgrounds.
c. Hospitals, including ward and treatment rooms.
d. Industrial, commercial shopping and traffic areas, including public addresses, indoors and outdoors.
e. Ceremonies, festivals and entertainment events, indoors and outdoors.
f. Music and other sounds through headphones.
g. Impulse sounds from toys, fireworks and firearms.

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h. Outdoors in parkland and conservation areas.

It is not enough to characterize the noise environment in terms of noise measures or indices based only on energy summation (e.g. LAeq), because different critical health effects require different descriptions. Therefore, it is important to display the maximum values of the noise fluctuations, preferably combined with a measure of the number of noise events. A separate characterization of noise exposures during night-time would be required. For indoor environments, reverberation time is also an important factor. If the noise includes a large proportion of low frequency components, still lower guideline values should be applied.

Supplementary to the guideline values given in Table 4.1, precautionary recommendations are given in Section 4.2 and 4.3 for vulnerable groups, and for noise of a certain character (e.g. low-frequency components, low background noise), respectively. In Section 3.10, information is given regarding which critical effects and specific environments are considered relevant for vulnerable groups, and what precautionary noise protection would be needed in comparison to the general population.

Table 4.1: Guideline values for community noise in specific environments.

Specific environment	Critical health effect(s)	LAeq [dB]	Time base [hours]	LAmax, fast [dB]
Outdoor living area	Serious annoyance, daytime and evening Moderate annoyance, daytime and evening	55 50	16 16	- -
Dwelling, indoors Inside bedrooms	Speech intelligibility and moderate annoyance, daytime and evening Sleep disturbance, night-time	35 30	16 8	 45
Outside bedrooms	Sleep disturbance, window open (outdoor values)	45	8	60
School class rooms and pre-schools, indoors	Speech intelligibility, disturbance of information extraction, message communication	35	during class	-
Pre-school bedrooms, indoors	Sleep disturbance	30	sleeping -time	45
School, playground outdoor	Annoyance (external source)	55	during play	-
Hospital, ward rooms, indoors	Sleep disturbance, night-time Sleep disturbance, daytime and evenings	30 30	8 16	40 -
Hospitals, treatment rooms, indoors	Interference with rest and recovery	#1		
Industrial, commercial shopping and traffic areas, indoors and outdoors	Hearing impairment	70	24	110
Ceremonies, festivals and entertainment events	Hearing impairment (patrons:<5 times/year)	100	4	110
Public addresses, indoors and outdoors	Hearing impairment	85	1	110
Music through headphones/ earphones	Hearing impairment (free-field value)	85 #4	1	110
Impulse sounds from toys, fireworks and firearms	Hearing impairment (adults) Hearing impairment (children)	- -	- -	140 #2 120 #2
Outdoors in parkland and conservation areas	Disruption of tranquillity	#3		

#1: as low as possible;
#2: peak sound pressure (not LAmax, fast), measured 100 mm from the ear;
#3: existing quiet outdoor areas should be preserved and the ratio of intruding noise to natural background sound should be kept low;
#4: under headphones, adapted to free-field values

ATTACHMENT 4

CRITERIA FOR A RECOMMENDED STANDARD

Occupational Noise Exposure

Revised Criteria 1998

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Centers for Disease Control and Prevention
National Institute for Occupational Safety and Health
Cincinnati, Ohio

June 1998

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DHHS (NIOSH) Publication No. 98–126

NIOSH recommends an improved criterion for significant threshold shift: an increase of 15 dB in the hearing threshold level (HTL) at 500, 1000, 2000, 3000, 4000, or 6000 Hz in either ear, as determined by two consecutive audiometric tests. The new criterion has the advantages of a high identification rate and a low false-positive rate. In comparison, the criterion NIOSH recommended in 1972 has a high false-positive rate, and the OSHA criterion (called the standard threshold shift) has a relatively low identification rate.

In contrast with the 1972 criterion, the new NIOSH criterion no longer recommends age correction on individual audiograms. This practice is not scientifically valid and would delay intervention to prevent further hearing losses in workers whose HTLs have increased because of occupational noise exposure. OSHA currently allows age correction only as an option.

The noise reduction rating (NRR) is a single-number, laboratory-derived rating that the U.S. Environmental Protection Agency (EPA) requires to be shown on the label of each hearing protector sold in the United States. In calculating the noise exposure to the wearer of a hearing protector at work, OSHA derates the NRR by one-half for all types of hearing protectors. In 1972, NIOSH recommended the use of the full NRR value; however, in this document, NIOSH recommends derating by subtracting from the NRR 25%, 50%, and 70% for earmuffs, formable earplugs, and all other earplugs, respectively. This variable derating scheme, as opposed to OSHA's straight derating scheme, considers the performances of different types of hearing protectors.

This document also provides recommendations for the management of hearing loss prevention programs (HLPPs) for workers whose noise exposures equal or exceed 85 dBA. The recommendations include program evaluation, which was not articulated in the 1972 criteria document and is not included in the OSHA and MSHA standards.

Adherence to the revised recommended noise standard will minimize the risk of developing occupational NIHL.

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ABSTRACT

This criteria document reevaluates and reaffirms the recommended exposure limit (REL) for occupational noise exposure established by the National Institute for Occupational Safety and Health (NIOSH) in 1972. The REL is 85 decibels, A-weighted, as an 8-hr time-weighted average (85 dBA as an 8-hr TWA). Exposures at or above this level are hazardous.

By incorporating the 4000-Hz audiometric frequency into the definition of hearing impairment in the risk assessment, NIOSH has found an 8% excess risk of developing occupational noise-induced hearing loss (NIHL) during a 40-year lifetime exposure at the 85-dBA REL. NIOSH has also found that scientific evidence supports the use of a 3-dB exchange rate for the calculation of TWA exposures to noise.

The recommendations in this document go beyond attempts to conserve hearing by focusing on prevention of occupational NIHL. For workers whose noise exposures equal or exceed 85 dBA, NIOSH recommends a hearing loss prevention program (HLPP) that includes exposure assessment, engineering and administrative controls, proper use of hearing protectors, audiometric evaluation, education and motivation, recordkeeping, and program audits and evaluations.

Audiometric evaluation is an important component of an HLPP. To provide early identification of workers with increasing hearing loss, NIOSH has revised the criterion for significant threshold shift to an increase of 15 dB in the hearing threshold level (HTL) at 500, 1000, 2000, 3000, 4000, or 6000 Hz in either ear, as determined by two consecutive tests. To permit timely intervention and prevent further hearing losses in workers whose HTLs have increased because of occupational noise exposure, NIOSH no longer recommends age correction on individual audiograms.

CHAPTER 3

Basis for the Exposure Standard

3.1 Quantitative Risk Assessment

The selection of an exposure limit depends on the definitions of two parameters: (1) the maximum acceptable occupational hearing loss (i.e., the fence) and (2) the percentage of the occupational noise-exposed population for which the maximum acceptable occupational hearing loss will be tolerated. The fence is often defined as the average HTL for two, three, or four audiometric frequencies. It separates the maximum acceptable hearing loss from smaller degrees of hearing loss and normal hearing. Excess risk is the difference between the percentage that exceeds the fence in an occupational-noise-exposed population and the percentage that exceeds it in an unexposed population. Mathematical models are used to describe the relationship between excess risk and various factors such as average daily noise exposure, duration of exposure, and age group.

The most common protection goal is the preservation of hearing for speech discrimination. Using this protection goal, NIOSH [1972] employed the term "hearing impairment" to define its criteria for maximum acceptable hearing loss; and OSHA later used the slightly modified term "material hearing impairment" to define the same criteria [46 Fed. Reg. 4078 (1981a)]. In this context, a worker was considered to have a material hearing impairment when his or her average HTLs for *both* ears exceeded 25 dB at the audiometric frequencies of 1000, 2000, and 3000 Hz (denoted here as the "1-2-3-kHz definition").

3.1.1 NIOSH Risk Assessment in 1972

NIOSH [1972] assessed the *excess* risk of material hearing impairment as a function of levels and durations (e.g., 40-year working lifetime) of occupational noise exposure. Thus, for a 40-year lifetime exposure in the workplace to average daily noise levels of 80, 85, or 90 dBA, the excess risk of material hearing impairment was estimated to be 3%, 16%, or 29%, respectively. On the basis of this risk assessment, NIOSH recommended an 8-hr TWA exposure limit of 85 dBA [NIOSH 1972].

To compare the NIOSH excess risk estimates with those developed by other organizations, the NIOSH data were also analyzed using the same 25-dB fence, but averaging the HTLs at 500, 1000, and 2000 Hz (the 0.5-1-2-kHz definition) [NIOSH 1972]. Table 3–1 presents the excess risk estimates developed by NIOSH [1972], EPA [1973], and the International Standards Organization (ISO) [1971] for material hearing impairment caused by occupational noise exposure. OSHA used these estimates as the basis for requiring hearing conservation programs for occupational noise exposures at or above 85 dBA (8-hr TWA) [46 Fed. Reg. 4078 (1981a)].

Table 3–1. Estimated excess risk of incurring material hearing impairment* as a function of average daily noise exposure over a 40-year working lifetime†

Reporting organization	Average daily noise exposure (dBA)	Excess risk (%)‡
ISO	90	21
	85	10
	80	0
EPA	90	22
	85	12
	80	5
NIOSH	90	29
	85	15
	80	3

*For purposes of comparison in this table, material hearing impairment is defined as an average of the HTLs for both ears at 500, 1000, and 2000 Hz that exceeds 25 dB.
†Adapted from 39 Fed. Reg. 43802 [1974b].
‡Percentage with material hearing impairment in an occupational-noise-exposed population after subtracting the percentage who would normally incur such impairment from other causes in an unexposed population.

The data used for the NIOSH risk assessment were collected by NIOSH in 13 noise and hearing surveys (collectively known as the Occupational Noise and Hearing Survey [ONHS]) from 1968 to 1971. The industries in the surveys included steelmaking, paper bag processing, aluminum processing, quarrying, printing, tunnel traffic controlling, woodworking, and trucking. Questionnaires and audiometric examinations were given to noise-exposed and non-noise-exposed workers who had consented to participate in the surveys. More than 4,000 audiograms were collected, but the sample excluded audiograms of (1) noise-exposed workers whose noise exposures could not be characterized relative to a specified continuous noise level over their working lifetime, and (2) noise-exposed workers with abnormal hearing levels as determined by their medical history. Thus, 1,172 audiograms were used. These represented 792 noise-exposed and 380 non-noise-exposed workers (controls) [NIOSH 1972; Lempert and Henderson 1973].

3.1.2 NIOSH Risk Assessment in 1997

A review of relevant epidemiologic literature did not identify new data suitable for estimating the excess risk of occupational NIHL for U.S. workers. The prolific use of hearing protectors in the U.S. workplace since the early 1980's would confound determination of dose-response relationships for occupational NIHL among contemporary workers. Therefore, the current risk assessment is based on a reanalysis of data from the NIOSH ONHS [Prince et al. 1997].

Prince et al. [1997] (reprinted in the Appendix of this document) derived a new set of excess risk estimates using the ONHS data with a model referred to as the "1997-NIOSH model," which differed from the 1972-NIOSH model [NIOSH 1972]. A noteworthy difference between the two models is that Prince et al. [1997] considered the possibility of nonlinear effects of noise in the 1997-NIOSH model, whereas the 1972-NIOSH model was based solely on a linear assumption for the effects of noise. Table 3–2 provides an overview of the differences between the 1997- and the 1972-NIOSH models. Prince et al. [1997] found that nonlinear models fit the data well and that the linear models similar to the 1972-NIOSH model did not fit as well. In addition to using the 0.5-1-2-kHz and the 1-2-3-kHz definitions of material hearing impairment to assess the risk of occupational NIHL, Prince et al. [1997] used the definition of hearing handicap* proposed by the American Speech-Language-Hearing Association (ASHA) Task Force on the Definition of Hearing Handicap. Prince et al. [1997] found the ASHA Task Force definition† (average of HTLs at 1000, 2000, 3000, and 4000 Hz) [ASHA 1981] useful because it was geared toward excess risk of hearing loss rather than compensation. Phaneuf et al. [1985] also found that the audiometric average of 1000, 2000, 3000, and 4000 Hz provided "a superior prediction of hearing disability in terms of specificity, sensitivity, and overall accuracy." The ASHA Task Force definition is also referred to as the 1-2-3-4-kHz definition in this criteria document. Table 3–3 presents the excess risk estimates for this definition and associated 95% confidence intervals.

The ISO has also developed procedures for estimating hearing loss due to noise exposure. In 1971, the ISO issued the first edition of *ISO 1999, Assessment of Occupational Noise Exposure for Hearing Conservation Purposes* [ISO 1971] (referred to as the "1971-ISO model"), which included risk estimates for material hearing impairment from occupational noise exposures. In 1990, the ISO issued a second edition of *ISO 1999, Acoustics—Determination of Occupational Noise Exposure and Estimation of Noise-Induced Hearing Impairment* [ISO 1990] (referred to as the "1990-ISO model"). Both ISO models are based on broadband, steady noise exposures for 8-hr work shifts during a working lifetime of up to 40 years.

The various models for estimating the excess risk of material hearing impairment are compared in Table 3–4. The excess risk estimates derived from the 1971-ISO, 1972-NIOSH, 1973-EPA, and 1997-NIOSH‡ models are reasonably similar. However,

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*ASHA makes a distinction between the terms "impairment" and "handicap"; however, for the purpose of the subsequent discussion in this criteria document, only the term "material hearing impairment" is used. The Prince et al. [1997] paper reports the use of a modified ASHA Task Force definition. This modification incorporates frequency-specific weights based on the articulation index for each frequency [ANSI 1969]. Negligible differences were found between excess risk estimates generated using the modified and the unmodified definitions. The excess risk estimates presented in this criteria document are based on the unmodified ASHA Task Force definition.

†Historical note, ASHA did not deliberate on the definition proposed by the ASHA Task Force.

‡Prince et al. [1997] found that the excess risk estimates at exposure levels below 85 dBA were not well defined. Insufficient data for workers with average daily exposures below 85 dBA led to considerable variability in the estimation, depending on the statistical assumptions used in the modeling.

Table 3–2. Comparison of the 1997– and 1972–NIOSH risk-damage models

Item	Description: 1997–NIOSH model	Description: 1972–NIOSH model
Model	Logit model: Dichotomous outcome* Model probability of hearing impairment directly	Probit model: Continuous outcome (average HTL) Model distribution of HTL and calculate percentage of population meeting impairment criteria
Sound level effect	Dependent on duration of exposure $\beta\,[L_e\text{-}L_0]^{\phi}$ L_0 (control sound level) and ϕ (shape of dose-response curve) are estimated from the data L_e=Sound level in exposed population Model allows flexibility in determining shape of dose-response curve and location of control sound levels	Dependent on duration of exposure $\beta\,[L_e\text{-}L_0]^1$ L_0 and ϕ are fixed values ϕ=1 assumes a linear dose-response relationship L_e=Sound level in exposed population
Age, years	Modeled as a continuous variable	Modeled as a categorical variable with five levels (17–27, 28–35, 36–45, 46–54, 55–70)
Duration of exposure, years	Modeled as a categorical variable with 4 levels (<2, 2–4, 5–10, >10)	Modeled as a categorical variable with five levels (<2, 2–4, 5–10, 11–20, 21–41)

*Each individual is categorized either as hearing-impaired (defined as average HTL >25 dB, both ears) or non-hearing-impaired (average HTL ≤25 dB).

except for the 1-2-3-4-kHz definition, the excess risk estimates derived from the 1990-ISO model are considerably lower than those derived from the other models. These disparities may be due to differences in the statistical methodology or in the underlying data used. Nevertheless, these five models confirm an excess risk of material hearing impairment at 85 dBA.

As mentioned earlier in this section, the protection goal incorporated in the definitions of material hearing impairment has been to preserve hearing for speech discrimation. The 4000-Hz audiometric frequency is recognized as being both sensitive to noise and important for hearing and understanding speech in unfavorable or noisy listening conditions [Kuzniarz 1973; Aniansson 1974; Suter 1978; Smoorenburg 1990]. In recognition of the fact that listening conditions are not always ideal in everyday life, and in concurrence with the ASHA [1981] Task Force proposal, NIOSH has modified its

Table 3-3. Excess risk estimates for material hearing impairment,* by age and duration of exposure

Average daily exposure (dbA)	5-10 years of exposure								>10 years of exposure							
	Age 30		Age 40		Age 50		Age 60		Age 30		Age 40		Age 50		Age 60	
	Risk (%)	95% CI†	Risk (%)	95% CI	Risk (%)	95% CI	Risk (%)	95% CI	Risk (%)	95% CI	Risk (%)	95% CI	Risk (%)	95% CI	Risk (%)	95% CI
90	5.4	2.1–9.5	9.7	3.7–16.5	14.3	5.5–24.4	15.9	6.2–26.2	10.3	5.8–16.2	17.5	10.7–25.3	24.1	14.6–33.5	24.7	14.9–34.3
85	1.4	0.3–3.2	2.6	0.6–6.0	4.0	0.9–9.3	4.9	1.0–11.5	2.3	0.7–5.3	4.3	1.3–9.4	6.7	2.0–13.9	7.9	2.3–16.6
80	0.2	0–1.1	0.4	0–2.2	0.6	0.01–3.6	0.8	0.01–4.7	0.3	0–1.8	0.6	0.01–3.3	1.0	0.01–5.2	1.3	0.01–6.8

*1997–NIOSH model for the 1-2-3-4-kHz definition of hearing impairment.
†CI=confidence interval.

Table 3–4. Comparison of models for estimating the excess risk of material hearing impairment at age 60 after a 40-year working lifetime exposure to occupational noise, by definition of material hearing impairment

Average exposure level (dBA)	0.5–1–2-kHz definition					1–2–3-kHz definition			1–2–3–4-kHz definition	
	1971-ISO	1972-NIOSH	1973-EPA	1990-ISO	1997-NIOSH	1972-NIOSH	1990-ISO	1997-NIOSH	1990-ISO	1997-NIOSH
90	21	29	22	3	23	29	14	32	17	25
85	10	15	12	1	10	16	4	14	6	8
80	0	3	5	0	4	3	0	5	1	1

definition of material hearing impairment to include 4000-Hz when assessing the risk of occupational NIHL. Therefore, with this modification, NIOSH defines material hearing impairment as an average of the HTLs for both ears that exceeds 25 dB at 1000, 2000, 3000, and 4000 Hz. Based on this definition, the excess risk is 8% for workers exposed to an average daily noise level of 85 dBA over a 40-year working lifetime. NIOSH continues to recommend the REL of 85 dBA as an 8-hr TWA on the basis of (1) analyses supporting the 1972 REL of 85 dBA as an 8-hr TWA, (2) reanalyses of the ONHS data, (3) ASHA Task Force positions on preservation of speech discrimination, and (4) analyses of excess risk of ISO, EPA, and NIOSH databases.

For extended work shifts (i.e., greater than 8 hr), lower exposure limits can be extrapolated from the REL of 85 dBA as an 8-hr TWA (see Section 1.1.1 or Table 1–1). Stephenson et al. [1980] studied human responses to 24-hr noise exposures and found that no temporary threshold shift occurred for broadband noise exposures less than 75 to 80 dBA. These data are in line with the recommendation that TWA exposures be less than 80 to 81 dBA for durations greater than 16 hr.

3.2 Ceiling Limit

Because NIOSH is recommending a 3-dB exchange rate with an 85-dBA REL, a ceiling limit for continuous-type noise is unnecessary. For example, with an 85-dBA REL and a 3-dB exchange rate, an exposure duration of less than 28 sec would be allowed at a 115-dBA level.

The generally accepted ceiling limit of 140 dB peak SPL for impulsive noise is based on a report by Kryter et al. [1966]. Ward [1986] indicated that "this number was little more than a guess when it was first proposed." To date, a proposal for a different limit has not been supported. Henderson et al. [1991] indicated that the critical level for chinchillas is between 119 and 125 dB; and if a 20-dB adjustment is used to account for the difference in susceptibility between chinchillas and humans, the critical level extrapolated for humans would be between 139 and 145 dB. Based on the 85-dBA REL and the 3-dB exchange rate, the allowable exposure time at 140 dBA is less than 0.1 sec; thus, 140 dBA is a reasonable ceiling limit for impulsive noise.

3.3 Exchange Rate

Health effects depend on exposure level and duration. The NIOSH recommendation for a 3-dB exchange rate is based in part on the conclusions from a NIOSH contract report [Suter 1992a]. This report involved an exhaustive analysis of the relationship between hearing loss, noise level, and exposure duration. Although the time/intensity relationship is most commonly referred to as the exchange rate, it is also referred to as the "doubling rate," "trading ratio," and "time-intensity tradeoff." The 3-dB exchange rate is also known as the equal-energy rule or hypothesis, because a 3-dB increase/decrease represents a doubling or halving of the sound energy. The most commonly used exchange rates incorporate either 3 dB or 5 dB per doubling or halving of exposure duration [Embleton 1994].

The 3-dB exchange rate is the method most firmly supported by scientific evidence for assessing hearing impairment as a function of noise level and duration. This rate is already used in the United States by the EPA and the U.S. Department of Defense. The 3-dB exchange rate is used worldwide by nations such as Canada, Australia, New Zealand, the People's Republic of China, the United Kingdom, Germany, and many others. First proposed by Eldred et al. [1955], the 3-dB exchange rate was later supported by Burns and Robinson [1970]. The premise behind the 3-dB exchange rate is that equal amounts of sound energy will produce equal amounts of hearing impairment regardless of how the sound energy is distributed in time. Theoretically, this principle could apply to exposures ranging from a few minutes to many years. However, Ward and Turner [1982] suggest restricting its use to the sound energy accumulated in 1 day. They distinguish between (1) an interpretation of the total energy theory that would allow an entire lifetime of exposure to be condensed into a few hours and (2) a restricted equal-A-weighted-daily-energy interpretation of the theory. Burns [1976] also cautions against the misuse of the equal-energy hypothesis, noting that it was based on data gathered from workers who experienced 8-hr occupational exposures daily for periods of months to years; thus, extrapolation to very different conditions would be inappropriate.

In 1973, the U.S. Air Force adopted a 4-dB exchange rate [U.S. Air Force 1973]. This exchange rate is based on an unpublished analysis by H.O. Parrack at the Aerospace Medical Research Laboratory. However, a set of curves based on this analysis was published as Figure 20 in a joint EPA/Air Force report [Johnson 1973]. The 4-dB exchange rate came closest to the curve that best described temporary theshold shift at 1000-Hz audiometric frequency [Johnson 1973]. However, Johnson [1973] also pointed out that according to these curves, the 3-dB exchange rate would best protect hearing at the 4000-Hz frequency, and the 5-dB exchange rate would be a good compromise if hearing were to be protected only at the midfrequencies—500, 1000, and 2000 Hz.

Noise Exposure

The relationship between the 3-dB exchange rate and energy can be illustrated as follows. The *American National Standard for Acoustical Terminology*, ANSI S1.1–1994 [ANSI 1994] defines the decibel as a "unit of level when the base of the logarithm is the tenth root of ten, and the quantities concerned are proportional to power. . . . [E]xamples of quantities that qualify are power (in any form), sound pressure squared, particle velocity squared, sound intensity, sound-energy density, and voltage squared. Thus, the decibel is a unit of sound-pressure-squared level; it is common practice, however, to shorten this to sound pressure level, when no ambiguity results from so doing."

Ostergaard [1986] provided a functional elucidation of the relationships pointed to in the ANSI definition:

> In acoustics, decibel notation is utilized for most quantities. The *decibel* is a dimensionless unit based on the logarithm of the ratio of a measured quantity to a reference quantity. Thus, decibels are defined as follows:
>
> $$L = k \log_{10} (A/B)$$
>
> where L is the level in decibels, A and B are quantities having the same units, and k is a multiplier, either 10 or 20 depending on whether A and B are measures of energy or pressure, respectively. Any time a level is referred to in acoustics, decibel notation is implied. In acoustics all *levels* are referred to some reverence quantity, which is the denominator, B, of the equation.

Applying this mathematical relationship in the following calculations demonstrates how every doubling of energy yields an increase of 3 dB:

Let X = the exchange rate whereby energy is doubled

$10 \text{ Log}_{10} (A/B) + X = 10 \text{ Log}_{10} (2A/B)$

$X = 10 \text{ Log}_{10} (2A/B) - 10 \log_{10} (A/B)$

$= 10 \text{ Log}_{10} (2)$

$= 10 (0.301)$

$= 3.01$ dB

This same relationship does not hold true for the 5-dB exchange rate. To derive $X = 5$ dB, the sound intensity would have to be more than doubled in this equation. Thus, the 5-dB exchange rate does not provide for the doubling or halving of energy per 5-dB increment.

The 5-dB exchange rate is sometimes called the OSHA rule; it is less protective than the equal-energy hypothesis. The 5-dB exchange rate attempts to account for the interruptions in noise exposures that commonly occur during the workday [40 Fed. Reg. 12336 (1975)], presuming that some recovery from temporary threshold shift occurs during these interruptions and the hearing loss is not as great as it would be if the noise were continuous. The rule makes no distinction between continuous and noncontinuous noise, and it will permit comparatively long exposures to continuous noise at higher sound levels than would be allowed by the 3-dB rule. On the basis of the limited data that existed in the early 1970's, NIOSH [1972] recommended the 5-dB exchange rate; however, after reviewing the more recent scientific evidence, NIOSH now recommends the 3-dB exchange rate.

The evolution of the 5-dB exchange rate began in 1965 when the Committee on Hearing, Bioacoustics, and Biomechanics (CHABA) for the National Academy of Sciences—National Research Council issued criteria for assessing allowable exposures to continuous, fluctuating, and intermittent noise [Kryter et al. 1966]. The CHABA criteria were an attempt to predict the hazard from nearly every conceivable noise exposure pattern based on temporary threshold shift experimentation. In the development of its criteria, CHABA used the following postulates:

1. TTS_2 (temporary threshold shift measured 2 min after a period of noise exposure) is a consistent measure of the effects of a single day of exposure to noise.

2. All noise exposures that produce a given TTS_2 will be equally hazardous (the equal temporary effect theory).

3. Permanent threshold shift produced after many years of habitual noise exposures for 8 hr per day is about the same as the TTS_2 produced in normal ears by an 8-hr exposure to the same noise.

However, these CHABA postulates were not validated. Research has been unable to demonstrate a simple relationship between temporary threshold shift, permanent threshold shift, and cochlear damage [Burns and Robinson 1970; Ward 1970, 1980; Ward and Turner 1982; Hétu 1982; Clark and Bohne 1978, 1986]. The CHABA criteria assumed that worker exposures could be characterized by regularly spaced noise bursts interspersed with periods that were sufficiently quiet to allow hearing to recover. However, this assumption is not characteristic of many typical industrial noise exposures. Workers will always develop temporary threshold shift before sustaining permanent threshold shift, barring an ototraumatic incident. Temporary threshold shift is a useful metric for monitoring the effects of noise exposure; these studies do not imply otherwise.

In general, the CHABA hearing damage risk criteria proved too complicated for general use. Botsford [1967] published a simplified set of criteria based on the CHABA criteria. One of the simplifications inherent to the Botsford [1967] method was the assumption that interruptions would be of "equal length and spacing so that a number of identical exposure cycles would be distributed uniformly throughout the day." These interruptions would occur during coffee breaks, trips to the washroom, lunch, and periods when machines were temporarily shut down.

Noise Exposure

During the same period, another related development led to the 5-dB exchange rate. Simplifying the criteria developed by Glorig et al. [1961] and adopted by ISO [1961], the Intersociety Committee [1970] published its criteria, which consisted of a table showing permissible exposure levels (starting at 90 dBA) as a function of duration and the number of occurrences per day. The exchange rates varied considerably depending on noise level and frequency of occurrence. For continuous noise with durations of less than 8 hr, the Committee recommended maximum exposure levels based on a 5-dB exchange rate. The only field study that has been repeatedly cited as supporting the 5-dB rule is one study of coal miners by Sataloff et al. [1969].

In 1969, the U.S. Department of Labor promulgated a noise standard [34 Fed. Reg. 790 (1969a)] under the authority of the Walsh-Healey Public Contracts Act. The standard contained a PEL of 90 dBA for continuous noise. Exposure to varying or intermittent noise was to be assessed over a weekly period according to a large table of exposure indices. The exchange rate varied according to level and duration: a rate of 2 to 3 dB was used for long-duration noises of moderate level, and 6 to 7 dB was used for short-duration, high-level bursts. This standard was withdrawn after a short period. Later in 1969, the Walsh-Healey noise standard that is in effect today was issued [34 Fed. Reg. 7948 (1969b)]. In this version, any special criteria for varying or intermittent noise had disappeared, and the 5-dB exchange rate became official. Thus, the 5-dB exchange rate appears to have been the outgrowth of the many simplifying processes that preceded it.

Beginning with the study of Burns and Robinson [1970], the credibility of the 3-dB rule has been increasingly supported by numerous studies and by national and international consensus [EPA 1973, 1974; 39 Fed. Reg. 43802 (1974b); ISO 1971; von Gierke et al. 1981; ISO 1990; U.S. Air Force 1993; U.S. Army 1994; ACGIH 1995].

Data from a number of field studies correspond well to the 3-dB rule (equal-energy hypothesis), as Passchier-Vermeer [1971, 1973] and Shaw [1985] have demonstrated. In Passchier-Vermeer's [1973] portrayal of the data, the Passchier-Vermeer [1968] and the Burns and Robinson [1970] prediction models for hearing losses as a function of continuous-noise exposure level fit the data on hearing losses from varying or intermittent noise exposures quite well. The fact that comparisons using the newer ISO standard [ISO 1990] corroborate Passchier-Vermeer's findings lend additional support to the equal-energy hypothesis.

Some older field data from occupations such as forestry and mining show less hearing loss than expected when compared with equivalent levels of continuous noise [Sataloff et al. 1969; Holmgren et al. 1971; Johansson et al. 1973; INRS 1978]. However, these findings have not been supported by the two NIOSH [1976, 1982] studies of intermittently exposed workers or the analyses conducted by Passchier-Vermeer [1973] and Shaw [1985].

Data from animal experiments support the use of the 3-dB exchange rate for single exposures of various levels within an 8-hr day [Ward and Nelson 1971; Ward and Turner

1982; Ward et al. 1983]. Nevertheless, several animal studies have demonstrated that some recovery may occur during the "quiet" periods of an intermittent noise exposure [Bohne and Pearse 1982; Ward and Turner 1982; Ward et al. 1982; Bohne et al. 1985; Bohne et al. 1987; Clark et al. 1987]. However, these benefits are likely to be smaller or even nonexistent in the industrial environment, where sound levels during quiet periods are considerably higher and where interruptions are not evenly spaced.

The possible ameliorative effect of intermittency does not justify the use of the 5-dB exchange rate. For example, although Ward [1970] noted that some industrial studies have shown lower permanent threshold shifts from intermittent noise exposure than would be predicted by the 3-dB rule, he did not favor selection of the 5-dB exchange rate as a compromise to compensate for the effects of intermittency, because it would allow single exposures at excessively high levels. In his opinion, "this compromise was futile and perhaps even dangerous" [Ward 1970].

One response to the evidence from the animal studies and certain field studies would be to select the 3-dB exchange rate but to allow an adjustment (increase) to the PEL for certain intermittent noise exposures, as suggested by EPA [1974] and Johansson et al. [1973]. This response would be in contrast to a 5-dB exchange rate, for which there is little scientific justification. Ideally, if an adjustment is needed, the amount should be determined by the temporal pattern of the noise and the levels of quiet between noise bursts. At this time, however, little quantitative information is available about these parameters in industrial environments. Therefore, the need for an adjustment should be clarified by further research. Although the 3-dB rule may be somewhat conservative in truly intermittent conditions, the 5-dB rule will be underprotective in most others. The 3-dB exchange rate is the method most firmly supported by the scientific evidence for assessing hearing impairment as a function of noise level and duration, whether or not an adjustment is used for certain intermittent exposures.

3.4 Impulsive Noise

The OSHA occupational noise standard [29 CFR 1910.95] states: "Exposure to impulsive or impact noise should not exceed 140 dB peak sound pressure." Thus, in this context, the 140-dB limit is advisory rather than mandatory. This number was first proposed by Kryter et al. [1966] and later acknowledged by Ward [1986] as little more than a guess. NIOSH [1972] did not address the hazard of impulsive (i.e., impulse or impact) noise, although NIOSH stated that the provisions of the recommended standard in the criteria document were intended to apply for all noise. Although there is yet no unanimity as to which criteria best describe the relationship between NIHL and exposure to impulsive noise, either by itself or in the presence of continuous-type (i.e., continuous, varying, or intermittent) noise, there is an international standard that has become widely used by most industrial nations. This standard, *ISO 1999, Acoustics—An Estimation of Noise-Induced Hearing Impairment* [ISO 1990], integrates both impulsive and continuous-type noise (and uses the 3-dB exchange rate of the equal-energy rule) when calculating sound exposures over any specified time period. NIOSH concurs with this approach and recommends that noise exposure levels be calculated by integrating all noises (both impulsive and continuous-type) over the duration of the measurement.

Despite its simplicity, the equal-energy rule is not universally accepted as a method for characterizing exposures that consist of both impulsive and continuous-type noises. Another approach favors evaluating impulsive noise separate from that of continuous-type noise. Studies that would argue for this approach will be discussed first, followed by a discussion of studies elucidating the rationale for the NIOSH position on the equal-energy rule.

3.4.1 Evidence That Impulsive Noise Effects Do Not Conform to the Equal-Energy Rule

In her evaluation of the effects of continuous and varying noises on hearing, Passchier-Vermeer [1971] found that the HTLs of workers in steel construction works did not conform to the equal-energy hypothesis; that is, the hearing losses in these workers, who were exposed to noise levels with impulsive components, were higher than predicted. Later studies by Ceypek et al. [1973], Hamernik and Henderson [1976], and Nilsson et al. [1977] also indicated that continuous and impulsive noises have a synergistic rather than additive effect on hearing.

Comparing the studies of Passchier-Vermeer [1973] and of Burns and Robinson [1970], Henderson and Hamernik [1986] suggested that the steeper slope of Passchier-Vermeer's exposure-response curve at the 4000-Hz audiometric frequency might have been due to noise exposures that contained impulsive components, a characteristic not present in the Burns and Robinson data. Citing the similarity of Passchier-Vermeer's data to those collected by Taylor et al. [1984] and Kuzniarz et al. [1976] on workers exposed to impulsive noise environments, Henderson and Hamernik [1986] indicated that exposure to continuous and impulsive noises in combination may be more hazardous than exposure to continuous noise alone.

Voight et al. [1980] studied noise exposure patterns in the building construction industry and related the equivalent continuous sound level for 8 hr (L_{Aeq8hr})to audiometric records of more than 81,000 construction workers in Sweden. They found differences in hearing loss among groups exposed to noise of the same L_{Aeq8hr} but with different temporal characteristics. Groups exposed to impulsive noise had more hearing loss than those exposed to continuous noise of the same L_{Aeq8hr}.

Sulkowski and Lipowczan [1982] conducted noise measurement and audiometric testing in a drop-forge factory. The HTLs of 424 workers in the factory were compared with the predicted values according to the Burns and Robinson equation [1970]. The observed and predicted values differed in that the observed hearing loss was smaller than predicted at the lower audiometric frequencies, but the observed hearing loss was greater than predicted at the higher audiometric frequencies. In their study of hearing loss in weavers, who were exposed to continuous noise, and drop-forge hammer men, who were exposed to impact noise of equivalent energy, Sulkowski et al. [1983] found that the hammer men had substantially worse hearing than the weavers.

Thiery and Meyer-Bisch [1988] conducted a cross-sectional epidemiologic study at an automobile manufacturing plant. The automotive workers were exposed to continuous and impulsive noises at L_{Aeq8hr} ranging from 87 to 90 dBA. When their HTLs were compared with those of workers exposed to continuous noise at L_{Aeq8hr} of 95 dBA for the same exposure time, the automotive workers showed greater hearing losses at the 6000-Hz audiometric frequency than the reference population after 9 years of exposure.

Starck et al. [1988] compared at the 4000-Hz audiometric frequency the HTLs of forest workers using chain saws and shipyard workers using hammers and chippers. The forest workers were exposed to continuous-type noise, whereas the shipyard workers were exposed to impact noise. Starck et al. [1988] also used the immission model developed by Burns and Robinson [1970] to predict the HTLs for both groups. They found that the Burns and Robinson model was accurate at 4000 Hz for the forest workers; however, it substantially underestimated the HTLs at 4000 Hz for the shipyard workers.

The studies described here provide evidence that the effects of combined exposure to impulsive and continuous-type noises are synergistic rather than additive, as the equal-energy hypothesis would support. One measure for protecting a worker from such synergistic effects would be to require that a correction factor be added to a measured TWA noise exposure level when impulsive components are present in the noise. The magnitude of such a correction has not been quantified. The matter becomes more complicated when other parameters of impulsive noise are considered. Noise energy does not appear to be the only factor that affects hearing. The amplitude, duration, rise time, number of impulses, repetition rate, and crest factor also appear to be involved [Henderson and Hamernik 1986; Starck and Pekkarinen 1987; Pekkarinen 1989]. The criteria for exposure to impulsive noise based on the interrelationships of these parameters await the results of further research.

3.4.2 Evidence That Impulsive Noise Effects Conform to the Equal-Energy Rule

In 1968, CHABA published damage risk criteria for impulsive noise based on the equal-energy hypothesis [Ward 1968]. Over the years, individuals and organizations have supported treating impulsive noise on an equal-energy basis [Coles et al. 1973; EPA 1974; Coles 1980; ISO 1990].

Burns and Robinson [1970] proposed the concept of immission, which is based on the equal-energy hypothesis, to describe the total energy from a worker's exposure to continuous noise over a period of time (i.e., months or years). Atherley and Martin [1971] modified this concept to include impulsive noise in the calculation of the L_{Aeq8hr}.

Noise Exposure

In a study of 76 men who were exposed to impact noise in two drop-forging factories, Atherley and Martin [1971] calculated each man's noise exposure (immission level) during his employment period and plotted it against his age-corrected HTLs over six audiometric frequencies. They found that the observed HTLs of the population came close to the predicted HTLs according to Robinson [1968] and concluded that the equal-energy hypothesis was applicable to impact noise. Similarly, Atherley [1973] examined the HTLs of 50 men exposed to impact noise produced by pneumatic chisels used on metal castings and found good agreement between observed and predicted HTLs.

Guberan et al. [1971] compared the HTLs of 70 workers exposed to impact noise in drop-forging workshops with the predicted HTLs according to Robinson [1968] at the 3-, 4-, and 6-kHz audiometric frequencies. Again, the observed HTLs were in close agreement with the predicted HTLs.

A study of 716 hammer and press operators in 7 drop forges by Taylor et al. [1984] indicated that hearing losses resulting from impact and continuous noises in the drop-forging industry were as great or greater than those resulting from equivalent continuous noise. Using noise dosimetry, Taylor et al. [1984] found that the hammer operators were exposed to an average $L_{Aeq,8hr}$ of 108 dBA, whereas the press operators were exposed to 99 dBA. The investigators also conducted audiometry for the operators. The median HTLs of hammer operators of all age groups approximated those predicted by the Robinson [1968] immission model. The median HTLs of younger press operators (aged 15 to 34) also corresponded closely with the predicted values; however, those of older press operators (aged 34 to 54) were significantly higher than predicted. These results indicate that, up to certain limits, the equal-energy hypothesis can be applied to combined exposure to impact and continuous noises.

3.4.3 Combined Exposure to Impulsive and Continuous-Type Noises

In many industrial operations, impulsive noise occurs in concert with a background of continuous-type noise. In some animal studies the effects of combined exposure to continuous-type and impulsive noises appear to be synergistic at high exposure levels [Hamernik et al. 1974]. But the synergism disappears when the exposure levels are comparable with those found in many common industrial environments [Hamernik et al. 1981]. Whether the effects of combined exposure are additive or synergistic, exposure to these noises causes hearing loss; thus the contribution of impulse noise to the noise dose should not be ignored. If the effects are additive, the 85-dBA REL with the 3-dB exchange rate would be sufficiently protective. If the effects are synergistic, the same would still be protective to a smaller extent. NIOSH therefore recommends that the REL of 85 dBA as an 8-hr TWA be applicable to all noise exposures, whether such exposures are from continuous-type noise, impulsive noise, or combined continuous-type and impulsive noises.

ATTACHMENT 5

From: Feith.Ken@epamail.epa.gov
To: Amy Minteer
Cc: Jefferson.Catrice@epamail.epa.gov
Subject: Re: Noise Limits to Prevent Hearing Loss
Date: Tuesday, August 11, 2009 11:45:06 AM

Dear Ms. Minteer,

Thank you for your note. You are correct that exposure to 100 dBA is unacceptable to 3rd parties who have no control over the noise being produced. The issue is public health and welfare, not just hearing loss. While the impact statement is essentially correct regarding potential hearing damage due to continuous human exposure, it apparently ignores the other equally important adverse health and welfare impacts, e.g. speech interference, sleep disturbance and stress related physiological effects. The EPA levels document identifies 55 dBA as the level requisite to the protection of public health and welfare with an adequate margin of safety in a residential community.

I suggest you may want to visit the website "nonoise.org" where you will find a link to the EPA library and our documents that speak to acceptable levels of sound. I am certain that you will find other information at the non-EPA portion of this website that may be of assistance to you - this is a no-cost website. Please let us know if you need more assistance.

K. E. Feith
U. S. EPA
Washington, D.C.

From: "Amy Minteer" <acm@cbcearthlaw.com>

To: Ken Feith/DC/USEPA/US@EPA, Catrice Jefferson/DC/USEPA/US@EPA

Date: 08/10/2009 08:12 PM

Subject: Noise Limits to Prevent Hearing Loss

Dear Mr. Feith and Ms. Jefferson,

I am an environmental attorney located in California. I am currently reviewing an environmental impact report for a project that proposes to increase allowable maximum noise levels to 100 dBA in an area that includes both residential and industrial uses. The impact report claims that EPA has established a health based noise level criteria of 71.4 dBA Leq to prevent hearing loss. Is this correct? Also, does the EPA have any criteria or guidelines regarding an Lmax level that would prevent hearing loss? 100 dBA Lmax is an incredibly high level of noise and I am concerned for the health of the residents that would experience this noise level, which would be generated during drag racing events. Could you point me in the direction of any credible studies regarding the health impacts of noise?

Thank you so much for any assistance you can provide in this matter.

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ATTACHMENT 6

ORIGINAL ARTICLE

Aircraft noise around a large international airport and its impact on general health and medication use

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See end of article for authors' affiliations

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Aims: To assess the prevalence of general health status, use of sleep medication, and use of medication for cardiovascular diseases, and to study their relation to aircraft noise exposure.
Methods: These health indicators were measured by a cross-sectional survey among 11 812 respondents living within a radius of 25 km around Schiphol airport (Amsterdam).
Results: Adjusted odds ratios ranged from 1.02 to 2.34 per 10 dB(A) increase in L_{den}. The associations were statistically significant for all indicators, except for use of prescribed sleep medication or sedatives and frequent use of this medication. None of the health indicators were associated with aircraft noise exposure during the night, but use of non-prescribed sleep medication or sedatives was associated with aircraft noise exposure during the late evening (OR = 1.72). Vitality related health complaints such as tiredness and headache were associated with aircraft noise, whereas most other physical complaints were not. Odds ratios for the vitality related complaints ranged from 1.16 to 1.47 per 10 dB(A) increase in L_{den}. A small fraction of the prevalence of poor self rated health (0.13), medication for cardiovascular diseases or increased blood pressure (0.08), and sleep medication or sedatives (0.22) could be attributed to aircraft noise. Although the attributable fraction was highest in the governmentally noise regulated area, aircraft noise had more impact in the non-regulated area, due to the larger population.
Conclusions: Results suggest associations between community exposure to aircraft noise and the health indicators poor general health status, use of sleep medication, and use of medication for cardiovascular diseases.

The continuing growth of air transportation may put pressure on the environment, especially in densely populated areas. People living near airports are concerned about health effects of aircraft related pollution and safety. These concerns are substantiated by findings that aircraft noise may have adverse health effects such as annoyance, sleep disturbance, and cardiovascular diseases.[1–7]

Since the 1960s many community surveys around airports have been conducted. Fields[8] identified 521 social surveys, published in English between 1943 and 2000, on residents' reactions to environmental noise in residential areas. Most of these studies measured annoyance. Some also measured general health and medication use and reported associations between self-rated health status or self-reported health complaints and aircraft noise exposure.[2 9–13] Several studies found an association between use of medication for sleep or cardiovascular diseases and aircraft noise levels,[14–16] but others reported no associations.[17] Knipschild,[14 18] one of the first to study self-reported health problems and use of cardiovascular drugs in a series of community surveys around Schiphol airport, found an increased use of cardiovascular drugs in areas with high aircraft noise levels. He also found a relation between aircraft noise exposure and the contact rate with general practitioners, especially for psychological problems, psychosomatic symptoms, and cardiovascular diseases. A more recent study on the use of medication around Schiphol airport, based on automated pharmacy registrations, suggested a relation between aircraft noise exposure and the use of sedatives.[19]

At the beginning of the 1990s, plans were made to expand Schiphol airport with a fifth runway. Schiphol is situated in a densely populated area on the outskirts of Amsterdam. It is the fourth international airport in Europe with 432 thousand aircraft movements, 39.5 million passengers, and 1183 thousand tons of freight.[20] Due to the expansion from four to five runways, the Dutch government initiated the Health Impact Assessment Schiphol Airport (HIAS), a long term research programme on health effects of environmental pollution around Schiphol airport.

The first phase of HIAS was part of an Environmental Impact Assessment (EIA) showing that exposure to aircraft noise caused annoyance, sleep disturbance, cardiovascular disease risk, and reduced performance.[21] The authors concluded that local air pollution levels were probably not associated with health effects such as respiratory diseases or cancer. Further research was recommended for several health indicators, for example, medication use, birth weight, cardiovascular diseases, annoyance, sleep disturbance, and neurobehavioural effects. This was realised in the second phase of the HIAS. Health impact assessments such as this one are currently considered necessary,[4] and are required under the EU programme of community action in the field of public health.[22]

Here we present results from a questionnaire survey, which was part of HIAS phase II.[23 24] Its two objectives were: (1) to assess the prevalence of annoyance, sleep disturbance, self-rated general health status, respiratory complaints, medication use, perceived risk, and residential satisfaction in the Schiphol region; and (2) to study the relation of these variables with aircraft noise exposure and/or air pollution. The selection of these health indicators was based on recommendations formulated in phase I of the HIAS and by local environmental action committees. The focus of this article is on general health status, use of sleep medication, and use of medication for cardiovascular diseases in relation to aircraft noise exposure.

Main messages

- Exposure to aircraft noise at levels above 50 dB(A) L_{den} may contribute to a poorer general health status.
- Exposure to aircraft noise may be a risk factor for cardiovascular diseases.
- Exposure to aircraft noise during the late evening is associated with the intake of non-prescribed sleep medication or sedatives.
- The number of people suffering health effects due to aircraft noise is dominated by the large number of people that is exposed to relatively moderate to low noise levels, not by those exposed to high noise levels.

Policy implications

- Effects of aircraft noise are not limited to annoyance reactions, but also include other health effects such as poorer general health, cardiovascular diseases, and sleep disturbance.
- Policy measures to reduce community exposure to aircraft noise should not only be concentrated on areas exposed to high aircraft noise levels.
- If expansion of the airport capacity will increase the number of moderate and low exposed people, the overall impact on public health is likely to also increase.

MATERIALS AND METHODS

Study design

We conducted a postal questionnaire among adults (18 years and older) between November 1996 and February 1997 in an area with a radius of 25 kilometres around the airport (fig 1), inhabited by almost 2 million people; approximately 1.5 million of these were aged 18 years and older. The questionnaire comprised questions on annoyance, sleep disturbance, general health status, respiratory complaints, medication use, perceived risk, and residential satisfaction. It also solicited information on potential determinants of these variables, such as personal characteristics, living situation, and smoking behaviour. Questions were derived, where possible, from existing, validated questionnaires.

We used stratified random sampling of 31 000 addresses, which were obtained from the Netherlands Post and Telecommunications company. The desired sample size was calculated according to Kirkwood[25] for two expected effects: annoyance due to noise and respiratory complaints. Background prevalences for annoyance and respiratory complaints were 10% and 3.6% respectively. Aircraft noise was assumed to increase the prevalence of annoyance by 25–50% and air pollution was assumed to increase the prevalence of respiratory complaints by 50–100%. Power calculations were performed for an area with high noise levels (>35 Kosten units; for a description of Kosten units refer to the "exposure assessment" section) and one with low levels (<35 Ke) with equal group sizes in each area. The power was 80% and the confidence limit 5%. Based on these calculations a random sample of 5000 people would be sufficient. However, fewer people live in high noise areas than in low noise areas; it is desirable that the former should be over-represented in the sample. The second form of stratification is based on the accuracy required to be able to observe differences in prevalence over time, in areas that at present have low noise levels. Over-representation of these areas is also desirable. On the basis of these considerations it was decided that a net sample size of 10 000 people would be required. Given an expected response rate of 25–35%, a random sample of 30 000 addresses from a radius of 25 km around the airport would be needed to achieve this net result.

The sample was stratified by aircraft noise exposure (10 categories) and distance to the centre of the airport (five categories). The stratification was carried out in a geographic information system (Arc/Info 7.2.1), by combining a digital map containing aircraft noise contours with a map containing distance contours. This combined map was again superimposed on a digital map containing address coordinates. The thinly populated areas, closer to the airport and with higher noise levels, contained too few addresses to adequately fill the sample cells. In these cells, all existing addresses were included in the sample, and the smaller number of addresses was compensated for in other cells with the same noise levels where possible. Questionnaires were sent to 30 216 addresses. Non-respondents received a reminder letter after a few weeks.

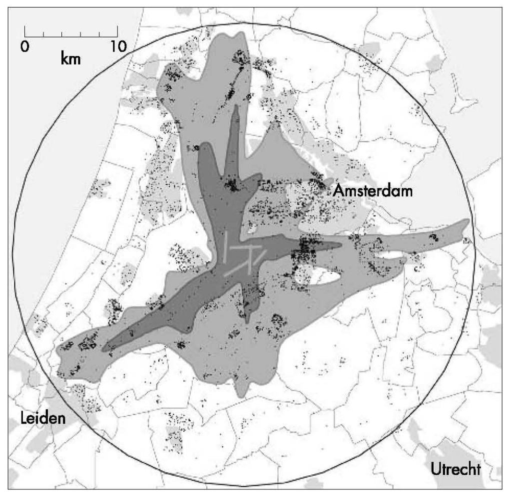

Figure 1 Study area with 20 and 35 Kosten unit contours (1996). The circle represents a distance of 25 kilometres around Schiphol. The dots show the residential locations of the respondents.

Health indicators

The general health status was measured in two ways, both widely used in (Dutch) health care research:

- With a single question: "How is your health in general?". Most health surveys ask similar kinds of questions, but there is still no standard formulation for this question. We used one that has been applied in Dutch national health surveys since 1983, and can be answered on a five point scale: (1) very good, (2) good, (3) moderate, (4) sometimes good and sometimes bad, (5) bad. For analysis the variable was dichotomised into "good" (categories (1) and (2)) and "poor" (the last three categories).[26]
- With a 13 item questionnaire (VOEG), consisting of a list of health complaints. The VOEG questionnaire was originally designed in the Netherlands to measure stress in industrial situations,[27] but is currently also commonly applied in general health surveys.[28] It covers items such as

physical complaints (for example, back pain), and symptoms reflecting vitality (for example, tiredness, listlessness). Respondents indicate which symptoms were present "lately". The total number of symptoms reported by a respondent is the VOEG score (with a minimum of 0 and a maximum of 13); a higher VOEG score indicates a poorer self-rated health. For analysis the VOEG was dichotomised: respondents with six or more symptoms were defined as having a "poor self-rated health". In addition, each of the 13 items was analysed separately.

We assessed use of medication for cardiovascular diseases or increased blood pressure and use of sleep medication or sedatives, whether on doctor's prescription or as self-medication. Respondents could indicate which medication was used in the 12 months prior to the moment of questioning. For medication for cardiovascular diseases and increased blood pressure, we only analysed prescribed medication, as this is rarely used without prescription (1% in this study). For sleep medication or sedatives we analysed both prescribed and non-prescribed medication. Respondents could also report the frequency of use of sleep medication or sedatives. This was measured on a four point scale: (1) every night, (2) regularly, (3) occasionally, (4) never. For analysis this variable was dichotomised: respondents who used sleep medication or sedatives "every night" or "regularly" were defined as frequent users, respondents who used these medicines "occasionally" or "never" were defined as non-frequent users.

Exposure assessment

The National Aerospace Laboratory, using a mathematical model of the annual exposure to aircraft noise around Schiphol airport calculated aircraft noise levels. Several annual average aircraft noise measures for 1996 were calculated at the geographical location of each respondent's residence. Since we did not have the x and y coordinates of the actual residential addresses, we took the closest alternative, being the x and y coordinates of the geometric centre of the six digit postal code area of each residential address. These areas cover on average 17 addresses. For the analyses we used the following noise measures: L_{den}, $L_{Aeq,\ 23-07\ h}$, and $L_{Aeq,\ 22-23\ h}$, expressed in dB(A) (A-weighted decibels), and the Kosten unit. L_{den} (day, evening, night) is an equivalent sound level over 24 hours in which sound levels during the evening (19 00–23 00 hours) are increased by 5 dB(A) and those during the night (23 00–07 00 hours) by 10 dB(A). As a result of these penalties for the evening and night, the L_{den} value is equal to, or larger than, the $L_{Aeq24\ h}$ value, the difference depending on the distribution of the traffic over the day, evening, and night period. $L_{Aeq,\ 23-07\ h}$ and $L_{Aeq,\ 22-23\ h}$ are also equivalent sound levels, calculated over the corresponding time periods. The Kosten unit is a commonly used measure for aircraft noise in the Netherlands, developed by the Kosten Committee in 1963.[29] With the fifth runway that became operational at Schiphol airport in January 2003, the Kosten unit is officially replaced by the noise measure L_{den}. The L_{den} value is approximately equal to (0.5 * Kosten unit + 41).[30]

Non-response follow up

To examine selective non-response, a follow up telephone interview was carried out among 500 non-respondents. The sample of non-respondents was randomly selected from all addresses in the initial sample from which no response was received as of 31 January 1997 (n = 17 840).

These non-respondents were asked for their sociodemographic characteristics (gender, age, education, and country of origin), the reason for not responding, their annoyance due to aircraft noise, their concern about safety because of living close to a large airport, and their attitude regarding the expansion of Schiphol airport. The questions were identical to the corresponding questions in the original, postal questionnaire. Results from this survey indicated that selective non-response was likely. Non-respondents suffered less annoyance due to aircraft noise, were less concerned about airport safety, and had a less negative attitude regarding the expansion of Schiphol. The non-respondent group was less highly educated and comprised more people of foreign origin.

Statistical analysis

All statistical analyses were performed with SAS 8.02. Observations were suitably re-weighted to take the stratified study design into account, and weighted overall prevalences of the health indicators were calculated. The association between the health indicators and aircraft noise exposure was assessed using a multiple logistic regression model, controlling for potential determinants such as age, sex, education level, country of origin, smoking behaviour, and degree of urbanisation. In the analyses of self-rated health, we also controlled for the number of household members and home ownership. To assess linearity of the relation, the aircraft noise measure was included continuous as well as categorised (in categories of 5 dB(A)). Both prevalences and odds ratios (ORs) were calculated with and without the non-response weighting factor (see section on non-response bias), to judge the sensitivity of results to selection bias. In the regression analyses for sleep medication or sedatives (prescribed and non-prescribed) and frequent use of sleep medication or sedatives, we excluded respondents who also took medication for cardiovascular diseases or increased blood pressure, and/or who took medication for rheumatism or painful joints, and/or who regularly worked night shifts. These variables might bias the relation between exposure and response.

Population attributive risks

To estimate how much of the prevalence of a health effect was attributable to aircraft noise, population attributive risks (PARs) were estimated for the area with aircraft noise levels of 20 Kosten units or more (approximately $\geqslant$50 dB(A) L_{den}), and 35 Kosten units or more (approximately $\geqslant$58 dB(A) L_{den}). The attributable fraction was defined as the prevalence of health effects caused by aircraft noise divided by the overall prevalence. PARs were estimated for poor self-rated health (single question), medication for cardiovascular diseases or increased blood pressure, and prescribed sleep medication or sedatives. Since there was no evidence for threshold levels of noise for health effects, a sensitivity analysis on the noise exposure measure was carried out. The following variants were calculated: (1) the noise level was included in the regression model as a continuous variable, with the reference value of the noise level set to zero, that is, with the assumption that there is no threshold; (2) the noise level was included in the regression model as a continuous variable, with the reference value of the noise level set to 10 Kosten units (approximately 46 dB(A) L_{den}), that is, it is assumed that no health effects result from aircraft noise below a threshold of 10 Kosten units; (3) the noise level was categorised into intervals, with 10 Kosten units or less as reference interval.

Non-response bias

We conducted a sensitivity analysis to estimate the impact of non-response. Data from a combined data set of respondents (n = 11 812) and non-respondents (n = 271) were used to estimate selection bias. We evaluated various prevalence estimates using logistic regression analysis, with "group" as

Table 1 Number of respondents and chance (p values, below) to end up in the sample per sample stratum; the number of non-respondents per exposure stratum are in parentheses

	Distance in km						
Kosten units	≤5	>5–10	>10–15	>15–20	>20–25	Total response	(non-respondents)
<20	33 0.05	595 0.01	766 0.01	750 0.01	543 0.01	2687 0.01	(45)
≥20–25	128 0.06	601 0.02	457 0.02	320 0.03	395 0.02	1901 0.02	(59)
≥25–30	104 0.05	736 0.03	513 0.07	602 0.13	421 0.17	2376 0.06	(51)
≥30–35	224 0.37	655 0.10	520 0.16	182 0.33	×	1581 0.14	(26)
≥35–40	138 0.46	802 0.26	341 0.43	55 0.40	×	1336 0.30	(44)
≥40–45	80 0.41	890 0.37	126 0.56	×	×	1096 0.39	(26)
≥45–50	47 0.55	528 0.35	6 0.36	×	×	581 0.36	(17)
≥50–55	47 0.43	179 0.41	4 0.64	×	×	230 0.42	(3)
≥55–60	9 0.33	11 0.75	×	×	×	20 0.46	(0)
≥60	4 0.45	×	×	×	×	4 0.45	(0)
Total response (non-response)	814 (52)	4997 (95)	2733 (46)	1909 (47)	1359 (31)	11812	 (271)

×, noise-distance combination does not occur.

the dependent variable (1 = respondent, 0 = non-respondent). Five models were estimated, each with a different explanatory variable: noise level, distance to the centre of the airport, annoyance due to aircraft noise, concern about airport safety, and attitude regarding the expansion of Schiphol. Each of the five models was further adjusted for age, gender, education, and country of origin. This resulted in five different weighting factors for each respondent, based on his or her score on the variables in these five models. The weighting factor was 1 divided by the probability (p) of response (W_1), divided by the average of W_1. The non-response weighting factors varied from 0.01 to 17.6. This method indicated substantial influence of non-response in the analysis of noise annoyance,[23 24] but only minor influence on the effects published here.

RESULTS

The final response rate was 39% (n = 11 812). The response rate of the non-response survey was 54% (n = 271). Table 1 shows the distribution of respondents and non-respondents among the exposure strata. Table 2 describes the aircraft noise exposure measures that were used in the analyses. The different noise measures are highly correlated (Pearson's $r > 0.90$). Table 3 shows the characteristics of the study population. Respondents are evenly distributed between the two sexes. Over 40% of the respondents are aged 35–54 years, and nearly half have an intermediate education level. There are few respondents of non-Dutch origin. These variables are more or less evenly distributed among the different noise level categories, except for degree of urbanisation (air traffic is preferably routed across rural area). Table 4 shows prevalences of the health indicators. The overall prevalence of poor self-rated health is comparable to the prevalence in the general Dutch population in 1996 (19%).[31] The average VOEG score is 3.1 (SD 2.8), compared to 2.6 in the general Dutch population.[32] Pain in bones and muscles, feelings of tiredness, and back pain are the most prevalent health complaints (38–41%). Pain in the chest or cardiac region, upset stomach, and dizziness are least prevalent (13–14%). The prevalences of medication use could not be compared to Dutch reference figures, due to differences in the phrasing of questions.

The effect of the non-response weighting factors on the prevalence estimates was assessed, and the differences in estimated prevalences were negligible. In table 4 we show the effect of the weighting factor based on the model with "annoyance due to aircraft noise" as the explanatory variable. It shows that non-response had only minor influence on the results; the overall prevalence varied only 0–2%. Results for the other four models were similar.

Exposure-response relations

Figures presented here are not weighted for non-response, as use of the non-response weighting factor in our regression models did not affect the results. Table 5 presents the associations between health indicators and aircraft noise exposure measures. Associations with L_{den} are all positive and statistically significant, except for prescribed sleep medication or sedatives and its frequent use. The health indicators do not appear to be related to noise exposure during the night ($L_{Aeq,\ 23-07\ h}$). However, the use of non-prescribed sleep medication or sedatives is associated with aircraft noise exposure in the late evening ($L_{Aeq,\ 22-23\ h}$) with an OR of 1.72. Analyses of the separate VOEG items showed statistically significant relations of L_{den} with six health complaints (ORs for an increase of 10 dB(A)): shortness of breath (OR = 1.29, 95% CI 1.09 to 1.53); feelings of tiredness (OR = 1.34, 95% CI 1.17 to 1.53); headache (OR = 1.16, 95% CI 1.01 to 1.34); tired sooner than considered normal (OR = 1.47, 95% CI 1.26 to 1.70); listlessness (OR = 1.17, 95% CI 1.01 to 1.36); and tired and not fully rested in the morning (OR = 1.20, 95% CI 1.03 to 1.41). For the remaining seven complaints the ORs were lower, ranging from 0.99 to

Table 2 Description of the aircraft noise exposure measures in the study population

Exposure measure	Range	Average	SD
L_{den}	41–76 dB(A)	51.3	3.1
$L_{Aeq,\ 22-23\ h}$	36–70 dB(A)	44.3	4.1
$L_{Aeq,\ 23-07\ h}$	32–65 dB(A)	37.9	4.0
Kosten units	0–64 Kosten units	17.3	6.8

Table 3 Characteristics of the study population per category of L_{den}, in percentages

L_{den} in dB(A)	<50	50–55	55–60	≥60	Total*	Total†
Sex (n = 11601)						
Male	50	53	54	53	52	49
Female	50	47	46	47	48	51
Age (n = 11481)						
18–34	30	28	21	24	28	34
35–54	39	40	38	40	40	38
55–74	24	26	33	28	26	21
≥75	7	6	8	8	6	8
Education level (n = 11220)						
None and lower	17	19	21	21	18	
Intermediate	46	46	50	48	47	
Higher	37	35	29	31	35	
Country of origin (n = 11335)						
Netherlands	95	94	94	96	95	
Other	5	6	6	4	5	
Smoking behaviour (n = 11509)						
Never smoked	37	37	39	40	37	
Ex-smoker	34	34	35	33	34	
Smoker	29	29	26	27	29	
Degree of urbanisation (n = 11812)						
Rural/slightly urban	26	15	35	54	20	
Urban/strongly urban	39	54	35	18	48	
Extremely urban	35	31	30	28	32	

*Total in the study population.
†Total in the overall population of study area. Source: Statistics Netherlands, 1 January 1998.

1.17, and not statistically significant. Table 6 shows the relation of the health indicators with L_{den} when this noise measure was categorised. The ORs tend to rise with increasing noise levels, but differences between the categories are not statistically significant. When the regression analyses for sleep medication or sedatives (prescribed, non-prescribed, and frequent use) were repeated without excluding the possibly modifying variables described under "materials and methods", similar results were obtained. In addition to health determinants, degree of urbanisation was also considered a potential determinant. However, omitting this determinant from our analyses did not substantially alter the results.

Population attributive risks

Table 7 shows results of the PAR analyses. The PARs vary for the three models tested. The PARs are naturally highest when the noise measure is included in the model as a continuous variable with reference value set to zero, and the model with a categorised noise measure gives the lowest PARs. Due to the low precision of the relation between exposure and response in areas with low aircraft noise exposure, the figures for the 20 Kosten unit zone show a wide range in the estimates. The confidence interval on either side of the point estimate is so wide that negative values are possible. In this zone the maximum attributable fraction for aircraft noise was 0.13 for poor self-rated health, 0.08 for medication for cardiovascular diseases or increased blood pressure, and 0.22 for sleep medication or sedatives.

DISCUSSION

Our main aims were to assess the prevalence of health indicators in the Schiphol region, in relation to aircraft noise

Table 4 Prevalences of the health indicators in the study population

	n_{effect}	% overall prevalence	% after non-response weighting
Poor self-rated health (based on single question)	2301	20	20
Poor self-rated health (based on VOEG* score)	2157	20	19
Items of VOEG* questionnaire:			
Bloated or heavy feeling in the gastric region	2149	19	18
Shortness of breath	2105	19	19
Pain in the chest or cardiac region	1412	13	13
Pain in bones and muscles	4240	38	38
Feelings of tiredness	4431	40	38
Headache	3786	34	33
Back pain	4643	41	41
Upset stomach	1582	14	14
Benumbed feeling or tingling in limbs	2584	23	24
Tired sooner than considered normal	2805	25	24
Dizziness	1524	14	14
Listlessness	2866	26	25
Tired and not fully rested in the morning	2595	23	22
Use of medication for cardiovascular diseases or increased blood pressure	1750	15	17
Use of prescribed sleep medication or sedatives	1231	10	11
Use of non-prescribed sleep medication or sedatives	647	5	5
Frequent use of sleep medication or sedatives	528	5	5

*For a description of VOEG, refer to the "materials and methods" section.

Table 5 Odds ratios (OR) and 95% confidence intervals (CI) after multiple logistic regression of health indicators, in relation to various noise exposure measures per 10 dB(A) increase in noise levels, controlling for potential determinants

Health indicator	n_{total}	n_{effect}	Noise measure	OR	95% CI
Poor self-rated health (single question)	10412	1969	L_{den}	1.23	1.04 to 1.46
			$L_{Aeq,\ 23–07\ hrs}$	1.05	0.91 to 1.22
Poor self-rated health (VOEG score)	9887	1871	L_{den}	1.21	1.02 to 1.43
			$L_{Aeq,\ 23–07\ hrs}$	1.08	0.94 to 1.25
Medication for cardiovascular diseases/increased blood pressure	10105	1316	L_{den}	1.30	1.06 to 1.60
			$L_{Aeq,\ 23–07\ hrs}$	1.13	0.94 to 1.35
Prescribed sleep medication or sedatives	7240	516	L_{den}	1.25	0.93 to 1.68
			$L_{Aeq,\ 23–07\ hrs}$	0.91	0.70 to 1.18
			$L_{Aeq,\ 22–23\ hrs}$	1.26	0.99 to 1.60
Non-prescribed sleep medication or sedatives	7240	309	L_{den}	2.34	1.63 to 3.35
			$L_{Aeq,\ 23–07\ hrs}$	1.20	0.87 to 1.65
			$L_{Aeq,\ 22–23\ hrs}$	1.72	1.27 to 2.32
Frequent use of sleep medication or sedatives	7175	189	L_{den}	1.02	0.63 to 1.65
			$L_{Aeq,\ 23–07\ hrs}$	1.36	0.91 to 2.04
			$L_{Aeq,\ 22–23\ hrs}$	1.15	0.78 to 1.70

exposure, as a baseline for monitoring future changes in health status due to the expansion of Schiphol airport and changing exposure patterns. The prevalences of the health indicators in the research area were similar to available reference figures for the Dutch population. Despite "normal" prevalences, the risks of both poor self-rated health and of medication use for sleep and cardiovascular diseases increased with aircraft noise levels.

The location of a large international airport may influence the social structure of the population, for example by lowering house prices, and selecting lower social classes with poorer health status. If so, the effects of aircraft noise would be overestimated. In studying the associations between the health indicators and aircraft noise exposure we controlled for a number of potential health determinants, such as lifestyle, personal characteristics, and social economical status. However, there may also be selection effects in the other direction, for example when sensitive subjects have moved out of the high noise areas, which leads to underestimating the effects of noise.[33] Since it is difficult to study selection in a cross-sectional design, the impact of selection on the results of this study cannot be estimated. Therefore, conclusions on the causality of associations have to be tentative. However, there are no indications that these phenomena play a role around Schiphol airport. Another, related, drawback of a cross-sectional study is that one cannot determine whether (accumulation of) exposure preceded the reported health complaints.[34 35] To minimise this problem retrospective exposure data should be collected. The main aim of this study, however, was to assess baseline prevalence data for monitoring future (changes in) health status. From this perspective detailed estimation of retrospective exposure was not needed.

Proper assessment of subjects' exposure levels is of great importance. Besides aircraft noise, people are exposed to other noises, for example, noise at work, which could be the main reason for health effects or at least interact with residential noise. Also, exposure history plays a role in the development of health effects. We obtained information on retrospective exposure and exposure at work by asking people

Table 6 Odds ratios (OR) and 95% confidence intervals (CI) after multiple logistic regression of health indicators per category of L_{den}, controlling for age, sex, education level, country of origin, smoking behaviour, and degree of urbanisation

Health indicator	L_{den} in dB(A)	n_{total}	n_{effect}	OR	95% CI
Poor self-rated health (single question)	<50	3012	519	1.00*	
	50–55	6505	1266	1.09	0.97 to 1.23
	55–60	786	160	1.01	0.82 to 1.25
	⩾60	109	24	1.30	0.79 to 2.12
Poor self-rated health (VOEG score)	<50	2836	508	1.00*	
	50–55	6208	1183	1.07	0.95 to 1.21
	55–60	741	154	1.13	0.92 to 1.40
	⩾60	102	26	1.61	1.01 to 2.56
Medication for cardiovascular diseases/ increased blood pressure	<50	2935	334	1.00*	
	50–55	6279	830	1.18	1.01 to 1.38
	55–60	780	134	1.26	0.98 to 1.61
	⩾60	111	18	1.22	0.67 to 2.21
Prescribed sleep medication or sedatives	<50	2173	141	1.00*	
	50–55	4449	326	1.15	0.93 to 1.42
	55–60	541	42	1.13	0.78 to 1.64
	⩾60	77	7	1.52	0.67 to 3.42
Non-prescribed sleep medication or sedatives	<50	2173	70	1.00*	
	50–55	4449	203	1.59	1.20 to 2.11
	55–60	541	31	1.89	1.21 to 2.95
	⩾60	77	5	2.02	0.77 to 5.30
Frequent use of sleep medication or sedatives	<50	2159	58	1.00*	
	50–55	4402	110	0.91	0.65 to 1.27
	55–60	539	18	1.12	0.64 to 1.95
	⩾60	75	3	1.66	0.50 to 5.50

*Reference category.

Table 7 Percentage of poor self-rated health and medication use which is attributable to aircraft noise, in areas exposed to 20 Kosten units or more*, and 35 Kosten units or more†

Variable	Percentage of people reporting health effect	Attribution to aircraft noise (%), range of 3 models	Attributable number in population age ⩾18 years
Poor self-rated health			
⩾20 Kosten units*	21	−0.4 to 2.8	−1500 to 10400
⩾35 Kosten units†	21	2.3 to 4.4	500 to 1000
Use of medication for cardiovascular diseases or increased blood pressure			
⩾20 Kosten units	17	0.6 to 1.4	2200 to 5200
⩾35 Kosten units	18	1.7 to 2.3	400 to 500
Use of prescribed sleep medication or sedatives			
⩾20 Kosten units	10	1.2 to 2.2	4400 to 8100
⩾35 Kosten units	11	2.6 to 3.6	600 to 800

*An area with approximately 370 300 inhabitants (age 18 years and older).
†An area with approximately 23 500 inhabitants (age 18 years and older).

how long they had lived in their present house and neighbourhood and to what extent they were exposed to aircraft noise at work. The average residential time in the house and neighbourhood was 14 (±12) and 17 (±15) years, respectively; 51% of the respondents had lived longer than 10 years in their neighbourhood. About 6% of the respondents indicated that they were highly exposed to aircraft noise at work. However, these questions are only a proxy for past exposure, and some misclassification cannot be ruled out. This might under- or over-estimate the effects of aircraft noise on health, depending on whether previous exposure was higher or lower than the exposure assessed at the time of study.

The geo-referencing of individuals to specific locations, instead of larger regions, decreases the chance of non-differential misclassification with respect to exposure.[36] In this survey, we geo-referenced subjects using the geometric centre of six digit postal code areas (PCAs) of subjects' residential addresses. These PCAs merely cover parts of streets in high density areas. To investigate its accuracy in less populated areas, we examined those addresses in the study population that were situated in the least densely populated areas. Of all respondents, 12% lived in six digit PCAs with a geometric centre that was more than 100 metres away from the nearest six digit PCA. Only 3% lived in six digit PCAs of which this distance was more than 200 metres. Since these addresses were evenly spread across the whole research area, misclassification in this group was assumed minor and unlikely to have a considerable impact on the results.

To attain the objectives of our study, we targeted approximately 10 000 completed questionnaires, but as the final response rate (39%) was higher than the expected rate of 25–35% our actual sample was larger. Nevertheless, the non-response group was still large enough to potentially cause under- or over-estimation of prevalences. In the analysis of noise annoyance, sensitivity analysis showed substantial influence of non-response on the prevalence. Although sensitivity analysis showed that weighting for non-response had little effect on estimates presented here, we cannot entirely exclude non-response bias. For example, we may have omitted variables in the non-response survey that explain differences between respondents and non-respondents. If non-response bias was still present, it may have affected the prevalences and PARs, but is unlikely to have substantially affected the exposure-response relations.

We carried out stratified random sampling. Observations were re-weighted to take the stratified study design into account. However, when comparing the distribution of age and sex in the respondents with the distribution of age and sex in the study area, the younger age group (18–34 years) is under-represented, while the older age group (55–74 years) is slightly over-represented. This is a common feature in these types of surveys. The distribution of sex is comparable in both groups, but there might be some bias due to difference in age distribution. This may have slightly overestimated the prevalences. However, an effect on the exposure-response relations and PARs is not expected, since these were adjusted for age.

Regression analyses of the two general health indicators gave consistent results. Both the single question and the VOEG were associated with annual average aircraft noise levels (L_{den}). Analysis of the separate health complaints of the VOEG showed that mainly vitality related health complaints, such as tiredness and headache, were associated with aircraft noise exposure. The use of non-prescribed sleep medication or sedatives was associated with aircraft noise exposure during the late evening ($L_{Aeq,\ 22-23\ h}$), but not with the exposure during the night ($L_{Aeq,\ 23-07\ h}$). This suggests that exposure to aircraft noise at times that people go to bed stimulates the use of sleep medication or sedatives. The use of prescribed sleep medication or sedatives was positively related to L_{den} and $L_{Aeq,\ 22-23\ h}$ (OR 1.25 and 1.26, respectively), but these ORs were not statistically significant. Van Willigenburg and colleagues,[19] who studied the use of prescribed sleep medication by pharmacy registration data found that the use of prescribed sleep medication was associated with aircraft noise exposure. The increased tendency to use non-prescribed sleep medication might be due to the fact that people rarely visit their general practitioner for noise related sleep problems. They might consider their sleep problems of minor importance and therefore prescription of stronger sedatives by a general practitioner unnecessary. The prevalence of prescribed drugs might be determined by other determinants, for example, the prescription behaviour of general practitioners. They might tend to not easily prescribe sleep medication for sleep complaints due to aircraft noise, which may mask the effects of aircraft noise.

PAR analyses provided estimates of the number of people in the study area suffering health effects due to aircraft noise exposure, and thereby the potential health gain of removing noise exposure. These analyses assume that the statistical association between the noise level and the effect reflects a causal relation and is not due to confounding, for example. The estimates proved sensitive to assumptions about threshold levels and the scale of measurement of noise levels (continuous versus intervals). From these PAR calculations, we estimated that between a few hundred and about one thousand people, living in the area with noise levels of 35 Kosten units or more, reported health effects. Until recently, the 35 Kosten unit zone was the area for which most governmental policies were formulated and regulations applied. PAR estimates for the area with noise levels of 20–35 Kosten units indicate that thousands of people are affected. If exposure-response relations are also applied in areas with noise levels <20 Kosten units, the number of people with health effects due to aircraft noise in the total research area would be two to three times higher than that in the area ≥20 Kosten units. It is worth noting that the number of people suffering these effects is dominated by the large number of people who are exposed to relatively moderate to low noise levels, not by those exposed to high noise levels.

Our findings are broadly consistent with what has been reported in the literature.[2 7 9–14 18] However, direct comparison of our results with those from other noise effects surveys is hampered by, for example, differences in phrasing and scoring of questions, different outcome measures or risk estimates, and different exposure measures. To improve comparability of various noise effects surveys in the future, the International Commission on the Biological Effects of Noise (ICBEN, Team No. 6: community response) has set the long term goal of developing questionnaire guidelines for noise effects research in social surveys. As a start, the German Ruhr University has developed a database of questionnaires on noise effects[37] to provide researchers a means to compare the operationalisation of health outcomes and confounding or moderating variables. Without further standardisation of research, inter-study and international comparisons will remain difficult.

In conclusion, we found associations between health indicators (general health status, use of medication for cardiovascular diseases or increased blood pressure, and use of sleep medication or sedatives) and the aircraft noise exposure measure L_{den}. None of the health indicators were associated with aircraft noise exposure during the night ($L_{Aeq,\ 23–07\ h}$), but use of non-prescribed sleep medication or sedatives was associated with aircraft noise exposure during the late evening ($L_{Aeq,\ 22–23\ h}$). Further, vitality related health complaints such as tiredness and headache were associated with aircraft noise, whereas most other physical complaints were not. In the area with aircraft noise exposure levels ≥20 Kosten units, a small fraction of the prevalence of poor self-rated health (0.13), medication for cardiovascular diseases or increased blood pressure (0.08), and sleep medication or sedatives (0.22) could be attributed to aircraft noise. Although the attributable fraction was highest in the governmentally noise regulated area, aircraft noise had more impact in the non-regulated area, due to the larger population exposed.

ACKNOWLEDGEMENTS

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ECHO

Workplace based faecal occult blood screening

Please visit the *Occupational and Environmental Medicine* website [www.occenvmed.com] for a link to the full text of this article.

Population screening using faecal occult blood tests may increase the rate of detection of early stage colorectal tumours and reductions in mortality of 15%, 18%, and 33% have been shown in three large studies. Screening programmes based on general practices have had low rates of acceptance. It has been suggested that on-site health education might increase compliance rates in workplace based programmes, but a study at a large engineering company in the East Midlands, UK has also shown disappointing rates of compliance.

During 1992–93 a total of 1828 employees aged 41–65 were sent a letter explaining the study and inviting them to participate. Posters were put up at the site and the firm's medical department answered enquiries. Employees who agreed were sent a Haemoccult pack to provide samples for testing on three separate days. Positive tests were repeated after dietary restrictions (no red meat, black pudding, cauliflower, cabbage, spinach, radishes, parsnip, broccoli, or bananas) and, if still positive colonoscopy was offered. In all, 465 employees (25.4%) completed three Haemoccult tests. The rate of compliance was not significantly different between men (425/1703) and women (40/125). Men aged 51–60 were more likely to comply than men aged 41–50 or 61–65. Among women compliance rates were similar at ages 41–50 and 51–60. There were only seven women aged 61–65 and none of them completed a series of occult blood tests. Compliance was better among managers (28.6%) than non-managers (23.5%) especially in the youngest age group (41–50).

Four occult blood series (0.9%) gave a positive result and one remained positive after dietary restriction. This positive test led to the discovery of a 1 cm pedunculated polyp in the splenic flexure. After colonoscopic removal the tumour proved to be a tubular adenoma with mild dysplasia and complete excision margins. The financial cost of screening in 1993 was £6180 (testing kits £580, staff costs £5000, colonoscopy £600).

The uptake of screening in this company based programme was low and similar to that achieved in some general practice studies. More intense presentation of the case for screening might increase uptake but older and non-managerial employees might be the least likely to consent.

▲ *Postgraduate Medical Journal* 2003;**79**:646–649.

ATTACHMENT 7

Ron Brown

August 5, 2009

Chatten-Brown & Carstens
2601 Ocean Park Blvd., Suite 205
Santa Monica, CA 90405

Attn: Ms. Amy Minteer

Subject: Auto Club Speedway Drag Strip

Dear Ms. Minteer:

The following report is a review of the document, Draft Subsequent EIR related to the Auto Club Speedway in Fontana. I believe the San Bernardino County document is severely flawed; it is very long and full of confusing discussions. Some of the rationale for adopting a new noise standard for the Speedway is based on questionable assumptions. The adoption of a standard with a noise limit of 100 dBA Lmax is not a good precedent; this will open the door for other communities to modify their ordinances in a similar manner.

I believe that residences close to the Speedway are still and will be more impacted by noise from the drag strip if the new noise standard is adopted.

Sincerely,

Ron Brown

cc: Elizabeth & Salvador Lopez

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Review of Draft Subsequent Environmental Impact Report for the Auto Club Speedway

August, 2009

Documentation related to the Draft Subsequent EIR for a drag strip at the Auto Club Speedway facility in Fontana is reviewed in the following report.

Findings

Section 3.0 Project Description

Table 3-1 contains the existing noise standard requirements. This Table shows a limit of 55 dBA for the County between 7 am and 10 pm and for the Speedway a limit of 65 dBA between 7 am and 11 pm. Continuing on page 3-1 it states that the noise cannot exceed the noise standard plus 20 dBA for any period of time. This is a practical set of requirements and should not be changed.

Page 3-3 --- They claim that the current standard is difficult to apply and thus must be changed. The drag strip produces very short duration noise events. Due to the background level created by traffic on Whittram Ave. it is virtually impossible to measure an uncontaminated average noise level created by the drag strip. The only way to measure the drag strip noise is to observe and note the Lmax of individual events; incidentally this procedure is proposed in the new standard. This impulsive event should be measured using a Fast time constant on the meter.

Note -- A slow time constant applies an averaging time of one second for measurement of the sound level whereas a fast time constant measures the level with an averaging time of 100 milliseconds, 0.1 seconds. Depending on the rise-time of the signal, for dragsters this is very fast, a slow time constant can result in a measured level several dB below the signals peak level. For slowly varying signals, such as race cars on the oval track, the difference between measurements with these two time constants is minimal.

The existing standard of 85 dBA for this Lmax limit is appropriate; this limit is common in many noise standards. Additionally, the existing standard for the Speedway only allows a maximum 85 dBA at six premiere events per year. Therefore, the change in noise standards would be a 15 dBA increase in the Lmax during the six premiere racing events and a <u>25 dBA</u> increase for all other events (including all drag racing) held at the Speedway.

They state that the EPA threshold for hearing loss is an average of 76 dBA. They also refer to a hearing loss limit of 71.4 dBA. We examined the EPA guidelines that state a 70 dBA limit for 24 hours to prevent hearing loss and an outdoor Leq limit of 55 dBA for activity interference & annoyance. The proposed noise standard does not comply with the EPA guidelines.

1

The SDEIR refers to OSHA regulations as a guideline to the new noise standard. OSHA regulations are not applicable because they relate to noise limits in the workplace to minimize hearing loss. The workplace is different than a residence because they are being subjected to noise over which they have no control. Also, OSHA requires persons to wear protective noise equipment that will reduce the noise levels they experience, although not the noise levels in the environment.

The SDEIR states the goal of eliminating hearing loss. This is not a common criterion in existing community noise regulations. More common is the reduction of annoyance. For proximity to drag strips this should also include elimination of "startle." In more than 40 years working as an acoustical engineer in many areas of the country with many different public jurisdictions I have never seen a noise regulation for a residential community that was based on the elimination of hearing loss as an objective instead of the reduction of annoyance. Annoyance from excessive noise levels can result in many significant health impacts, such as increased blood pressure.

Another aspect of this topic; spectators and workers at the drag strip are subjected to noise levels of over 110 dBA, possibly as high as 120 dBA. At these levels, there is a real danger of hearing damage. The severity of this damage may not result in immediate hearing loss unless the subject is exposed to these levels for extended periods. The cumulative effects of exposure to high noise levels are well documented in the literature; hearing loss will result.

Page 3-4 -- The proposed noise standard of 100 dBA Lmax is a completely inappropriate limit. I have been at a residence on Whittram Ave. when this level was generated by a dragster, it was startling, and I have experienced many occasions of high noise levels in the past, I would not like to experience this on a regular basis at my home.

The SDEIR states that the new noise standard will require events to end at 11 pm; this is one hour later than the requirements of almost all of the many noise ordinances I have seen. Allowing maximum noise levels of 100 dBA to occur until 11 pm in a residential neighborhood is unheard of. These noise levels, particularly at that hour of the night, could significantly disturb the sleep patterns of the residents.

Section 4.2-1 -- They do not specify the meter time constant for measurement of noise events. For impulsive noise events such as those created at the drag strip, a fast time constant should be used. A slow time constant could result in measured levels several dB below the maximum level.

Pages 4.2-5 to 4.2-8 -- There are many examples of noise level data presented; most in a very poor and confusing format. None of the measurements indicate the meter time constant or weather conditions. Examples of these data are as follows:

• The text states that in Table 4.2-3, L50 = 48 to 69 dBA and Lmax = 61 to 65 dBA. The actual values in the table are L50 = 50 to 69 dBA and Lmax = 62 to 85 dBA.

• They state that data shown in Table 4.2-4 exceeds the track noise standard when this data is only an ambient taken without track operations.

• In Table 4.2-5 data are shown without a speedway event that shows a range of levels for L50 and Lmax without any definition of the measurement durations. When L50 noise levels are determined they must be based on some duration such as 10 minutes or an hour. However, the measurement of an impulsive single event to determine Lmax is based on a very short interval, just a few seconds, thus it is not necessary to define a duration. In Table 4.2-6, with a speedway event, only single values for these same parameters are shown. This is acceptable for the Lmax but not for the L50.

Although purportedly illustrating comparative data, it appears that these data were also taken at different locations. Table 4.2-5 shows many violations of the noise standard while Table 4.2-6 shows no violations. If the noise measurements were taken at the same location, the maximum noise levels should be similar, but there was a large difference, noise levels during the speedway event were much lower than without the event.

The consultant should provide more details on the conditions that were present during each of these measurements. Without that information it is impossible to compare the data. It would be desirable to show a map with the locations identified, weather conditions, street traffic volumes and train operations.

Data shown in this document are very poorly presented; data like this will easily mislead the public that are not aware of the complexity of noise measurements.

Page 4.2-8 -- They state that alcohol and nitro methane powered vehicles were run in April and May of 2007. This is in violation of the current noise standard. Table 4.2-7 show measured noise levels up to 90 dBA Lmax. At the residence on Whittram Ave. I have measured levels up to 100 dBA Lmax and the resident has measured levels up to 110 dBA Lmax. This is a violation of the noise standards that were applicable to the Speedway at that time. I am not aware of an enforcement action taken by the County in response to these violations.

Section 4.2.2 Thresholds of Significance

They state that the 100 dBA Lmax equates to an EPA limit of 71.4 dBA Leq. This relationship is questionable at best and probably untrue. Their calculation of this relationship is based on assumptions regarding the duration of dragster runs and the number of runs per event which I believe may not be accurate. Leq is an average noise level for an extended period of time that can be calculated from a series of single events where the integrated energy level of the events is summed. This is not a trivial calculation. Also, they fail to quote a viable reference.

This section also shows the noise standard as 85 dBA Lmax. As stated above, the correct standard is 75 dBA Lmax for all events at the Speedway except 6 premiere racing events.

Section 4.2.3 Environmental Impacts

The SDEIR states that with the new standard, noise levels will remain the same. However, the new standard allows other racing vehicle classes to use the facility and assumes the new standard will allow an Lmax of 100 dBA at nearby residential areas. I do not believe their assertion is true, noise levels will increase and the new noise limit is excessive.

Page 4.2-14 -- In the present document (Appendix E) they calculated the relationship between the EPA Leq to the new standard Lmax of 100 dBA based on a variety of run and operation durations. This calculation is not clearly shown and I doubt the validity of the relationship.

This section contains several noise contours. I question the shape of these contours; they show attenuation where I do not believe it exists. The area around the track is completely flat and there should be no excess attenuation to the north except for very small areas behind one-story buildings. It may also be noted that the contours to the south are not affected by the grandstands on the south side of the oval track; there should be some attenuation beyond the grandstands.

A standard attenuation rate is 6 dB per doubling of distance. There are residents that live approximately 200 feet further north from the residence located on Whittram Avenue. If the noise level is 100 dBA Lmax at 550 feet from the Speedway property, the residents another 200 feet further north would experience maximum noise levels of 98.7 dBA (due to another 1.3 dB in noise attenuation). There are also schools located approximately .25 miles from the Speedway property. Noise at those locations would be attenuated by another 3.8 dB, resulting in a 96.2 dBA Lmax, still very loud, especially for elementary school students.

Page 4.2-24 -- They state that the residences on Whittram Ave. will experience a noise increase of 3 dBA. Changing from the present standard to the new one could result in an increase of 15 dBA, 85 dBA to 100 dBA Lmax during six premiere racing events and an increase of 25 dBA, 75 dBA to 100 dBA, for all other events.

Mitigation Measures

In a previous report I identified some mitigation measures that could be implemented to alleviate some or most of the noise impact from the drag strip. These are:

1) Homes in the area that are impacted by noise could be sound insulated and have air conditioning installed.

2) The drag strip could be relocated.

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3) A sound wall could be constructed on the north side of the drag strip. It is estimated that this wall would need to be at least 30 feet in height in order to provide significant attenuation. Exhibit I on Page 33 states that a ten foot wall next to the drag strip would alleviate noise impact at nearby residences, a wall of this height would only provide minimal attenuation so this statement is simply not true.

4) Exclusion of dragsters that generate excessive noise levels could alleviate some of the impact on the community.

5) Enforcement of the rule excluding non-gas powered dragsters could be a benefit.

Conclusions

It is obvious that this document is flawed. It is very long and difficult to absorb the misleading and inconsistent data and assertions. This document and the data that was gathered, even though done under flawed conditions must have had a dear cost. The proposed noise limit of 100 dBA Lmax is excessive and unnecessary.

Many of the findings presented above also apply to the Technical Noise Analysis in Appendix E of the Draft Subsequent EIR.

The most flagrant diversion from standard acoustical practices is the use of a Slow time constant in the measurement of the drag-strip events. This results in an inaccurate value for the maximum level of an impulsive event.

The drag strip in its current location creates a serious noise impact on the surrounding community. The mitigation measures listed above, all except number 2, would only reduce this impact, it would still be considered "Potentially Significant." As mentioned above, the drag strip creates noise events that are short-term or impulsive in nature. This type of noise is much more noticeable and intrusive. The residents in this area experience noise events that are similar for residents that live under jet aircraft passing directly overhead close to touchdown at an airport. Both of these types of locations are not pleasant.

Ron Brown

POSITION: Independent Consultant

RETIRED FROM WYLE: 1998

PRINCIPAL DUTIES AND RESPONSIBILITIES AT WYLE:

Project Management, consulting, and advisor for programs in acoustics and dynamics.

BACKGROUND:

Independent Consultant, Redondo Beach, CA (1998 to Present). Consultant to several acoustical engineering firms providing a variety of engineering services.

Wyle Laboratories, El Segundo, CA (1973 to 1998). Program Manager. Specialist in the acquisition, analysis, and investigation of noise and vibration associated with aircraft, ground transportation, and industrial sources. Performed noise measurements near highways, construction sites, and industrial sources at numerous locations throughout the United States over a period of more than 25 years. Program Manager of projects supporting FAR Part 150 noise studies at commercial airports, procurement of airport noise monitoring systems, evaluation of noise and sonic boom in military operations areas, community noise studies for power generation stations, and environmental noise studies for federal, state and local agencies. Developed procedures for measurement of sound attenuation of homes and schools for airport RSIP projects. Provided technical support to many Wyle programs involving environmental noise.

LTV Research Center, Anaheim, CA and Dallas, TX (1960 to 1973). Senior Scientist. Project engineer for the design, development, testing, and production of specialized acoustic and electronic systems. Principal projects included development of techniques for calibration of acoustic transducers; project engineer for the development of large data acquisition systems; development of electrostatic transducers, microphones, and systems for calibration, communication, and high-intensity sound production.

EDUCATION:

B.S., Physics, Long Beach State College, Long Beach, CA, 1960.
Graduate studies in electrical engineering at UCLA, Los Angeles, CA.

PROFESSIONAL MEMBERSHIPS:

Audio Engineering Society
Institute of Electrical and Electronic Engineers
Institute of Environmental Sciences

PUBLICATIONS:

Principal author of over 110 publications and reports.

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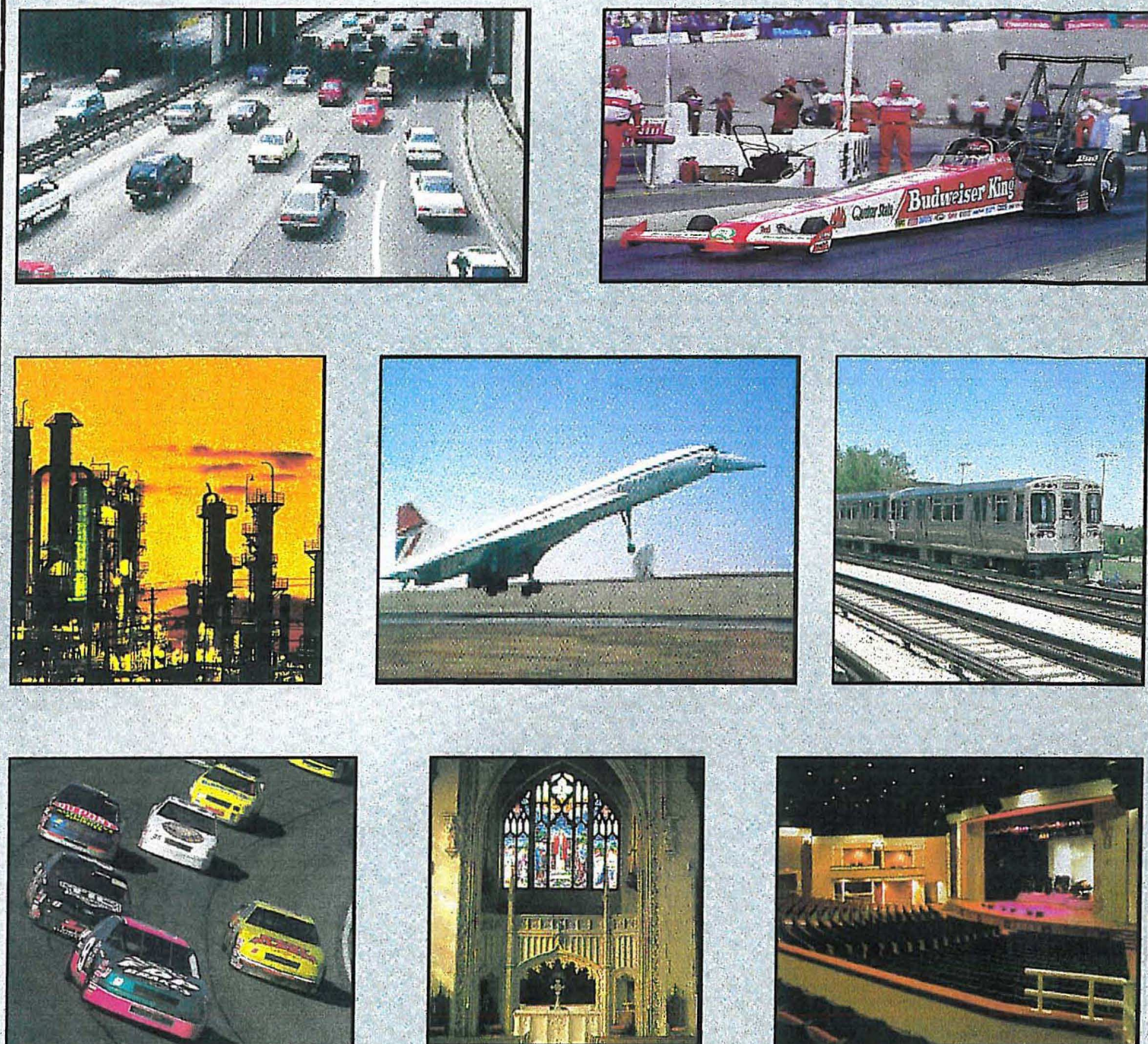
ATTACHMENT 8



AUTO CLUB DRAG STRIP NOISE STUDY

GORDON BRICKEN AND ASSOCIATES,

1621 EAST 17TH STREET, SUITE K
SANTA ANA, CALIFORNIA 92705-8518
714-835-0249

ACOUSTICAL AND ENERGY ENGINEERS

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TABLE 5

DESIGN SOUND LEVELS 50 FEET[1]

TYPE OF CAR	Lmax	L50	Leq
Alcohol Dragster/Funny Car	125	92	111
Pro-Stock/Super Stock/Comp Eliminator	118	103	105
Super Comp/Super Gas	117	104	104
Brackets	115	100	102
Unmuffled Stocks	113	98	100
Street Legal (Muffled)	109	94	96
Junior Dragsters (unmuffled)	102	87	87

(1) The data is based on samples taken at the Pomona International Raceway, Texas Motorplex, Byron Raceway, River City Raceway Immokalee Raceway over an eight year period.

5.3 SCHEDULES

The track schedules will vary from year to year. The full 2006 schedule is contained in Appendix 5. The summary is given in Table 6.

TABLE 6

SUMMARY OF ANNUAL SCHEDULES[1]

VEHICLE TYPE	SCHEDULED HOURS	TRACK HOURS
Alcohol Dragsters	4.5	0.3
Bracket Classes	180.0	72.0
Street Legal	225.0	113.5
Jr. Drags	72.0	24.0
Stocks	36.0	18.0
Annual Total	517.5	227.8

Scheduled hours are the total time the track is available for the event. Track time is the time the cars are actually on the track generating sound.

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6.0 SOUND LEVELS

6.1 MAXIMUM SOUND LEVELS

Three conditions were examined. They were the condition for an alcohol car, the representative worst case bracket car, and the worst case street legal car. In each case, a set of contours has been presented so as to clearly depict the area influence of the condition. The following Exhibits represent the results:

1. Exhibit 6 is the alcohol car.

The Speedway limit is 85 dBA. The level exceeds 85 dBA for a small area north of Whittram Avenue lying between Mulberry Avenue and Banana Avenue.

2. Exhibit 7 is the bracket car.

The Speedway limit is 85 dBA. The level exceeds 85 dBA for a small area north of the railroad tracks.

3. Exhibit 8 is the street legal car.

The Speedway limit is 85 dBA. The level exceeds 85 dBA only in the parking lot of the Speedway.

The alcohol car Exhibit (6) represents nearly any alcohol car. The bracket and street legal Exhibits (7 and 8) represent the worst case. Ninety-nine percent of all runs would be five dBA or more, less than the cases presented.

6.2 LEVEL EXCEEDED MORE THAN 30 MINUTES IN AN HOUR

The level exceeded more than 30 minutes in an hour is called the L50 level. Three conditions were examined. They were the condition for an alcohol car, the representative worst case bracket car, and the worst case street legal car. In each case, a set of contours has been presented so as to clearly depict the area influence of the condition. The following Exhibits represent the results:

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1. Exhibit 9 is the alcohol car run for at least one hour.

The Speedway limit is 65 dBA. The level exceeds 65 dBA for a small area north of Whittram Avenue lying between Mulberry Avenue and Banana Avenue. This is basically the same area defined by the maximum noise contour.

2. Exhibit 10 is bracket car runs.

The Speedway limit is 65 dBA. The level exceeds 65 dBA for essentially the entire area north of Whittram Avenue to Arrow Highway between Cottonwood Avenue and Cherry Avenue and a small area east of Cherry Avenue.

3. Exhibit 11 is the street legal car.

The Speedway limit is 65 dBA. The level exceeds 65 dBA for a small area just north of Whittram Avenue between Mulberry Avenue and Banana Avenue.

6.3 CNEL LEVEL

The average daily CNEL is computed using the Leq data from Table 5 along with the schedule data from Table 6. The contours are shown on Exhibit 12. The Land Use Compatibility definition of impact for residential uses is 65 dBA CNEL. The 65 dBA CNEL contour is just slightly north of the railroad tracks.

7.0 ASSESSMENT OF IMPACT

Inspection of the Exhibits results in three observations:

1. Only the alcohol car produces sufficiently high maximum levels to result in areas north of Whittram Avenue exceeding the 85 dBA Speedway sound limit. The area affected is confined to a small area between Mulberry and Banana Avenues. This area contains an industrial use, vacant land, and a few houses.

2. The alcohol car and bracket car have L50 levels which exceed 65 dBA L50, but the alcohol car affects about the same area as does its maximum sound level. The bracket car covers a much larger area with a

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large number of residential and industrial uses.

3. The combined drag strip operation produces an average daily CNEL that is less than the Land Use Compatibility criteria of 65 dBA CNEL for residential, commercial, and industrial uses.

8.0 MITIGATION

There are several approaches that can be employed in deciding the future of the drag strip proposal. They are as follows:

1. Add sound walls to the track. This option was examined by increasing the height on the north side to 25 feet in some manner. This results in an added six dBA noise reduction at Whittram Avenue. This would bring the alcohol cars into compliance with the speedway limits and the bracket car maximum level within speedway limits. It would not produce compliance with the L50 condition for the bracket cars.

2. Move the drag strip. This has no practical effect as long as it is on the north side of the speedway.

3. Alter the number of runs. This would not produce compliance with the speedway limits with any practical adjustments short of elimination of classes of cars.

4. Limit the days of operation. This is a version of altering schedules and would not affect compliance.

5. Reexamine the limits.

Item 5 is probably to most workable solution. The various issues regarding regulation, including the question of the future development of the San Sevaine Redevelopment area is contained in Appendix 6. The conclusion of the discussion is that the objectives of the Speedway and the County would be better served by adopting a single definition of impact based on the Community Noise Equivalent Level (CNEL) and create a short-term limit that is easily measured and insures compliance with the average daily CNEL limit based on 365 days of operation. The limit would be 85 dBA Leq at 800 feet as measured at a point at the curb line of the north side of Whittram Avenue.

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TABLE A6-3

NOISE LEVELS AT 1,000 FEET WITH NO SOUND BARRIERS DIFFERENT OPERATIONAL SCENARIOS (1)

TYPE OF CAR	HOURLY OPERATIONS	DAILY HOURS	ANNUAL DAYS	NOISE LEVEL CNEL	Lmax	L50
Bracket	120	8	1	46	84	69
		8	10	56	84	69
		8	30	61	84	69
Alcohol	16	2	1	44	98	74
			10	54	98	74
			30	59	98	74

(1) The bracket car is assumed at 115 dBA at 50 feet and alcohol car is assumed at 125 dBA at 50 feet.

The example illustrates that neither car type exceeds the most restrictive Land Use Compatibility limit of 65 dBA CNEL. However, the alcohol car does exceed the limits of 85 dBA Lmax and 65 dBA L50. The bracket car would exceed the L50 limit of 65 dBA CNEL. Neither car type exceeds the CNEL limit of 65 dBA. Even if the CNEL numbers of the alcohol and bracket cars were combined, as would occur in a typical year of operations, the total would not exceed 60 dBA CNEL in this example. The CNEL level will usually result in a smaller difference with the allowed noise criteria than the Noise Ordinance.

5.0 SOME PRACTICAL CONSIDERATIONS

The drag strip will be located on the north side of the Speedway oval. The Speedway is situated in the San Sevaine Redevelopment area. The area was designated based on the blighted industrial uses, notably the Kaiser Steel plant. The object is to encourage new development and improve the infrastructure. The California Speedway occupies a portion of the old Kaiser facility and was the first major redevelopment project for this area.

The nearest affected land uses are the area north of Whittram Avenue to Arrow Highway and the area east of Cherry Avenue. Both locations feature a combination of residential, commercial and industrial land uses and the uses are mixed together in the area. The residential or commercial use at one location would be judged differently than an adjacent industrial use as to noise impact because there are different limits. However, a larger problem is the direction that public policy will take relative to the existing land uses. A person that develops a new use on a parcel must comply with the County's Land Use Compatibility

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criteria. This means that the site must be mitigated to the allowed limits as expressed in CNEL terms. In Table A6-2, the Land Use Compatibility would impose less of a burden for mitigation of highway and railroad noise than the Speedway noise limits. This condition would result in permitting more sensitive land uses while potentially threatening the viability of the drag strip operation.

Looked at another way, the alternate scenario is that the area might be pushed toward industrial development and push out residential uses since the industrial limits are higher.

7.0 ADDRESSING THE PROBLEM

The answer to the problem of two noise standards and uniform enforcement in the redevelopment area is to even the playing field so to speak and adopt a single methodology standard for the track and the other uses for the San Sevaine Redevelopment area. The standard should follow the conventional Land Use Compatibility criteria based on the CNEL metric, but be adjusted so that a measure is developed that can be used during racing events but which will be equivalent to the average daily CNEL for the track.

ATTACHMENT 9

South Coast
Air Quality Management District
21865 Copley Drive, Diamond Bar, CA 91765-4178
(909) 396-2000 · www.aqmd.gov

June 4, 2009

Mr. and Mrs. Salvador Lopez
13932 Whittram Avenue
Fontana, CA 92335

Dear Mr. and Mrs. Lopez:

During the public comment period at the March 6, 2009, meeting of the South Coast Air Quality Management District (AQMD) Governing Board, you expressed concerns about possible air quality impacts of drag racing activities at the California Speedway on local residents.

In response to these concerns, AQMD staff have since conducted an inspection sweep, surveillance, and sampling activities in the vicinity of these alleged sources. The purpose of this letter is to provide you with an overview of these activities and their respective findings.

- **Inspection sweep**

  March 19 - April 3, 2009: AQMD inspectors conducted an inspection sweep within a two-mile radius of your residence. During this sweep the inspectors identified and inspected about 200 industrial sources to determine which, if any, might be possible odor sources. None of these sources were emitting odors at the time of inspection. Although six industrial sources were determined to have some potential for generating odor emissions, the fact that they were located more than a mile from your neighborhood ruled them out as likely contributors to the odors previously reported.

- **Surveillance**

  March 14-15, 2009: An AQMD inspector conducted weekend surveillance in your area every half hour for 10 hours per day. Drag racing activities took place both days. The inspector observed white smoke but no opacity violations when the cars burned rubber at the start of each race. No idling trucks were observed anywhere in the immediate vicinity at any time during the surveillance period. On several occasions, the inspector observed train cars coupling and uncoupling on a rail spur next to the Speedway, but at no time did she observe trains idling at this location. The inspector detected odors at the drag strip, the train spur, near the property line of the Speedway, and down the street from your residence, but not at your residence itself. On Sunday, the inspector traced a strong burning rubber odor to a local business burning metal and rubber in a container approximately a quarter mile from your location, but AQMD received no odor complaints about this or any other odor incident on either day.

- **Sampling activities**

  - **Deposition plate sampling**

    March 10 - 17, 2009: AQMD staff placed deposition plates at your residence, just north of the California Speedway. These glass plates were collected by AQMD staff on March 18, 2009, and, consistent with findings from plates collected in other areas near roadways with diesel truck traffic, rubber particles were found to be major components. It was not possible to determine whether the rubber particles were from racing vehicle tires or from nearby road traffic.

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Mr. and Mrs. Salvador Lopez -2- June 4, 2009

■ **High-volume PM10[1] sampling**

March 11 & 14, 2009: High-volume PM10 samplers were used to take two 24-hour samples at your residence. These samples were analyzed for PM10 mass and elemental carbon. Elemental carbon (EC) is considered an indicator of diesel exhaust as well as tire wear, but may also be emitted from more exotic racing fuels and engines. The first 24-hour sample was taken on March 11, 2009, a day with no known racing activity; the second 24-hour sample was taken on March 14, a day with drag racing activity. Both samples were compared to concurrent samples taken at the AQMD Fontana Air Monitoring Station (AMS) about half a mile NE of your residence and farther away from the drag strip at the Speedway. Results are shown below:

Date/Activity	Sample Location	PM10 Mass[2]	Elemental Carbon (EC) Mass[3]
March 11, 2009 No known racing activity	Residence	47 ug/m^3	2.1 ug/m^3
	Fontana AMS	48 ug/m^3	2.0 ug/m^3
March 14, 2009 Drag racing activity	Residence	35 ug/m^3	1.0 ug/m^3
	Fontana AMS	57 ug/m^3	2.1 ug/m^3

On March 11, 2009, the day with no known racing activity, the results from samples taken at your residence and the Fontana AMS were very similar in mass for PM10 (47 vs. 48 ug/m^3) and EC (2.1 vs. 2.0 ug/m^3).

On March 14, 2009, the day with drag racing activity, the sample taken at the Fontana AMS showed higher mass levels of PM10 (57 vs. 35 ug/m^3) and EC (2.1 vs. 1.0 ug/m^3) than at your residence. While the flow rate of the sampler at your residence was outside of specifications that day, the resulting data are still useful for comparison purposes. The levels of PM10 and EC mass found at both sites on both sampling days are within the expected range of concentrations observed in Southern California. It was not possible to determine any specific impacts from the Speedway in these samples.

■ **Grab sampling**

March 14-15, 2009: While racing activities were underway at the Speedway, an inspector collected grab samples at four locations around the drag strip, including a sample collected 160 feet east of your residence. Analyses of three of the four grab samples showed air toxic organic gas levels typical of ambient air in Southern California, without any specific influence of the Speedway. The fourth sample, collected immediately adjacent to the east end of the drag strip and downwind of racing activity, showed higher levels of certain hydrocarbons including toluene (73.1 ppb[4]). The elevated concentrations are likely attributable to racing vehicle exhaust, but were not found in the other samples taken elsewhere in the community.

April 3, 2009: Late in the afternoon, you contacted AQMD to advise us that you had collected two consecutive grab samples at your residence. The canisters were retrieved by AQMD staff and submitted to the AQMD Laboratory for analysis. Both samples showed moderately elevated levels of hydrocarbons, but also showed very high and unusual levels of methanol (4.9 and 32 ppm[5]). According to the California Office of Environmental Health Hazard Assessment (CA-OEHHA), the Reference Exposure Level (REL) for an acute (one hour) exposure to methanol is 21 ppm; the REL for a chronic (several years) exposure to methanol is

[1] PM10: Fine particulate matter less than 10 microns in diameter
[2] Measured in micrograms per cubic meter (ug/m^3)
[3] Measured in micrograms per cubic meter (ug/m^3)
[4] ppb: Parts per billion
[5] ppm: Parts per million

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Mr. and Mrs. Salvador Lopez -3- June 4, 2009

3 ppm. The RELs are set to be protective of health impacts with a margin of safety. These findings do not necessarily mean that adverse effects will occur, but they do raise concern for exposures and call for additional investigation on the ambient levels and potential sources of methanol at the location(s) where samples were taken and elsewhere, which are already underway.

<u>April 17 & 18, 2009</u>: You contacted AQMD to advise us that you had collected two additional grab samples at your residence. These canisters were also collected by AQMD staff and submitted to the AQMD Laboratory for analysis. The sample collected on April 17 showed levels of air toxic organic gases typical of ambient air in Southern California. The sample collected on April 18 showed moderately elevated levels of hydrocarbons, including MTBE (Methyl Tertiary Butyl Ether) and toluene. The analysis of both of these samples also found detectable levels of chloro-fluoro-alkanes, species that are not normally found in ambient air.

Based on these sample findings, we can conclude the following:

- On the days we sampled, it was not possible to distinguish the California Speedway as a unique contributor to:
  - PM10 mass or EC mass concentrations found in high-volume samples.
  - Rubber particles found on deposition plates.
- While grab samples taken closer to the Speedway on racing days show somewhat elevated concentrations of certain hydrocarbons, those same hydrocarbons appear in smaller, more typical, concentrations, if at all, farther away from racing activities at the drag strip.

As indicated above, we are actively pursuing an investigation of ambient levels and sources of methanol based on findings from the grab samples you indicated had been taken at your residence on April 3, 2009. We will be pleased to share the outcome of this investigation with you upon its conclusion. In the meantime, if you have any further questions regarding our sampling and analysis activities, please contact Dr. Philip Fine (909-396-2239).

Sincerely,

Mohsen Nazemi, P.E.
Deputy Executive Officer
Engineering & Compliance

MN:CLS

cc: Dr. Barry R. Wallerstein
Dr. Chung Liu
Dr. Anupom Ganguli
Dr. Cher Snyder
Dr. Philip Fine

ATTACHMENT 10

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Martin and Multistack Team Look To Extend The Streak In Fontana

Fontana, Calif. – When 29-year old, second generation drag racer Will Martin straps into his low 7-second, 190 mile per hour Jam-Air Motorsports MULTISTACK / PROLONG Blown Alcohol Funny Car this weekend at Auto Club Dragway in Fontana, Calif., he will seek to extend an impressive eight-consecutive round winning streak during the NHRA Heritage Series second event of the 2010 season.

The reigning NHRA Heritage Series 7.0 Pro Series Champion enters this event coming off of an impressive wire-to-wire victory, where he qualified number one and captured the event title at the 52nd running of the NHRA March Meet, contested last month in Bakersfield, Calif. A victory at the 2009 season ending NHRA Hot Rod Reunion has given the driver from San Dimas, Calif. a streak he believes is possible to extend.

"Our car is running exceptionally well right now," noted Martin whose father John is a former NHRA Fuel Funny Car Champion in his own right. "Geoff Monise, Jeff Pepin, Scott Franklin, Dan Holloway, our crew chief Howard Mazei and Dad have this car set on "KILL". After we qualified number one and took the win at the historic March Meet, we felt like we were on to something special. We'd love to end up this weekend with four round wins and another trophy."

Martin's win in Bakersfield last month was also due to help provided by one of his racing team mates. NHRA A/Fuel Dragster driver Johnny Ahten, who along with Martin is a client of CRX Media, provided a set of Goodyear tires to the MULTISTACK / Prolong Super Lubricants sponsored team after a problem with their current tires appeared after the first qualifying effort. The results were good enough for Martin as he has a new set of Goodyear Tires ready for this weekend's home-track race.

"I'm excited to race at home in front of my friends and family this weekend in Fontana. We're going to kick off the race in

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Home Page

style by setting up our Jam-Air Motorsports MULTISTACK / PROLONG Alcohol Funny Car at The Lamplighter Inn in San Bernardino, on Thursday April 22nd between 6:30-8:30pm. We would like all our friends, family and fans come and support our team this weekend at Fontana. It's a great track which we've never raced at, but I think our guys will fine-tune this wicked running flopper to another NHRA Heritage Series 7.0 event title."

Next Event: April 23-25 NHRA Heritage Series Sportsman Shootout - Fontana, CA

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Responses to Letter No. 1: Chatten-Brown & Carstens

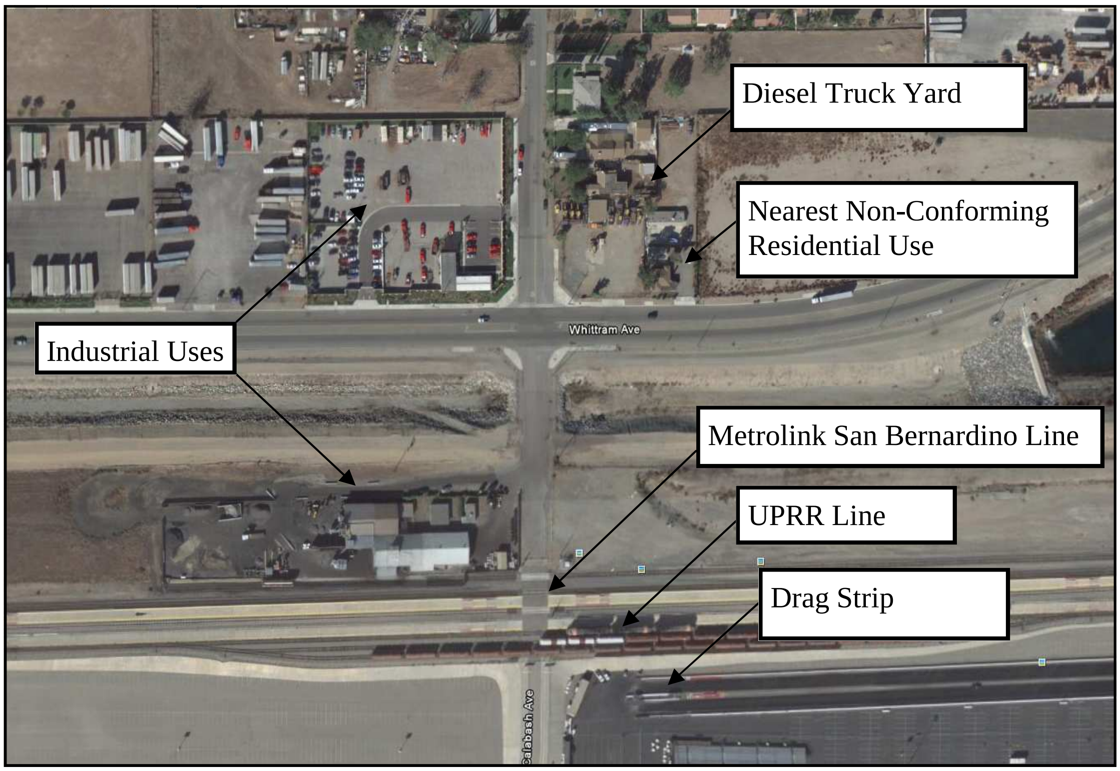
1-1. This letter is from Chatten-Brown & Carstens on behalf of the Concerned Community Members and Parents of Redwood Elementary School Students (CCoMPRESS). This comment provides introductory remarks and a partially accurate project description (see response below).

The proposed project, as described in the comment letter, does include a revision to noise standards for the Auto Club Speedway (Speedway), permanent operation of a drag strip on the north side of the Speedway property, elimination of a prohibition against race activities in Parking Lot Nos. 3-10, and an amendment of the San Bernardino County General Plan Hazard Overlay Maps to include noise contours for the Speedway. However, the remaining characterization of the proposed project and its surrounding environs as set forth in the comment letter is inaccurate. As described in *Section 2.0 Environmental Setting* of the Recirculated Draft Subsequent Environmental Impact Report (RDSEIR), the Speedway is located within the San Sevaine Redevelopment Area in an area planned and zoned as Community Industrial (IC). The Speedway, which is located on the site of the former Kaiser Fontana steel mill, is within an area that has long been devoted to heavy industrial use, currently including California Steel Industries (CSI), West Valley Material Recovery Facility (WVMRF), truck sales and service facilities, and warehouse/distribution uses within the Kaiser Commerce Center Specific Plan (KCCSP). The CSI facilities, formerly part of the Kaiser Steel operation, are located to the south. West of the Speedway is the WVMRF and the KCCSP area. Each of these uses generates significant truck traffic and CSI, which is a steel rolling mill, is a heavy rail user.

As shown in Figure 2-4, *Existing Land Use*, of the RDSEIR, properties to the north, beyond the Union Pacific Railroad (UPR) and its switching area, which forms the northern boundary of the Speedway, are generally industrial in nature. A Metrolink stop, occasionally used for special events (when needed), is located adjacent to the Speedway at the railroad tracks. Farther to the north, between Whittram Avenue (approximately 530 feet north of the Speedway's northern boundary) and Arrow Highway (approximately 2,100 feet north of the Speedway northern boundary), is a mixture of industrial uses and some non-conforming residences located within the IC zone within the County and the City of Fontana. Many of the residences are located on deep lots in this area that also contain light industrial uses.

The nearest residence to the Speedway Planned Development (PD) is planned and zoned IC and, pursuant to the County Development Code, is considered to be a legal, non-conforming use. This residence is located approximately 570 feet north of the Speedway PD property line, northeast of the intersection of Whittram Avenue and Calabash Avenue, adjacent to a diesel truck yard, which is a permitted use within the IC zone. This non-conforming residence is depicted in the aerial photograph below.

Industrial General Plan and zoning designations extend for a minimum of 1,350 feet surrounding the Speedway. The closest residence located in areas zoned for residential uses are located approximately 1,500 feet east of the Speedway PD, east of Redwood Avenue. The closest residences located in areas planned and zoned for residential uses to the north are located just south of Arrow Highway approximately 1,700 feet directly north of the Speedway and 1,350 northeast of the Speedway. The schools closest to the Speedway include Redwood Elementary School to the northeast (0.25 mile[1]), Almond Elementary School to the north (0.75 mile), Beech Avenue Elementary School to the east (1.0 mile), Live Oak Elementary School to the east (0.25 mile), and Sequoia Middle School to the east (0.8 mile). The Etiwanda School District and the Chaffey Joint Union High School District serve the areas west of the Speedway. There are no schools identified west of the Speedway. The closest churches are the Living Waters Church located on Arrow Highway approximately 2,000 feet north of the Speedway and the Jehovah's Witness Kingdom Hall approximately 2,600 feet east of the Speedway. A third church, Ministeros Tesoro Escondido, is located approximately 4,125 feet northeast of the drag strip starting line for the Speedway.



As stated, the Speedway is located within the San Sevaine Redevelopment Area. Figure 2-6, *San Sevaine Redevelopment Project Area* of the RDSEIR, shows the boundaries of the San Sevaine Redevelopment Area which generally extend from the Speedway facility boundary approximately 1,500 feet to the north 1,225 feet to the east, over one mile to the south and at least 2,500 feet to the west. The San Sevaine Redevelopment Plan incorporates a variety of goals, objectives, and policies, including the following:

- <u>Elimination of</u> blight and the correction of environmental deficiencies in the Project Area inclusive of the Original Area and the Added Area, including, among others, buildings in which it is unsafe or unhealthy for persons to live or work, <u>incompatible</u> and uneconomic <u>land uses</u>, and high crime rates;

[1] All measurements are estimated to the closest point of the Speedway's property line. The actual distance from the drag strip starting line to the closest school, Redwood Elementary, is approximately 0.9 mile.

- Elimination of substandard buildings and those that conflict with uses in the General Plan and the applicable County standards and guidelines;
- Facilitation and recapture of industrial growth and commercial sales activity; and
- Encouragement of business park, industrial, research and development, and office types of uses. (emphasis added)

Discontinuing non-conforming uses that are incompatible with the primarily industrial character of the redevelopment area, particularly in light of the existing noise levels including maximum noise levels reaching 116 dBA Lmax from sources other than the Speedway, is consistent with the goals of the San Sevaine Redevelopment Plan. Another redevelopment goal is the elimination of inconsistent buildings because they conflict with the General Plan (Amended and Restated Redevelopment Plan San Sevaine Redevelopment Project. Rosenow Spevacek Group, Inc., Pages 3-5. October 2004).

The County's General Plan includes a discussion of the IC land use designation. Specifically, it states that its purpose is "to identify and establish areas suited to industrial activities; to provide opportunities for the concentration of industrial uses to enable efficient use of transportation, circulation and energy facilities; and to protect adjacent land uses from harmful influences, as well as to prevent the intrusion of incompatible uses into industrial areas” (County of San Bernardino General Plan Page II-17. April 2007).

Locational criteria for the IC designation include "areas of existing industrial uses; areas that are or can be adequately buffered from adjacent uses in other land use categories; and areas where industrial traffic is not routed through residential or other areas not compatible with industrial traffic" (County of San Bernardino General Plan Page II-17. April 2007).

Residential uses, except caretaker or accessory residential uses (one per legally created parcel), are not permitted in the IC District.

The General Plan's Land Use Goal 4 states: "The unincorporated areas within the County will be sufficiently served by industrial land uses." Policy LU 4.1 is to "Protect areas best suited for industrial uses by virtue of their location and other criteria from residential and other incompatible uses" (County of San Bernardino General Plan Page II-32. April 2007).

Because industrial activities are impacted by incompatible residential uses when they encroach into areas designated for industrial use, the presence of residences within an IC land use designation is contrary to General Plan policy, and impacts the County's ability to implement its General Plan. Legal non-conforming residences within the industrial land use designations surrounding the Speedway are already subjected to the industrial impacts that exist in the area, including high noise levels and odors from industrial uses. While the County’s Development Code provides protection for residential uses from high noise levels and other nuisances, County General Plan Policy and the San Sevaine Redevelopment project aim to provide industrial activities within the Community Industrial land use designation with adequate buffer areas so that industrial uses can operate without having to conform to residential standards. As the comment letter correctly states in Comment 1-56, the County’s Development Code “does discourage the long-term continuance of legal non-conforming uses…”

As shown in Figure 4.2-9, *Lmax Noise Contours- A-Dragster With Wall* of the RDSEIR, even with the loudest vehicle racing at the drag strip, noise levels beyond the San Sevaine Redevelopment Area, including residential zoned areas, would be anticipated to experience noise levels of 75 dBA Lmax and less with the proposed sound wall. Noise levels within the San Sevaine Redevelopment Area would be consistent with the industrial standards otherwise allowed in the IC zone (90dBA Lmax).

1-2. This comment asserts that the Speedway would result in noise impacts detrimental to community health including hearing loss, cardiovascular health, mental health, societal well being, and child development.

The 1995 Speedway PD established development and operational standards and allows a maximum noise level of 85 dBA measured at the nearest residential use during six premier race event weekends annually. The United States Environmental Protection Agency's (EPA) noise standards have shown that the EPA has promulgated criteria recommending an average noise level to protect a community from hearing loss, as a function of the duration of exposure during each year for a 40-year period. EPA's recommended average annual noise level to protect the community from hearing loss is 71.4 dBA Leq.

Based on noise monitoring conducted at the Speedway property line, the EPA threshold will be met if a maximum level of 100 dBA measured at 550 feet from the property line is not exceeded. Therefore, if 100 dBA Lmax is set as the maximum standard, EPA health-based criteria would be met, which is the most stringent of the standards surveyed. By limiting noise to the equivalent levels recommended by EPA, residents exposed to sound generated by the Speedway would not be expected to experience hearing loss. Thus, the proposed noise standard would adhere to federal guidelines regarding maximum noise levels to prevent hearing loss. Further, the proposed noise standard evaluated in the RDSEIR limits the occurrence of noise levels reaching 100 dBA Lmax (measured at 550 feet from the Speedway property line) to 35 days per year for a cumulative total of 60 minutes in any single day, and only between the hours of 10 AM and 7 PM. In addition, Mitigation Measure 4.2-1 was added in the RDSEIR to require construction of a 20 foot high sound attenuation wall along the northern boundary of the drag strip. This noise attenuation wall would provide approximately 9 to 10 dBA of attenuation. Even with mitigation, levels of worst-case noise impacts would still exceed 85 dBA Lmax at the closest receptor up to 35 days per year, which has been identified in the RDSEIR as a significant and unavoidable impact.

Regarding the other community health issues raised in the comment letter (cardiovascular, mental health, etc.), please note that the nearest residential units that would experience noise levels above 75 dBA Lmax, which is the current PD standard for residential uses for non-premier events, are legal non-conforming uses located within the San Sevaine Redevelopment area, which is planned and zoned for industrial uses. Industrial land use and zoning designations extend outward from the Speedway in all directions for a minimum of 1,350 feet. Ambient conditions in the vicinity of the Speedway consistently produce noise levels in excess of residential noise standards and the noise levels proposed to be generated by the Speedway on a regular basis. As discussed in the RDSEIR, ambient noise levels near the Speedway and at the residences closest to the Speedway are generated by railroad activity along the UPR rail line on the northern side of the Speedway; traffic noise (including a large number of trucks) on nearby streets; stationary noise from nearby industrial and commercial operations; and other non-Speedway related activities. As monitored in 2006, these non-Speedway sources also generated noise levels in excess of 110 dBA and up to 116 dBA Lmax without operation of the Speedway at various locations, including those located 550 feet and more from the Speedway property line. See RDSEIR, Table 4.2-5. It is likely that residents living within the industrially zoned area experience the effects cited in the comment letter without the Speedway in operation, demonstrating that residential uses are incompatible within the IC land use designation surrounding the Speedway. The County's standard for Lmax levels within industrial areas is 90 dBA versus the 75 dBA Lmax standard for residential uses.

Noise monitoring of ambient conditions in the vicinity of the Speedway has demonstrated that while the industrial noise standard is generally met, the residential standard is consistently exceeded. Even so, the RDSEIR did acknowledge that the proposed project would result in significant nuisance noise, defined as maximum noise levels in excess of the levels found by the Board of Supervisors to be acceptable as documented in the Statement of Overriding Considerations for the 1995 Speedway PD EIR.

See Response 1-52 for a standard agreed to by the Speedway to further restrict noise levels. The exposure limits for noise levels between 75 and 85 dBA Lmax are consistent with the recommendations set forth by the United States Department of Health Services National Institute of Safety and Health (NIOSH) and referred to in Attachment 4 to this comment letter, while the exposure limits for noise levels above 85 dBA Lmax are well below NIOSH recommendations. A Technical Review of Health Effects Study (Attachment 2) was prepared to address the potential for the proposed project to result in health effects. As demonstrated in that report, the noise doses experienced at the closest sensitive receptor, closest conforming residence and closest educational facility (Redwood Elementary) were below the NIOSH recommended exposure level. Responses 1-11 through 1-22 provide additional detail.

The comment also incorrectly infers that the proposed project will result in detrimental effects to the well-being of school children at bedtime, in school and in religious services. The proposed project with its proposed mitigation complies with the existing County Noise standard (Development Code § 83.01.080) at sensitive receptors (i.e., schools and churches). In response to this comment being raised on the previous DSEIR, an evaluation of the noise impacts that will result at schools and churches was presented in the RDSEIR (Figures 4.2-4 through 4.2-10, 6-2 and 6-3). As shown, in Figure 4.2-9 of the RDSEIR, all schools would be located outside of the 75 dBA Lmax contour even when the loudest vehicle class capable of reaching 100 dBA Lmax (measured 550 feet from the Speedway property line) is run with incorporation of Mitigation Measure 4.2-1 (noise attenuation wall). Thus, the neighboring schools would not experience peak noise levels of 85 dBA Lmax or even 75 dBA Lmax for that matter. Further, please see Comment Letter E, included in Appendix G of the RDSEIR from the Fontana Unified School District. Superintendent Olsen-Binks indicated that Almond Elementary and Redwood Elementary Schools have never experienced interruptions to their instructional programs from Speedway-generated noise. Although Live Oak Elementary School is not specifically mentioned in Superintendent Olsen-Binks' letter, it is the furthest school from the drag strip, located over 7,000 feet from the starting line of the drag strip and well beyond the 75 dBA Lmax contours. Comment Letter 14 to the RDSEIR is from the Principal of Redwood Elementary and confirms that the Speedway operations have not been a source of concern for the school. That letter further elaborates that the closest residential use does not have children at Redwood Elementary School and that CCoMPRESS does not represent their school or their Parent Teacher Association.

Noise levels at the two churches nearest the Speedway -- the Jehovah's Witness Kingdom Hall located 2600 feet east of the proposed project and the Living Waters Church located on the corner of Arrow Highway and Mulberry Avenue 2,000 feet from the Speedway– were also evaluated in the RDSEIR[2]. Mitigation Measure 4.2-1 was added to the RDSEIR requiring construction of a sound attenuation wall to reduce nuisance noise by 9 to 10 dBA. As shown in Figure 4.2-9, during events with a vehicle capable of producing 100 dBA Lmax at 550 feet from the Speedway boundary, the Living Waters Church would be located beyond the 75 dBA Lmax contour, with incorporation of a noise attenuation wall as a mitigation measure. The Jehovah's Witness Kingdom Hall is also outside of the 75 dBA

[2] A third church, Ministerios Tesoro Escondidos, located at 8430 Cherry Avenue, north of Arrow Highway, approximately 4,125 feet from the drag strip starting line, is well outside the 75 dBA Lmax contours.

contour. Therefore, with incorporation of the proposed mitigation (sound attenuation wall), schools and churches would not experience noise in excess of the County's existing noise standard nor any significant nuisance noise, defined in the RDSEIR as noise levels in excess of the levels found by the Board of Supervisors to be acceptable as documented in the Statement of Overriding Considerations for the 1995 Speedway PD EIR.

Regarding evening noise, the proposed standard would limit peak noise levels between 85 and 100 dBA Lmax as measured at 550 feet from the Speedway property line to a maximum cumulative time period of one hour per day for a maximum of 35 days per year. The proposed noise standards would further limit the production of peak noise levels between 85 and 100 dBA Lmax to the hours from 10 AM to 7 PM on those 35 days. Peak noise levels above 100 dBA Lmax measured at 550 feet from the Speedway boundary would be prohibited at all times. It is noted that ambient noise conditions without the Speedway operations have resulted in peak noise levels exceeding 110 dBA within areas surrounding the Speedway. See RDSEIR, Table 4.2-5.

1-3 This comment provides summary remarks asserting that the proposed project would result in noise, air quality, land use, water quality, hazard and hazardous materials, environmental justice, and public service impacts. Additionally this comment asserts that there are feasible mitigation measures and alternatives.

These comments are all expanded upon in subsequent portions of this letter and will be addressed in detail in the following responses: Noise (Responses 1-2, 1-10 through 35); Air Quality (Responses 1-36 through 1-42); Land Use (Responses 1-33 and 1-46); Water Quality (Response 1-47); Hazards (Response1-48); Environmental Justice (Response 1-49); Public Services (Response 1-50); and Mitigation Measures and Alternatives (Response 1-51 through 1-52, and 1-56 through 1-62).

1-4 This comment incorrectly states that the County has allowed the Speedway to operate the drag strip in violation of state environmental laws for four years. The full history of the Speedway's approvals is provided in *Section 2.2, Project Background*, of the RDSEIR, and is repeated below. As shown in the RDSEIR, the Speedway operated in accordance with its approvals. The PD was approved by the County Board of Supervisors on May 2, 1995, following certification of the EIR (SCH No. 94082080) for the Speedway. The PD established a master plan for a motor sports-oriented events center with a maximum capacity of 107,000 persons (subsequently expanded to 110,000 persons) and a total grandstand seating capacity of 93,880 persons (which was also subsequently expanded). A 50-acre business park was also proposed, along with a Metrolink station to be developed at some future phase. The Metrolink station, although proposed, was not analyzed in detail in the 1995 EIR. The approved business park was not developed, and the area intended for that use has been used as part of the Speedway's parking area. The Speedway PD established development and operational standards for the Speedway. The County noise standard was also revised specifically for the PD in 1995 to allow higher noise levels associated with Speedway use and set a maximum noise level of 85 dBA measured at the nearest residential use during six premier event weekends[3]. The 1995 Final EIR for the

[3] When Revision 4 to the Speedway PD, which redefined the operations occurring at the Speedway facilities to be all part of the Speedway Event Center, was approved in 2003, both the County and the Speedway intended that Revision 4 would eliminate references to "premier weekends," creating a year-round event center with a single set of PD noise standards that would apply to all events at the Speedway Event Center. Specifically, both the County and Speedway intended Revision 4 to establish the noise standards for all activities at the Speedway as 85 dBA Lmax and 65 dBA L_{50}. With the adoption of Revision 4 in 2003, the Speedway Event Center operated activities under this single PD noise standard. However, in October 2009, the Court's tentative ruling found that the Speedway-specific noise standards contained in the Speedway PD

Speedway PD identified potentially significant unavoidable adverse impacts to air quality, traffic, and noise.

The Speedway PD Final Development Plan included a two (2)-mile tri-oval race track with grandstand seating for 67,880 people, infield facilities with a pit area, infield suites, auxiliary garages, fuel island, training road course, gate houses, ticket offices, VIP suites, administration office building, maintenance building, two helistops, race control tower, scoring pylons, internal billboards, kitchen/commissary facility, first aid stations, retail midway, gift shops, restrooms, concessions, parking for grandstand seating, VIP/press, employees and recreation vehicles (RVs), and paved access from Cherry, Whittram, and Etiwanda Avenues. The first race was held on June 22, 1997, with approximately 80,000 people in attendance.

On November 12, 1997, the County approved an expansion of the grandstand seating from 67,880 to 71,000 seats, relocation of the VIP helistop, and construction of a scoring pylon adjacent to the pit row, a fuel station, and various other support structures.

On December 18, 1997, the County approved an expansion of the grandstand seating from 71,000 to 87,000 seats, of which 86,790 seats were actually constructed. A number of revisions to the Speedway's PD permit have been approved and implemented since then. These include:

Revision 1 (March 2001-Added Seats, Removed Business Park) – This revision added 5,875 seats to increase grandstand seating from 86,790 to 92,665 seats and added a new elevator tower, restroom buildings, and concession building. It also converted temporary Parking Lot Nos. 4, 5, and 6 into permanent parking lots and established a new off-site overflow grass parking lot/community soccer fields for a total parking capacity of 36,866 spaces. The planned retail business park was eliminated with this revision. An additional 1,215 seats were also proposed for a maximum patron occupancy of 93,880 seats. This revision was approved on March 13, 2001.

Revision 2 (May 2001-NHRA Drag Strip) – This revision expanded operations to include National Hot Rod Association (NHRA)-sponsored drag racing (street legal cars) on a drag strip located in the Speedway's south Parking Lot No. 1 and a temporary grandstand of 1,500 seats. This revision was approved on May 22, 2001.

Revision 4 (April 2003-Time, Lights, Sound Attenuation, Parking) – This revision renamed the facility the California Speedway Event Center, extended event operations to 11 PM, and established standards for ancillary (smaller) events, including drag racing activities, that allowed year-round (365 day per year) operations. The Final Development Plan was revised to allow temporary and permanent lighting for the area of the drag strip, a temporary Metrolink stop, a sound attenuation wall at the east side of the drag strip[4], and modified the parking allocation table. An Initial Study and EIR Addendum were prepared as part of this revision and the revision was approved on April 24, 2003.

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applied only to six premier race weekends, and that all other operations were required to meet the Countywide noise standards contained in the County's Development Code. The Court's ruling is presently being appealed.

[4] Two 40-foot sea-land containers were placed at the south side drag strip location to provide noise attenuation.

Temporary Use Permit (June 2006-Relocate Dragstrip) – San Bernardio County Code Enforcement approved a Temporary Use Permit (TUP) to allow construction and interim use of the drag strip as relocated to the north side of the facility and noise monitoring of various vehicles on this track to calculate allowable noise per vehicle type. The drag strip was relocated from Parking Lot No. 1 to its current location within Parking Lot Nos. 6 and 8. Noise monitoring was conducted for different vehicle types at the drag strip. This revision was approved on June 23, 2006. An annual extension for the drag strip was approved on June 22, 2007.

Revision 8 (July 2006-Midway Expansion) – This revision expanded the concession area to create a Fan Zone, with restaurants, ticket booths, an additional pedestrian bridge, escalators, cash room, shade structures, entertainment areas, and a parking area for disabled visitors. This revision was approved on July 24, 2006.

Revision 9 (July 2007-Relocated Dragstrip) – This revision allowed the permanent operation of the drag strip at its current locaton within Parking Lot Nos. 6 and 8. No alcohol, nitromethane, jet, or rocket powered classes of vehicles were allowed to operate unless additional documentation demonstrating compliance with the established Speedway noise standards was submitted to the County. An Initial Study in support of a Mitigtated Negative Declaration was prepared for this revision. The revision was approved by the County Planning Commission on July 6, 2007. An appeal to the decision led to a revised Initial Study, and the appeal was denied by the Board of Supervisors in December 2008, thereby approving the proposed PD revision. In October 2009, the Superior Court of the State of California for the County of San Bernardino issued a tentative ruling deeming the Mitigated Negative Declaration (MND), which provided environmental clearance for Revision 9, inadequate. Therefore, the approval of the permanent operation of the drag strip in its location north of the oval track was set aside until adequate CEQA documentation is provided.

As shown in the history of approvals above, in May 2001, the County approved Revision 2 to the Speedway PD. This revision expanded operations to include NHRA-sponsored drag racing (street legal cars) on a drag strip located south of the oval track in Parking Lot No. 1 and a temporary grandstand of 1,500 seats. Revision 4 in 2003 expanded ancillary events including drag racing to allow 365 day annual operation. In 2006, the County issued a TUP to permit the drag strip to relocate to its present site on the north side of the oval track, as well as to allow the interim use of the drag strip. The TUP established a noise monitoring program to determine which vehicle types could meet the Speedway's established noise standards (thus demonstrating compliance for other vehicle types), and therefore operate on the drag strip once a permanent permit to operate the drag strip was approved. Only vehicle types determined to comply with the approved noise standard for the drag strip were allowed to operate. The drag strip was relocated from Parking Lot No. 1 to Parking Lot Nos. 6 and 8 in compliance with County approvals. The TUP was approved on June 23, 2006 and an annual extension was approved on June 22, 2007. In July 2007, the County approved Revision 9 of the PD allowing the permanent operation of the drag strip within Parking Lot Nos. 6 and 8. However, this Revision was overturned in October 2009, when the Superior Court of the State of California for the County of San Bernardino issued a tentative ruling deeming the MND, which provided environmental clearance for Revision 9, inadequate. Therefore, the approval for permanent operation of the drag strip in its location north of the oval track was set aside until adequate CEQA documentation is provided. The Court issued a stay from further enforcement of the judgment, which permits the drag strip to continue operations, and an appeal was filed staying enforcement during the appeal process. Therefore, the Auto Club Speedway is operating in compliance with state law and with the current approved noise standards within the PD. According to the noise monitoring reports prepared since the drag strip was relocated to the north in June 2006, the drag strip has complied with what was believed by the County and the Speedway to be the allowable standard of 85 dBA Lmax adopted in Revision 4, as measured at the nearest residential use for all events (rather than only Premier Events)(See *Summary of Monitoring Results* within Appendix E of the RDSEIR). Exceptions to compliance were noted during the initial noise monitoring when the Speedway tested non-gasoline powered vehicle cars on a few days in March, April and May 2007. Since the drag strip was installed in 2000, the County has retained and continues to retain full jurisdiction to apply its enforcement discretion concerning the County's noise standards. That discretion includes administrative and civil penalties should the County determine they are warranted.

1-5 This comment provides a list of the issues addressed in the comment letter, and does not include any specific comments on the RDSEIR. No response is warranted.

1-6 This comment discusses the concept of "environmental justice," because the DSEIR and RDSEIR were produced in English, and not translated into Spanish. An unpublished legal case is cited in the comment to indicate that environmental documents and notices for the proposed project should have been published in Spanish, as well as English. However, there is no requirement under CEQA to address environmental justice in the manner addressed in the comment letter, and the County fully complied with the notice provisions set forth pursuant to CEQA (see Public Resources Code Section 21092). As noted in Public Resources Code Section 71110 (formerly Section 72000), environmental justice provisions in California are limited to an obligation upon the California EPA (Cal-EPA) in designing its programs, policies and standards. Secondly, Government Code Section 65040.12(a) tasks the Office of Planning and Research to be the coordinating agency in state government for environmental justice programs and to consult with Cal-EPA pursuant to Public Resources Code Section 72002 (renumbered Section 71112).

California has, however, developed general plan guidelines at the state level to address environmental justice matters in city and county general plans pursuant to Government Code Section 65040.2 (see Government Code Section 65040.12(c)). As set forth in 65040.12(d), the recommended elements to include within general plan guidelines describe methods for locating (1) public facilities, (2) industrial facilities, (3) schools, and (4) transit-oriented development. There are no guidelines for provision of environmental documents in multiple languages.

The County of San Bernardino 2007 General Plan contemplates and incorporates environmental justice (See General Plan Update Program, Goals and Policies Report, Page 7, September 14, 2005). As a result, the General Plan conformed to the requirements of environmental justice in its adoption. This comment does not address the content of the EIR in relation to environmental justice, only the language the EIR is available in. The County followed all CEQA notification and disclosure standards as well as its established policy of distributing environmental documents in English. Beyond the language the EIR is available in, the comment does not address the adequacy of the environmental document; thus, no changes were made to the EIR in response to this comment. It is not County policy to provide CEQA-related or other public hearing material in any language other than English. However, in response to this comment, the Applicant has volunteered to provide in Spanish, notices of public hearings for this project, the Executive Summary and Preface to the RDSEIR .

1-7 This comment asserts that the County should have prepared a new DEIR rather than recirculating the existing DSEIR.

According to *Section 15088.5 Recirculation of an EIR Prior to Certification*, a lead agency is required to recirculate an EIR when significant new information is added to the EIR after public notice is given of the availability of the Draft EIR for public review under Section 15087 but before certification. As used in this section the term "information" can include changes in the project or environmental setting as well as additional data or other information."

The County correctly recirculated the entire DSEIR including responses to comments received on the original DSEIR for a full 45-day public review period to provide the public an opportunity to comment on the additional information provided in the RDSEIR, including the project description. Additionally, the comment incorrectly describes the Court action in CCoMPRESS v. County of San Bernardino. As clearly shown in the Court order (Attachment 2 of the comment letter), the Court ruled that the County improperly segmented environmental documentation of Revision 9 (relocation of the drag strip) and Revision 11 (new noise standards). The Court made no express ruling on the DSEIR for Revision 11, only that some type of "new EIR" document be prepared.[5] Because the DSEIR for Revision 11 had already been released for public review (but not yet a final EIR) at the time of the issuance of the Court's tentative ruling, the County determined the appropriate course of action to prepare a new EIR document was to incorporate permanent operation of the drag strip in its northern location (Revision 9), along with the proposed General Plan Amendment into the EIR already distributed for public review (Revision 11), and to recirculate the document for public review. The noise analyses undertaken in the original DSEIR evaluated the noise levels that would result from approval of the proposed noise standards, including operation of the drag strip at its northern location. The effect of incorporating environmental analysis for Revision 9 into the EIR already prepared for Revision 11 was no change in relation to noise from the oval track, and to change the baseline for analysis of noise from the drag strip from (1) analyzing the difference between operating under the existing noise standards and the proposed standards to (2) analyzing the difference between no operation of drag strip and operating under the proposed standards. Thus, while consolidation of analyses of Revisions 9 and 11 changed the baseline used in the DSEIR, it did not change the impact analysis. Although additional noise contours were added to reflect noise at 75 dBA Lmax and 80 dBA Lmax, the analysis of operating the drag strip under the proposed noise standards was the same in both documents (DSEIR and the RDSEIR). The existence of the proposed General Plan Amendment in the Recirculated RDSEIR provides some additional information and clarification of the analysis provided in the original DSEIR, but also did not necessitate a separate (third) EIR as opposed to recirculation of the DSEIR to create the "new" EIR document called for by the Court. The proposed General Plan Amendment encompasses and incorporates average daily noise contours for Speedway operations into the Hazards Overlay Maps of the General Plan. The information generated as part of the proposed General Plan Amendment demonstrates the Speedway's existing and future consistency with the provisions of the County's Noise Element, but does not alter the basic conclusions of the Recirculated RDSEIR.

The comment letter also refers to removal of a previous mitigation measure. The referenced measure was a Condition of Approval that prohibited racing activities within Parking Lot Nos. 3-10. Because the Speedway PD (as amended) specifies all of the locations where racing activities are permitted to occur, the County determined that a Condition of Approval specifying that racing activities were not permitted in other locations was unnecessary. The drag strip was relocated from Parking Lot No. 1 to

[5] The term "EIR" is used to describe many types of documents, ranging from supplemental and subsequent EIRs to master and staged EIRs. See Title 14, CCR, Division 6, Article 11, "Types of EIRs."

Parking Lot Nos. 6 and 8 under a Temporary Use Permit in June 2006. Impacts associated with proposed drag strip activities in this location have been addressed in the RDSEIR.

The commenter also asserts that a new Initial Study should have been prepared prior to recirculation. According to *Section 15063 Initial Study* of the CEQA Guidelines, if the Lead Agency can determine that an EIR will clearly be required for the project, an Initial Study is not required but may still be desirable. The purposes of an Initial Study as defined in Section 15063(c) are as follows:

1. Provide the Lead Agency with information to use as the basis for deciding whether to prepare an EIR or a Negative Declaration
2. Enable an applicant or Lead Agency to modify a project, mitigating adverse impacts before an EIR is prepared, thereby enabling the project to qualify for a Negative Declaration
3. Assist in the preparation of an EIR, if one is required, by:
a. Focusing the EIR on the effects determined to be significant
b. Identifying the effects determined not to be significant
c. Explaining the reasons for determining that potentially significant effects would not be significant, and
d. Identifying whether a program EIR, tiering, or another appropriate process can be used for analysis of the project's environmental effects.
4. Facilitate environmental assessment early in the design of a project
5. Provide documentation of the factual basis for the fining in a negative Declaration that a project will not have a significant effect on the environment
6. Eliminate unnecessary EIRs
7. Determine whether a previously prepared EIR could be used with the project.

As shown, an Initial Study is not required when the Lead Agency is preparing an EIR, and its primary purpose is to aid the Lead Agency in its process. Given the court ruling, the County determined that recirculation of the existing DSEIR was not required, and would serve as the appropriate new EIR document. Nowhere in the CEQA Guidelines does it state that a Lead Agency must prepare a new Initial Study and Notice of Preparation for a recirculated EIR. The only requirements for a recirculated EIR are to provide notice to the public of the availability of the Draft EIR for public review pursuant to Section 15087. The County followed all relevant noticing requirements.

The commenter also asks which responsible and trustee agencies were provided notice of the proposed project, and what consultation was undertaken for the revised project description. The County has consulted with the South Coast Air Quality Management District (SCAQMD) and Regional Water Quality Control Board (RWQCB) during the public review period for the RDSEIR. (See comment letters 15 and 6). In addition, 15 copies of the RDSEIR were sent to the State Clearinghouse for distribution to state agencies, including: Department of Fish and Game, Region 6; Office of Historic Preservation; Department of Parks and Recreation; Department of Water Resources; Office of Emergency Services; California Highway Patrol; Caltrans, District 8; Regional Water Quality Control Board, Region 8; Department of Toxic Substances Control; and Native American Heritage Commission.

1-8 This comment asserts that because the proposed project requires a "new" EIR (see Response 1-7) and includes a General Plan Amendment, the project would be considered of statewide, regional or area wide significance, thus requiring a scoping meeting.

In response to comments provided by CCoMPRESS on the DSEIR noting that the County's General Plan Noise Element did not include Speedway noise contours within its Noise Hazard Overlay, the County initiated an amendment to the Noise Element and included those noise contours into the project description of this EIR. While adding noise contours to the Hazard Overlay Maps involves a General Plan Amendment, it does not change land use, zoning, or any policies or guidelines within the General Plan, nor does it involve any new activities that would result in impacts not already addressed as part of the evaluation of new noise standards and operation of the drag strip in its location north of the oval track. The General Plan Amendment simply provides a graphical depiction of the Speedway's noise contours as expected under the proposed revisions to Speedway noise standards. Amending the Hazard Overlay Maps as proposed would not result in any impacts beyond the impacts of the proposed revisions to the Speedway's noise standards and operation of the drag strip in its northerly location, which is not a project of statewide, regional, or area wide significance under CEQA. The proposed project is also wholly within the jurisdiction of San Bernardino County as the lead agency. A scoping meeting was not required and one was not held. To facilitate public comment on the potential impacts of the proposed project, the County complied with all CEQA requirements and has circulated this EIR for public review twice, allowing ample opportunity for public input to the CEQA process. In addition, the public will have the opportunity to review the Final EIR for the proposed project, and provide input at public hearings before the County Planning Commission and Board of Supervisors.

1-9 This comment requests information as to how the Speedway handles fueling during drag racing events.

Unlike other types of racing, yet consistent with drag racing venues throughout California and the rest of the country, most drag strip race teams carry fuel within the vehicle fuel tank or in separate Department of Transportation (DOT)-approved containers when entering the facility. Vehicle fueling activities, when required, are conducted by each of the respective vehicle owners. Fuels are added to vehicles under conditions prohibiting any smoking in the vicinity of the vehicle. As an additional safety measure beyond what is required when fueling a private vehicle at a typical gasoline station, each vehicle owner is required to maintain a fire extinguisher, and, per NHRA rules, the vehicle itself includes a fire extinguisher. If a vehicle is fueled in its respective pit area, which is a designated area where a vehicle is "hand-parked" and checked by the vehicle owner and mechanics, a minimum ten pound fire extinguisher is required. All vehicles are inspected by a race official at a "tech location" before they are permitted to operate on the drag strip. A "tech card" for inspected vehicles is entered into the facility's tower computer thereby controlling the use of the facility only by approved vehicles that have met all safety standards. Fuel, when needed, is purchased at a prescribed locked and controlled location (where a temporary supply is stored only for the race activity) and sold in California Air Resources Board (CARB)-compliant five-gallon fuel containers (thereby minimizing incidental air emissions from fueling).

At the conclusion of a racing event, fuel containers and fuel are not permitted to remain at the drag strip. There have been no identified releases of fuel from drag racing activities and because of the small amount of fuel in each container (five gallons); even an inadvertent release is not anticipated to affect water quality.

Based on the foregoing, public safety and the environment are not impacted by the fueling of vehicles for drag racing activities.

1-10 This comment describes the proposed noise standard and asserts that removal of an L_{50} standard means that noise levels of 85 dBA would be permitted for all Speedway activities during the hours of operation of 7 AM to 11 PM. The comment states this would be perceived as twice as loud as the existing limit of 75 dBA.

Existing operations have already been analyzed within the RDSEIR and found not to remotely reach a threshold of continuous operation at 85 decibels from 7 AM to 11 PM, 330 days per year. To the contrary, Table 6-2 of the RDSEIR sets forth the *existing* annual noise hours, which are not anticipated to change as a result of the proposed project. Annual operations on the oval track that would generate noise are anticipated to occur only 788 hours, or less than 15% of the 330 days, 16-hours per day during which the Speedway is permitted to operate. (See RDSEIR, Table 3-2). The removal of the L_{50} standard does not alter the existing activities, but does provide for uniform and easier enforcement given that the elevated industrial and exempt noise levels in and around the Speedway facility impact the ability to perform L_{50} measurements solely for the Speedway facility's existing activities. As already demonstrated by existing operations which are not anticipated to change (and as discussed in detail in Response 1-67), the existing activities do not reach and maintain 85 decibels for 16 hours in any one day, nor is any change of existing activities considered or anticipated by the proposed project.

As for drag racing activities, it is anticipated that noise-generating activities will occur only 255.8 hours annually, of which only 35 hours in a worst-case analysis would exceed 85 decibels (see RDSEIR, Table 3-2). That would mean a worst-case exposure of 220.8 hours annually to Lmax noise levels 85 dBA and below from drag racing activities, not exposure of 16 hours per day 330 days per year.[6] The addition of the proposed sound attenuation wall would effectively reduce drag strip noise by 9 to 10 decibels and would also reduce any possible L_{50} levels from the proposed project operations by 9 to 10 decibels. With the proposed wall, the drag strip activities account for an annual Leq of 49 dBA or less. See Response 1-28 for a further discussion on L_{50}.

The commenter misperceives the manner in which noise is actually generated at the Speedway. Existing activities do not operate at constant decibel levels; in fact, the standard is set to determine an instantaneous level that generally occurs for only a few seconds at a time. Drag racing activities do not emit continuous noise, but emit short burst noise[7]. As mitigation, a sound attenuation wall designed to reduce noise from the drag racing activities by 9 to 10 decibels is proposed, which should prevent noise from exceeding approximately 90 decibels at 550 feet from the facility. All of that area is located in the IC zone, which has an Lmax standard of 90 decibels and an L_{50} standard of 70 decibels.

1-11 This comment states the proposed standard does not adhere to recommendations offered by the World Health Organization (WHO) and Occupational Safety and Health Administration (OSHA).

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[6] The proposed activities up to and not exceeding 85 decibels are determined by the following equation:

(255.8 noise hours (drag racing) – 35 noise hours (limit exceeding 85 decibels)/(330 days x 16 hours per day) = 220.8/5,280 or 4%.

This number is over-estimated since it assumes no overlap of oval and drag strip activities, which will occur and thus reduce the total noise hours of exposure from the proposed project.

[7] Because the drag strip activity emits a mobile stable noise source (and the receptor is at a fixed location), the maximum noise level occurs only for the one second the source is closest to the receptor. As the distance from the mobile sources to the fixed receptor increases, the sound level will decrease.

The WHO standards are not adopted in the United States and have no legal effect. Nevertheless, a review of the WHO standards and what they imply is instructive to demonstrate that the proposed project will have no significant impact on human health or the environment. The WHO standard agrees with the information identified in the RDSEIR concerning lifetime/annual environmental noise of less than 70 dBA Leq as determined by the information outlined for the noise contour for the General Plan; i.e., no hearing impairment will occur even after a lifetime exposure. As stated in Response 1-33 and RDSEIR page 8-4 and Figure 3-2), at 550 feet from the Speedway facility, the Ldn value is less than 60 dBA. As for speech impairment, the WHO analysis assumes long-term or continuous noise for that impediment, something that does not occur with short instantaneous sound. Sleep disturbance might be a problem if the louder activities were allowed in earlier morning and evening hours; however, the specific hours of use for any noise of 85 dBA Lmax or greater at the nearest receptor are limited to 10 AM to 7 PM, thus avoiding nighttime hours. Note that the maximum level suggested by the WHO for nighttime hours is 60 dBA, which is inconsistent with County noise standards, especially those set for industrial uses.[8] Given the existing noise environment in and around the legal non-conforming residences located in the IC zone allowing industrial use, pre-existing physiological conditions cannot be attributed to the Speedway. This point is reinforced by the discussion on cardiovascular conditions from long-term road noise exposure when exposed to noise at 65-70 dBA Leq. As set forth in the RDSEIR in Section 6.2.1, the existing Leq on Whittram Avenue is 72.1 dBA, yet as explained in Response 1-35, with the installation of the sound wall no increase in decibels of that Leq value will occur from the proposed project. While the 1999 WHO document is instructive, it cannot redress the existing conditions that already affect the legal non-conforming residences in the IC zone already being impacted by existing noise. Moreover, the WHO document specifically provides that “land use planning is one of the main tools for noise control.” (Page 55). In this instance persons occupying legal non-conforming residential uses are doing so in direct contradiction of the prescribed industrial land use designation as described in Response 1-1. Nevertheless, the proposed project as mitigated will not cause a significant impact to the health of those persons.

The OSHA standards are applicable under federal and state law. The well-established federal and state OSHA noise standards are designed to protect human health from excessive noise in the work place and have existed for decades. Workers cannot exceed eight hours of *continuous* noise that equals 90 decibels. As set forth at Title 29 Code of Federal Regulations Section 1910.95, Table G-16 and Title 8, California Code of Regulations Section 5096(b), a reference duration of 16 *continuous* hours at 85 decibels is deemed safe in the workplace. Under the proposed standard a maximum of one hour exceeding 85 decibels and up to 100 decibels is permitted 35 days per year from 10 AM to 7 PM (nine hours); however, the OSHA noise standard states that even at 100 decibels, an allowance of two continuous hours in a work day of eight hours is permitted. Under the proposed standard, the worst-case scenario is set at one hour, spread over nine not eight hours. As for the remaining intermittent noise hours at the facility from the drag strip activities, as described in footnote 6, above, they are found to constitute 4% of the total operational hours. Thus, as described, the proposed project activities will not expose any persons to levels deemed unhealthful pursuant to OSHA standards.

Attachment 4 of the comment letter contains a document produced by NIOSH that sets forth a recommended standard for noise exposure. NIOSH is an agency that prepares unenforceable guidance documents for safety and health in the United States, including the partial 1998 document concerning worker exposure provided by the commenter entitled, “Criteria for a Recommended Standard, Occupational Noise Exposure, Revised Criteria 1998” (“NIOSH Document”).

[8] The industrial standard for continuous noise at any hour is 70dBA Leq with a maximum of 90dBA.

Table 1-1 of the NIOSH document contained in Attachment 4 of the comment letter contains recommended time-weighted noise exposures defined as the combination of durations and exposure levels that no worker should be exposed to. The table recommends that workers could safely be exposed to a total of 16 hours duration of noise at 82 dBA, and 8 hours of noise at 85 dBA. The recommended exposure duration for 90 dBA is 2 hours, 31 minutes. At 95 dBA, the recommended exposure limit is 47 minutes, 37 seconds, with a maximum of 15 minutes exposure at 100 dBA. See also Response 1-16 for a further discussion on NIOSH.

Thus, the NIOSH recommendations referred to in Attachment 4 of this comment letter provide for exposures to noise levels while protecting workers' health as shown below:

Maximum Daily Duration of Exposure per NIOSH Recommendation			
Noise level (dBA)	Hours	Minutes	Seconds
80	16[1]	0	0
85	8	0	0
90	2	31	0
95	0	47	37
100	0	15	0

The maximum exposure duration recommended by NIOSH is 24 hours. The 16-hour standard expressed in the table reflects the number of hours the Speedway is permitted to operate on a daily basis.

See Response 1-52 for a standard agreed to by the Speedway to further restrict noise levels. The exposure limits for noise levels between 75 and 85 dBA Lmax are consistent with the recommendations set forth by NIOSH and referred to in Attachment 4 to the comment letter, while the exposure limits for noise levels above 85 dBA Lmax are well below NIOSH recommendations.

Finally, please note that the proposed project standard for noise has been evaluated by a person qualified to determine health impacts associated with noise impact. LaCroix Davis, LLC, prepared a Technical Review of Health Effects for the proposed project. Steve Davis and Benjamin Heckman are Certified Industrial Hygienists, whose backgrounds and education include the area of identifying health impacts associated with noise and protecting persons from harmful impact. As set forth by LaCroix Davis, the proposed project noise standard, as it applies to the existing and proposed uses at the facility, will protect persons exposed at 550 feet from the facility boundary from unhealthful effects of noise. See Attachment 2, A Technical Review of Health Effects.

1-12 This comment states that the proposed standard would allow for noise levels to exceed 85 dBA Lmax for 35 days per year for a cumulative total of 60 minutes per day within the hours of 10 AM to 7 PM. This is a correct depiction of the proposed standard, and the RDSEIR acknowledges that this standard would allow maximum noise levels to exceed the currently allowed noise limits of 85 dBA Lmax during premier weekends and 75 dBA Lmax during non-premier weekends. It should be noted that the County's noise standard states that a value is exceeded only if it exceeds the ambient noise existing at the location (See County Development Code Section 83.170.080(e)). It is already well established that ambient noise in and around the area of the Speedway facility, including the legal non-conforming residences occupying the industrial zone north of Whittram Avenue, exceeds 110 dBA, a level well above any noise originating at the Speedway as it exists now or as part of the proposed project. Thus, pursuant to the County's noise standard, other noises in the interval measured are not deemed to be in violation of the standard if the background level is equivalent or higher. Because occasional noise at the Speedway might potentially exceed the ambient conditions over a particular measured interval even after mitigation, the proposed project is considered to have a significant impact. As stated in the RDSEIR, the proposed project would result in significant nuisance noise, defined as maximum noise levels in excess of the levels found by the Board of Supervisors to be acceptable as documented in the Statement of Overriding Considerations for the 1995 Speedway PD EIR.

The RDSEIR requires mitigation in the form of a 20-foot high sound attenuation wall. Because the sound attenuation wall cannot fully reduce noise levels to below a level of significance, a significant and unavoidable impact is identified and a statement of overriding considerations will be required for approval of the proposed project.

This comment further correctly states that the proposed standard would not apply to emergencies, accidents and activities such as fireworks and aircraft, rail, airship, and helicopter operations. This exemption is consistent with the current PD noise standard, which was reviewed and approved by the County Board of Supervisors in 1995. The exclusion exists because emergencies and accidents are isolated and uncontrollable events. It is noted that noise generated by emergency equipment, vehicles and devices are exempt from the County noise standards as well, Emergency equipment, vehicles and devices (83.01.080(g)). Regarding fireworks, it should also be noted that the Speedway only has fireworks events for its two large NASCAR events and during its July 4th celebration for a total of three times per year and conducts the activities pursuant to County-approved permits specific to the fireworks shows. It should also be noted that helicopter activities were expressly considered and permitted in prior County approvals for the Speedway. The original PD approval for the Speedway included a helistop, the location for which was revised as part of the November 12, 1997 PD amendment approval.

1-13 This comment asserts that the health of residents, school children, employees, and parishioners are already adversely impacted by Speedway noise.

Please refer to Response 1-1 that provides an accurate description of the heavy industrial nature of the industrially-zoned area surrounding the Speedway, wherein the noise standard is 90 dBA Lmax. Also, note that ambient noise conditions due to industrial operations, truck traffic from those operations, and railroad traffic exceed levels above 110 dBA Lmax in the area surrounding the Speedway without the Speedway in operation. As stated numerous times throughout the RDSEIR, the local schools and churches[9] are located well beyond the 75 dBA Lmax contour line for the loudest vehicles running on the drag strip. Therefore, Speedway operations would not result in peak noise levels exceeding currently adopted noise standards at schools or churches. For those residents living within the designated IC industrial area, including the closest residence to the Speedway, which is adjacent to a diesel truck yard, across the street from a UP rail switching area and along a major trucking route, the proposed noise standard revisions would allow for maximum noise levels to increase beyond the current Speedway standard. Furthermore, as the data indicates, maximum noise levels of 100 dBA Lmax (attenuated to approximately 90 dBA with the sound wall) for 35 days a year for a cumulative total of 60 minutes throughout the day (not 60 minutes consecutively) would not result in hearing loss. Removal of the L_{50} standard is included within the project description of the RDSEIR (Section 3) and is addressed throughout *Section 4.2 Noise* of the RDSEIR and in Responses 1-10 and 1-28. The proposed project would not extend the hours of operation that the Speedway may operate. The Speedway's

[9] As previously discussed, attenuation with the sound wall will be required for one church to fall below 75 decibels when the loudest vehicle (100 decibels) operates.

current operating hours (7 AM to 11 PM for every day throughout the year) were approved by the County in 2003 as part of Revision 4 to the PD. This project limits the hours that the Speedway may exceed 85 dBA (to a maximum of 100 dBA) to the hours of 10 AM to 7 PM. This project does not extend the annual number of days of Speedway operations beyond what was previously approved in 2003.

In an example demonstrating the 100dBA Lmax standard (a total of one hour) cannot be exceeded on any one of the 35 days it would be used, the following considerations and assumptions are appropriate.

No vehicle is anticipated to exceed 100dBA Lmax at 550 feet, more so with the inclusion of the proposed sound attenuation wall. A worst-case assumption of drag strip operations considers up to 63 runs with vehicles exceeding 85 decibels.[10] The foregoing total anticipated worst-case exposure in a given day exceeding 85 decibels is only 10 minutes 30 seconds[11]. Since the number of cars operating in these classes is fairly limited due to the great expense of operating and maintaining these vehicles, it is physically impossible to have six times the number of cars (thus *potentially* violating the standard) operating at the facility in any one day. Thus, anticipated worst-case exposure is not expected to exceed the standard.

While one might assume that the potential does exist that more cars could be available in the future to run in these classes, it would take greater than 360 runs with these conservative assumptions to reach one hour of noise exceeding 85 decibels or about 285 cars in higher speed classifications, a number that does not appear plausible given the limited number of these vehicles throughout the entire country over the last fifty years. As a result, compliance is assured for all available cars allowed to run above 85 decibels.

The comment incorrectly asserts that the RDSEIR fails to assess the impacts of allowing up to 9 hours of 100 dBA exposures, 35 days per year, since the proposed standard expressly limits exposure to noise levels in excess of 85 dBA Lmax to a maximum of one hour for each of those 35 days. Even in a worst-case, but realistic scenario, noise levels exceeding 85 dBA Lmax but no greater than 100 dBA would actually occur for less than eleven minutes on any of the 35 days such noise levels would be permitted.

See Response 1-52 for a standard agreed to by the Speedway to further restrict noise levels. The exposure limits for noise levels between 75 and 85 dBA Lmax are consistent with the recommendations set forth by the United States Department of Health Services National Institute of Safety and Health (NIOSH) and referred to in Attachment 4 to this comment letter, while the exposure limits for noise levels above 85 dBA Lmax are well below NIOSH recommendations. A Technical Review of Health Effects Study (Attachment 2) was prepared to address the potential for the proposed project to result in health effects. As demonstrated in that report, the noise doses experienced at the closest sensitive receptor, closest conforming residence and closest educational facility (Redwood Elementary) were below the NIOSH recommended exposure level.

1-14 This comment states that the proposed standard would result in health impacts and cites a WHO diagram that allegedly shows pain levels. The web reference does not link to an existing site, so there is no ability to review the statement allegedly made by the WHO. Based on the information presented in Response 1-11 it does not appear that there is any basis to conclude that "very painful" noise is

[10] The 63 runs with vehicles in classes that might exceed 85 decibels would occur where 50 vehicles would run an average of 2.5 runs each.
[11] At 10 seconds (a six second run and two, two second burnouts per run) for 63 runs.

occurring as a result of the proposed project activities at the drag strip. Moreover, since exposure to two hours of noise at 100 decibels per work day is deemed acceptable and protective of human health under OSHA standards, which apply throughout the United States, it seems incongruous to have a chart suggesting the same amount of noise is "very painful," and thus contrary to a standard enforced by an agency charged to protect workers from harmful (i.e., very painful) exposure. As described in Response 1-13, the worst-case exposure appears to be far lower than any number ascribed by the WHO as being a "very painful" noise.

As noted in Response 1-11, Table 1-1 of the NIOSH document referred to in Attachment 4 of the comment letter contains recommended time-weighted noise exposures defined as the combination of durations and exposure levels that no worker should be exposed to. The table recommends that worker could safely be exposed to a total of 16 hours duration of noise at 80 dBA, and 8 hours of noise at 85 dBA. The recommended exposure duration for 90 dBA is 2 hours, 31 minutes. At 95 dBA, the recommended exposure limit is 47 minutes, 37 seconds, with a maximum of 15 minutes exposure at 100 dBA. See Response 1-52 for a standard agreed to by the Speedway to further restrict noise levels. The exposure limits for noise levels between 75 and 85 dBA Lmax are consistent with the recommendations set forth by NIOSH and referred to in Attachment 4 to the comment letter, while the exposure limits for noise levels above 85 dBA Lmax are well below NIOSH recommendations (see Response 1-11).

1-15 This comment states that the proposed standard would result in health effects including hearing damage and cites the EPA Health Effects Handbook. The EPA Health Effects Handbook was already addressed by the analysis performed by Gordon Bricken as reported in the RDSEIR, Section 3. Separately, LaCroix Davis conducted a review of EPA, OSHA, NIOSH and WHO standards and conducted a noise induced hearing loss (NIHL) analysis in their Technical Review of Health Effects (Attachment 2). As explained in the report, the selection of an exposure limit depends on the definitions of two parameters: (1) the maximum acceptable occupational hearing loss (i.e., "the fence") and (2) the percentage of the occupational noise exposed population for which the maximum acceptable occupational hearing loss will be tolerated. The "fence" is often defined as the average hearing threshold level (HTL) for two, three, and four audiometric frequencies. It separates the maximum allowable hearing loss from smaller degrees of hearing loss and normal hearing.

Excess risk is the difference between the percentage that exceeds the fence in an occupational noise exposed population and the percentage that exceeds it in an unexposed population. Mathematical models are used to describe the relationship between excess risk and various factors such as average daily noise exposure, duration of exposure, and age group.

Since 1969 OSHA has referred to "material impairment of hearing" as the amount of hearing loss that should be prevented. In the early days this amount was defined as an average hearing threshold level or "low fence" of 25 dB or greater at the audiometric frequencies of 500, 1000, and 2000 Hertz (Hz). OSHA now uses 25 dB at 1000, 2000, and 3000 Hz and the most recent NIOSH criteria document uses 1000, 2000, 3000, and 4000 Hz.

In general, as definitions include higher frequencies and lower "fences", the acceptable risk becomes more stringent and a higher percentage of the exposed population will be at risk from given levels of noise. There is widespread agreement that the old definition using merely 500, 1000, and 2000 Hz is now obsolete.

Of all the standards and risk assessment approaches surveyed, NIOSH was determined to be the most stringent. One major difference between the risk assessment approach used by NIOSH and other agencies is that NIOSH does not adjust the NIHL for aging (presbycusis), which increases the percentage of the population that fits the NIHL criteria. The NIOSH approach is very health-conservative.

LaCroix Davis conducted a noise exposure assessment (NEA) involving probabilistic (Monte Carlo) modeling to quantify the noise exposures at the closest sensitive receptor, at the closest conforming residence and at the Redwood Elementary School, the closest educational facility. The model relies on the information obtained on historical race events such as the Nostalgia Race, April 2010 and on proposed events such as the NHRA Lucas Oil Divisional Race to simulate resultant noise doses from what are projected as the worst-case noise events.

As demonstrated in that report, the noise doses experienced at the closest sensitive receptor, closest conforming residence and closest educational facility (Redwood Elementary) were below the NIOSH recommended exposure level.

1-16 NIOSH is an agency that prepares guidance documents for safety and health in the United States, including the partial 1998 document concerning worker exposure provided by the commenter entitled, “Criteria for a Recommended Standard, Occupational Noise Exposure, Revised Criteria 1998” (“NIOSH Document”). Notably, the Foreword to the NIOSH Document makes a statement undercutting the commenter’s arguments about the NIOSH values as follows: “The 1998 recommendations go beyond attempting to conserve hearing by focusing on preventing occupational noise-induced hearing loss (NIHL).” Thus, the NIOSH recommendations focus on NIHL, ignoring conservation in the workplace, which is an acceptable means of health control. Nevertheless, the NIOSH document referred to in Attachment 4 of the comment letter contains recommended time-weighted noise exposures stating that a worker should not be exposed for more than 16 hours duration of noise at 82 dBA, and 8 hours of noise at 85 dBA. The recommended exposure duration for 90 dBA is 2 hours, 31 minutes. At 95 dBA, the recommended exposure limit is 47 minutes, 37 seconds, with a maximum of 15 minutes exposure at 100 dBA.

As set forth by Response 1-13, the worst-case exposure from the drag strip activities cannot exceed that worker exposure threshold in a single day. Although 16 hours of operation are part of the proposed project, even if each run were attributed 15 seconds of noise, the worst-case exposure from drag strip activities (554 runs in one day) should not exceed 138.5 minutes of exposure. Since the decibel value will seldom be at 100 decibels, let alone 85 decibels at the receptor location, the noise value must be determined by basic and reasonable worst-case assumptions.

Another point on basic noise readings is necessary to understand the length of time an exposure occurs at a receptor when the source is mobile. If the noise is constant but moving over a period of, for example, eight seconds, the peak noise will only be heard at the receptor for about one second with the sound decreasing as it moves away from the receptor. Alternatively, if the source is moving toward the receptor, the maximum noise level will only be heard when the source reaches its closest point to the receptor. Thus, the Lmax sound is likely to be limited to intervals of roughly one second each.

In the activity of allowing a maximum of 554 runs at the drag strip, approximately 63 runs would involve vehicles likely to exceed 85 decibels up to a maximum of 100 decibels[12]. Realistically, the worst-case run could have two one-second burnouts peaking at 100 decibels and one second of the run at 100 decibels or just 3 seconds peaking to 100 decibels. In our more conservative analysis, we consider that a burnout is about 2 seconds and a run is about 6 seconds means the noise exceeding 85 decibels, resulting in about a maximum of 10 seconds of operations. Thus, the total peak time of 100 decibels would be about three minutes in a worst-case day (63 runs/burnouts x 3 seconds), and the total time in excess of 85 decibels (but no greater than 100 decibels for three minutes) would be 10.5 minutes in a worst day (63 runs/burnouts x 10 seconds).[13] If any noise expert were to look at these values and compare them to the NIOSH standards, they would be unable to find a health-based concern.

A Technical Review of Health Effects Study (Attachment 2) was prepared to address the potential for the proposed project to result in health effects. As demonstrated in that report, the noise doses experienced at the closest sensitive receptor, closest conforming residence and closest educational facility (Redwood Elementary) were below the NIOSH recommended exposure level.

1-17 This comment references the same e-mail attachment of the CCoMPRESS letter from K.E. Feith at EPA to Amy Minteer, attorney for CCoMPRESS that was included in CCoMPRESS's original letter on the DSEIR. Mr. Feith's statements about acceptable noise levels were addressed in original Response to Comments D-9 through D-11 contained in the DSEIR, and provide further explanation of the criteria that EPA has set forth for hearing damage and its applicability to the proposed project. As shown, Mr. Feith ***does*** agree that the threshold for hearing damage set forth in the RDSEIR is correct (100 dBA Lmax) and states that there are additional impacts associated with noise levels. Additionally, Mr. Feith refers to the EPA levels document identifying 55 dBA as the level requisite to the protection of public health. The 55 dBA being referred to in the document is not an Lmax. Please see Response 1-15 regarding the EPA's criteria. As described above in Response 1-2, the RDSEIR acknowledges potential stress-related impacts, and includes restrictions within the proposed standard and mitigation to reduce the impact, but ultimately acknowledges that impacts associated with stress caused by noise would continue to be significant and unmitigated.

1-18 The issue of the total hours of Speedway noise production in regards to WHO, EPA, NIOSH and OSHA standards has been raised and addressed in Responses 1-11 and 1-16.

1-19 This comment asserts that the County should adopt a noise standard more protective of hearing loss than the standard based on EPA's threshold. See Response 1-52 for a standard agreed to by the Speedway to further restrict noise levels. The exposure limits for noise levels between 75 and 85 dBA Lmax are consistent with the recommendations set forth by NIOSH and referred to in Attachment 4 to this comment letter, while the exposure limits for noise levels above 85 dBA Lmax are well below NIOSH recommendations. A Technical Review of Health Effects Study (Attachment 2) was prepared to address the potential for the proposed project to result in health effects. As demonstrated in that report, the noise doses experienced at the closest sensitive receptor, closest conforming residence and closest educational facility (Redwood Elementary) were below the NIOSH recommended exposure level.

1-20 This comment states that the project could result in health effects other than hearing loss and cites WHO has supporting documentation. The Technical Review of Health Effects Study (Attachment 2)

[12] See also prior discussion at Response 1-13.
[13] Rounding the value up to 15 seconds and assuming this activity were to occur over 35 days means an annual worst-case noise exposure of 9.3 hours. See RDSEIR, Table 3-2, Alcohol Dragsters.

conducted by LaCroix Davis reviewed the WHO criteria document and found that extra-auditory effects of noise are contextual. They cited to the WHO criteria document for support: "there is a very complex multidimensional relationship between the various characteristics of the environmental noise and the effects it has on people. Unfortunately, we do not completely understand all of the complex links between noise characteristics and the resulting effects on people." They also found that ambient noise levels in the area surrounding the Speedway have been shown to be significant, often substantially greater than the Speedway noise emissions and in excess of County noise standards.

1-21. This comment asserts that that high noise levels may impact small children. No impact to small children is anticipated. Please see Responses 1-15, 1-20 and the Technical Review of Health Effects Study (Attachment 2).

1-22 This comment asserts that intermittent noise may cause greater impacts than prolonged exposure and cites NIOSH. See Response 1-52 for a standard agreed to by the Speedway to further restrict noise levels. The exposure limits for noise levels between 75 and 85 dBA Lmax are consistent with the recommendations set forth by NIOSH and referred to in Attachment 4 to the comment letter, while the exposure limits for noise levels above 85 dBA Lmax are well below NIOSH recommendations. Also, the Technical Review of Health Effects Study (Attachment 2) addressed the potential for the proposed project to result in health effects. As demonstrated in that report, the noise doses experienced at the closest sensitive receptor, closest conforming residence and closest educational facility (Redwood Elementary) were below the NIOSH recommended exposure level.

1-23 This comment incorrectly states that the proposed project would extend the Speedway's permitted hours of operation. As previously stated, the Speedway PD's current hours of operation (7 AM to 11 PM, 365 days per year) were approved on April 24, 2003.

The comment also asserts that national and international health agencies agree noise levels of 85 dBA are unacceptable in residential neighborhoods. First, the areas surrounding the exterior boundary of the Speedway for a minimum of 1,350 feet in all directions is not "residential neighborhoods" as they are referred to in the comment; they are industrial areas that have long been planned and zoned for industrial use (see Response 1-1, which accurately depicts the area surrounding the Speedway). Rather, the residential uses referred to in the comment letter are legal non-confirming uses scattered among light, medium, and heavy industrial uses It is unclear whether the comment is referring to maximum noise levels (Lmax) or average noise levels of 85 dBA (e.g., CNEL, Ldn), making comparison to the proposed noise standard problematic. As previously stated, the proposed noise standard is based on EPA (national environmental agency) thresholds for hearing loss.

The current adopted PD noise standard allows 85 dBA Lmax measured at the receptor location for six premier events each year. It is noted that the County and the Speedway both believed that approval of Revision 4 to the PD in 2003 removed the concept of premier events in favor of a single year round standard for the Speedway Event Center. However, in October 2009, the Court ruled that this interpretation was incorrect. As a result, the proposed noise standard removes the concept of premier events; therefore making the proposed standard 85 dBA Lmax as measured 550 feet from the Speedway property for all events with the exception of 35 days per year. In addition, incorporation of the sound wall (Mitigation Measure 4.2-1) is anticipated to provide for 9 to10 dBA of sound attenuation, reducing noise levels at the nearest legal non-conforming residence, located in an industrial zone, to approximate the 75 dBA Lmax contour, as shown in Figure 4.2-10 *Lmax Noise Contours- Street Legal Cars with Wall*, during the majority of the year. For event days where noise levels would be permitted to exceed

85 dBA Lmax as measured 550 feet from the Speedway property, hours of operation are restricted to between 10 AM and 7 PM. Furthermore, with incorporation of the sound wall, noise levels in legally zoned residential neighborhoods would experience noise levels much less than 75 dBA Lmax when street legal vehicles are raced.

1-24 This comment again questions the Speedway's impact on schools. This issue was raised and addressed in Response 1-2. Additionally, the comment is not clear when it refers to background noise levels of 35 decibels and 55 decibels on playgrounds and whether these noise levels are Lmax, CNEL, Ldn, or Leq. It would appear however, that the attachment refers to Leq values for classroom instruction or recess times. Nonetheless, as stated in Response 1-1, the schools nearest the Speedway are a minimum of ¼ mile away, and include Almond Elementary School to the north (0.75 mile[14]), Redwood Elementary School to the northeast (0.25 mile), Beech Avenue Elementary School to the east (1.0 mile), Live Oak Elementary School to the east (0.25 mile), and Sequoia Middle School to the east (0.8 mile). In addition, as noted in Response 1-1, Industrial General Plan land use designations and zoning extend for a minimum of 1,350 feet outward in all directions from the boundaries of the Speedway.

In addition, this comment refers to noise estimates provided by Ron Brown. Each of Ron Brown's points has been addressed in Appendix G to the RDSEIR (Responses D-49 through D-78). As stated in those responses, Ron Brown is basing his estimate of noise level attenuation by applying a rule of thumb that noise attenuates 6 decibels per doubling of distance (which assumes no attenuating structures, vegetation, etc.), rather than any actual modeling of noise. However, Gordon Bricken, a leading expert in racetrack noise issues, has calculated modeled noise levels at the Speedway from actual field testing and provided noise contours of the noise levels that would result from Speedway operations. No new comments have been raised challenging the validity of the noise technical analysis provided by Gordon Bricken beyond those already responded to in Appendix G of the RDSEIR. Therefore, no further response beyond those provided in Appendix G of the RDSEIR is warranted.

1-25 This comment asserts that noise impacts to residences (both legally non-conforming residences located within the San Sevaine Redevelopment Project Area and residentially zoned residences) located north of Whittram Avenue have not been assessed and disclosed.

On page 4.2-31, the RDSEIR discusses the impacts to residences that will occur with implementation of the sound wall based on actual modeling results as compared to Ron Brown's rule of thumb estimates (See Responses D-49 through D-78 in Appendix G of RDSEIR):

> The expected noise reduction from a 20-foot sound wall constructed directly adjacent to the track at the base of the existing slope would result in an additional approximately 9 to 10 dBA of noise reduction. Figure 4.2-9 depicts sound contours for maximum sound levels for the A-Dragster—the vehicle type representing those vehicles that could produce noise up to 100 dBA Lmax and Figure 4.2-10 depicts sound contours for maximum sound levels for gasoline-powered non-street legal vehicles. As shown by Figure 4.2-9, the sound wall would reduce noise levels for all legally zoned residences to below 85 dBA Lmax. However, some legally zoned residences located on both sides of Arrow Highway would experience noise levels in excess of 75 dBA Lmax. As shown by Figure 4.2-9, with incorporation of the sound attenuation wall, maximum noise levels 550 feet from the Speedway property line would reach approximately 90 dBA when the worst-case A-dragster is run, which is in excess of the County

[14] All measurements are estimated to the closest point of the Speedway's property line.

Development Code noise levels and the nuisance noise levels deemed acceptable by the Board of Supervisors (as documented in the Statement of Overriding Considerations for the 1995 Speedway PD EIR). Therefore, even with incorporation of the sound attenuation wall, the proposed project would still result in a significant and unavoidable impact related to nuisance noise.

As stated, the proposed project would result in nuisance noise levels in excess of the County Development Code. Despite the area being zoned for industrial use with an Lmax of 90dBA, the closest residence (sensitive receptor) is identified in all of the graphics for representational purposes. As shown in the contour graphics, noise levels from Speedway activities will decrease as the distance increases from the source.

1-26 This comment repeats the point previously raised in comment D-14 of the Response to Comments for the original SDEIR included in Appendix G of the RDSEIR and also repeated here. As stated in Response D-14, employers, including the Speedway, are subject to the requirements for workers set forth by the California Occupational Safety and Health Administration (Cal-OSHA) and its noise standard pursuant to Title 8 California Code of Regulations Sections 5095-5100. Accordingly, the Speedway includes and implements a noise program to comply with Cal-OSHA standards, and therefore protect workers at the Speedway. As a result of compliance with that statutory requirement, which includes hearing protection and other controls, potential levels that would occur from the proposed project would have a less than significant impact on workers.

Spectators at racing events are aware of the exposure to high noise levels that occur by the very nature of the sport. The projected noise levels of Auto Club Speedway races at both the oval track and drag strip are typical of auto racing events, and are no different than those occurring elsewhere throughout the sport. The result is that spectators voluntarily choose to attend racing events, and in fact are knowingly paying for and anticipating the noise levels that are an inherent part of auto racing. Further, due to the nature of these single day, non-continuous activities, any potential impact from an increase in sound level exposure will be transient and not permanent. Because the noise levels produced at racing events are the inherent result of the rules governing the design of engines and conduct of races set by national and international sanctioning bodies, it would be infeasible for San Bernardino County to require vehicles racing at the Auto Club Speedway to meet different design requirements than those set by sanctioning bodies for all other tracks and races.

1-27 The issue of the exemption of fireworks, aircraft, and emergencies has been raised and responded to in Response 1-12. As stated, this exemption is consistent with the current PD noise standard, which was reviewed and approved by the County Board of Supervisors in 1995. The exemption is not a part of the proposed project and the sound from these activities is already incorporated into the existing baseline cumulative noise levels. Activities associated with the proposed project with installation of the sound wall result in a sound level of at least 49 dBA Leq and will not increase the cumulative average daily noise levels above the 72.1 dBA Leq already analyzed. The other activities are already part of the approved facility operations.

1-28 This comment states that "The Project removes the existing L_{50} noise limit of 55 dBA…," and objects to its removal.

The comment incorrectly identifies the L_{50} standard. The actual current noise standards for the Speedway were presented in Table 3-1 of the RDSEIR and are provided above.

TABLE 3-1
EXISTING COUNTY AND SPEEDWAY PD NOISE STADARDS

Affected Land Use (Receiving Noise)	**County Code §83.01.080 Noise Standard (L_{eq})**	**Speedway PD Noise Standard (L_{eq})<u>During Premier Events (6 weekends annually)</u>**
Residential/Churches/Schools Exterior from mobile source	55 dBA (7:00 AM - 10:00 PM) 45 dBA (10:00 PM - 7:00 AM) Up to 65 dBA any time	65 dBA (7:00 AM - 11:00 PM) 45 dBA (11:00 PM - 7:00 AM)
Professional Services	55 dBA anytime	65 dBA anytime
Commercial Exterior from mobile source	60 dBA anytime Up to 65 dBA any time	65 dBA anytime
Industrial	70 dBA anytime	70 dBA anytime
Source: 2007 County Development Code (Amended March 25,2010) The California Speedway PD, approved by the County Board of Supervisors on May 2, 1995		

The County Development Code and the Speedway PD permit the noise standard identified in Table 3-1 to be exceeded as follows:

- The noise standard for the receiving land use as specified above for a cumulative period of more than 30 minutes in any hour (L_{50}).
- The noise standard plus five (5) dBA for a cumulative period of more than 15 minutes in any hour (L_{50}).
- The noise standard plus ten (10) dBA for a cumulative period of more than five (5) minutes in any hour (L_8).
- The noise standard plus 15 dBA for a cumulative period of more than one minute in any hour (L_2).
- The noise standard plus 20 dBA for any period of time (Lmax).

Thus, the existing L_{50} noise standard for the Speedway at the property boundary of a residential use is 65 dBA during premier events (6 weekends annually) and 55 dBA outside of premier events. In addition to the 65 dBA premier event and 55 dBA non-premier event / L_{50} duration combination, the current noise standard for the Speedway PD includes three other combinations of duration and noise level in any one (1)-hour period in addition to a peak (Lmax) noise standard.

The proposed project would remove the L_{50}, L_{25}, L_8, and L_2 combinations of noise level and duration from the PD noise standard because of the difficulty of determining whether the Speedway or other ambient noise sources (trucks, railroad traffic or other industrial and exempt[15] noise sources) cause the L_{50} value to exceed the County standard.

[15] The County Development Code (Section 83.01.080(c)) provides an exemption for certain noise, but does not provide a mechanism by which to remove noises emanating from those exempt noises when measuring at longer time intervals. Specifically, Section 83.01.080(g) exempts motor vehicles (i.e., truck, autos, trains) "not under the control of the commercial or industrial use."

While it is true that the measured L_{50} noise standard was exceeded during races on the Speedway's oval track, it was not possible to determine whether the racing event solely exceeded the L_{50} standard since race related noise could not be separated from ambient conditions and exempted noise including the rail line and truck traffic. As shown in Table 4.2-5, *Ambient Noise Levels (Without Speedway Operations)* of the RDSEIR, L_{50} noise levels in the Speedway area ranged from 48 to 58 dBA and the Lmax ranged from 65 to 116 dBA prior to construction of the Speedway. The unfiltered monitoring results show that the L_{50} noise levels exceeded the noise standards for non-premier event weekends and the Lmax noise levels exceeded the noise standard for non-premier times and premier event weekends. However, that L_{50} evaluation includes non-source and exempt noise that cannot be separately calculated and removed. As indicated by the monitoring reports (Appendix E of the RDSEIR), it is very difficult to accurately measure Speedway-generated L_{50} and other intermediate period noise levels due to the frequency and intensity of ambient noise conditions caused by railroad operations, truck traffic, and other non-Speedway related noise sources in the area. The monitoring protocol for the proposed standard is included as Attachment 4 to the Response to Comments and enforcement is discussed in greater detail in Response 1- 52. Information discussing the draft Gordon Bricken March 2006 report is provided in Response 1-71.

This comment incorrectly asserts that the L_{50} standard is needed to protect health and hearing because the WHO notes that it is equally important to measure the Leq as the Lmax when setting standards to protect human health. However, Leq is not the same as L_{50}. Leq is the average A-weighted sound level over any specified time period. It is the 'equivalent' constant sound level that would have to be produced by a given source that is equal to the average of the fluctuating noise levels measured during any given period of time. Thus, CNEL is essentially a 24-hour Leq with a 5 decibels penalty during the evening hours from 7 AM to 10 PM, and a 10 decibel penalty during the nighttime hours from 10 PM to 7 AM. The Day-Night Noise Level (Ldn) is a similar 24-hour Leq measure, but includes a penalty for noise between 10 PM and 7 AM only. L_{50} refers to the noise level exceeded 50 percent of the time, or 30 minutes within a one hour period. L_{50} is thus not an Leq measurement for a 30 minute measurement period. "Lmax" is the maximum noise level measured over the monitoring period (which, for example, could be a one hour interval), while "Lmin" refers to the minimum noise level measured over a given monitoring interval. Although the comment letter often interchanges these terms, it is important to note that they have distinctly different meanings. The average Leq value on Whittram, an industrial area, is 72.1 dBA Leq. The proposed project with installation of the sound attenuation wall results in 72.1 dBA Leq, and no change in the noise exposure for legal non-conforming residences present within the industrial zone.

The County's L_{50} standard cannot be used to measure compliance for activities at the Speedway including those considered as part of the proposed project for two specific reasons. First, Development Code Section 83.01.080(c)(2)(A) prohibits a person from operating "a source of sound"… "which causes the noise level when measured on another property"… "to exceed" … "[t]he noise standard for the receiving land use as specified" … "for a cumulative period of more than 30 minutes in any hour.". In order to determine if the source causes the standard to be exceeded at the receptor, one needs to exclude sounds that are not part of the source, which in the case of the highly industrial nature surrounding the non-conforming residences, is not possible. Second, the County's Code provides an exemption for certain noise, but does not provide a mechanism by which to remove noises emanating from those exempt noises when measuring at longer time intervals. Specifically, Section 83.01.080(g) exempts motor vehicles (i.e., truck, autos, trains) "not under the control of the commercial or industrial use." Due to the elevated noise generated by the truck, auto and train activity in and around Whittram

Avenue and surrounding the Speedway facility, it is not possible to remove the exempted sound from the longer L_{50} measurement, thereby precluding an effective enforcement mechanism.

This comment also asserts that noise levels reaching 85 dBA Lmax exceed what is recommended by EPA, OSHA and NIOSH. This issue has been raised and addressed in Response 1-11. See Response 1-52 for a standard agreed to by the Speedway to further restrict noise levels based on NIOSH recommendations.

1-29 This comment raises concerns over RVs at the Speedway facility. RVs are parked in lots south of the drag strip at least 700 plus feet from the nearest residences, which are legal non-conforming uses located within an industrial zone. RV generators emit noise up to 75 decibels Lmax measured at 20 feet from the generator. Even with an overly conservative analysis that applies a rule of thumb attenuation of 6 dBA decrease per doubling of the distance from the source (and does not consider attenuation from intervening structures, berms, etc.), the nearest residences to the Speedway will experience noise levels less than 45 decibels from RV generators. The nighttime residential noise standard is 45 dBA Leq and cannot be exceeded for more than 30 minutes in any one hour. The industrial noise standard, 70 dBA (for continuous noise), would otherwise apply if residential uses were not located in the IC land use designation. Thus, the impact is less than significant.

1-30 This comment requests that the groundborne vibration analysis be provided to the public and decision makers. The pertinent components of the groundborne vibration analysis prepared by Gordon Bricken were incorporated directly into the RDSEIR. As a result, the analysis was not included as a separate appendix to the SEIR. However, in response to this comment, Mr. Bricken's letter report is included as Attachment 1 to this Response to Comments.

1-31 This comment states that the proposed project would result in greater traffic impacts than previously analyzed.

As previously stated, the proposed project is not extending hours of operation. The Speedway has been permitted to operate from 7 AM to 11 PM every day of the year since 2003. Drag racing is covered under ancillary events in the Addendum and PD revision for Revision 4 adopted in 2003, and ancillary events include drag strip operations which are allowed to operate "all days" throughout the year. See Initial Study, LSA, April 2003, at page 2-6. The 2003 Addendum to the 1995 EIR analyzed this change to site activities. A Traffic Impact Study was performed by LSA in April 2003 for ancillary activities and concluded that the lower attended ancillary activities would have less than a significant impact. The frequency of racing activities will not increase more than was previously analyzed, but is likely to be slightly less for the proposed project than were previously analyzed in the 2003 Addendum. As previously discussed, the number of attendees previously analyzed in the 2003 Addendum (40,000) is more than are presently projected to be attending the largest drag racing event. Thus the impacts associated with spectator vehicles are less than was previously analyzed.

1-32 This comment correctly states that the proposed project includes removal of the prohibition of race operations in Parking Lot Nos. 3-10 that was approved as part of Revision 4 in 2003. The drag strip was relocated from Parking Lot No. 1 to Parking Lot Nos. 6 and 8 under a TUP in June 2006. The proposed project includes permanent operation of the drag strip in its current, northerly location and removal of the prohibition of race operations in those parking lots.

The landowner has the legal right to request revisions to the approved PD. Such requests require environmental documentation to be prepared pursuant to the provisions of CEQA to evaluate what impacts would result from removal of a condition of approval and to demonstrate whether the impact would be significant or not. It would be incumbent on the environmental document prepared for such a project to determine whether alternative mitigation is available and should be implemented if a significant impact would result. Impacts associated with the drag strip in Parking Lot Nos. 6 and 9 (referred to in the RDSEIR as northern location) have been addressed in the RDSEIR.

Since the PD represents the Speedway's operating permit from San Bernardino County, and effectively represents the zoning standards applied to the Speedway property, the provisions of the PD are as enforceable as any other zoning standards and equally as enforceable as an EIR Mitigation Measure. Since the PD specifies the locations where racing may occur, racing is not permitted in any location not specified in the PD. Under the current PD approval, parking lots may be used only for parking, unless a specific approval is secured from the County to permit another use. Once the PD states where racing may occur, it is superfluous to state where racing is not permitted.

The comment letter faults the County for taking an action without making proper findings; however, the County has not yet taken any action in reference to the information cited in the comment letter. It is the purpose of the EIR to disclose environmental impacts; only after a final EIR document is prepared, and public hearings are undertaken, does a lead agency prepare findings to determine what action is appropriate. This RDSEIR adequately addressed impacts associated with the removal of the prohibition against racing in Parking Lot Nos. 3-10.

1-33 This comment asserts that the proposed project is inconsistent with the San Bernardino County General Plan Noise Element because the proposed project does not eliminate nuisance-based noise.

The purpose of the Noise Element is to guide land use decisions to limit the exposure of the community to excessive noise levels. The Auto Club Speedway is consistent with the General Plan Land Use Element and Development Code which designate the Speedway Special Development within a surrounding, noise tolerant, industrial area. The Speedway is surrounded by industrial land use and zoning designations (IC and IR) on all sides including a major freight and commuter rail line between its property and the closest residences to the north, which are legal non-conforming uses located in the industrially zoned area. The closest lands actually designated and zoned for residential use are located a minimum of 1,350 feet away from the outer boundary of the Speedway property. The legal non-conforming residences located closest to the Speedway along Whittram Avenue are designated and zoned for Community Industrial use. The designation of the Speedway and surrounding lands for industrial use is important since the locational standards for the IC and IR designations make clear that these are areas intended for industrial uses where adequate buffer areas from incompatible uses are available. What is inconsistent with the General Plan is that residential uses are incompatible with industrial land use and designations and the desired industrial character of the area. Housing is not identified as a permitted use within the IC and IR designations.

However, to reduce nuisance noise to existing residents, the RDSEIR includes restrictions within the proposed standard to reduce the frequency, timing, and intensity of peak noise levels. The proposed noise standard would limit noise levels to 100 dBA Lmax (measured 550 feet from the Speedway property) to 35 days per year for a cumulative total of one hour between the hours of 10 AM and 7 PM for each of those days and 85 dBA Lmax for the rest of the days. See Response 1-52 for a standard agreed to by the Speedway to further restrict noise levels. Additionally, as per Mitigation Measure 4.2-

1, the Speedway will construct a sound attenuation wall to reduce noise levels at the closest sensitive receptor by approximately 9 to 10 dBA. The RDSEIR has included all feasible mitigation measures available to reduce noise levels to adjacent residential uses.

In addition, pursuant to California Government Code Sections 65300 et seq., the County has prepared and adopted a General Plan in order to adequately plan land use and zoning. One of the mandatory elements of the General Plan is the Noise Element, which under state law is required to identify and appraise existing and potential noise conditions and compatibility in the community. The County Development Code at Chapter 82.18 sets forth a Noise Hazard Overlay, which is to be applied to those areas where the average noise level, measured as Ldn, is 65 dBA or greater. The Noise Hazard Overlay is intended to guide development within the overlay by providing standards that apply to proposed development in addition to the standards and regulations of the primary land use zoning district, where important community, site, environmental, safety, compatibility, or design issues require particular attention in project planning. Residences, if otherwise allowed in the primary land use zoning and lying within the 65 dBA Ldn Noise Hazard Overlay, are provided additional consideration (See County Development Code Sections 82.01.030(d) and 82.18.030).

Operations at the Speedway for an entire year were analyzed. Operational hours (2,050) and hours of actual use (1,043.8) are set forth in Table 3-2 of the RDSEIR. Based on these hours, the Ldn contours for Speedway operations that are proposed to be included in the County General Plan Hazard Overlay Maps were presented in Figure 3-2 of the RDSEIR. As shown, the 65 dBA Ldn contour is located almost entirely within the Speedway boundaries with the exception of a small area occupied by the adjoining railroad tracks. No sensitive uses, including residences, are located within the 65 dBA Ldn contour. At 550 feet from the Speedway facility, the Ldn value is less than 60 dBA. Therefore, the project is consistent with the General Plan and its Noise Element. Impacts related to the proposed project and the Speedway's land use as it relates to the General Plan Noise Element are less than significant.

The comment letter implies that the only means of addressing noise issues is to control noise sources; however, the comment ignores the fact that one of the key means to achieve community noise compatibility is through the separation of noise tolerant and noise sensitive uses. As set forth in the County General Plan and Development Code, the IC and IR land use designations that surround the Speedway for a minimum of 1,350 feet in all directions are clearly intended as areas where industrial uses can conduct business free from the intrusion of incompatible uses. The table below summarizes the intended purpose, location criteria used to designate IC and IR land use areas, and permitted uses within these districts.

	Community Industrial (IC)	**Regional Industrial (IR)**
Purpose as set forth in General Plan	▪ To identify and establish areas suited to industrial activities. ▪ To provide opportunities for the concentration of industrial uses to enable efficient use of transportation, circulation, and energy facilities. ▪ To protect adjacent land	▪ To identify and establish areas suitable for major industrial centers or a single large industrial plant having 200,000 or more square feet of floor area, or more than 500 employees on any shift. ▪ To provide sites for

	Community Industrial (IC)	Regional Industrial (IR)
	uses from harmful influences, as well as to prevent the intrusion of incompatible uses into industrial areas.	industrial uses which have severe potential for negative impacts on any uses this would locate relatively close to them. ▪ To identify areas intended eventually to be utilized for industrial purposes to support the public need for manufacturing uses and employment opportunities.
Locational Criteria Set forth in General Plan	▪ Areas located within urban areas where full urban services are available. ▪ Areas of existing industrial uses. ▪ Areas physically suited for industrial activities. ▪ Areas that are or can be adequately buffered from adjacent uses in other land use categories. ▪ Areas adjacent to major transportation terminals and energy facilities. ▪ Areas where industrial traffic is not routed through residential or other areas not compatible with industrial traffic. ▪ Areas that are at the intersection or have direct access to major arterial, major divided streets, or a freeway, or are served by railroad access. ▪ Areas appropriate for development of large acreages using the concepts of planned development to provide industrial parks with unified landscaping, signing, building design, services, infrastructure, and circulation.	▪ Areas located within urban areas where full urban services are available. ▪ Areas of existing industrial uses. ▪ Areas physically suited to industrial activities. ▪ Areas that are or can be adequately buffered from adjacent uses in other land use categories. ▪ Areas adjacent to major transportation terminals and energy facilities. ▪ Areas where industrial traffic is not routed through residential or other areas not compatible with industrial traffic. ▪ Areas that have direct access to a major arterial, major divided streets, or freeways, or are served by railroad access. ▪ Areas appropriate for development of large acreages using the concepts of planned development to provide industrial parks with unified landscaping, signing, building design, services,

	Community Industrial (IC)	Regional Industrial (IR)
	▪ Areas located peripheral to urban areas where residential or long-term agricultural uses are inappropriate. ▪ Areas that have stable soil with average slope of 10 percent or less. ▪ Rural areas where there is a demonstrated need for industrial land uses.	infrastructure, and circulation. ▪ Areas located peripheral to urban areas where residential or long-term agricultural uses are inappropriate. ▪ Areas that have stable soil with average slope of 10 percent or less. ▪ Rural areas where there is a demonstrated need for industrial land uses

Source: County of San Bernardino General Plan. April 2007

Implementing the provisions of the General Plan is the County Development Code. As shown in Table 82-17 of the Development Code, single family dwellings, multiple family dwellings, and mobile home parks are not permitted within the IC and IR land use designations. Although the General Plan and Development Code seek to avoid the intrusion of incompatible residential uses into IC and IR areas, the County does recognize that some residential dwellings already exist in areas designated for IC and IR use. The residential structures existing within areas designated IC and IR surrounding the Speedway may have generally met applicable requirements at the time they were constructed, even though they are not now allowed uses per the Development Code, and are therefore described by the Code as being "legal non-conforming" uses. Legal non-conforming uses are governed by Chapter 84.17 of the Development Code. Generally, while such legal non-conforming uses may continue, undergo routine maintenance, and be brought into compliance or closer to compliance with the standards of the Development Code, they can only be altered subject to approval of a CUP unless the residential use is being modified or expanded up to a maximum of 2,000 square feet of floor space or by no more than 25 percent of the floor space or ground area existing at the time the use became non-conforming, whichever is greater (See Section 84.17.080(e)). If a CUP is required for the proposed change, the following findings are required to be made in order to approve the permit:

- The remaining normal life of the existing non-conforming use is determined to be in compliance with provisions specified in this Development Code before consideration of the proposed alteration if located in a residential land use zoning district.
- The proposed alteration shall not prolong the normal life of the existing non-conforming use.
- The alteration of the existing non-conforming use shall not be detrimental to, nor prevent the attainment of, general land uses, objectives, policies, and programs specified in the General Plan or any applicable community or specific plan.
- The granting of permission to alter the non-conforming use shall not be substantially detrimental to the public health, safety, or general welfare, or injurious to the property or improvements in the vicinity and land use zoning district in which the use is located.
- The alteration shall not change the primary use of the land nor increase the intensity of the use unless such change brings the use into greater compliance with current zoning regulations.
- The existing non-conforming use shall comply with all other existing County regulations, including those applicable to and enforced by the Director, and County Sheriff's Department.

While the Development Code permits legal non-conforming residential structures to remain during their useful life, the Code also contains provisions for termination of legal non conforming uses, including residential uses. Section 84.17.050 of the Development Code states that a "legal non-conforming use, that was designated or intended for a use not presently allowed in the land use zoning district where it is located, shall be completely removed or altered to comply with the requirements for the uses allowed in the land use zoning district within a time period fixed by the (Land Use Services) Department[16]. The time for removal or alteration may not be fixed for a date before the expiration of the normal life of a structure as determined by the Director. The determination of the normal life of a non-conforming structure and the fixing of time for its removal or alteration may only be made after notice to the owner." Thus, since single family dwellings are not permitted uses within the IC and IR land use designations, Section 84.17.050 would apply to the residential uses within industrial land use designations nearest the Speedway. Although termination proceedings have not been initiated by the County, the preceding discussion demonstrates that the existing residential uses located within the IC and IR land use designations are inconsistent with the General Plan, and that the Development Code provides for termination of such uses following the useful life of the existing non-conforming structures.

1-34 This comment correctly states that the RDSEIR did not explicitly address interior noise level standards. However, interior noise levels are typically 20 dBA less than exterior noise levels due to the attenuation provided by the structure. As noted in the comment, the County's Development Code states that interior noise levels in residential and educational buildings shall not exceed 45 dBA Ldn. As stated in Response 1-33, at 550 feet from the Speedway facility, which is a location at least 20 or more feet from the nearest residence (which is located within the industrial zone), the Ldn value is less than 60 dBA. With anticipated attenuation of at least 20 decibels from the residence, the proposed project activities would result in Ldn interior levels less than 40 dBA. Therefore, interior noise levels would be less than significant.

1-35 The comment letter asserts that because current ambient noise levels are "estimated to be 72.1 dBA, whereas 65 dBA is the acceptable maximum Ldn noise level for residences, …any increase in that noise level should be considered to be cumulatively significant."

As discussed in Section 6.0 of the RDSEIR, the Ldn levels from drag strip operations would be 58 dBA Ldn. The combined levels of the drag strip and the ambient noise levels would be 72.3 dBA Ldn, resulting in a 0.2 dBA increase over ambient conditions alone. This analysis did not account for the installation of a sound wall as prescribed by the RDSEIR. With the implementation of this mitigation measure, which will reduce the sound levels from the drag strip by approximately 9 to 10 decibels, there will be no increase in the 72.1 dBA Ldn ambient noise level. Thus, there is no cumulative impact from the drag racing activities; however, as stated in the RDSEIR truck and rail activity from industrial uses other than the Speedway is continuing to increase in the area so it is anticipated that noise levels will increase in the industrially zoned area surrounding the Speedway.

Furthermore, in determining the appropriate response to cumulative increases in noise levels, it is important to evaluate the character of the area being affected. As discussed in many responses to comments, including Response 1-33, the Speedway is surrounding by areas designated for IC and IR uses for a minimum of 1,350 feet in all directions. As noted in Response 1-33, control of noise sources

[16] The Code also set forth procedures for the Department to set such a time period.

is one, but by no means the only response to achieving noise compatible land use relationships. The other key method of achieving noise compatible land use relationships is separation of noise tolerant and noise sensitive uses, which is what the County's General Plan and Development Code seek to do in the area surrounding the Speedway. As discussed in other responses, the area surrounding the Speedway is designated for industrial use and is clearly industrial in character for a minimum of 1,350 feet in all directions. Whereas, 65 decibels is the commonly accepted average daily noise standard for residential neighborhoods, the IC and IR designated areas are clearly industrial areas and not residential neighborhoods. California General Plan Guidelines (Figure 2 of Appendix C) shows that average daily noise levels reaching 75 decibels are "clearly acceptable" for the latter industrial areas.

1-36 The comment suggests that the drag strip operation at the location north of the oval track would result in additional pollutant emissions beyond those considered at the drag strip when it was located south of the oval track. In response to this comment and Comment Letter 15 from SCAQMD, Yorke Engineering prepared an Air Quality Modeling Technical Study (Attachment 3) to analyze emissions from the drag strip in its northern location with the proposed standards. Please see Responses 15-1 through 15-18 and Attachment 3 for a detailed analysis of the proposed project's potential air emissions. As shown in the responses and Technical Study, the project would not result in criteria pollutant emissions beyond levels previously analyzed in the 1995 EIR and would not pose a significant risk due to toxic air emissions. The statement also presumes "street legal" means only gasoline cars with mufflers and emission controls. The statement is incorrect.

Finally, as discussed previously, drag strip operations have been approved for 365 day, year round use since 2003. See Response 1-4.

1-37 The comment suggests that criteria air pollutants have not been analyzed. Yorke Engineering reviewed the criteria air pollutants that would be emitted from the proposed project. The ensuing Air Quality Modeling Technical Study (Attachment 3) analysis analyzed potential increases in cumulative pollutant emissions in relation to the significance thresholds set forth by the SCAQMD. See Response 15-10 and Section 7.0 of the attached Air Quality Modeling Technical Study. As shown, the proposed project would not result in potential increases in cumulative pollutant emissions beyond levels previously analyzed.

1-38 The comment questions the prior air quality modeling report produced for the proposed project. In response to this comment and comments by the SCAQMD (Comment Letter 15), Yorke Engineering re-evaluated the proposed project and the potential impacts associated with acute, 8-hour and chronic hazard as well as cancer risk (Attachment 3 Air Quality Modeling Technical Study). That evaluation compared the worst-case and average exposures from the proposed project with the significance thresholds established by SCAQMD, which are a 1.0 Hazard Index (HI) for acute, 8-hour and chronic risk and 10 in one million for cancer risk. The evaluation was based upon reference exposure levels (RELs) adopted and accepted by the state, which are extremely conservative and generally include large uncertainty multipliers that greatly over-estimate risk. Based on these factors, the evaluation found that the 1.0 HI and the 10 in one million significance thresholds were not exceeded by the proposed project. See Response 15-4 for additional detail.

Because inhalation is the assumed worst-case pathway of exposure (particularly given the gaseous nature of the pollutants), dermal and ingestion exposure pathways would cause significantly less risk of exposure than the inhalation pathway and thus be less than significant.

1-39 The commenter refers to samples taken by a resident and provided to the SCAQMD, which include results reporting the presence of methanol in the sample. This issue was raised and addressed in the response to comments on the DSEIR (included in Appendix G of the RDSEIR).

As stated in Response D-23, "According to the SCAQMD letter, the samples showed high levels of methanol at 32 ppm which is in excess of the California Office of Environmental Health Hazard Assessment (CAOEHHA), the Reference Exposure Level (REL) for an acute (one hour exposure to methanol is 21 ppm, the REL for chronic (at least one year) exposure to methanol is 3ppm. SCAQMD did not make a conclusion of adverse effects as a result of sample results; however, SCAQMD stated that additional investigation on the ambient levels and potential sources of methanol within the project area and potential receptors would be made. All sample references in this SCAQMD letter cite to activities from the existing operations at the project site that have already been approved and are not the subject of the proposed project. Air samples from an unspecified location were allegedly taken by Salvador Lopez and presented to the SCAQMD on April 3, 17 and 18, 2009. No information concerning the sampler, the sampler's training, the sampling methodology, the sampling container, the sampling duration, the exact sampling location and the chain of custody are presented in the SCAQMD letter. As such, it is impossible to determine the credibility of the information."

In response to comments on the RDSEIR, Yorke Engineering re-evaluated the proposed project and the potential impacts associated with acute, 8-hour and chronic hazard as well as cancer risk (Attachment 3 Air Quality Modeling Technical Study). That evaluation compared the worst-case and average exposures from the proposed project with the significance thresholds established by SCAQMD, which are a 1.0 Hazard Index (HI) for acute, 8-hour and chronic risk and 10 in one million for cancer risk. The evaluation was based upon reference exposure levels (RELs) adopted and accepted by the state, which are extremely conservative and generally include large uncertainty multipliers that greatly over-estimate risk. Based on these factors, the evaluation found that the 1.0 HI and the 10 in one million significance thresholds were not exceeded by the proposed project. See Response 15-4 for additional detail.

Additionally, the commenter inaccurately suggests that methanol is being used with the compound applied to the drag strip surface. PJ1 TrackBite, formerly known as "VHT TrackBite" or simply "VHT," is a custom formulated resin that sticks to the man-made surfacing on which it is applied, and is used on race tracks to increase traction. The Speedway now uses the reformulated "PJ1 TrackBite," which does not include methanol and is a low-VOC product that performs exactly as needed for drag strip activities. No other VHT product is anticipated for use. Therefore, no significant air quality impacts would result from the VHT application and no mitigation is required.

1-40 The commenter suggests greenhouse gases (GHG) should be analyzed and cites a number of non-specific goals and the prospect of future regulations.

No specific thresholds of significance have been established for GHG emissions. The SCAQMD recently adopted an interim emission threshold that applies only to industrial (stationary source) projects where the SCAQMD is the lead agency. The threshold of significance helps determine if projects could potentially be significant in terms of greenhouse gas (GHG) emissions. The SCAQMD guideline analyzes an entire project and compares the project emissions to the significance threshold level of 10,000 metric tonnes (MT) of carbon dioxide equivalent (CO2E) emissions. A proposed project's emissions, including mobile source emissions, are compared to the 10,000 MT CO2E threshold of significance.

The California Air Resources Board (CARB) also recently adopted thresholds for significance determinations primarily for industrial activities and set the threshold at 7,000 MT CO2E. However, that agency's guidelines do not include emissions from transportation-related activities such as mobile sources. Therefore, the CARB significance levels would be inappropriate to apply to the proposed project.

The majority of activities occurring at the Speedway facility are already existing, including the oval activities and the use of gasoline and some alcohol fuels at the drag strip when it was located south of the oval track. Thus, the only new sources of potential CO2E emissions are fairly limited.

Yorke Engineering quantified emissions from the drag strip operations using the SCAQMD's published emission factors of criteria pollutants for mobile sources. Although these emission factors are not specific to drag race vehicles, they do represent emissions from gasoline combustion. A factor of 10 was applied to these emission factors to match the same 10 times multiplier used for toxic emissions. Drag racing activities were previously approved in 2003 at the facility, which is before the enactment of California's GHG legislation in October 2006. Although the existing drag racing activities are already approved and therefore need not be analyzed, a very conservative analysis was performed that assumes that no drag racecars were previously approved for racing at the facility.

N2O is a GHG. It allows an engine to consume more fuel because of the oxygen made available from the gaseous N2O molecule. This oxygen atom is stripped from the molecule and used in the combustion of the fuel. A potentially small amount of N2O will not get consumed in the reaction and may potentially be released into the atmosphere. N2O is stored in small containers that feed directly into the engine. Based on discussions with the Speedway staff, it is expected that approximately 30 pounds of N2O is consumed during any race day. Since there are 120 race days, 3,600 pounds of N2O would be used in a year. There is no information on the level of N2O that does not get consumed; however, automotive combustion analysis reveals that emission byproducts generally result in values measured in fractions of percentages. Yorke Engineering applied a highly conservative number and assumed that 1.0 percent (10,000 ppm) of the N2O does not get consumed. This results in direct N2O emissions into the atmosphere of 36 pounds per year.

The resulting emissions of carbon dioxide (CO2), methane and N2O, all evaluated as CO2E, are summarized below. Removing the previously approved vehicles from this analysis would result in a value well under 1,000 MT CO2E or more than ten times less than the SCAQMD threshold of significance.

Source	**CO_2 Emissions (metric tonnes)**	**Methane Emissions (metric tonnes)**	**N_2O Emissions (metric tonnes)**	**Total CO_2E Emissions (metric tonnes)**
Gasoline Racecars	1,014	< 1	0	1,014
Nitromethane Vehicles	243	< 1	0	243
Methanol Vehicles	223	< 1	0	223
Towing Vehicles	17	< 1	0	17
Racecar Tunings	320	< 1	0	320
N2O	0	0	0.0164	5
Total	1,817	< 1	0.0164	1,822
SCAQMD Threshold				10,000
Significant?				No

Source	CO_2 Emissions (metric tonnes)	Methane Emissions (metric tonnes)	N_2O Emissions (metric tonnes)	Total CO_2E Emissions (metric tonnes)
(Yes/No)				

Further, as discussed in Section 8.0 of the DSEIR, the County is in the process of preparing a GHG Emissions Reduction Plan and all new actions approved by the County after approval of the Plan would be required to comply with the requirements of this Plan.

1-41 This comment raises the issue of potential odor impacts associated with the drag strip.

As previously discussed (see Response 1-1), the Speedway is surrounded by industrial uses. There are numerous existing sources of odor generation in the immediate vicinity of the Speedway, including rail, trucks, diesel emissions from the diesel trucking operation located adjacent to the sensitive receptor nearest the Speedway, California Steel Industries (steel rolling mill), West Valley Materials Recycling Facility (concentration point for trash trucks), and other general industrial uses. As a result of these uses, it is challenging to pinpoint the specific source(s) of any odors in the area.

As discussed in Attachment 9 of this comment letter, inspections by the SCAQMD conducted in response to air quality and odor complaints by the nearest residence to the Speedway, confirm that ambient conditions generate odor.

During weekend surveillance every half hour for 10 hours per day March 14-15, 2009, the AQMD inspector observed white “smoke,” i.e., steam, but no opacity violations when the drag racing vehicles “burned rubber” at the start of each race. The inspector detected odors at the drag strip, the train spur, near the property line of the Speedway and down the street from the residence, but not at the residence nearest the Speedway. On March 15, the inspector traced a strong burning rubber odor to a local business burning metal and rubber in a container approximately a quarter mile from the residence nearest the Speedway, but AQMD received no odor complaints about this or any other odor incident on either day. SCAQMD has inspected the Speedway site on numerous other occasions, and has never identified an odor violation from operations of the drag strip. Therefore, the RDSEIR determined that permanent operation of the drag strip in the northern location would result in less than significant impacts related to odor. In terms of other health effects related to the white “smoke,” the alleged clouds of smoke are water vapor (i.e., steam) generated when the tires are heated in a shallow film of water. An air toxics analysis was prepared for the drag strip and concluded that air toxics are less than significant (See Responses 1-38 and 1-39 and Attachment 3 (Air Quality Modeling Technical Study). Therefore, the water vapor clouds are unlikely to be the cause of the other health effects cited by the commenter.

Inspections were conducted by SCAQMD during March and April 2009 and included an inspection sweep within a two-mile radius of the Speedway. During this sweep, SCAQMD inspectors identified and inspected about 200 industrial sources to determine which, if any, might be possible odor sources. Although no exterior odors were detected, six industrial sources were determined to have some potential for generating odor emissions, the fact that they were located more than a mile from the neighborhood ruled them out as likely contributors to the odors previously reported.

1-42 The commenter states that no cumulative emissions analysis of criteria pollutants was performed. In response to this comment and comments from the SCAQMD, Yorke Engineering analyzed cumulative impact from criteria pollutants. See Responses 1-37 and 15-10 and Section 7.0 of the attached Air Quality Modeling Technical Study. As shown, the proposed project would not result in potential increases in cumulative pollutant emissions beyond levels previously analyzed.

1-43 This comment asserts that the proposed project changes traffic patterns in the vicinity of the Speedway. Traffic patterns have not changed. The Calabash Avenue gate was used for exiting during the October 2009 and February 2010 NASCAR premier events occurred because the use of Metrolink charter trains was ceased. This exit's use was unrelated to activities at the drag strip since there were no drag racing activities taking place on those weekends. Use of the Calabash gate for access to and from the Speedway during events was included in the original approval of the Speedway in 1995. The Calabash/Whittram intersection was analyzed in the 1995 Traffic Study undertaken for the original approval of the Speedway based on the intended use of that gate for exiting the Speedway (see The California Speedway Traffic Impact Study, O'Rourke Engineering, November 1994, Table 2, available at the County). As part of this original approval, it was intended that the Calabash Avenue gate would be used to assist vehicles parked in the northerly parking lots, as well as for RV access to the oval infield; however, when Metrolink charter trains were used, the Calabash entry gate was blocked and could therefore not be used. Since use of the Calabash gate was contemplated with the original approval of the Speedway and the drag strip activities do not involve use of the Calabash exit, the proposed project does not change traffic patterns and the facility ingress and exits used when the drag strip was located on the south side of the oval track remain the same.

1-44 This comment suggests that new vehicle trips have been generated by the drag strip relocation. Section 2.3.5 of the 2003 Initial Study Errata (Available at the County) discusses operations at ancillary events, which include drag racing events. Attendance is limited to 20,000 for race/performance type weekend events and 40,000 for weekend exhibition type events. Weekday race events are limited to 7,500 (2003 Initial Study Errata, available at the County). Participants, staff and press are estimated to make up 3% of the maximum number described for each event type. RVs are anticipated for racing activities in both the 1995 and 2003 Traffic Impact Studies and are accounted for as part of Average Vehicle Occupancy (AVO). Permanent operation of the drag strip in its northern location and modification of noise standards will not result in changing the location of ingress and egress points from those which have been analyzed in previous traffic studies, nor will the proposed project increase the number of days that activities will occur within the Speedway event center beyond those analyzed in previous traffic studies. While addition of the most popular drag racing vehicle types will increase attendance at the drag strip as compared to events with only street legal vehicles, attendance at drag racing events will be consistent with the attendance figures used for ancillary activities in previous environmental analyses. Thus, traffic from the drag racing activities that will occur pursuant to the proposed project has already been addressed in a traffic study undertaken pursuant to CEQA.

The drag strip is not operated during the NASCAR weekends, which generate the maximum potential attendance. Both premier and ancillary weekend events have been previously analyzed and no activities being conducted at the facility exceed the attendance figures used to analyze for potential traffic impacts. Thus, no vehicle trips other than those that were previously analyzed will occur.

1-45 This comment demands that the 1995 traffic analysis be revised due to the current lack of Metrolink service. Metrolink's charter train service was halted for the October 2009 and February 2010 premiere events due to a decline in attendance caused by economic conditions. The decrease in attendance reduced the number of persons attending and consequently the number of vehicles (and parking needs) for the premier event.

The 1995 EIR did not include the necessity of Metrolink service in the traffic study, nor did it consider the use of Metrolink as a mitigation measure since actual usage of Metrolink service could not be guaranteed and it was possible that even if Metrolink service were to be provided, it could be terminated at some point in the future (as actually occurred). Thus, Speedway traffic and parking analyses do not "discount" vehicular traffic at the Speedway based presumed use of Metrolink service.

All ancillary events, including the drag strip operations, do not utilize Metrolink since the train's use is limited to premier events that can generate large-scale use of such service.

The 2003 Traffic Study prepared as part of the 2003 Addendum (available at the County) analyzed the potential traffic impact for ancillary events, and drag strip activities being permanently relocated to the north side of the oval track do not affect its results. The 2003 Traffic Study analyzed ancillary events, which include drag racing activities, and determined weekday trip generation would not create additional trips beyond those initially analyzed in the 1995 Traffic Study for the proposed Business Park that was not constructed. The weekend analysis of ancillary events in the 2003 Traffic Study determined the allowable attendance under future conditions while maintaining a level of service "C" or "D" on area roadways (available at the County).

The 1995 Traffic Study did not analyze the traffic benefit of a permanent Metrolink station. A Metrolink station was anticipated in the 6th phase of development, but was not analyzed or included as a necessary component of traffic mitigation. Its use was intended for only maximum attendance (i.e., a premier event on the oval, not an ancillary event like a drag strip event). Persons using Metrolink were considered for needed parking requirements on a maximum capacity day assumed, as of 1995 to be in 2010, which also considered significant development of a portion of the facility as a Business Park by that year. Additional parking was made available when the Speedway Business Park was not developed. Thus, the Metrolink charter train use reduces premier event traffic use below that which was analyzed by the 1995 and 2003 Traffic Studies, but was neither required nor proposed as mitigation for Speedway-related traffic.

Most importantly, the ancillary events, including the drag strip activities, are all anticipated to cause significantly less impact than a premier event for both traffic and parking. Thus, the Traffic Studies do not need to be revised.

1-46 This comment asks for consistency with the General Plan. This issue was raised and addressed in Response 1-33.

1-47 This comment asserts that the RDSEIR did not analyze the potential runoff impacts from VHT (i.e., a traction-improving surface coating product designed to withstand high temperatures), fuel, oil and solvents coming from drag strip activities that could affect the Hickory Basin located approximately 500 feet from the drag strip to the northwest.

The Hickory Basin is actually located approximately 1,500 feet due west of the drag strip. Local topography slopes to the south-southwest with storm water runoff flowing from the drag strip track away from the Hickory Basin. The drag strip was relocated to its present location with authorization of a TUP approved by San Bernardino County in June 2006. The drag strip is located in an area that was already paved as a parking lot (Parking Lot Nos. 6 and 8) with the original development of the Speedway. Because no alterations to drainage patterns were made as part of drag strip development, permanent operation of the drag strip in this location would not affect drainage patterns or result in an increased amount of pervious surfaces leading to an increase in surface runoff. Additionally, the Speedway now uses a reformulated VHT, which is primarily a resin that sticks to the man-made surfacing on which it is applied. The reformulated VHT does not include methanol and is a low-VOC product.

The proposed project includes construction of a noise attenuation wall to be located along the quarter mile northern perimeter of the drag strip. However, as evidenced in Comment Letter 6 from the Chief of the Regional Water Quality Control Board, Santa Ana Region, the project would not add or create 5,000 square feet or more of impervious surface, therefore, the current municipal permit requirements will not trigger the requirement for a Water Quality Management Plan.

1-48 The issue of fueling has been raised and addressed in Response 1-9. As discussed in that Response, the proposed project does not include a fueling station, since individual racing teams bring their own fuel. The County has provided a copy of the DSEIR and RDSEIR to the Department of Toxic Substance Control, which issued no comments on the project. All events include trained fire safety and medical Speedway personnel. Both the County Fire Marshal and local fire department personnel are aware of all racing events and frequently observe the activities. No citation or infraction from the existing practices has ever been noted.

The comment also asserts that safety hazards associated with running non-street legal drag vehicles should have been addressed in the RDSEIR, and cites a statement in the RDSEIR that Top Fuel dragsters and Top Fuel funny cars are not expected to run at the drag strip due to safety considerations. A fatal incident occurred in 2008 when a race participant performed a trans-brake test without having the vehicle on jack stands, which is in violation of NHRA rules. Only the participant was harmed and there was no affect on the public or the environment. No other occurrence of this nature has occurred during the ten years of drag strip operations at the Speedway. No citation or infraction from the existing practices at the Auto Club Speedway has ever been noted by agency officials overseeing these activities. Each race and each racing participant at the Speedway are bound the safety rules of the race sanctioning body, ensuring that equivalent safety features and procedures, as well as emergency response are in place. The Speedway meets all of the safety requirements and provides all of the safety features and emergency response capabilities required by each sanctioning body running races at the Speedway. The RDSEIR notes that Top Fuel dragsters and Top Fuel funny cars are not expected to run at the drag strip. These vehicles typically run up to 75 miles per hour faster than the next fastest vehicles run on the drag strip, and would require lengthening of and improvements to the drag strip's shut down area at the end of the track. Because such improvements are not proposed, modern Top Fuel dragsters and Top Fuel funny cars are not expected to run at the drag strip. The current shut down area at the Speedway's drag strip meets current safety standards for all other vehicle types running and anticipated to run at the facility.

1-49 The comment discusses the concept of "environmental justice" that was also raised and responded to in Response 1-6. As noted in that response, there is no requirement under CEQA to address environmental justice in the manner addressed in the comment letter, and the County fully complied with the notice provisions set forth pursuant to CEQA (See Public Resources Code Section 21092).

The County followed its policy of distributing environmental documents in English. Beyond the language the EIR is available in, the comment does not address the adequacy of the environmental document; thus, no changes were made to the EIR in response to this comment. It is not County policy to provide CEQA-related or other hearing material in any language other than English. However, in an effort to eliminate any potential misunderstanding that interested persons may not comprehend this particular proposed project, the Applicant has volunteered to provide in Spanish, notices of public hearings for this project, the Executive Summary, Preface to the RDSEIR.

1-50 This comment asserts that public services will be significantly impacted by illegal racing near the drag strip before and after drag racing events and by fire activities that would occur from fireworks. Comment 1-43 asserted that operation of the drag strip leads to greater traffic before and after drag strip events on the circulation network located near the drag strip. If, as stated in Comment 1-43, higher traffic volumes are anticipated to result in LOS C and D streets around the facility following ancillary events (and therefore still not be significant), with that level of traffic it is unlikely that illegal drag racing would be able to occur near the drag strip before or after events given the higher volume of traffic anticipated. In fact, operation of the drag strip at the Speedway is expected to decrease illegal racing by regularly providing its venue for street legal vehicle racing to occur in a controlled and safe environment.

Both the County Fire Marshal and local fire department personnel are aware of all racing events and firework shows and frequently observe the activities. No citation or infraction from the existing practices at the Speedway has ever been noted. As previously mentioned fireworks have been already analyzed and included in the Speedway PD and are exempt from noise standards. Therefore the proposed revision to the noise standard would have no effect one way or another on the Speedway's use of fireworks displays and the proposed project will not result in significant impacts to public services that have not been previously analyzed.

1-51 This comment asserts that because the RDSEIR incorporated what was a mitigation measure in the DSEIR as part of the project description, the noise restrictions would be less enforceable. The mitigation measure limiting the frequency of peak noise levels from exceeding 85 dBA Lmax was added into the project description as part of the proposed PD noise standard in order to simplify the process of enforcement. As previously stated, since the PD represents the Speedway's operating permit from the County, and effectively represents the zoning standards applied to the Speedway property, the provisions of the PD are as enforceable as any other zoning standards and are equally enforceable as a mitigation measure.

1-52 This comment provides questions regarding the enforcement of the proposed standard.

The proposed project is a revision to the Auto Club Speedway PD. As noted in Response to Comment 1-32, since the PD represents the Speedway's operating permit from San Bernardino County, and effectively represents the zoning standards applied to the Speedway property, the provisions of the PD are as enforceable as any other zoning standard and equally as enforceable as an EIR Mitigation Measure.

The monitoring protocol for the proposed standard was included as Attachment 1 to the Technical Noise Analysis and also included as Appendix E in the RDSEIR, entitled Specification for the Measurement of Sound in Compliance with the California Speedway and Auto Club Drag Strip Standards. This protocol has been updated to reflect the revised standard set forth below and is included as Attachment 4 to these Response to Comments. The commenter states that the protocol in Appendix E of the RDSEIR does not specify 100 dBA Lmax. This is correct; however, the protocol refers to the approved maximum standard, which would be 85 dBA Lmax measured 550 feet from the Speedway property for 330 days a year and 100 dBA Lmax measured 550 feet from the Speedway for 35 days a year for a cumulative total of 60 minutes per day between the hours of 10 AM and 7 PM. In response to comments, the Speedway has agreed to restrict peak noise levels above 85 dBA Lmax to durations far less than the NIOSH duration exposure recommendations contained in Attachment 4 to this comment letter. The Speedway has further agreed to modifications to the monitoring protocol and to maintain a monitoring and compliance program to improve enforcement of applicable noise standards and reduce worst-case impacts. Noise monitoring of the two loudest drag strip events involving non-street legal vehicles would be undertaken for a minimum two year (maximum four year) period to confirm that the standard cannot be exceeded. The methodology would require an actual monitor to be present at race events in order to eliminate any sounds not generated by the Speedway and thereby get an accurate reading of noise levels generated by Speedway race activities. Because of their fleeting duration, each exceedence of 85 dBA Lmax at the drag strip will be counted as a six second occurrence. For example, a one second exceedence from a burnout will be counted as six seconds. This will simplify timing exceedences of the 85 dBA Lmax and provide a further restriction on noise emissions since peak noise levels from the drag strip occur at any given point for less than 3 seconds (see Responses 1-13 and 1-16). The standard agreed to by the Speedway can be summarized as follows:

Standard Operating Days (330 Days Annually)	**Remaining 35 Days Annually to be Scheduled in Advance with the County**
▪ 85 dBA Lmax as measured at 550 feet from the Speedway property line ▪ To be applied to all permitted activities at the Speedway from 7 AM to 11 PM. ▪ The cumulative duration of noise exceeding 75 dBA Lmax within any single day shall be limited as follows: Level 5 : 75.1 – 80.0 dBA Lmax: hours not used at Level 4 Level 4 : 80.1 – 85.0 dBA Lmax: 8 hours ▪ This standard would not apply to: emergencies, accidents, and activities such as fireworks and aircraft, rail, airship, and helicopter operations.	▪ 100 dBA Lmax as measured at 550 feet from the Speedway property line ▪ To be applied to all permitted activities and vehicles at the Speedway. ▪ Noise levels above 85 dBA Lmax may be exceeded only between the hours of 10 AM and 7 PM. ▪ The cumulative duration of noise exceeding 85 dBA Lmax within any single day shall be limited to a maximum total of 60 minutes (one hour) with additional limitations on the cumulative duration of noise exceeding 75 dBA Lmax as follows: Level 3 : 85.1 - 90.0 dBA Lmax: 50 minutes Level 2 : 90.1 - 95.0 dBA Lmax: 9.5 minutes Level 1 : 95.1 – 100.0 dBA Lmax: 30 seconds ▪ The cumulative duration of noise exceeding 75 dBA Lmax to 85.0 dBA Lmax within any single day shall be limited as follows: Level 5 : 75.1 – 80.0 dBA Lmax: hours not used at Levels 1 through 4 Level 4 : 80.1 – 85.0 dBA Lmax: 3.5 hours ▪ This standard would not apply to: emergencies, accidents, and activities such as fireworks and aircraft, rail, airship, and helicopter operations.

Notes applicable to the noise standard:

1. Any separable Lmax reading at the drag strip between 95.1-100 dBA Lmax will be identified as an "event" and counted as having occurred for 6 seconds. A maximum of 5 events between 95.1 and 100 dBA Lmax at the drag strip are allowed.
2. Any separable Lmax reading at the drag strip between 90.1 to 95 dBA Lmax will be identified as an "event" and counted as having occurred for 6 seconds. A maximum of 95 events within this range 90.1 to 95 are allowed (plus all remaining events of 95.1 dBA Lmax and above that are not used).
3. Any separable Lmax reading at the drag strip between range 85.1 to 90 dBA Lmax will be identified as an "event" and counted as having occurred for 6 seconds. A maximum of 500 events are allowed (plus all remaining events of 90.1 and above that are not used).
4. Any Lmax reading at the facility between range 80.1 to 85 dBA Lmax will be identified and counted. The maximum hours described are allowed (plus all remaining time from 85.1 dBA and above that is not used).
5. Any Lmax reading at the facility between range 75.1 to 80 dBA Lmax will be identified and counted. The maximum hours described are allowed (plus all remaining time from 80.1 dBA and above that is not used).
6. If any exceedence of the Speedway noise standard durations occurs in a day, a NIOSH dosage analysis pursuant to the NIOSH 1998 criteria document shall be undertaken. If the daily dosage exceeds a 100% NIOSH dose, the Speedway will be considered to be in violation of the adopted noise standard that day.

The exposure limits for noise levels between 75 and 85 dBA Lmax are consistent with the recommendations set forth by NIOSH and referred to in Attachment 4 to the comment letter, while the exposure limits for noise levels above 85 dBA Lmax are well below NIOSH recommendations (see Response 1-11 and Attachment 2). As indicated, the cumulative one hour time frame that Lmax noise levels may exceed 85 dBA over the nine hours that such levels would be permitted to occur during 35 days annually may not exceed a total of 600, 6-second counts.

It is ultimately up to the County's enforcement discretion to determine how monitoring of the proposed standard would be done. However, as stated in the previous response to comments, D-29, a County-approved noise monitor will be responsible for conducting noise monitoring as specified in the Noise Specification and Monitoring Protocol (Attachment 4). The Speedway will be required to submit the days that the Speedway operations could exceed 85 dBA to the County in advance of events so that the County can schedule a noise monitor to be present. The noise monitor would then be present for the scheduled days expected to exceed 85 dBA Lmax at 550 feet from the Speedway. Beyond those 35 days, County Code enforcement will conduct unannounced monitoring to ensure compliance with the proposed standard. If the Speedway violates the proposed noise standard, the County will take enforcement action according to County Code enforcement procedures. The Speedway will fund the noise monitoring. All noise monitoring results will be available to the public to the extent allowed by County regulation. Due to the short length of the actual noise activities from the drag strip, it is mathematically impossible to exceed one hour of noise in excess of 85 decibels; however, County officials will have the discretion to stop activities if the proposed noise standard is ever exceeded.

1-53 The comment alleges that the specifications for measuring noise levels provide numerous ways to avoid compliance with the proposed noise standard, including that the Speedway noise level be at least 5 dBA above ambient noise levels before considered to be noncompliant. One of the challenges with any noise standard is the placement of the sound measuring instrumentation. Because of the industrial nature of the entire area at 550 feet from the Speedway property, including along Whittram Avenue, industrial noises, trucks and trains may be at or exceed any noise that would otherwise emanate from the Speedway drag strip operations. Notably, noises from mobile sources like trucks and trains are not limited for existing development by *any* standard and are otherwise exempted (See County Development Code Sections 83.01.080(d) and (g)(1)). When two sounds are measured that are very close in decibels, it is difficult to discern where the sound originates. The problem is further compounded due to the use of "fast" response for the sound meter. In order to distinguish the sounds, a level of five decibels is prescribed since it allows the monitor to include/exclude the sound source depending on its origins. After the reading the meter is reset for its next reading. This form of inclusion/exclusion cannot be done with L_{50} analysis due to the length of noise sampling required and the inability to reset the meter to exclude off-site (i.e., non-source) and exempt noise sources.

1-54 This comment asserts that the Speedway has a history of non-compliance. This issue was raised and responded to in Response 1-4. Also, measurements taken by local residents without verification of qualifications, experience, equipment calibration, etc., would not be considered reliable evidence of non-compliance.

The comment includes reference to Attachment 10 to the comment letter, which is an advertisement for an alcohol funny car at the drag strip and appears intended by the comment to provide guidance in potential future litigation about non-compliance. No information is produced by the commenter to suggest the advertised vehicle operated at the drag strip. Further the A-Fuel class is below the Top Fuel class that is not included to operate as part of the proposed project. Existing compliance and enforcement is not an environmental issue included within a CEQA document. Therefore, this comment does not raise a substantive environmental issue or address the adequacy of the RDSEIR. Therefore, no further response is warranted.

1-55 This comment summarizes what CEQA requires regarding projects, such as the proposed project, for which one or more significant unavoidable impacts have been identified. The comment also incorrectly asserts that "if feasible mitigation measures or alternatives that would lessen the significant impacts, the County must reject the Project as proposed." Section 15126.4(a)(1) of State CEQA Guidelines states that an EIR "shall describe feasible measures which could minimize significant adverse impacts," but does not limit the actions that may taken by the lead agency in relation to a proposed project to either incorporating all feasible mitigation measures or rejecting the project as proposed. CEQA Section 21002, while not an enforceable statute, states:

"The Legislature finds and declares that it is the policy of the state that public agencies **should not approve** projects as proposed if there are feasible alternatives or feasible mitigation measures available which would **substantially lessen** the significant environmental effects of such projects …." (PRC Sec. 21002) [emphasis added]

Similar wording is found in CEQA guidelines Section 15021(a)(2), stating that "A public agency **should not approve** a project as proposed if there are feasible alternatives or mitigation measures available that would **substantially lessen** any significant effects that the project would have on the environment." (Guidelines Sec. 15021(a)(2)) [emphasis added] CEQA Section 21002 also makes clear that lead agencies are not required to adopt those feasible mitigation measures or alternatives by stating:

"The Legislature further finds and declares that in the event specific economic, social, or other conditions make infeasible such project alternatives or such mitigation measures, individual projects **may be approved in spite of one or more significant effects thereof**." (PRC Sec. 21002) [emphasis added]

This comment also reviews the guidelines pertaining to Findings of Fact and a Statement of Overriding Considerations. This comment does not address substantive issues regarding the adequacy of the RDSEIR; thus, no change was made to the RDSEIR in response to this comment. The County acknowledges that the RDSEIR concludes that significant unavoidable impacts will result from the proposed project and that a Statement of Overriding Consideration will need to be prepared and adopted prior to approving the project. Following preparation of responses to all comments on the RDSEIR, the County will prepare the proposed Final SEIR for the proposed project. Only after preparation of the Final SEIR and public hearings before the Planning Commission will the Planning Commission determine what recommendation it will make to the Board of Supervisors regarding project approval. Appropriate findings to support the Planning Commission's recommendation will be prepared and approved by the Commission prior to making its recommendation. After receiving the Final SEIR and the Planning Commission's recommendations, the Board of Supervisors will hold public hearings and determine what action regarding the proposed project is appropriate. Additional findings will be prepared before any action on the proposed project is taken by the Board of Supervisors.

1-56 This comment requests additional information pertaining to the feasibility of residential retrofitting.

It is noted that residential structure modification could reduce interior noise levels, by 10 dBA with windows closed, but would not reduce exterior noise levels. The noise reduction of the structure is the combined noise reductions of the various components of the building envelope. In any house constructed after 1974, the walls and roof will likely contain insulation. Dual pane windows would have been required after 1995, but could have been installed before that time to meet the energy requirements of a particular design. Houses built before 1974 would not have had wall and roof insulation, unless installed after the original construction by the owner.

If houses have wall and roof insulation, then the overall noise reduction of the structure could be improved by the installation of sound rated windows. A sound rated window is usually a dual pane window, but not all dual pane windows are sound rated. Dual pane windows do not universally produce improved noise reduction unless they carry a specific sound rating.

Houses without wall and roof insulation will not obtain a significant increase in the overall sound reduction by installation of sound rated windows alone. Such structures would also require installation of wall and roof insulation. In some cases, the exterior facing of the structure may have to be taken off and rebuilt depending on the quality of the structure. Observations of the legal non-conforming residences located south of Arrow Highway within the IC zone suggest that most would require the installation of insulation and new sound rated windows. Since the benefit of the new construction would only occur when the windows are closed, whole house air conditioning would also have to be added to those structures currently without it. In summary, to obtain an additional 10 dBA of interior noise reduction for the residences closest to the Speedway, which are of a vintage that precedes any use of sound attenuating technology, a major reconstruction/rehabilitation of the legal non-conforming houses south of Arrow Highway would need to be conducted.

The comment letter notes that County's Development Code "does discourage the long-term continuance of legal non-conforming uses…" One reason that retrofitting was not proposed as a mitigation measure is that it would do exactly what the Development Code prohibits without a CUP – provide for the long-term continuance of legal non-conforming uses. The County's General Plan also seeks to avoid this incompatible use because retrofitting would discourage development of future industrial uses within the San Sevaine Redevelopment Area by requiring such industrial uses to comply with the residential noise standards contained in the Development Code rather than the industrial standards that are more appropriate to the intended industrial use of the area.

The comment correctly notes that the Development Code permits modification of non-conforming uses without a CUP, but fails to note that modifications in the absence of a CUP are limited to:

- Routine maintenance;
- Bringing the structure or use into compliance; and
- Expanding a structure up to a maximum of 2,000 square feet of floor space or by no more than 25 percent of the floor space or ground area existing at the time the use became non-conforming, whichever is greater.

Further, the Development states that if a CUP is required for a proposed modification of a non-conforming use, the following findings are required to be made in order to approve the permit:

- The remaining normal life of the existing non-conforming use is determined to be in compliance with provisions specified in this Development Code before consideration of the proposed alteration if located in a residential land use zoning district.
- The proposed alteration shall not prolong the normal life of the existing non-conforming use.
- The alteration of the existing non-conforming use shall not be detrimental to, nor prevent the attainment of, general land uses, objectives, policies, and programs specified in the General Plan or any applicable community or specific plan.
- The granting of permission to alter the non-conforming use shall not be substantially detrimental to the public health, safety, or general welfare, or injurious to the property or improvements in the vicinity and land use zoning district in which the use is located.

These findings provide a good description of the County's objectives regarding non-conforming uses. Key among them are not prolonging the normal life of the existing non-conforming use, not being detrimental to or preventing the attainment of planned land uses and implementation of the General Plan, and not being injurious to property or improvements within the land use zoning district in which the use is located. Any program of retrofitting non-conforming residential uses within the IC and IR areas surrounding the Speedway could cause each of the undesirable results. Retrofitting, particularly if it involves reconstruction beyond simply replacing windows would prolong the normal life of the existing non-conforming residences. Continuing to require industrial uses within the designated industrial areas to meet residential, rather than industrial noise standards would be detrimental to implementation of the County's General Plan, and potentially injurious to industrial uses that were otherwise compatible with other industrial uses in the area and in compliance with applicable standards for industrial uses. Because retrofitting is legally inconsistent with the provisions of the General Plan and the intended industrial use of the area surrounding the Speedway, retrofitting was not recommended as a mitigation measure.

The comment further suggests that purchasing non-conforming structures would be an alternative to retrofitting. As noted in Response 1-33, the Development Code contains provisions for termination of legal non-conforming uses, including residential uses. Section 84.17.050 of the Development Code states that a "legal non-conforming use that was designated or intended for a use not presently allowed in the land use zoning district where it is located, shall be completely removed or altered to comply with the requirements for the uses allowed in the land use zoning district within a time period fixed by the (Land Use Services) Department. The time for removal or alteration may not be fixed for a date before the expiration of the normal life of a structure as determined by the Director. The determination of the normal life of a non-conforming structure and the fixing of time for its removal or alteration may only be made after notice to the owner." Thus, since single family dwellings are not permitted uses within the Community Industrial and Regional Industrial land use designations, Section 84.17.050 would apply to the residential uses within industrial land use designations nearest the Speedway.

The non-conforming structures in question are located within the San Sevaine Redevelopment project area, which precludes the use of eminent domain for the purchase of residential structures. Thus, while the County Redevelopment Agency has the legal authority to purchase non-conforming residential structures, it could only do so on a "willing buyer – willing seller" basis. Further, the Redevelopment Agency would be precluded from purchasing residential structures at other than fair market value. However, because current General Plan and zoning designations do not permit residential use, the fair market value of these structures would need to be based not on their non-conforming (and thus time-limited) residential use, but on their value for industrial uses permitted by applicable industrial land use and zoning designations, which would require demolition of residential structures to create developable vacant industrial land. Further, creating a "willing buyer – willing seller" situation where the buyer (San Bernardino County Redevelopment Agency) is not so much "willing" as *required* to purchase a property would likely preclude purchase at the actual "fair market value" of a non-conforming structure.

In light of these General Plan, Development Code and fair market value considerations, as well as project-related mitigation and requirements reducing noise levels by approximately 9 to 10 dBA and limiting the frequency (35 days per year exceeding 85 dBA Lmax as measured 550 feet from the Speedway property) and duration of noise levels (cumulative total of 60 minutes for each of the 35 days, and limitation on the drag strip to reduce hours for non-gas powered vehicles to 10 AM-7 PM), the requirement to refurbish/retrofit homes or to purchase the property is not considered reasonable or feasible.

1-57 The commenter suggests a wall taller than 20 feet has not been shown to be infeasible in the RDSEIR, and that the noise reduction was not discussed at the nearest non-conforming residence.

The sound wall and the noise levels it will reduce in this specific location/area must be placed into context since ambient noise surrounding the Speedway is already very loud. An important way of predicting human reaction to a new noise environment is the way the new noise compares to the existing noise levels to which one has presumably adapted: the so called "ambient noise" level. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will be when judged by those hearing it. Conversely, addition of new noise sources that are below ambient noise levels are generally not noticed. In situations where ambient (existing) noise levels exceed County noise standards, the Development Code (at Section 83.01.080(e)) provides for the higher, ambient noise level to be used as the basis for regulating noise generated by stationary sources. Due to the extreme variability of ambient noise levels, ambient levels during race events rise and fall above and below noise levels of racing activities. Thus, it is impossible to definitively state that drag strip noise with or without a sound wall will or will not exceed ambient noise levels in the vicinity of the Speedway. To be conservative, the RDSEIR concludes that the noise from the proposed project cannot be attenuated to a level of insignificance and therefore a statement of overriding considerations must be prepared.

With regard to increases in A-weighted noise level, the following relationships occur:

- Except in carefully controlled laboratory experiments, a change of 1 dBA cannot be perceived;
- Outside of the laboratory, a change of 3 dBA is considered a just-perceivable difference when the change in noise is perceived, but does not cause a human response;
- A change in level of at least 5 dBA is required before any noticeable change in human response would be expected; and
- A change in level of 10 dBA is subjectively heard as approximately a doubling in loudness, and can cause an adverse response.

These relationships occur in part because noise is measured on a logarithmic, rather than a linear scale. An increase of 10 dBA represents a ten-fold increase in actual sound energy, and is perceived by human hearing to be roughly twice as loud. Because decibels are measured on a logarithmic scale, two noise sources do not combine in a simple linear fashion; adding two identical 50 dBA noise sources together results in a combined sound level of 53 dBA, not 100 dBA.

Technically, determination of what constitutes feasible and reasonable wall height construction in the RDSEIR is consistent with the approach employed by Caltrans for its noise abatement policy under CEQA, which considers attenuating noise when technically feasible and reasonable. For Caltrans, a 5 dBA noise reduction must be achieved in order for the noise barrier to be considered feasible (see Caltrans Project Development Procedures Manual, Chapter 30, June 18, 2009).

The proposed project in the RDSEIR identified the construction of an approximately 20 foot sound attenuation wall as a mitigation measure, which it is anticipated to reduce noise levels approximately 9 to 10 decibels at both legal conforming and non-conforming uses to the north of the drag strip (including the nearest non-conforming residence). The height of the wall was conservatively determined at 20 feet because it is both technically feasible and reasonable to construct at that height, and will achieve a minimum noise reduction of at least 5 dBA.

The effectiveness of a sound attenuation wall has already been demonstrated and discussed in the RDSEIR. To determine the proper height of the wall and the resulting noise reduction that would be anticipated from varying heights of a sound attenuation wall installed along the north side of the drag strip, Gordon Bricken analyzed anticipated noise values at the closest uses zoned for residential purposes (just south of Arrow Route on Banana Avenue)[17]. See the table below.

Wall Height Effects at 310 feet South of Calabash and Banana

Height	Calabash	Banana

[17] The current locations appear to be a vacant lot and a commercial use. The locations are zoned for intended future multifamily residential use.

13 '	80.4	80.1
20'	79.5	78.1
25'	79.1	78.3
30'	78.5	77.7
35'	82.4	77.2
40'	81.7	76.7

(1) Source: Gordon Bricken 2010
(2) The wall heights are relative to track grade.

The contours already presented in the RDSEIR, which are generated on a grid matrix, generalize the values anticipated to occur in the field. They find that this nearest conforming use would expect, with a 100 decibel Lmax sound at 550 feet from the Speedway, approximately 90 decibels Lmax without a wall and approximately 80 decibels with a wall (see RDSEIR Figures 4.2-4 and 4.2-9).

As confirmed by Gordon Bricken in the table above, which calculates noise levels at a location on Banana immediately adjacent to the nearest legally conforming residential zone, construction of a 20-foot wall results in an anticipated noise level of 78.1 dBA Lmax (again with a 100 dBA Lmax use at 550 feet from the Speedway). More notably however, the report demonstrates that less than three decibels (actually 1.4 decibels) of noise reduction is anticipated even if the wall were doubled in height from 20 feet to 40 feet and only 0.4 decibels if the wall were increased from 20 to 30 feet in height[18].

Typically, Caltrans limits the height of sound walls along freeways at 13 feet, with 20 feet at a maximum. Special footings are required for walls exceeding 13 feet in height, and typical masonry construction is limited to 20 feet in height. Walls above 20 feet require lighter construction materials to withstand winds and seismic events. For the noise that would be generated at the drag strip, even the reduction of noise when raising the wall from 13 to 20 feet is limited to 2.0 decibels. Above 13 feet, these minor improvements in sound reduction do not rise to the level of perceptible change that would be noticeable outside of the laboratory.

As discussed above, a significant differential of at least 3 to 5 dBA is necessary before a change is not only perceivable, but commonly noticeable outside of laboratory conditions. As analyzed, a 13 foot wall will clearly reduce noise impact in excess of 5 decibels; however, the subsequent noise reduction benefits diminish very quickly as the wall height increases. In the most reasonable scenario, it would appear that a 13 foot wall is the most technically feasible and realistic height since taller walls will reduce noise by less than three decibels. In a more conservative scenario and as proposed by the proposed project, a 20 foot wall will further reduce noise levels by an additional 2 decibels, a level that cannot be perceived outside of a laboratory. Any height increase to a wall above that amount will reduce noise levels by about one decibel or less. Thus, a sound attenuation wall constructed to 20 feet in height is not only more conservative, but also the most technically feasible and reasonable approach.

[18] Because noise attenuation is provided by other forms of barriers, (e.g., slopes, trees buildings), when those other barriers no longer block a noise source it is possible for noise levels to increase, resulting in a higher noise value at a receptor despite a higher wall being constructed. Mr. Bricken also evaluated another nearby conforming use on Calabash and found that the noise level will only decrease by one (1.0) decibels if raised from 20 to 30 feet, but actually increase 2.2 decibels when the wall is raised from 20 to 40 feet due to the loss of other attenuating barriers.

Thus, this analysis and a determination of the most technically feasible and reasonable wall height construction are also consistent with the approach employed by Caltrans. While a 13 foot wall achieves at least a 5 decibel reduction, further increases in the wall do not.

Finally, consideration must be made to existing ambient noise conditions. Because ambient conditions will exceed the worst-case noise levels when mitigated by the noise wall, particularly at the legal conforming residences, the sound levels as mitigated will conform to the County Development Code at the legal conforming residences (see County Development Code Section 83.01.080(e)).

Based on the foregoing discussion, a wall height of 20 feet as proposed as a mitigation measure for the proposed project is the most technically feasible and reasonable alternative.

1-58 The commenter requests that no simultaneous oval and drag racing activities be allowed due to noise, traffic and air impacts. Simultaneous operation of the oval and drag strip does not occur when large premier events are scheduled. Since traffic studies are based on the large premier events (e.g., NASCAR) that would completely fill the Speedway's parking lots, the only time that the drag strip and other racing facilities might operate simultaneously would be for events that would cumulatively not draw crowds the size of a major premier event. In addition, should smaller simultaneous events occur, the events would jointly be subject to applicable noise standards. Applicable Lmax noise standards would apply to both events and cumulative exposure limits would apply to the Speedway as a whole rather than to portions of the facility individually. Thus, the combination of noise generated at each venue within the Speedway would not be permitted to exceed 100 dBA Lmax, even if peak noise were to be generated simultaneously at more than one venue, and cumulative exposure limits to Lmax sound levels exceeding 85 dBA would be considered a cumulative exposure of all venues within the Speedway. Finally, cumulative air emission impacts that consider the oval track and the drag strip operation were already addressed at Response 1-37. Thus, the suggested mitigation measure is unnecessary.

1-59 The commenter raises the concept that if an alternative meets most of the project objectives it does not need to fully meet each one. The citation in the comment letter to *Center for Biological Diversity, Inc. v FPL Group, Inc.* (2008) 166 CA4th 1349, 1367, footnote 19 provides a basis for noting several CEQA statutes and guidelines about following appropriate CEQA guidance, but is merely a restatement of those sections. The court is discussing a comment from oral argument by plaintiff's counsel and is validating the obligation of a governmental agency to enforce its public trust obligations (which are not relevant to the current proposed project). Notably, the court found that the action brought by the plaintiffs need not be recognized because it was misdirected to the wrong party and the court did not otherwise determine what constitutes a feasible alternative.

In determining whether an alternative meets "most" of the objectives of a project, it is critical to evaluate the relative importance of each objective, since not all objectives are equally important or critical to the ultimate feasibility or desirability of a project. The comment incorrectly concludes that since 95 percent of the drag races could meet the 85 dBA Lmax standard, the 85 dBA alternative "meets more than 95% of the Project objectives." As the RDSEIR makes clear, the drag racing vehicles that would exceed 85 dBA up to but not exceeding 100 dBA Lmax are the most popular vehicles and those that draw the largest crowds. Effectively, what the comment suggests is that holding a major league sporting event while prohibiting the top 5 percent of performers meets most of the objectives of holding such an event. For drag racing, prohibiting the top 5 percent of performing vehicles is the difference between a "major league" and a "minor league" event. In every sport, there is a fundamental difference in major and minor league events in terms of attendance, ticket price, sponsorships, and notoriety of the event. The fundamental reason there is an objective related to running all racing vehicles (except for the Top Fuel dragster and Top Fuel funny car class) is the ability to run “major league” drag events. With the proposed project, the Auto Club Speedway is seeking to be able to run “major league” drag events on the drag strip in addition to street legal and other “minor league” events. In overturning the County’s approval to permanently operate the drag strip in its northerly location under existing noise standards, the Court ruled that the environmental clearance for that approval was improperly separated from the Speedway’s request to modify its noise standards, recognizing that in requesting the northerly location for the drag strip, it was the Speedway’s intent to operate the full range of drag racing vehicle at the drag strip.

As a basis for comparison, another California track’s activities were viewed and contrasted from existing Speedway drag strip activities. The Bakersfield track runs a Heritage activity every year that includes all of the classes considered as part of the proposed project. On average, the Bakersfield event has over 400 participants (cars in all classes) and 12,000 spectators. A Heritage activity recently run at the Speedway that does not run the vehicles being considered by the proposed project had 225 participants and 1,500 spectators. The anticipated increase of both participants and spectators as a result of operating the cars identified in the proposed project greatly increases the revenue generated by an event.

Additionally, it must be noted that television channels (i.e., ESPN and Speed) limit their coverage to races where nitromethane cars are operated. The ability to operate the vehicles identified in the proposed project thereby creates the potential for an additional revenue stream as well as further exposure to prospective attendees.

1-60 The commenter raises yet another alternative, permitting only street legal vehicles to run at the drag strip. CEQA requires that an EIR evaluate a reasonable range of alternatives, not every conceivable alternative. In fact, many alternatives were analyzed in the RDSEIR, including:

- **No Project**. Noise standards would remain the same and existing Speedway operations would continue under these standards. The drag strip would remain at the location originally permitted under its TUP but would not be permanently operated.
- **85 dBA Lmax With a Sound Wall.** This would eliminate the intermediate L-level noise standards, but keep the Lmax standard at 85 dBA measured at the nearest residential use. The drag strip would be permanently operated at its current location north of the oval track pursuant to the 85 Lmax standard measured at the nearest residential use. This alternative would require construction of a sound attenuation wall along the north side of the drag strip to provide approximately 9-10 dBA of sound attenuation.
- **85 dBA Lmax Without a Sound Wall Alternative.** This would eliminate the construction of the sound wall from the 85 dBA Lmax With a Sound Wall, above.
- **86 to 99 dBA Lmax Alternative.** This provides a noise standard that is higher than the current 85 dBA Lmax but lower than the proposed 100 dBA Lmax for 35 days per year. This would also require construction of a sound attenuation wall along the north side of the drag strip to provide approximately 9-10 dBA of sound attenuation.
- **Dual Standard Alternative.** This alternative would maintain the existing 85 dBA Lmax standard for standard operating days at the Speedway and allow noise levels to reach 100 dBA Lmax for 35 days per year.
- **Permanent Operation of Drag Strip in its Current Location North of the Oval Track while Maintaining Current Maximum Noise Levels**. This would provide for permanent

operation of the drag strip at its location north of the oval track, but would maintain the Speedway's existing noise standards, eliminating intermediate standards and providing for maximum noise levels being measured at 550 feet from the Speedway's boundary.

The alternatives, 85 dBA Lmax With a Sound Wall and the Permanent Operation of Drag Strip in its Current Location North of the Oval Track while Maintaining Current Maximum Noise Levels, approximately resemble the alternative suggested in this comment. Thus, adding analysis of a "street legal only" alternative is not necessary. Further, using "street legal" rather than a specific noise standard to define operating standards for the drag strip would lead to unknown noise impacts, since it cannot be known what types of engines and resulting noise characteristics might be defined as "street legal" in the future. Since the term "street legal" has no specific definition (it is often considered to mean only that a vehicle has brake lights and headlights), it is difficult to qualify the sound level that would be allowed for such a use.

1-61 The comment incorrectly states that the Speedway "relocated the drag strip to the north side of its property in 2006 prior to getting any approval or environmental clearance for the relocated drag strip." As stated on page 3-7 of the RDSEIR, "In June 2006, the County granted a TUP allowing for the relocation of the drag strip at Parking Lot Nos. 6 and 8 and the temporary use of that facility." Concurrent with the processing of the TUP, the Speedway requested Revision 9 to the Speedway PD to permit permanent operation of the drag strip at its northerly location. Thus, relocation of the drag strip had been authorized first through a TUP and then permanent operation of the drag strip after it had been relocated pursuant to the TUP was approved in Revision 9 to the Speedway PD. Revision 9 was provided with environmental clearance through a Mitigated Negative Declaration (MND). However, in October 2009, the San Bernardino Superior Court issued a tentative ruling that the MND did not adequately address the issue of potential noise impacts. Therefore, the MND and approval of Revision 9 were set aside until such time that the County could provide additional CEQA documentation for the permanent operation of the drag strip, which is one of the primary objectives of the RDSEIR. In addition, development of the Midway south of the oval track was approved by San Bernardino County as part of Revision 8 in 2006. The Midway, which involved the installation of small food and entertainment activity locations, was sited over portions of the former drag strip, precluding the ability to use that location for further racing. To ignore the valid approval of the Midway and its existence south of the oval track would be ignoring reality, and it was on that basis that the alternative of relocating the drag strip south of the oval track was rejected.

1-62 This comment suggests as a mitigation measure that drag strip operations should be required to end by 7 PM. All ancillary events are currently allowed to operate from 7 AM to 11 PM. The current proposed project would not have vehicles exceeding the 85 dBA Lmax limit after 7 PM on any day of operation, With mitigation of 9 to 10 decibels provided by the sound wall, the anticipated Lmax at the nearest residence, which is located in an industrial zone, would be approximately 75 decibels, which is in conformance with the County's Lmax standard for residences. Within the IC zone, the County's standard for industrial activity allows an Lmax of 90 decibels 24-hours per day and non-conforming residences impact the ability of these activities to operate. See County Development Code Table 83-2 and Section 83.01.080(c)(2)(E). The County noise standards are designed to allow higher sound levels at residences to 10 PM, with the value lowered by 10 decibels from 10 PM to 7 AM. Note that already existing and approved noise standards allow six premier events per year to operate to 85 dBA Lmax until 11 PM.

1-63 The first part of this comment provides a summary of the comment letter's assertions regarding impacts of high noise levels. Reponses to these assertions have been provided above, and further response is unnecessary. The comment also asserts that the RDSEIR "fails to provide any evidence that benefits from the Project would outweigh these significant impacts."

The purpose of an EIR is to provide for an evaluation of the impacts that would result from a proposed discretionary action along with the significance of those impacts, propose measures to mitigate identified impacts, evaluate alternatives to the project that could reduce the significance of identified impacts, and provide for public disclosure of these evaluations prior to any action being taken by the lead agency. It is not the purpose of the EIR itself to evaluate whether there are project benefits that outweigh the project's impacts. The appropriate forum for such balancing is in the findings that the County is required to prepare before taking any action on the proposed project and in the statement of overriding considerations that CEQA requires prior to any action by the lead agency approving the project.

Discussion of the comments assertions regarding the types of vehicles that would run on the drag strip is provided in Response 1-59.

Following preparation of responses to all comments on the RDSEIR, the County will prepare the proposed Final SEIR for the proposed project. Only after preparation of the Final SEIR and public hearings before the Planning Commission will the Planning Commission determine what recommendation it will make to the Board of Supervisors regarding project approval. Appropriate findings to support the Planning Commission's recommendation will be prepared and approved by the Commission before making its recommendation. After receiving the Final SEIR and the Planning Commission's recommendations, the Board of Supervisors will hold public hearings and determine what action regarding the proposed project is appropriate. Additional findings will be prepared before any action on the proposed project being taken by the Board of Supervisors. Should the Planning Commission determine that a recommendation of approval for the proposed project is appropriate, a Statement of Overriding Considerations will be prepared as part of the Planning Commission's recommendation. In addition, should the Board of Supervisors determine that project approval would be appropriate, a Statement of Overriding Considerations will be approved by the Board in compliance with CEQA before any approval action. Without specifically conducting an evaluation of benefits of the proposed project, a determination as to whether those benefits would outweigh project-related impacts is speculative at this time.

1-64 This is an attachment to the CCoMPRESS letter including an unpublished court case related to environmental justice, which was addressed in Responses D-2 through D-4 of the original Response to Comments and in Response 1-6 above.

1-65 This comment includes Attachment 2, the San Bernardino Superior Court judgment in CCoMPRESS v. County of San Bernardino. This attachment is discussed in Response 1-7.

1-66 This comment references a 1998 WHO noise guideline. As set forth in Response 1-16 to the NIOSH concerns, the worst-case day analyzed with greater than worst-case exposures, does not exceed 15 minutes in one day and will be substantially less in actual operation. Even at a worst-case analysis, the amount of noise exceeding 85 decibels (not reaching 100 decibels) is no more than 9.3 hours per year (see RDSEIR Table 3-2), far below the thresholds cited by the WHO.

1-67 This comment includes Attachment 4, the NIOSH documentation. This attachment is discussed in Response 1-16.

1-68 This is the same e-mail attachment of the CCoMPRESS letter from K.E. Feith at EPA to Amy Minteer, attorney for CCoMPRESS that was included in CCoMPRESS's original letter on the DSEIR and is addressed in Response 1-17.

1-69 This comment references an article on airport noise in the Netherlands. As set forth in the discussion from Response 1-16, the actual time of noise exposure is relatively short and the worst case noise is proposed to occur during the day-time hours. The article sets forth a number of conclusions about airport noise, but the article fails to discuss the frequency of the noise, and the airport hours of operation, which appear to be 24-hours per day, seven days per week as the fourth busiest airport in Europe. The exposure to aircraft noise in night and evening hours is not analogous of the proposed project. The study does not distinguish between daytime noise, similar to what is projected by the proposed project, versus evening and night noise that is dissimilar from the proposed project. While the conclusions rendered from the report suggest various health effects, the exposure mechanism differs significantly and even the report notes that its results should not be directly compared to any other scenario given the great variability.

1-70 This attachment is a duplicate from the attachment included in the original CCoMPRESS letter. Detailed responses to each point raised by Ron Brown are included in Response D-48 through D-79 of the original Response to Comments included in Appendix G of the RDSEIR.

1-71 The *draft* Gordon Bricken and Associates report from March 13, 2006 reviewed possible noise impacts associated with a hypothetical drag strip located north of the oval. The modeled data was prepared from historical and assumed conditions, including source noise levels. No actual data was prepared, nor were any points taken in the field at actual receptors. Geometrical spreading was used without the benefit of in-field attenuation.

The reasoning for removing the L_{50} is already explained in Responses 1-10 and 1-28, and is not dependent on the draft Bricken report. Enforcement of the L_{50} requires that other sources as well as exempt sources be removed from the noise accumulated for the prescribed 60 minute metering duration. No sound equipment is capable of that task. For that reason, the Lmax is the only effective enforcement tool capable of measuring the source noise at a receptor 550 feet from the Speedway property boundary and excluding other and exempt noise from that review.

1-72 This attachment includes the same SCAQMD June 2009 letter regarding measured air pollutants that was included CCoMPRESS's original letter on the DSEIR. These comments were addressed in Responses D-81 through D-87 in the previous Response to Comments to the SEIR included in Appendix D of the RDSEIR. Additionally, Responses 1- 36 through 1-40 and Responses 15-1 through 15-18 respond to the most current SCAQMD comment letter.

1-73 This attachment includes an article on NHRA event at the Speedway. This attachment was addressed in Response 1-54.

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Via email (dferemenga@lusd.sbcounty.gov) and USPS

LETTER 2

Doug Feremenga, AICP
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Re: Comments on Recirculated Draft Subsequent Environmental Impact Report for Auto Club Speedway, SCH 2008081077

Dear Mr. Feremenga:

2-1 On behalf of Communities for a Better Environment, we provide these comments on the Re-Circulated Draft Subsequent Environmental Impact Report (RDSEIR) prepared for the proposed revisions to noise standards for the Auto Club Speedway (Speedway) and permanent relocation of a drag strip to the north side of Speedway Property. The mission of Communities for a Better Environment is to achieve environmental health and justice by building grassroots power in and with communities of color and working-class communities. CBE opposes the relocation of the drag strip and the proposed noise standard because it will subject the community north and east of the Speedway to dangerous noise levels and unhealthy air quality.

2-2 The RDSEIR describes the area north and east of the Speedway as an industrial center with "nonconforming" residential uses. In reality, the area is a thriving residential community containing two elementary schools and a middle school, several churches, and hundreds of homes. 2-3 Although this working class community has fewer resources than other similar County communities, it has worked hard to avail itself of opportunities to participate in the administrative processes concerning Speedway activities. Community members have submitted numerous petitions, testified at hearings, and attended many meetings, despite the scheduling of many of these meetings during the work day and the County's continued refusal to issue meeting notices and environmental documents in Spanish, the dominant language in the community.

2-4 The relocation of the Speedway's drag strip from its previous location, south of the oval track, to its current location north of the oval track has already harmed the community. Along with the relocation of the drag strip, which moved it to within 570 feet of residents, the Speedway expanded drag strip operations to include events nearly every weekend and on many weekdays. Drag races primarily affect the community by increasing the community's exposure to noise and foul smelling clouds of burned rubber and vehicle exhaust. On race days, several hundred drag races may occur. Each race lasts 4 to 10 seconds, and each race is preceded by a 2 second "burnout period" wherein dragsters intentionally burn up their tires. Typically, races occur 30 seconds apart. Community members trace many neighborhood health problems to the drag strip's relocation. These problems include asthma, migraines, difficulty sleeping, inability to concentrate and for children, inability to learn or complete homework.

2-5 The Speedway's proposed "health based" noise standard will permit noise levels of up to 85 decibels at homes, 16 hours per day, 365 days per year. Levels of up to 100 decibels will be

allowed 35 days per year. Instead of protecting the community's hearing or general health, the standard will exacerbate existing health impacts and expose residents to the long-term impacts of noise-induced stress, which include hypertension, coronary artery disease, heart attacks, and various mental health impairments. Children who learn in classrooms with background noise levels exceeding 50 decibels have a more difficult time understanding speech than those who learn in quieter settings because high noise levels compromise auditory processing functions.
2-5 cont. (Wakefield, Julie. "Learning the Hard Way." *Environmental Health Perspectives* 110 (6) (June 2002), available at http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1240882/pdf/ehp0110-a00298.pdf.) These children also have greater difficulty reading, problem solving, and memorizing. (WHO Community Noise Guidelines, p. x.)

The proposed standard also promotes hearing loss. The National Institute for Occupational Safety and Health, a division of the U.S. Department of Health and Human Services has found that hearing loss can begin with noise exposures that exceed an 8-hour average of 85 decibels. (National Institute for Occupational Safety and Health and Center for Disease Control and Prevention, Criteria for a Recommended Standard, June 1998, http://nonoise.org/hearing/criteria/criteria.htm.) The agency finds, "Exposures at and above this level are considered hazardous." (*Ibid.*)

The RDSEIR also fails to adequately analyze the air quality impacts of holding an increased number of drag races in close proximity to homes, schools, and churches. Dragsters produce pollutants in addition to those produced at the oval track because they operate more frequently, use different fuel types, and operate at very high speeds for a short duration. Tire burnouts are not typical of oval track races. Unlike operations on the south side of the property,
2-6 the Speedway now proposes to allow non-street-legal, gas-powered dragsters, alcohol fueled dragsters, and nitromethane fueled dragsters. These new fuel emissions, and their impacts on human health, have not been adequately assessed in the Health Risk Assessment prepared for the RDSEIR. The RDSEIR also fails to analyze the drag strip's emissions of criteria pollutants, including nitrogen oxides, sulfur oxides, lead, carbon monoxide, particulate matter, and ground level ozone. Additionally, methanol levels in the area already exceed the acute and chronic reference exposure levels set by the California Office of Environmental Health Hazard Assessment.

As detailed above, the RDSEIR does not adequately analyze the Speedway project's adverse impacts on noise and air quality, or the corresponding impacts on community health.
2-7 Accordingly, the RDSEIR must be revised and recirculated in order to satisfy the California Environmental Quality Act. Thank you for this opportunity to comment on this matter.

Sincerely,

/s/

Maya Golden-Krasner
Staff Attorney,
Communities for a Better Environment

Responses to Letter No. 2: Communities for a Better Environment

2-1 This comment provides introductory remarks and states the Communities for a Better Environment (CBE) objection to the proposed project because of noise and air quality. Specific comments regarding CBE's concerns with noise and air quality are raised throughout the letter and responses are provided below.

2-2 This comment erroneously depicts the area surrounding the Speedway as a thriving residential community. Please review Response 1-1 for an accurate characterization of the industrial environment surrounding the Speedway. As stated, industrial General Plan and zoning designations extend for a minimum of 1,350 feet surrounding the Speedway. The closest residence located in areas zoned for residential uses are located approximately 1,500 feet east of the Speedway, east of Redwood Avenue. The closest residences located in areas planned and zoned for residential uses to the north are located just south of Arrow Highway approximately 1,700 feet directly north of the Speedway and 1,350 feet northeast of the Speedway. The schools closest to the Speedway include Redwood Elementary School to the northeast (0.25 mile[19]), Almond Elementary School to the north (0.75 mile), Beech Avenue Elementary School to the east (1.0 mile), Live Oak Elementary School to the east (0.25 mile), and Sequoia Middle School to the east (0.8 mile).

2-3 It is noted that community members have participated in the County's planning and environmental review process regarding the proposed project. However, the commenter appears to be referencing activities associated with a Mitigated Negative Declaration for the Speedway that was processed in 2007-2008. Regardless, each of the comments provided on the SEIR for the proposed project have been responded to and addressed either through the first round of Response to Comments on the DSEIR included as Appendix G of the RDSEIR or through these Response to Comments to the RDSEIR. Each community member that has participated in the process will receive notice of upcoming public hearings for additional opportunities to comment on the project. The issue of the County's policy toward providing environmental documents in languages other than English has been raised and addressed in Response 1-6 and Response 3-4 (NRDC letter).

2-4 This comment states that the proposed project includes the expansion of drag strip operations. As stated in Response 1-31, the proposed project is not extending hours of operation. The Speedway has been permitted to operate from 7 AM to 11 PM every day since 2003. Drag racing is covered under ancillary events in the Addendum approved for Revision 4 to the PD. Under the PD revision adopted in 2003, ancillary events include drag strip operations which are allowed to operate "all days" throughout the year.

This comment also asserts that the proposed project would increase the community's exposure to noise. With regards to an increase in the community's exposure to noise, the RDSEIR does acknowledge that the proposed project would generate noise levels in excess of levels found by the Board of Supervisors to be acceptable as documented in the Statement of Overriding Considerations for the 1995 Speedway PD EIR. Further as set forth in the RDSEIR in Section 6.2.1 and further explained in Response 1-35,

[19] All measurements are estimated to the closest point of the Speedway's property line. The actual distance from the drag strip starting line to the closest school, Redwood Elementary, is approximately 0.9 mile.

the existing annual Leq on Whittram Avenue is 72.1 dBA, yet with the installation of the sound wall (Mitigation Measure 4.2-1) no increase in decibels of that Leq value would occur with the proposed project.

Regarding air quality concerns, the alleged clouds of smoke are water vapor (i.e., steam) generated when the tires are heated in a shallow film of water. They do not produce objectionable odors. The issue of air quality has been raised and addressed in Responses 1-36 through 1-42. The health risk assessment for air emissions (included as Attachment 3 to this Response to Comments) prepared for the proposed project demonstrates that the project would not result in unhealthy air quality. Additionally, no evidence has been presented that any existing physiological problems within the community are attributable to the Speedway. Please refer to Response 1-1 which explains the industrial nature of the surrounding area of the Speedway including the very heavy truck traffic along Whittram Avenue and train tracks and rail switching station located just north of the Speedway's boundary. It is also noted that the adjoining use to the nearest sensitive receptor on Whittram Avenue is a diesel truck yard. Legal non-conforming residences within the industrial land use designations surrounding the Speedway are already subjected to the industrial impacts that exist in the area, including high noise levels and odors from industrial uses. The County acknowledges that residential uses should not be located within heavy industrial uses within its General Plan and Zoning Code. (See Response 1-33).

Finally, with regards to the assertion that the Speedway leads to difficulty in sleeping and inability to concentrate at school, the alleged lost sleep could also easily be occurring from the rail or truck activity that has been recorded exceeding 110 decibels without any corresponding Speedway activity. The allowed noise level for industrial use activities in the IC zone is 90 decibels at any time day or night and mobile activities such as trucks and trains have no limit at all. Any legal non-conforming residences in the IC zone are already exposed to those conditions. The alleged inability to concentrate at school would not appear to be from noise. In Response Letter E, included in Appendix G of the RDSEIR, Superintendent Olsen-Brinks from the Fontana Unified School District stated unequivocally that there is no impact from the drag strip at the nearest school, which is located over 3/4 of a mile from the end of the 1/4 mile run. Also, per the Figures set forth in Chapter 4.2, the persons potentially exposed after mitigation to the worst-case noise from the facility are almost all exclusively within the San Sevaine Redevelopment Area and are primarily in IC zoning. No school is being exposed to noise in excess of County standards. See also Response 1-2 and Response 1-24.

2-5 This comment raises concerns regarding health impacts associated with the proposed standard. This issue has been raised and addressed in Responses 1-11 through 1-22. The specific concern raised regarding children's inability to learn in classrooms has been raised and addressed in Response 2-4.

2-6 The issue of potential air quality effects has been raised and addressed in Responses 1-36 through 1-42.

2-7 This comment summarizes comments raised in this comment letter. Responses 2-1 through 2-5 address the specific issues raised in this summary.

LETTER 3

NRDC
THE EARTH'S BEST DEFENSE

NATURAL RESOURCES DEFENSE COUNCIL

Via email (dferemenga@lusd.sbcounty.gov) and U.S. mail

May 10, 2010

Doug Feremenga, AICP
Senior Planner
County of San Bernardino
Land Use Services Department
385 N. Arrowhead Ave., First Floor
San Bernardino, CA 92415-0130

Re: Comments on Recirculated Draft Subsequent Environmental Impact Report for Auto Club Speedway, SCH 2008081077

3-1

On behalf of the Natural Resources Defense Council ("NRDC"), we are submitting these comments on the Re-Circulated Draft Subsequent Environmental Impact Report ("RDSEIR") prepared for the proposed noise standards and permanent drag strip relocation at the Auto Club Speedway ("Speedway"). We recognize that the Speedway, as a host for NASCAR and other events, is an important sporting venue and regional economic driver. But current Speedway operations inflict public health problems on surrounding communities and those problems will worsen if San Bernardino County ("County") relaxes noise standards.

NRDC is a national nonprofit environmental organization with more than 1.3 million members and online activists, over 250,000 of whom live in California. NRDC has advocated and litigated widely in matters intended to protect public health and promote environmental justice. We believe that pollution comes in many forms and that, as the California legislature has found, "[e]xcessive noise is a serious hazard to the public health and welfare" and "can result in physiological, psychological, and economic damage." California Noise Control Act of 1973, Cal. Health & Safety Code §§ 46000 *et seq.* We further agree with the legislature that "[a]*ll Californians* are entitled to a peaceful and quiet environment without the intrusion which may be hazardous to their health or welfare." *Id.* at § 46000(f) (emphasis added).

3-2

But we fear the noise standards the County is considering will not respect that entitlement and will instead subject area residents to "physiological, psychological, and economic damage." *Id.* at § 46000(b). Ambient noise levels around the Speedway are already high. The RDSEIR estimated them at 72.1 dBA Ldn.[1] RDSEIR Executive

[1] Federal agencies generally use Day-Night Average Noise Level (Ldn) to measure noises. California uses the Community Noise Equivalent Level (CNEL). Ldn and CNEL are similar in that they both assign greater weights to noises that occur at more annoying hours. But they use slightly different weights and thus are not perfectly equivalent measurements.

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Doug Feremenga, AICP
May 10, 2010
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3-2 cont. Summary at S-7. To put that in perspective, California building codes warn against building residences in areas where exterior ambient noise levels exceed 65 dBA CNEL. *See, e.g.*, Cal. Code Regs. tit. 25, § 1092. Similarly, federal regulations consider workday exposures of 90 dBA for more than 8 hours to be unacceptable. 29 C.F.R. § 1910.95. The proposed noise standards will worsen existing conditions – and will be far less protective than state and federal laws recommend.

3-3 The County should be aware that by failing to enforce current noise standards and replacing them with even weaker standards, it risks violating a range of laws. Concerned Community Members and Parents of Redwood Elementary School Students ("CCoMPRESS") and Communities for a Better Environment ("CBE") have submitted comments discussing the inadequacies of the RDSEIR and its failure to satisfy California Environmental Quality Act ("CEQA") requirements. We join in those comments, and for our part we wish to alert you to the environmental justice and civil rights laws the proposed noise standards could implicate.

3-4 Foremost among these is Cal. Gov. Code § 11135(a), which prohibits any agency that receives state funding from conducting programs or activities that discriminate against protected racial and ethnic groups. This discrimination does not have to be intentional. An agency may violate § 11135 by pursuing a policy that has a disparate impact on protected classes if there is no substantial legitimate justification for that policy or if a plaintiff can show that there are alternative, equally effective actions that will have less impact on protected classes. *Darensburg v. Metro Trans. Comm'n*, 611 F. Supp. 2d 994, 1041 (N.D. Cal. 2009).

San Bernardino County, like other counties across California, receives millions of dollars of state funding every year and would be subject to § 11135. *See, e.g.*, 2009-10 Final Budget – General Fund Financing at 48, 51; Cal. Code Regs. tit. 22, § 98010; *Comm. for Immigrant Rights v. County of Sonoma*, 644 F. Supp. 2d 1177, 1207 (N.D. Cal. 2009). And many of the residents who live near the Auto Club Speedway are members of protected racial and ethnic classes. The city of Fontana estimates that 66 percent of its population is Latino.[2] The neighborhood that shares the same zip code as the race track was 68.8 percent Latino, according to figures from the 2000 Census.[3]

The County has fallen short of the requirements of § 11135 in several respects. Implementing regulations define numerous discriminatory practices prohibited under § 11135. Cal. Code. Regs tit. 22, § 98101. One such practice is "provid[ing] different or separate aid, benefits or services to a person, or to any class of persons, than is provided to others." *Id.* at § 98101(d). The proposed standards would allow residents to be subjected to noises as loud as 100 dBA 35 days a year and to intermittent noises as loud as 85 dBA year-round. Such volumes are significantly higher than noise levels permitted

[2] City of Fontana, Econ. Dev. Dep't, Citywide Demographics, http://www.fontanabusiness.org/demos.html (last visited May 10, 2010).
[3] U.S. Census Bureau, American FactFinder, http://factfinder.census.gov/home/saff/main.html?_lang=en (last visited May 10, 2010).

Doug Feremenga, AICP
May 10, 2010
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elsewhere in the County – including commercial and industrial areas. San Bernardino County Code § 83.01.080. The County has offered no substantial legitimate justification as to why neighborhoods near the Speedway should have to endure more harmful noise levels than other neighborhoods or why they should not be entitled to noise standards that,
3-4 like the countywide standards, reflect medical knowledge about excessive noise and its
cont. impact on public health.

Additionally, the § 11135 implementing regulations prohibit agencies from "fail[ing] to take appropriate steps to ensure that alternative communication services are available to ultimate beneficiaries, except where the State agency determines that such a requirement would place an undue hardship on the recipient." Cal. Code. Regs tit. 22, §§ 98211(c).

During the environmental review for the drag strip relocation, residents participated as best they could. They submitted petitions that told of the burdens the track had forced upon them – the clouds of smoke, the lost sleep, and the inability to concentrate at school. But many residents spoke only Spanish, and the County refused to provide translators or Spanish document summaries. This is somewhat surprising given the demographic makeup of the county – where more than a third of residents speak a language other than English at home – and the many state and federal policies that call
3-5 for documents to provide language assistance. *E.g.*, Executive Order 13166, Improving Access to Services for Persons with Limited English Proficiency, 65 Fed. Reg. 50121 (Aug. 11, 2000) ("agencies shall ensure that stakeholders, such as [limited English proficiency] persons and their representative organizations, recipients, and other appropriate individuals or entities, have an adequate opportunity to provide input"); Dymally-Alatorre Bilingual Services Act, Cal. Gov't Code §§ 7290 *et seq.*, 7291 ("the intention of the Legislature in enacting this chapter [is] to provide for effective communication between all levels of government in this state and the people of this state who are precluded from utilizing public services because of language barriers").

Given the above, we urge the County to develop a solution for Speedway noise that satisfies all state and federal laws and that rests upon sound considerations of equity
3-6 and public health. CCoMPRESS has pointed out that there are readily available mitigation measures and alternatives that would reduce noise impacts. By acting upon such measures and alternatives, the County could help to ensure that it complies with § 11135 and other civil rights statutes. Thank you for considering our comments.

Sincerely,

Adriano L. Martinez

Adriano Martinez
Project Attorney
Natural Resources Defense Council

Damon K. Nagami

Damon Nagami
Staff Attorney
Natural Resources Defense Council

Responses to Letter No. 3: NRDC

3-1. This comment asserts that the Speedway is currently inflicting public health problems on surrounding communities in the form of excessive noise. However, no information is provided to support this assertion.

Health & Safety Code sections 46000 et seq are cited by the NRDC and apply to the California Noise Control Act of 1973. Section 46000(a) and (b) have been cited to suggest "[e]xcessive noise is a serious hazard to public health and welfare" and that "[e]xposure to certain levels of noise can result in physiological, psychological and economic damage." The level of noise required to result in these damages is unstated by the commenter. However, as discussed in the report issued by Steve Davis (Attachment 2), the Speedway does not currently nor would the proposed actions inflict public health problems upon any person, including the surrounding industrial zone. Residents occupying the industrial zone and in conforming residential communities nearby do not and will not have their health affected by the current Speedway activities and the proposed project. Please see Responses 1-10 through 1-22 for discussion of potential noise and health related impacts. Based on the foregoing, impacts concerning public health problems have been determined to be less than significant.

Additionally, the County prepared and approved a Noise Element and a Land Use Element for its General Plan in compliance with state law. See Cal. Government Code 65300 et seq. The Speedway activities conform to the Noise Element and are discussed throughout the RDSEIR and the responses. See County Development Code Sections 82.01.030(d) and 82.18.030. Further, the activities occurring at the Speedway are consistent with the zoning in and around the area of the Speedway including the Commercial Industrial (IC) zoning. In contrast, non-conforming residential uses are contrary to the County's General Plan and impact the ability of properly zoned uses to fully utilize the zone as intended, which results in economic damage for the industrial users. In this instance the County has taken the steps necessary to provide for the control, abatement, and prevention of unwanted noise in properly zoned areas and has taken steps to require these uses to occupy specified zones protective of more noise-sensitive zones. The conforming uses are entitled to their use and the contrary is true for a non-conforming uses causing economic damage.

3-2. The commenter suggests incorrectly that the proposed project would lead to physiological, psychological and economic damage to area residents. As discussed in the RDSEIR and many of the responses to comments, including the report prepared by LaCroix Davis (Attachment 2), activities at the Speedway will not cause psychological or physiological damage to anyone, including the closest residences to the Speedway (See Responses 3-1 and 1-10 through 1-22). As for economic damage, the legal non-conforming uses are already impacted by the industrial zone they inhabit, which by County statute means that the remaining years of the non-conforming residential use are limited, and the zoning will not change with the proposed project. See County Development Code Section 84.17.050. Moreover, the commenter's citation to the 72.1 dBA Ldn correctly reinforces that the legal non-conforming uses themselves are already impacted by their presence in an industrially zoned area where industrial noise levels can legally reach 90 dBA Lmax.

The commenter's description concerning the federal OSHA standard of 90 dBA continuous exposure for eight (8) hours is irrelevant since it does not correctly express the potential exposure from the proposed project. The proposed standard would only exceed 85 dBA for a maximum of one (1) hour per day, 35 days per year and would be lower the remaining 330 days per year. Thus, the suggestion that the proposed noise standard will be far less protective than what state and federal laws recommend is incorrect.

Finally, it should be noted that the County's noise standard states that a value is exceeded only if it exceeds the ambient noise existing at the location. See County Development Code Section 83.170.080(e). It is already well established that ambient noise in and around the area of the Speedway facility, including the legal non-conforming residences occupying the industrial zone north of Whittram Avenue, exceeds 110 dBA, a level well above any noise originating at the Speedway as it exists now or as part of the proposed project. See RDSEIR, Table 4.2-5. Thus, pursuant to the County's noise standard, other noises in the interval measured are not deemed to be in violation of the standard if the background level is equivalent or higher. Because occasional noise at the Speedway might potentially exceed the ambient conditions over a particular measured interval even after mitigation, the proposed project is considered to have a significant impact. As stated in the RDSEIR, the proposed project would result in significant nuisance noise, defined as maximum noise levels in excess of the levels found by the Board of Supervisors to be acceptable as documented in the Statement of Overriding Considerations for the 1995 Speedway PD EIR.

3-3. The commenter asserts that a failure to enforce the current noise standard and to replace it with even weaker standards risks violation of a range of laws. The issue of violation of noise standards has been raised and addressed in Response 1-4. In addition, the commenter cites the CCoMPRESS and CBE comments and joins in those comments. Because responses have already been provided for both of the CCoMPRESS comment letters (1 and 2, respectively) and those responses demonstrate appropriate enforcement and no violation of laws, no further response is required.

3-4. The commenter cites environmental justice and civil rights laws and specifically prohibitions cited in California Government Code Section 11135(a) and its implementing regulations at Title 22 CCR sections 98101 et seq. The commenter does not reference how these provisions are supposed to apply under CEQA. CEQA is detailed in the State's Public Resources Code and does not reference Government Code Section 11135 nor include any requirement specifying that notice be issued in Spanish or an alternative language. County Development Code Section 86.07.020 states notice under CEQA is to comply with Public Resources Code Section 21091. The County has met that requirement. The issue of environmental justice has been raised and addressed in Response 1-6.

The County finds that no statutory or regulatory obligation exists to provide information on a CEQA-mandated document in an alternative language, including in this case, Spanish. The commenter refers to the presence of Latinos in the City of Fontana and the census tract that includes the Speedway facility as the basis to conclude that alternative communication in Spanish is necessary. The commenter does not provide any information to suggest that the Latinos cannot speak, read or write English (or can only speak, read or write Spanish), so there is no basis to determine if the commenter's conclusions are correct and the request valid. It is not County policy to provide CEQA-related or other hearing material in any language other than English. However, in an effort to eliminate any potential misunderstanding that interested persons may not comprehend this particular proposed project, the Applicant has volunteered to provide in Spanish, notices of public hearings for this project, the Executive Summary, Preface to the RDSEIR. In addition, the Applicant has also volunteered to provide a Spanish translator at the hearings.

3-5. This comment states that residents in the vicinity of the Speedway have participated in public comment opportunities including public hearings conducted only in English for the Mitigated Negative Declaration review process that occurred in 2007-2008. Although this comment is not related to the RDSEIR, it is noteworthy that the residents were able to participate and raise their concerns even though noticing was conducted in English-only materials.

This comment also contains citations to the federal Executive Order 13166, which applies solely to federal agencies and not to state agencies or private persons and is therefore not germane to this project. The comment also cites the Dymally-Alatorre Bilingual Services Act, which applies only to public contact positions in government and not to CEQA and is therefore irrelevant to the proposed project. CEQA statutes and regulations make no reference to either of these provisions. In any event, even potential compliance under the Dymally-Alatorre Bilingual Services Act is uncertain if federal, state or local funds are unavailable. As state and local governments are all addressing significant deficits in funding, it would appear that any consideration under the Dymally-Alatorre Bilingual Services Act is premature.

3-6. The commenter urges the County to develop a solution for Speedway noise that satisfies all state and federal laws and that rests upon sound considerations for equity and public health. As provided in the RDSEIR, the responses to the comments in this letter as well as responses to all of the other commenters, the County has given sound considerations to equity and public health that are based upon compliance with state and federal laws. The County's actions are consistent with its General Plan. Its actions protect the community's public health while allowing for appropriate economic development. As determined by the RDSEIR, these responses and all of the other responses to comments, the County satisfies its legal and equitable obligations.

LETTER 4

To: Feremenga, Douglas - LUS
Subject: Comments on Recirculated Draft Subsequent Environmental Impact Report for Auto Club Speedway, SCH 2008081077

May 10, 2010

Doug Feremenga
County of San Bernardino
385 N Arrowhead Ave
San Bernardino, CA 92415

Dear Mr. Feremenga:

4-1 The Endangered Habitats League is concerned over the quality life in urban communities, as a vital component of sustainable land use and environmental planning. Noise is a major factor. We thus endorse the comments of the Natural Resources Defense Council in regard to this project.

Sincerely,

Dan Silver, Executive Director
Endangered Habitats League
8424 Santa Monica Blvd., Suite A 592
Los Angeles, CA 90069-4267

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dsilverla@me.com
www.ehleague.org

Responses to Letter No. 4: Endangered Habitats League

4-1 This comment states that the Endangered Habitats League endorses the comments of the NRDC letter. Please refer to Responses 3-1 through 3-6 for responses to the NRDC comment letter.

LETTER 5

CCAEJ

Center for Community Action and Environmental Justice

Centro de Acción Comunitaria y Justicia Ambiental

Penny Newman
Executive Director

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Glen Avon Heritage Park
7701 Mission Blvd
Glen Avon, CA 92509

May 6, 2010

Doug Feremenga, AICP
Senior Planner
County of San Bernardino
Land Use Services Department
385 N. Arrowhead Ave.
First Floor
San Bernardino, CA 92415-0130

Re: Comments on Recirculated Draft Subsequent Environmental Impact Report for Auto Club Speedway, SCH 2008081077

Dear Mr. Feremenga:

5-1 On behalf of the Center for Community Action and Environmental Justice, we provide these comments on the Re-Circulated Draft Subsequent Environmental Impact Report (RDSEIR) prepared for the proposed relaxation of noise standards for the Auto Club Speedway (Speedway) and permanent relocation of a drag strip to the north side of Speedway property. The goal of the Center is to build a strong movement for change that recognizes the connections between environmental and worker exploitation, and oppression on the basis of race, gender, sexual orientation and class. We advocate for environmental health and justice by seeking opportunities to bring together groups of people working on a variety of social, economic and environmental justice issues. The Center supports Concerned Community Members and Parents of Redwood Elementary School Students (CCoMPRESS) in its opposition to the relocation of the drag strip and the proposed relaxation of noise standards because it will subject the community north and east of the Speedway, a mainly lower income and Latino community, to dangerous noise levels and unhealthy air quality.

5-2 The RDSEIR is misleading in its claims that allowing the drag strip to produce noise levels up to 100 decibels at homes near the Speedway for 35 days per year and 85 decibels on all other days is a "health based" standard. Instead of protecting community hearing or general health, the standard will exacerbate existing health impacts and expose residents to the long term impacts of noise-induced stress, which include hypertension, coronary artery disease,

bringing people together to improve our social and natural environment heart attacks, and various mental health impairments. These excessive noise levels will make it difficult for children living and attending school in this community to concentrate and learn, putting them at significant educational disadvantage.

5-3 The location of the drag strip on the north side of the Speedway's property also exposes community members, school children, and parishioners to increased levels of air pollution. One of the most significant impacts experienced in this community is the smoke and foul smelling air produced when each dragster heats up its tires before a race. The clouds of smoke containing produced by the burning of rubber spreads through the community on race days. Additionally, unlike operations on the south side of the property, the Speedway now proposes to allow non-street legal gas-powered dragsters, alcohol fueled dragsters, and nitromethane fueled dragsters. These new fuel emissions, and their impacts on human health, have not been adequately assessed in the Health Risk Assessment prepared for the RDSEIR. The RDSEIR also fails to analyze the drag strip's emissions of criteria pollutants, including nitrogen oxides, sulfur oxides, lead, carbon monoxide, particulate matter, and ground level ozone. Additionally, methanol levels in the area already exceed the acute and chronic reference exposure levels set by the California Office of Environmental Health Hazard Assessment.

5-4 As detailed above, and in the comments that will be submitted by CCoMPRESS, the RDSEIR does not adequately analyze the Speedway project's adverse impacts on noise and air quality, or the corresponding impacts on community health. Under the proposed project, the Speedway would be allowed to operate under much more lax standards than applicable to other land uses in the County, to the significant detriment of the community north and east of the Speedway. Thank you for this opportunity to comment on this matter.

Sincerely,

Penny Newman
Executive Director,
Center for Community Action and Environmental Justice

Responses to Letter 5: Center for Community Action and Environmental Justice

5-1 This comment provides introductory remarks and states the Center for Community Action and Environmental Justice (CCAEJ) organizational mission and its opposition to the proposed project due to noise and air quality concerns in a Latino community. Specific comments raised by CCAEJ are addressed in the following responses.

5-2 This comment asserts that the proposed project would exacerbate *existing health impacts* and affect school children in their ability to concentrate and learn. The existing industrial nature of the community surrounding the Speedway has been described in detail in Response 1-1. Concerns regarding health effects have been raised and addressed in Responses 1-11 through 1-22. The issue of impacts to school children has been raised and addressed in Responses 1-2, 1-24 and 2-4. The County has a mechanism under the Development Code to address existing health impacts by eliminating non-conforming residential uses within a prescribed period of time (See Response 1-33).

5-3 This comment raises the issue of air quality including odors, air toxics, criteria pollutants and specifically methanol levels. The issue of air quality has been raised and addressed in Responses 1-36 through 1-42. The health risk assessment for air emissions (included as Attachment 3 to this Response to Comments) prepared for the proposed project demonstrates that the project would not result in unhealthy air quality. Air Quality has also been addressed in Responses 15-1 through 15-18 in response to the SCAQMD comment letter. As demonstrated in these responses, the proposed project would not result in significant air quality impacts.

5-4 This comment provides summary comments and restates the CCAEJ's overall opposition to the proposed project due to potential effects on noise, air quality, and community health. As demonstrated in previous response to comments, the RDSEIR does adequately address potential effects on noise, air quality, and community health.

LETTER 6

From: Milasol Gaslan [mailto:MGaslan@waterboards.ca.gov]
Sent: Thursday, May 06, 2010 10:18 AM
To: Feremenga, Douglas - LUS
Cc: Kurt Berchtold; Michael Adackapara; Mark Adelson
Subject: Draft SEIR for the Auto Club Speedway in Fontana

Mr. Feremanga,
6-1 This is a follow up to the voice mail message I left you this AM. I wanted to touch base with you regarding the subject draft SEIR. We received a complaint expressing water quality concerns regarding the proposed project, specifically the relocation of the drag strip and wanted to find out if we will be providing comments. Complainant characterized it as an addition of about a 1/4 mile of drag strip disturbing about 50 acres of land. However, my brief review of the initial study checklist determined no impact to water quality and hydrology because there will be no physical modifications to the facility. I wanted to confirm that there will be no construction activity that involves soil disturbance 1 acre or greater that would require construction storm water permit coverage, or the addition or replacement of 5000 square feet or more of impervious surface that would trigger the requirement for a Water Quality Management Plan. I hope to hear from you before the 5/10 due date for comments. Thank you

Milasol C. Gaslan, Chief
Inland Storm Water Section
RWQCB 8, Santa Ana Region
(951)782-4419
E-MAIL: MGASLAN@WATERBOARDS.CA.GOV

1

Responses to Letter No. 6: Email from RWQCB

6-1 This comment includes an inquiry regarding construction of the drag strip in its current northern location with relation to the need for a storm water permit or water quality management plan. The drag strip was relocated to its present location with authorization of a Temporary Use Permit in June 2006. The drag strip is currently located in an area that was already paved as a parking lot (Parking Lot Nos. 6 and 8) with the original development of the Speedway. Because no alterations to drainage patterns were made as part of drag strip development, permanent operation of the drag strip in this location would not affect drainage or result in an increased amount of pervious surfaces leading to an increase in surface runoff. Further, the Speedway would continue to comply with its internal standard operating procedures for storm water management.

The proposed project includes construction of a noise attenuation wall to be located along the quarter mile northern edge of the drag strip. However, the project would not create a soil disturbance of one acre or greater, or create 5,000 square feet or more of impervious surface; therefore, construction of the wall would not require a construction storm water permit or Water Quality Management Plan. Engineering design plans for the sound wall are not finalized. If designs change requiring a disturbance of soil greater than one acre, than the Speedway would obtain all requisite permits from the Regional Water Quality Control Board prior to construction. With requisite permits, impacts would be less than significant.

LETTER 7

City of Fontana
CALIFORNIA

May 10, 2010

County of San Bernardino
Land Use Services Department
Attn: Doug Feremenga
385 North Arrowhead Avenue
San Bernardino, CA 92415-0182

Re: **Notice of Completion of a Draft Re-Circulated Subsequent Environmental Impact Report (EIR) for the Auto Club (formerly California) Speedway Event Center**

Dear Mr. Feremenga,

On March 29, 2010, the City of Fontana Planning Division received the Notice of Completion of a Draft Re-Circulated Subsequent Environmental Impact Report for the Auto Club (formerly California) Speedway Event Center. The project consists of approximately 550 acres and is located on the west side of
7-1 Cherry Avenue, north of San Bernardino Avenue, and south of Whittram Avenue within the City of Fontana's Sphere of Influence in unincorporated San Bernardino County. The public review period began on March 23, 2010, through May 10, 2010. At this time, the City has no comments or concerns; however, we would like to document that a resident has repeatedly expressed concerns regarding the proposed project and its potential adverse impacts on his property and the surrounding neighborhood. The following environmental issues/concerns were raised during the City Council meetings:

- Nearby homes and noise impacts to these and other sensitive uses
- 7-2 New sporting events at the Speedway were not analyzed in the previous EIR
- Excess noise levels from the Auto Club drag strip
- Mitigation for noise is needed
- Impacts to physical health as a result of excessive noise levels

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7-2 cont.

- Propose an alternative location for the drag strip
- Incomplete Project Description
- Speedway violates federal, state, county noise standards.

After a thorough review of the Re-Circulated Subsequent EIR, staff has determined the following in response to the aforementioned environmental issues/concerns:

7-3

- In the original Speedway Final EIR (1995), the race event noise levels were evaluated. These were expected to exceed the County's nuisance-based noise performance standards. A significant and unmitigated impact for the nuisance caused by the increase in noise levels over and above the County's noise performance standards were identified at that time and a Statement of Overriding Considerations was adopted.
- As identified in the Re-Circulated Subsequent EIR (2010), in a worst-case scenario, the closest residence to the drag strip would experience an Lmax noise level of approximately 90 dBA, which would not exceed the 100 dBA Lmax recommended by the EPA to prevent hearing loss.
- A 20 foot high wall has been proposed as a mitigation measure, but will not fully reduce noise levels below a level of significance. Additional mitigation measures were considered but none were available that would be effective at reducing noise; therefore, unavoidable significant adverse noise impacts are expected with the proposed revision to the Speedway PD and General Plan amendment.
- A Statement of Overriding Considerations is required; making a finding that it has reviewed the potential noise impacts of the project; has balanced the benefits of the proposal against its significant effects; and has concluded that the benefits of the proposal outweigh the significant unavoidable adverse noise impacts.

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Thank you for allowing the City of Fontana to participate in the public review process.

Sincerely,
COMMUNITY DEVELOPMENT DEPARTMENT
PLANNING DIVISION

Stephanie Hall, Senior Planner

SH: am

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Responses to Letter No. 7: City of Fontana

7-1 This comment states that the City has no concerns regarding the proposed project but notes that one resident has expressed concerns regarding the project. No environmental issues have been raised in this comment; thus no further response is needed.

7-2 This comment summarizes concerns that were raised during City Council meetings. The City of Fontana offers a response to each of the issues raised during the City Council meeting in Comment 7-3; however, also note that each of these issues have been raised and addressed in previous comment letters including: exposure of sensitive receptors (Response 1-1), new sporting events (1-23), noise (Responses 1-10 through 13), noise mitigation (Responses 1-51 and 1-52) , physical health impacts (Responses 1-11 through 1-22), alternative location for the drag strip (Response 1-61), incomplete project description (Response 1-9) , and violation of noise standards (Response 1-4).

7-3 This comment includes the City of Fontana's responses to the previous list of issues raised during City Council Meetings. No additional response is required.

LETTER 8

STEPHEN W. ROGERS, P.E. CONSULTING
820 CHURCH ST. REDLANDS, CA 92374
PHONE: 909.556.1988 (CELL) EMAIL: STEVE_ROGERS@VERIZON.NET

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May 10, 2010

County of San Bernardino
Land Use Services Department
Advance Planning Division
385 N. Arrowhead Avenue
San Bernardino, CA 92415-0182
Attn: Doug T. Feremenga, Ph.D., Senior Planner

**SUBJECT: DRAFT RECIRCULATED SUBSEQUENT ENVIRONMENTAL IMPACT REPORT
AUTO CLUB SPEEDWAY REVISED NOISE STANDARDS
COUNTY OF SAN BERNARDINO (LEAD AGENCY)
SCH 2008081077**

The following comments are provided pertaining to the subject Draft EIR document for the Auto Club Speedway Revised Noise Standards, the "Project", dated March 2010:

8-1

1. The Initial Study (IS) for the Project (Appendix A), dated July 14, 2008, was the subject of a meeting between Mr. Doug Feremenga and myself on April 28, 2010. Mr. Feremenga requested that I transmit a list of questions, which were provided and are attached hereto as Exhibit 1. Mr. Feremenga indicated in our meeting that the questions were "good questions", however, he was unable to provide any additional relevant information or direction and tended to downplay the matters with his responses. The primary concern voiced to Mr. Feremenga was that the IS used to scope the EIR document for the Project was substantially outdated and therefore inadequate. Both the IS and the Draft SEIR fail to address the physical relocation, associated environmental impacts, necessary mitigation and project alternatives for the existing NHRA drag strip located on the north side of the Speedway property.

8-2

2. The Notice of Preparation (NOP) for the Project (Appendix B) was for a "…Supplemental EIR for the Auto Club (Formerly California) Speedway Event Center", issued by County Land Use Services under the Directorship of Julie Rynerson Rock. The Notice of Completion, however, dated March 23, 2010, has been improperly prepared as a "…Subsequent EIR…" under the Directorship of Dena M. Smith, former Clerk of the Board of Supervisors. (Pg. 1-3, last paragraph), "…in accordance with Section 15162 of the CEQA Guidelines, *preparation of a Supplemental EIR was determined necessary* by the County of San Bernardino (Lead Agency) for proposed revisions to the Speedway noise standards." Inconsistent with the NOP circulated on August 15, 2008, and "after completion of the public review process for the NOP, *the County decided to*

1

8-2 cont. *prepare a Subsequent EIR, rather than a Supplemental EIR.* A Subsequent EIR is only appropriate for use with a Program Environmental Impact Report (PEIR) process, pursuant to the CEQA Guidelines.

8-3

3. The Project "baseline conditions" for the purposes of the Draft SEIR document have been misleadingly stated (Pg. 1-4, first paragraph) as "…those occurring on-site at the time the NOP was distributed in August 2008 and as substantially determined by the Court to be the Speedway's current legal operating conditions." Seeing that in October 2009, the approval, environmental review and permanent operation of the drag strip in it's current north end location was invalidated until adequate CEQA documentation is provided, the "baseline conditions" as stated in the document are erroneous. With the definition of the Project being expanded to include the physical relocation and operation of a drag strip on the north end of the Speedway property, a new Initial Study (IS) and Supplemental Environmental Impact Report (SEIR) are required. Under CEQA Guidelines the documentation must study and analyze any potentially significant Project environmental impacts and associated mitigation measures resulting from such a substantial modification to the original development plan and Final / Amended EIR approvals.
4. The document unreasonably indicates (Pg. 1-4, first paragraph) "The baseline conditions include the drag strip's physical location along the Speedway's northern perimeter as authorized under a Temporary Use Permit." when the October 2009 court action has invalidated this approval (Revision #9) to the development plan and associated environmental documentation for the relocated drag strip. Therefore, the baseline condition must be adjusted or "shifted" to properly address the physical change, analyze the environmental impacts, and review proposed mitigation measures and alternatives involving the relocated location of the drag strip to the northern perimeter of the Speedway property.

8-4

5. Section 1.4.1 Scope of Subsequent EIR (pg.1-10) indicates that the inadequately scoped "NOP was prepared for the proposed revision to the noise standard (only) and the document circulated to all identified affected and interested agencies and individuals to solicit their comments on the scope and analysis to be included in the Subsequent EIR for the proposal." It is unreasonable to expect that such an incomplete solicitation, through circulation of the outdated NOP and IS, would result in an adequate presentation and processing of the Project, to obtain appropriate agency and public input that would result in the proper environmental review and analysis of the relocated drag strip. In addition to reanalyzing noise impacts (utilizing reasonable and accepted noise level standards), the following potentially significant impacts should be analyzed with a new Initial Study (IS) and Supplemental Environmental Impact Report (SEIR) for the Project: Air Quality, Hazards and Hazardous Materials, Hydrology and Water Quality, Land Use and Planning, Transportation and Traffic, and Utilities and Service Systems.

8-5

6. Under Section 2.2 Project Background (Pg. 2-9, first paragraph) "The 1995 Final EIR for the Speedway PD identified potentially significant unavoidable adverse impacts to air quality, traffic and noise." Additionally, (Pg.2-10, last paragraph) "In October 2009, the Superior Court of the State of California for the County of San Bernardino issued a tentative ruling deeming the Mitigated Negative Declaration, which provided environmental clearance for Revision 9 inadequate. Therefore, the approval of the permanent operation of the drag strip in its location north of the oval track was set aside (invalidated) until adequate CEQA documentation is provided." Although the County has attempted to expand the Project description to include the relocated drag strip and the elimination of the prohibition in the PD against racing activity in Parking Lots 3-10 as Revision 11,

2

no substantial additional analysis has been provided in the subject Draft SEIR document. It is therefore unreasonable to expect that the subject documentation
8-5 would adequately address any and all potentially significant environmental
cont. impacts of these proposed Project modifications, as is required pursuant to the CEQA Guidelines.

7. Under Section 5 (Pg. 5-1): Significant Irreversible Environmental Changes and Unavoidable Adverse Impacts, the following misstated "baseline conditions" or assumptions for the Project do not consider the physical change and associated environmental impacts associated with the relocated drag strip and should be
8-6 analyzed and reviewed with a new IS and Draft Supplemental EIR: Ground disturbance, construction activities, new infrastructure systems, utility lines and public facilities; changes in trip generation, traffic patterns, access or on-site circulation; increase in vehicle emissions, change in hazardous materials use and construction noise impacts.
8. The Initial Study (IS) is inadequate for the Project, including the physical changes and associated environmental impacts associated with the relocated drag strip, as required be considered by the October 2009 court action invalidating Revision 9 and its companion MND. The following categories of environmental factors should be considered as having a "Potentially Significant Impact" for the Project IS and be properly reviewed and analyzed in the Supplemental EIR:
   - Air Quality (Would the project:)
     a. "Conflict with or obstruct implementation of the applicable air quality plan?"
     b. "Violate any air quality standard or contribute substantially to an existing or projected air quality violation?"
     c. "Result in a cumulatively considerable net increase in any criteria pollutant for which the project region is in non-attainment under any applicable federal or state ambient air quality standard (including releasing emissions, which exceed quantitative thresholds for ozone precursors)?"
8-7 d. "Expose sensitive receptors to substantial pollutant concentrations?"
     e. "Create objectionable odors affecting a substantial number of people?"
   - Hazards and Hazardous Materials (Would the project:)
     a. "Create a significant hazard to the public or the environment through the routine transport, use or disposal of hazardous materials?"
     b. "Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?"
     c. "Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?"
     g. "Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?"
   - Hydrology and Water Quality (Would the project:)
     a. "Violate any water quality standards or waste discharge standards?"
     f. "Otherwise substantially degrade water quality?"
   - Land Use and Planning (Would the project:)
     b. "Conflict with any applicable land use plan, policy or regulation of an agency with jurisdiction over the project (including but not limited to the general plan, specific plan, local costal program, or

3

zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?"

- Noise (Would the project;)
  - a. "Exposure of persons to or generation of excessive ground borne vibration or ground borne noise levels?"
- Population and Housing (Would the project:)
  - c. "Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?"
- Public Services

8-7 cont.

  - a. "Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services: Fire Protection, Police Protection, Schools and Other Public Facilities?"
- Transportation/ Traffic (Would the project:)
  - a. "Cause an increase in traffic, which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections)?"
  - b. "Exceed either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?"
  - e. "Result in inadequate emergency access?"
  - f. "Result in inadequate parking capacity?"
  - g. "Conflict with adopted policies, plans or programs supporting alternative transportation?"

If there are any questions about the contents of this correspondence, please call Mr. Stephen Rogers at (909) 556-1988. Thank you for the opportunity to participate in this very important project for the residents and other stakeholders of the County of San Bernardino.

Sincerely,

Stephen W. Rogers, P.E.

c: Sal and Elizabeth Lopez
Amy Minteer, Chatten-Brown & Carstens

4

EXHIBIT 1

QUESTIONS INVOLVING THE DRAFT RE-CIRCULATED SEIR FOR THE AUTO CLUB SPEEDWAY

8-8
1. The Notice of Preparation (10/08) refers to a Supplemental EIR, while the Notice of Completion (3/10) refers to the document being a Subsequent EIR. What is the significance of this modification within the framework of the CEQA processing of the SEIR?

8-9
2. The project description in the IS indicates the project is to "…modify noise standards…" and later that no physical change or modification to the project /operation is to be included in the EIR. Since Amendment No. 9 to the Speedway project has been invalidated by a recent court action, how does the County anticipate addressing the IS and SEIR process for the physical change associated with the relocated drag strip on the north end of the 550ac project?

8-10
3. The environmental/ existing site conditions in the IS indicates "Further to the north, between Whittram Ave. and Arrow Route, is a mixture of residential and industrial uses in the City of Fontana and the abutting unincorporated area within the Fontana Sphere of Influence." Has the County had discussions with the City of Fontana and LAFCO regarding annexation of this unincorporated area to the City of Fontana for the area within the Fontana Sphere of Influence?

8-11
4. Shouldn't the IS environmental factors for "Potentially Significant Impact" also include those affected by the physical change of relocating a drag strip on the project, to include: Air Quality, Hazards & Hazardous Materials, Land Use/ Planning, Population/ Housing and Transportation/ Traffic, in order to consider all potentially significant impacts?

8-12
5. Shouldn't the Findings of Significance also consider the "physical changes" of the relocated drag strip that was inadequately considered in invalidated Amendment No. 9?

8-13
6. Does the relocated drag strip include a fueling station, and if so, have the safety hazards associated with the fueling station been considered?

Responses to Letter No. 8: Stephen Rogers

8-1 This comment summarizes the commenter's concerns raised during a meeting with the County Planning Department regarding the adequacy of the Initial Study (IS) prepared for the proposed project. The comment asserts that both the IS and the DSEIR fail to address the physical relocation, associated environmental impacts, mitigation and alternatives for the permanent relocation of the drag strip to the north side of the Speedway property. Each of these issues have been raised and addressed in the previous response to comments. Regarding the revised project description please see the Preface to the Recirculated EIR in the RDSEIR which explains in detail the reasons for the revisions to the project description, namely as a result of the Superior Court of the State of California for the County of San Bernardino October 2009 decision regarding previous Speedway approvals. Additionally, Response 1-7 addresses concerns raised about the adequacy of the Initial Study and recirculated EIR versus preparation of a new EIR. Please see Responses 1-10 through 1-22 for discussion of potential noise and health-related impacts, Responses 1-51 and 1-52 for a discussion on noise mitigation and Responses 1-56 through 1-62 for a discussion on mitigation and alternatives considered in the RDSEIR.

8-2 This comment incorrectly asserts that the County improperly prepared a Subsequent EIR and should have prepared a Supplemental EIR.

According to Section 15162 of the CEQA Guidelines:

(a) When an EIR has been certified or a negative declaration adopted for a project, a subsequent EIR shall be prepared for that project if the lead agency determines, based on substantial evidence in the light of the whole record, one or more of the following:

(1) Substantial changes are proposed in the project which will require major revisions of the previous EIR or ND due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects;

(2) Substantial changes occur with respect to the circumstances under which the project is undertaken which will require major revisions of the previous EIR or Negative Declaration (ND) due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects; or

(3) New information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at the time the previous EIR was certified as complete or the ND was adopted, shows any of the following:

(A) The project will have one or more significant effects not discussed in the previous EIR or ND;

(B) Significant effects previously examined will be substantially more severe than shown in the previous EIR;

(C) Mitigation measures or alternatives previously found not to be feasible would in fact be feasible, and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measure or alternative; or

(D) Mitigation measures or alternatives which are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measure or alternative.

(b) If changes to a project or its circumstances occur, or new information becomes available after adoption of a ND, the lead agency shall prepare a subsequent EIR if required under subdivision (a). Otherwise, the lead agency shall determine whether to prepare a subsequent negative declaration or an addendum.

(c) Once a project has been approved, the lead agency's role in project approval is completed, unless further discretionary approval on that project is required. Information appearing after an approval does not require reopening of that approval. If after the project is approved, any of the conditions described in subdivision (a) occurs, a subsequent EIR or negative declaration shall only be prepared by the public agency which grants the next discretionary approval for the project, if any. In this situation no other responsible agency shall grant an approval for the project until the subsequent EIR has been certified or subsequent negative declaration adopted.

(d) A subsequent EIR or subsequent ND shall be given the same notice and public review as required under CEQA Guidelines Section 15087 or Section 15072. A subsequent EIR or ND shall state where the previous documents are available and may be reviewed.

As stated in Section 15163 of the CEQA Guidelines:

(a) The lead or responsible agency may choose to prepare a supplement to an EIR rather than a subsequent EIR if:

(1) Any of the conditions described in Section 15162 would require the preparation of a subsequent EIR, and

(2) Only minor additions or changes would be necessary to make the previous EIR adequately apply to the project in the changed situation.

(b) The supplement to the EIR need contain only the information necessary to make the previous EIR adequate for the project as revised.
(c) A supplement to an EIR shall be given the same kind of notice and public review as is given to a draft EIR under Title 14 CCR, Section 15087.
(d) A supplement to an EIR may be circulated by itself without re-circulating the previous draft or Final EIR.

As shown, the County was correct in preparing a Subsequent EIR because there were more than minor additions to the project description to make the 1995 Speedway EIR apply to the proposed action. It is also important to note that format and noticing guidelines are identical between a Subsequent and Supplemental EIR.

8-3 This comment questions the baseline conditions presented in the DSEIR because of the October 2009 court action. The DSEIR was recirculated in part due to changing baseline conditions. The RDSEIR contains updated information related to the project description to include the permanent operation of the drag strip on the north side of the Speedway. Responses D-5 and D-7 of the Response to Comments prepared for the DSEIR in Appendix G of the RDSEIR addressed concerns related to baseline conditions. As stated in Response D-5, revisions were made to the Draft SEIR to depict the existing PD noise standard as applying only to six premier race event weekends. In addition, in response to the October 2009 Court tentative decision, the project description has been revised to include County approval for permanent operation of the drag strip north of the oval track. Finally, in response to comments (D-69) about the accuracy of noise contours, revised noise contours have been added to the DSEIR to more accurately reflect attenuation gained by intervening structures and topography in the Speedway vicinity. These graphics also show the 75 dBA contour to depict the County's noise standard for events occurring during non-premier race weekends. Although the baseline presented in the original Draft SEIR did not clearly mention that permitted noise levels were only applicable to six event weekends per year, it did present an accurate depiction of existing noise levels through provision of results of extensive noise monitoring. The concept of baseline under CEQA requires that impacts be analyzed by comparing existing physical conditions to what would occur with the project. The EIR accurately depicted noise levels that result from current operations of the oval and from the drag strip as it was operating at the north side of the oval track pursuant to a Temporary Use Permit. Similarly, the Draft SEIR accurately depicts noise levels that would occur as a result of the permanently relocated drag strip and proposed noise standards. As stated on Page 4.2-14 of the original Draft SEIR and Page 4.2-18 of the recirculated Draft SEIR, the Draft SEIR states, 'A person's reaction to new noise is subjective and usually based on its comparison to the existing environment to which the person has adapted. It should be noted that people do not react to noise levels based on what is permitted, but based on how loud the noise is as compared to ambient noise levels.' Therefore, the Draft SEIR presented sufficient baseline for existing noise levels. The changes made to the recirculated Draft SEIR regarding the existing standard do not change the conclusions of the Draft SEIR because the resultant noise levels of the proposed project have been accurately depicted in the Draft SEIR. The DSEIR concluded that as a result in the increase in perceived loudness and increase in residents annoyed by noise near the Speedway, the proposed standard would allow for noise in excess of the levels currently determined to be an acceptable level of nuisance noise by the County Board of Supervisors, and thus a significant impact was identified. Therefore, regardless of whether 75 or 85 dBA Lmax is the current standard, the DSEIR acknowledges a significant and unmitigated impact from noise would occur requiring a Statement of Overriding Considerations."

Additionally, Response 1-7 addresses concerns raised about the adequacy of the Initial Study and recirculated EIR versus preparation of a new EIR.

8-4 This comment asserts that the NOP prepared for the proposed project was inadequate because it was limited to revision of the noise standards. While the NOP did contain a limited project description, the entire SEIR was recirculated with a Preface explaining the reasons for recirculation and summarizing the additions to the project description. A new NOP was not required to be prepared per the Court's October 2009 ruling. Regarding impacts associated with issue areas beyond noise, please see the following: Air Quality (Section 8 of the RDSEIR and Responses 1-36 through 1-42); Hazards and Hazardous Materials (Section 8 of the RDSEIR and Response 1-48); Hydrology and Water Quality (Section 8 of the RDSEIR and Response 1-47 and 6-1), Land Use and Planning (Section 8 of the RDSEIR and Response 1-33); Transportation and Traffic (Section 8 of the RDSEIR and Responses 1-43 through 45), and Utilities and Service Systems (Section 8 of the RDSEIR and Response 1-50). As demonstrated in Section 8 of the RDSEIR and in the aforementioned response to comments, the project would result in less than significant impacts to all of the issues areas raised in this comment.

8-5 This comment states that no substantial additional analysis has been provided in the RDSEIR to support the expanded project description. As discussed in Response 8-3 (and D-7 of the previous response to comments on the DSEIR), the DSEIR accurately depicted noise levels that result from current operations of the oval and from the drag strip as it was operating at the north side of the oval track pursuant to a Temporary Use Permit. Similarly, the DSEIR accurately depicted noise levels that would occur as a result of the permanently relocated drag strip and proposed noise standards. The changes made to the RDSEIR regarding the existing standard do not change the conclusions of the DSEIR because the resultant noise levels of the proposed project have been accurately depicted in the DSEIR. The DSEIR concluded that as a result in the increase in perceived loudness and increase in residents annoyed by noise near the Speedway, the proposed standard would allow for noise in excess of the levels currently determined to be an acceptable level of nuisance noise by the County Board of Supervisors, and thus a significant impact was identified. Therefore, regardless of whether 75 or 85 dBA Lmax is the current standard, or whether the drag strip was temporarily or permanently operated in the northern location the DSEIR and RDSEIR acknowledge that a significant and unmitigated impact from noise would occur requiring a Statement of Overriding Considerations. Therefore, while the project description was expanded in the RDSEIR, the overall impacts and analysis and conclusions did not require significant expansion.

This comment also noted that the 1995 Final EIR for the Speedway PD identified potentially significant unavoidable adverse impacts to air quality, traffic and noise. The proposed project would not exacerbate impacts to air quality or traffic as discussed in Section 8 of the RDSEIR and in Responses 1-36 through 1-42 (Air Quality), and Responses 1-43 through 45 (traffic).

8-6 This comment states that the RDSEIR did not address potential impacts associated with construction of the drag strip in its northern location. As stated on Page 0.1-1 of the RDSEIR: “The project description within the recirculated Draft SEIR has been revised to explicitly include permanent relocation and operation of the drag strip on the north side of the oval track. While the impacts of operating the drag strip at its north location pursuant to the proposed noise standards had already been accurately represented throughout the original Draft SEIR, that document was based on the premise that the drag strip had County approval to operate on a permanent basis pursuant to existing noise standards. Thus, the recirculated Draft SEIR was revised to reflect the premise that the existing drag strip north of the oval track was legally constructed at its present location pursuant to the previously approved temporary use permit, but does not currently have a valid permit to operate.” Because the drag strip has already been constructed in its current location north of the oval track, the RDSEIR did not address physical impacts associated with its construction. However, it is noted that the drag strip was constructed in a previously paved parking lot and did not result in ground disturbance activities. Nor does the drag strip require major new infrastructure systems, utility lines or public facilities since the Speedway facility already has such systems. Any noise effects that occurred during construction of the drag strip have already occurred when the drag strip was relocated upon issuance of a temporary use permit, which received no legal challenge. As described in Response 1-43, the relocation of the drag strip in its northern location did not change traffic patterns nor increase traffic beyond that which was previously analyzed. That comment had cited the use of the Calabash Avenue gate as evidence that traffic patterns had changed as a result of the relocated drag strip. However, the Calabash Avenue gate was used for exiting during NASCAR events because of changes to the Metrolink charter trains and was unrelated to the activities at the drag strip. Further, use of the Calabash gate for access to and from the Speedway during events was included in the original approval for the Speedway in 1995. Since use of the Calabash gate was contemplated with the original approval of the Speedway and the drag strip activities do not involve use of the Calabash exit, the proposed project does not change traffic patterns and the facility ingress and exits used when the drag strip was located on the south side of the oval track remain the same. Additionally as addressed in Response 1-44, trip generation would not be increased with permanent operation of the drag strip at its northern location. The proposed project will not increase the number of days that activities will occur with the Speedway event center beyond those analyzed in previous traffic studies. While addition of the most popular drag racing vehicle types will increase attendance at the drag strip as compared to events with only street legal vehicles, attendance at drag racing events will be consistent with the attendance figures used for ancillary activities in previous environmental analysis. The issue of an increase in vehicle emissions has been addressed in Responses 1-36 and 1-37. As stated, the permanent operation of the drag strip and revised noise standards would not result in a significant increase in vehicle emissions.

8-7 This comment provides a summary of the significance thresholds found in Appendix G of the CEQA Guidelines. The issue of whether a new Initial Study needed to be prepared was raised and addressed in Responses 8-3 and 1-7. Further, as described in Response 8-4, each of the issues areas listed in this comment have been analyzed in Section 8 of the DSEIR and RDSEIR (Section 8) and expanded upon in response to comments. See Response 8-4.

8-8 This comment is the first in the list of questions provided to the County. Please see Response 8-2 regarding the reason a Subsequent EIR was prepared.

8-9 The issue of addressing the physical change associated with the relocated drag strip has been addressed in Response 8-1, 8-3 and 8-6.

8-10 This comment questions whether the County has had discussions with the City of Fontana and LAFCO regarding annexation of the unincorporated County area into the City of Fontana. The proposed project includes permanent operation of a drag strip and revised noise standards for the Speedway which is located within the unincorporated area of the County. Because the Speedway is not contiguous to the City of Fontana, annexation of the Speedway could not occur without impacting other surrounding land uses. The County has land use authority over the Speedway and has notified the City of Fontana of the proposed project and provided the City with copies of the DSEIR and RDSEIR for review and comment. The City provided comments (see Comment Letter 7). Because this comment does not raise environmental issues, no further response is warranted.

8-11 The issue of addressing the physical change and potentially significant impacts associated with the relocated drag strip has been addressed in Responses 8-1, 8-3 and 8-6.

8-12 The issue of addressing the physical change associated with the relocated drag strip has been addressed in Responses 8-1, 8-3 and 8-6.

8-13 This comment inquires about whether or not the drag strip requires a fueling station and whether potential safety hazards associated with fueling have been addressed. This issue was raised and addressed in Response 1-9 and 1-48. As stated in those responses, public safety and the environment are not impacted by the fueling of vehicles for drag racing activities.

LETTER 9

From: Fritz Koenig [mailto:fritzkoenig@hushmail.com]
Sent: Sunday, May 09, 2010 2:02 PM
To: Feremenga, Douglas - LUS
Cc: Tish anderson; late98765@aol.com; Dplme@yahoo.com; milehighhollywood@yahoo.com; secovers1@netzero.net; Amy Minteer
Subject: Comments on Recirculated Draft Subsequent Environmental Impact Report for Auto Club Speedway, SCH 2008081077

May 9, 2010

Doug Feremenga, AICP
Senior Planner
County of San Bernardino
Land Use Services Department
385 N. Arrowhead Ave.
First Floor
San Bernardino, CA 92415-0130

Re: Comments on Recirculated Draft Subsequent Environmental Impact Report for Auto Club Speedway, SCH 2008081077

Dear Mr. Feremenga:

9-1

I strongly oppose the operation of a drag strip on the north side of the Auto Club Speedway's property and the proposed increase in noise standards to a maximum of 100 decibels 35 days per year and 85 decibels the remainder of the year.

My opposition is based on the following deficiencies in the Draft Subsequent Environmental Impact Report, as well as common decency and consideration for the rights of citizens who live near the existing facility to live without annoyance and in peace.

A) OBSOLETE STANDARDS

9-2

On page 4.2-29 of the *Revised Noise Standards for Auto Club Speedway SCH 2008081077 Subsequent Environmental Impact Report* , reference is made to "the EPA recommended health standard of 100 dBA Lmax". One presumes this refers to:

U.S. Environmental Protection Agency. "Information on Levels of Environmental Noise Requisite to Protect

Health and Welfare with an Adequate Margin of Safety." EPA/ONAC 550/9-74-004. March 1974.

as cited as a reference.

9-2 cont. The U.S. Environmental Protection Agency disbanded its noise department by the Reagan administration. The 1974 report is now an artifact and has no regulatory jurisdiction whatsoever. It is inappropriate to rely on it for regulation of noise today.

OSHA and the USA Center for Disease Control have standards which are jurisdictional and should be considered for this Environmental Impact Report

http://www.cdc.gov/nceh/hsb/noise/
http://www.osha.gov/SLTC/noisehearingconservation/standards.html

B) IMPROPER METRICS

The draft report heavily relies on analysis of potential hearing loss, as do the OSHA and CDC standards.

9-3 By analogy, a report about water could heavily rely only on its toxicity as opposed to flavor color and hardness which are all highly significant factors to public acceptance of a water supply.

Metrics for noise on residential lands are BY FAR not limited only to consideration to potential for hearing loss. Annoyance to human life from noise sources is as important to setting noise levels are is consideration of "hearing loss".

See enclosed,

Synthesis of social surveys on noise annoyance
Theodore J. Schultz
9-4 Bolt Beranek and Newman Incorporated, Moulton Street, Cambridge Massachuse0tt2s1 38
(Received 17 December 1976; 10 March 1978)

From: Dan Silver [mailto:dsilverla@me.com]
Sent: Monday, May 10, 2010 11:21 AM

Responses to Letter No. 9: Koenig

9-1 This comment provides introductory remarks and asserts the commenter's general opposition to the proposed project due to perceived noise impact. No environmental issues were raised; therefore no further response is warranted.

9-2 This comment states that the EPA document entitled "Information on Levels of Environmental Noise Requisite to Protect Health and Welfare with an adequate Margin of Safety" (1974) is outdated and the EIR instead should reply upon OSHA and Center for Disease Control (CDC) Standards. The CDC Web site referenced in this comment contains information regarding noise but does not offer standards or guidelines published by the CDC. However, in preparation of the RDSEIR and response to comments, several national and international organizations were surveyed for noise standards including EPA, OSHA, NIOSH, ISO and WHO. Please refer to Response 1-15 regarding the EPA Noise Effects Handbook, Response 1-11 regarding the OSHA standards, and Response 1-16 regarding NIOSH standards. Further Attachment 2 to this Response to Comments documents includes a report prepared to analyze potential health effects resulting from the proposed project and includes an analysis of the various noise guidance provided by the aforementioned agencies. The Lacroix Davis report demonstrates that historical Speedway activities and projected noise generated from the proposed project will not exceed OSHA standards. As discussed in that report, the proposed noise standard would comply with all standards and guidelines offered by OSHA and NIOSH. The proposed noise standard would not result in significant hearing and health effects to anyone, including those closest adjacent residences located in an industrially zoned area, and conforming residences located further away.

9-3 This comment asserts that the RDSEIR focuses too heavily on hearing loss. Please see Responses 1-14, 1-17, 1-20, 1-21, and 1-22 for additional analysis of other health effects. The Lacroix Davis report at Attachment 2 demonstrates that historical Speedway activities and projected noise generated from the proposed project do not contribute to other health effects. Other responses confirm that the non-conforming residential uses located in the industrial zone near the Speedway are already subjected to high levels of noise without the Speedway, so any perceived health effects may be the result of this exposure (See, e.g., Response 5-2.) Even with the County's own noise standard measuring Lmax values, depending on the measurement interval, Speedway noise may not exceed ambient noise during the interval and thus be in compliance with the noise standard and not contributing to health effects (See County Development Code 83.01.080(e)). The RDSEIR acknowledges that because the measuring interval cannot be determined in advance, that the proposed project would contribute to a significant and unmitigated impact associated with nuisance noise and a statement of overriding considerations would be required. However, the project would not result in significant health effects.

9-4 This comment contains an attachment from 1976. It is noted that in Comment 9-2, the commenter referred to EPA reports from 1974 as artifacts. The Schultz article describes the results of a study comparing the conclusions of more than eighteen social surveys on annoyance due to noise with the goal of identifying a noise threshold for annoyance. The article notes that the results are subjective and non-acoustical variables such as the person's attitude toward the source of noise or neighborhood in general appear to affect whether or not one expresses annoyance and the amount of one's annoyance. The article also notes that additional work needs to be done on the subject. Schultz concludes that a threshold of 70 dBA Ldn could be considered an acceptable level of environmental noise exposure for urban areas but that 25-40% of the population would be highly annoyed by noise or seriously disturbed in important activities.

Response 1-33 addresses Ldn levels generated by the Speedway. As stated in Response 1-33 and as shown in Figure 3-2 of the RDSEIR, the 65 dBA Ldn contour is located almost entirely within the Speedway boundaries with the exception of a small area occupied by the adjoining railroad tracks. No sensitive uses, including residences, are located within the 65 dBA Ldn contour. At 550 feet from the Speedway facility, the Ldn value is less than 60 dBA. Therefore, the closest sensitive receptors to the Speedway would experience Ldn values less than 60 dBA which is consistent with the General Plan and its Noise Element and 10 dBA less than the threshold suggested in this article.

LETTER 10a

May 6, 2010

To: Doug Feremenga, AICP
Senior Planner
County of San Bernardino
Land Use Services Department
385 N. Arrowhead Ave.
First Floor
San Bernardino, CA 92415-0130
Fax.909-387-3223

Salvador and Elizabeth Lopez
13932 Whittram Ave.
Fontana, Ca. 92335

Subject: Comments on Recirculated Draft Subsequent Environmental Impact Report
RSDEIR for AAA Auto Club Speedway 550 acres Event Center
County of San Bernardino (Lead Agency) SCH 2008081077

Dear Mr. Feremenga:

10a-1

I strongly oppose the operation of a drag strip on the north side of the Auto Club Speedway's property and the proposed increase in noise standards to a maximum of 100 decibels, 35 days per year and 85 decibels the remainder of the year.

The operation of the drag strip has and will continue to have significant noise, air quality, and traffic impacts on residents, school children, parishioners, and businesses. Noise levels produced by the drag strip are so loud many residents are not able to use the outdoor portions of their property during events. Even when they are indoors, it is often difficult to have conversations during drag races. This is especially significant because drag races are held on weekends when many residents are trying to enjoy the peace and quiet of their homes with their families. I am often forced to stay inside on weekends due to drag racing, instead of being able to enjoy the outdoors with my family as other families throughout the County are able to do.

Additionally, children are unable to concentrate on their school work during drag races. Drag races are held on Sundays, which negatively impacts area church services. Community members already experience headaches and other ailments from the high noise levels produced by the drag strip.

10a-2

Negative air quality impacts are also significant during drag racing events. I have witnessed large clouds of smoke engulfing the community north of the drag strip during

1

10a-2 cont. drag racing events. The Recirculated Draft Subsequent Environmental Impact Report (RDSEIR) fails to analyze the impacts of the smoke produced by dragsters heating up their tires before a race. The terrible smell of this smoke fills the community during drag racing events, making it difficult to breath.

10a-3 The drag strip on the north side of the Speedway's property also produces high levels of traffic that causes traffic jams on small, residential streets north of the drag strip. These impacts are especially significant when the Speedway holds drag racing events on the same day as events at the oval track.

10a-4 The RDSEIR is misleading in its claim that a 100 decibel maximum noise level is a "health based" standard, claiming it provides protection from hearing loss. Community members have already experienced hearing loss from the significant noise levels produced by the drag strip. Additionally, these extremely high noise levels can trigger elevated blood pressure levels and other stress and mental health impacts. Because these noise levels would be allowed to continue until 11 pm, it would lead to sleep disturbance. A lack of adequate sleep results in many negative health impacts. The RSDEIR fails to analyze the health impacts of this noise level increase on infants, elderly, handicapped persons, pregnant women, persons with illnesses and domestic animals.

10a-5 The County has allowed the Speedway to operate a drag strip in violation of state environmental laws and the County's noise standards for nearly four years. Approving this project, and allowing the Speedway to produce noise levels 25 decibels higher than any other use in the County, would reward the Speedway's continued lack of concern and consideration for the community located to the north of the drag strip. I urge you <u>not</u> to approve this project until all of its significant impacts have been fully analyzed and completely mitigated.

10a-6 Mr. Feremenga, please answer my comments and questions above and to all the comments and questions that will follow below.. **Please review: (THE CONSTITION OF CALIFORNIA AND THE UNITED STATES), and RELATED DOCUMENTS.**

Please review it and its entirety and answer this:

(A) Has the County of San Bernardino or the Auto Club Speedway violated any laws in the relocation the drag strip to the north of the A Auto Club Speedway property?

(B)Has the County of San Bernardino or the Auto Club Speedway violated any laws by operating the drag strip for four years illegally and the County of San Bernardino knowingly and willingly allowing the Auto Club Speedway to violate the law for four years?

2

(C)Why is the AAA Auto Club Speedway, currently still continues to date this May 9, 2010 on Mother's Day allowed to operate in violation of the law knowingly and willingly by the County of San Bernardino?

(D)We were trying to celebrate Mother's Day by having a BBQ and at the same time we are sucked by DRAGSTER FUMES and getting our ear drums hammered with noise and hearing lost is caused by these DRASTER NOISE, do you think this is acceptable?

10a-6 cont.

(E)Why is the County of San Bernardino NOT enforcing the law at The Auto Club Speedway?

(F)Why is The Auto Club Speedway receiving immunity from the law, in the County of San Bernardino?

(G)Will the County of San Bernardino continue to allow The Auto Club Speedway violate law and continue to give immunity from the law knowingly and willingly as it has for the past four years?

(H)Does this proposed noise revision comply with **THE CONSTITION OFCALIFORNIA AND THE UNITED STATES, and RELATED DOCUMENTS**?

Please review: **(THE CONSTITION OF CALIFORNIA AND THE UNITED STATES), and RELATED DOCUMENTS** carefully read and make any corrections necessary to comply with all the laws in **(THE CONSTITION OF CALIFORNIA AND THE UNITED STATES), and RELATED DOCUMENTS** To all the questions pertaining **THE CONSTITION OF CALIFORNIA AND THE UNITED STATES, and RELATED DOCUMENTS**.

10a-7

Please answer by stating the law that shows that the speedway is complying or state the law code that shows violation. **We are in a redevelopment zone (The Speedway Redevelopment Area).**

Please review all of the redevelopment business plan, redevelopment laws, including but not limited to HEALTH AND SAFETY CODES, local, County, State and Federal laws and answer the following questions by referencing the including but not limited to law, regulation, or code, that shows compliance or violation, to RDSEIR, to the relocated drag strip to the north, the four years operations in the north, the current operations and the expected operations in the future.

3

10a-7 cont.

(H)After you reviewed the above review the RDSEIR and answer this question, will the drag strip comply?

(I)Will the County of San Bernardino also comply and will the County enforce the law to the fullest extent at the Auto Club Speedway?

10a-8 (J)Is it a conflict of interest for the Board of Supervisor to deny the appeal of the drag strip on the north if they received if campaign contributions from the Auto Club Speedway or the president of the Speedway and should this board of supervisors make decisions, and is it possible that these decisions can be bias?

10a-9 (K)It is my understanding that laws and ordinances may not be relaxed at a redevelopment zone and that the regulations may only be more stringent. Is this true?

10a-10

(L)Will it be legal to relax the noise standard?
(M)Will relaxing the noise lower the standard of living?
(N)Will it be legal to lower the pollution standards?
(O)Will it be legal to bring more traffic onto small streets into our neighborhoods?

The noise reports

10a-11

The wrong parameter was used for all the in regard to residential use property.

The proper parameter for residential use property is L50 55dBA, L25 60dBA, L8 65dBA, L2 70dBA and never to over Lmax 75dBA and NOT Lmax 85dBA. This makes all the reports invalid. The parameters used were only for premier events and drag racing is not considered a premier event.

10a-12

The August 19, 2006 may have never happened normally I would have noticed. The same report shows compliance for the drag strip on that day but it show the position of the noise meter 850ft. from the drag strip and my residence is 570 ft. that is 300 ft difference. My residence is also directly in front of the start line where the tire burn out is performed. That makes it significant higher noise and clouds of smoke reach our residence and other community neighbors, depending on the direction of the wind.

We have observed that the wind blows all four directions at different times of the day and the direction cannot be predicted.

10a-13 The same report states that 253 noise samples were taken but it has no evidence.

4

10a-14 The same report does not show evidence of the location of the monitors except for a couple of dot on exhibit 1, pictures of the monitors location would had been more appropriate instead exhibit 2 shows pictures of the street and of the speedway and it appears that the same pictures are copied and pasted on the next report.

10a-15 The same report does not have the evidence of what time the noise was measured or for haw long. I observed that the person was not there when the loud dragsters were operating and only the quieter of the dragsters were monitored.

10a-16 Another observation I made was that most of the ambient noise reports were made directly next to passing traffic. This makes it seem as if the ambient noise is louder that it really is, because be don't have our ears next to passing traffic. For example our property is 300 feet in-depth this allows us to be 300 feet from passing traffic..

Passing traffic looses about 15-30 dba from the side of the road to the rear of our property, but the dragsters may only loose about 3dba from the side of the road to the rear of our property about 300feet.

10a-17 **Let me** I urge you again not approve this project until all of its significant impacts have been fully analyzed and completely mitigated.

Sincerely,

Sal and Elizabeth Lopez

Concerned Community Members and Parents of Redwood Elementary School Student

5

Responses to Letter No. 10a: Lopez 1

10a-1 This comment states the commenter's opposition to the proposed project citing noise, air quality, traffic, school children's ability to concentrate, and interior noise as the reason for this opposition. These issues have been raised and addressed in previous response to comments. Please see Responses 1-10 through 1-13 (noise), Responses 1-36 through 1-42 (air quality), Responses 1-43 through 45 (traffic), Responses 2-4, 1-2, 1-24, and 2-4 (school children), and Response 1-34 (interior noise).

10a-2 This comment raises the issue of the vapor clouds created by the drag strip and potential odor effects. This issue has been raised and addressed in Response 1-41.

10a-3 This comment raises the issue of traffic. This issue has been raised and addressed in Responses 1-43 through 45.

10a-4 This comment raises the issue of physical health effects. This issue has been raised and addressed in Responses 1-11 through 1-22. Further, the proposed standard would limit noise levels from exceeding 85dBA Lmax to the hours of 10 AM to 7 PM, reducing potential noise exposure associated with the proposed project during evening hours.

10a-5 This comment incorrectly asserts that the County has allowed the Speedway to operate the drag strip in violation of state environmental laws and County noise standards for four years. No environmental laws are cited, but a review of the state's environmental laws finds that none have been violated. A direct review of the County's noise standard finds that existing Speedway operations comply due to the effects of ambient and exempt noise (See Development Code Sections 83.01.080(e) and (g)). This issue has also been raised and addressed in Response 1-4.

10a-6 This comment requests analysis of the proposed project in relation to the United States and State of California constitutions. The federal and state constitutions delegate land use authority to local government. The County of San Bernardino has local land use authority over the Speedway. Please see Response 1-33 for a discussion of the project's consistency with the County's General Plan and Zoning Ordinance.

This comment also states that the Speedway has operated in violation of local laws. This issue has been raised and addressed in Responses 1-4 and 10a-5. This comment raises a specific event of alleged non-compliance on May 9, 2010. As explained in Response 1-4, the drag strip was relocated from Parking Lot No. 1 to Parking Lot Nos. 6 and 8 in compliance with County approvals. The Temporary Use Permit that permitted this relocation was approved on June 23, 2006 and an annual extension was approved on June 22, 2007. In July 2007, the County approved Revision 9 of the PD allowing the permanent operation of the drag strip within Parking Lot Nos. 6 and 8. However, this Revision was overturned in October 2009, when the Superior Court of the State of California for the County of San Bernardino issued a tentative ruling deeming the MND, which provided environmental clearance for Revision 9, inadequate. Therefore, the approval for permanent operation of the drag strip in its location north of the oval track was set aside until adequate CEQA documentation is provided. The Court issued a stay from further enforcement of the judgment, which permits the drag strip to continue operations, and an appeal was filed staying enforcement during the appeal process. Therefore, the Auto Club Speedway was operating in May 2010 and continues to operate in compliance with state law and with the current approved noise standards within the PD.

10a-7 This comment is generally a repeat of the previous comment (10a-6) in terms of requesting a review of the project in relation to federal and state laws. In addition, this comment requests a review of local redevelopment policies relative to the proposed project. The following documents have been reviewed and analyzed in relation to the proposed project: County of San Bernardino General Plan; County of San Bernardino Development Code; San Sevaine Redevelopment Plan; Speedway Planned Development; Speedway 1995 EIR and subsequent environmental documentation; OSHA, EPA, NIOSH and WHO guidelines related to noise; SCAQMD regulations related to air quality; RWQCB regulations related to stormwater runoff; and the CEQA Guidelines. As discussed in the RDSEIR and response to comments, the proposed project would be in compliance with all of the aforementioned documentation.

This comment also raises the issue of enforcement of the proposed noise standards. This issue has been raised and addressed in Response 1-52.

10a-8 This comment does not raise environmental issues nor does it address the adequacy of the RDSEIR. No further response is warranted.

10a-9 This comment asserts the commenter's assumption that ordinances may not be "relaxed" within a redevelopment zone. There is no basis for this assumption. The Speedway is located within the San Sevaine Redevelopment Area which promotes industrial activities. The PD represents the Speedway's operating permit from San Bernardino County, and effectively represents the zoning standards applied to the Speedway property. The PD may be amended subject to approval by the Planning Commission and/or Board of Supervisors depending on the amendment requested. See also Response 1-33 concerning the appropriate County Development Code provisions applicable to conforming and non-conforming uses in the San Sevaine Redevelopment Area.

10a-10 This comment raises issues related to impacts and the legality associated with higher noise levels and quality of life for residents, air quality, and traffic. All of what the project proposes and the environmental consequences of project approval would be legal should the Board of Supervisors certify the Final SEIR and approve the project. The environmental impacts associated with the project have been disclosed in the RDSEIR and addressed in previous response to comments. Please see Response 1-25 (noise impacts to residential uses), Responses 1-36 through 1-42 (air quality), and Responses 1-43 through 45 (traffic).

10a-11 This comment states that incorrect standards were used in unspecified noise reports. The SEIR was recirculated in part due to the Superior Court of the State of California for the County of San Bernardino ruling issued in October 2009 relating to both the County's and Speedway's understanding of the Speedway PD noise standard approved in Revision 4 to the PD. As discussed in the Preface to the RDSEIR, "When Revision 4 to the Speedway PD, which redefined the operations occurring at the Speedway facilities to be all part of the Speedway Event Center, was approved in 2004, both the County and the Speedway believed that Revision 4 eliminated references to "premier weekends," creating a year-round event center with a single set of PD noise standards that would apply to all events at the Speedway Event Center. Specifically, both the County and Speedway believed that Revision 4 established the noise standards for all activities at the Speedway as 85 dBA Lmax and 65 dBA L_{50}. With the adoption of Revision 4 in 2004, the Speedway Event Center conducted operations under this assumed single PD noise standard. However, in October 2009, the Court found that the County and Speedway were both wrong in their understanding of Revision 4, that the Speedway-specific noise standards contained in the Speedway PD applied only to six premier race weekends, and that all other operations were required to meet the Countywide noise standards contained in the County's Development Code. Although discussed generally in the original DSEIR, revisions were made to the project description in the RDSEIR to more explicitly reflect that the existing PD noise standard applies to six premier weekends and that the proposed standard would apply to all operations at the Speedway event center, eliminating the concept of "premier weekends. The RDSEIR was also revised to include additional contour graphics depicting the 75 dBA contour to illustrate the County's noise standard for events occurring during non-premier race weekends.

As stated in Response 8-3, although the baseline presented in the original Draft SEIR did not clearly mention that permitted noise levels were only applicable to six event weekends per year, it did present an accurate depiction of existing noise levels through provision of results of extensive noise monitoring. The concept of baseline under CEQA requires that impacts be analyzed by comparing existing physical conditions to what would occur with the project. The DSEIR accurately depicted noise levels that result from current operations of the oval and from the drag strip as it was operating at the north side of the oval track pursuant to a Temporary Use Permit. Similarly, the DSEIR accurately depicts noise levels that would occur as a result of the permanently relocated drag strip and proposed noise standards.

10a-12 This comment refers to noise monitoring conducted by Gordon Bricken on August 19, 2006. The noise monitoring summary was included in Appendix E of both the SEIR and RDSEIR. The comment questions the locations of the monitoring in relation to the nearest residence and notes high noise levels and clouds of smoke. The noise monitoring locations are identified in the summary report and in Exhibit 1. The commenter is correct that monitoring on that day occurred north of the commenter's residence. However, the monitoring and modeling that occurred to prepare the revised contour graphics for the RDSEIR took noise measurements at the corner of Whittram and Calabash to ensure noise levels at the commenter's residence were accounted for and represented correctly on the contour graphics. Additionally, the monitoring protocol for the proposed project (Attachment 4) requires monitoring to occur at 550 feet from the Speedway property line. This will ensure that noise compliance with the proposed noise standard is measured at a location before the noise reaches the closest sensitive receptor.

The issue of existing and proposed noise conditions as been raised and addressed in Responses 1-10 through 1-13. The issue of air quality has been raised and addressed in Responses 1-35 through 1-42, and odor has been specifically addressed in Response 1-41.

The commenter also notes that wind blows in all four directions at different times and cannot be predicted. Meteorological conditions may vary; however, the prevailing wind at the Speedway comes from the west.

10a-13 This comment further challenges the August 19, 2006 noise monitoring conducted by Gordon Bricken and asserts there is no evidence that 253 noise samples were taken. It is not clear what evidence beyond the distribution of results presented in Exhibits 3 and 4, the commenter would like to see. This issue does not raise environmental issues related to the RDSEIR; therefore, no further response is warranted.

10a-14 This comment questions the monitoring locations presumably from the August 19, 2006 report but notes that the locations are identified in Exhibit 1 of the report. The pictures in Exhibit 2 are taken from the monitoring location and are an attempt to depict the surrounding conditions and the lack of any intervening structures from the monitoring location. Had the monitoring occurred behind a large building rather than within line-of-sight of the Speedway, noise levels would have measured lower than they did.

10a-15 This comment notes that the monitoring times and durations are not noted on the August 19, 2006 noise report and asserts that monitoring did not occur when the “loud dragsters” operated. Page 5 of the monitoring report indicates that monitoring occurred between 9:00AM and 3:00PM. The commenter’s assertion that this was not when certain vehicles ran is purely anecdotal and has no basis.

10a-16 This comment questions the methods in which ambient noise was calculated. Ambient noise was measured in the same locations as the monitoring locations during race times. The commenter notes that their property is 300 feet from passing traffic; presumably this reference is to the property residence. The relevance of this statement is not clear because the commenter’s property begins 570 feet back from the drag strip and therefore the residence is 870 feet from the drag strip. It is important to note that when ambient noise is loud, the County’s noise standard makes the ambient noise level the noise compliance standard. The comment regarding noise attenuation from vehicle traffic as compared to vehicles on the drag strip has no substantiation. Subsequent noise monitoring to prepare the noise contours presented in the RDSEIR was conducted from the corner of Whittram and Calabash to best reflect worst-case noise levels at the commenter’s property line, not residence. Additionally, the monitoring protocol for the proposed project (Attachment 4) requires monitoring to occur at 550 feet from the Speedway property line. This will ensure that compliance is measured at the closest sensitive receptor and ambient noise is fully determined.

10a-17 This comment concludes the comment letter reiterating the commenter’s opposition to the project and requests that all significant impacts be fully analyzed and completely mitigated. The RDSEIR has fully analyzed all potential environmental impacts and additional supporting analysis (air quality and environmental health) has been provided as part of the Final RDSEIR and response to comments. Mitigation has been identified in the form of a sound attenuation wall (Mitigation Measure 4.2-1). However, the RDSEIR does acknowledge that the proposed project would generate noise levels in excess of levels found by the Board of Supervisors to be acceptable as documented in the Statement of Overriding Considerations for the 1995 Speedway PD EIR. Therefore a Statement of Overriding Considerations will be required for approval of the proposed project.

LETTER 10b

RECEIVED
MAY 1 0 2010
LAND USE SERVICES DEPT.
ADVANCE PLANNING DIVISION

May 10, 2010

To: Doug Feremenga, PH.D., Advance Planning
Senior Planner
County of San Bernardino
Land Use Services Department
First Floor
San Bernardino, CA. 92415-0130

From: Salvador and Elizabeth Lopez, Residents of Fontana County, SBC
13932 Whittram Ave. Fontana CA. 92335

Subject: Notice of draft Recalculated RSDEIR for the AAA Auto Club Speedway 550 acres
County of San Bernardino (Lead Agency)
SCH 2008081077

Dear Mr. Feremenga,

10b-1 To get a perceptive of a project, the significance and implications that it will have in relationship to these physical changes to noise modification and the relocation of the drag strip the north end. We can all gain an understanding, vision and the aspirations of the reissuance of is "project notice".

As the Advance Planning of the project, then this leads to us asking these questions of you? Would you be able a send the next notifications of this project in English and Spanish due to the minority of the people that live in the County of Fontana is not fluent readers or understanding of the English Legal language.

10b-2 Our questions begins with, what are the new physical and unseen changes associated with the relocation of the drag strip on the north end?

10b-3 1. Accounting to this South Coast Air quality management district, from your point of view, is the air safe for the residents to be exposed to? I have noticed that Octane is very prevalent in the report from the AQMD report dated 3/21/09, does this means extra lead exposure to the community?

10b-4 2. How much lead is in a gallon of racing fuel? Are high octane fuels always going to be used for the dragster with high compression engines (NHRA)? How much fuel does a dragster use for one run down the ¼ drag strip? (On the worst case scenario)

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10b-5 3. Does the drag strip influence or impact the flood control water storage basin located 500 feet away from?

4. Is there a need to renew of the NPDES (National Pollutant Discharge Elimination System) permit? The Sec. 122.21 of the NPDES Application for a permit, is it subject to review of it has new toxic impacts? (Subject to Chino basin Municipal Water District applicable to State programs, see Sec. 123.25).

5. Is AAA Auto Club Speedway Drag strip required to reissuance and review of the NPDES permit may require by determining whether to issue a permit with modification (*under 40 CFR 122.62(a)*) because of the new adverse water quality impacts or other sources and new discharges at may impact the storage basin 500 feet away?

10b-6 6. Is there new adverse impacts to the storm water storage basin between (Banana and Hickory basin) of these physical changes have been added?

7. Subject to Chino basin Municipal Water District BMPs (Best management practices) has there bin contact with BMPs (Best management practices) for public safety for comment in regards to the relocation of the drag strip on the north end? Have there been updates with MWD and BMP about the basin if there is going to be affects with these physical changes?

a. Working on vehicles.
b. leaded, methanol, nitro methane and alcohol , diesel fuel uses
c. Tire burn-outs
d. Heating up the tires with chemicals called(track bite)
e. Possible recreational vehicles (RVs) black water over spills

8. What kinds of fuels are being used when the dragsters are operating?
Are ME3, ME2, ME1, E gas, A gas, AA gas, Nitro. B gas, C gas, D gas, Diesel and E gas are
10b-7 being used. Are all of these fuels listed above going too used for all or any of these dragster events?

10b-8 9. Is there going to be a monitoring devise at the near-by school sites for fuel odors for an emergency warning system?

10b-9 10. Are Top fuel, Funny cars and Pro Stock Dragsters going to be minority racing competitions at the ¼ track on the North end?

10b-10 11. Is there are going to be procedures for an emergency response and warning system in place with the San Bernardino County Fire Department to be reviewed and approved?

10b-11 12. Is there going to be an Air Filter Devise systems and program called (Fast –Track Program) implemented for the nearness school, resident and business?

10b-12 13. Is there going to be monitoring program for the child for their health and hearing, that live with in a one mile radius around the Speedway event center?

2

10b-13 14. Does the Speedway need to notify the community about the air quality changes every year with a reporting informational system?

10b-14 15. Is there a permit from AQMD certifying the approval of the relocation of the drag strip to the north end?

10b-15 16. What is the vision that the County has for the Speedway?

10b-16 17. Does the County support the drag strips request to raise the noise ordinance to 100dba, 500 feet out-side the Speedway property lines?

10b-17 18. Does the City of Fontana plan to annex the un-incorporate the area of Fontana with in the next five year?

10b-18 19. Does the City of Fontana need to be included in the comments to the RESEIR because it is the spear of influence?

10b-19 20. When should noise and air quality mitigations need to be implemented for the community?

10b-20 How many residents live around the Speedway? And should they be put then at risk for the vision of one big company that conflicts with many lives around it. Thank you for your time and we are awaiting you response to these questions.

Sincerely

Salvador and Elizabeth Lopez

5-9-10

Eliz. Lopez 5-10-10

xx:liz

Attchments:
Exhibits A, B, AQMD Reports, Exhibits C Dragster Classifications

Exhibit A 10b-21

Exhibit B 10b-22

Exhibit C 10b-23

3

EXHIBIT A

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
21865 Copley Dr., Diamond Bar, CA 91765-4182

MONITORING & ANALYSIS
REPORT OF LABORATORY ANALYSIS

TO: Ed Pupka, Senior Enforcement Manager
Engineering & Compliance

SAMPLE DESCRIPTION:

Canister #E3702
Canister #53485

SAMPLE SOURCE:
California Speedway
9300 Cherry avenue
Fontana, CA 92335

LABORATORY NO: 09111-08
REFERENCE NO: MSF-5-034
FACILITY ID#: 110986
DATE SAMPLED: 4/17-4/18/09
DATE RECEIVED: 4/21/09
DATE ANALYZED: 4/22/09
ANALYZED BY: Ken Sanchez
SUBMITTED BY: Crystal Maldonado

ANALYTICAL WORK PERFORMED, METHOD OF ANALYSIS AND RESULTS
Qualitative Analysis and Quantitation of Toxic Organics by Gas Chromatography(GC) - Mass Spectrometry(MS) and Flame Ionization Detection(FID)

Note: See Attached Results.

Date Approved: 5/1/09 Approved By: Rudy Eden
Rudy Eden, Sr. Manager
Laboratory Services Branch
(909) 396-2391

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LAB NO: 09111-08
SOURCE: California Speedway

ANALYTICAL WORK PERFORMED, METHOD OF ANALYSIS AND RESULTS
Qualitative Analysis and Quantitation of Toxic Organics by GC/MS/FID

	#E3702	#53485	Typical
	4/17/09	4/18/09	Ambient Air
Compound, ppb	Conc. (ppb)	Conc. (ppb)	Conc. (ppb)
Ethane	3.2	8.7	3.0
Ethylene	0.8	11.2	1.1
Acetylene	1.1	22.7	2.4
Propane	2.5	6.4	6.4
Freon-12	0.5	0.5	0.3
Propylene	0.2	4.8	0.8
Isobutane	1.2	1.3	1.4
Chloromethane	N.D.	0.5	0.5
n-Butane	0.8	2.7	1.9
Vinyl Chloride	N.D.	N.D.	N.D.
1,1-Difluoroethane	0.1	0.4	0.1
Freon-114	N.D.	N.D.	N.D.
Bromomethane	N.D.	N.D.	N.D.
1-Butene	0.1	0.4	0.1
1,3-Butadiene	<0.1	0.5	0.1
trans-2-Butene	<0.1	0.2	<0.1
Isobutylene	0.1	3.0	0.2
Chloroethane	N.D.	N.D.	N.D.
Acetaldehyde	N.D.	3.6	1.0
cis-2-Butene	N.D.	N.D.	<0.1
Vinyl Bromide	N.D.	N.D.	N.D.
Ethanol	8.4	12.3	7.3
Acrolein	0.1	0.3	0.1
Isopentane	0.7	19.4	2.1
Acetone	3.5	7.2	9.9
Freon-11	0.2	0.2	0.3
1-Pentene	<0.1	0.1	<0.1
Ethanethiol	N.D.	N.D.	N.D.
Isopropyl Alcohol	0.9	4.2	0.7
Acrylonitrile	N.D.	N.D.	N.D.

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LAB NO: 09111-08
SOURCE: California Speedway

ANALYTICAL WORK PERFORMED, METHOD OF ANALYSIS AND RESULTS
Qualitative Analysis and Quantitation of Toxic Organics by GC/MS/FID

Compound, ppb	#E3702 4/17/09 Conc. (ppb)	#53485 4/18/09 Conc. (ppb)	Typical Ambient Air Conc. (ppb)
n-Pentane	0.2	1.4	0.9
Isoprene	0.1	0.4	<0.1
trans-2-Pentene	N.D.	0.1	<0.1
Dimethyl Sulfide	N.D.	N.D.	N.D.
1,1-Dichloroethene VDC	N.D.	N.D.	N.D.
cis-2-Pentene	N.D.	0.1	<0.1
Methylene Chloride	0.1	0.2	0.2
Carbon Disulfide	N.D.	N.D.	0.1
Freon-113	0.1	0.1	0.1
2,2-Dimethylbutane	0.1	0.3	0.2
2-Propanethiol	N.D.	N.D.	N.D.
trans-1,2-Dichloroethene	N.D.	N.D.	N.D.
1,1-Dichloroethane	N.D.	N.D.	N.D.
Cyclopentane	<0.1	2.4	0.1
2,3-Dimethylbutane	0.1	1.3	0.2
Methyl Tert Butyl Ether	0.2	8.3	<0.1
2-Methylpentane	0.2	1.5	0.7
Vinyl Acetate	N.D.	N.D.	0.2
2-Methyl-2-Propanethiol	N.D.	N.D.	N.D.
2-Butanone MEK	0.3	0.6	0.8
3-Methylpentane	0.1	0.8	0.4
1-Hexene	N.D	0.1	<0.1
cis-1,2-Dichloroethylene	N.D.	N.D.	N.D.
1-Propanethiol	N.D.	N.D.	N.D.
n-Hexane	0.1	0.6	0.6
Chloroform	<0.1	<0.1	<0.1
Ethyl Acetate	N.D.	<0.1	0.1
Tetrahydrofuran	0.1	0.1	<0.1
Methylcyclopentane	0.1	0.6	0.5
1,2-Dichloroethane EDC	N.D.	N.D.	<0.1

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LAB NO: 09111-08
SOURCE: California Speedway

ANALYTICAL WORK PERFORMED, METHOD OF ANALYSIS AND RESULTS

Qualitative Analysis and Quantitation of Toxic Organics by GC/MS/FID

Compound, ppb	#E3702 4/17/09 Conc. (ppb)	#53485 4/18/09 Conc. (ppb)	Typical Ambient Air Conc. (ppb)
2,4-Dimethylpentane	0.1	1.8	0.2
1,1,1-Trichloroethane	1.1	15.7	<0.1
Benzene	0.2	1.2	0.4
Carbon Tetrachloride	0.1	0.1	0.1
Cyclohexane	<0.1	0.3	0.2
2-Methylhexane	<0.1	0.7	0.2
2,3-Dimethylpentane	0.2	7.2	0.2
3-Methylhexane	0.1	0.8	0.3
1,2-Dichloropropane	N.D.	N.D.	N.D.
Bromodichloromethane	N.D.	N.D.	N.D.
Trichloroethylene	N.D.	<0.1	<0.1
2,2,4-Trimethylpentane	1.0	52.4	0.5
1,4-Dioxane	N.D.	N.D.	N.D.
Methyl Methacrylate	N.D.	N.D.	N.D.
n-Heptane	<0.1	0.4	0.2
cis-1,3-Dichloropropene	N.D.	N.D.	N.D.
Methyl Isobutyl Ketone MIBK	<0.1	N.D.	<0.1
Methylcyclohexane	<0.1	0.2	0.2
trans-1,3-Dichoropropene	N.D.	N.D.	N.D.
1,1,2-Trichloroethane	N.D.	N.D.	N.D.
2,3,4-Trimethylpentane	0.1	3.6	0.1
Toluene	0.6	13.2	1.5
2-Methylheptane	N.D.	0.1	0.1
2-Hexanone	N.D.	N.D.	N.D.
3-Methylheptane	N.D.	0.2	0.1
Dibromochloromethane	N.D.	N.D.	N.D.
1,2-Dibromoethane EDB	N.D.	N.D.	N.D.
1,3,5-Heptatriene	N.D.	N.D.	N.D.
Butyl Acetate	0.1	0.3	0.2
n-Octane	<0.1	0.1	0.1
Perchloroethylene	<0.1	<0.1	0.1

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LAB NO: 09111-08
SOURCE: California Speedway

ANALYTICAL WORK PERFORMED, METHOD OF ANALYSIS AND RESULTS
Qualitative Analysis and Quantitation of Toxic Organics by GC/MS/FID

Compound, ppb	#E3702 4/17/09 Conc. (ppb)	#53485 4/18/09 Conc. (ppb)	Typical Ambient Air Conc. (ppb)
Chlorobenzene	N.D.	N.D.	N.D.
Ethylbenzene	<0.1	0.3	0.2
m-Xylene	0.1	0.7	0.4
p-Xylene	0.1	0.4	0.2
2-Heptanone	N.D.	N.D.	N.D.
Bromoform	N.D.	N.D.	N.D.
Styrene	<0.1	0.1	0.1
1,1,2,2-Tetrachloroethane	N.D.	N.D.	N.D.
o-Xylene	<0.1	0.3	0.2
n-Nonane	<0.1	0.1	0.1
Isopropylbenzene	N.D.	<0.1	<0.1
n-Propylbenzene	N.D.	0.1	<0.1
m-Ethyltoluene	<0.1	0.2	0.1
p-Ethyltoluene	<0.1	0.1	0.1
1,3,5-Trimethylbenzene	<0.1	0.1	<0.1
o-Ethyltoluene	<0.1	0.1	0.1
1,2,4-Trimethylbenzene	<0.1	0.2	0.1
n-Decane	<0.1	0.1	0.1
Benzyl Chloride	N.D.	N.D.	N.D.
1,4-Dichlorobenzene	N.D.	N.D.	<0.1
1,3-Dichlorobenzene	N.D.	N.D.	N.D.
1,2,3-Trimethylbenzene	<0.1	0.1	<0.1
1,2-Dichlorobenzene	N.D.	N.D.	N.D.
m-Diethylbenzene	<0.1	<0.1	<0.1
p-Diethylbenzene	N.D.	<0.1	<0.1
n-Undecane	N.D.	0.1	0.1
1,2,4-Trichlorobenzene	N.D.	N.D.	N.D.
Naphthalene	<0.1	N.D.	N.D.
n-Dodecane	<0.1	<0.1	0.1
Hexachloro-1,3-Butadiene	N.D.	N.D.	N.D.

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LAB NO: 09111-08
SOURCE: California Speedway

ANALYTICAL WORK PERFORMED, METHOD OF ANALYSIS AND RESULTS

Qualitative Analysis and Quantitation of Toxic Organics by GC/MS/FID

Compound, ppb	#E3702 4/17/09 Conc. (ppb)	#53485 4/18/09 Conc. (ppb)	Typical Ambient Air Conc. (ppb)
Total NMOC as ppbC HC	135	1220	100-700

Additional Compounds Detected, Identified and Concentrations Estimated within ± 50% :

Compound Name	Estimated Concentrations (ppb)	
Chloro-Fluoro-Butanes	7.5	17.1
Chloro-Fluoro-Ethanes	1.7	6.2
Dimethylhexanes	ND	4.3
2,2,5-Trimethylhexane	ND	0.6
1,1-difluoroethane	0.1	0.4
Octamethylcyclotetrasiloxane(D4)	0.2	0.4
Hexanal	0.3	0.3
Butyl Acetate	<0.1	0.3
Decamethylcyclopentasiloxane(D5)	ND	0.3
Butanal	0.2	0.3
Hexamethylcyclotrisiloxane(D3)	0.1	0.1
Limonene	<0.1	0.1
Pinene	0.1	0.1
Dimethyl Ether	6.9	ND

ND: Not Detected

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EXHIBIT B

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
21865 Copley Dr., Diamond Bar, CA 91765-4182

MONITORING & ANALYSIS
REPORT OF LABORATORY ANALYSIS

TO: Ed Pupka, Senior Enforcement Manager
Engineering & Compliance

SAMPLE DESCRIPTION:

Canister #E3837
Canister #53455

SAMPLE SOURCE:
California Speedway
9300 Cherry avenue
Fontana, CA 92335

LABORATORY NO: C9077-10
REFERENCE NO: MSF-5-026
FACILITY ID#: 110986
DATE SAMPLED: 3/15/09
DATE RECEIVED: 3/18/09
DATE ANALYZED: 3/20/09
ANALYZED BY: Ken Sanchez
SUBMITTED BY: Crystal Maldonaco

ANALYTICAL WORK PERFORMED, METHOD OF ANALYSIS AND RESULTS
Qualitative Analysis and Quantitation of Toxic Organics by Gas Chromatography(GC)
Mass Spectrometry(MS) and Flame Ionization Detection(FID)

Note: See Attached Results

Date Approved: 4/2/09 Approved By: [signature]
Rudy Eden, Sr. Manager
Laboratory Services Branch
(909) 396-2391

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Page 1 of 5

LAB NO: 09077-10
SOURCE: California Speedway

ANALYTICAL WORK PERFORMED, METHOD OF ANALYSIS AND RESULTS
Qualitative Analysis and Quantitation of Toxic Organics by GC/MS/FID

Compound, ppb	#E3837 Conc. (ppb)	#53455 Conc. (ppb)	Typical Ambient Air Conc. (ppb)
Ethane	3.2	3.3	3.0
Ethylene	1.5	2.1	1.1
Acetylene	2.4	5.7	2.4
Propane	1.8	1.2	6.4
Freon-12	0.4	0.4	0.3
Propylene	0.7	0.9	0.8
Isobutane	0.2	0.2	1.4
Chloromethane	0.5	0.5	0.5
n-Butane	0.8	0.6	1.9
Vinyl Chloride	N.D.	N.D.	N.D.
1,1-Difluoroethane	0.1	0.1	0.1
Freon-114	N.D.	N.D.	N.D.
Bromomethane	N.D.	N.D.	N.D.
1-Butene	0.1	0.1	0.1
1,3-Butadiene	0.1	0.1	0.1
trans-2-Butene	<0.1	<0.1	<0.1
Isobutylene	0.4	0.7	0.2
Chloroethane	N.D.	N.D.	N.D.
Acetaldehyde	1.3	1.0	1.0
cis-2-Butene	N.D.	N.D.	<0.1
Vinyl Bromide	N.D.	N.D.	N.D.
Ethanol	2.6	1.3	7.3
Acrolein	0.2	0.1	0.1
Isopentane	1.8	4.3	2.1
Acetone	5.9	1.7	9.9
Freon-11	0.2	0.2	0.3
1-Pentene	<0.1	<0.1	<0.1
Ethanethiol	N.D.	N.D.	N.D.
Isopropyl Alcohol	1.0	0.7	0.7
Acrylonitrile	N.D.	N.D.	N.D.

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LAB NO: 09077-10
SOURCE: California Speedway

ANALYTICAL WORK PERFORMED, METHOD OF ANALYSIS AND RESULTS
Qualitative Analysis and Quantitation of Toxic Organics by GC/MS/FID

Compound, ppb	#E3837 Conc. (ppb)	#53455 Conc. (ppb)	Typical Ambient Air Conc. (ppb)
n-Pentane	0.3	0.3	0.9
Isoprene	<0.1	<0.1	<0.1
trans-2-Pentene	<0.1	N.D.	<0.1
Dimethyl Sulfide	N.D.	N.D.	N.D.
1,1 Dichloroethene VDC	N.D.	N.D.	N.D.
cis-2-Pentene	<0.1	N.D.	<0.1
Methylene Chloride	0.1	0.1	0.2
Carbon Disulfide	N.D.	N.D.	0.1
Freon-113	0.1	0.1	0.1
2,2-Dimethylbutane	0.1	<0.1	0.2
2-Propanethiol	N.D.	N.D.	N.D.
trans-1,2-Dichloroethene	N.D.	N.D.	N.D.
1,1-Dichloroethane	N.D.	<0.1	N.D.
Cyclopentane	0.1	1.7	0.1
2,3 Dimethylbutane	0.2	0.3	0.2
Methyl Tert Butyl Ether	0.5	6.9	<0.1
2-Methylpentane	0.3	N.D.	0.7
Vinyl Acetate	N.D.	N.D.	0.2
2-Methyl-2-Propanethiol	N.D.	N.D.	N.D.
2-Butanone MEK	0.2	0.3	0.8
3-Methylpentane	0.2	0.1	0.4
1-Hexene	<0.1	<0.1	<0.1
cis-1,2-Dichloroethylene	N.D.	N.D.	N.D.
1-Propanethiol	N.D.	N.D.	N.D.
n-Hexane	0.1	0.1	0.6
Chloroform	<0.1	<0.1	<0.1
Ethyl Acetate	N.D.	N.D.	0.1
Tetrahydrofuran	N.D.	N.D.	<0.1
Methylcyclopentane	0.1	0.1	0.5
1,2-Dichloroethane EDC	<0.1	<0.1	<0.1

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LAB NO: 09077-10
SOURCE: California Speedway

ANALYTICAL WORK PERFORMED, METHOD OF ANALYSIS AND RESULTS
Qualitative Analysis and Quantitation of Toxic Organics by GC/MS/FID

Compound, ppb	#E3837 Conc. (ppb)	#53455 Conc. (ppb)	Typical Ambient Air Conc. (ppb)
2,4-Dimethylpentane	0.3	0.4	0.2
1,1,1-Trichloroethane	<0.1	<0.1	<0.1
Benzene	0.3	0.2	0.4
Carbon Tetrachloride	0.1	0.1	0.1
Cyclohexane	0.1	<0.1	0.2
2-Methylhexane	0.1	0.1	0.2
2,3-Dimethylpentane	1.0	1.4	0.2
3-Methylhexane	0.1	0.1	0.3
1,2-Dichloropropane	N.D.	N.D.	N.D.
Bromodichloromethane	N.D.	N.D.	N.D.
Trichloroethylene	N.D.	N.D.	<0.1
2,2,4-Trimethylpentane	5.2	9.5	0.5
1,4-Dioxane	N.D.	N.D.	N.D.
	N.D.	N.D.	
n-Heptane	0.1	<0.1	0.2
cis-1,3-Dichloropropene	N.D.	N.D.	N.D.
Methyl Isobutyl Ketone MIBK	N.D.	N.D.	<0.1
Methylcyclohexane	0.1	<0.1	0.2
trans-1,3-Dichoropropene	N.D.	N.D.	N.D.
1,1,2-Trichloroethane	N.D.	N.D.	N.D.
2,3,4-Trimethylpentane	0.5	0.8	0.1
Toluene	3.3	3.2	1.5
2-Methylheptane	<0.1	<0.1	0.1
2-Hexanone	N.D.	N.D.	N.D.
3-Methylheptane	<0.1	<0.1	0.1
Dibromochloromethane	N.D.	N.D.	N.D.
1,2-Dibromoethane EDB	N.D.	N.D.	N.D.
1,3,5-Heptatriene	N.D.	N.D.	N.D.
Butyl Acetate	N.D.	<0.1	0.2
n-Octane	<0.1	<0.1	0.1
Perchloroethylene	<0.1	<0.1	0.1

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Page 4 of 5

LAB NO: 09077-10
SOURCE: California Speedway

ANALYTICAL WORK PERFORMED, METHOD OF ANALYSIS AND RESULTS

Qualitative Analysis and Quantitation of Toxic Organics by GC/MS/FID

Compound, ppb	#E3837 Conc. (ppb)	#53455 Conc. (ppb)	Typical Ambient Air Conc. (ppb)
Chlorobenzene	N.D.	N.D.	N.D.
Ethylbenzene	0.1	0.1	0.2
m-Xylene	0.2	0.2	0.4
p-Xylene	0.1	0.1	0.2
2-Heptanone	N.D.	N.D.	N.D.
Bromoform	N.D.	N.D.	N.D.
Styrene	0.1	<0.1	0.1
1,1,2,2-Tetrachloroethane	N.D.	N.D.	N.D.
o-Xylene	0.1	0.1	0.2
n-Nonane	<0.1	<0.1	0.1
Isopropylbenzene	<0.1	<0.1	<0.1
n-Propylbenzene	<0.1	<0.1	<0.1
m-Ethyltoluene	0.1	<0.1	0.1
p-Ethyltoluene	<0.1	<0.1	0.1
1,3,5-Trimethylbenzene	<0.1	<0.1	<0.1
o-Ethyltoluene	<0.1	<0.1	0.1
1,2,4-Trimethylbenzene	0.1	0.1	0.1
n-Decane	<0.1	0.1	0.1
Benzyl Chloride	N.D.	N.D.	N.D.
1,4-Dichlorobenzene	<0.1	<0.1	<0.1
1,3-Dichlorobenzene	N.D.	N.D.	N.D.
1,2,3-Trimethylbenzene	0.1	<0.1	<0.1
1,2-Dichlorobenzene	N.D.	N.D.	N.D.
m-Diethylbenzene	<0.1	<0.1	<0.1
p-Diethylbenzene	<0.1	<0.1	<0.1
n-Undecane	<0.1	<0.1	0.1
1,2,4-Trichlorobenzene	N.D.	N.D.	N.D.
Naphthalene	N.D.	N.D.	N.D.
n-Dodecane	<0.1	<0.1	0.1
Hexachloro-1,3-Butadiene	N.D.	N.D.	N.D.

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LAB NO: 09077-10
SOURCE: California Speedway

ANALYTICAL WORK PERFORMED, METHOD OF ANALYSIS AND RESULTS
Qualitative Analysis and Quantitation of Toxic Organics by GC/MS/FID

Compound, ppb	#E3837 Conc. (ppb)	#53455 Conc. (ppb)	Typical Ambient Air Conc. (ppb)
Total NMOC as ppbC HC	200	268	100-700

Additional Compounds Detected, Identified and Concentrations Estimated within ± 50% :

Compound Name	Estimated Concentrations (ppb)	
Butanal	<0.1	0.2
Hexanal	0.2	0.2
Heptanal	<0.1	0.2
Nonanal	<0.1	1.3
2,2,3,3-Tetramethylbutane	4.4	8.1
Dimethylhexanes	0.6	1.0
2,2,5-Trimethylhexane	0.1	0.2
2,2,4,6,6-Pentamethylheptane	N.D.	0.2
1-Chloro-2 Propanol	3.8	N.D.

N.D. – Not Detected

I:\Ambient VOC's & Microscopy\00toxFAMS\2009 Toxics\Final Reports\California Speedway-3-15-09 LN09077-10.xls

EXHIBIT C

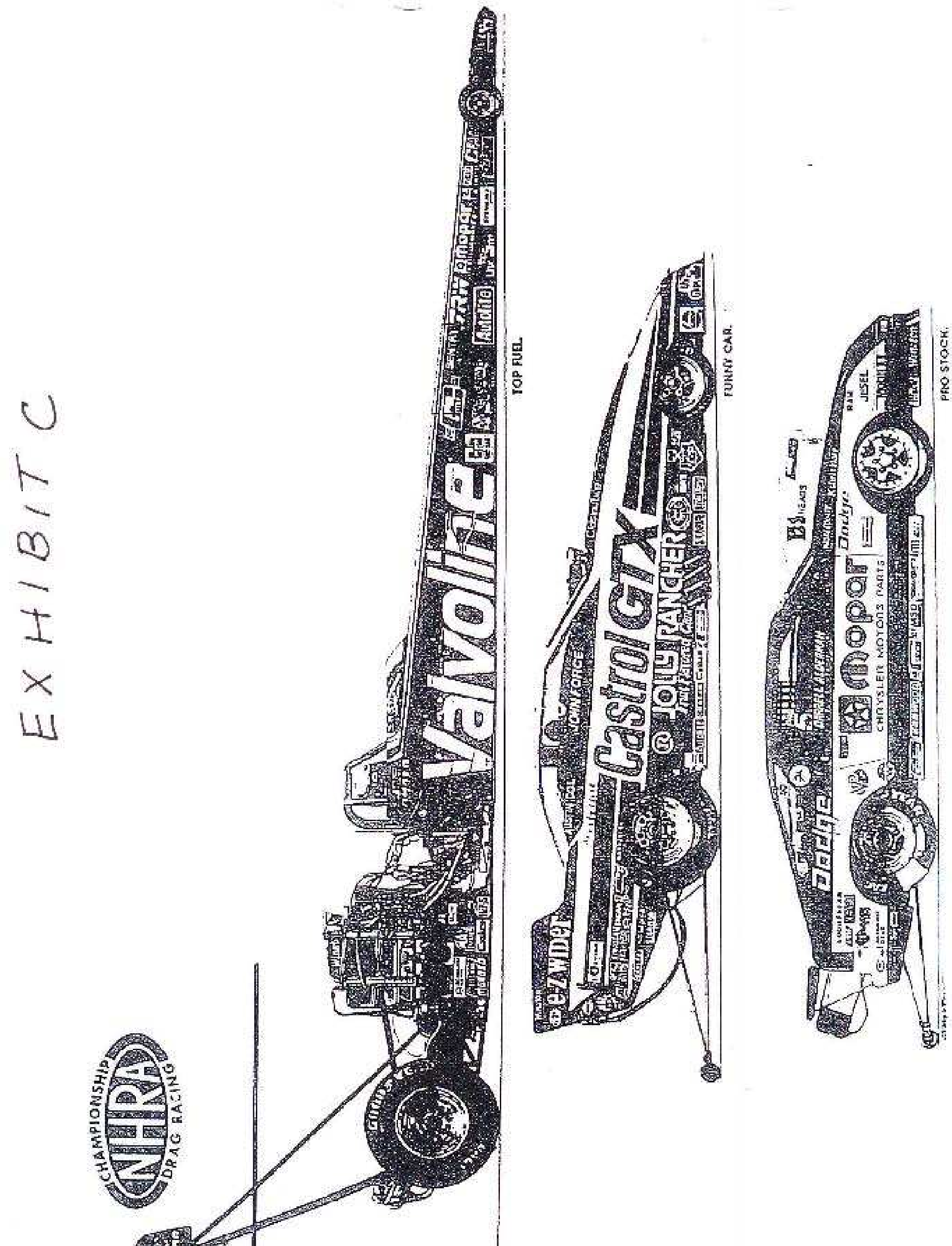
EXHIBIT C
CHAMPIONSHIP
NHRA
DRAG RACING
Valvoline
TOP FUEL
Castrol GTX
JOLLY RANCHER
FUNNY CAR
mopar
CHRYSLER MOTORS PARTS
Dodge
PRO STOCK

9

Responses to Letter No. 10b: Lopez 2

10b-1 This comment requests that notices for the proposed project be provided in English and Spanish. As stated in previous responses, it is not County policy to provide CEQA-related or other hearing material in any language other than English. However, in an effort to eliminate any potential misunderstanding that interested persons may not comprehend this particular proposed project, the Applicant has volunteered to provide in Spanish, notices of public hearings for this project, the Executive Summary, Preface to the RDSEIR. In addition, the Applicant has also volunteered to provide a Spanish translator at the hearings.

10b-2 This comment questions whether there are impacts associated with the permanent operation of the drag strip in its current location north of the oval track. The issue of addressing the physical change associated with the relocated drag strip has been addressed in Responses 8-1, 8-3 and 8-6.

10b-3 This comment raises the issue of air quality. For a complete discussion of air quality, please refer to Responses 1-36 through 1-42 and 15-1 through 18 and Attachment 3, which is the Air Quality Modeling Technical Study prepared in response to Comment Letter 15 from SCAQMD. See Response 15-7 for a review of specific emissions including an analysis of lead. As concluded in the RDSEIR and in the Air Quality Modeling Technical Study, the proposed project would not result in unhealthful air quality.

10b-4 This comment raises questions about the fuel content for dragsters. Please refer to the Air Quality Modeling Technical Study (Attachment 3) prepared in response to Comment Letter 15 from SCAQMD. This study includes all of the assumptions used for fuel content and type currently used and anticipated to be used if the proposed project is approved.

10b-5 This comment questions the proposed project's potential impact on flood control storage facilities. This issue has been raised and addressed in Response 1-47.

10b-6 This comment questions the proposed project's potential impact on flood control storage facilities at a location several hundred feet to the west and water quality associated with storm water. This issue has been raised and addressed in Response 1-47.

10b-7 This comment asks which types of fuels are being used for drag vehicles. Please refer to the Air Quality Modeling Technical Study (Attachment 3) prepared in response to Comment Letter 15 from SCAQMD. This study includes all of the assumptions used for fuel content and the type currently used and anticipated to be used if the proposed project is approved.

10b-8 This comment questions whether an emergency warning system will occur at schools due to fuel odors. The Air Quality Modeling Technical Study (Attachment 3) concluded that the proposed project would not result in significant air toxics or odors at any location. Also, note that the closest school (Redwood Elementary) is located 0.25 mile from the Speedway's property line and 0.9 mile from the drag strip's starting line. Comment Letter 14 is from the principal of the Redwood Elementary School who does not mention any concern for air toxics and odors emanating from the Speedway. Therefore no emergency warning system for fuel odors will be installed at any school as a result of this proposed project.

10b-9 This comment asks which types of vehicle would be permitted to operate on the drag strip with the proposed project. Any vehicles that meet the noise standard would be permitted to operate at the drag strip. However, the RDSEIR notes that Top Fuel dragsters and Top Fuel funny cars are not expected to run at the drag strip. These vehicles typically run up to 75 miles per hour faster than the next fastest vehicles run on the drag strip, and would require lengthening of and improvements to the drag strip's shut down area at the end of the track. Because such improvements are not proposed, modern Top Fuel dragsters and Top Fuel funny cars are not expected to run at the drag strip. The current shut down area at the Speedway's drag strip meets current safety standards for all other vehicle types running and anticipated to run at the facility.

10b-10 This comment asks whether emergency response and warning systems will be put in place with the County Fire Department. The issue of safety concerns has been raised and addressed in Responses 1-9, 1-48 and 10b-8.

10b-11 This comment again asks whether air quality devices will be installed for the nearest schools, residences and businesses. Please see Responses 1-36 through 1-42, 15-1 through 15-18, and Attachment 3 Air Quality Modeling Technical Study for a thorough discussion of air quality. Based on this discussion and the conclusion that air impacts are less than significant, no air quality devices are proposed for installation for the proposed project.

10b-12 This comment raises the issue of potential health effects occurring as a result of the proposed project. This issue has been raised and addressed in Responses 1-11 through 1-22 and in the LaCroix Davis report included as Attachment 2. The LaCroix Davis report finds that applying the most conservative noise guidance and under the most conservative assumptions, no health effect will occur at any location at 550 feet from the Speedway property line or beyond as a result of the proposed project's noise effects. As a result, no monitoring program for children living within a one mile radius of the Speedway is proposed.

10b-13 This comment again questions whether the project would result in the need for air quality monitoring. Please see Responses 1-36 through 1-42, 15-1 through 15-18, and Attachment 3 Air Quality Modeling Technical Study for a thorough discussion of air quality. Based on these Responses, no monitoring is required.

10b-14 This comment asks whether a permit from SCAQMD is needed to approve the relocation of the drag strip. A permit from that agency is not required for the permanent operation of the drag strip.

10b-15 This comment asks about the County's vision for the Speedway and does not raise environmental issues related to the RDSEIR. Therefore, no further response is required.

10b-16 This comment asks whether the County supports the proposed project. The proposed project will be brought to the County's Planning Commission and Board of Supervisors for review. Only then will a decision be made regarding approval or denial of the proposed project. The RDSEIR has been prepared to analyze potential environmental effects of the proposed project and should be seen neither as an endorsement or condemnation of the project.

10b-17 This comment asks whether the City of Fontana is planning to annex the unincorporated County area. As stated in Response 8-10, the proposed project includes permanent operation of a drag strip and revised noise standards for the Speedway, which is located within the unincorporated area of the

County. Because the Speedway is not contiguous to the City of Fontana, annexation of the Speedway could not occur without impacting other surrounding land uses. The County has land use authority over the Speedway and has notified the City of Fontana of the proposed project and provided the City with copies of the DSEIR and RDSEIR for review and comment. The City provided comments indicating that the City has no concerns regarding the proposed Project (see Comment Letter 7). Because this comment does not raise environmental issues, no further response is warranted.

10b-18 This comment asks whether the City of Fontana should be included in comments to the RDSEIR. Please see Response 10b-17 and Comment Letter 7 from the City of Fontana.

10b-19 This comment asks about noise and air quality mitigation. The project would not result in significant impacts to air quality requiring mitigation. Noise mitigation is identified for the proposed project requiring construction of a sound wall. Please see Section 10 of the RDSEIR which includes the Mitigation Monitoring Program. As stated, the wall shall be constructed prior to the first drag strip use that includes vehicles that will exceed 85dBA Lmax as measured 550 feet from the Speedway property. In addition, mitigation measures from the original Speedway EIR shall be implemented during construction of the sound attenuation wall. Those measures are also identified in the Mitigation Monitoring Program.

10b-20 This comment asks how many residents live around the Speedway. The term “around” is very vague and therefore the exact number of residents is not provided. However, please review Response 1-1 for an accurate depiction of the industrial nature of the Speedway’s immediate surrounding area. Impacts to residential uses have been thoroughly analyzed in the RDSEIR and in response to comments.

10b-21 This comment includes an SCAQMD laboratory analysis of grab samples provided to AQMD by the commenter in April 2009. A summary of this analysis was included as an attachment to the CCoMPRESS comment letter (Comment Letter D) on the DSEIR. Air samples from an unspecified location were allegedly taken by Salvador Lopez (commenter) and presented to the SCAQMD on April 3, 17 and 18, 2009. No information concerning the sampler, the sampler's training, the sampling methodology, the sampling container, the sampling duration, the exact sampling location and the chain of custody are presented in the SCAQMD letter as attached to Comment Letter D on the DSEIR or in the attachment to this comment letter. As such, it is impossible to determine the credibility of the information. Further, an Air Quality Modeling Technical Study was prepared in response to the SCAQMD letter (Comment Letter 15). According to the health risk assessment performed in that Study, no significant impacts related to air toxics would occur as a result of the proposed project.

10b-22 This comment includes an SCAQMD laboratory analysis from March 2009. The summary letter by SCAQMD was provided to the commenter and included as an attachment to the CCoMPRESS comment on the DSEIR (Comment Letter D). As stated in that summary report, “analysis of three of the four grab samples showed air toxic organic gas levels typical of Southern California, without any specific influence of the Speedway. The fourth sample, collected immediately adjacent to the east end of the drag strip and downwind of racing activity, showed higher levels of certain hydrocarbons including toluene (73.1 ppb). The elevated concentrations are likely attributable to racing vehicle exhaust, but were not found in the other samples taken elsewhere in the community.” An Air Quality Modeling Technical Study was prepared in response to the SCAQMD letter (Comment Letter 15). According to the health risk assessment performed in that Study, no significant impacts related to air toxics would occur as a result of the proposed project.

10b-23 This includes an attachment depicting drag race vehicles. It is not clear what purpose this graphic serves. No environmental issues are raised in this comment; therefore no response is warranted.

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LETTER 11

May 6, 2010

Doug Feremenga, AICP
Senior Planner
County of San Bernardino
Land Use Services Department
385 N. Arrowhead Ave.
First Floor
San Bernardino, CA 92415-0130

RECEIVED
MAY 10 2010
LAND USE SERVICES DEPT.
ADVANCE PLANNING DIVISION

Re: Comments on Recirculated Draft Subsequent Environmental Impact Report for Auto Club Speedway, SCH 2008081077

Dear Mr. Feremenga:

11-1 I strongly oppose the operation of a drag strip on the north side of the Auto Club Speedway's property and the proposed increase in noise standards to a maximum of 100 decibels 35 days per year and 85 decibels the remainder of the year.

The operation of the drag strip has and will continue to have significant noise, air quality, and traffic impacts on residents, school children, parishioners, and businesses. Noise levels produced by the drag strip are so loud many residents are not able to use the outdoor portions of their property during events. Even when they are indoors, it is often difficult to have conversations during drag races. This is especially significant because drag races are held on weekends when many residents are trying to enjoy the peace and quiet of their homes with their families. I am often forced to stay inside on weekends due to drag racing, instead of being able to enjoy the outdoors with my family as other families throughout the County are able to do.

Additionally, children are unable to concentrate on their school work during drag races. Drag races are held on Sundays, which negatively impacts area church services. Community members already experience headaches and other ailments from the high noise levels produced by the drag strip.

11-2 Negative air quality impacts are also significant during drag racing events. I have witnessed large clouds of smoke engulfing the community north of the drag strip during drag racing events. The Recirculated Draft Subsequent Environmental Impact Report (RDSEIR) fails to analyze the impacts of the smoke produced by dragsters heating up their tires before a race. The terrible smell of this smoke fills the community during drag racing events, making it difficult to breath.

11-3 The drag strip on the north side of the Speedway's property also produces high levels of traffic that causes traffic jams on small, residential streets north of the drag strip. This impacts are especially significant when the Speedway holds drag racing events on the same day as events at the oval track.

11-4 The RDSEIR is misleading in its claim that a 100 decibel maximum noise level is a "health based" standard, claiming it provides protection from hearing loss. Community members have already experienced hearing loss from the significant noise levels produced by the drag strip. Additionally, these extremely high noise levels can trigger elevated blood pressure levels and other stress and mental health impacts. Because these noise levels would be allowed to continue until 11 pm, it would lead to sleep disturbance. A lack of adequate sleep results in many negative health impacts. The RSDEIR fails to analyze the health impacts of this noise level increase on infants, elderly, handicapped persons, pregnant women, persons with illnesses and domestic animals.

11-5 The County has allowed the Speedway to operate a drag strip in violation of state environmental laws and the County's noise standards for nearly four years. Approving this project, and allowing the Speedway to produce noise levels 25 decibels higher than any other use in the County, would reward the Speedway's continued lack of concern and consideration for the community located to the north of the drag strip.

I urge you to not approve this project until all of its significant impacts have been fully analyzed and completely mitigated.

Sincerely,

5-7-2010

JIM C. GRICKON
8153 Cherry Ave.
Fontana, CA 92335

Concerned Community Members and Parents of Redwood Elementary School Student

Responses to Letter No. 11: Crickon

11-1 This comment states the commenter's opposition to the proposed project and raises the issues of noise, air quality, traffic, school children's ability to concentrate, and interior noise. These issues have been raised and addressed in previous response to comments. Please see Responses 1-10 through 1-13 (noise), Responses 1-36 through 1-42 (air quality), Responses 1-43 through 45 (traffic), Responses 2-4, 1-2, 1-24, and 2-4 (school children), and Response 1-34 (interior noise).

11-2 This comment raises the issue of the vapor clouds created by the drag strip and potential odor effects. This issue has been raised and addressed in Response 1-40.

11-3 This comment raises the issue of traffic. This issue has been raised and addressed in Responses 1-43 through 45.

11-4 This comment raises the issue of physical health effects. This issue has been raised and addressed in Responses 1-11 through 1-22. Further, the proposed standard would limit noise levels from exceeding 85 dBA Lmax to the hours of 10 AM to 7 PM, reducing potential noise exposure associated with the proposed project during evening hours.

11-5 This comment incorrectly asserts that the County has allowed the Speedway to operate the drag strip in violation of state environmental laws and County noise standards for four years. No environmental laws are cited, but a review of the state's environmental laws finds that none have been violated. A direct review of the County's noise standard finds that existing Speedway operations comply due to the effects of ambient and exempt noise. See Development Code Sections 83.01.080(e) and (g). This issue has also been raised and addressed in Response 1-4.

LETTER 12

May 6, 2010

Doug Feremenga, AICP
Senior Planner
County of San Bernardino
Land Use Services Department
385 N. Arrowhead Ave.
First Floor
San Bernardino, CA 92415-0130

Re: Comments on Recirculated Draft Subsequent Environmental Impact Report for Auto Club Speedway, SCH 2008081077

Dear Mr. Feremenga:

12-1

I strongly oppose the operation of a drag strip on the north side of the Auto Club Speedway's property and the proposed increase in noise standards to a maximum of 100 decibels 35 days per year and 85 decibels the remainder of the year.

The operation of the drag strip has and will continue to have significant noise, air quality, and traffic impacts on residents, school children, parishioners, and businesses. Noise levels produced by the drag strip are so loud many residents are not able to use the outdoor portions of their property during events. Even when they are indoors, it is often difficult to have conversations during drag races. This is especially significant because drag races are held on weekends when many residents are trying to enjoy the peace and quiet of their homes with their families. I am often forced to stay inside on weekends due to drag racing, instead of being able to enjoy the outdoors with my family as other families throughout the County are able to do.

Additionally, children are unable to concentrate on their school work during drag races. Drag races are held on Sundays, which negatively impacts area church services. Community members already experience headaches and other ailments from the high noise levels produced by the drag strip.

12-2

Negative air quality impacts are also significant during drag racing events. I have witnessed large clouds of smoke engulfing the community north of the drag strip during drag racing events. The Recirculated Draft Subsequent Environmental Impact Report (RDSEIR) fails to analyze the impacts of the smoke produced by dragsters heating up their tires before a race. The terrible smell of this smoke fills the community during drag racing events, making it difficult to breath.

12-3 The drag strip on the north side of the Speedway's property also produces high levels of traffic that causes traffic jams on small, residential streets north of the drag strip. This impacts are especially significant when the Speedway holds drag racing events on the same day as events at the oval track.

12-4 The RDSEIR is misleading in its claim that a 100 decibel maximum noise level is a "health based" standard, claiming it provides protection from hearing loss. Community members have already experienced hearing loss from the significant noise levels produced by the drag strip. Additionally, these extremely high noise levels can trigger elevated blood pressure levels and other stress and mental health impacts. Because these noise levels would be allowed to continue until 11 pm, it would lead to sleep disturbance. A lack of adequate sleep results in many negative health impacts. The RSDEIR fails to analyze the health impacts of this noise level increase on infants, elderly, handicapped persons, pregnant women, persons with illnesses and domestic animals.

12-5 The County has allowed the Speedway to operate a drag strip in violation of state environmental laws and the County's noise standards for nearly four years. Approving this project, and allowing the Speedway to produce noise levels 25 decibels higher than any other use in the County, would reward the Speedway's continued lack of concern and consideration for the community located to the north of the drag strip.

I urge you to not approve this project until all of its significant impacts have been fully analyzed and completely mitigated.

Sincerely,

Tami Wetzel
Citizens for Fontana First

Concerned Community Members and Parents of Redwood Elementary School Student

Responses to Letter No. 12: Wetzel

12-1 This comment states the commenter's opposition to the proposed project and raises the issues of noise, air quality, traffic, school children's ability to concentrate, and interior noise. These issues have been raised and addressed in previous response to comments. Please see Responses 1-10 through 1-13 (noise), Responses 1-36 through 1-42 (air quality), Responses 1-43 through 45 (traffic), Responses 2-4, 1-2, 1-24, and 2-4 (school children), and Response 1-34 (interior noise). Note that with implementation of Mitigation Measure 4.2-1 (a sound attenuation wall) no churches are located in an area that will exceed 75 decibels even when the loudest vehicle is operated at the drag strip. See Response 1-2.

12-2 This comment raises the issue of the vapor clouds created by the drag strip and potential odor effects. This issue has been raised and addressed in Response 1-40.

12-3 This comment raises the issue of traffic. This issue has been raised and addressed in Responses 1-43 through 45.

12-4 This comment raises the issue of physical health effects. This issue has been raised and addressed in Responses 1-11 through 1-22 and in the Lacroix Davis report at Attachment 2. Further, the proposed standard would limit noise levels from exceeding 85dBA Lmax to the hours of 10 AM to 7 PM, reducing potential noise exposure from the proposed project during evening hours.

12-5 This comment incorrectly asserts that the County has allowed the Speedway to operate the drag strip in violation of state environmental laws for four years. This issue has been raised and addressed in Response 1-4 and Response 11-5.

LETTER 13

May 4, 2010

RECEIVED
MAY 10 2010
LAND USE SERVICES DEPT.
ADVANCE PLANNING DIVISION

Advance Plannning
385 North Arrowhead Avenue
San Beuradino, CA. 92415-0182

To: Doug Feremenga, PH.D., Advance Planning

From: Mr + Mrs Gabe LaRosa
Mentone, Ca.

Subject: Notice of draft RSDEIR Subsequent Environmental Impact Report for the AAA Auto Club Speedway (California Speedway) 550 acres Event Center

Questions to Planner:

13-1 1- noise Polution - We understand that the decimal on sound is soppose to be 65-75 decimals and that the Speedway wants it to be 100 desimals, where they are almost at.

13-2 2- The water reclamation (lake, area) - Isn't that being polluted by fumes from fuels used for the cars on the race tracts?

13-3 3- Why is stimulous monies being given to aaa auto Club Speedway when it was meant for other things, schools etc.

13-4 4- Why and how did aaa auto club Speedway move from their original South location to a north location where they are at this present time

Responses to Letter No. 13: La Rosa

13-1 This comment incorrectly states that the current noise standard is 65-75 dBA and that the Speedway is requesting to increase the standard to 100 dBA. The actual current noise standards for the Speedway were presented in Table 3-1 of the RDSEIR and are provided below.

TABLE 3-1 **EXISTING COUNTY AND SPEEDWAY PD NOISE STADARDS**		
Affected Land Use (Receiving Noise)	**County Code §83.01.080 Noise Standard (L_{eq})**	**Speedway PD Noise Standard (L_{eq})<u>During Premier Events (6 weekends annually)</u>**
Residential/Churches/Schools Exterior from mobile source	55 dBA (7:00 AM - 10:00 PM) 45 dBA (10:00 PM - 7:00 AM) Up to 65 dBA any time	65 dBA (7:00 AM - 11:00 PM) 45 dBA (11:00 PM - 7:00 AM)
Professional Services	55 dBA anytime	65 dBA anytime
Commercial Exterior from mobile source	60 dBA anytime Up to 65 dBA any time	65 dBA anytime
Industrial	70 dBA anytime	70 dBA anytime
Source: 2007 County Development Code (Amended March 25,2010) The California Speedway PD, approved by the County Board of Supervisors on May 2, 1995		

The County Development Code and the Speedway PD permit the noise standard identified in Table 3-1 to be exceeded as follows:

- The noise standard for the receiving land use as specified above for a cumulative period of more than 30 minutes in any hour (L50).
- The noise standard plus five (5) dBA for a cumulative period of more than 15 minutes in any hour (L50).
- The noise standard plus ten (10) dBA for a cumulative period of more than five (5) minutes in any hour (L8).
- The noise standard plus 15 dBA for a cumulative period of more than one minute in any hour (L2).
- The noise standard plus 20 dBA for any period of time (Lmax).

Therefore, for premier events, the Speedway is currently permitted to produce maximum noise levels of 85 dBA and 75 dBA Lmax for non-premier events. These standards are affected also by exempt and ambient noise. See Development Code Sections 83.01.080(e) and (g).

As discussed in the Section 3.0 Project Description (Section 3) of the RDSEIR: The proposed revision to the noise standard would change the maximum allowable noise level during Speedway operations for 35 days per year for a cumulative total of one hour per each of those days between the hours of 10 AM and 7 PM and include a procedure for measuring and reporting noise levels from the Speedway. Currently, the Speedway's noise standards are based on a set of five (5) noise levels for the maximum level (Lmax) and varying durations (30, 15, 5, and 1-minute intervals) at nearby land uses. The Speedway proposes a new standard of up to 100 dB for 35 days per year for a cumulative total of one hour per each of those days between the hours of 10 AM and 7 PM to be measured at 550 feet from the property line of the Speedway. This standard will result in an increase in maximum allowable noise level from 85 dB at the nearest sensitive receptor (currently industrially zone property on which a residence is located, approximately 570 feet north of the facility) for premier events (6 annually) and would eliminate intermediate L-level standards for the 30-, 15-, 5- and 1-minute intervals. This standard would apply to all permitted activities covered in the Speedway PD, including racing and testing on the oval and drag strip, activities during filming, speaker amplification, and crowd noise. Noise measurements are to be conducted according to established County protocol and those set forth for the proposed project.

In response to comments, the Speedway has agreed to restrict peak noise levels above 85 dBA Lmax to durations far less than the NIOSH duration exposure recommendations contained in Attachment 4 to this comment letter. The Speedway has further agreed to modifications to the monitoring protocol and to maintain a monitoring and compliance program to improve enforcement of applicable noise standards and reduce worst-case impacts. Please see Response 1-52.

13-2 This comment raises the issue of water quality and potential impacts to water bodies as a result of fumes. This issue has been raised and addressed in Response 1-47.

13-3 This comment is not related to the adequacy of the RDSEIR; therefore no additional response is warranted.

13-4 This comment inquires about the history of the Speedway’s relocation of the drag strip from the southern location to its current present location north of the oval track. The full history of the Speedway’s approvals is provided in Section 2.2, Project Background, of the RDSEIR and summarized in Response 1-4. The RDSEIR has been prepared to address environmental impacts associated with the permanent operation of the drag strip in its current location north of the oval track.

LETTER 14

Fontana Unified School District

Redwood Elementary School

Sergio C. Chavez – Principal Reneé Gulllixson – Assistant Principal
8570 Redwood Avenue, P.O. Box 5090, Fontana, CA 92334-5090 (909) 357-5470 Fax (909) 357-5749

June 2, 2010

To Whom It May Concern:

14-1

This letter is in reference to the activities of Mr. and Mrs. Lopez regarding their alleged dispute with the California Speedway. I have asked them what Redwood families do they represent and I have yet to know of other Redwood families working with them. I want to make it perfectly clear that they do not represent Redwood Elementary School nor do they represent our PTA. Furthermore, the organization CCoMPRESS (Concerned Community Members and Parents of Redwood Elementary School Students) is not in any way affiliated nor representative of Redwood Elementary School. In dealing with Mr. and Mrs. Lopez for some time, we have come to understand that they have a personal vested interest in the race track issue due to some pending civil litigation. We have no part in that litigation.

They did join our PTA as community members last year and Mr. Lopez even made it to the board as historian for PTA, but they have no children at Redwood (only a nephew). At first, they came off very positive and supportive of PTA, but over time they have been pushing their agenda more and more. One afternoon they were in front of the school getting parents to sign petitions. I approached Mr. Lopez and told him that he could not petition parents on school grounds and after reviewing the petition itself, I asked him to remove any mention of Redwood Elementary School or the principal from the literature. He said that he would do so immediately. He asked me if I was happy with the Speedway and I told him that I had no comment either way. They were voted out of the PTA board for 2010-11 school year. I have met with him in person and over the phone regarding his issue with the race track and his personal litigation presented a conflict of interest among other concerns. He was instructed to not speak on behalf of Redwood Elementary School or any of its organizations, including PTA, School Site Council, or ELAC.

14-1

In conclusion, I want to reiterate that Mr. and Mrs. Lopez are acting on their own behalf and DO NOT speak for Redwood Elementary School, Redwood PTA, nor Redwood administration and any mention, verbal or written, of the school, PTA, or administration should be stricken from any record, as they were used without consent or permission. Please feel free to contact me if you have any further questions.

Respectfully,

Sergio C. Chavez, Principal

cc: Mrs. Cali Olsen-Binks, Superintendent

"Knowledge is Power! - ¡Saber es Poder!"

Responses to Letter No. 14: Redwood Elementary School

14-1 This comment is a letter from the Principal of Redwood Elementary School which is the closest school to the drag strip. This comment confirms that the Speedway operations have not been a source of concern for the school. This comment letter further elaborates that the closest residential use does not have children at Redwood Elementary School and that CCoMPRESS does not represent their school or their Parent Teacher Association.

LETTER 15

South Coast
Air Quality Management District
21865 Copley Drive, Diamond Bar, CA 91765-4182
(909) 396-2000 • www.aqmd.gov

E-mailed: June 3, 2010

June 3, 2010

Mr. Doug Feremenga
Senior Planner
County of San Bernardino
Land Use Services Department
385 North Arrowhead Avenue, First Floor
San Bernardino, CA 92415-0182

Review of the Recirculated Draft Subsequent Environmental Impact Report (SEIR) for the Auto Club Speedway Project

South Coast Air Quality Management District (AQMD) staff appreciates the opportunity to comment on the above-mentioned document, and that the lead agency will accept comments after the close of the comment period (March 26, 2010 to May 25, 2010). Neither the Initial Study, nor the Recirculated Draft SEIR were provided to the AQMD until April 27, 2010. Pursuant to Public Resources Code (PRC) 15082 and 15086, please ensure that the AQMD receives a copy of all future CEQA documents from your agency. The following comments are intended to provide guidance to the lead agency and should be incorporated into the Final SEIR.

AQMD staff is concerned that the proposed operation of the drag strip on the north side of the project site will bring a potentially significant source of emissions in close proximity to residences. AQMD staff recognizes the difficulty in quantifying emissions from a unique source like a drag strip, however staff is concerned that the lead agency prematurely concluded that air quality impacts are less than significant without fully
15-1 analyzing the proposed project. The air quality analysis in the Recirculated Draft SEIR is incomplete. In addition, the limited analysis underestimates air quality impacts by including incorrect calculation methodologies, omitting any criteria pollutant analysis, excluding some emission sources, and potentially underreporting emission rates.

AQMD staff is especially concerned about the proposed project and its potential impacts given the history of air quality complaints about this facility over the past several years. AQMD staff strongly recommends that the lead agency consider each of the detailed comments in the attachment, and provide a revised and comprehensive analysis to the public with sufficient time to review and provide comments.

Pursuant to Public Resources Code Section 21092.5, please provide the AQMD staff with written responses to all comments contained herein prior to the adoption of the Final SEIR. Further, staff is available to work with the lead agency to address these issues and -

Mr. Doug Feremenga 2 June 3, 2010

15-1 cont. any other questions that may arise. Please contact Ian MacMillan, Program Supervisor, CEQA Section, at (909) 396-3244, if you have any questions regarding the enclosed comments.

Sincerely,

Ian V. MacMillan

Ian MacMillan
Program Supervisor, CEQA Inter-Governmental Review
Planning, Rule Development & Area Sources

Attachment

SN:IM

SBC100422-01
Control Number

Mr. Doug Feremenga 3 June 3, 2010

GENERAL COMMENTS

Availability of CEQA Documents for Project

15-2 1. As indicated in Appendix C of the Recirculated Draft SEIR, the AQMD was not included in the distribution list for the Initial Study, and also did not receive a copy of the Recirculated Draft SEIR until it requested one from the lead agency on April 27, 2010. AQMD staff is concerned that it was not informed about this project by the lead agency, especially considering the air quality complaints regarding operations at the project site received both by the AQMD and the lead agency. Pursuant to Public Resources Code (PRC) § 15082 and 15086, please ensure that AQMD receives a copy of all future CEQA documents from your agency.

Adequacy of Air Quality Analysis in Initial Study and Recirculated Draft SEIR

15-3 2. As indicated in Comment #1 above, the AQMD staff was unaware of this project during the comment period for the Initial Study. The Recirculated Draft SEIR relies on the analysis in the Initial Study and on a limited Air Quality Modeling Technical Study to determine that air quality impacts are less than significant for this project. However, the analyses in the Initial Study and in the Recirculated Draft SEIR do not follow standard AQMD guidance and appear to underestimate potential air quality impacts. Prior to certifying the Final SEIR, AQMD staff strongly recommends that the lead agency present a revised air quality analysis following standard guidance available on our website[1].

15-4 3. Part of the rationale for not completing a comprehensive air quality analysis in the Recirculated Draft SEIR is explained on pages 7-8 of the Initial Study. It states that the project will not expose sensitive receptors (e.g., residences) to substantial pollutant concentrations because *"The project involves modifying noise standards, and does not include any physical or programmatic changes that might alter sensitive receptor exposure to air pollutants. No impact will result."* However, this statement appears to be contradicted in the Recirculated Draft SEIR on page 3-7, where the lead agency states that *"Modifying the noise standard . . .could permit the operation of additional classes of drag cars . . ."*. Further, the northerly drag strip location is approximately 600 feet from the closest residence, whereas the previous southerly drag strip location was nearly 3200 feet from the closest residence. These two physical changes in the environment have the effect of potentially increasing emissions and moving emission sources substantially closer to sensitive receptors. Therefore, AQMD staff strongly recommends that the lead agency provide further analysis of these impacts prior to certification of the Final SEIR pursuant to Public Resources Code §15126.2 and 15162.

15-5 4. On page 0.1-2 and page 3-7 of the Recirculated Draft SEIR, the lead agency states that Revision 11 would remove any restriction on racing within the facility and would allow for racing at any location at the Speedway Facility as long as it meets the proposed noise standard. Pursuant to Public Resources Code §15064 the lead agency must consider all potential environmental effects of a project. The analysis presented in the current Recirculated Draft SEIR is limited to the relocated drag strip. Any future relocation or substantial modification of racing activities may have environmental impacts other than noise (e.g., air quality, greenhouse gases, etc.). If

[1] http://www.aqmd.gov/ceqa/hdbk.html

15-5 cont. the lead agency wishes to provide unlimited racing activity at the project site, an analysis of the potential environmental effects of this action should be presented to the public prior to modifying operations.

15-6 5. The potential for air quality impacts from accidents and subsequent racing vehicle fires at the drag strip was not discussed in the Recirculated Draft SEIR or in the Initial Study. While the toxic emissions from these unique events may be difficult to quantify, a discussion of the frequency and scale of these foreseeable accidental releases and the potential types of emissions from them is warranted as the source of this hazard will be substantially closer to sensitive receptors with the proposed new drag strip operations.

EMISSIONS CALCULATIONS

Fuel Usage

15-7 6. The Air Quality Modeling Technical Study determined emission rates for operations at the northern drag strip using emission factors from US EPA in a document titled "The Master List of Compounds Emitted by Mobile Sources" (EPA List). However, as noted in the companion report to this document[2], the EPA List primarily studies onroad "street legal" vehicles and does not include emission factors for typical racing vehicles that would use the drag strip. The nonroad vehicles included in the EPA List are also not typical of vehicles that will operate at the project site (e.g., trains, construction equipment, lawn mowers, marine vessels, etc.). As indicated in Table 3-2 of the Recirculated Draft EIR, a substantial proportion of vehicles racing on the new drag strip will not be "street legal" and many may also use non-standard fuels such as nitromethane, leaded gasoline, methanol, nitrous oxide, diesel (for support vehicles), etc.

In order to account for the alternate engines and fuels, a scaling factor of 4.0 is assumed during vehicle acceleration in the Air Quality Modeling Technical Study. It is unclear if this ad-hoc assumption about increased emissions reasonably captures the correct volume of contaminants. For example, the emission factors from the EPA List are derived from vehicle miles travelled (VMT) from on-road vehicles that presumably achieve approximately 0.05 gallons per mile (20 mpg) fuel efficiency. On a fuel consumption basis, the factor of 4.0 increase used in the Recirculated Draft SEIR reduces the fuel efficiency to approximately 0.2 gallons per mile. However, drag racing vehicles may consume more than 10 gallons for start-up, staging, and a single ¼ mile run[3]. This equates to a potential 200-fold underestimation of emissions.

AQMD staff recognizes the complexity in analyzing potential emissions from a unique source such as a drag strip. Applicable emission factors may not be readily available from either EPA or CARB. AQMD staff therefore recommends that the lead agency present a qualitative discussion comparing emissions from drag strip vehicles and vehicles used in the EPA List. In addition, when revising the quantitative analysis the lead agency should use the emission factors based on horsepower rather than mileage from the EPA List. These emission factors should then be corrected for total fuel consumption for typical events at the project site.

[2] Expanding and Updating the Master List of Compounds Emitted by Mobile Sources – Phase III. Available at: http://www.epa.gov/oms/regs/toxics/420r06005.pdf

[3] http://nhra.org/streetlegal/funfacts.html

Speciated Emissions

7. The speciation of contaminants emitted during racing is based on the EPA List,
however this list was compiled using unleaded gasoline available for onroad vehicles.
Fuels used in drag racing are exempt from California Air Resources Board standards
for reformulated gasoline[4], and may include mixtures such as methanol, leaded
15-8 gasoline, nitromethane, and nitrous oxide. The only modification to the speciated
emissions in the Air Quality Modeling Technical Study included an assumed 8-fold
increase in fuel usage for nitromethane fueled vehicles, and a 10-fold increase in
ammonia and formaldehyde emissions. References for these assumptions were not
provided. AQMD staff recommends that further analysis be provided for emissions
from these alternate fuels prior to certifying the Final SEIR. This should also include
a description of the typical composition of alternate fuels utilized at the track.

Proportion of Alternate Fueled Vehicles

8. The Air Quality Modeling Technical Study stated that only 1% of all races would
include vehicles that use nitromethane. The proportion of other alternate fuels used in
15-9 races is unclear, however the project description states that the vehicle fleet mix may
change if the project is approved. The Final SEIR should include a breakdown of the
approximate number of races for each specific fuel type that are expected during
project operations.

Additional Pollutants not Included in Recirculated Draft SEIR

9. The Recirculated Draft SEIR did not determine if Ambient Air Quality Standards or
(AAQS) or AQMD thresholds would be exceeded from project operations. Pollutants
not analyzed include criteria pollutants such as NO2, PM10, PM2.5, CO, and Lead.
15-10 Adverse health effects are associated with short term exposure to each of these
pollutants, and the potentially substantial emissions of these contaminants should be
analyzed prior to certifying the Final SEIR. This analysis should include an
evaluation of regional and localized impacts consistent with standard AQMD
guidance.[5]

Additional Sources of Emission not Included in Recirculated Draft SEIR

10. Several sources of emissions have not been assessed in the Recirculated Draft SEIR.
These include racing emissions from tires during "burn-outs"; brake wear; and tuning,
15-11 maintenance, and idling of racing and support vehicles. Information regarding the
potential emissions from these sources is available from US EPA AP-42 section 2.5
(for burning tires) and EMFAC2007 (for brake wear). Emissions from tuning/idling
should be based on fuel consumption for racing vehicles, and EMFAC2007 or
OFFROAD2007 for support vehicles.

AVERAGING OF EMISSIONS

Number of Vehicles Operating at Track

15-12 11. The Air Quality Modeling Technical Study states that there will be approximately
200 drag races per day at the project site with a total of 13,200 races per year. The air

[4] http://www.arb.ca.gov/enf/advs/advs397.pdf
[5] www.aqmd.gov/ceqa/hdbk.html

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15-12 cont. quality analysis then incorrectly assumes that there will only be emissions from 200 vehicles per day. As two vehicles typically participate in each race, the emissions appear to be underestimated by 50%.

Emissions Averaged on Annual Basis

15-13

12. Based on the emissions calculation sheets provided directly to AQMD staff that were not included in the Recirculated Draft SEIR, the vehicle emissions are calculated by multiplying the grams/mile emission factor from the EPA List by the total number of vehicle miles travelled per year. This calculation methodology substantially underestimates hourly and annual ground level concentrations (GLC's).

    According to the Air Quality Modeling Technical Study, racing is only predicted to occur for a few hours a day for just 66 days per year. The majority of hours in a year will have no emissions from the project. By including hours with zero emissions into the average, the actual high hourly emissions are reduced to a much lower level. In order to describe to the public the potential short term health effects of this project, the lead agency should provide maximum hourly emissions estimates and model these emissions during all expected operating hours of the project. This maximum rate should be calculated for the worst case engine and fuel fleet mix.

    Further, for estimating annual GLCs, the model files include the assumption that emissions may occur 24 hours per day. In order to account for meteorological conditions only during project operations, the hourly scalar factor should be used in the model analysis to match the expected operating hours of the project. The long term average emission rates should then be modified accordingly.

VHT Emissions Calculations

15-14

13. In May 2009, the Auto Club Speedway facility received a Notice of Compliance from the AQMD regarding its application of VOC-containing materials (specifically methanol) to the drag strip during racing activities. Subsequently, facility representatives have indicated to AQMD staff that these coatings are no longer in use, and have been replaced with very low VOC (<1%) coatings. In order to reduce the potential for future emissions of VOCs from coating the drag strip, a mitigation measure should be added to the Final SEIR that prohibits the application of coatings with VOC content greater than 1% at all future drag strip events. In addition, the Final SEIR should revisit the ingredient list for coatings applied to the drag strip and present an updated emissions estimate.

HEALTH RISK ASSESSMENT

8 hour RELs

15-15

14. In February 2009, the Office of Environmental Health Hazard Assessment (OEHHA) released updated risk assessment health values, including a new 8-hour REL for six compounds (acetaldehyde, acrolein, arsenic, formaldehyde, manganese, and mercury).[6] The health risk assessment should be revised to reflect these more recent health standards.

[6] http://www.arb.ca.gov/toxics/healthval/healthval.htm

Location of Receptors

15-16 15. The air quality ISC model run uses a 2 km grid with 100 m spacing between receptors. However this grid spacing extends less than one quarter mile to the east of project operations, and only 500 feet into the nearest neighborhood. No health risk values are presented for residences to the east of the project site. In addition, none of the nearby schools mentioned in the Recirculated Draft SEIR is explicitly evaluated in the model. The receptor grid should be extended prior to certifying the Final SEIR, and discrete health risk values should be reported at the closest residential receptor to the east and at each school identified in the Recirculated Draft SEIR.

Odors

15-17 16. As indicated on page 8-1 of the Recirculated Draft SEIR, AQMD has received several complaints regarding odor impacts from the facility in the past few years. Specifically, from June 2006 through May 2010, the AQMD has received 51 complaints from local residents alleging the Auto Club Speedway as the source of odors or other emissions. The lead agency concludes that impacts are less than significant because the temporary monitoring by AQMD staff that occurred in the spring of 2009 did not result in any Notices of Violation. This analysis by the lead agency does not evaluate the physical changes to the environment (closer drag strip, different operating hours, and a different racing fleet mix) that may occur due to project activities, or the variable nature of odorous emissions. Prior to certifying the Final SEIR, the lead agency should present a more robust analysis of potential odor impacts from the project.

MITIGATION MEASURES

15-18 17. If air quality impacts are found to be significant after re-evaluation based on the preceding comments, the lead agency may want to consider the following mitigation measures.

- Limit the number of vehicles that can race in a single day, and the number of vehicles that can race in a year.
- Limit the number of vehicles that can race in one hour.
- Limit the types of cars that can race in a single day or year based on fuel type or expected emissions from a specific vehicle class.
- The project proponent should establish a monitoring program to evaluate emissions from project operations.
- The project proponent should provide a contact person who can receive concerns from the community, especially with regards to air quality and odors.
- Limit the types of fuels used on the drag strip.
- Prohibit drag strip coatings with a VOC content greater than 1%.

Responses to Letter No. 15: South Coast AQMD

15-1 This comment provides introductory remarks and summarizes specific issues raised in detail throughout the comment letter. In general, SCAQMD is concerned about the drag strip in its current location north of the oval track because of the potential for pollutant emissions. SCAQMD also raises concerns about the existing air quality report provided in Appendix F of the RDSEIR and notes that there has been a history of air quality complaints lodged against the Speedway. Please see Attachment 3, which contains the Air Quality Modeling Technical Study prepared in response to these comments, as well as specific answers to questions raised in Comments 15-2 through 15-18.

15-2 This comment correctly states that the County did not include SCAQMD in its distribution list for the Initial Study and RDSEIR. This omission was made in error. The County provided SCAQMD a copy of the RDSEIR as soon as the error was realized and is responding to this comment letter even though it was received beyond the close of the public review period. The County will ensure that SCAQMD is included on all future distribution lists, particularly regarding the proposed project and will provide a copy of the response to this comment to SCAQMD prior to public hearings. This comment also refers to previous complaints (Appendix G) about air quality regarding operations at the proposed facility. Please refer to the previous response to comments (Responses D-81 through D-87) received during the first public review period for the SEIR and included in Appendix G of the RDSEIR. These responses were prepared in response to a SCAQMD letter included as Attachment 6 to the August 2009 CCoMPRESS letter. As demonstrated, SCAQMD responded to complaints lodged against the Speedway through follow up visits. No violations were identified.

15-3 This comment requests that a revised air quality analysis be provided following the guidance on the SCAQMD web site. Attachment 3 to the Response to Comments includes a revised Air Quality Modeling Technical Study (July 2010) prepared by Yorke Engineering. The revised air quality analysis was performed following the SCAQMD's and the Office of Environmental Health and Hazard Assessment Guidelines and the SCAQMD's CEQA guidelines and thresholds of significance. As demonstrated in the revised report, worst case operations were analyzed and impacts related to air quality and air toxics would be less than significant.

15-4 This comment requests analysis be conducted on emissions related to the permanent operation of the drag strip in its current northern location as well as from additional vehicle types that may be permitted to run on the drag strip. As stated in the attached Air Quality Modeling Technical Study, atmospheric dispersion modeling was conducted to analyze potential localized ambient air quality impacts associated with all drag strip operations of the Speedway. A health risk assessment was then conducted to determine the maximum individual cancer risk (MICR), and non-cancer acute and chronic hazard indices (HI). The resulting ground level concentrations (GLC) for each pollutant were then used to estimate the expected health risk impacts from the various pollutant emissions. The cancer risk at the MICR was calculated to be 2.21×10^{-6}. The SCAQMD threshold of environmental significance is 10 in one million. The highest potential impacts to the local residences are lower than the levels considered by SCAQMD as environmentally significant.

Exposure to pollutants can result in carcinogenic and non-carcinogenic impacts. The impact from short term exposures, typically 1–hour, is known as the acute health risk. This risk is calculated as the ratio of the maximum hourly or 8-hour GLC to an acute reference exposure level (REL) determined by

OEHHA to not result in noticeable health impacts. This ratio is known as the Acute Hazard Index (HIA).

A non-carcinogenic impact from long term exposure, typically 1-year, is known as the chronic health risk. This risk is calculated as the ratio of the annual average GLC to a chronic REL. This ratio is known as the Chronic Hazard Index (HIC).

The results of the risk assessment are shown below and the reported results represent the worst-case potential exposure. The typical environmentally significant level is 10E-06 for the MICR and 1.0 for each HI value. The highest potential impacts to the local residences are lower than the SCAQMD thresholds and thus would be considered less than significant.

Residential Receptors

	MICR	**HIC**	**HIA-1 Hour**	**HIA-8 Hour**
Receptor 1	N/A	N/A	6.77E-01	9.37E-01
Receptor 4	2.21E-06	1.03E-02	N/A	N/A

Source: Yorke Engineering, 2010

15-5 This comment expresses concern over the removal of the prohibition of race operations in Parking Lot Nos. 3-10. The removal of the prohibition is not intended to increase the amount of racing activity permitted at the facility. The prohibition was approved as part of Revision 4 to the PD in 2003. The drag strip was relocated from Parking Lot No. 1 to Parking Lot Nos. 6 and 8 under a TUP in June 2006. The proposed project includes permanent operation of the drag strip in its current, northern location and removal of the prohibition of race operations in Parking Lot Nos. 3-10. This issue was raised and addressed in previous response to comments. As stated in Response 1-32, the landowner has the legal right to request revisions to the approved PD. Such requests require environmental documentation to be prepared pursuant to the provisions of CEQA to evaluate what impacts would result from removal of a condition of approval and to demonstrate whether a significant impact would occur. It would be incumbent on the environmental document prepared for such a project to determine whether alternative mitigation is available and should be implemented if a significant impact would result. Impacts associated with the drag strip in Parking Lot Nos. 6 and 8 (referred to in the RDSEIR as northern location) have been addressed in the RDSEIR.

Since the PD represents the Speedway's operating permit from San Bernardino County, and effectively represents the zoning standards applied to the Speedway property, the provisions of the PD are as enforceable as any other zoning standards and equally as enforceable as an EIR mitigation measure. Since the PD specifies the locations where racing may occur, racing is not permitted in any location not specified in the PD. Under the current PD approval, parking lots may be used only for parking, unless a specific approval is secured from the County to permit another use. Once the PD states where racing may occur, it is superfluous to state where racing is not permitted.

15-6 This comment asserts that the potential exists for air quality impacts to occur from accidents and racing vehicle fires. This issue has been raised and addressed in Responses 1-9 and 1-48. In addition, the attached Air Quality Modeling Technical Study reviewed other potentially foreseeable emissions. As stated in the Study, the frequency of accidents and fires and the potential consequences of these events were reviewed. Generally, there are no fires or fuel releases from the drag strip activities. A single incident in 2009 is described in the RDSEIR. A person performing a trans-brake test in violation of safety and NHRA standards in the pit caused the car to go out of control and crash, resulting in a small fire. Small hand-held fire extinguishers immediately put out the fire. No fuel was released.

Other than that single incident, there have been no accidents resulting in a release of gasoline or causing a fire in the last five years. There has also been no fire or release of fuel during the races themselves in that time. About 5-8 minor breakdowns and malfunctions occur per year, requiring a vehicle to be towed off the track, but no air emission releases occur from these incidents.

Based on the historic operations of the Speedway, the likelihood of a fire or fuel release is very low from the proposed project and any corresponding release from this unlikely event would be anticipated as insignificant, since the amount of fuel held in the vehicles is generally limited (approximately five gallons maximum). Thus, potential fires or fuel releases from the proposed project are anticipated to have less than a significant impact on the environment and would not alter the conclusions provided in the Air Quality Modeling Technical Study (Attachment 3).

15-7 This comment questions the emission factors and estimations that were used in the previous Air Quality Study prepared for the RDSEIR and provides guidance for new quantification of emissions. The revised Air Quality Modeling Technical Study (Attachment 3) updated the analysis in response to this comment. As stated in the Study, Yorke quantified the emissions generated by vehicles participating in drag strip activities using the Environmental Protection Agency (EPA) publication called “The Master List of Compounds Emitted by Mobile Sources”. This document is a compilation of all testing performed by EPA on mobile sources. The document quantifies the maximum and minimum emission rates of any compounds ever detected during a test. The list is comprehensive and includes various model year vehicles, engine sizes, and fuels. However, this list is highly conservative and does not distinguish the emission factors for specific fuels.

Another source of toxic emission factors for internal combustion engines was found from the South Coast Air Quality Management District’s Annual Emissions Reporting program. These are the default emission factors that the SCAQMD recommends for stationary and portable gasoline combustion engines. Although a stationary or portable engine would not necessarily represent a mobile source engine, the engine technologies are similar and better represent gasoline combustion versus the many different types of fuel combustion signified by the EPA list. To account for potential variations from stationary and portable engines versus mobile source engines, the listed emission factor was conservatively multiplied by a factor of 10. Comparing the SCAQMD emission factor to the EPA list, it was found that the EPA list was typically higher by a factor of 25 or more. Another source for comparison was found with the World Health Organization (WHO) which shows that emissions of formaldehyde from gasoline combustion range from 0.2 to 1.6 grams/liter. This value equalled 13.4 lbs/MGal. Using a multiplier of 10 for the SCAQMD emission factor results in higher emission factors than the WHO report and is thus considered conservative.

It may be noted that the SCAQMD emission factors are for the combustion of regular unleaded gasoline. The racecars may be modified to use leaded gasoline. Regulations for the phase-out of leaded gasoline were designed to reduce toxic emissions from gasoline combustion by 20%. Therefore, the 10 times multiplier would more than properly represent the emissions from leaded gasoline combustion. Based on a Material Safety Data Sheet (MSDS) for leaded gasoline, Yorke determined the amount of lead contained in the leaded gasoline. It was then conservatively assumed that all the lead in the fuel would be released as lead emissions. The SCAQMD emission factor for lead was replaced with this calculated lead content.

The SCAQMD does not list emission factors for methanol or nitromethane combustion. Research on toxic emissions from nitromethane combustion revealed that nitromethane is a very clean burning fuel and that emissions from combustion of nitromethane are minimal except for potentially formaldehyde and ammonia. The same SCAQMD emission factor with a 10 times multiplier was used for formaldehyde. The SCAQMD list does not include ammonia as a toxic. Therefore, the ammonia emission factor from the EPA list was used.

Research on methanol fuel has shown that it is a cleaner fuel than gasoline, resulting in lower emissions. The EPA list does indicate M85 as one of the fuel types tested, but the emission factors do not specifically indicate the factors specifically associated with M85. To calculate emissions from methanol combustion, a list of toxic chemicals was obtained from the EPA list. If a chemical on this list was found to also be on the SCAQMD list, the emission factor for that chemical was replaced with the SCAQMD factor (including a conservative 10 times multiplier).

Yorke also determined that the races analyzed at the drag strip involve a vehicle traveling a short distance from where it was parked to the starting line. That vehicle will then travel 0.25 miles while pressing the accelerator followed by 0.42 miles to the end of the track to slow down. The vehicle will then return to its original starting location. The distance covered by the vehicle to get to the starting line and to return from the end of the track was determined to be 0.75 miles, for a total race distance of 1.42 miles per race per vehicle.

Dragsters and funny cars are typically towed to the starting line by a smaller vehicle. They are also towed back to their pit area at the end of the race. To retain the conservative nature of the analysis, a tow vehicle emitting emissions equal to a race car traveling the same distance was added to account for the tow vehicles.

A fuel efficiency factor was applied to the vehicles as they traveled these distances. This provided a total fuel used per vehicle per race. It is expected that the gasoline cars would run an average of 2.5 runs each day. On the special events with funny cars and dragsters, funny cars were estimated to also average 2.5 runs per day and the dragsters would average about two runs per day.

Refer to the spreadsheets included in Attachment 3 for details on the estimated fuel usages for two identified special events and for an average race event. The fuel usages were then used to estimate the maximum daily and annual average emissions.

Using these emission calculations, Yorke concluded that emissions would be below SCAQMD significance thresholds.

15-8 This comment requests further analysis regarding the fuels used in drag racing including mixtures such as methanol, leaded gasoline, nitromethane, and nitrous oxide. The assumptions used for these fuel types in the Air Quality Modeling Technical Study were included in Response 15-7 and along with references are explained in greater detail in the Air Quality Modeling Technical Study.

15-9 This comment requests a breakdown of the approximate number of races for each specific fuel type that are expected during project operations. The Air Quality Modeling Technical Study analyzed two special events which would draw the largest number of gasoline and non-gasoline vehicles to determine the worst-case maximum 1-hour and 8-hour air emission impacts. Annual impacts were assumed to include 38 average race events and two special race events. The two absolute worst-case special event races are generally limited by the amount of time available to run.

This comment was also raised and addressed in Response to 1-13 in the context of noise production rather than air emissions. As stated in that response, a worst-case assumption of drag strip operations considers up to 63 runs with vehicles exceeding 85 dB. The foregoing total anticipated worst-case exposure in a given day exceeding 85 dB is only 10 minutes 30 seconds. Since the number of cars operating in these classes that include nitromethane and methanol fast cars is fairly limited due to the great expense of operating and maintaining these vehicles, it is physically impossible to have six times the number of cars (thus *potentially* violating the standard) operating at the facility in any one day.

While one might assume that the potential does exist that more cars could be available in the future to run in these classes, the number of nitromethane and methanol fast cars has not substantially increased in the last 50 years of the sport. The louder vehicles that run the nitromethane and methanol fuels do not exceed the maximum number of cars estimated. Note also that the methanol and nitromethane cars were analyzed with fairly similar fuel characteristics, so they can be generally interchanged.

It is also important to note that more vehicles will not affect the significance conclusion for carcinogenic and chronic health standards based on the annual numbers. The only number that could be impacted by an increase in vehicle types would be the assessment of acute one-day. This estimate would be altered if the Speedway could run more cars, (however, this could not be done without violating the noise standard- see above), the mix of cars changes (unlikely given the cost and history with limited numbers operating across the country) or the cars consume more fuel (trends indicate this is not so based on general historic improvements in fuel efficiency). Also note that the acute analysis is driven by the estimated fuel consumed for the race and one chemical, formaldehyde, as an emission component.

Further, because the modeling already overestimates emissions by choosing either the numbers from the EPA list (which are the worst-case highest numbers) or 10 times the SCAQMD numbers, and the ambient conditions (wind pattern) are overstated (the worst-case day is paired with the worst case fuel usage) it is more than likely these numbers already overstate any potential risk.

15-10 This comment requests an evaluation of regional and localized impacts from criteria pollutants such as NO_2, PM_{10}, $PM_{2.5}$, CO, and lead consistent with SCAQMD guidance. Section 7.0 of the attached Air Quality Modeling Technical Study analyzed potential increases in cumulative pollutant emissions beyond levels previously analyzed.

As stated in the Air Quality Modeling Technical Study, the original 1995 EIR prepared for the Speedway oval analyzed a worst-case operation assumed to include a 500-mile race on the oval and more than 100,000 fans in attendance. That analysis measured cumulative emissions and compared them to the SCAQMD CEQA guidelines and thresholds of significance.

Table 7-1: Speedway Oval Emissions (1995) (lbs/day)

	CO	**ROG**	**NOx**	**SOx**	**PM10**
1995 Race Sunday	33,951.8	3,668.0	2,791.1	230.1	421.5
Race car emissions	3234.0	327.6	134.4	0.0	10.0
2010 Race Sunday (projected)	18,262.1	76.4	165.	26.5	53.7
SCAQMD Threshold	550	55	55	150	150
Significant?	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/No/No	Yes/No/No

Source: 1995 Speedway EIR

The estimates for the 1995 race emissions included all vehicles assumed to be attending the event. The table above also includes predicted emissions calculated for an assumed oval race in 2010. The dramatic reduction in projected 2010 emissions considered the expected improvements in vehicle emission controls for attending fan vehicles. NASCAR vehicles average no more than five miles per gallon and a NASCAR single-day event includes 43 cars, some of which do not complete the event due to mechanical breakdown, etc. A car completing the race would expend at least 100 gallons of fuel. Thus a race day estimate of 3,000 gallons is conservative. NASCAR events do not occur when drag racing activities are held. Following the 1995 EIR, the operation of the drag strip at the facility was included in subsequent CEQA documentation when its operations were substituted for a large business park that had been proposed and approved for the Speedway facility.

The worst-case day of vehicle fuel consumption for drag racing activities is the Nostalgia Race, which consumes an estimated 686.91 gallons for all activities (fuel volumes are included within the appendix of Attachment 3, Air Quality Modeling Technical Study). This fuel volume, coupled with the lower attendance occurring for drag strip events results in emissions well below the maximums previously analyzed. Overall emissions from the event would also be lower for attending fan vehicles given the improvements in vehicle emission controls. Thus, cumulative emissions do not exceed values previously analyzed in the 1995 EIR.

The potential exists for an average drag race activity to be held in conjunction with a small oval activity (i.e., road race or 100 mile event). Attendance for these two events would be significantly less than analyzed for the NASCAR weekend events. Additionally, fuel consumed at both the drag race activity and the oval activity collectively would be significantly less than the fuel consumed at the 500-mile NASCAR weekend events. Thus, the combined activities are not expected to impact current air quality standards beyond what was previously analyzed and are not expected to result in cumulative impacts.

Note that the PM_{10} emissions were determined as significant in 1995, but insignificant in 2010. $PM_{2.5}$ was not analyzed as part of the 1995 EIR, but as described in the Air Quality Modeling Technical Study, it should not exceed the 55 pounds per day SCAQMD threshold of significance which was adopted in October 2006. The SCAB is in non-attainment for the federal and state PM_{10} and $PM_{2.5}$ standard. Since $PM_{2.5}$ is a subset of PM_{10}, the methodology for calculating PM_{10} from fugitive dust sources (grading, demolition, unpaved roads, open storage piles, etc.) and combustion sources (stationary combustion sources, vehicle exhaust, etc.) are used and would then be multiplied by the applicable $PM_{2.5}$ fraction. Thus, by any measure the $PM_{2.5}$ value will be less than the PM_{10} measure.

As shown in the table above, the 1995 EIR projected the PM_{10} values for a 2010 race day to be less than 55 pounds (53.7 pounds), which was an estimate based upon 107,000 fans attending a full day NASCAR event. Within that 53.7 pounds estimate of PM_{10} for the entire day of activities was a subset for vehicles that assumed 10 pounds PM_{10} per day from the race vehicles. As stated previously, activities associated with the drag strip, including the fan attendance and race vehicles, will be a small fraction of the previously analyzed NASCAR race day in 2010. $PM_{2.5}$ has a significance threshold of 55 pounds, an amount which is greater than the assumed PM_{10} emissions determined for a worst-case (NASCAR) race at the Speedway in 2010.

Therefore, (1) because PM_{10} emissions are already anticipated to be less than 55 pounds at the worst-case event, (2) because the amount of activities from the proposed project will be less than the worst-case analyzed event and (3) because the amount of $PM_{2.5}$ will be a fraction of the PM_{10} emissions, the amount of $PM_{2.5}$ anticipated to be generated by the proposed project is anticipated to be less than the 55 pound SCAQMD threshold of significance.

See Response 15-7 and Attachment 3 for the analysis of lead.

Moving the drag strip operation from the south end of the facility to the north end of the facility will not result in an increase to cumulative emissions previously analyzed since the maximum cumulative impact results from the NASCAR Sunday race event, which has not changed. The move does result in a minor increase of toxic emissions at the closest receptors. However, the health risk assessment (Attachment 3) demonstrates no significant risk due to toxic air emissions. Since there is no increase in the amount of criteria pollutant emissions from what was previously analyzed, there will be little to no change to the monitored ambient air pollutant concentrations. The proposed project is not anticipated to impact current air quality standards beyond what was previously analyzed and is not expected to result in cumulative impacts.

15-11 This comment requests evaluation of additional sources of emissions including burn-outs, brake wear, tuning, maintenance, and idling of racing and support vehicles. As stated on page 2 of the attached Air Quality Modeling Technical Study, a brief review was made of potential emissions associated with burnouts, brake wear, tuning, maintenance and idling of race cars and support vehicles. Specifically, the literature suggests that burnouts are primarily water vapor (i.e., steam) and that actual removal of the tire material (i.e., burning of the tire) is neither intended nor desired for racing. Brake wear is generally reduced at these activities due to the ability of the vehicles to disengage their brakes for burnouts and use parachutes to slow the vehicle at the end of races. Brake wear would occur during the actual braking portion of the race and result in minor PM_{10} emissions. No toxic emissions would be generated from this activity. Tuning, maintenance and idling of race vehicles was contemplated in the Air Quality Modeling Technical Study analysis. It was assumed that all race cars would perform these activities for a total of 30 minutes each race day. Support vehicles are not tuned or maintained at the Speedway facility as a part of drag racing events, but their operations were contemplated in the analysis. As previously stated, the air quality study concludes that the proposed project would not result in significant air quality impacts; nor in significant cumulative air quality impacts above levels previously analyzed in the 1995 EIR.

15-12 This comment correctly points out that the previous air quality study included in RDSEIR was incorrect in its assumptions regarding the total number of vehicles racing per day. This was corrected in the attached Air Quality Modeling Technical Study. As stated in the study, by reviewing the facility's racing and activities calendar, it was determined that drag strip activities may take place on approximately 40 weekends per year at a location north of the oval track at the facility. The average event consists of two to three days of overall activities. A conservative value of three days of racing for a total of 120 days of racing in a year was used for the analysis. This analysis is conservative, since all drag racing events are analyzed. Much of the drag racing activities were previously permitted at a location south of the oval.

The Speedway does not allow the fastest category of vehicles known as 'Top Fuel" to participate. On a standard race event, the most common cars are street legal vehicles and modified stock vehicles that operate on high octane unleaded gasoline and the super gas and super stock vehicles that operate on leaded racing gasoline. The Speedway estimates that, on average, 100 vehicles participate in these events. A small number of vehicles may have been modified to run on either methanol or nitromethane, and visually these cars cannot be distinguished from the gasoline vehicles. Although often not present, it was conservatively estimated that on average there are two methanol vehicles and two nitromethane vehicles at all standard race events.

On special events, which would occur approximately twice a year, funny cars and dragsters running on either methanol or nitromethane may participate. These vehicles are similar to the Top Fuel versions but are slower and have less horsepower with smaller engines. These two special events will also draw the most number of gasoline vehicles and were used to determine the worst-case maximum 1-hour and 8-hour air emission impacts. Annual impacts were assumed to include 38 average race events and two special race events. Tables 3-1 and 3-2 in the study include the car type, fuel type, and number of vehicles anticipated in the worst-case scenario race.

It is expected that the gasoline cars would run an average of 2.5 runs each day. On the special events with funny cars and dragsters, funny cars were estimated to also average 2.5 runs per day and the dragsters would average about two runs per day. In the revised analysis, the total number of races analyzed approximated 15,000 races per year (average number of vehicles per race day is 100 x 2.5 runs each or 125 races. There are 120 race days per year). As previously stated in Response 15-4, the MICR and HIC based on annual values were well below significance and even a substantial increase of vehicle use in a year at average events would appear to be below significance.

15-13 This comment requests that the revised Air Quality Modeling Technical Study provide maximum hourly emissions estimates and model these emissions during all expected operating hours of the project. This comment also requests that the hourly scalar factor should be used in the analysis to account for meteorological conditions. Appendix A of the Air Quality Modeling Technical Study included the detailed operating conditions included in the modeling assumptions which include maximum fuel usage in gallons per hour. Normal drag strip operations were limited to 16 hrs (7 am to 11 pm). Special events for the loudest vehicles, (generally funny cars and dragsters), were limited to 9 hours (10 AM to 7 PM).

15-14 This comment raises the issue of the Speedway's application of VOC-containing materials to the drag strip during racing activities. This issue was raised and addressed in Responses 1-39 and 1-47. As stated, the Speedway now uses a reformulated VHT, which is primarily a resin that sticks to the man-made surfacing on which it is applied. The reformulated VHT does not include methanol and is a low-VOC product that performs exactly as needed for drag strip activities. No other VHT product is anticipated for use. Therefore, no significant air quality impacts would result from the VHT application and no mitigation is required.

15-15 This comment requests that the revised Air Quality Modeling Technical Study reflect the most current OEHHA February 2009 risk assessment health values. All risk factors were updated to the latest OEHHA values including the 8-hr RELs. In addition, the revised version of the Air Quality Modeling Technical Study includes an analysis of 8-hour impacts. As demonstrated in the Air Quality Modeling Technical Study, the project would result in emissions below the thresholds of significance for air toxics for all risk assessment health values.

15-16 This comment requests that the revised Air Quality Modeling Technical Study include assessment of impacts to residences located to the east of the project site and nearby schools. As mentioned in the Air Quality Modeling Technical Study, a grid of receptors spaced 100 meters apart beginning from the drag strip starting line and extending 2,000 meters in all directions was created. Yorke reviewed the potential for impacts to the residences located to the east of the project site and schools in the vicinity and determined that they would be lower than the receptor locations previously identified. Since the worst-case impacts to the closest sensitive receptors are within allowable limits, the impacts at other locations further from the drag strip would also be within allowable limits.

15-17 This comment raises the issue of odors. This comment has been raised and addressed in Response 1-41 and in Section 6.0 of the attached Air Quality Modeling Technical Study. As indicated, the proposed project would not result in significant impacts related to door.

15-18 This comment provides a list of suggested mitigation measures to consider if air quality impacts were identified to be significant. Based on the analysis included in the attached Air Quality Modeling Technical Study, no significant air quality impacts would occur with implementation of the proposed project. Therefore, no mitigation is required.

ATTACHMENT 1

GORDON BRICKEN & ASSOCIATES
ACOUSTICAL and ENERGY ENGINEERS

February 10, 2009

MR. MICHEAL YURICK
AUTO CLUB SPEEDWAY
9300 Cherry Avenue
Fontana, California 92335

SUBJECT: REPLY TO INQUIRY ABOUT GROUNDBORNE VIBRATION AT AUTO CLUB SPEEDWAY -- FONTANA

Dear Mr. Yurick:

We were asked by Melyssa Sheeran to respond to an inquiry as to whether the new dragstrip vehicles will induce unacceptable levels of ground vibration. We had previously stated that they would not exceed the threshold of perception at the nearest residence. This letter addresses the opinion in greater detail.

Groundborne vibration is a compression wave induced into the surface by some type of force. The force can be mechanical such as a hammer strike or it can be produced by a pressure wave from a high intensity sound source. As the compression wave expands from the source it loses energy as a function of distance, soil content and obstructions in the path. When the wave reaches a structure it is coupled to the structure and induces a vibration. The degree of coupling depends on how the structure is anchored to the ground and the construction of the building. The vibration can be radiated as a sound wave or couple to lightweight items in the building which in turn radiate sound.

1621 East Seventeenth Street, Suite K Santa Ana, California 92705-8518
Phone (714) 835-0249 FAX (714) 835-1957

The maximum vibration level is given by the equation:

$$L(t) = Lo + 10*Log[Do/R(t)] - 20*Log\{(e)(a)[R(t) - Do]\} \text{ dB (re 1g)}$$

where
$R(t)$ = Square Root $[(D)^2 - (st)^2]$
D = Distance of Receiver in feet
Do = Reference distance for Lo in feet
e = 2.17
a = Soil factor
s = Vehicle speed in feet per second
t = time in seconds

For the dragster relative to the nearest home D = 550 feet, Do = 6.5 feet, a = .016 (Gravel soil with sand and silt), s = 440 feet per second (300 miles per hour) and t = one second. With these factors L(t) = Lo - 40.6.

The value of Lo at 6.5 feet is given by the equation:

$$Lo = -4.155(PSR) + 17.2*Log(V) + 10+Log(Wg) - 87.7 \text{ dB (re 1g)}$$

where
V = Speed in miles per hour
Wg = Weight in thousands of pounds
PSR = Pavement surface factor

For this condition V = 300 miles per hour, Wg = 4 and PSR = 5. The pavement is considered smooth. The value of Lo = -58.9 dB (re 1 g). Therefore, L(t) reduces to a value of -98.5 dB (re 1g). The level of vibration is about 99 dB less than the reference of one G of acceleration.

The amplification of a house can vary from -5 dB to +15 dB depending on the coupling to the structure. For purposes of this analysis, the worst case of +15 dB will be assumed. The vibration level will be -84 dB (-99 + 15).

The threshold of perception varies with the frequency of the vibration. It ranges from -68 dB at one Hertz to -50 dB at 100 Hertz. The value of -84 dB is lower than the lowest value by a large factor.

The conclusion is that the vibration likely to be induced in the nearest building is less than the threshold of perception. Therefore, it may be concluded that the new vehicles will not alter the present vibration conditions at the nearest residence to the north.

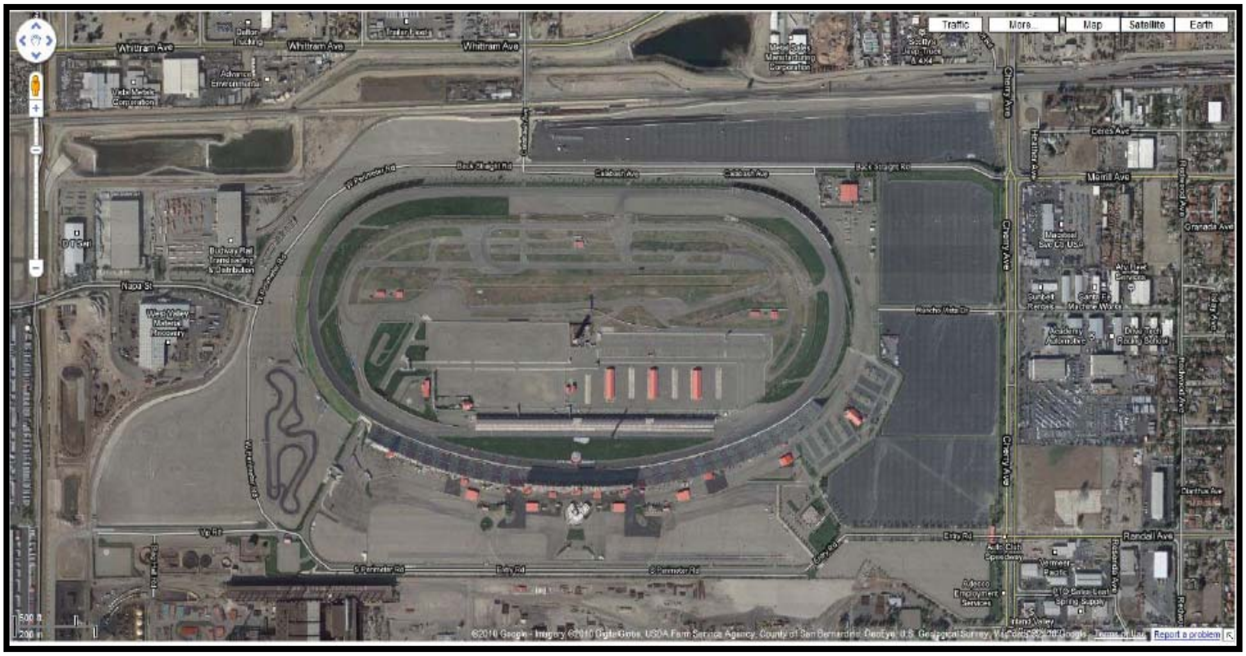
Respectively submitted,

Gordon Bricken

Gordon Bricken

ATTACHMENT 2

TECHNICAL REVIEW OF HEALTH EFFECTS
AUTO CLUB SPEEDWAY PROPOSED NOISE STANDARDS
LaCroix Davis Project No. 2813-685



Prepared for:

Mike Yurick, VP Operations
Auto Club Speedway.
9300 Cherry Avenue
Fontana, CA 92335

Prepared by:

Stephen C. Davis
Principal, LaCroix Davis LLC
MPH, CIH, CSP, CAC

Benjamin J. Heckman
Senior Manager, LaCroix Davis LLC
MPH, CIH, CAC

Revised Final Report Date:
August 4, 2010

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ATTACHMENTS

Stephen C. Davis *Curriculum Vitae*
Benjamin J. Heckman *Curriculum Vitae*

I. PURPOSE OF REPORT

Mr. Stephen C. Davis and Mr. Benjamin J. Heckman of LaCroix Davis LLC (LCD) were retained by the Auto Club Speedway (Speedway) to provide an expert industrial hygiene assessment of the health effects of the potential noise to be generated as part of the proposed project for the Speedway. The March 2010 Recirculated Draft Subsequent Environmental Impact Report (RDSEIR) provides an environmental impact analysis of the noise generated under the revised noise standard for the Speedway facility's Oval Track and Drag Strip.

The purpose of this report is to examine the potential, quantifiable health impacts (hearing loss) of the anticipated Speedway noise on the community. The analysis focuses on the OSHA, NIOSH, WHO and ISO noise standards and the associated risks of noise-induced hearing loss. The noise dose calculations are provided for historical and potential Speedway Dragstrip events. Finally, the Speedway proposed noise standards are assessed on the closest sensitive receptor (non-conforming residence), the closest conforming residence, and the Redwood Elementary School (closest educational facility).

This report is written in response to a request to review documents related to the referenced issue and address the potential impacts of noise on the community. This report also supplements the existing RDSEIR and its conclusions that there are insignificant impacts to health from the proposed project and the revised noise standard.

II. PROFESSIONAL QUALIFICATIONS

A. Stephen C. Davis

Mr. Stephen C. Davis began his career in the field of industrial hygiene with the California State Compensation Insurance Fund in 1970. His relevant educational background includes an undergraduate degree in Zoology/Life Science from the University of California at Riverside in 1967 and a Master of Public Health degree in Environmental Health Science and Industrial Hygiene from the University of California at Berkeley in 1972. (See attached *curriculum vitae)*

Mr. Davis was certified by the American Board of Industrial Hygiene in the comprehensive practice of industrial hygiene in 1975. He has maintained the uninterrupted status of diplomat in the American Academy of Industrial Hygiene since that time. He became certified in the field of industrial safety by the Board of Certified Safety Professionals in 1978. In 2009, he was awarded the title of Fellow in the American Industrial Hygiene Association (AIHA).

He has consistently served as a technical advisor to various California regulatory agencies on matters involving industrial hygiene, environmental health, and safety. He served on the first Cal/OSHA Health Standards Advisory Committee in the early 1970s. He has continued to serve on various local advisory and legislative committees throughout his career. In the early 1980s, he also chaired the American Mining Congress' Carcinogen Sub-Committee in Washington, D.C.

In 1976, Mr. Davis joined the Environmental Quality Department at Utah International, Inc. as the Corporate Manager of Industrial Hygiene. He implemented the industrial hygiene and occupational health programs for aragonite, coal, copper, gold, iron ore and uranium mines in the US, Canada, Chile, Mali, New Zealand and Australia. Later in his career with the Company, he was promoted to Manager, Environmental Services for the worldwide operations of the Minerals Division of Broken Hill Proprietary, Inc.

In 1990, Mr. Davis joined Health Science Associates as Senior Vice President. During his 12 years with HSA, he diversified the Northern California client base to include industrial hygiene/environmental services for organizations such as Space Systems/Loral, US Mint, FAA, National Park Service and large commercial and residential property management firms.

In June 2002, Mr. Davis co-founded the firm of LaCroix Pryor Davis, LLC. He manages the environmental division in Lafayette, California. He continues to serve as a senior consultant to academic, governmental and industrial clients and to function as an expert witness in asbestos, benzene, lead, mold, and other toxics litigation. In 2004, the firm was restructured and the name was changed to LaCroix Davis, LLC.

Mr. Davis' project-specific qualifications include designing and conducting industrial hygiene and environmental health surveys in a wide variety of industrial, institutional, and commercial environments. Over the past 40 years, he has conducted more than a thousand exposure surveys to a variety of airborne contaminants in industrial, commercial and residential settings.

As the Senior Industrial Hygienist for the State Fund, Mr. Davis developed noise training and certification programs for the field safety staff. Field safety staffs were taught noise measurement and monitoring techniques. In turn, noise surveys were conducted for industrial, commercial and governmental clients throughout the State of California. He personally conducted surveys for major policyholders such as a month-long survey of the Golden Gate Bridge, Highway & Transportation District toll booth operators' exposure to noise, dust and carbon monoxide.

While at Utah International, Mr. Davis was responsible for the development and implementation of hearing conservations programs in the United States, Canada and Australia. He designed and implemented the Industrial Hygiene Sampling System (IHSS) for Utah Development Company, headquartered in Brisbane, Australia. Special teams composed of a mining engineer, chief chemist, and safety advisor from each mine were trained in basic industrial hygiene testing and sampling methods. The classroom training coupled with sampling site selection and coordination with the Queensland Institute of Technology resulted in a multi-year sampling program for noise, respirable coal dust and respirable free silica.

In developing this report, he has applied recognized scientific and risk assessment techniques. In addition, he is familiar with the current scientific literature pertaining to noise exposure, and exposure assessments techniques.

B. Benjamin J. Heckman

Mr. Benjamin J. Heckman began his career in the field of industrial hygiene with the Northern California-based firm Health Science Associates in 2000. His relevant educational background includes an undergraduate degree in Biology and Environmental Studies from the University of California at Santa Cruz in 2000, and a Master of Public Health degree in Industrial Hygiene from the University of Michigan in 2005 (See attached *curriculum vitae).* While in graduate school, he completed his degree with an integrated work project on Monte Carlo computer exposure modeling, titled *Quantitatively Estimating Historical Occupational Exposures to Airborne Asbestos*.

Mr. Heckman is the Eastern Regional Manager of LaCroix Davis, LLC. He is responsible for managing office operations, client relations, and business development in the areas of industrial hygiene, environment, health and safety consulting. Mr. Heckman also provides project management services for private industry, government, construction, chemical and pharmaceutical manufacturing, and commercial industrial hygiene related projects. He has performed exposure simulations, historical exposure reconstructions, exposure modeling, statistical analyses, regulatory/literature research and litigation support related to asbestos, silica, solvents, volatile organic compounds, welding fumes, and other environmental contaminants. Mr. Heckman is a member of International Society of Exposure Science (ISES), Society for Risk Analysis (SRA), and the American Industrial Hygiene Association's (AIHA) Risk Assessment Committee.

III. SITE ORIENTATION AND MATERIALS REVIEWED

A. Site Orientation

The Speedway facility occupies approximately 570 acres of land at 9300 Cherry Avenue, within the unincorporated area of San Bernardino County (County). The Speedway is located in the southwestern section of the County, north, south and west of the City of Fontana, and east of the cities of Ontario and Rancho Cucamonga. The site characteristics are adequately described in various public documents.

The author visited the Speedway on June 29, 2010. Otis Greer, Director of Community Affairs, Michael Yurick, VP Operations and other Speedway personnel explained the general operation of the facility. The oval track and the drag strip were visited along with the surrounding neighborhood. The orientation included brief stops at the Redwood Elementary School, various conforming residential neighborhoods, the closest sensitive receptor location (non-conforming residence near the corner of Whittram and Calabash Avenues), and other industrial operations.

Subsequently, the author revisited and photographed a number of these locations. As noted in various public documents, this area is industrially-zoned, with railroad, Metro lines, industrial operations and heavy truck traffic. There are significant noise emissions from these sources.

B. Project-Specific Materials

Various materials have been reviewed, including the Recirculated Draft Subsequent Environmental Impact Report, Auto Club Speedway Revised Noise Standards (RDSEIR) and Appendix E, Technical Noise Analysis.[1] The Concerned Community Members and Parents of Redwood Elementary School Students (CCoMPRESS) comments on the RDSEIR were also reviewed prior to the site visit.[2] Numerous governmental, academic and technical documents were consulted throughout the process. The key documents are referenced in the report.

IV. AUTO SPEEDWAY NOISE

A. 1995 Noise Study

As part of the 1995 California Speedway Final EIR, a series of noise measurements were taken in 1994 before the start of Speedway operations. As shown in Table 4.2-3 of the RDSEIR, *Short-Term Noise Measurement Data (1994)*, maximum noise levels range from 61 to 85 dBA. As shown in Table 4.2-4 of the RDSEIR, *Long-Term Noise Measurement Data (1994),* the sound levels at the two (2) long-term measurement locations had an Lmax from ambient noise of 85 dBA and 90 dBA, respectively.[3]

As a result of the assumed noise to be generated by the oval track, the County established an 85 dBA Lmax noise threshold for six premier weekend events at the Speedway. This alternate noise standard allows the higher noise limit from 7am to 11pm at the Facility for premier events.

B. 2006 and 2007 Noise Studies

Noise levels in the project area without Speedway operations were measured in 2006 at three (3) locations on three (3) separate days. Noise measurements are shown in Table 4.2-5 of the RDSEIR, *Ambient Noise Levels (Without Speedway Operations).* As shown, the Lmax ranged from 65 to 116 dBA. The readings show that the ambient Lmax noise levels exceeded the noise standard for non-premier times and premier event weekends.

Noise levels were also measured at 14 locations on February 26, 2006, during a Speedway premier event (Nextel Cup Race). The monitoring locations and data are shown in Table 4.2-6 of the RDSEIR, *Noise Levels during Speedway Event (NASCAR Nextel Cup Race).* Data show that the Lmax ranged from 65 to 85 dBA. Due to significant ambient interference, only the Lmax values can be adequately confirmed as accurate. The Lmax is consistent with the current PD regulations for premier event weekends.

---

[1] "Draft Recirculated Subsequent Environmental Impact Report, Auto Club Speedway Revised Noise Standards (RDSEIR)," County of San Bernardino, SCH 200801077, March 2010.
[2] Letter from Amy Minteer and Michelle Black, Chatten-Brown & Carstens, on "Comment on Recirculated Draft Subsequent Environmental Impact Report, for Auto Club Speedway, SCH2008081077," May 10, 2010.
[3] RDSEIR, March 2010, p. 4.2-6 and 4.2-7.

Noise measurements were also conducted at three (3) locations north of the drag strip during drag strip events on August 19, September 16 and September 28, 2006, and March 24, 2007. Table 4.2-7 of the RDSEIR, *Existing (2006-2007) Noise Levels with Drag Strip Operations* shows the Lmax ranged from 72 to 81 dBA on August 19, 76 to 85 dBA on September 16 and from 54 to 93 dBA on March 24, 2007. The Lmax values ranging from 87 to 90 dBA on September 28, resulted from non-Speedway activities.

Nitromethane powered fuel cars were run and their noise measured at Whittram Avenue on April 21, 2007. The readings showed Lmax values ranging from 65 to 100 dBA. Alcohol and nitromethane–fueled cars were run and their noise measured at Whittram Avenue on May 5, 2007. The event included alcohol funny cars, alcohol dragsters and A-Fuel Dragsters (an un-supercharged nitromethane fuel car). The readings showed Lmax values ranging from 68 to 95 dBA.

C. TYPICAL ANNUAL OPERATIONS

The National Hot Rod Association (NHRA) website provides information on the classes of vehicles. Top Fuel, Funny Car, and Pro Stock are just three of the more than 200 classes of vehicles featured in NHRA competition. Those classes are grouped into 12 categories, or eliminators, each strictly governed by NHRA rule makers. Class eligibility is based on various requirements and specifications, including type of vehicle, engine size, vehicle weight, allowable modifications, and aerodynamics.[4]

The typical annual operations of the Speedway drag strip were obtained from several sources and also include operations considered for the proposed project. The RDSEIR contains a summary of the annual hours of operation based on classes of competitors. These NHRA classes were placed into similar groups (Types of Cars) based on the type, fuel and noise output of the vehicles. Noise contours provided by Gordon Bricken & Associates are reproduced in Section 4.0 of the RDSEIR. Noise contours (dBA Lmax) are provided for the Oval Track and the Drag Strip. The drag strip contours are further broken down into A-Dragster, Alcohol Fuel Car, Gas Powered Car and Street Legal Car (Figures 4.2-4 – 4.2-7 of the RDSEIR). The noise emissions data from these contours were used in the noise dose calculations.[5]

[4] NHRA, "NHRA 101, Drag Racing Classes." 2010. ONLINE. Available: http://www.nhra.com/nhra101/classes.aspx [July 2010].
[5] A noise dose of 100% or less is equivalent to the acceptable value of the respective agency's standards.

Table 4.1 – Auto Club Speedway, Proposed Annual Drag Strip Operations

<table>
<tr><th rowspan="2">NHRA Classes a)</th><th rowspan="2">Fuel</th><th rowspan="2">Types of Cars b)</th><th colspan="3">Typical Speedway Annual Operations[2]</th><th rowspan="2">Avg. Hours / Day d)</th><th colspan="2">Closest Sensitive Receptor e)</th></tr>
<tr><th>Scheduled Hours</th><th>Actual Hours</th><th>Days / Year c)</th><th>dBA Lmax Min.</th><th>dBA Lmax Max.</th></tr>
<tr><td>Top Fuel Dragster</td><td>Nitro-methane</td><td>Not run at Speedway</td><td>NA</td><td>NA</td><td>NA</td><td>NA</td><td>NA</td><td>NA</td></tr>
<tr><td>Top Fuel Funny Car</td><td>Nitro-methane</td><td>Not run at Speedway</td><td>NA</td><td>NA</td><td>NA</td><td>NA</td><td>NA</td><td>NA</td></tr>
<tr><td>A-Fuel Dragster</td><td>Nitro-methane</td><td>A-Fuel Only</td><td rowspan="3">394</td><td rowspan="3">9.3</td><td rowspan="3">35</td><td>0.07</td><td>95</td><td>100</td></tr>
<tr><td>Top Alcohol Dragster</td><td>Alcohol</td><td rowspan="2">Alcohol Dragsters</td><td rowspan="2">0.20</td><td rowspan="2">90</td><td rowspan="2">95</td></tr>
<tr><td>Top Alcohol Funny Car</td><td>Alcohol</td></tr>
<tr><td>Pro-stock Eliminator</td><td>Gas</td><td rowspan="2">Special Classes</td><td rowspan="2">110</td><td rowspan="2">31.2</td><td rowspan="2">10</td><td rowspan="2">3.12</td><td rowspan="2">85</td><td rowspan="2">90</td></tr>
<tr><td>Pro-stock Bike</td><td>Gas</td></tr>
<tr><td>Competition Eliminator</td><td>Gas</td><td rowspan="4">Bracket Classes</td><td rowspan="4">480</td><td rowspan="4">139.7</td><td rowspan="4">48</td><td rowspan="4">2.91</td><td rowspan="4">85</td><td rowspan="4">90</td></tr>
<tr><td>Super Gas</td><td>Gas</td></tr>
<tr><td>Stock Eliminator (1960 or newer)</td><td>Gas</td></tr>
<tr><td>Super Stock Eliminator</td><td>Gas</td></tr>
<tr><td>Super Street</td><td>Gas</td><td>Street Legal Class?</td><td>99</td><td>63.5</td><td>11</td><td>5.77</td><td>80</td><td>85</td></tr>
<tr><td>Junior Dragsters (<17 yrs)</td><td>Gas</td><td>1/8th of a mile, not 1/4 mile</td><td>88</td><td>12.1</td><td>11</td><td>1.10</td><td>75</td><td>80</td></tr>
<tr><td colspan="9">a) NHRA Classes – Gordon Bricken & Associates, Noise Contours Report, January 8, 2009
b) Typical Annual Operations – RDSEIR, Table 3-2, Proposed Project Typical Annual Operations
c) Days/Year – Based on Gordon Bricken’s analyses of the 2008 ACS Facility Rental Schedule
d) Hours/Day – Result of dividing hours by days/year
e) Closest Sensitive Receptor (CSR) – located ~570 feet north of Dragstrip starting line</td></tr>
</table>

V. HEALTH EFFECTS, STANDARDS & RISK ASSESSMENT

A. OVERVIEW OF NOISE-RELATED HEALTH EFFECTS

Noise Induced Hearing Loss – The principal adverse health effect of excessive noise exposures is noise-induced hearing loss (NIHL). This can occur from an acute exposure to blasts, explosions, or other high-impulse noises or from chronic exposure to continued unsafe levels of noise that lead to sensorineural hearing impairment. Depending on the context, noise can interfere with speech, sleep, and cause annoyance. Through extra-auditory effects, noise can create alterations in blood pressure and have adverse influences of existing illnesses.

The assessment of noise requires quantitative information on the amount of noise (intensity), the frequency of exposure (number of events per unit time) and the duration of noise (seconds, minutes, hours, etc.). Knowledge of the intensity, duration and frequency can be translated into dose, which can then be compared to the risk of an adverse effect.

Empirical data from large scale epidemiological studies of industrial noise exposures and resultant NIHL provide the basis to quantitatively evaluate the risk of exposure (risk assessment) to a particular dose. Typically, occupational noise exposure standards are based on an 8-hour, time-weighted (TWA) average. The predicted NIHL is based on an exposure to an integrated TWA for a 40-year, working lifetime.

Extra-Auditory Effects – The extra-auditory effects of noise are dependent on a multitude of factors such as the nature, physical condition and temperament of the receptor(s), and the intensity, frequency and duration of the noise source. The World Health Organization criteria document on noise (WHO) states that "there is a very complex multidimensional relationship between the various characteristics of the environmental noise and the effects it has on people. Unfortunately, we do not completely understand all of the complex links between noise characteristics and the resulting effects on people." [6]

This WHO criteria document lists a series of adverse health effects of noise: noise induced hearing impairment, interference with speech communication, sleep disturbance, cardiovascular and physiological effects, mental health effects, and finally, effects on performance.

WHO acknowledges that on the issue of sleep disturbance that "our understanding of the impact of noise exposure on sleep stems mainly from experimental research in controlled environments. Field studies conducted with people in their normal living situations are scarce." *The results of meta-analyses* of field and laboratory studies on sleep interference "*have been questioned (emphasis added)*, because the studies were not controlled for such things as the sound insulation of the buildings, and the number of bedrooms with closed windows." [7]

On cardiovascular and physiological effects, the WHO states that "laboratory experiments and field quasi-experiments show that if noise exposure is temporary, the physiological system usually returns - after the exposure terminates - to a normal (preexposure) state within a time in the range of the exposure duration."[8]

The WHO examines mental health effects and concludes that "environmental noise is not believed to be a direct cause of mental illness, but *it is assumed (emphasis added)* that it accelerates and intensifies the development of latent mental disorder" and that "*the findings on environmental noise and mental health effects are inconclusive (emphasis added*)." [9]

In the 1998 text, Environmental and Occupational Medicine, Chapter 101, Occupational Exposure to Noise, the authors identify three fundamental risks to health. Acute and chronic

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[6] WHO 1980a Noise. "Environmental Health Criteria Document No. 12, Section 2.3, The Complexity of Noise and Its Practical Implications", World Health Organization, Geneva, Switzerland., p 8
[7] WHO, 1980, p. 26-27.
[8] WHO, 1980, p. 29.
[9] WHO, 1980, p. 30.

exposure to noise that can lead to sensorineural hearing impairment and "extra-auditory effects, including alterations in blood pressure and adverse influences on existing illnesses such as hyperlipoproteinemia and diabetes."[10] However, while the authors conclude that the extra-auditory effects of noise, most notably hypertension, remain an area of active interest, they found that "investigations have been hampered by the prevalence of hypertension and presbycusis, as well as NIHL, tends to increase with age." [11]

Ambient Noise Levels – As noted earlier, assessing the extra-auditory effects of noise is complex and contextual. The background or ambient noise must be considered in the evaluation of the impact of noise on a community. The WHO states that "A number of studies have suggested that the annoyance effect of a particular noise would depend on how much that noise exceeded the level of ambient noise. [12]

The ambient noise levels in the area surrounding the Speedway have been shown to be significant and often substantially greater than the Speedway noise emissions. Noise levels in the project area, without Speedway operations, were measured in 2006 at three locations on 3 separate days. Section 4.0 of the RDSEIR, Table 4.2-5, Ambient Noise Levels (Without Speedway Operations), identifies Lmax noise levels ranging from 77 – 111 and 65 – 116 between Banana and Calabash Avenues (250 feet north of the centerline of Whittram Avenue). All 3 locations had ambient noise levels above 100 dBA. Six ambient noise levels greater than 104 dBA Lmax were recorded in the project area. [13]

The 2006 ambient noise levels exceed all of the County Development Code noise standard limits and thresholds for residential and industrial use as set forth at 83.01.080, Table 83-2 and Section 83.01.080(c), which are limited to 75 and 90 decibels, respectively. As noted earlier, the extra-auditory effects of noise are contextual; ambient noise levels without the Speedway in operation are substantial.

B. Occupational Safety and Health Administration (OSHA)

The Occupational Health and Safety Administration (OSHA), National Institute of Safety and Health (NIOSH) and the Environmental Protection Agency (EPA) have published noise standards and guidelines based on the risk of NIHL. OSHA and NIOSH focus on occupational health, while the EPA focuses on community health.

OSHA must consider technical and economic feasibility in standards development. NIOSH, in contrast, develops worker health recommendations based on medical, epidemiological and toxicological data without the obligation to consider technical and economic feasibility.

OSHA is the federal agency responsible for setting and enforcing occupational safety and health regulations. OSHA was formed under the Williams-Steiger Occupational Safety and

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[10] McCunney, R. J., Meyer, J. D., "Environmental and Occupational Medicine, Third Edition, Chapter 101, Occupational Exposure to Noise," Lippincott-Raven Publishers, Philadelphia, 1998.
[11] McCunney, 1989, p. 1350.
[12] WHO, 1980, p. 10.
[13] RDSEIR, March 2010, p. 4.2-8

Health Act of 1970, Public Law 91-596 (US House 1970). OSHA standards for physical and chemical agents are expressed as Permissible Exposure Limits (PELs).

In 1971, OSHA took a Department of Labor noise standard and applied it as law. In 1981, OSHA promulgated revisions to the standard; this was followed by various delays (public hearings, deferrals, lawsuits, revisions, stays), finally culminating in the *Occupational Noise Exposure; Hearing Conservation Amendment; Final Rule,* issued March 8, 1983. The final rule is the basis for the OSHA-related noise dose analyses in this report.

The OSHA noise standard is based on a 90 dBA, 8-hour, time-weighted average (TWA) with a 5 dB exchange rate and a maximum exposure to impulse noise of 140 dBA. The 1983 amendment maintained the existing PEL of 90 dBA, but required employers to institute a hearing conservation programs at, or above, the action level of 85 dBA.

C. National Institute of Safety and Health (NIOSH)

NIOSH was created under the Williams-Steiger Act of 1970. It is part of the Centers for Disease Control (CDC). NIOSH is tasked with conducting occupational health and safety research and conveying their recommendations to OSHA. Although the NIOSH Recommended Exposure Limits (REL) is not regulatory, OSHA is obliged to consider their recommendations on occupational health and safety issues.

In 1972, NIOSH published *Criteria for a Recommended Standard: Occupational Exposure to Noise*. This document, which provided the basis for a recommended standard to reduce workers' risk of developing permanent hearing loss due to occupational exposure, was revised and updated in 1998.

The 1998 criteria document reevaluated the 1972 REL. The REL is 85 dBA as an 8-hr TWA. NIOSH recommended a more conservative method to evaluate NIHL. By incorporating the 4000-Hz audiometric frequency into the definition of hearing impairment in the risk assessment, NIOSH has found an 8% excess risk of developing occupational NIHL during a 40-year lifetime exposure. NIOSH also found that scientific evidence supports the use of a 3-dB exchange rate for the calculation of TWA exposures to noise. The recommendations in the document attempt to conserve hearing by focusing on prevention of occupational NIHL.

D. Basis For NIHL Risk Assessment

The selection of an exposure limit depends on the definitions of two parameters: (1) the maximum acceptable occupational hearing loss (i.e., the fence) and (2) the percentage of the occupational noise exposed population for which the maximum acceptable occupational hearing loss will be tolerated. The fence is often defined as the average hearing threshold level (HTL) for two, three, and four audiometric frequencies. It separates the maximum allowable hearing loss from smaller degrees of hearing loss and normal hearing.

Excess risk is the difference between the percentage that exceeds the fence in an occupational noise exposed population and the percentage that exceeds it in an unexposed population.

Mathematical models are used to describe the relationship between excess risk and various factors such as average daily noise exposure, duration of exposure, and age group.[14]

Since 1969 OSHA has referred to "material impairment of hearing" as the amount of hearing loss that should be prevented. In the early days this amount was defined as an average hearing threshold level or "low fence" of 25 dB or greater at the audiometric frequencies of 500, 1000, and 2000 Hertz (Hz). OSHA now uses 25 dB at 1000, 2000, and 3000 Hz and the most recent NIOSH criteria document uses 1000, 2000, 3000, and 4000 Hz.[15]

In general, as definitions include higher frequencies and lower fences, the acceptable risk becomes more stringent and a higher percentage of the exposed population will be at risk from given levels of noise. There is widespread agreement that the old definition using merely 500, 1000, and 2000 Hz is now obsolete.[16]

When the Department of Labor issued the first federal noise standard, the selected 90-dBA PEL was thought to protect about 80% of the exposed population, leaving 20% of the population to incur a hearing impairment. Since that time, NIOSH has estimated that between 23% and 32% would incur a material impairment of hearing at the 90 dBA PEL, depending upon the definition of hearing impairment.

Table 5.1 – Definition of Material Hearing Impairment[17]

Frequency / Agency	**Average Exposure Level Over 40-Year Lifetime**		
	90 dBA	**85 dBA**	**80 dBA**
0.5-1-2 kHz	**Percentage (%) Noise Induced Hearing Loss [c)]**		
1971 – ISO [a)]	21	10	0
1972 – NIOSH [b)]	29	15	3
1973 – EPA	22	12	5
1990 - ISO	3	1	0
1998 - NIOSH	23	10	4
1-2-3 kHz			
1972 - NIOSH	29	16	3
1990 - ISO	14	4	0
1998 - NIOSH	32	14	5
1-2-3-4 kHz			
1990 - ISO	17	6	1
1998 - NIOSH	25	8	1
a) The early ISO standard incorporated the data of W.S. Baughn, and the EPA included the Baughn data as well as those of Burns and Robinson and Passchier-Vermeer (Baughn, 1973; EPA, 1973). The Baughn data were later excluded by the ISO, and NIOSH relied exclusively on its own noise-exposure			

[14] Rosenstock, L. "Criteria for a Recommended Standard, Occupational Noise Standard, Chapter 3, Basis for the Exposure Standard," NIOSH, Revised 1998.
[15] Rosenstock, L. ,1998.
[16] Madison, M.A., "CCC-A, Job Health Highlights, 3M Technical Information for Occupational Health and Safety Professionals," Vol. 25, No. 5, August 2007.
[17] Madison, August 2007.

Frequency / Agency	**Average Exposure Level Over 40-Year Lifetime**		
	90 dBA	**85 dBA**	**80 dBA**
0.5-1-2 kHz	**Percentage (%) Noise Induced Hearing Loss** [c)]		
data to develop its earlier damage-risk criteria. b) 1972 NIOSH Criteria Document recommended 85 dBA for 8 hours with the same 5 dBA time / intensity exchange rate as the OSHA PEL (29 CFR 1910.95). Percentage risks listed above for the 1972 NIOSH REL are equivalent to the OSHA PEL at the time. c) All values are expressed in percentage impaired when exceeding the 8-hour, time-weighted (dBA) exposure threshold over a 40-year working lifetime.			

The ISO provides a method for calculating noise-induced hearing impairment in populations exposed to all types of noise (continuous, intermittent, and impulse) during working hours. Noise exposure is characterized by LAeq over 8 hours of work (LAeq,8h).[18] The ISO 1999 Standard applies an equal energy concept in the calculation of noise dose with a 3-dBA exchange rate. The relationships between LAeq,8h and noise-induced hearing impairment are given for frequencies of 500-6,000 Hz, and for exposure times of up to 40 years. These relationships show that noise-induced hearing impairment occurs predominantly in the high-frequency range of 3,000-6,000 Hz, the effect being largest at 4,000 Hz.

With increasing LAeq,8h and increasing exposure time, noise-induced hearing impairment also occurs at 2,000 Hz. However, at LAeq,8h levels of 75 dBA and lower, even prolonged occupational noise exposure will not result in noise induced hearing impairment. This value is equal to that specified in 1980 by the WHO.[19] The percentages of noise induced hearing loss shown in Table 5.1 above for ISO 1990 are equivalent to those predicted by the WHO.

The OSHA PEL for occupational noise exposures has not been updated for decades. It presents the greatest percentage risk of NIHL among the 4 agency (OSHA, NIOSH, ISO and WHO) noise criteria/standards. The ISO 1990 and NIOSH 1998 noise standards predict similar potential NIHL for working populations exposed to 80 dBA for 40 years. The NIOSH REL predicts modestly a higher percentage of NIHL (8% versus 6%) at 85 dBA and a greater difference occurs at 90 dBA. One major difference between the risk assessment approach used by NIOSH and other agencies is that NIOSH does not adjust the NIHL for aging (presbycusis), which increases the percentage of the population that fits the NIHL criteria. The NIOSH approach is very health-conservative.

As noted earlier, the WHO criteria are similar to the ISO 1990 standard. OSHA and NIOSH have been used in the risk assessments since one method represents the enforceable legal standard for noise in the United States and the other represents the most conservative noise guideline.

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[18] IS0 1990. “Acoustics-Determination of occupational noise exposure and estimation of noise induced hearing impairment.” International Standard IS0 1999, International Organization for Standardization, Geneva, Switzerland.
[19] WHO 1980, p. 22.

VI. NOISE EXPOSURE ASSESSMENTS

A. NOISE EXPOSURE ASSESSMENT (NEA) PROCESS

A noise exposure assessment (NEA) involving probabilistic (Monte Carlo) modeling was used to quantify the noise exposures at the closest sensitive receptor (CSR), at the closest conforming residence (CCR) and at the Redwood Elementary School, the closest educational facility (CEF). The model relies on the information obtained on historical race events such as the Nostalgia Race, April 2010 and on proposed events such as the NHRA Lucas Oil Divisional Race to simulate resultant noise doses from what are projected as the worst-case noise events.

Noise exposure data (dBA Lmax at the CSR, CCR and CEF) for various classes of vehicles are used for intensity inputs. The number and type of cars run are based on race records and projected use for the proposed project. These records and projections indicate the frequency of noise emissions. Elapsed time ranges by class (total seconds per run including burn outs) provide the duration for the calculations.

The Monte Carlo technique used in this NEA involves reducing uncertainty by performing repeated computer simulation trials with inputs that represent the distribution of possible, or the most likely, parameters. The technique uses a probabilistic (stochastic; i.e., random) modeling approach. This modeling approach relies on probability distributions for each input exposure parameter (e.g., frequency, duration, intensity).[20] The Monte Carlo model utilized in this report generated the mean (average), 95th percentile and the 98th percentile exposure levels for the designated input parameters and race scenarios described below. For example, the 95th percentile exposure value represents that 95 percent of the exposures for this scenario are at or below this exposure level.

B. HISTORICAL EVENT ANALYSES – NOSTALGIA RACE, APRIL 2010

In 2009, the NHRA Hot Rod Heritage Racing Series featured 9 points-earning events and 5 non-points-earning affiliate events. The Series awarded year-end points champions in 14 categories.

The 2009 Series 14 featured classes included: Nostalgia Top Fuel Dragster; Nostalgia Funny Car; Group 1 (A/Fuel, AA Supercharged, Jr. Fuel (same rules as the 2008 Jr. Fuel B class) and 7.0 Pro) and Group 2 (Nostalgia I, II and III; A, B, C and D/Gas and Hot Rod). The new 7.0 Pro class was an index class with breakout rules – intended for front engine dragsters, center-steer Altereds and pre-1980 Nostalgia Funny Cars.[21]

In 2010, the NHRA Hot Rod Heritage race was hosted by the Auto Club Speedway. The Series occurred on the weekend of April 23-25, 2010. It featured similar classes; the number and types of cars that were run during this 3-day event are shown in Table 6.1, Heritage Nostalgia Race Parameters (Type, Number and Elapsed Time). A total of 164 gasoline-powered cars, 34 methanol-powered cars, and 15 nitromethane-powered cars competed during the 2010 Series.

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[20] Ignacio, J.S. and Bullock, W.H, "A Strategy for Assessing and Managing Occupational Exposures, Appendix I: Assessing Variability via Monte Carlo Simulation, 3rd Ed.," Fairfax: AIHA Press, 2006.
[21] Press Release, "NHRA announces formation of Hot Rod Heritage Racing Series," 2009.

Each car averaged 2.5 runs per day with an average elapsed time of 6 seconds. The total hours of noise emissions by type of car are provided. These data were used as inputs for the noise dose simulations.

Table 6.1 – Heritage Nostalgia Race Parameters (Type, Number and Elapsed Time)

Fuel Type/Car	Type of Car	# Cars	Runs/Day	Time/Run (sec)	Daily Hours
Gasoline	Special Classes	164	2.5	6	0.34
Methanol	Alcohol Dragster	34	2.5	6	0.07
Nitromethane	A-Fuel Dragster	15	2.5	6	0.03
Total Hours					**0.44**

It should be noted that Wieland Acoustics, Inc. (WAI) conducted noise measurements during this weekend event on behalf of the County of San Bernardino, Department of Health.[22] The WAI acoustical engineer(s) conducted measurements in two positions: the first position was at the property line of a residence at the northeast corner of Whittram Avenue and Calabash Avenue and the second position was at the end of the Valencia Avenue cul-de-sac. The latter position "was selected to represent the noise levels that are experienced at the nearby Redwood Elementary School."[23]

The analyses of noise dosage from the Nostalgia Race were conducted for three locations: the closest sensitive receptor (CSR), the closest conforming residence (CCR) and the closest educational facility (CEF). The CSR is the non-conforming single-family residence located to the east of the intersection of Whittram and Calabash Avenues. The CCR are apartments located directly north of the drag strip starting line and south of Arrow Highway. The CEF is the Redwood Elementary School. The three locations and the WAI surrogate location for the Redwood Elementary School are shown in Figure 6.1 – Auto Club Speedway and Vicinity Aerial with CSR, CCR and CEF.

[22] Wieland, DL, "Measurement of Noise Levels from Racing Activities at the Auto Club Dragway in Fontana, CA," May 18, 2010.
[23] Wieland, 2010, p. 2.

Figure 6.1 – Auto Club Speedway and Vicinity Aerial with CSR, CCR and CEF

The results of the Monte Carlo simulation of the Heritage Nostalgia Race are provided in Table 6.2, Heritage Nostalgia Race Simulation Results at CSR, CCR and CEF below.

Table 6.2 – Heritage Nostalgia Race Simulation Results at CSR, CCR and CEF

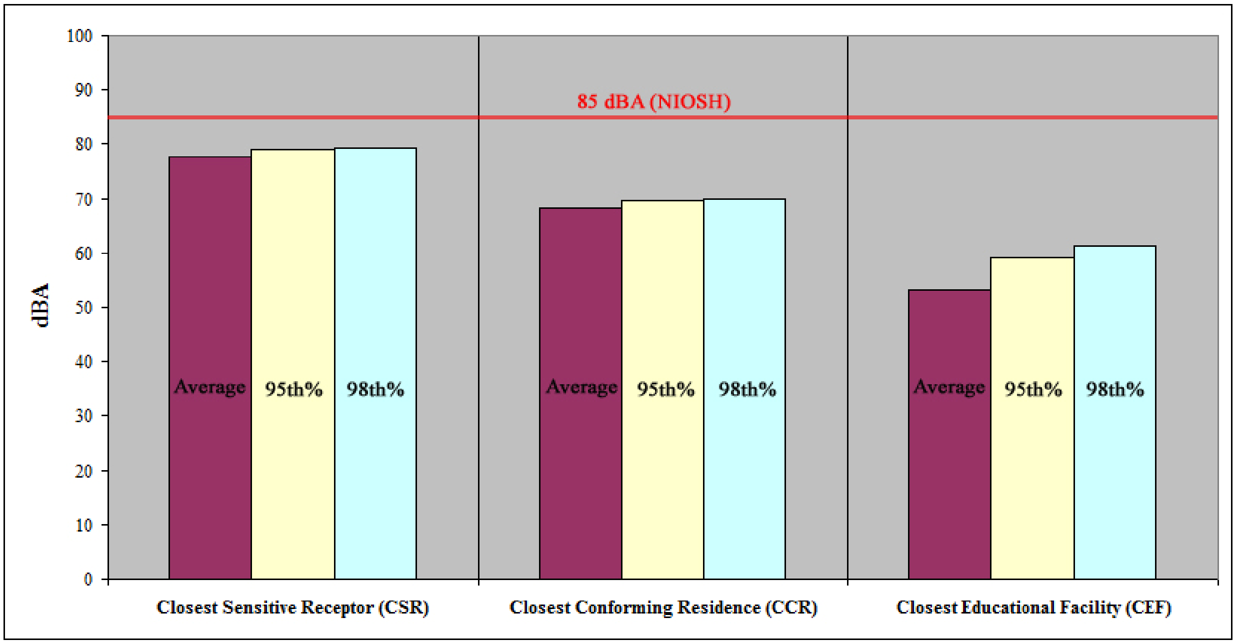
Agency Standard	Noise Exposure	Closest Sensitive Receptor (CSR)		Closest Conforming Residence (CCR)		Closest Educational Facility (CEF)	
		dBA	Dose %	dBA	Dose %	dBA	Dose %
OSHA [a)]	Average	68.7	5.3	59.5	1.5	46.2	0.3
	95th %	70.3	6.5	61.1	1.8	52.9	0.6
	98th %	70.5	6.7	61.3	1.9	54.1	0.7
NIOSH [b)]	Average	77.6	18.6	68.2	2.2	53.2	0.1
	95th %	79.0	25.3	69.7	2.9	59.2	0.3
	98th %	79.3	27.1	70.0	3.1	61.3	0.4

a) OSHA – based on 90 dBA, 8-hour time-weighted average (TWA) with a 5 dB exchange rate.
b) NOISH – based on 85 dBA, 8-hour time-weighted average (TWA) with a 3 dB exchange rate.

The NIOSH Monte Carlo simulation results for the average, 95th, and 98th percentile exposure levels for the CSR were 77.6, 79.0, 79.3 dBA, respectively. The simulation results for the average, 95th, and 98th percentile exposure levels for the CCR were 68.2, 69.7, 70.0 dBA, respectively. The simulation results for the average, 95th, and 98th percentile exposure levels for the CEF were 53.2, 59.2, 61.3 dBA, respectively.

The results of the Monte Carlo simulation of the Heritage Nostalgia Race are graphically compared to the NIOSH REL in Figure 6.2, Heritage Nostalgia Race Simulation Results at CSR, CCR and CEF below.

Figure 6.2 – Heritage Nostalgia Race Simulation Results at CSR, CCR and CEF (NIOSH)



C. Potential Event Analyses – NHRA Lucas Oil Divisional

A potential event such as the National Hot Rod Association (NHRA) Lucas Oil Divisional (Lucas) competition is also evaluated in the noise dose simulation. The Lucas event would feature race vehicles that range from five-second Top Alcohol Dragsters and Top Alcohol Funny Cars to 15-second Stockers. The NHRA Lucas Oil Drag Racing Series is the premier Sportsman series in drag racing.

The Lucas would have eight categories of Top Alcohol Dragster, Top Alcohol Funny Car, Comp, Super Stock, Stock, Super Comp, Super Gas, and Super Street, whose racers make up the vast majority of entries at NHRA national events. The proposed race is depicted in Table 6.3 –NHRA Lucas Oil Race Parameters (Type, Number and Elapsed Time). Again, the types and number of cars, runs per day and total daily hours of noise emissions are shown. These data were used as input values for the Monte Carlos noise dose simulations.

Table 6.3 –NHRA Lucas Oil Race Parameters (Type, Number and Elapsed Time)

Fuel Type	Type of Car	# Cars	Runs/Day	Time/Run (sec)	Daily Hours
Gasoline	Special Classes	400	2.5	6	0.83
Methanol	Alcohol Dragster	40	2.5	6	0.08
Nitromethane	A-Fuel Dragster	3	2.5	6	0.01
Total Hours					**0.92**

The results of the Monte Carlo simulation of the NHRA Lucas Oil Race are provided in Table 6.4 – NHRA Lucas Oil Race Simulation Results at CSR, CCR and CEF below.

Table 6.4 – NHRA Lucas Oil Race Simulation Results at CSR, CCR and CEF

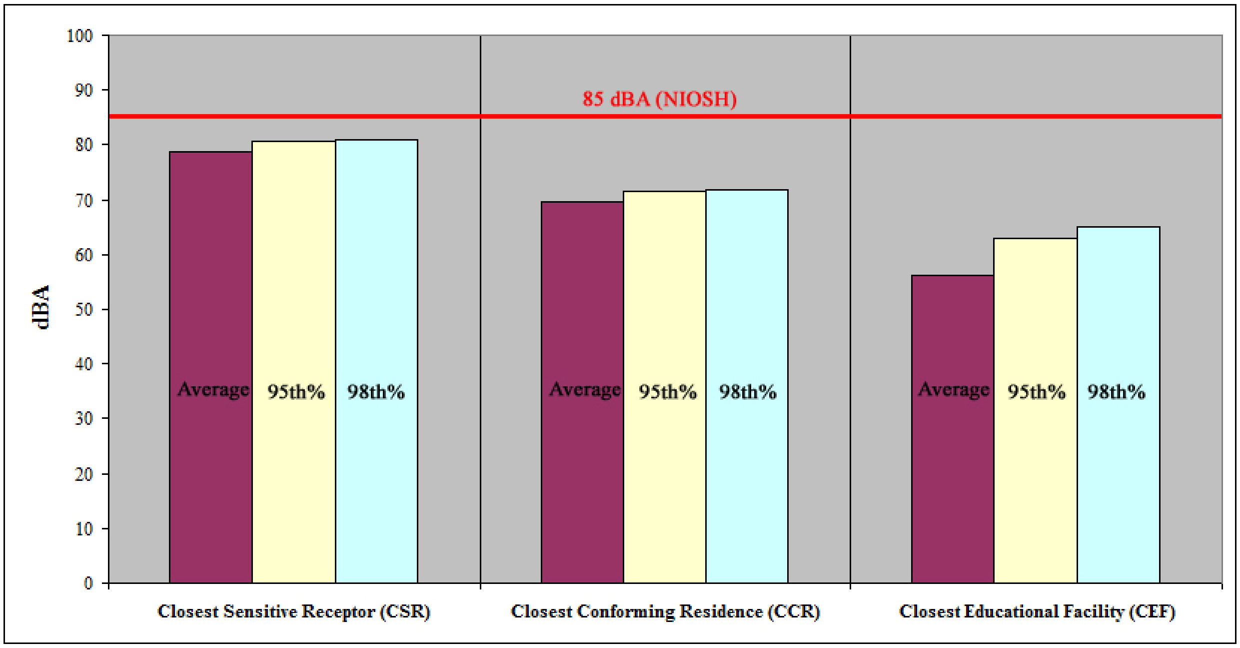
Agency Standard	Noise Exposure	Closest Sensitive Receptor (CSR)		Closest Conforming Residence (CCR)		Closest Educational Facility (CEF)	
		dBA	**Dose %**	**dBA**	**Dose %**	**dBA**	**Dose %**
OSHA [a)]	**Average**	72.4	8.9	63.4	2.5	51.2	0.5
	95th %	74.5	11.6	65.4	3.3	58.8	1.3
	98th %	74.7	11.9	65.6	3.4	60.1	1.6
NIOSH [b)]	**Average**	78.8	24.5	69.7	3.0	56.1	0.2
	95th %	80.7	36.9	71.6	4.6	62.9	0.6
	98th %	80.9	39.0	71.9	4.8	65.0	1.0

a) OSHA – based on 90 dBA, 8-hour time-weighted average (TWA) with a 5 dB exchange rate.
b) NOISH – based on 85 dBA, 8-hour time-weighted average (TWA) with a 3 dB exchange rate.

The NIOSH Monte Carlo simulation results for the average, 95th, and 98th percentile exposure levels for the CSR were 78.8, 80.7, 80.9 dBA, respectively. The simulation results for the average, 95th, and 98th percentile exposure levels for the CCR were 69.7, 71.6, 71.9 dBA, respectively. The simulation results for the average, 95th, and 98th percentile exposure levels for the CEF were 56.1, 62.9, 65.0 dBA, respectively.

The results of the Monte Carlo simulation of the NHRA Lucas Race are graphically compared to the NIOSH REL in Figure 6.3, NHRA Lucas Oil Race Simulation Results at CSR, CCR and CEF below.

Figure 6.3 – NHRA Lucas Oil Race Simulation Results at CSR, CCR and CEF (NIOSH)



VII. SOUND WALL AND PROPOSED NOISE STANDARD

A. Sound Wall Noise Mitigation

A major component of the proposed project is the installation of a noise attenuation wall at the drag strip. This element is identified as Mitigation Measure 4.2-1 in the RDSEIR. The proposed wall would be constructed to a level that is 20 feet above the drag strip and would be located along the northern edge of the quarter mile length of the drag strip. A representational diagram of the proposed wall is provided at Figure 4.2-11 of the RDSEIR. As described in the RDSEIR, analysis of the proposed noise attenuation wall indicates a 9 to 10 decibel reduction at the CSR. The analysis herein conservatively estimates only a five decibel reduction from the wall installation in order to determine its beneficial impact upon the various parameters analyzed, including the proposed noise performance standard in the RDSEIR.

Since the CCR and CEF evaluations (Section VI above) already demonstrate that noise dosages are well below the OSHA and NIOSH criteria, only the CSR is analyzed for the potential benefits associated with the noise attenuation wall.

B. Proposed Speedway Noise Standard

The existing Speedway standard allows six premier weekend events to operate at 85 dBA Lmax from 7am to 11 pm. The proposed noise standard for the Speedway is to establish a limit of 85 dBA Lmax for all operations (8 hours per day 330 days per year) except that "all noise exceeding 85 decibels can occur for only one hour on 35 days per year from 10am to 7pm and cannot exceed 100 decibels." Additional details of the proposed standard are described below.

This section evaluates the potential for NIHL at the CSR based on the NIOSH risk assessment criteria described earlier.

In addition to the Speedway's revised noise standard, the proposed project also recommends the institution of a 2- to 4-year, 2- to 4-events per year noise monitoring program that would be administered by the County of San Bernardino and paid for by the Speedway. The proposed noise standard also contains three brackets of allowable noise, described as follows:

One hour - The one-hour exposure exceeding 85 and equal or less than 100 decibels will be further refined as follows:

Level 1 – 30 seconds from 95.1-100 decibels (dBA Lmax): Any separable Lmax reading in range is identified as an event and counts as 6 seconds. A maximum of 5 counts are allowed.

Level 2 – 9.5 minutes from 90.1-95 decibels (dBA Lmax): Any separable Lmax reading in range is identified as an event and counts as 6 seconds. A maximum of 95 counts are allowed (plus all remaining counts above 95.1 dBA that are not used).

Level 3 – 50 minutes from 85.1-90 decibels (dBA Lmax): Any separable Lmax reading in range is identified as an event and counts as 6 seconds. A maximum of 500 counts are allowed (plus all remaining counts above 90.1 dBA that are not used).

Additionally, all noise exceeding the County noise standard of 75 dBA Lmax are represented by the following:

Level 4 – 3.5 hours from 80.1 to 85 decibels (dBA Lmax) for 35 days a year (plus all remaining hours from Levels 1-3) and 8 hours for the remaining 330 days per year

Level 5 – From 75.1 to 80 decibels (dBA Lmax), all hours not used from Levels 1-4

The results of the Monte Carlo simulation of the Proposed Speedway Noise Standard are provided in Table 7.1 – Proposed Speedway Noise Standard at CSR below.

Table 7.1 – Proposed Speedway Noise Standard at CSR

Agency Standard	Noise Exposure	Closest Sensitive Receptor (CSR)	
		dBA	Dose %
OSHA [a)]	**Average**	80.1	25.6
	95th %	81.7	31.6
	98th %	82.0	32.9
NIOSH [b)]	**Average**	82.2	53.9
	95th %	83.6	73.0
	98th %	83.9	78.0

a) OSHA – based on 90 dBA, 8-hour time-weighted average (TWA) with a 5 dB exchange rate.
b) NOISH – based on 85 dBA, 8-hour time-weighted average (TWA) with a 3 dB exchange rate.

The NIOSH Monte Carlo simulation results for the average, 95th, and 98th percentile exposure levels for the CSR were 82.2, 83.6, 83.9 dBA, respectively. The average noise dose (53.9%) is well below 100% using health-conservative assumptions.

C. CONSERVATIVE ASSUMPTIONS IN NOISE DOSE ASSESSMENTS

A number of conservative assumptions were made in the analysis of the potential health effects of the operation of the Auto Club Speedway. These assumptions range from the selection of very health-conservative criteria to define NIHL, to the potential sound attenuation to be achieved by the installation of a sound wall. Some of these assumptions are described below:

The first health-conservative assumption was the selection of the NIOSH Recommended Exposure Level (REL) and associated risk assessment as the basis for NIHL. The NIOSH risk assessment does not adjust for presbycusis, which is the loss of hearing that gradually occurs in most individuals as they grow older. According to the National Institute on Deafness and Other Communication Disorders (NIDCD), "Hearing loss is a common disorder associated with aging. About 30-35 percent of adults between the ages of 65 and 75 years have a hearing loss. It is estimated that 40-50 percent of people 75 and older have a hearing loss." [24]

The calculation of noise dose from the Speedway was based on the assumption that each vehicle produces peak noise emissions at the CSR during the entire race. This assumption is clearly biased toward the calculation of higher noise doses than would occur because noise diminishes with distance from the source. For example, the noise dose calculations for the closest sensitive receptor were performed with the noise source assumed to be stationary at the start line for the entire race.

[24] National Institutes of Health, National Institute on Deafness and Other Communication Disorders. 2007. "Presbycusis." ONLINE. Available: http://www.nidcd.nih.gov/health/hearing/presbycusis.html [July 2010]

The noise intensity ranges (See Table 4.1 – Auto Club Speedway, Proposed Annual Drag Strip Operations) used in the calculations for various types of cars were significantly higher than those measured by WAI in April 2010. The noise dose input values (dBA Lmin and dBA Lmax) were 5 to 10 dBA higher than the WAI values.

The acoustical engineer's analysis of the proposed noise attenuation wall indicates a 9 to 10 decibel reduction at the CSR. The noise dose calculations for the proposed Speedway noise standard conservatively estimate only a five decibel reduction from the wall installation in order to determine its beneficial impact upon the various parameters analyzed including the proposed noise performance standard in the RDSEIR. Additionally, the proposed noise performance standard accounts for every increment as a prescribed time (6-seconds duration), thus overvaluing even the worst-case performance that might occur in any one race.

VIII. CONCLUSIONS

1. The principal, quantifiable health effect of exposure to noise is noise induced hearing loss (NIHL). Depending on the context, noise can interfere with speech, sleep, and cause annoyance; however, extra-auditory effects of noise are contextual. The World Health Organization (WHO) acknowledges that "there is a very complex multidimensional relationship between the various characteristics of the environmental noise and the effects it has on people. Unfortunately, we do not completely understand all of the complex links between noise characteristics and the resulting effects on people."

2. Ambient noise levels in the area surrounding the Speedway have been shown to be significant, often substantially greater than the Speedway noise emissions and in excess of County noise standards.

3. NIOSH guidance was applied to produce the most conservative, generally accepted occupational noise standard and methodology. Compliance with NIOSH levels and the underlying NIHL risk assessment means compliance with the majority of other occupational exposure methodologies.

4. The potential risk for NIHL in the community from Speedway operations was analyzed for the closest sensitive receptor (CSR), the closest conforming residence (CCR) and the closest educational facility (CEF). Exposure calculations were performed for a historical race (Heritage Nostalgia Race, April 2010), a proposed future race (NHRA Lucas Oil Divisional) and the proposed Speedway noise standard. In all instances, the noise doses were below the NIOSH recommended exposure level.

5. Health-conservative assumptions were made at multiple points in the exposure analyses. For example, the NIOSH risk assessment does not adjust for presbycusis, which is the loss of hearing that gradually occurs in most individuals as they grow older. Noise emissions used as the input values for various types of cars in the dose calculations were significantly higher than those measured by Wieland Acoustics, Inc. in April

2010. Noise reduction values for the proposed sound wall were reduced from 9 to 10 decibel reduction at the CSR to 5 dBA.

6. The potential exposure at the CSR under the noise performance standard finds that the worst-case impacts do not exceed the allowable NIOSH dose. The installation of the sound wall will provide an added measure of protection.

IX. LIMITATIONS AND QUALIFICATIONS

1. The assessment performed by LCD does not include or cover the following matters: (a) Matters that are subsequently discovered that could not have been reasonably foreseen or detected, using industry standards, during the performance of the assessment; (b) Matters that could not have been discovered by LCD because of barriers, lack of access or other matters affecting accessibility; (c) Matters that were not disclosed to LCD prior to, during, or after the performance of the assessment; and (d) Any new deficiency that arose after the completion of the assessment by LCD.

2. To the extent that additional information becomes available to LCD, LCD reserves the right (without any obligation to do so) to modify its evaluation and/or this Report at any time, based upon further review and analysis of any such additional information or data.

3. Certain items mentioned in the Report were performed by others not involving the supervision of, or management by, LCD, but were relied upon by LCD in making its evaluation and assessment.

4. The assessment performed by LCD is not meant or intended to supplement, modify, or extinguish any warranty or representation made or given by third parties performing any of the recommended corrective work.

5. This Report and the assessment/survey conducted by LCD is prepared, and was performed, solely for the use and benefit of the client identified at the beginning of this Report. No other party may rely on this Report for any other purpose.

The authors reserve the right to revise and supplement this report based on additional information, or personal investigations. Please let us know if you have any questions.

Respectfully submitted,

S C Davis

Stephen C. Davis
MPH, CIH, CSP, CAC
Principal

THE AMERICAN BOARD OF INDUSTRIAL HYGIENE
INCORPORATED
CERTIFICATION NUMBER
930 CP
EXPIRES
6-1-2013

Respectfully submitted,

Benjamin J. Heckman
MPH, CIH, CAC
Senior Manager

THE AMERICAN BOARD OF INDUSTRIAL HYGIENE
INCORPORATED
CERTIFICATION NUMBER
9218 CP
EXPIRES
6-1-2012
PENNSYLVANIA - 1960
BENJAMIN JACOB HECKMAN, CIH

LaCroix Davis LLC
Building & Environmental Forensics

Stephen C. Davis
MPH, CIH, CSP, CAC

Mr. Davis has more than forty years of increasingly responsible technical, managerial, and consulting experience in the environmental and occupational/community health and safety field. He is a highly-credentialed, seasoned professional with substantial experience in the military, government, insurance, mining and environmental health and safety consulting.

Military & Insurance – His career began in 1964 in the military in the field of preventative medicine with assignments in Washington, Korea and Thailand. In 1968, he joined the California State Compensation Insurance Fund. At the State Fund, he conducted special studies for high-profile policyholders, developed corporate industrial hygiene training programs and collaborated on underwriting standards for high-risk clients. During this period, he also earned a Masters of Public Health (MPH) degree at U.C. Berkeley, served on the first Cal/OSHA Health Standards Advisory Board and earned a certification in the Comprehensive Practice of Industrial Hygiene (CIH) from the American Board of Industrial Hygiene.

Mining & Environment – In 1976, Mr. Davis joined the Environmental Quality Department at Utah International, Inc. as the Corporate Manager of Industrial Hygiene. He implemented the industrial hygiene and occupational health programs for aragonite, coal, copper, gold, iron ore and uranium mines in the US, Canada, Chile, Mali, New Zealand and Australia. He also developed the hazardous materials/PCB inventory and control systems for the corporation, served as Chairman of the Carcinogen Subcommittee for the American Mining Congress, planned and moderated seminars in Washington D.C. and at UC Berkeley on quantitative risk assessment, and published numerous articles on health and safety program development in the mining industry. Mr. Davis also managed the corporate Human Resources responsibilities of compensation, medical services, organizational staffing and development.

Consulting & Litigation – In 1990, Mr. Davis joined Health Science Associates (HSA) as Senior Vice President. During his 12 years with HSA, he diversified the Northern California client base to include industrial hygiene/environmental services for organizations such as Space Systems/Loral, US Mint, FAA, National Park Service and large commercial and residential property management firms.

In June 2002, Mr. Davis co-founded the firm of LaCroix Pryor Davis, LLC. He manages the environmental division in Lafayette, California. He continues to serve as a senior consultant to academic, governmental and industrial clients and to function as an expert witness in asbestos, benzene, lead, mold, and other toxics litigation. In 2004, the firm was restructured and the name was changed to LaCroix Davis, LLC.

Public Service & Teaching – Throughout his career, he has volunteered as a technical expert on Local, State, and National committees. He has served on the City and County of San Francisco's, Lead Hazard Reduction, Citizens Advisory Committee, on the Cal/OSHA Special Emphasis Program on Lead in the Construction Industry, and on curriculum advisory committees for UC Berkeley Extension, Hazardous Materials Management Program. He has been an instructor on hazardous materials at UC Berkeley Extension for over fifteen years.

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EDUCATION

1972 Master of Public Health, Environ. Health Science/Industrial Hygiene
University of California at Berkeley
Berkeley, California

1967 Bachelor of Arts, Life Science/Zoology
University of California at Riverside
Riverside, California

CERTIFICATIONS AND REGISTRATIONS

Certified Industrial Hygienist (CIH), American Board of Industrial Hygiene, Comprehensive Practice of Ind. Hygiene, No. 930

Certified Safety Professional (CSP), American Board of Certified Safety Professionals, Certification No. 5534

Certified Asbestos Consultant (CAC), Calif. Division of Occupational Safety and Health, (Cal/OSHA), Certification No. 93-1073

Lead-Related Construction, Calif. Department of Health Services, (Cal/DHS),
Project Monitor, Certificate No. M-1563
Inspector/Assessor, Certificate No. I-1563
Project Designer, Certificate No. D-1563

AWARDS AND HONORS

Fellow Award, American Industrial Hygiene Association

"Recognizes members who have made significant contributions to the practice of industrial hygiene and/or related disciplines." February 2009

Certificate of Honor, Board of Supervisors, City and County of San Francisco

"Certificate of Honor in appreciative public recognition of distinction and merit for outstanding service to a significant portion of the people of the City and County of San Francisco in Working for a Healthy Environment."
June 2004

Educational Contribution Award, Univ. of California at Berkeley Extension

"Presented in appreciation for your contribution to the success of Programs in Environmental Hazard Management and with gratitude for your commitment to excellence and integrity in environmental education."
October 1993

Undergraduate Research Grant, National Science Foundation

An undergraduate research grant provided to conduct a "Genetic Study of Wing Venation Patterns in *Fannia canicularis*." Part of a larger, agricultural research project to study the genetics of the "little house fly."
Winter 1967

PROFESSIONAL EXPERIENCE

2002- Pres. **Managing Member**
LaCroix Davis LLC, Lafayette, CA
As a co-founder and managing member of LaCroix Davis, LLC (formerly LaCroix Pryor Davis, LLC), Mr. Davis is responsible for the development and operation of the industrial hygiene and environmental consulting aspects of the business. He is the senior professional for the organization, which provides consulting services to governmental, academic and private clients. Mr. Davis also functions as an expert witness in a wide variety of toxic tort and environmental health litigation such as asbestos, benzene, lead, mold, volatile organic compounds, and silica.

Major projects/accomplishments:
Managed and/or conducted site assessments and developed abatement specifications for hazardous materials such as asbestos, lead-based paint (LBP) and polychlorinated biphenyls (PCBs) in high-rise commercial buildings, pharmaceutical manufacturing complexes, and residential buildings in the greater San Francisco Bay Area.

Managed and/or conducted fungal assessments in hundreds of commercial and residential buildings in construction defects and other litigated/mediated construction issues. Investigations have included single family dwellings, condominiums, apartment complexes, hotels, conference centers, courthouses, and commercial storage facilities. Recently completed a comprehensive water damage / mold assessment in a 24-story commercial building located in Sacramento and operated by the State of California, Department of General Services.

Managed the flood response assessment and abatement process in the 9th Circuit Court of Appeals Building in San Francisco, California. Approximately 9,000 gallons of hot water (~180^{0} F) flooded a portion of the building, which included electrical transformers, ventilation systems, and the main servers for the 9th Circuit Court's computer systems.

The Courthouse was opened in August 1905, survived the 1906 San Francisco earthquake, but was damaged by the 1989 Loma Prieta earthquake. The building was closed and extensively repaired, retrofitted with state-of-the-art mechanical and seismic upgrades, and was reopened in October 1996. It was listed on the National Register of Historic Places in 1971.

Functioned as the senior consultant on the confined space program for the $3-5 billion San Francisco-Oakland Bay Bridge construction project. Reviewed and modified the existing joint venture confined space program; conducted industrial hygiene air monitoring and ventilation testing in the "pile cap" prototype; and recommended design modifications to the ventilation system during the construction phase of the bridge foundations.

Functions as an expert witness in asbestos (personal injury, wrongful death and contemporary regulatory cases), benzene, lead, mold, welding fume, and other toxics litigation. Has qualified as an expert in multiple states and in federal court; testified in approximately 40 depositions and 8 trials in the past 20 years.

1992- Pres. **Staff, Course Director & Instructor**
University of California at Berkeley, Extension Services, Berkeley, CA

Mr. Davis began teaching at the University of California at Berkeley Extension, Hazardous Materials Management Program more than a dozen years ago as a guest lecturer in the Asbestos Hazard Emergency Response Act (AHERA) courses. He initially lectured on the managing asbestos and lead-based paint hazards in construction projects. Through the years, he has designed, developed, and presented a number of multi-day, multi-disciplinary classes, which have been approved by the UC Berkeley Academic Senate.

Major projects/accomplishments:
Presented the first lecture series on managing combined lead and asbestos projects in an EPA-approved AHERA course at the UCB Extension program.

Designed, developed, and presented a unique course on lead-based paint for Certified Industrial Hygienists (CIHs), entitled "Lead-Based Paint Issues for CIHs." The course was approved by the UC Berkeley Academic Senate, by the State of California, Department of Health Services (Cal/DHS) in their Title 17 regulations and by the American Board of Industrial Hygiene (ABIH) as continuing education for CIH maintenance (3.0 points).

Designed, developed, and presented three separate, 1-day courses to prepare students to sit for the Cal/DHS examinations for Lead-Related Construction, Project Monitor/Supervisor, Inspector/Risk Assessor, and Project Designer.

Organized and presented contract courses on lead-based paint for the Department of Defense at various military installations such as Vandenberg Air Force Base in Vandenberg, California and Camp Butler Marine Corps Base in Okinawa, Japan.

Designed, developed, and presented a 3-day course entitled, "Mold: Inspection, Assessment and Control." The initial course was presented in the Fall of 2002 and continues as a regular offering to the present. The course was approved by the UC Berkeley Academic Senate and by the American Board of Industrial Hygiene (ABIH) as continuing education for CIH maintenance (3.0 points).

Co-designed and presented a 2-day course entitled "Mold: Building Science, Construction Defects and Remediation." Stephen L. Quarles, Ph.D., Wood Durability Advisor, UC Berkeley, Department of Agriculture & Natural Resources, is the co-designer and a principal instructor for the course. The course was approved by the

UC Berkeley Academic Senate and by the American Board of Industrial Hygiene (ABIH) as continuing education for CIH maintenance (2.0 points).

1990-2002 **Senior Vice President**
Health Science Associates, Oakland, CA
As Senior Vice President, Mr. Davis managed the Northern California office of Health Science Associates (HSA). He was responsible for business development as well as developing new products, services, and markets for the organization. In this capacity, he expanded the client base of the Northern California operations from just two commercial real estate management firms to a broad-based, industrial hygiene/environmental consulting firm with clients in the residential, commercial, industrial, and governmental sectors.

Some of the newly-developed Northern California federal clients were the Federal Aviation Administration (FAA), General Services Administration (GSA), and National Park Service (NPS). New local, governmental clients included the San Francisco Housing Authority (SFHA), San Francisco Department of Public Works (SFDPW), and the Benicia Housing Authority (BHA). New private clients included Space Systems/Loral, the Shorenstein Company, the Unocal Oil Refinery and the Sera Monte Shopping Center.

Major projects/accomplishments:
Managed the HSA industrial hygiene and emergency response contract services to the Unocal oil refinery in Rodeo, California. Industrial hygiene services included the 1994 emergency response to the release of Catacarb into the local community.

From August 22 through September 6, 1994, an estimated 200 tons of Catacarb (potassium carbonate, diethanolamine, potassium borate, and potassium metavanadate) was released from a leaky regeneration tower. The aerosolized plume was carried by winds, potentially exposing approximately 1329 workers (including 546 refinery workers and 730 contract workers). HSA provided 24-hour industrial hygiene support for approximately 10 days to the refinery's efforts to assess, monitor and respond to the release.

Managed comprehensive asbestos and lead-based surveys and/or abatement in major buildings and/or projects on the University of California at Berkeley Campus such as:

> *McCone Hall (123,612 SF in 7 Levels)* – supported the $15 million, multi-year seismic upgrade project of the former Earth Sciences Building.
>
> *Bowles Hall (73,700 SF in 8 Levels)* – supported the site assessment study to evaluate the seismic safety of the structure. In 1929, Bowles Hall became the first residence hall on Campus and was listed on the National Register of Historic Places in 1989.
>
> *Main Libraries (Doe 169,861 SF in 5 levels and Bancroft 161,980 SF in 10 levels)* – provided asbestos abatement and industrial hygiene oversight for the Doe Core seismic project. The asbestos in Doe Core library stacks were

abated, the stacks were removed, and the upgrades completed while both the Doe and Bancroft Libraries remained in operation.

Functioned as the Corporate Training Director for Health Science Associates. Role required interface with the California Division of Occupational Health and Safety (Cal/OSHA) for all asbestos-related AHERA training and interface with the Cal/DHS, Childhood Lead Poisoning Prevention Branch for all lead-based paint courses. Developed numerous specialized, contract courses for public agencies and private clients.

Managed and/or conducted complex industrial hygiene surveys for the United States Mint in San Francisco such as:

Melt Room Conversion – conducted the site assessment, developed the hazardous materials (e.g. asbestos, cobalt, lead, nickel, silver, and other heavy metals) abatement specifications for the conversion of the melt room into office spaces. Project involved the deconstruction of the old melting furnaces, which recycled, imperfectly minted coins and gold/silver bullion. Pools of liquid mercury were discovered underneath the old furnaces during abatement.

Automated Die Polishing Operation – conducted the industrial hygiene assessments of the manual and automated die polishing operations. Employee exposures to dust, silica, volatile organic compounds (VOCs) and heavy metals were conducted. A ventilation design criteria report was developed for the automated process to control exposures to VOCs.

Coin Burnishing Operations – conducted exposure surveys for noise, dusts and other process chemicals (ammonium and sodium hydroxide) to assess employee exposures under the operating conditions at the time and to assess the impact of the introduction of new equipment and processes on future exposures.

Managed and/or conducted complex industrial hygiene surveys for the United States National Park Service, Golden Gate National Recreation Area (NPS, GGNRA) in San Francisco such as:

San Francisco Presidio Buildings – conducted asbestos and lead-based paint site assessments, developed abatement specifications and/or provided industrial hygiene oversight in dozens of the United States Army residential (single family housing and multi-family housing), industrial (Crissy Army Air Field support facilities), and main post buildings at the Presidio.

Virtually all structures were considered to be historically significant with architectural styles ranging from Italian and Greek revival to Queen Ann and Victorian.

Golden Gate Bridge/NPS Land Contamination – conducted the initial site investigations of lead contamination of the GGNRA lands beneath the Golden Gate Bridge. Assessments resulted in the immediate closure of

Fisherman's Point at the North Anchorage as well as closure of Park lands directly beneath the South Anchorage of the Golden Gate Bridge. Participated in early negotiations between the Golden Gate Bridge, Highway & Transportation District and the GGNRA.

Balclutha Pentachlorophenol Contamination – designed the industrial hygiene assessment and simulated condition surveys to determine the levels of residual pentachlorophenol in the wooden structure. Study was designed to assess the potential exposures of San Francisco Maritime National Historical Park employees, volunteers, and visitors (day time and overnight).

The Balclutha is a wooden, three-masted schooner that sailed her maiden voyage on January 15, 1887 from Cardiff, Wales to San Francisco. The ship is located at the Hyde Street Pier in San Francisco.

1987- **Manager, Organization Staffing & Development**
1990 **BHP-Utah International Inc., San Francisco, CA**
As Manager, Organizational Staffing and Development, Mr. Davis managed the corporate staff that provided employment, immigration, relocation, medical and professional development support to the international minerals exploration, operations, and marketing divisions ($2.2 billion annual sales) during a period of major international growth.
Major projects/accomplishments:
Managed the organizational development, succession planning, and high potential programs for the United States and the international minerals division.

Coordinated the senior-level managerial and professional staffing of the $1.2 billion Escondida mine in Northern Chile and the Syama gold mine in the French West Africa.

Reorganized the medical services for 130 expatriate families in more than a dozen foreign countries and established a worldwide medical evacuation program.

Introduced cross-cultural and residential language training programs to expedite the development of international managers. Family members and managers were trained the residential programs prior to being introduced to foreign assignments.

1984- **Manager, Compensation**
1987 **BHP-Utah International Inc., San Francisco, CA**
As Manager, Compensation, Mr. Davis developed and managed salary compensation guidelines for all domestic and international operations. He designed and conducted salary and benefits survey in several foreign locations. He coordinated the implementation of the Company's first integrated Human Resources Information System.

Major projects/accomplishments:
Developed and managed a fully-integrated, base salary and incentive compensation planning system focused on pay-for-performance. Annual base salary structures and incentive systems were developed and maintained in nine countries.

Designed, computerized, and conducted a multi-year Chilean salary and benefits survey, which established the basis for local salary and benefits for the 1,000 plus Minera Escondida workforce.

Coordinated the implementation of the batch mode (ISI version 8.0) and the on-line Human Resource Information System (ISI version 9.0). Functioned as the user/manager between key personnel functions (compensation, benefits and professional development), payroll and data services. Supervised the development of a 2-volume users' manual.

1976- **Manager, Environmental Services / Sr. Engineer**
1984 **Utah International Inc., San Francisco, CA**

Managed the technical support service programs and supervised a professional staff with specialties in process engineering, hydrology, meteorology, soils and industrial hygiene. Most of the technical staff had masters and/or doctorate degrees in their respective disciplines. Maintained the senior technical responsibility for corporate-wide industrial hygiene policies, programs, and procedures.

Major projects/accomplishments:

Developed a computerized hazardous Chemical Control System (CCS) that addressed the worker right-to-know laws in several countries. The system was successfully implemented at all United States, Canadian and Australian operations.

Developed an empirical, computer-based study (mineralogical reserves projection model) of the potential silica exposures of workers at the planned copper mine (Minera Escondida) in Chile. This life-of-the-mine simulated/projected silica exposure analysis lead to the decision to incorporate state-of-the-art tempered/pressurized cabs on all mobile, mining equipment.

Spearheaded the American Mining Congress's carcinogen and risk assessment technical development, member-company education, and technical lobbying activities in Washington, D.C.

Testified before the Senate Committee on Environment and Public Works as well as numerous federal regulatory agencies such as the Occupational Health and Safety Administration (OSHA), Mine Safety and Health Administration (MSHA), National Institute for Occupational Safety and Health (NIOSH) and Environmental Protection Agency (EPA).

Designed, developed and implemented the Industrial Hygiene Sampling System (IHSS) for Utah Development Company (UDC), headquartered in Brisbane, Australia. The IHSS program was initiated with a 3-day training sessions for all the UDC coal mines.

Special teams composed of a mining engineer, chief chemist, and safety advisor from each mine were trained in basic industrial hygiene testing and sampling methods. The classroom training coupled with sampling site selection and coordination with the Queensland Institute of Technology resulted in a multi-year sampling program for noise, respirable coal dust and respirable free silica.

1970- **Senior Industrial Hygienist**
1976 **State Compensation Insurance Fund of California, San Francisco, CA**

Promoted and transferred to the Company headquarters to develop the occupational health and industrial hygiene programs for the 7th largest insurance carrier in the United States. State Fund sponsored Mr. Davis' graduate school education at the University of California at Berkeley, School of Public Health. Originated client service concepts, internal policies, procedures, and training programs that continue to this day.

Major projects/accomplishments:

Designed, developed and implemented the corporate Noise Training and Certification Program and the Illumination Training and Certification Programs. These two programs involved the development of technical courses, operation manuals, and certification criteria/procedures for field safety and health staff. Successful field S&H staff members were authorized to conduct noise surveys, noise dosimetry and commercial/industrial illumination (light) surveys for State Fund policyholders.

Conducted complex industrial hygiene surveys for major policyholders such as C&H Sugar, Lindsay Olive Company, and Golden Gate Bridge, Highway & Transportation District. The latter survey focused on the exposure of toll booth operators to noise, dust and carbon monoxide.

Functioned as the technical, occupational health/industrial hygiene liaison between the California Division of Occupational Health and Safety (Cal/OSHA) and the State Compensation Insurance Fund, while a member of the first Cal/OSHA Occupational Health Advisory Committee.

Completed the Masters of Public Health Program in Environmental Science/Industrial Hygiene at the University of California at Berkeley with a 4.0 GPA, while working half to full time at the State Compensation Insurance Fund.

1968- **Safety Representative / Safety Consultant**
1970 **State Compensation Insurance Fund of California, San Bernardino, CA**

Mr. Davis began safety and health career in the San Bernardino District Office of the State Compensation Insurance Fund as a field Safety Representative. His duties initially included site safety and health inspections, accident investigations, and safety training of policyholder employees.

He conducted safety inspections and training in a wide range of businesses: dairy farms, chicken ranches, city and school districts, manufacturing plants, and underground lead, silver, gold, and tungsten mines. During this time, he regularly received commendation and praise from policyholders on his dedication to employee safety and health.

During 1969 – 1970, he attended the State Fund's first 10-week, Safety Consultant School in San Francisco, California. The Safety Consultant concept was designed to significantly upgrade the level of professionalism and service to policyholders in the field of occupational health and safety. The School was also an institutional response to the pending legislative and regulatory changes in safety and health on the federal level (e.g. the Occupational Safety and Health Act of 1970).

1964-1966 **Preventative Medicine Specialist**
Department of Defense, United States Army

Mr. Davis participated in basic training at Fort Ord, California and advanced training in Preventative Medicine at Fort Sam Houston, San Antonio, Texas. He served on active duty at Fort Lewis, Tacoma, Washington and was then transferred to Korea.

He was assigned to the 65th Medical Group in Seoul, Korea where he participated in field epidemiological studies of epidemic hemorrhagic fever, malaria and yellow fever. He volunteered as an instructor in "Conversational English" in Konkuk Foreign Language Institute at Konkuk University in Seoul. He also earned the rank of Brown Belt in the Tae Kwon Do school of karate under the training of his 5th Degree Black Belt instructor, Kim Pyung-soo.

He spent 4 months on a temporary duty assignment (TDY) in Thailand in support of the World Health Organization's (WHO) Malaria Eradication Program. He was honorably discharged from the Army in March 1966.

ADVISORY BOARDS, MEMBERSHIPS AND AFFILIATIONS

University Advisory Boards

College of Natural and Agricultural Science, University of California Riverside, February 2010 – Present

Professional Memberships

American Academy of Industrial Hygiene (AAIH), Diplomat, 1975 – Present

American Industrial Hygiene Association (AIHA), Full Member, 1972 – Present

Board of Certified Safety Professionals (BCSP), Full Member, 1978 – Present

Northern California Section, American Industrial Hygiene Association, Full Member, 1972 – Present

American Conference of Governmental Industrial Hygienists (ACGIH), Associate Member, 2004 – Present

Environmental Memberships

National Parks and Conservation Association, Member, 1991 – Present

The Nature Conservancy, Member**,** 1991 – Present

The Commonwealth Club of California, Member, 2006

Technical and Professional Committees

National American Industrial Hygiene Association

Short Courses Committee, Member, 1973 – 1975
Trade Practices Committee, Member, 1973 – 1975
Local Sections Council, Coordinator, Member, 1973 – 1974

Northern California Section, American Industrial Hygiene Association
Board of Directors, Director, 1975 – 1976
President-Elect, 1976 – 1977
President, 1977 – 1978
Past-President, 1978 – 1979

California Occupational Health and Safety Administration (Cal/OSHA)
Occupational Health Standards Advisory Committee
Member, 1973 – 1975
Construction Industry Lead Standard Advisory Committee
Member, 1993 – 1994
Special Emphasis Program on Lead, Advisory Committee
Member, 2001 - 2003

American Mining Congress
Occupational Health Advisory Committee
Member, 1978 – 1984
Occupational Health Advisory Committee
Carcinogen Sub-Committee, Chairman, 1980 – 1984

California Department of Health Services (Cal/DHS), Childhood Lead Poisoning Prevention Branch
Lead Related Training and Accreditation Advisory Committee, Member, 1993 – 1994

Alameda County, Childhood Lead Poisoning Prevention Program
Environmental Intervention Committee
Member, 1992 – 1994

Lead Safe California
Insurance and Liability Committee, Member, 1994 – 1996
Legislative Drafting Committee, Member, 1995 – 1996

City and County of San Francisco
Lead Hazard Reduction, Citizens Advisory Committee
Member, 1993 – September 2006

PUBLICATIONS AND PRESENTATIONS

McGrath, D.B., Van Orden, D.R., Howard, R.M., Guerrero, P. and Davis, S.C., 2010, "Two Different Methods, Three Different Variations, Four Different Sources: What Bulk Asbestos PLM Method Is Your Laboratory Using, Part 1 and 2, Journal of Occupational and Environmental Hygiene, American Industrial Hygiene Association (Accepted for publication).

Davis, S.C. 2010, “The Expert Witness in Environmental, Construction Defects and Toxic Torts”, Innovations from Small Businesses in the Environmental Industry, American Chemical Society Annual Conference, San Francisco, 23 March 2010.

LaCroix, J.R., Davis, S.C. 2008, “The Importance of Understanding Construction Sequencing in an Asbestos Case,” California Asbestos Litigation 2008: Witness for the Defense – Getting the Most Out of Your Experts, a two-seminar series, Association of Defense Counsel of Northern California and Nevada, San Francisco, CA, 22 April 2008.

Heckman, B.J., Davis, S.C. 2006, “Lumberyard Mold - Types, Causes, Health Effects, and Remediation of Fungi Associated with Lumber,” Lumber Association of California and Nevada, (In Progress) October 2006.

Davis, S.C. 2006, “The CIH Expert Witness: A View from the Trenches and the Benches,” AIHA-NCS, Mountain View, CA, 11 July 2006.

Quarles, S.L., Davis, S.C. 2006, “Remediation of Fungal Growth on Wood-Based Building Materials: Challenges to the Forest Products Industry,” 49th Annual Convention Society of Wood Science and Technology, Newport Beach, CA, 25 June 2006.

Davis, S.C. 2005, “Flood Response and Remediation in an Historical Structure,” Santa Clara Valley Chapter, Construction Specifications Institute, Sunnyvale, CA, 5 May 2005.

Davis, S.C., Heckman, B.J. 2005, “Childhood EBL Levels: Problems, Solutions & Case Study,” Lead-Related Construction, General Continuing Education, University of California at Berkeley Extension, Berkeley, CA, 10 February 2005.

Davis, S.C., Cohn, K., Kimball, L. 2005, “Amended San Francisco Building Code, Section 4301, Work Practices for Lead-Based Paint,” Lead-Related Construction, General Continuing Education, University of California at Berkeley Extension, Berkeley, CA, 10 February 2005.

Davis, S.C. 2004, Three-part lecture series: “Part I - Assessment of Mold Exposures in Buildings, Part II - Real World Mold Problems, Part III - Flood Response in the 9th Circuit Court of Appeals,” Mold Health Effects and Assessment, 17th Annual Occupational Safety and Health Institute, University of California at Berkeley, Center for Occupational and Environmental Health (COEH), 30 July 2004.

Davis, S.C. 2004, “Building Systems and Mold Investigations,” American Industrial Hygiene Association, Sacramento Valley Section, 15 January 2004.

Quarles, S.L., Davis, S.C. 2003 – 2004, <u>Syllabus for Mold: Building Science, Defects, and Remediation</u>, University of California at Berkeley Extension, Berkeley, CA, 30-31 October 2003. (Co-designed course, developed curriculum and presented two 2-day courses from 2003 to present.)

Kahane, D., Davis, S.C., Hicks, J., Kollmeyer, B. 2003, "Building Science for Health and Safety Professionals, Roundtable - Toward Standardization," California Industrial Hygiene Conference, Crowne Plaza Hotel, San Francisco, CA, 10 December 2003.

Davis, S.C. 2003, "Mold Exposure Assessments in Buildings," Mold Health Effects and Assessment, 16th Annual Occupational Safety and Health Institute, University of California at Berkeley, Center for Occupational and Environmental Health (COEH), 30 July 2003.

Davis, S.C. 2003, "Mold Litigation and the Industrial Hygienist," Mold Health Effects and Assessment, 16th Annual Occupational Safety and Health Institute, University of California at Berkeley, Center for Occupational and Environmental Health (COEH), 28 July 2003.

Davis, S.C. 2003 – 2004, "Implications of SB 460 on Lead Inspections, Assessments and Project Design," Lead-Related Construction, General Continuing Education, University of California at Berkeley Extension, Berkeley, CA.

Davis, S.C. 2003, "Mold in Your Home or Office: What are the Health Risks and Responses?" Public Programs, Summer Series 2003, University of California at Berkeley Extension, Berkeley, CA, 24 June 2003.

Davis, S.C. 2003, "Integrating Mold Issues into Project Design and Specifications," ProFair 2003, Construction Specifications Institute, San Francisco and East Bay/Oakland Chapters, 12 March 2003.

Davis, S.C., Gallup, D.F., Kahane, D. 2002 – 2005, Syllabus for Mold: Inspection, Assessment and Control, University of California at Berkeley Extension, Berkeley, CA, 28-30 October 2002, (Designed course, developed curriculum and approved by the UC Berkeley Academic Senate as Course Director). (Presented six, 3-day courses from 2002 to present.)

Davis, S.C. 2002, "Building Systems and Fungal Investigations," Professional Conference on Industrial Hygiene, Hyatt Regency, Cincinnati, OH, 2 October 2002.

Davis, S.C. 1999 – 2002, "Implications of Inspections and Risk Assessments in the Project Design Process," Lead-Related Construction, General Continuing Education, University of California at Berkeley Extension, Berkeley, CA.

Davis, S.C., Bayne, G., Wangerin, T. 2000, Contract course for United States Marines in Okinawa, "Lead-Related Construction, Inspection and Risk Assessment," University of California at Berkeley Extension, 28 August - 1 September 2000. (The three-person team taught the 5-day course in Okinawa, Japan.)

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Safe Schools Guide, which was distributed to virtually all Public Elementary Schools in California.)

Davis, S.C., Bacci, R.M. 1998, Syllabus for Confined Space Training, California Occupational Health and Safety Administration (Cal/OSHA), 13-14 January 1998, (Designed course, developed curriculum, moderated and presented various sessions in three locations throughout California to Cal/OSHA inspectors. Course approved by ABIH #5626 for 2.0 CM points.)

Davis, S.C., Wangerin, T. 1997 – 2002, Syllabus for Lead-Based Paint Issues for Certified Industrial Hygienists, University of California at Berkeley Extension, Berkeley, CA, (As Course Director, co-developed, organized, moderated and presented seven courses over a six year period.)

Davis, S.C. 1997, “Asbestos and Lead Paint: Lurking Liabilities for Owners, Lessees and Purchasers of Real Property,” Barristers Club of San Francisco, Environment & Real Estate Committee, BASF Board Room, San Francisco, 18 March 1997.

Davis, S.C., et al. 1996, “Lead-Based Paint Abatement, Supervision and Monitoring,” California Occupational Safety and Health Administration (Cal/OSHA), Oakland District Office, 18-22 November 1996. (Organized, moderated and presented various sessions in 5-day course for Cal/OSHA inspectors in Northern California.)

Davis, S.C. 1996, “Responsible Management of Heavy Metal Paint Issues During O&M Projects - The Role of the Certified Industrial Hygienist,” California Water Pollution Control Association Annual Conference, Redding, CA, 11 November 1996.

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Davis, S.C. 1992, “Lead Abatement Methodologies,” Orange County Section, American Industrial Hygiene Association, Costa Mesa, CA, 6 October 1992.

Davis, S.C. 1991, “Fire Sprinkler Retrofit in Los Angeles High Rise Buildings with Asbestos Containing Materials,” Special Workshop on the Los Angeles Sprinkler Ordinance, Sponsored by Building Owners and Manager Association of Greater Los Angeles and Life/Fire Safety Engineering Consultants, Pacific Financial Center, Los Angeles, 6 May 1991.

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Davis, S.C. 1984, "Data Collection and Retrieval," Biomedical and Environmental Health Science, Course 249, Industrial Hygiene Practice, University of California at Berkeley, School of Public Health, Berkeley, CA, 13 November 1984.

Davis, S.C. 1984, "Industrial Hygiene: Regulations and Administration," Intensive Residency in Occupational Medicine, University of California at San Francisco Medical Center, 9 October 1984.

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Davis, S.C. 1984, "Risk Assessment: Playing the Odds," American Mining Congress Mining Convention, Phoenix, AZ, 24 September 1984.

Davis, S.C., et al. 1984, American Mining Congress Risk Assessment Briefing Session, Capitol Hill, Rayburn Room, Washington, D.C., August 1984. (Chaired program committee and moderated session, which was designed for congressional, executive, and judicial branch staffers.)

Davis, S.C. 1984, "Right-To-Know and Hazardous Chemicals," Roundtable 3: Health and Safety in Mining, An Integrated Approach, American Industrial Hygiene Conference, Detroit, MI, 22 May 1984.

Davis, S.C. 1983, "Data Collection and Retrieval," Biomedical and Environmental Health Science, Course 249, Industrial Hygiene Practice, University of California at Berkeley, School of Public Health, Berkeley, CA, 31 May 1983.

Davis, S.C. 1983, "Testimony on the National Occupational Exposure Survey of Mining (NOESM) on behalf of the America Mining Congress," National Institute for Occupational Safety and Health, Washington, D.C., 21 April 1983.

Davis, S.C. 1983, "Chemical Control System: One Answer to Chemical Risk Management and Worker Right-To-Know Laws," American Industrial Hygiene Association, Northern California Section, Berkeley, CA, 1 March 1983.

Davis, S.C. 1983, "Sampling and Measurement of Airborne Particulates," Intensive Residency in Occupational Medicine, University of California at San Francisco Medical Center, 17 February 1983.

Abrahamson, S., Byrd, D.M., Davis, S.C., et al. 1982, American Mining Congress Risk Assessment Seminar, University of California at Berkeley, 28-29 June 1982. (Organizer and moderator)

Davis, S.C. 1982, "Environmental Health and Safety Data Collection and Retrieval in the Mining Industry," Biomedical and Environmental Health Science, Course 249, Industrial Hygiene Practice, University of California at Berkeley, School of Public Health, Berkeley, CA, 8 June 1982.

Davis, S.C. 1982, "Chemical Risk Management: Practical Answers to Tough Questions," National Safety Management Society, 2nd Annual Conference, San Francisco, CA, 12 May 1982.

Davis, S.C., Raymond, M.A., Balzer, J.L. 1982, Chemical Control System, Utah International Inc., San Francisco, CA, January 1982. (Developed computerized, hazardous chemical inventory system and training programs for all North American mining and laboratory operations.)

Davis, S.C. 1981, "Syllabus for Risk Assessment Workshop," American Mining Congress, Four Seasons Hotel, Washington, D.C., 12 August 1981. (Organizer and moderator)

Davis, S.C. 1981, "Testimony on the Clean Air Act, Section 112, National Emission Standards for Hazardous Air Pollutants," Oversight Hearing on the Clean Air Act, Senate Committee on Environment and Public Works, Dirksen Senate Office Building, Washington, D.C., 11 June 1981.

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Richman, B.S., Stafford, W.S., Davis, S.C. 1978, "A Quality Controlled Noise Level/Dosimetry Measurement System for Dispersed Field Safety Personnel," American Industrial Hygiene Conference, Los Angeles, 9 May 1978.

Davis, S.C., Laszcz, C.L. 1977, Women in the Workplace - Symposium, American Industrial Hygiene Association Monograph, 24-25 March 1977 (Co-organizer and co-moderator).

Davis, S.C. 1976, "Occupational Health Hazards by Industry," Occupational Health and Safety Seminar for Executives and Staff, Greater Los Angeles Safety Congress and Exposition, Anaheim, CA, 27 May 1976.

Davis, S.C., Conklin, D.L., Oberg, M., Lim, J., West, I., Persoff, R. 1976, "Resources in Solving Your Plant Occupational Health Problems" Golden West Safety Congress, Sacramento Conference Center, Sacramento, CA, 8 April 1976 (Organized and moderated presentations by speakers noted above.)

Davis, S.C., Laszcz, C.L., Killianey, S.L. 1976, "Understanding Your Plant Industrial Hygiene Problems," Golden West Safety Congress, Sacramento Conference Center, Sacramento, CA, 7 April 1976 (Organized and moderated presentations by speakers noted above.)

Davis, S.C. 1976, "Overview of Occupational Health Problems in California Industry," Occupational Health Hazards in California Industry, California Safety Congress & Exhibits, Miyako Hotel, San Francisco, CA, 4 March 1976.

Davis, S.C. 1975, "Occupational Health for Physical Plant Operators," 17th Annual Workshop for Physical Plant Administrators, Sponsored by The Association of Physical Plant Administrators of Universities and Colleges, University of California at Santa Barbara, Santa Barbara, CA, 15 August 1975.

Davis, S.C. 1975, “Trends in Occupational Health and the Safety Professional,” American Society of Safety Engineers, Greater San Jose Chapter, Santa Clara, CA, 12 March 1975.

Davis, S.C., Williams, J., Waldron, J. 1975, “Occupational Health and Industrial Hygiene,” Panel on Public Schools and the Cal/OSH Act, Golden West Safety Congress, Sacramento Conference Center, Sacramento, CA, 6 March 1975.

Davis, S.C. 1975, “Changes in Industrial Hygiene Effecting the Lumber Industry,” C.R. Johnson Accident Prevention Association, Quarterly Safety Conference, Eureka, CA, 21 February 1975.

Davis, S.C. 1974, “Occupational Safety and Health,” Motor Fleet Supervisors Course, The Institute of Transportation and Traffic Engineering, University of California at Berkeley Extension Programs, Oakland Holiday Inn, Oakland, CA, 12 December 1974.

Davis, S.C. 1974, “Occupational Health for Physical Plant Operators,” 16th Annual Workshop for Physical Plant Administrators, Sponsored by The Association of Physical Plant Administrators of Universities and Colleges, University of California at Santa Barbara, Santa Barbara, CA, 16 August 1974.

Davis, S.C. 1974, “Noise!!,” American Water Works Association Safety Conference, Long Beach Water Department, Long Beach, CA, 29 May 1974.

Davis, S.C. 1974, “Noise!!,” California Section of the American Water Works Association Safety Conference, Belmont Holiday Inn, Belmont, CA, 28 March 1974.

Davis, S.C. 1973, “Occupational Health Aspects of Cal/OSHA,” Hospital Health and Safety Coordinators, State Office Building, Sacramento, CA, 12 December 1973.

Davis, S.C. 1973, “Occupational Health Hazards in Water Treatment,” California New Occupational Safety & Health Act, Impact on Public Agencies, Association of California Water Agencies, Disneyland Hotel Convention Center, Anaheim, CA, 29 November 1973.

Brown, T., Davis, S.C., Richardson, T., Seroka, C., Valoff, D.M. 1973, “Industrial Hygiene and OSHA,” OSHA and the New California Plan, University of California at Santa Barbara Extension, Bakersfield Jr. College, Bakersfield, CA, 27 October 1973.

Davis, S.C. 1973, “Occupational Health Aspects of COSHA,” Public Employees Session, California Safety Congress & Exhibits, San Francisco Chapter, National Safety Council, Hyatt Regency, San Francisco, CA, 26 September 1973.

Davis, S.C. 1973, “Occupational Health/Industrial Hygiene and COSHA,” 15th Annual Workshop for Physical Plant Administrators, Sponsored by The Association of Physical Plant Administrators of Universities and Colleges, University of California at Santa Barbara, Santa Barbara, CA, 17 August 1973.

Davis, S.C. 1973, “COSHA, NIOSH, the Target Health Hazard Program and Noise,” Governor’s Safety and Rehabilitation Program, Safety Coordinators Meeting, Sacramento, CA, 16 August 1973.

Davis, S.C. 1973, “Industrial Hygiene and OSHA,” Sheet Metal & Air-Conditioning Contractors Association of California, Annual Convention, San Diego, CA, 12 April 1973.

Davis, S.C. 1973, “Occupational Health and Safety,” Street Superintendents and Maintenance Association, Airporter Inn Hotel, Newport Beach, CA, 13 March 1973.

Davis, S.C. 1973, “Overview of the Report of the National Commission on State Workmen’s Compensation Laws,” OSHA Panel Discussion, 4th Annual Southern California Laboratory Conference and Exhibits, Anaheim Convention Center, Anaheim, CA, 6 March 1973.

Inman, J., Davis, S.C. 1973, “The Target Health Hazards,” (Asbestos, Lead, Silica, Carbon Monoxide, Cotton Dust), Information Bulletin, U. S. Occupational Safety & Health Act - No. 22, State Compensation Insurance Fund, San Francisco, CA, 26 February 1973.

Davis, S.C. 1972, “A Critical Evaluation of Occupational Noise Standards in the United States,” University of California at Berkeley, Berkeley, CA, May 1972. (Graduate Thesis)

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EDUCATION

2005 Master of Public Health, Industrial Hygiene
University of Michigan, School of Public Health
Environmental Health Sciences
Ann Arbor, Michigan

2000 Bachelor of Arts, Biology & Environmental Studies**,** Double Major
University of California at Santa Cruz
Santa Cruz, California

CERTIFICATIONS, REGISTRATIONS AND AWARDS

Certified Industrial Hygienist (CIH), American Board of Industrial Hygiene, Comprehensive Practice of Industrial Hygiene, No. 9218 CP (2006 – 2012)

Certified Asbestos Consultant (CAC), California Division of Occupational Safety and Health, (Cal/OSHA), No. 03-3448 (2002-2010)

Certified Asbestos Building Inspector, Management Planner, Supervisor and Project Designer, Pennsylvania Department of Labor and Industry, No. 044521 (2009)

Certified Lead-Related Construction, California Department of Public Health, (Cal/DPH) (2002-2009)
Inspector/Risk Assessor, No. I-8752
Project Monitor, No. M-8752

Asbestos Accreditation, Environmental Protection Agency**,** (AHERA)
AHERA-Accredited Asbestos Abatement Contractor/Supervisor (5 day)
AHERA-Accredited Asbestos Building Inspector (3 day)
AHERA-Accredited Asbestos Management Planner (2 day)
AHERA-Accredited Asbestos Project Designer (3 day)

PROFESSIONAL EXPERIENCE

2008 - Pres. **Eastern Regional Manager**
Lacroix Davis, LLC, Harrisburg Office (Mechanicsburg, PA)

As the Eastern Regional Manager of LaCroix Davis in the Harrisburg office, Mr. Heckman is responsible for managing office operations, client relations, and business development in the areas of industrial hygiene, environment, health and safety consulting. Mr. Heckman also provides project management services for government, construction, chemical and pharmaceutical manufacturing, and commercial industrial hygiene related projects. Performs exposure simulations, historical exposure reconstructions, exposure modeling, statistical analysis, literature searches and

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litigation support related to asbestos, silica, solvents, volatile organic compounds, welding fumes, and other environmental contaminants. Provides expert witness testimony related to industrial hygiene and indoor air quality litigation. Performs exposure assessments and indoor air quality investigations related to bioaerosols and other compounds.

2002 - 2008 **Senior Associate/Project Manager**
Lacroix Davis, LLC, San Francisco Office (Lafayette, CA)

Project Manager for federal and local government, manufacturing, agricultural, construction, and commercial industrial hygiene related projects. Provided industrial ventilation solutions and evaluations for contaminant control in industrial settings. Performed historical exposure reconstructions, exposure modeling, statistical analysis, literature searches and litigation support related to asbestos, volatile organic compounds, welding fumes, and other environmental contaminants. Provided expert witness testimony related to industrial hygiene and indoor air quality litigation. Performed exposure assessments and indoor air quality investigations related to bioaerosols and other compounds. Performed hazardous materials surveys for residential, large commercial and government clients. Conducted environmental lead hazard Risk Assessments/Inspections and asbestos building inspections to assess environmental health, occupational safety and hazards. Provided remediation specifications, oversight, air monitoring, and certifications for large scale hazardous materials abatement projects. Developed business relationships, maintained client relations, cost estimates, report generation, and scheduling functions. Developed and presented training programs for the SFDPH (Mold Training for Property Owners and Maintenance Workers).

2005 - 2008 **Instructor**
University of California, Berkeley, School of Public Health, Center for Occupational and Environmental Health, Berkeley, California
Conducted lectures and hands-on workshops within the Center for Occupational and Environmental Health's (COEH) *Lead-Related Construction Inspection and Risk Assessment* course.

2002 - 2007 **Instructor**
University of California, Berkeley Extension, Environmental Management Program Berkeley, California
Conducted lectures and hands-on workshops within the Environmental Management's *Lead-Related Construction Inspection/ Risk Assessment* (June 2002 to July 2005) and *Mold: Inspection, Assessment and Control* courses (October 2002 to October 2007). Aided in the design and implementation of the 3 day course *Mold: Inspection, Assessment and Control.*

2000 - 2002 **Industrial Hygienist/Project Manager**
Health Science Associates, Oakland, California
Environmental, Health and Safety (EHS) Project Manager for U.S. Department of Treasury (SF Mint), San Francisco Housing Authority, San Francisco Maritime National Historic Park - National Park Service and numerous construction and commercial clients. Developed and maintained client relations, cost estimates, report/invoice generation, and scheduling functions. Conducted environmental lead hazard Risk

Assessments/Inspections and asbestos building inspections to assess environmental health, occupational safety and hazards. Provided oversight, air monitoring, and visual inspections for large scale lead and asbestos abatement projects. Assisted in designing projects in occupational safety and environmental hazard reduction. Conducted exposure assessments and Indoor Air Quality investigations in response to health complaints related to bioaerosols, industrial manufacturing processes, and litigation support. Conducted University of California, Berkeley Extension Inspector/Risk Assessor Workshops on lead inspections. Conducted environmental, health and safety training related to lead, asbestos, and respiratory protection. Designed, implemented, and trained the San Francisco Housing Authority's Modernization and Construction Department in Lead Operations and Maintenance Program (150 employees).

1999 - 2000 **Undergraduate Researcher**
University of California at Santa Cruz, Environmental Toxicology Department. Santa Cruz, California
Collaborated with Post-Doctorate Researchers in the investigation of the benefits of new risk assessment techniques of household lead sources to children in a National Institute of Health/United States Housing and Urban Development funded project. Performed lead risk assessments utilizing professional environmental field collection/ processing methods (Lead-Based Paint-Housing and Urban Development Guidelines). Developed a high level of problem solving ability in Natural Science curriculum with a critical interdisciplinary approach. Developed Proficiency in Biochemical Calculations, Data Reduction and Analyses. Performed analytical chemistry techniques for metals (bulk and biological media) using Flame Atomic Absorption and Inductively Coupled Plasma-Mass Spectrometry. Performed multiple tasks with Hazardous Chemicals involving Trace Metal Clean Laboratory procedures.

MEMBERSHIPS AND AFFILIATIONS

City and County of San Francisco's *Asthma Task Force*, Main Committee and Environmental Sub-Committee (2005 – 2008)
Developed and recommeded city-wide policies to help manage and prevent asthma within multiple environmental areas; created policies to improve housing conditions within the San Francisco Housing Authority; created standards and guidelines for comprehensive healthy housing (private and public housing stock); developed monitoring plan to estimate outdoor pollution exposures in different parts of the city and in different seasons; and developed a city wide collaborative group to address indoor air quality (IAQ) issues.

University of Michigan, Committee for Curriculum Development for the On Job/On Campus, MPH Program (2004-2005)
Aided in the development of the curriculum for the On Job/On Campus, MPH Program (2006-2008) accredited by the American Board of Engineering and Technology.

American Industrial Hygiene Association - National and Local Sections (Central Pennsylvania and Potomac Sections) – Full Member

American Industrial Hygiene Association - Risk Assessment Committee Member

American Conference of Governmental Industrial Hygienists – Associate Member

International Society of Exposure Science (ISES) – Full Member

Society for Risk Analysis (SRA) – Full Member

Diplomat of the Academy of Industrial Hygiene

Harrisburg Regional and West Shore Chamber of Commerce - Member

PUBLICATIONS AND PRESENTATIONS

Heckman, B.J., "Indoor Air Quality for Facility Managers," Pennsylvania Facility Management Association Annual Conference, Fort Indiantown Gap, Pennsylvania, September 2009.

Wangerin, T.J., Heckman, B.J., "Healthy Homes, Energy Savings, and Building Sustainability," San Francisco Asthma Task Force and San Francisco Department of Public Health, San Francisco, California, (1-day seminar), September 2008.

Heckman, B.J., Murphy, M.A., "Defending Causation in Mold Cases - Meet the Experts," Association of Defense Counsel of Northern California and Nevada, Oakland, California, October 2007.

Heckman, B.J., Davis, S.C., "Some Common Sense Discussion about Lumber Mold," Lumber Association of California and Nevada, March 2007.

Heckman, B.J., "Quantitatively Estimating Historical Occupational Exposures to Airborne Asbestos," Integrated Work Project, University of Michigan, School of Public Health, Environmental Health Sciences, August 2005.

Davis, S.C., Heckman, B.J., "Childhood EBL: Problem, Solutions & Case Study," Lead-Related Construction, General Continuing Education, University of California at Berkeley Extension, Berkeley, California, February 2005.

Davis, S.C., Heckman, B.J., "Mold Workshop for Property Owners and Maintenance Workers," Children's Environmental Health Promotion, Environmental Health Section, San Francisco Department of Public Health, San Francisco, California, (five 1-day seminars) 2003 - 2005.

CONTINUING EDUCATION AND SEMINARS

Turning Challenges into Opportunities, California Industrial Hygiene Council, San Francisco, California, (3 day seminar) 2009.

Nanotechnology Symposium - California Nanotechnology Initiative Symposium V: An Industry Perspective, Department of Toxic Substances Control and the California Nano Industry Network, Sacramento, California, (1 day seminar) 2009.

Discoveries Beyond Borders, American Industrial Hygiene Conference & Exposition, Toronto, Canada, (4 day seminar) 2009.

Current Topics in Safety, Health & Environmental Issues, American Industrial Hygiene Association, The Chesapeake and National Capital Chapters of the American Society of Safety Engineers & the Chesapeake Section of the American Industrial Hygiene Association, Laurel, Maryland, (1 day seminar) 2009.

Exposure Assessment Strategies and Statistics, American Industrial Hygiene Association, Distance Learning Program, Fairfax, Virginia, 2008.

Exposure Modeling: Using Mathematical Models to Estimate Exposure, American Industrial Hygiene Conference & Exposition, Minneapolis, Minnesota, (2 day seminar) 2008.

Environmental Compliance and Regulation for Industrial Hygienists, University of California at Berkeley, Center for Occupational and Environmental Health Continuing Education Program, Oakland, California, (1/2 day seminar) 2008.

Vision, Value, Impact, American Industrial Hygiene Conference & Exposition, Minneapolis, Minnesota, (4 day seminar) 2008.

Spanning Industrial Hygiene Practice in California, California Industrial Hygiene Council, San Francisco, California, (3 day seminar) 2007.

Sparking Tradition with Invention, American Industrial Hygiene Conference & Exposition, Philadelphia, Pennsylvania, (4 day seminar) 2007.

Industrial Hygiene Forum Series - New Asbestos Control Technologies, UC Berkeley Center for Occupational and Environmental Health, Oakland, California, 2007.

Bayesian Statistics: Overview and Applications in Industrial Hygiene Data Interpretation and Exposure Risk Assessment, Professional Conference on Industrial Hygiene, San Jose, California, (1 day seminar) 2006.

Emerging Technology and Emerging Issues in Occupational Health, American Industrial Hygiene Association – Northern California Section, Stanford University, Palo Alto, California, 2006.

Implementing Best Practices in Exposure Assessment, CGI AMS, San Francisco, California, 2006.

Comprehensive Industrial Hygiene Review Course, University of California at Los Angeles, Southern California Education and Research Center, Los Angeles, California, (5 day seminar) 2006.

Science to Policy: Bridging the Gap, California Industrial Hygiene Council, San Francisco, California, 2005.

Meth Lab Decontamination: Background and Practice, American Industrial Hygiene Association's Teleweb Virtual Seminar Series, Fairfax, Virginia, 2005.

Introduction to Crystal Ball, Decisioneering, Inc., San Francisco, California, 2005.

Application of Microsoft Excel to Industrial Hygiene and Laboratory Analysis Course, American Industrial Hygiene Conference & Exposition, Anaheim, California, 2005.

Emerging Trends and Technologies, California Industrial Hygiene Council, San Francisco, California, 2002.

Mold: Inspection, Assessment & Control Course, University of California at Berkeley Extension, Berkeley, California, 2002.

ATTACHMENT 3

Auto Club Speedway
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August 2010

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Air Quality Modeling Technical Study

Air Quality Modeling Technical Study

Prepared for:

Auto Club Speedway
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August 2010

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Air Quality Modeling Technical Study

1.0 Introduction

The Auto Club Speedway (Speedway) has requested Yorke Engineering, LLC. (Yorke) to perform an analysis of the air emissions associated with the drag strip operations at their Fontana, California facility. This analysis was performed following the South Coast Air Quality Management District's (SCAQMD) and the Office of Environmental Heath and Hazard Assessment guidelines and the SCAQMD CEQA guidelines and thresholds of significance.

The analysis was performed by Mr. Kelvin Lu, his contact information is provided below.

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Senior Engineering, Yorke Engineering, LLC	
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The analysis involved 4 tasks.

1) Fleet Determination
2) Emission Calculations
3) Air Dispersion Modeling
4) Health Risk Assessment

The details of the tasks performed are described in this report.

2.0 Fleet Determination

The first task was to determine the types and quantity of vehicles associated with drag strip activities. By reviewing the facility's racing and activities calendar, it was determined that drag strip activities may take place on approximately 40 weekends per year at a location north of the oval track at the facility. The average event consists of two to three days of overall activities. A conservative value of three days of racing for a total of 120 days of racing in a year was used for the analysis. This analysis is conservative, since all drag racing events are analyzed. Much of the drag racing activities were previously permitted at a location south of the oval.

The Speedway does not allow the fastest category of vehicles known as 'Top Fuel" to participate. On a standard race event, the most common cars are street legal vehicles and modified stock vehicles that operate on high octane unleaded gasoline and the super gas and super stock vehicles that operate on leaded racing gasoline. The Speedway estimates that, on average, 100 vehicles participate in these events. A small number of vehicles may have been modified to run on either methanol or nitromethane, and visually these cars cannot be distinguished from the gasoline vehicles. Although often not present, it is conservatively estimated that on average there are two methanol vehicles and two nitromethane vehicles at all standard race events.

On special events, which would occur approximately twice a year, funny cars and dragsters running on either methanol or nitromethane may participate. These vehicles are similar to the Top Fuel versions but are slower and have less horsepower with smaller engines.

These two special events will also draw the most number of gasoline vehicles and were used to determine the worst-case maximum 1-hour and 8-hour air emission impacts. Annual impacts were assumed to include 38 average race events and two special race events.

Other potential foreseeable emissions were also considered. Specifically, the frequency of accidents and fires and the potential consequences of these events were reviewed. Generally, there are no fires or fuel releases from the drag strip activities. A single incident in 2009 has already been described in the RDSEIR. A person performing a trans-brake test in violation of safety and NHRA standards in the pits caused the car to go out of control and crash resulting in a small fire. Small hand-held fire extinguishers immediately put out the fire. No fuel was released.

Other than that single incident, there have been no accidents resulting in a release of gasoline or causing a fire in the last five years. There has also been no fire or release of fuel during the races themselves in that time. About 5-8 minor breakdowns and malfunctions per year will require a vehicle to be towed off the track, but no air emission releases occur from these incidents.

Based on the historical use, the likelihood of a fire or fuel release is very low from the proposed project and any corresponding release from this unlikely event would be anticipated as insignificant, since the amount of fuel held in the vehicles is generally limited (approximately five gallons maximum). Thus, potential fires or fuel releases from the proposed project are anticipated to have less than a significant impact on the environment and would not alter the conclusions provided herein.

Finally, a brief review was made of potential emissions associated with burnouts, brake wear, tuning, maintenance and idling of race cars and support vehicles. Specifically, the literature suggests that burnouts are primarily water vapor (i.e., steam) and that actual removal of the tire material (i.e., burning of the tire) is neither intended nor desired for racing. Brake wear is generally reduced at these activities due to the ability of the vehicles to disengage their brakes for burnouts and use parachutes to slow the vehicle at the end of races. Brake wear would occur during the actual braking portion of the race and result in minor PM_{10} emissions. No toxic emissions would be generated from this activity. Tuning, maintenance and idling of race vehicles is contemplated in the analysis. It was assumed that all race cars would perform these activities for a total of 30 minutes each race day. Support vehicles are not tuned or maintained at the Speedway facility as a part of drag racing events, but their idling is contemplated in the analysis.

3.0 EMISSION CALCULATIONS

The second task was to quantify the emissions generated by vehicles participating in drag strip activities. The Environmental Protection Agency (EPA) maintains a publication called "The Master List of Compounds Emitted by Mobile Sources"[1]. This document is a compilation of all testing performed by EPA on mobile sources. The document quantifies the maximum and minimum emission rates of any compounds ever detected during a test. The list is very comprehensive and includes various model year vehicles, engine sizes, and fuels. However, this list is highly conservative and it does not distinguish the emission factor for specific fuels. For example, the list contains an emission factor of benzene. The list also indicates that benzene was found when testing gasoline, diesel, compressed natural gas, liquefied propane gas, methanol, ethanol, jet fuel, and residual fuel. Therefore, it is possible that the maximum emission factor listed for benzene may not have come from gasoline combustion, but from some other fuel combustion and the actual tested values from gasoline combustion could be significantly lower[2].

Another source of toxic emission factors for internal combustion engines was found from the South Coast Air Quality Management District's Annual Emissions Reporting program[3]. These are the default emission factors that the SCAQMD recommends for stationary and portable gasoline combustion engines. Although a stationary or portable engine would not necessarily represent a mobile source engine, the engine technologies are similar and better represent gasoline combustion versus the EPA list. To account for potential variations from stationary and portable engines versus mobile source engines, the listed emission factor was multiplied by a factor of 10. Comparing the SCAQMD emission factor to the EPA list, it was found that the EPA list was typically higher by a factor of 25 or more. Another source for comparison is from the World Health Organization (WHO)[4] which shows that emissions of formaldehyde from gasoline combustion is in the range of 0.2 to 1.6 grams/liter. This equals 13.4 lbs/MGal. Using a multiplier of 10 for the SCAQMD emission factor results in higher emission factors than the WHO report and is thus considered conservative.

It may be noted that the SCAQMD emission factors are for the combustion of reformulated unleaded gasoline. Race cars are usually modified to use an unregulated form of leaded gasoline. Regulations for the phase-out of leaded gasoline were designed to reduce toxic emissions from gasoline combustion by 20%[5]. Therefore, the 10 times multiplier would account for the higher emissions from the use of the unregulated leaded gasoline. Based on an MSDS for leaded gasoline[6], Yorke determined the amount of lead contained in the leaded gasoline. It was then conservatively assumed that all the lead in the fuel would be released as lead emissions. The SCAQMD emission factor for lead was replaced with this calculated lead content.

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[1] The Master List of Compounds Emitted by Mobile Sources; United States EPA; February 2006.
[2] This conclusion is supported by numerous articles showing a higher benzene emission rate from diesel fuel as compared to gasoline.
[3] Supplemental Instructions Reporting Procedures for AB2588 Facilities for Reporting their Quadrennial Air Toxics Emissions Inventory; South Coast Air Quality Management District; January 2010.
[4] Environmental Health Criteria 89, Formaldehyde; World Health Organization; 1989.
[5] Air Toxics From Mobile Sources; United States EPA; August 1994.
[6] Material Safety Data Sheet; Sunoco, Inc.

The SCAQMD does not list emission factors for methanol or nitromethane combustion. Research on toxic emissions from nitromethane combustion revealed that nitromethane is a very clean burning fuel and that emissions from combustion of nitromethane are minimal except for potentially formaldehyde and ammonia[7]. The same SCAQMD emission factor with a 10 times multiplier was used for formaldehyde. The SCAQMD list does not include ammonia as a toxic. Therefore, the ammonia emission factor from the EPA list was used.

Research on methanol fuel showed that it was a cleaner fuel than gasoline, resulting in lower emissions. The EPA list does indicate M85 as one of the fuel types tested, but again, the emission factors do not specifically indicate the factors specifically associated with M85. To calculate emissions from methanol combustion, the list of toxic chemicals was obtained from the EPA list. If a chemical was found to also be on the SCAQMD list, the emission factor for that chemical was replaced with the SCAQMD factor (including a conservative 10 times multiplier).

Yorke has also determined that the races analyzed at the drag strip involve a vehicle traveling a short distance from where it is parked to the starting line. That vehicle will then travel 0.25 miles while pressing the accelerator followed by 0.42 miles to the end of the track to slow down. The vehicle will then return to its original starting location. The distance covered by the vehicle to get to the starting line and to return from the end of the track was determined to be 0.75 miles, for a total race distance of 1.42 miles per race per vehicle.

Dragsters and funny cars are typically towed to the starting line by a smaller vehicle. They are also towed back to their pit area at the end of the race. A tow vehicle emitting emissions equal to a race car traveling the same distance was added to account for the tow vehicles. This results in an overestimate of the emissions from these vehicles.

A fuel efficiency factor was applied to the vehicles as they traveled these distances. This provided a total fuel used per vehicle per race. It is expected that the gasoline cars would run an average of 2.5 runs each day. On the special events with funny cars and dragsters, funny cars were estimated to also average 2.5 runs per day and the dragsters would average about two runs per day.

The details on the emission calculations are included in Appendix A.

The fuel usages were then used to estimate the maximum daily and annual average emissions.

The table below indicates the expected vehicles and fuel usages during the special event which is expected to result in the worst-case acute emissions.

[7] Thermochemistry and Reaction Mechanisms of Nitromethane Ignition; Journal De Physique IV; 1995.

Table 3-1: Worst Case Scenario – Nostalgia Race

Car Type	Fuel Type	Vehicles	Fuel Used gal/run	# Runs per day	Total Fuel gal/day	Max Fuel gal/hr
Race Car	Leaded Gasoline	220	0.317	2.5	174.35	10.90
Dragster	Methanol	20	3.34	2	133.6	14.84
Funny Car	Nitromethane	20	3.34	2.5	167	18.56
Dragster	Nitromethane	15	3.34	2	100.2	11.13
Tow car	Leaded Gasoline	55	0.473	2.18	56.76	6.31
Race Car Tuning	Leaded Gasoline	220	0.25	N/A	55	3.44
Race Car	Leaded Gasoline	220	0.317	2.5	174.35	10.90

The vehicle count and fuel usage for an average race is shown in the table below.

Table 3-2: Average Dragstrip Racing Operations

Car Type	Fuel Type	Vehicles	Fuel Used gal/run	# Runs per day	Total Fuel gal/day	Total Fuel gal/year
Race Car	Leaded Gasoline	100	0.317	2.5	79.25	9193
Race Car	Methanol	2	3.34	2.5	16.7	1937.2
Race Car	Nitromethane	2	3.34	2	13.36	1549.76
Race Car Tuning	Leaded Gasoline	100	0.25		25	2900

4.0 Air Dispersion Modeling

Atmospheric dispersion modeling was conducted to analyze potential localized ambient air quality impacts associated with the drag strip operations of the Speedway. The atmospheric dispersion modeling methodology is based on generally accepted modeling practices and modeling guidelines of both the USEPA and the SCAQMD. All dispersion modeling was performed using the Industrial Source Complex Short Term 3 (ISCST3) dispersion model (Version 02035) (USEPA, 2002).

The options used in the ISCST3 dispersion modeling are summarized in Table 4-1. USEPA regulatory default modeling options were selected, except for the calm processing option. Since the meteorological data sets developed by the SCAQMD are based on hourly average wind measurements, rather than airport observations that represent averages of just a few minutes, the SCAQMD's modeling guidance requires that this modeling option not be used.

Table 4-1: Dispersion Modeling Options for ISCST3

Feature	Option Selected
Terrain processing selected	No
Meteorological data input method	Card Image
Rural-urban option	Urban
Wind profile exponents values	Defaults
Vertical potential temperature gradient values	Defaults
Program calculates final plume rise only	Yes
Program adjusts all stack heights for downwash	No
Concentrations during calm period set = 0	No
Aboveground (flagpole) receptors used	No
Buoyancy-induced dispersion used	Yes
Year of surface data	1981
Year of upper air data	1981

Building downwash parameters were not used for this analysis since there are no large buildings or other large structures near the race strip.

The SCAQMD has established a standard set of meteorological data files for use in air quality modeling in the Basin. For the vicinity of the Speedway, the Fontana 1981 meteorological data file was used.

The area surrounding the facility is fairly level with little terrain changes. It was therefore not necessary to include elevation data in the model.

Appropriate model receptors must be selected to determine the worst-case modeling impact. A grid of receptors spaced 100 meters apart extending from the starting line extending 2,000 meters in all directions was created. Additional receptors were placed to represent nearby residential locations. The residential locations used in this analysis are summarized below:

Table 4-2: Residential Receptors

	Address	UTM-X	UTM-Y	Comment
Receptor 1	13934 Whittram Ave.	453770	3772760	House
Receptor 2	8726 Calabash Ave	453690	3772770	House
Receptor 3	8705 Calabash Ave	453720	3772810	House
Receptor 4	14224 Whittram Ave	454370	3772890	Trailer Park
Receptor 5	14136 Whittram Ave	453300	3772780	House Structure

Note – Receptor 5 was the structure of a house but appeared to be a business. This receptor was treated as a residential receptor to be conservative.

The dispersion modeling was performed by separating the race track into nine emission groups.

- Gasoline Vehicles During Acceleration
- Gasoline Vehicles During Braking
- Gasoline Vehicles During Standard Travel[8]
- Nitromethane Vehicles During Acceleration
- Nitromethane Vehicles During Braking
- Methanol Vehicles During Acceleration
- Methanol Vehicles During Braking
- Gasoline Towing Vehicles
- Racecar Tuning Activity

Each emission group is represented by a series of volume sources. A volume source represents an emission source where emissions are emitted in all directions (except downward)

The air dispersion modeling performed produced results for expected ground level concentrations (GLC) for various averaging times based on a unit emission rate of 1.0 g/s. The predicted ground level concentrations for the nearby residential receptors were then extracted.

The predicted ground level concentrations for each emission group are presented in the attached spreadsheets.

From the analysis, it was determined that Receptor 1 has the highest 1-hour and 8-hour GLC and Receptor 4 would have the highest annual average GLC.

[8] The dragsters that operate on methanol and nitromethane do not travel on their own from their waiting area to the start line or from the end of the run back to their waiting area. These vehicles are typically towed by another vehicle. As previously discussed, the emissions from towing vehicles were considered.

5.0 HEALTH RISK ASSESSMENT

A health risk assessment (HRA) involves the determination of the maximum individual cancer risk (MICR), cancer burden, and noncancerous acute and chronic hazard indices (HI). The HRA was performed following the SCAQMD Risk Assessment Procedure for Rule 1401 and 212 (Procedures) version 7.0 dated July 1, 2005. The SCAQMD CEQA Air Quality Significance Thresholds (Rev. March 2009), included in Appendix B, were applied.

The resulting GLCs for each pollutant were then used to estimate the expected health risk impacts from the various pollutant emissions. The potential cancer risk from a pollutant is calculated using an equation developed by the Environmental Protection Agency (EPA) Office of Environmental Health Hazard Assessment (OEHHA).

Cancer risk is based on a 70-year lifetime exposure. It is assumed that the person affected is exposed to the annual average GLC, every year for 70-years.

$$CancerRisk = Dosh - inh * CP$$

$$\frac{Dose - inh = C_{air} * DBR * A * EF * ED * 10^{-6}}{AT}$$

Where:

CP = cancer potency as published by OEHHA (mg/kg/d)
C_{air} = annual average ground level concentration (µg/m3)
DBR = daily breathing rate (l/kg body weight – day)
A = inhalation absorption factor
EF = exposure frequency (day/year)
ED = exposure duration (years)
AT = averaging time (days)

The cancer risk for each pollutant was found using the equation above. The resulting risks were summed to obtain the final MICR.

The cancer risk at the MICR was calculated to be 2.21×10^{-6} or 2.21 in one million. The SCAQMD threshold of environmental significance is 10 in one million. The highest impacts to the local residences are lower than the levels typically considered as environmentally significant.

In addition to carcinogenic impacts, exposure to pollutants can also result in non-carcinogenic impacts. The impact from short term exposures, typically 1–hour, is known as the acute health risk. This risk is calculated as the ratio of the maximum hourly or 8-hour GLC to an acute reference exposure level (REL) determined by OEHHA to not result in noticeable health impacts. This ratio is known as the Acute Hazard Index (HIA).

A non-carcinogenic impact from long term exposure, typically 1-year, is known as the chronic health risk. This risk is calculated as the ratio of the annual average GLC to a chronic REL. This ratio is known as the Chronic Hazard Index (HIC).

The results of the risk assessment are shown below. The typical environmentally significant level is 1.0 for each value. The highest potential impacts to the local residences are lower than the SCAQMD thresholds considered as environmentally significant.

Table 5-1: Residential Receptors

	MICR	HIC	HIA-1 Hour	HIA-8 Hour
Receptor 1	N/A	N/A	6.77E-01	9.37E-01
Receptor 4	2.21E-06	1.03E-02	N/A	N/A

The calculations of the health risk impacts are included in Appendix C.

6.0 ODOR AND NUISANCE

Another concern related to the drag strip operations is odor and it's potential for nuisance. Several nuisance odor complaints have been reported to the SCAQMD by nearby residences. SCAQMD investigated these complaints by visiting the Speedway on numerous occasions. A review of the investigation reports did not indicate any confirmed odors being emitted from Speedway. The following are summaries of three complaints received by SCAQMD in 2009 alleging the Speedway was emitting odors.

1) An odor complaint was reported to the SCAQMD on March 7. 2009. A SCAQMD inspector visited the site on March 10, 2009. No odors were observed by the SCAQMD inspector and the complaint was closed.
2) An odor complaint was reported to the SCAQMD on April 17, 2009. A SCAQMD inspector visited the site a few hours later. The complaint alleged smoke and odors emanating from Speedway. The SCAQMD inspector was able to verify the smoke (i.e., steam from heating the tires), but could not verify any odors. The inspector also could not identify odors at other nearby locations and the complaint was closed.
3) An odor complaint was reported to the SCAQMD on May 25, 2009. A SCAQMD inspector visited the site on May 26, 2009. The inspector was able to identify burning rubber and car exhaust odors. However, they were observed at an intensity level of 1, on a scale of 1 to 5, with 5 being the highest. Other odors in the area were identified by the inspector as originating from other industrial sources. This complaint did not trigger any further action and the complaint was closed.

The Speedway has cooperated with SCAQMD each and every time an odor complaint is submitted to the SCAQMD. Given the heavy industrial nature of the area including recycling facilities, a steel mill, large amounts of diesel fuel consumption with rail activities, truck distribution centers and mobile truck emissions, the level of ambient odor in the area is very high. Based on all of the complaints received by SCAQMD alleged to originate at the Speedway, no significant odors have been identified as being caused by the Speedway and no violations have been issued to Speedway.

7.0 CUMULATIVE IMPACTS

The methods for determining cumulative impacts are based on current air quality standards, monitored ambient pollutant concentrations, and increases in pollutant emissions beyond levels previously analyzed.

The original 1995 Environmental Impact Report (EIR) prepared for the Speedway oval analyzed a worst-case operation assumed to include a 500 mile race on the oval and more than 100,000 fans in attendance. That analysis measured cumulative emissions and compared them to the SCAQMD CEQA guidelines and thresholds of significance.

Table 7-1: Speedway Oval Emissions (1995) (lbs/day)

	CO	ROG	NOx	SOx	PM10
1995 Race Sunday	33,951.8	3,668.0	2,791.1	230.1	421.5
Race car emissions	3234.0	327.6	134.4	0.0	10.0
2010 Race Sunday (projected)	18,262.1	76.4	165.	26.5	53.7
SCAQMD Threshold	550	55	55	150	150
Significant?	Yes/ Yes/ Yes	Yes/ Yes/ Yes	Yes/ Yes/ Yes	Yes/ No/ No	Yes/ No/ No

Source: 1995 Speedway EIR

The estimates for the 1995 race emissions included all vehicles assumed to be attending the event. The table above also includes predicted emissions calculated for an assumed oval race in 2010. The dramatic reduction in projected 2010 emissions considered the expected improvements in vehicle emission controls for attending fan vehicles. NASCAR vehicles average no more than five miles per gallon and a NASCAR single-day event includes 43 cars, some of which do not complete the event due to mechanical breakdown, etc. A car completing the race would expend at least 100 gallons of fuel. Thus a race day estimate of 3,000 gallons is conservative. The NASCAR event does not operate when any drag racing activities are held. Following the 1995 EIR, the operation of the drag strip at the facility was included in subsequent CEQA documentation when its operations were substituted for a large business park that had been proposed and approved for the Speedway facility.

The worst-case day of vehicle fuel consumption for drag racing activities, the Nostalgia Race, consumes 686.91 gallons for all activities, and the fuel volumes are included in the Tables attached to this report. This fuel volume, coupled with the lower attendance occurring for drag strip events results in emissions well below the maximums previously analyzed. Overall emissions from the event would also be lower for attending fan vehicles given the improvements in vehicle emission controls. Thus, cumulative emissions do not exceed values previously analyzed in the 1995 EIR.

The potential exists for an average drag race activity to be held in conjunction with a small oval activity (i.e., road race or 100 mile event). Attendance for these two events would be significantly less than analyzed for the NASCAR weekend events. Additionally, fuel consumed at both the drag race activity and the oval activity collectively would be significantly less than the fuel consumed at the 500-mile NASCAR weekend events. Thus, the combined activities are not expected to impact current air quality standards beyond what was previously analyzed and are not expected to result in cumulative impacts.

Note that the PM_{10} emissions were determined as significant in 1995, but insignificant in 2010. $PM_{2.5}$ was not analyzed as part of the EIR, but as described below, it should not exceed the SCAQMD threshold of significance of 55 pounds per day adopted in October 2006. The SCAB is in non-attainment for the federal and state PM_{10} and $PM_{2.5}$ standard. Since $PM_{2.5}$ is a subset of PM_{10}, the methodology for calculating PM_{10} from fugitive dust sources (grading, demolition, unpaved roads, open storage piles, etc.) and combustion sources (stationary combustion sources, vehicle exhaust, etc.) are used and would then be multiplied by the a applicable $PM_{2.5}$ fraction. Thus, by any measure the $PM_{2.5}$ resulting value from a project will be less than the PM_{10} measure.

As shown above, the 1995 EIR projected the PM_{10} values for a 2010 race day to be less than 55 pounds (53.7 pounds), which was an estimate based upon 107,000 fans attending a full day NASCAR event. Within that 53.7 pounds of PM_{10} for the entire day of activities was a subset for vehicles that assumed 10 pounds PM_{10} per day from the race vehicles. As stated previously, activities associated with the drag strip, including the fan attendance and race vehicles, will be a small fraction of the previously analyzed NASCAR race day in 2010. $PM_{2.5}$ has a significance threshold of 55 pounds, an amount which is greater than the assumed PM_{10} emissions determined for a worst-case (NASCAR) race at the Speedway in 2010.

Therefore, (1) because PM_{10} emissions are already anticipated to be less than 55 pounds at the worst-case event, (2) because the amount of activities from the proposed project will be less than the worst-case analyzed event and (3) because the amount of $PM_{2.5}$ will be a fraction of the PM_{10} emissions, the amount of $PM_{2.5}$ anticipated to be generated by the proposed project is anticipated to be less than the 55 pound SCAQMD threshold of significance.

Moving the drag strip operation from the south end of the facility to the north end of the facility will not result in an increase to cumulative emissions previously analyzed since the maximum cumulative impact results from the NASCAR Sunday race event, which has not changed. The move does result in a minor increase of toxic emissions at the closest receptors, hence the health risk assessment being performed above that demonstrates no significant risk due to toxic air emissions. Since there is no increase in the amount of criteria pollutant emissions from what was previously analyzed, there will be little to no change to the monitored ambient air pollutant concentrations. The proposed project is not expected to impact current air quality standards beyond what was previously analyzed and is not expected to result in cumulative impacts.

8.0 GREENHOUSE GASES

The SCAQMD recently adopted an interim emission threshold that applies only to industrial (stationary source) projects where the SCAQMD is the lead agency. The threshold of significance helps determine if projects could potentially be significant in terms of greenhouse gas (GHG) emissions. The SCAQMD guideline analyzes an entire project and compares the project emissions to the significance threshold level of 10,000 metric tonnes (MT) of carbon dioxide equivalent (CO_2E) emissions. A proposed project's emissions, including mobile source emissions, are compared to the 10,000 MT CO2E threshold of significance.

The California Air Resources Board (CARB) also recently adopted thresholds for significance determinations primarily for industrial activities and set the threshold at 7,000 MT CO_2E. However, that agency's guidelines do not include emissions from transportation-related activities such as mobile sources. Therefore, the CARB significance levels would be inappropriate to apply to the proposed project.

The emissions from the drag strip operations were quantified using the SCQMD's published emission factors of criteria pollutants for mobile sources[9]. Although these emission factors are not specific to drag race vehicles, they do represent emissions from gasoline combustion. Again a factor of 10 was applied to these emission factors to match the same 10 times multiplier used for toxic emissions. Drag racing activities were previously approved in 2003 at the facility, which is before the enactment of California's GHG legislation in October 2006. Although the existing drag racing activities are already approved and therefore need not be analyzed, a very conservative analysis was performed that assumes that no drag racecars were previously approved for racing at the facility

In addition to emissions of CO_2 and methane generated by the fuel, occasional drag racecars may also employ nitrous oxide (N_2O) as an oxygen booster injected with the fuel into the car engine. N_2O has been determined to have a 298 times CO_2E value. This means that one pound of N_2O emission should be considered as being equivalent to 298 pounds of CO_2 emissions when calculating total GHGs.

N_2O allows an engine to consume more fuel because of the oxygen made available from the gaseous N_2O molecule. This oxygen atom is stripped from the molecule and used in the combustion of the fuel. A potentially small amount of N_2O will not get consumed in the reaction and may potentially be released into the atmosphere. N_2O is stored in small containers that feed directly into the engine. Based on discussions with the Speedway staff, it is expected that approximately 30 pounds of N_2O is consumed during any race day. Since there are 120 race days, 3,600 pounds of N_2O would be used in a year. There is no information on the level of N_2O that does not get consumed; however, automotive combustion analysis reveals that emission byproducts generally result in values measured in fractions of percentages. We applied a highly conservative number and assume that 1.0 percent (10,000 ppm) of the N_2O does not get consumed. This results in direct N_2O emissions into the atmosphere of 36 pounds per year.

[9] Emission Factors for Onroad Passenger vehicles and Delivery Trucks; South Coast Air Quality Management District; Year 2010 data.

The resulting emissions of carbon dioxide (CO_2), methane, N_2O, and CO_2E are summarized below. Removing the previously approved vehicles from this analysis would result in a value well under 1,000 MT CO_2E or more than ten times less than the SCAQMD threshold of significance.

Table 8-1: Greenhouse Gas Emissions

Source	CO_2 Emissions (metric tonnes)	Methane Emissions (metric tonnes)	N_2O Emissions (metric tonnes)	Total CO_2E Emissions (metric tonnes)
Gasoline Racecars	1,014	< 1	0	1,014
Nitromethane Vehicles	243	< 1	0	243
Methanol Vehicles	223	< 1	0	223
Towing Vehicles	17	< 1	0	17
Racecar Tunings	320	< 1	0	320
N2O	0	0	0.0164	5
Total	1,817	< 1	0.0164	1,822
SCAQMD Threshold				10,000
Significant? (Yes/No)				No

9.0 CONCLUSION

Based on the above analysis, the air dispersion modeling and health risk assessment calculations indicate that emissions from the proposed project will not result in health risks or impacts considered to be environmentally significant.

APPENDIX A – DETAILED EMISSION CALCULATIONS

Operating Scenarios:

	Gasoline Usage			Methanol Usage		Nitromethane	
	Accel	Brake	Travel	Accel	Brake	Accel	Brake
mi/gal	2	10	5	0.1	0.5	0.1	0.5
gal/mi	0.5	0.1	0.2	10	2	10	2
mi	0.25	0.42	0.75	0.25	0.42	0.25	0.42
gal	0.125	0.042	0.15	2.5	0.84	2.5	0.84
Total	0.317			3.34		3.34	
	0.394	0.132	0.473	0.749	0.251	0.749	0.251

Worst Case #1: NASCAR Lucas Oil Divisional Race

Car Type:	Fuel Type:	Vehicles	Fuel Used	# Runs	Total Fuel	Max Fuel	Op. days	Total Fuel
			gal/run	per day	gal/day	gal/hr	day/year	gal/year
Race Car	Leaded Gasoline	400	0.317	2.5	317	19.8125	2	634
Funny Car	Methanol	10	3.34	2.5	83.5	9.27777778	2	167
Dragster	Methanol	5	3.34	2	33.4	3.71111111	2	66.8
Funny Car	Nitromethane	5	3.34	2.5	41.75	4.63888889	2	83.5
Dragster	Nitromethane	5	3.34	2	33.4	3.71111111	2	66.8
Tow car	Leaded Gasoline	25	0.473	2.3	27.1975	3.02194444	2	54.395
Race Car Tuning	Leaded Gasoline	400	0.25		100	6.25	2	200

Worst Case #2: Nostalgia Race

Car Type:	Fuel Type:	Vehicles	Fuel Used	# Runs	Total Fuel	Max Fuel	Op. days	Total Fuel
			gal/run	per day	gal/day	gal/hr	day/year	gal/year
Race Car	Leaded Gasoline	220	0.317	2.5	174.35	10.896875	2	348.7
Dragster	Methanol	20	3.34	2	133.6	14.8444444	2	267.2
Funny Car	Nitromethane	20	3.34	2.5	167	18.5555556	2	334
Dragster	Nitromethane	15	3.34	2	100.2	11.1333333	2	200.4
Tow car	Leaded Gasoline	55	0.473	2.18181818	56.76	6.30666667	2	113.52
Race Car Tuning	Leaded Gasoline	220	0.25		55	3.4375	2	110

Average Race

Car Type:	Fuel Type:	Vehicles	Fuel Used	# Runs	Total Fuel	Max Fuel	Op. days	Total Fuel
			gal/run	per day	gal/day	gal/hr	day/year	gal/year
Race Car	Leaded Gasoline	100	0.317	2.5	79.25	4.953125	116	9193
Race Car	Methanol	2	3.34	2.5	16.7	1.04375	116	1937.2
Race Car	Nitromethane	2	3.34	2	13.36	0.835	116	1549.76
Race Car Tuning	Leaded Gasoline	100	0.25		25	1.5625	116	2900

Total

Car Type:	Fuel Type:	Total Fuel
		gal/year
Race Car	Leaded Gasoline	10175.7
Race Car	Methanol	1937.2
Funny Car	Methanol	167
Dragster	Methanol	334
Race Car	Nitromethane	1549.76
Funny Car	Nitromethane	417.5
Dragster	Nitromethane	267.2
Towing Vehicle	Leaded Gasoline	167.915
Tuning	Leaded Gasoline	3210

Fuel Type:	Total Fuel
	gal/year
Leaded Gasoline	10175.7
Methanol	2438.2
Nitromethane	2234.46

Maximum Toxic Emissions as Found From EPA List for Gasoline

Max Fuel:	19.8125	gal/hr
Total Fuel:	10175.7	gal/yr
Ave Fuel:	1.742414384	gal/hr

		Emission Factor			Maximum		Total	Average	
Pollutant	**Abbrev.**	**lb/mi**	**lb/gal (a)**	**lbs/gal**	**lbs/hr**	**g/s**	**lbs/yr**	**lbs/hr**	**g/s**
Carbon Monoxide	CO	0.00826276	0.16525514	1.6526E+00	3.2741E+01	4.1254E+00	1.6816E+04	2.8794E+00	3.6281E-01
Oxides of Nitrogen	NOx	0.00091814	0.01836282	1.8363E-01	3.6381E+00	4.5840E-01	1.8685E+03	3.1996E-01	4.0315E-02
Reactive Organic Gases	ROG	0.00091399	0.01827977	1.8280E-01	3.6217E+00	4.5633E-01	1.8601E+03	3.1851E-01	4.0132E-02
Oxides of Sulfur	SOx	1.0775E-05	0.00021549	2.1549E-03	4.2695E-02	5.3796E-03	2.1928E+01	3.7548E-03	4.7311E-04
Particulate Matter 10 microns	PM10	8.6979E-05	0.00173958	1.7396E-02	3.4465E-01	4.3426E-02	1.7701E+02	3.0311E-02	3.8191E-03
Particulate Matter 2.5 microns	PM2.5	5.4781E-05	0.00109563	1.0956E-02	2.1707E-01	2.7351E-02	1.1149E+02	1.9090E-02	2.4054E-03
Carbon Dioxide	CO2	1.09568235	21.913647	2.1914E+02	4.3416E+03	5.4705E+02	2.2299E+06	3.8183E+02	4.8110E+01
Methane	CH4	8.1461E-05	0.00162922	1.6292E-02	3.2279E-01	4.0671E-02	1.6578E+02	2.8388E-02	3.5769E-03
							1.0136E+03		
							7.5356E-02		

		Emission Factor			Maximum		Total	Average	
TAC	**CAS**	**mg/mi**	**lbs/Mgal**	**lbs/Mgal**	**lbs/hr**	**g/s**	**lbs/yr**	**lbs/hr**	**g/s**
1,3-butadiene	00106-99-0		9.1830E-01	9.1830E+00	1.8194E-01	2.2924E-02	9.3443E+01	1.6001E-02	2.0161E-03
2-butanone	00078-93-3		6.6400E-02	6.6400E-01	1.3156E-02	1.6576E-03	6.7567E+00	1.1570E-03	1.4578E-04
2-methoxy-2-methylpropane	01634-04-4		2.0579E+00	2.0579E+01	4.0772E-01	5.1373E-02	2.0941E+02	3.5857E-02	4.5180E-03
2-propenal	00107-02-8		1.9920E-01		0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
acetaldehyde	00075-07-0		8.2980E-01	8.2980E+00	1.6440E-01	2.0715E-02	8.4438E+01	1.4459E-02	1.8218E-03
benzene	00071-43-2		3.8061E+00	3.8061E+01	7.5408E-01	9.5015E-02	3.8730E+02	6.6318E-02	8.3561E-03
chlorine	07782-50-5		4.5500E-01	4.5500E+00	9.0147E-02	1.1359E-02	4.6299E+01	7.9280E-03	9.9893E-04
copper	07440-50-8		3.3000E-03	3.3000E-02	6.5381E-04	8.2380E-05	3.3580E-01	5.7500E-05	7.2450E-06
ethylbenzene	00100-41-4		1.6596E+00	1.6596E+01	3.2881E-01	4.1430E-02	1.6888E+02	2.8917E-02	3.6436E-03
formaldehyde	00050-00-0		3.4520E+00	3.4520E+01	6.8393E-01	8.6175E-02	3.5127E+02	6.0148E-02	7.5787E-03
hexane	00110-54-3		1.4494E+00	1.4494E+01	2.8716E-01	3.6182E-02	1.4749E+02	2.5255E-02	3.1821E-03
lead	07439-92-1		9.1676E+00	9.1676E+00	1.8163E-01	2.2886E-02	9.3287E+01	1.5974E-02	2.0127E-03
m- & p-xylene	1330-20-7			0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
m-xylene	00108-38-3		4.9235E+00	4.9235E+01	9.7547E-01	1.2291E-01	5.0100E+02	8.5788E-02	1.0809E-02
manganese	07439-96-5		3.3000E-03	3.3000E-02	6.5381E-04	8.2380E-05	3.3580E-01	5.7500E-05	7.2450E-06
methyl alcohol	00067-56-1		7.7450E-01	7.7450E+00	1.5345E-01	1.9334E-02	7.8811E+01	1.3495E-02	1.7004E-03
naphthalene	00091-20-3		1.4380E-01	1.4380E+00	2.8490E-02	3.5898E-03	1.4633E+01	2.5056E-03	3.1570E-04
nickel	07440-02-0		3.3000E-03	3.3000E-02	6.5381E-04	8.2380E-05	3.3580E-01	5.7500E-05	7.2450E-06
o-xylene	00095-47-6		1.7149E+00	1.7149E+01	3.3976E-01	4.2810E-02	1.7450E+02	2.9881E-02	3.7650E-03
propene	00115-07-1			0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
styrene	00100-42-5		1.4380E-01	1.4380E+00	2.8490E-02	3.5898E-03	1.4633E+01	2.5056E-03	3.1570E-04
toluene	00108-88-3		7.5125E+00	7.5125E+01	1.4884E+00	1.8754E-01	7.6445E+02	1.3090E-01	1.6493E-02
ammonia	7664-41-7			0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
1,2,4-Trimethylbenzene	95-63-6		1.3941E+00	1.3941E+01	2.7621E-01	3.4802E-02	1.4186E+02	2.4291E-02	3.0607E-03

(b) Lead emissions changed to accoutn for leaded gasoline.
MSDS indicates 0.15% tetraethyl lead.

Toxic Emissions for Methanol Vehicles

Max Fuel:	12.98888889	gal/hr
Total Fuel:	2438.2	gal/yr
Ave Fuel:	0.4175	gal/hr

		Emission Factor			Maximum		Total	Average	
Pollutant	**Abbrev.**	**lb/mi**	**lb/gal (a)**	**lbs/gal**	**lbs/hr**	**g/s**	**lbs/yr**	**lbs/hr**	**g/s**
Carbon Monoxide	CO	0.00826276	0.16525514	1.6526E+00	2.1465E+01	2.7046E+00	4.0293E+03	6.8994E-01	8.6932E-02
Oxides of Nitrogen	NOx	0.00091814	0.01836282	1.8363E-01	2.3851E+00	3.0053E-01	4.4772E+02	7.6665E-02	9.6598E-03
Reactive Organic Gases	ROG	0.00091399	0.01827977	1.8280E-01	2.3743E+00	2.9917E-01	4.4570E+02	7.6318E-02	9.6161E-03
Oxides of Sulfur	SOx	1.0775E-05	0.00021549	2.1549E-03	2.7990E-02	3.5268E-03	5.2542E+00	8.9969E-04	1.1336E-04
Particulate Matter 10 microns	PM10	8.6979E-05	0.00173958	1.7396E-02	2.2595E-01	2.8470E-02	4.2414E+01	7.2627E-03	9.1510E-04
Particulate Matter 2.5 microns	PM2.5	5.4781E-05	0.00109563	1.0956E-02	1.4231E-01	1.7931E-02	2.6714E+01	4.5742E-03	5.7635E-04
Carbon Dioxide	CO2	1.09568235	21.913647	2.1914E+02	2.8463E+03	3.5864E+02	5.3430E+05	9.1489E+01	1.1528E+01
Methane	CH4	8.1461E-05	0.00162922	1.6292E-02	2.1162E-01	2.6664E-02	3.9724E+01	6.8020E-03	8.5705E-04
							2.4286E+02		
							1.8056E-02		

		Emission Factor			Maximum		Total	Average	
TAC	**CAS**	**mg/mi**	**lbs/Mgal**	**lbs/Mgal**	**lbs/hr**	**g/s**	**lbs/yr**	**lbs/hr**	**g/s**
1,3-butadiene	00106-99-0		9.1830E-01	9.1830E+00	1.1928E-01	1.5029E-02	2.2390E+01	3.8339E-03	4.8307E-04
2-butanone	00078-93-3		6.6400E-02	6.6400E-01	8.6246E-03	1.0867E-03	1.6190E+00	2.7722E-04	3.4930E-05
2-methoxy-2-methylpropane	01634-04-4		2.0579E+00	2.0579E+01	2.6730E-01	3.3680E-02	5.0176E+01	8.5917E-03	1.0826E-03
2-propenal	00107-02-8		1.9920E-01		0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
acetaldehyde	00075-07-0		8.2980E-01	8.2980E+00	1.0778E-01	1.3581E-02	2.0232E+01	3.4644E-03	4.3652E-04
benzene	00071-43-2		3.8061E+00	3.8061E+01	4.9437E-01	6.2291E-02	9.2800E+01	1.5890E-02	2.0022E-03
chlorine	07782-50-5								
copper	07440-50-8								
ethylbenzene	00100-41-4		1.6596E+00	1.6596E+01	2.1556E-01	2.7161E-02	4.0464E+01	6.9288E-03	8.7303E-04
formaldehyde	00050-00-0		3.4520E+00	3.4520E+01	4.4838E-01	5.6495E-02	8.4167E+01	1.4412E-02	1.8159E-03
hexane	00110-54-3		1.4494E+00	1.4494E+01	1.8826E-01	2.3721E-02	3.5339E+01	6.0512E-03	7.6246E-04
lead	07439-92-1								
m- & p-xylene	1330-20-7	1068.75842	4.7123E+01	4.7123E+01	6.1208E-01	7.7122E-02	1.1490E+02	1.9674E-02	2.4789E-03
m-xylene	00108-38-3								
manganese	07439-96-5								
methyl alcohol	00067-56-1		7.7450E-01	7.7450E+00	1.0060E-01	1.2675E-02	1.8884E+01	3.2335E-03	4.0743E-04
naphthalene	00091-20-3		1.4380E-01	1.4380E+00	1.8678E-02	2.3534E-03	3.5061E+00	6.0037E-04	7.5646E-05
nickel	07440-02-0								
o-xylene	00095-47-6		1.7149E+00	1.7149E+01	2.2275E-01	2.8066E-02	4.1813E+01	7.1597E-03	9.0212E-04
propene	00115-07-1	2483.4958	1.0950E+02	1.0950E+02	1.4223E+00	1.7921E-01	2.6699E+02	4.5717E-02	5.7603E-03
styrene	00100-42-5		1.4380E-01	1.4380E+00	1.8678E-02	2.3534E-03	3.5061E+00	6.0037E-04	7.5646E-05
toluene	00108-88-3		7.5125E+00	7.5125E+01	9.7579E-01	1.2295E-01	1.8317E+02	3.1365E-02	3.9520E-03
ammonia	7664-41-7								
1,2,4-Trimethylbenzene	95-63-6								

Toxic Emissions for Nitromethane Vehicles

Max Fuel:	8.35	gal/hr
Total Fuel:	2234.46	gal/yr
Ave Fuel:	0.382613014	gal/hr

		Emission Factor			**Maximum**		**Total**	**Average**	
Pollutant	**Abbrev.**	**lb/mi**	**lb/gal (a)**	**lbs/gal**	**lbs/hr**	**g/s**	**lbs/yr**	**lbs/hr**	**g/s**
Carbon Monoxide	CO	0.00826276	0.16525514	1.6526E+00	1.3799E+01	1.7386E+00	3.6926E+03	6.3229E-01	7.9668E-02
Oxides of Nitrogen	NOx	0.00091814	0.01836282	1.8363E-01	1.5333E+00	1.9320E-01	4.1031E+02	7.0259E-02	8.8526E-03
Reactive Organic Gases	ROG	0.00091399	0.01827977	1.8280E-01	1.5264E+00	1.9232E-01	4.0845E+02	6.9941E-02	8.8125E-03
Oxides of Sulfur	SOx	1.0775E-05	0.00021549	2.1549E-03	1.7994E-02	2.2672E-03	4.8151E+00	8.2451E-04	1.0389E-04
Particulate Matter 10 microns	PM10	8.6979E-05	0.00173958	1.7396E-02	1.4525E-01	1.8302E-02	3.8870E+01	6.6558E-03	8.3864E-04
Particulate Matter 2.5 microns	PM2.5	5.4781E-05	0.00109563	1.0956E-02	9.1485E-02	1.1527E-02	2.4481E+01	4.1920E-03	5.2819E-04
Carbon Dioxide	CO2	1.09568235	21.913647	2.1914E+02	1.8298E+03	2.3055E+02	4.8965E+05	8.3844E+01	1.0564E+01
Methane	CH4	8.1461E-05	0.00162922	1.6292E-02	1.3604E-01	1.7141E-02	3.6404E+01	6.2336E-03	7.8543E-04

2.2257E+02
1.6547E-02

		Emission Factor			**Maximum**		**Total**	**Average**	
TAC	**CAS**	**mg/mi**	**lbs/Mgal**	**lbs/Mgal**	**lbs/hr**	**g/s**	**lbs/yr**	**lbs/hr**	**g/s**
1,3-butadiene	00106-99-0								
2-butanone	00078-93-3								
2-methoxy-2-methylpropane	01634-04-4								
2-propenal	00107-02-8								
acetaldehyde	00075-07-0								
benzene	00071-43-2								
chlorine	07782-50-5								
copper	07440-50-8								
ethylbenzene	00100-41-4								
formaldehyde	00050-00-0		3.4520E+00	3.4520E+01	2.8824E-01	3.6318E-02	7.7134E+01	1.3208E-02	1.6642E-03
hexane	00110-54-3								
lead	07439-92-1								
m- & p-xylene	1330-20-7								
m-xylene	00108-38-3								
manganese	07439-96-5								
methyl alcohol	00067-56-1								
naphthalene	00091-20-3								
nickel	07440-02-0								
o-xylene	00095-47-6								
propene	00115-07-1								
styrene	00100-42-5								
toluene	00108-88-3								
ammonia	7664-41-7	292.399994	1.2892E+01	1.2892E+01	1.0765E-01	1.3564E-02	2.8808E+01	4.9328E-03	6.2153E-04
1,2,4-Trimethylbenzene	95-63-6								

(d) literature suggests that nitromethane burns clean leaving only trace toxics except for formaldehyde and ammonia

		Maximum (g/s)		
Pollutant	**Abbrev.**	**Accel**	**Brake**	**Travel**
Carbon Monoxide	CO	7.7117E+00	2.1422E-01	6.4265E-01
Oxides of Nitrogen	NOx	8.5691E-01	0.02380315	0.07140945
Reactive Organic Gases	ROG	8.5304E-01	0.02369549	0.07108647
Oxides of Sulfur	SOx	1.0056E-02	0.00027934	0.00083802
Particulate Matter 10 microns	PM10	8.1178E-02	0.00225496	0.00676487
Particulate Matter 2.5 microns	PM2.5	5.1128E-02	0.00142023	0.00426068
Carbon Dioxide	CO2	1.0226E+03	28.4059758	85.2179273
Methane	CH4	7.6028E-02	0.0021119	0.00633571

		Maximum (g/s)								
TAC	**CAS**	**G_ACC**	**M_ACC**	**N_ACC**	**G_BRAKE**	**M_BRAKE**	**N_BRAKE**	**G_TRAVEL**	**TOW**	**TUNING**
		0.394	**0.749**	**0.749**	**0.132**	**0.251**	**0.251**	**0.473**	**3.02194444**	**6.25**
1,3-butadiene	00106-99-0	9.03E-03	1.13E-02	0.00E+00	3.03E-03	3.77E-03	0.00E+00	1.08E-02	3.50E-03	7.23E-03
2-butanone	00078-93-3	6.53E-04	8.14E-04	0.00E+00	2.19E-04	2.73E-04	0.00E+00	7.84E-04	2.53E-04	5.23E-04
2-methoxy-2-methylpropane	01634-04-4	2.02E-02	2.52E-02	0.00E+00	6.78E-03	8.45E-03	0.00E+00	2.43E-02	7.84E-03	1.62E-02
2-propenal	00107-02-8	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
acetaldehyde	00075-07-0	8.16E-03	1.02E-02	0.00E+00	2.73E-03	3.41E-03	0.00E+00	9.80E-03	3.16E-03	6.53E-03
benzene	00071-43-2	3.74E-02	4.67E-02	0.00E+00	1.25E-02	1.56E-02	0.00E+00	4.49E-02	1.45E-02	3.00E-02
chlorine	07782-50-5	4.48E-03	0.00E+00	0.00E+00	1.50E-03	0.00E+00	0.00E+00	5.37E-03	1.73E-03	3.58E-03
copper	07440-50-8	3.25E-05	0.00E+00	0.00E+00	1.09E-05	0.00E+00	0.00E+00	3.90E-05	1.26E-05	2.60E-05
ethylbenzene	00100-41-4	1.63E-02	2.03E-02	0.00E+00	5.47E-03	6.82E-03	0.00E+00	1.96E-02	6.32E-03	1.31E-02
formaldehyde	00050-00-0	3.40E-02	4.23E-02	2.72E-02	1.14E-02	1.42E-02	9.12E-03	4.08E-02	1.31E-02	2.72E-02
hexane	00110-54-3	1.43E-02	1.78E-02	0.00E+00	4.78E-03	5.95E-03	0.00E+00	1.71E-02	5.52E-03	1.14E-02
lead	07439-92-1	9.02E-03	0.00E+00	0.00E+00	3.02E-03	0.00E+00	0.00E+00	1.08E-02	3.49E-03	7.22E-03
m- & p-xylene	1330-20-7	0.00E+00	5.78E-02	0.00E+00	0.00E+00	1.94E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
m-xylene	00108-38-3	4.84E-02	0.00E+00	0.00E+00	1.62E-02	0.00E+00	0.00E+00	5.81E-02	1.87E-02	3.88E-02
manganese	07439-96-5	3.25E-05	0.00E+00	0.00E+00	1.09E-05	0.00E+00	0.00E+00	3.90E-05	1.26E-05	2.60E-05
methyl alcohol	00067-56-1	7.62E-03	9.49E-03	0.00E+00	2.55E-03	3.18E-03	0.00E+00	9.15E-03	2.95E-03	6.10E-03
naphthalene	00091-20-3	1.41E-03	1.76E-03	0.00E+00	4.74E-04	5.91E-04	0.00E+00	1.70E-03	5.48E-04	1.13E-03
nickel	07440-02-0	3.25E-05	0.00E+00	0.00E+00	1.09E-05	0.00E+00	0.00E+00	3.90E-05	1.26E-05	2.60E-05
o-xylene	00095-47-6	1.69E-02	2.10E-02	0.00E+00	5.65E-03	7.04E-03	0.00E+00	2.02E-02	6.53E-03	1.35E-02
propene	00115-07-1	0.00E+00	1.34E-01	0.00E+00	0.00E+00	4.50E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
styrene	00100-42-5	1.41E-03	1.76E-03	0.00E+00	4.74E-04	5.91E-04	0.00E+00	1.70E-03	5.48E-04	1.13E-03
toluene	00108-88-3	7.39E-02	9.21E-02	0.00E+00	2.48E-02	3.09E-02	0.00E+00	8.87E-02	2.86E-02	5.92E-02
ammonia	7664-41-7	0.00E+00	0.00E+00	1.02E-02	0.00E+00	0.00E+00	3.40E-03	0.00E+00	0.00E+00	0.00E+00
hydrogen cyanide	74-90-8	1.37E-02	0.00E+00	0.00E+00	4.59E-03	0.00E+00	0.00E+00	1.65E-02	5.31E-03	1.10E-02

Average (g/s)		
Accel	**Brake**	**Travel**
4.7647E-01	1.3235E-02	3.9706E-02
5.2944E-02	0.00147067	0.004412
5.2705E-02	0.00146402	0.0043921
6.2132E-04	1.7259E-05	5.178E-05
5.0156E-03	0.00013932	0.000418
3.1589E-03	8.7748E-05	0.0002632
6.3182E+01	1.75505551	5.2651665
4.6974E-03	0.00013048	0.0003915

Average (g/s)								
G_ACC	**M_ACC**	**N_ACC**	**G_BRAKE**	**M_BRAKE**	**N_BRAKE**	**G_TRAVEL**	**TOW**	**TUNING**
0.394	**0.749**	**0.749**	**0.132**	**0.251**	**0.251**	**0.473**	**167.915**	**3210**
7.94E-04	3.62E-04	0.00E+00	2.66E-04	1.21E-04	0.00E+00	9.54E-04	2.22E-05	4.24E-04
5.74E-05	2.62E-05	0.00E+00	1.92E-05	8.77E-06	0.00E+00	6.90E-05	1.60E-06	3.07E-05
1.78E-03	8.11E-04	0.00E+00	5.96E-04	2.72E-04	0.00E+00	2.14E-03	4.97E-05	9.50E-04
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7.18E-04	3.27E-04	0.00E+00	2.40E-04	1.10E-04	0.00E+00	8.62E-04	2.00E-05	3.83E-04
3.29E-03	1.50E-03	0.00E+00	1.10E-03	5.03E-04	0.00E+00	3.95E-03	9.19E-05	1.76E-03
3.94E-04	0.00E+00	0.00E+00	1.32E-04	0.00E+00	0.00E+00	4.72E-04	1.10E-05	2.10E-04
2.85E-06	0.00E+00	0.00E+00	9.56E-07	0.00E+00	0.00E+00	3.43E-06	7.97E-08	1.52E-06
1.44E-03	6.54E-04	0.00E+00	4.81E-04	2.19E-04	0.00E+00	1.72E-03	4.01E-05	7.66E-04
2.99E-03	1.36E-03	1.25E-03	1.00E-03	4.56E-04	4.18E-04	3.58E-03	8.34E-05	1.59E-03
1.25E-03	5.71E-04	0.00E+00	4.20E-04	1.91E-04	0.00E+00	1.51E-03	3.50E-05	6.69E-04
7.93E-04	0.00E+00	0.00E+00	2.66E-04	0.00E+00	0.00E+00	9.52E-04	2.21E-05	4.23E-04
0.00E+00	1.86E-03	0.00E+00	0.00E+00	6.22E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4.26E-03	0.00E+00	0.00E+00	1.43E-03	0.00E+00	0.00E+00	5.11E-03	1.19E-04	2.27E-03
2.85E-06	0.00E+00	0.00E+00	9.56E-07	0.00E+00	0.00E+00	3.43E-06	7.97E-08	1.52E-06
6.70E-04	3.05E-04	0.00E+00	2.24E-04	1.02E-04	0.00E+00	8.04E-04	1.87E-05	3.58E-04
1.24E-04	5.67E-05	0.00E+00	4.17E-05	1.90E-05	0.00E+00	1.49E-04	3.47E-06	6.64E-05
2.85E-06	0.00E+00	0.00E+00	9.56E-07	0.00E+00	0.00E+00	3.43E-06	7.97E-08	1.52E-06
1.48E-03	6.76E-04	0.00E+00	4.97E-04	2.26E-04	0.00E+00	1.78E-03	4.14E-05	7.92E-04
0.00E+00	4.31E-03	0.00E+00	0.00E+00	1.45E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1.24E-04	5.67E-05	0.00E+00	4.17E-05	1.90E-05	0.00E+00	1.49E-04	3.47E-06	6.64E-05
6.50E-03	2.96E-03	0.00E+00	2.18E-03	9.92E-04	0.00E+00	7.80E-03	1.81E-04	3.47E-03
0.00E+00	0.00E+00	4.66E-04	0.00E+00	0.00E+00	1.56E-04	0.00E+00	0.00E+00	0.00E+00
1.21E-03	0.00E+00	0.00E+00	4.04E-04	0.00E+00	0.00E+00	1.45E-03	3.37E-05	6.44E-04

Maximum Toxic Emissions as Found From EPA List for Gasoline

Max Fuel:	10.896875	gal/hr
Total Fuel:	10175.7	gal/yr
Ave Fuel:	1.742414384	gal/hr

		Emission Factor			Maximum		Total	Average	
Pollutant	**Abbrev.**	**lb/mi**	**lb/gal (a)**	**lbs/gal**	**lbs/hr**	**g/s**	**lbs/yr**	**lbs/hr**	**g/s**
Carbon Monoxide	CO	0.00826276	0.16525514	1.6526E-01	1.8008E+00	2.2690E-01	1.6816E+03	2.8794E-01	3.6281E-02
Oxides of Nitrogen	NOx	0.00091814	0.01836282	1.8363E-02	2.0010E-01	2.5212E-02	1.8685E+02	3.1996E-02	4.0315E-03
Reactive Organic Gases	ROG	0.00091399	0.01827977	1.8280E-02	1.9919E-01	2.5098E-02	1.8601E+02	3.1851E-02	4.0132E-03
Oxides of Sulfur	SOx	1.0775E-05	0.00021549	2.1549E-04	2.3482E-03	2.9588E-04	2.1928E+00	3.7548E-04	4.7311E-05
Particulate Matter 10 microns	PM10	8.6979E-05	0.00173958	1.7396E-03	1.8956E-02	2.3884E-03	1.7701E+01	3.0311E-03	3.8191E-04
Particulate Matter 2.5 microns	PM2.5	5.4781E-05	0.00109563	1.0956E-03	1.1939E-02	1.5043E-03	1.1149E+01	1.9090E-03	2.4054E-04
Carbon Dioxide	CO2	1.09568235	21.913647	2.1914E+01	2.3879E+02	3.0088E+01	2.2299E+05	3.8183E+01	4.8110E+00
Methane	CH4	8.1461E-05	0.00162922	1.6292E-03	1.7753E-02	2.2369E-03	1.6578E+01	2.8388E-03	3.5769E-04

		Emission Factor			Maximum		Total	Average	
TAC	**CAS**	**mg/mi**	**lbs/Mgal**	**lbs/Mgal**	**lbs/hr**	**g/s**	**lbs/yr**	**lbs/hr**	**g/s**
1,3-butadiene	00106-99-0		9.1830E-01	9.1830E+00	1.0007E-01	1.2608E-02	9.3443E+01	1.6001E-02	2.0161E-03
2-butanone	00078-93-3		6.6400E-02	6.6400E-01	7.2355E-03	9.1168E-04	6.7567E+00	1.1570E-03	1.4578E-04
2-methoxy-2-methylpropane	01634-04-4		2.0579E+00	2.0579E+01	2.2425E-01	2.8255E-02	2.0941E+02	3.5857E-02	4.5180E-03
2-propenal	00107-02-8		1.9920E-01		0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
acetaldehyde	00075-07-0		8.2980E-01	8.2980E+00	9.0422E-02	1.1393E-02	8.4438E+01	1.4459E-02	1.8218E-03
benzene	00071-43-2		3.8061E+00	3.8061E+01	4.1475E-01	5.2258E-02	3.8730E+02	6.6318E-02	8.3561E-03
chlorine	07782-50-5		4.5500E-01	4.5500E+00	4.9581E-02	6.2472E-03	4.6299E+01	7.9280E-03	9.9893E-04
copper	07440-50-8		3.3000E-03	3.3000E-02	3.5960E-04	4.5309E-05	3.3580E-01	5.7500E-05	7.2450E-06
ethylbenzene	00100-41-4		1.6596E+00	1.6596E+01	1.8084E-01	2.2786E-02	1.6888E+02	2.8917E-02	3.6436E-03
formaldehyde	00050-00-0		3.4520E+00	3.4520E+01	3.7616E-01	4.7396E-02	3.5127E+02	6.0148E-02	7.5787E-03
hexane	00110-54-3		1.4494E+00	1.4494E+01	1.5794E-01	1.9900E-02	1.4749E+02	2.5255E-02	3.1821E-03
lead	07439-92-1		9.1676E+00	9.1676E+00	9.9898E-02	1.2587E-02	9.3287E+01	1.5974E-02	2.0127E-03
m- & p-xylene	1330-20-7			0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
m-xylene	00108-38-3		4.9235E+00	4.9235E+01	5.3651E-01	6.7600E-02	5.0100E+02	8.5788E-02	1.0809E-02
manganese	07439-96-5		3.3000E-03	3.3000E-02	3.5960E-04	4.5309E-05	3.3580E-01	5.7500E-05	7.2450E-06
methyl alcohol	00067-56-1		7.7450E-01	7.7450E+00	8.4396E-02	1.0634E-02	7.8811E+01	1.3495E-02	1.7004E-03
naphthalene	00091-20-3		1.4380E-01	1.4380E+00	1.5670E-02	1.9744E-03	1.4633E+01	2.5056E-03	3.1570E-04
nickel	07440-02-0		3.3000E-03	3.3000E-02	3.5960E-04	4.5309E-05	3.3580E-01	5.7500E-05	7.2450E-06
o-xylene	00095-47-6		1.7149E+00	1.7149E+01	1.8687E-01	2.3546E-02	1.7450E+02	2.9881E-02	3.7650E-03
propene	00115-07-1			0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
styrene	00100-42-5		1.4380E-01	1.4380E+00	1.5670E-02	1.9744E-03	1.4633E+01	2.5056E-03	3.1570E-04
toluene	00108-88-3		7.5125E+00	7.5125E+01	8.1863E-01	1.0315E-01	7.6445E+02	1.3090E-01	1.6493E-02
ammonia	7664-41-7			0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
1,2,4-Trimethylbenzene	95-63-6		1.3941E+00	1.3941E+01	1.5191E-01	1.9141E-02	1.4186E+02	2.4291E-02	3.0607E-03

Lead emissions changed to accoutn for leaded gasoline.
MSDS indicates 0.15% tetraethyl lead.

Toxic Emissions for Methanol Vehicles

Max Fuel:	14.84444444 gal/hr
Total Fuel:	2438.2 gal/yr
Ave Fuel:	0.4175 gal/hr

		Emission Factor			Maximum		Total	Average	
Pollutant	**Abbrev.**	**lb/mi**	**lb/gal (a)**	**lbs/gal**	**lbs/hr**	**g/s**	**lbs/yr**	**lbs/hr**	**g/s**
Carbon Monoxide	CO	0.00826276	0.16525514	1.6526E-01	2.4531E+00	3.0909E-01	4.0293E+02	6.8994E-02	8.6932E-03
Oxides of Nitrogen	NOx	0.00091814	0.01836282	1.8363E-02	2.7259E-01	3.4346E-02	4.4772E+01	7.6665E-03	9.6598E-04
Reactive Organic Gases	ROG	0.00091399	0.01827977	1.8280E-02	2.7135E-01	3.4190E-02	4.4570E+01	7.6318E-03	9.6161E-04
Oxides of Sulfur	SOx	1.0775E-05	0.00021549	2.1549E-04	3.1989E-03	4.0306E-04	5.2542E-01	8.9969E-05	1.1336E-05
Particulate Matter 10 microns	PM10	8.6979E-05	0.00173958	1.7396E-03	2.5823E-02	3.2537E-03	4.2414E+00	7.2627E-04	9.1510E-05
Particulate Matter 2.5 microns	PM2.5	5.4781E-05	0.00109563	1.0956E-03	1.6264E-02	2.0493E-03	2.6714E+00	4.5742E-04	5.7635E-05
Carbon Dioxide	CO2	1.09568235	21.913647	2.1914E+01	3.2530E+02	4.0987E+01	5.3430E+04	9.1489E+00	1.1528E+00
Methane	CH4	8.1461E-05	0.00162922	1.6292E-03	2.4185E-02	3.0473E-03	3.9724E+00	6.8020E-04	8.5705E-05

		Emission Factor			Maximum		Total	Average	
TAC	**CAS**	**mg/mi**	**lbs/Mgal**	**lbs/Mgal**	**lbs/hr**	**g/s**	**lbs/yr**	**lbs/hr**	**g/s**
1,3-butadiene	00106-99-0		9.1830E-01	9.1830E+00	1.3632E-01	1.7176E-02	2.2390E+01	3.8339E-03	4.8307E-04
2-butanone	00078-93-3		6.6400E-02	6.6400E-01	9.8567E-03	1.2419E-03	1.6190E+00	2.7722E-04	3.4930E-05
2-methoxy-2-methylpropane	01634-04-4		2.0579E+00	2.0579E+01	3.0548E-01	3.8491E-02	5.0176E+01	8.5917E-03	1.0826E-03
2-propenal	00107-02-8		1.9920E-01		0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
acetaldehyde	00075-07-0		8.2980E-01	8.2980E+00	1.2318E-01	1.5521E-02	2.0232E+01	3.4644E-03	4.3652E-04
benzene	00071-43-2		3.8061E+00	3.8061E+01	5.6499E-01	7.1189E-02	9.2800E+01	1.5890E-02	2.0022E-03
chlorine	07782-50-5								
copper	07440-50-8								
ethylbenzene	00100-41-4		1.6596E+00	1.6596E+01	2.4636E-01	3.1041E-02	4.0464E+01	6.9288E-03	8.7303E-04
formaldehyde	00050-00-0		3.4520E+00	3.4520E+01	5.1243E-01	6.4566E-02	8.4167E+01	1.4412E-02	1.8159E-03
hexane	00110-54-3		1.4494E+00	1.4494E+01	2.1516E-01	2.7110E-02	3.5339E+01	6.0512E-03	7.6246E-04
lead	07439-92-1								
m- & p-xylene	1330-20-7	1068.75842	4.7123E+01	4.7123E+01	6.9952E-01	8.8140E-02	1.1490E+02	1.9674E-02	2.4789E-03
m-xylene	00108-38-3								
manganese	07439-96-5								
methyl alcohol	00067-56-1		7.7450E-01	7.7450E+00	1.1497E-01	1.4486E-02	1.8884E+01	3.2335E-03	4.0743E-04
naphthalene	00091-20-3		1.4380E-01	1.4380E+00	2.1346E-02	2.6896E-03	3.5061E+00	6.0037E-04	7.5646E-05
nickel	07440-02-0								
o-xylene	00095-47-6		1.7149E+00	1.7149E+01	2.5457E-01	3.2075E-02	4.1813E+01	7.1597E-03	9.0212E-04
propene	00115-07-1	2483.4958	1.0950E+02	1.0950E+02	1.6255E+00	2.0481E-01	2.6699E+02	4.5717E-02	5.7603E-03
styrene	00100-42-5		1.4380E-01	1.4380E+00	2.1346E-02	2.6896E-03	3.5061E+00	6.0037E-04	7.5646E-05
toluene	00108-88-3		7.5125E+00	7.5125E+01	1.1152E+00	1.4051E-01	1.8317E+02	3.1365E-02	3.9520E-03
ammonia	7664-41-7								
1,2,4-Trimethylbenzene	95-63-6								

Toxic Emissions for Nitromethane Vehicles

Max Fuel:	29.68888889 gal/hr
Total Fuel:	2234.46 gal/yr
Ave Fuel:	0.382613014 gal/hr

		Emission Factor			Maximum		Total	Average	
Pollutant	**Abbrev.**	**lb/mi**	**lb/gal (a)**	**lbs/gal**	**lbs/hr**	**g/s**	**lbs/yr**	**lbs/hr**	**g/s**
Carbon Monoxide	CO	0.00826276	0.16525514	1.6526E-01	2.4531E+00	3.0909E-01	4.0293E+02	6.8994E-02	8.6932E-03
Oxides of Nitrogen	NOx	0.00091814	0.01836282	1.8363E-02	2.7259E-01	3.4346E-02	4.4772E+01	7.6665E-03	9.6598E-04
Reactive Organic Gases	ROG	0.00091399	0.01827977	1.8280E-02	2.7135E-01	3.4190E-02	4.4570E+01	7.6318E-03	9.6161E-04
Oxides of Sulfur	SOx	1.0775E-05	0.00021549	2.1549E-04	3.1989E-03	4.0306E-04	5.2542E-01	8.9969E-05	1.1336E-05
Particulate Matter 10 microns	PM10	8.6979E-05	0.00173958	1.7396E-03	2.5823E-02	3.2537E-03	4.2414E+00	7.2627E-04	9.1510E-05
Particulate Matter 2.5 microns	PM2.5	5.4781E-05	0.00109563	1.0956E-03	1.6264E-02	2.0493E-03	2.6714E+00	4.5742E-04	5.7635E-05
Carbon Dioxide	CO2	1.09568235	21.913647	2.1914E+01	3.2530E+02	4.0987E+01	5.3430E+04	9.1489E+00	1.1528E+00
Methane	CH4	8.1461E-05	0.00162922	1.6292E-03	2.4185E-02	3.0473E-03	3.9724E+00	6.8020E-04	8.5705E-05

		Emission Factor			Maximum		Total	Average	
TAC	**CAS**	**mg/mi**	**lbs/Mgal**	**lbs/Mgal**	**lbs/hr**	**g/s**	**lbs/yr**	**lbs/hr**	**g/s**
1,3-butadiene	00106-99-0								
2-butanone	00078-93-3								
2-methoxy-2-methylpropane	01634-04-4								
2-propenal	00107-02-8								
acetaldehyde	00075-07-0								
benzene	00071-43-2								
chlorine	07782-50-5								
copper	07440-50-8								
ethylbenzene	00100-41-4								
formaldehyde	00050-00-0		3.4520E+00	3.4520E+01	1.0249E+00	1.2913E-01	7.7134E+01	1.3208E-02	1.6642E-03
hexane	00110-54-3								
lead	07439-92-1								
m- & p-xylene	1330-20-7								
m-xylene	00108-38-3								
manganese	07439-96-5								
methyl alcohol	00067-56-1								
naphthalene	00091-20-3								
nickel	07440-02-0								
o-xylene	00095-47-6								
propene	00115-07-1								
styrene	00100-42-5								
toluene	00108-88-3								
ammonia	7664-41-7	292.399994	1.2892E+01	1.2892E+01	3.8276E-01	4.8228E-02	2.8808E+01	4.9328E-03	6.2153E-04
1,2,4-Trimethylbenzene	95-63-6								

literature suggests that nitromethane burns clean leaving only trace toxics except for formaldehyde and ammonia

		Maximum (g/s)		
Pollutant	**Abbrev.**	**Accel**	**Brake**	**Travel**
Carbon Monoxide	CO	7.6057E-01	2.1127E-02	6.3381E-02
Oxides of Nitrogen	NOx	8.4514E-02	0.0023476	0.00704279
Reactive Organic Gases	ROG	8.4131E-02	0.00233698	0.00701094
Oxides of Sulfur	SOx	9.9180E-04	2.755E-05	8.265E-05
Particulate Matter 10 microns	PM10	8.0063E-03	0.0002224	0.00066719
Particulate Matter 2.5 microns	PM2.5	5.0425E-03	0.00014007	0.00042021
Carbon Dioxide	CO2	1.0086E+02	2.80155362	8.40466086
Methane	CH4	7.4983E-03	0.00020829	0.00062486

		Maximum (g/s)								
TAC	**CAS**	**G_ACC**	**M_ACC**	**N_ACC**	**G_BRAKE**	**M_BRAKE**	**N_BRAKE**	**G_TRAVEL**	**TOW**	**TUNING**
		0.394	**0.749**	**0.749**	**0.132**	**0.251**	**0.251**	**0.473**	**6.30666667**	**3.4375**
1,3-butadiene	00106-99-0	4.97E-03	1.29E-02	0.00E+00	1.66E-03	4.31E-03	0.00E+00	5.96E-03	7.30E-03	3.98E-03
2-butanone	00078-93-3	3.59E-04	9.30E-04	0.00E+00	1.20E-04	3.12E-04	0.00E+00	4.31E-04	5.28E-04	2.88E-04
2-methoxy-2-methylpropane	01634-04-4	1.11E-02	2.88E-02	0.00E+00	3.73E-03	9.66E-03	0.00E+00	1.34E-02	1.64E-02	8.91E-03
2-propenal	00107-02-8	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
acetaldehyde	00075-07-0	4.49E-03	1.16E-02	0.00E+00	1.50E-03	3.90E-03	0.00E+00	5.39E-03	6.59E-03	3.59E-03
benzene	00071-43-2	2.06E-02	5.33E-02	0.00E+00	6.90E-03	1.79E-02	0.00E+00	2.47E-02	3.02E-02	1.65E-02
chlorine	07782-50-5	2.46E-03	0.00E+00	0.00E+00	8.25E-04	0.00E+00	0.00E+00	2.95E-03	3.62E-03	1.97E-03
copper	07440-50-8	1.79E-05	0.00E+00	0.00E+00	5.98E-06	0.00E+00	0.00E+00	2.14E-05	2.62E-05	1.43E-05
ethylbenzene	00100-41-4	8.98E-03	2.32E-02	0.00E+00	3.01E-03	7.79E-03	0.00E+00	1.08E-02	1.32E-02	7.19E-03
formaldehyde	00050-00-0	1.87E-02	4.84E-02	9.67E-02	6.26E-03	1.62E-02	3.24E-02	2.24E-02	2.74E-02	1.50E-02
hexane	00110-54-3	7.84E-03	2.03E-02	0.00E+00	2.63E-03	6.80E-03	0.00E+00	9.41E-03	1.15E-02	6.28E-03
lead	07439-92-1	4.96E-03	0.00E+00	0.00E+00	1.66E-03	0.00E+00	0.00E+00	5.95E-03	7.28E-03	3.97E-03
m- & p-xylene	1330-20-7	0.00E+00	6.60E-02	0.00E+00	0.00E+00	2.21E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
m-xylene	00108-38-3	2.66E-02	0.00E+00	0.00E+00	8.92E-03	0.00E+00	0.00E+00	3.20E-02	3.91E-02	2.13E-02
manganese	07439-96-5	1.79E-05	0.00E+00	0.00E+00	5.98E-06	0.00E+00	0.00E+00	2.14E-05	2.62E-05	1.43E-05
methyl alcohol	00067-56-1	4.19E-03	1.09E-02	0.00E+00	1.40E-03	3.64E-03	0.00E+00	5.03E-03	6.15E-03	3.35E-03
naphthalene	00091-20-3	7.78E-04	2.01E-03	0.00E+00	2.61E-04	6.75E-04	0.00E+00	9.34E-04	1.14E-03	6.23E-04
nickel	07440-02-0	1.79E-05	0.00E+00	0.00E+00	5.98E-06	0.00E+00	0.00E+00	2.14E-05	2.62E-05	1.43E-05
o-xylene	00095-47-6	9.28E-03	2.40E-02	0.00E+00	3.11E-03	8.05E-03	0.00E+00	1.11E-02	1.36E-02	7.43E-03
propene	00115-07-1	0.00E+00	1.53E-01	0.00E+00	0.00E+00	5.14E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
styrene	00100-42-5	7.78E-04	2.01E-03	0.00E+00	2.61E-04	6.75E-04	0.00E+00	9.34E-04	1.14E-03	6.23E-04
toluene	00108-88-3	4.06E-02	1.05E-01	0.00E+00	1.36E-02	3.53E-02	0.00E+00	4.88E-02	5.97E-02	3.25E-02
ammonia	7664-41-7	0.00E+00	0.00E+00	3.61E-02	0.00E+00	0.00E+00	1.21E-02	0.00E+00	0.00E+00	0.00E+00
hydrogen cyanide	74-90-8	7.54E-03	0.00E+00	0.00E+00	2.53E-03	0.00E+00	0.00E+00	9.05E-03	1.11E-02	6.04E-03

Average (g/s)		
Accel	**Brake**	**Travel**
4.8301E-02	1.3417E-03	4.0250E-03
5.3671E-03	0.00014909	0.0004473
5.3428E-03	0.00014841	0.0004452
6.2985E-05	1.7496E-06	5.249E-06
5.0844E-04	1.4123E-05	4.237E-05
3.2023E-04	8.8952E-06	2.669E-05
6.4049E+00	0.17791373	0.5337412
4.7619E-04	1.3227E-05	3.968E-05

Average (g/s)								
G_ACC	**M_ACC**	**N_ACC**	**G_BRAKE**	**M_BRAKE**	**N_BRAKE**	**G_TRAVEL**	**TOW**	**TUNING**
0.394	**0.749**	**0.749**	**0.132**	**0.251**	**0.251**	**0.473**	**167.915**	**3210**
7.94E-04	3.62E-04	0.00E+00	2.66E-04	1.21E-04	0.00E+00	9.54E-04	2.22E-05	4.24E-04
5.74E-05	2.62E-05	0.00E+00	1.92E-05	8.77E-06	0.00E+00	6.90E-05	1.60E-06	3.07E-05
1.78E-03	8.11E-04	0.00E+00	5.96E-04	2.72E-04	0.00E+00	2.14E-03	4.97E-05	9.50E-04
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7.18E-04	3.27E-04	0.00E+00	2.40E-04	1.10E-04	0.00E+00	8.62E-04	2.00E-05	3.83E-04
3.29E-03	1.50E-03	0.00E+00	1.10E-03	5.03E-04	0.00E+00	3.95E-03	9.19E-05	1.76E-03
3.94E-04	0.00E+00	0.00E+00	1.32E-04	0.00E+00	0.00E+00	4.72E-04	1.10E-05	2.10E-04
2.85E-06	0.00E+00	0.00E+00	9.56E-07	0.00E+00	0.00E+00	3.43E-06	7.97E-08	1.52E-06
1.44E-03	6.54E-04	0.00E+00	4.81E-04	2.19E-04	0.00E+00	1.72E-03	4.01E-05	7.66E-04
2.99E-03	1.36E-03	1.25E-03	1.00E-03	4.56E-04	4.18E-04	3.58E-03	8.34E-05	1.59E-03
1.25E-03	5.71E-04	0.00E+00	4.20E-04	1.91E-04	0.00E+00	1.51E-03	3.50E-05	6.69E-04
7.93E-04	0.00E+00	0.00E+00	2.66E-04	0.00E+00	0.00E+00	9.52E-04	2.21E-05	4.23E-04
0.00E+00	1.86E-03	0.00E+00	0.00E+00	6.22E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4.26E-03	0.00E+00	0.00E+00	1.43E-03	0.00E+00	0.00E+00	5.11E-03	1.19E-04	2.27E-03
2.85E-06	0.00E+00	0.00E+00	9.56E-07	0.00E+00	0.00E+00	3.43E-06	7.97E-08	1.52E-06
6.70E-04	3.05E-04	0.00E+00	2.24E-04	1.02E-04	0.00E+00	8.04E-04	1.87E-05	3.58E-04
1.24E-04	5.67E-05	0.00E+00	4.17E-05	1.90E-05	0.00E+00	1.49E-04	3.47E-06	6.64E-05
2.85E-06	0.00E+00	0.00E+00	9.56E-07	0.00E+00	0.00E+00	3.43E-06	7.97E-08	1.52E-06
1.48E-03	6.76E-04	0.00E+00	4.97E-04	2.26E-04	0.00E+00	1.78E-03	4.14E-05	7.92E-04
0.00E+00	4.31E-03	0.00E+00	0.00E+00	1.45E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1.24E-04	5.67E-05	0.00E+00	4.17E-05	1.90E-05	0.00E+00	1.49E-04	3.47E-06	6.64E-05
6.50E-03	2.96E-03	0.00E+00	2.18E-03	9.92E-04	0.00E+00	7.80E-03	1.81E-04	3.47E-03
0.00E+00	0.00E+00	4.66E-04	0.00E+00	0.00E+00	1.56E-04	0.00E+00	0.00E+00	0.00E+00
1.21E-03	0.00E+00	0.00E+00	4.04E-04	0.00E+00	0.00E+00	1.45E-03	3.37E-05	6.44E-04

APPENDIX B – SCAQMD SIGNIFICANCE THRESHOLDS

South Coast Air Quality Management District

21865 Copley Drive, Diamond Bar, CA 91765-4182
(909) 396-2000 • www.aqmd.gov

SCAQMD Air Quality Significance Thresholds

Mass Daily Thresholds [a]		
Pollutant	**Construction [b]**	**Operation [c]**
NOx	100 lbs/day	55 lbs/day
VOC	75 lbs/day	55 lbs/day
PM10	150 lbs/day	150 lbs/day
PM2.5	55 lbs/day	55 lbs/day
SOx	150 lbs/day	150 lbs/day
CO	550 lbs/day	550 lbs/day
Lead	3 lbs/day	3 lbs/day

Toxic Air Contaminants (TACs) and Odor Thresholds	
TACs (including carcinogens and non-carcinogens)	Maximum Incremental Cancer Risk ≥ 10 in 1 million Cancer Burden > 0.5 excess cancer cases (in areas ≥ 1 in 1 million) Hazard Index ≥ 1.0 (project increment)
Odor	Project creates an odor nuisance pursuant to SCAQMD Rule 402
Ambient Air Quality for Criteria Pollutants [d]	
NO2 1-hour average annual average	SCAQMD is in attainment; project is significant if it causes or contributes to an exceedance of the following attainment standards: 0.18 ppm (state) 0.03 ppm (state)
PM10 24-hour average annual average	10.4 μg/m^3 (construction)[e] & 2.5 μg/m^3 (operation) 1.0 μg/m^3
PM2.5 24-hour average	10.4 μg/m^3 (construction)[e] & 2.5 μg/m^3 (operation)
Sulfate 24-hour average	1 μg/m^3
CO 1-hour average 8-hour average	SCAQMD is in attainment; project is significant if it causes or contributes to an exceedance of the following attainment standards: 20 ppm (state) 9.0 ppm (state/federal)

[a] Source: SCAQMD CEQA Handbook (SCAQMD, 1993)
[b] Construction thresholds apply to both the South Coast Air Basin and Coachella Valley (Salton Sea and Mojave Desert Air Basins).
[c] For Coachella Valley, the mass daily thresholds for operation are the same as the construction thresholds.
[d] Ambient air quality thresholds for criteria pollutants based on SCAQMD Rule 1303, Table A-2 unless otherwise stated.
[e] Ambient air quality threshold based on SCAQMD Rule 403.

KEY: lbs/day = pounds per day ppm = parts per million μg/m^3 = microgram per cubic meter ≥ greater than or equal to

(Rev. March 2009)

APPENDIX C – HEALTH RISK ASSESSMENT CALCULATIONS

	G_ACC	M_ACC	N_ACC	G_BRAKE	M_BRAKE	N_BRAKE	G_TRAVEL	TOW	TUNING
GLC -->	**145.926**	**143.6965**	**143.6965**	**86.42782**	**64.9199**	**64.9199**	**53.0547**	**52.85435**	**50.95683**

Toxic Air Contmainant		**Emissions (g/s)**								
CAS	**NAME**	**G_ACC**	**M_ACC**	**N_ACC**	**G_BRAKE**	**M_BRAKE**	**N_BRAKE**	**G_TRAVEL**	**TOW**	**TUNING**
106990	1,3-butadiene	4.97E-03	1.29E-02	0.00E+00	1.66E-03	4.31E-03	0.00E+00	5.96E-03	7.30E-03	3.98E-03
78933	2-butanone	3.59E-04	9.30E-04	0.00E+00	1.20E-04	3.12E-04	0.00E+00	4.31E-04	5.28E-04	2.88E-04
1634044	2-methoxy-2-methylpropane	1.11E-02	2.88E-02	0.00E+00	3.73E-03	9.66E-03	0.00E+00	1.34E-02	1.64E-02	8.91E-03
107028	2-propenal	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
75070	acetaldehyde	4.49E-03	1.16E-02	0.00E+00	1.50E-03	3.90E-03	0.00E+00	5.39E-03	6.59E-03	3.59E-03
71432	benzene	2.06E-02	5.33E-02	0.00E+00	6.90E-03	1.79E-02	0.00E+00	2.47E-02	3.02E-02	1.65E-02
7782505	chlorine	2.46E-03	0.00E+00	0.00E+00	8.25E-04	0.00E+00	0.00E+00	2.95E-03	3.62E-03	1.97E-03
7440508	copper	1.79E-05	0.00E+00	0.00E+00	5.98E-06	0.00E+00	0.00E+00	2.14E-05	2.62E-05	1.43E-05
100414	ethylbenzene	8.98E-03	2.32E-02	0.00E+00	3.01E-03	7.79E-03	0.00E+00	1.08E-02	1.32E-02	7.19E-03
50000	formaldehyde	1.87E-02	4.84E-02	9.67E-02	6.26E-03	1.62E-02	3.24E-02	2.24E-02	2.74E-02	1.50E-02
110543	hexane	7.84E-03	2.03E-02	0.00E+00	2.63E-03	6.80E-03	0.00E+00	9.41E-03	1.15E-02	6.28E-03
7439921	lead	4.96E-03	0.00E+00	0.00E+00	1.66E-03	0.00E+00	0.00E+00	5.95E-03	7.28E-03	3.97E-03
1330207	m- & p-xylene	0.00E+00	6.60E-02	0.00E+00	0.00E+00	2.21E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
108383	m-xylene	2.66E-02	0.00E+00	0.00E+00	8.92E-03	0.00E+00	0.00E+00	3.20E-02	3.91E-02	2.13E-02
7439965	manganese	1.79E-05	0.00E+00	0.00E+00	5.98E-06	0.00E+00	0.00E+00	2.14E-05	2.62E-05	1.43E-05
67561	methyl alcohol	4.19E-03	1.09E-02	0.00E+00	1.40E-03	3.64E-03	0.00E+00	5.03E-03	6.15E-03	3.35E-03
91203	naphthalene	7.78E-04	2.01E-03	0.00E+00	2.61E-04	6.75E-04	0.00E+00	9.34E-04	1.14E-03	6.23E-04
7440020	nickel	1.79E-05	0.00E+00	0.00E+00	5.98E-06	0.00E+00	0.00E+00	2.14E-05	2.62E-05	1.43E-05
95476	o-xylene	9.28E-03	2.40E-02	0.00E+00	3.11E-03	8.05E-03	0.00E+00	1.11E-02	1.36E-02	7.43E-03
115071	propene	0.00E+00	1.53E-01	0.00E+00	0.00E+00	5.14E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
100425	styrene	7.78E-04	2.01E-03	0.00E+00	2.61E-04	6.75E-04	0.00E+00	9.34E-04	1.14E-03	6.23E-04
108883	toluene	4.06E-02	1.05E-01	0.00E+00	1.36E-02	3.53E-02	0.00E+00	4.88E-02	5.97E-02	3.25E-02
7664417	ammonia	0.00E+00	0.00E+00	3.61E-02	0.00E+00	0.00E+00	1.21E-02	0.00E+00	0.00E+00	0.00E+00
95636	1,2,4-Trimethylbenzene	7.54E-03	0.00E+00	0.00E+00	2.53E-03	0.00E+00	0.00E+00	9.05E-03	1.11E-02	6.04E-03

Maximum 1-Hour GLC (ug/m3)									1-Hr Acute		
G_ACC	M_ACC	N_ACC	G_BRAKE	M_BRAKE	N_BRAKE	G_TRAVEL	TOW	TUNING	ug/m3	REL	HI
7.25E-01	1.85E+00	0.00E+00	1.44E-01	2.80E-01	0.00E+00	3.16E-01	3.86E-01	2.03E-01	0.00E+00	0.00E+00	0.00E+00
5.24E-02	1.34E-01	0.00E+00	1.04E-02	2.02E-02	0.00E+00	2.29E-02	2.79E-02	1.47E-02	5.64E-01	1.30E+04	4.34E-05
1.62E+00	4.14E+00	0.00E+00	3.22E-01	6.27E-01	0.00E+00	7.09E-01	8.64E-01	4.54E-01	0.00E+00	0.00E+00	0.00E+00
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.50E+00	0.00E+00
6.55E-01	1.67E+00	0.00E+00	1.30E-01	2.53E-01	0.00E+00	2.86E-01	3.49E-01	1.83E-01	7.05E+00	4.70E+02	1.50E-02
3.00E+00	7.66E+00	0.00E+00	5.96E-01	1.16E+00	0.00E+00	1.31E+00	1.60E+00	8.40E-01	6.47E+01	1.30E+03	4.98E-02
3.59E-01	0.00E+00	0.00E+00	7.13E-02	0.00E+00	0.00E+00	1.57E-01	1.91E-01	1.00E-01	1.76E+00	2.10E+02	8.37E-03
2.61E-03	0.00E+00	0.00E+00	5.17E-04	0.00E+00	0.00E+00	1.14E-03	1.39E-03	7.28E-04	6.37E-03	1.00E+02	6.37E-05
1.31E+00	3.34E+00	0.00E+00	2.60E-01	5.06E-01	0.00E+00	5.72E-01	6.97E-01	3.66E-01	0.00E+00	0.00E+00	0.00E+00
2.73E+00	6.95E+00	1.39E+01	5.41E-01	1.05E+00	2.10E+00	1.19E+00	1.45E+00	7.62E-01	3.07E+01	5.50E+01	5.58E-01
1.14E+00	2.92E+00	0.00E+00	2.27E-01	4.42E-01	0.00E+00	4.99E-01	6.09E-01	3.20E-01	0.00E+00	0.00E+00	0.00E+00
7.24E-01	0.00E+00	0.00E+00	1.44E-01	0.00E+00	0.00E+00	3.16E-01	3.85E-01	2.02E-01	0.00E+00	0.00E+00	0.00E+00
0.00E+00	9.49E+00	0.00E+00	0.00E+00	1.44E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.18E+01	2.20E+04	9.93E-04
3.89E+00	0.00E+00	0.00E+00	7.71E-01	0.00E+00	0.00E+00	1.70E+00	2.07E+00	1.09E+00	1.90E+01	2.20E+04	8.64E-04
2.61E-03	0.00E+00	0.00E+00	5.17E-04	0.00E+00	0.00E+00	1.14E-03	1.39E-03	7.28E-04	0.00E+00	0.00E+00	0.00E+00
6.11E-01	1.56E+00	0.00E+00	1.21E-01	2.36E-01	0.00E+00	2.67E-01	3.25E-01	1.71E-01	3.29E+00	2.80E+04	1.18E-04
1.14E-01	2.89E-01	0.00E+00	2.25E-02	4.38E-02	0.00E+00	4.95E-02	6.04E-02	3.17E-02	0.00E+00	0.00E+00	0.00E+00
2.61E-03	0.00E+00	0.00E+00	5.17E-04	0.00E+00	0.00E+00	1.14E-03	1.39E-03	7.28E-04	1.27E-02	6.00E+00	2.12E-03
1.35E+00	3.45E+00	0.00E+00	2.69E-01	5.23E-01	0.00E+00	5.91E-01	7.20E-01	3.78E-01	1.46E+01	2.20E+04	6.62E-04
0.00E+00	2.20E+01	0.00E+00	0.00E+00	3.34E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.02E+02	3.10E+03	3.27E-02
1.14E-01	2.89E-01	0.00E+00	2.25E-02	4.38E-02	0.00E+00	4.95E-02	6.04E-02	3.17E-02	1.22E+00	2.10E+04	5.82E-05
5.93E+00	1.51E+01	0.00E+00	1.18E+00	2.29E+00	0.00E+00	2.59E+00	3.16E+00	1.66E+00	1.60E+02	3.70E+04	4.31E-03
0.00E+00	0.00E+00	5.19E+00	0.00E+00	0.00E+00	7.86E-01	0.00E+00	0.00E+00	0.00E+00	1.20E+01	3.20E+03	3.74E-03
1.10E+00	0.00E+00	0.00E+00	2.18E-01	0.00E+00	0.00E+00	4.80E-01	5.86E-01	3.08E-01	0.00E+00	0.00E+00	0.00E+00
											6.77E-01

	G_ACC	M_ACC	N_ACC	G_BRAKE	M_BRAKE	N_BRAKE	G_TRAVEL	TOW	TUNING
GLC -->	**66.80673**	**35.73142**	**35.73142**	**18.91846**	**10.23062**	**10.23062**	**24.40685**	**11.84679**	**23.50897**

Toxic Air Contmainant		Emissions (g/s)								
CAS	**NAME**	**G_ACC**	**M_ACC**	**N_ACC**	**G_BRAKE**	**M_BRAKE**	**N_BRAKE**	**G_TRAVEL**	**TOW**	**TUNING**
106990	1,3-butadiene	4.97E-03	1.29E-02	0.00E+00	1.66E-03	4.31E-03	0.00E+00	5.96E-03	7.30E-03	3.98E-03
78933	2-butanone	3.59E-04	9.30E-04	0.00E+00	1.20E-04	3.12E-04	0.00E+00	4.31E-04	5.28E-04	2.88E-04
1634044	2-methoxy-2-methylpropane	1.11E-02	2.88E-02	0.00E+00	3.73E-03	9.66E-03	0.00E+00	1.34E-02	1.64E-02	8.91E-03
107028	2-propenal	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
75070	acetaldehyde	4.49E-03	1.16E-02	0.00E+00	1.50E-03	3.90E-03	0.00E+00	5.39E-03	6.59E-03	3.59E-03
71432	benzene	2.06E-02	5.33E-02	0.00E+00	6.90E-03	1.79E-02	0.00E+00	2.47E-02	3.02E-02	1.65E-02
7782505	chlorine	2.46E-03	0.00E+00	0.00E+00	8.25E-04	0.00E+00	0.00E+00	2.95E-03	3.62E-03	1.97E-03
7440508	copper	1.79E-05	0.00E+00	0.00E+00	5.98E-06	0.00E+00	0.00E+00	2.14E-05	2.62E-05	1.43E-05
100414	ethylbenzene	8.98E-03	2.32E-02	0.00E+00	3.01E-03	7.79E-03	0.00E+00	1.08E-02	1.32E-02	7.19E-03
50000	formaldehyde	1.87E-02	4.84E-02	9.67E-02	6.26E-03	1.62E-02	3.24E-02	2.24E-02	2.74E-02	1.50E-02
110543	hexane	7.84E-03	2.03E-02	0.00E+00	2.63E-03	6.80E-03	0.00E+00	9.41E-03	1.15E-02	6.28E-03
7439921	lead	4.96E-03	0.00E+00	0.00E+00	1.66E-03	0.00E+00	0.00E+00	5.95E-03	7.28E-03	3.97E-03
1330207	m- & p-xylene	0.00E+00	6.60E-02	0.00E+00	0.00E+00	2.21E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
108383	m-xylene	2.66E-02	0.00E+00	0.00E+00	8.92E-03	0.00E+00	0.00E+00	3.20E-02	3.91E-02	2.13E-02
7439965	manganese	1.79E-05	0.00E+00	0.00E+00	5.98E-06	0.00E+00	0.00E+00	2.14E-05	2.62E-05	1.43E-05
67561	methyl alcohol	4.19E-03	1.09E-02	0.00E+00	1.40E-03	3.64E-03	0.00E+00	5.03E-03	6.15E-03	3.35E-03
91203	naphthalene	7.78E-04	2.01E-03	0.00E+00	2.61E-04	6.75E-04	0.00E+00	9.34E-04	1.14E-03	6.23E-04
7440020	nickel	1.79E-05	0.00E+00	0.00E+00	5.98E-06	0.00E+00	0.00E+00	2.14E-05	2.62E-05	1.43E-05
95476	o-xylene	9.28E-03	2.40E-02	0.00E+00	3.11E-03	8.05E-03	0.00E+00	1.11E-02	1.36E-02	7.43E-03
115071	propene	0.00E+00	1.53E-01	0.00E+00	0.00E+00	5.14E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
100425	styrene	7.78E-04	2.01E-03	0.00E+00	2.61E-04	6.75E-04	0.00E+00	9.34E-04	1.14E-03	6.23E-04
108883	toluene	4.06E-02	1.05E-01	0.00E+00	1.36E-02	3.53E-02	0.00E+00	4.88E-02	5.97E-02	3.25E-02
7664417	ammonia	0.00E+00	0.00E+00	3.61E-02	0.00E+00	0.00E+00	1.21E-02	0.00E+00	0.00E+00	0.00E+00
95636	1,2,4-Trimethylbenzene	7.54E-03	0.00E+00	0.00E+00	2.53E-03	0.00E+00	0.00E+00	9.05E-03	1.11E-02	6.04E-03

Maximum 8-Hour GLC (ug/m3)									8-Hr Acute		
G_ACC	M_ACC	N_ACC	G_BRAKE	M_BRAKE	N_BRAKE	G_TRAVEL	TOW	TUNING	ug/m3	REL	HI
3.32E-01	4.60E-01	0.00E+00	3.15E-02	4.41E-02	0.00E+00	1.46E-01	8.64E-02	9.35E-02	0.00E+00	0.00E+00	0.00E+00
2.40E-02	3.32E-02	0.00E+00	2.28E-03	3.19E-03	0.00E+00	1.05E-02	6.25E-03	6.76E-03	0.00E+00	0.00E+00	0.00E+00
7.44E-01	1.03E+00	0.00E+00	7.06E-02	9.88E-02	0.00E+00	3.26E-01	1.94E-01	2.10E-01	0.00E+00	0.00E+00	0.00E+00
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.00E-01	0.00E+00
3.00E-01	4.15E-01	0.00E+00	2.85E-02	3.99E-02	0.00E+00	1.32E-01	7.81E-02	8.45E-02	1.08E+00	3.00E+02	3.59E-03
1.38E+00	1.91E+00	0.00E+00	1.31E-01	1.83E-01	0.00E+00	6.03E-01	3.58E-01	3.88E-01	0.00E+00	0.00E+00	0.00E+00
1.64E-01	0.00E+00	0.00E+00	1.56E-02	0.00E+00	0.00E+00	7.21E-02	4.28E-02	4.63E-02	0.00E+00	0.00E+00	0.00E+00
1.19E-03	0.00E+00	0.00E+00	1.13E-04	0.00E+00	0.00E+00	5.23E-04	3.11E-04	3.36E-04	0.00E+00	0.00E+00	0.00E+00
6.00E-01	8.31E-01	0.00E+00	5.69E-02	7.97E-02	0.00E+00	2.63E-01	1.56E-01	1.69E-01	0.00E+00	0.00E+00	0.00E+00
1.25E+00	1.73E+00	3.46E+00	1.18E-01	1.66E-01	3.32E-01	5.47E-01	3.25E-01	3.51E-01	8.27E+00	9.00E+00	9.19E-01
5.24E-01	7.26E-01	0.00E+00	4.97E-02	6.96E-02	0.00E+00	2.30E-01	1.36E-01	1.48E-01	0.00E+00	0.00E+00	0.00E+00
3.31E-01	0.00E+00	0.00E+00	3.14E-02	0.00E+00	0.00E+00	1.45E-01	8.63E-02	9.33E-02	0.00E+00	0.00E+00	0.00E+00
0.00E+00	2.36E+00	0.00E+00	0.00E+00	2.26E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1.78E+00	0.00E+00	0.00E+00	1.69E-01	0.00E+00	0.00E+00	7.80E-01	4.63E-01	5.01E-01	0.00E+00	0.00E+00	0.00E+00
1.19E-03	0.00E+00	0.00E+00	1.13E-04	0.00E+00	0.00E+00	5.23E-04	3.11E-04	3.36E-04	2.48E-03	1.70E-01	1.46E-02
2.80E-01	3.88E-01	0.00E+00	2.66E-02	3.72E-02	0.00E+00	1.23E-01	7.29E-02	7.89E-02	0.00E+00	0.00E+00	0.00E+00
5.20E-02	7.20E-02	0.00E+00	4.93E-03	6.91E-03	0.00E+00	2.28E-02	1.35E-02	1.46E-02	0.00E+00	0.00E+00	0.00E+00
1.19E-03	0.00E+00	0.00E+00	1.13E-04	0.00E+00	0.00E+00	5.23E-04	3.11E-04	3.36E-04	0.00E+00	0.00E+00	0.00E+00
6.20E-01	8.58E-01	0.00E+00	5.88E-02	8.24E-02	0.00E+00	2.72E-01	1.61E-01	1.75E-01	0.00E+00	0.00E+00	0.00E+00
0.00E+00	5.48E+00	0.00E+00	0.00E+00	5.26E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
5.20E-02	7.20E-02	0.00E+00	4.93E-03	6.91E-03	0.00E+00	2.28E-02	1.35E-02	1.46E-02	0.00E+00	0.00E+00	0.00E+00
2.72E+00	3.76E+00	0.00E+00	2.58E-01	3.61E-01	0.00E+00	1.19E+00	7.07E-01	7.65E-01	0.00E+00	0.00E+00	0.00E+00
0.00E+00	0.00E+00	1.29E+00	0.00E+00	0.00E+00	1.24E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
5.04E-01	0.00E+00	0.00E+00	4.78E-02	0.00E+00	0.00E+00	2.21E-01	1.31E-01	1.42E-01	0.00E+00	0.00E+00	0.00E+00
											9.37E-01

	G_ACC	M_ACC	N_ACC	G_BRAKE	M_BRAKE	N_BRAKE	G_TRAVEL	TOW	TUNING
GLC -->	**3.47255**	**1.59461**	**1.59461**	**1.66576**	**0.50608**	**0.50608**	**1.94116**	**0.74963**	**1.71141**

Toxic Air Contmainant		**Emissions (g/s)**								
CAS	**NAME**	**G_ACC**	**M_ACC**	**N_ACC**	**G_BRAKE**	**M_BRAKE**	**N_BRAKE**	**G_TRAVEL**	**TOW**	**TUNING**
106990	1,3-butadiene	7.94E-04	3.62E-04	0.00E+00	2.66E-04	1.21E-04	0.00E+00	9.54E-04	2.22E-05	4.24E-04
78933	2-butanone	5.74E-05	2.62E-05	0.00E+00	1.92E-05	8.77E-06	0.00E+00	6.90E-05	1.60E-06	3.07E-05
1634044	2-methoxy-2-methylpropane	1.78E-03	8.11E-04	0.00E+00	5.96E-04	2.72E-04	0.00E+00	2.14E-03	4.97E-05	9.50E-04
107028	2-propenal	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
75070	acetaldehyde	7.18E-04	3.27E-04	0.00E+00	2.40E-04	1.10E-04	0.00E+00	8.62E-04	2.00E-05	3.83E-04
71432	benzene	3.29E-03	1.50E-03	0.00E+00	1.10E-03	5.03E-04	0.00E+00	3.95E-03	9.19E-05	1.76E-03
7782505	chlorine	3.94E-04	0.00E+00	0.00E+00	1.32E-04	0.00E+00	0.00E+00	4.72E-04	1.10E-05	2.10E-04
7440508	copper	2.85E-06	0.00E+00	0.00E+00	9.56E-07	0.00E+00	0.00E+00	3.43E-06	7.97E-08	1.52E-06
100414	ethylbenzene	1.44E-03	6.54E-04	0.00E+00	4.81E-04	2.19E-04	0.00E+00	1.72E-03	4.01E-05	7.66E-04
50000	formaldehyde	2.99E-03	1.36E-03	1.25E-03	1.00E-03	4.56E-04	4.18E-04	3.58E-03	8.34E-05	1.59E-03
110543	hexane	1.25E-03	5.71E-04	0.00E+00	4.20E-04	1.91E-04	0.00E+00	1.51E-03	3.50E-05	6.69E-04
7439921	lead	7.93E-04	0.00E+00	0.00E+00	2.66E-04	0.00E+00	0.00E+00	9.52E-04	2.21E-05	4.23E-04
1330207	m- & p-xylene	0.00E+00	1.86E-03	0.00E+00	0.00E+00	6.22E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00
108383	m-xylene	4.26E-03	0.00E+00	0.00E+00	1.43E-03	0.00E+00	0.00E+00	5.11E-03	1.19E-04	2.27E-03
7439965	manganese	2.85E-06	0.00E+00	0.00E+00	9.56E-07	0.00E+00	0.00E+00	3.43E-06	7.97E-08	1.52E-06
67561	methyl alcohol	6.70E-04	3.05E-04	0.00E+00	2.24E-04	1.02E-04	0.00E+00	8.04E-04	1.87E-05	3.58E-04
91203	naphthalene	1.24E-04	5.67E-05	0.00E+00	4.17E-05	1.90E-05	0.00E+00	1.49E-04	3.47E-06	6.64E-05
7440020	nickel	2.85E-06	0.00E+00	0.00E+00	9.56E-07	0.00E+00	0.00E+00	3.43E-06	7.97E-08	1.52E-06
95476	o-xylene	1.48E-03	6.76E-04	0.00E+00	4.97E-04	2.26E-04	0.00E+00	1.78E-03	4.14E-05	7.92E-04
115071	propene	0.00E+00	4.31E-03	0.00E+00	0.00E+00	1.45E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00
100425	styrene	1.24E-04	5.67E-05	0.00E+00	4.17E-05	1.90E-05	0.00E+00	1.49E-04	3.47E-06	6.64E-05
108883	toluene	6.50E-03	2.96E-03	0.00E+00	2.18E-03	9.92E-04	0.00E+00	7.80E-03	1.81E-04	3.47E-03
7664417	ammonia	0.00E+00	0.00E+00	4.66E-04	0.00E+00	0.00E+00	1.56E-04	0.00E+00	0.00E+00	0.00E+00
95636	1,2,4-Trimethylbenzene	1.21E-03	0.00E+00	0.00E+00	4.04E-04	0.00E+00	0.00E+00	1.45E-03	3.37E-05	6.44E-04

Annual Average GLC (ug/m3)									CP
G_ACC	M_ACC	N_ACC	G_BRAKE	M_BRAKE	N_BRAKE	G_TRAVEL	TOW	TUNING	
2.76E-03	5.77E-04	0.00E+00	4.43E-04	6.14E-05	0.00E+00	1.85E-03	1.66E-05	7.26E-04	6.00E-01
1.99E-04	4.17E-05	0.00E+00	3.21E-05	4.44E-06	0.00E+00	1.34E-04	1.20E-06	5.25E-05	0.00E+00
6.18E-03	1.29E-03	0.00E+00	9.93E-04	1.38E-04	0.00E+00	4.15E-03	3.73E-05	1.63E-03	1.80E-03
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2.49E-03	5.21E-04	0.00E+00	4.01E-04	5.54E-05	0.00E+00	1.67E-03	1.50E-05	6.56E-04	1.00E-02
1.14E-02	2.39E-03	0.00E+00	1.84E-03	2.54E-04	0.00E+00	7.67E-03	6.89E-05	3.01E-03	1.00E-01
1.37E-03	0.00E+00	0.00E+00	2.20E-04	0.00E+00	0.00E+00	9.17E-04	8.24E-06	3.60E-04	0.00E+00
9.91E-06	0.00E+00	0.00E+00	1.59E-06	0.00E+00	0.00E+00	6.65E-06	5.97E-08	2.61E-06	0.00E+00
4.99E-03	1.04E-03	0.00E+00	8.01E-04	1.11E-04	0.00E+00	3.35E-03	3.00E-05	1.31E-03	8.70E-03
1.04E-02	2.17E-03	1.99E-03	1.67E-03	2.31E-04	2.11E-04	6.96E-03	6.25E-05	2.73E-03	2.10E-02
4.35E-03	9.11E-04	0.00E+00	7.00E-04	9.69E-05	0.00E+00	2.92E-03	2.62E-05	1.15E-03	0.00E+00
2.75E-03	0.00E+00	0.00E+00	4.43E-04	0.00E+00	0.00E+00	1.85E-03	1.66E-05	7.24E-04	4.20E-02
0.00E+00	2.96E-03	0.00E+00	0.00E+00	3.15E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1.48E-02	0.00E+00	0.00E+00	2.38E-03	0.00E+00	0.00E+00	9.92E-03	8.91E-05	3.89E-03	0.00E+00
9.91E-06	0.00E+00	0.00E+00	1.59E-06	0.00E+00	0.00E+00	6.65E-06	5.97E-08	2.61E-06	0.00E+00
2.33E-03	4.87E-04	0.00E+00	3.74E-04	5.18E-05	0.00E+00	1.56E-03	1.40E-05	6.12E-04	0.00E+00
4.32E-04	9.03E-05	0.00E+00	6.94E-05	9.61E-06	0.00E+00	2.90E-04	2.60E-06	1.14E-04	1.20E-01
9.91E-06	0.00E+00	0.00E+00	1.59E-06	0.00E+00	0.00E+00	6.65E-06	5.97E-08	2.61E-06	9.10E-01
5.15E-03	1.08E-03	0.00E+00	8.28E-04	1.15E-04	0.00E+00	3.46E-03	3.10E-05	1.36E-03	0.00E+00
0.00E+00	6.88E-03	0.00E+00	0.00E+00	7.32E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4.32E-04	9.03E-05	0.00E+00	6.94E-05	9.61E-06	0.00E+00	2.90E-04	2.60E-06	1.14E-04	0.00E+00
2.26E-02	4.72E-03	0.00E+00	3.63E-03	5.02E-04	0.00E+00	1.51E-02	1.36E-04	5.94E-03	0.00E+00
0.00E+00	0.00E+00	7.42E-04	0.00E+00	0.00E+00	7.90E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4.19E-03	0.00E+00	0.00E+00	6.73E-04	0.00E+00	0.00E+00	2.81E-03	2.52E-05	1.10E-03	0.00E+00

Cancer Risk										Chronic		
G_ACC	**M_ACC**	**N_ACC**	**G_BRAKE**	**M_BRAKE**	**N_BRAKE**	**G_TRAVEL**	**TOW**	**TUNING**	**Total**	**ug/m3**	**REL**	**HI**
4.79E-07	1.00E-07	0.00E+00	7.70E-08	1.07E-08	0.00E+00	3.22E-07	2.89E-09	1.26E-07	1.12E-06	3.34E-03	2.00E+01	1.67E-04
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3.22E-09	6.74E-10	0.00E+00	5.18E-10	7.17E-11	0.00E+00	2.16E-09	1.94E-11	8.48E-10	7.52E-09	2.24E-02	8.00E+03	2.80E-06
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.50E-01	0.00E+00
7.22E-09	1.51E-09	0.00E+00	1.16E-09	1.61E-10	0.00E+00	4.84E-09	4.35E-11	1.90E-09	1.68E-08	3.01E-03	1.40E+02	2.15E-05
3.31E-07	6.93E-08	0.00E+00	5.32E-08	7.37E-09	0.00E+00	2.22E-07	2.00E-09	8.71E-08	7.72E-07	4.15E-02	6.00E+01	6.91E-04
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.37E-03	2.00E-01	6.83E-03
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1.26E-08	2.63E-09	0.00E+00	2.02E-09	2.79E-10	0.00E+00	8.43E-09	7.57E-11	3.30E-09	2.93E-08	2.41E-02	2.00E+03	1.21E-05
6.31E-08	1.32E-08	1.21E-08	1.01E-08	1.40E-09	1.29E-09	4.23E-08	3.80E-10	1.66E-08	1.60E-07	1.45E-02	9.00E+00	1.61E-03
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.26E-03	7.00E+03	7.52E-07
3.35E-08	0.00E+00	0.00E+00	5.38E-09	0.00E+00	0.00E+00	2.25E-08	2.02E-10	8.81E-09	7.04E-08	0.00E+00	0.00E+00	0.00E+00
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.92E-03	7.00E+02	8.46E-06
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.96E-02	7.00E+02	4.23E-05
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.91E-06	9.00E-02	1.10E-04
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.81E-03	4.00E+03	7.03E-07
1.50E-08	3.14E-09	0.00E+00	2.41E-09	3.34E-10	0.00E+00	1.01E-08	9.05E-11	3.95E-09	3.50E-08	5.22E-04	9.00E+00	5.80E-05
2.61E-09	0.00E+00	0.00E+00	4.20E-10	0.00E+00	0.00E+00	1.75E-09	1.57E-11	6.87E-10	5.49E-09	1.98E-05	5.00E-02	3.96E-04
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.25E-02	7.00E+02	1.78E-05
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.88E-03	3.00E+03	2.29E-06
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.22E-04	9.00E+02	5.80E-07
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.19E-02	3.00E+02	2.73E-04
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.42E-04	2.00E+02	3.71E-06
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Total Cancer Risk								**2.21E-06**			**1.03E-02**

ATTACHMENT 4

NOISE SPECIFICATION AND MONITORING PROTOCOL
AUGUST 2010

1.0 PURPOSE

This specification is intended to describe the methods to be employed, equipment to be used, and locations for measurements required to be conducted in accordance with the Auto Club Speedway (herein after known as the Speedway) noise standard.

2.0 APPLICABLE CRITERIA

2.1 NOISE

The proposed noise standard is as follows:

Standard Operating Days (330 Days Annually)	**Remaining 35 Days Annually to be Scheduled in Advance with the County**
▪ 85 dBA Lmax as measured at 550 feet from the Speedway property line ▪ To be applied to all permitted activities at the Speedway Event Center from 7 AM to 11 PM. ▪ The cumulative duration of noise exceeding 75 dBA Lmax within any single day shall be limited as follows: <u>Level 5</u>. 75.1 – 80.0 dBA Lmax: hours not used at Level 4. <u>Level 4</u>. 80.1 – 85.0 dBA Lmax: 8 hours ▪ This standard would not apply to: emergencies, accidents, and activities such as fireworks and aircraft, rail, airship, and helicopter operations.	▪ 100 dBA Lmax as measured at 550 feet from the Speedway property line ▪ To be applied to all permitted activities and vehicles at the Speedway. ▪ Noise levels exceeding 85 dBA Lmax may be exceeded only between the hours of 10 AM and 7PM. ▪ The cumulative duration of noise exceeding 85 dBA Lmax within any single day shall be limited to a maximum total of 60 minutes (one hour) with additional limitations on the cumulative duration of noise exceeding 85 dBA Lmax as follows: <u>Level 3</u>. 85.1 - 90.0 dBA Lmax: 50 minutes <u>Level 2</u>. 90.1 - 95.0 dBA Lmax: 9.5 minutes <u>Level 1</u>. 95.1 – 100.0 dBA Lmax: 30 seconds ▪ The cumulative duration of noise exceeding 75 dBA Lmax to 85.0 dBA Lmax within any single day shall be limited as follows: <u>Level 5</u>. 75.1 – 80.0 dBA Lmax: hours not used at Levels 1 through 4 <u>Level 4.</u> 80.1 – 85.0 dBA Lmax: 3.5 hours ▪ This standard would not apply to: emergencies, accidents, and activities such as fireworks and aircraft, rail, airship, and helicopter operations.

Notes applicable to the noise standard:

1. Any separable Lmax reading at the drag strip between 95.1-100 dBA Lmax will be identified as an “event” and counted as having occurred for 6 seconds. A maximum of 5 events between 95.1 and 100 dBA Lmax at the drag strip are allowed.

2. Any separable Lmax reading at the drag strip between 90.1 to 95 dBA Lmax will be identified as an "event" and counted as having occurred for 6 seconds. A maximum of 95 events within this range 90.1 to 95 are allowed (plus all remaining events of 95.1 dBA Lmax and above that are not used).
3. Any separable Lmax reading at the drag strip between range 85.1 to 90 dBA Lmax will be identified as an "event" and counted as having occurred for 6 seconds. A maximum of 500 events are allowed (plus all remaining events of 90.1 and above that are not used).
4. Any Lmax reading at the facility between range 80.1 to 85 dBA Lmax will be identified and counted. The maximum hours described are allowed (plus all remaining time from 85.1 dBA and above that is not used).
5. Any Lmax reading at the facility between range 75.1 to 80 dBA Lmax will be identified and counted. The maximum hours described are allowed (plus all remaining time from 80.1 dBA and above that is not used).
6. If any exceedance of the Speedway noise standard durations occurs in a day, a National Institute for Occupational Safety and Health (NIOSH) dosage analysis pursuant to the NIOSH 1998 criteria document shall be undertaken. If the daily dosage exceeds a 100% NIOSH dose, the Speedway will be considered to be in violation of the adopted noise standard that day.

2.2 EXCEPTIONS

As noted, the only exceptions to the limits are emergencies, accidents and activities such as fireworks, aircraft, rail, airship and helicopter operations.

2.3 PROHIBITED ACTIVITY

There are no prohibited activities.

DEFINITIONS

Ambient -- The sound level that exists at a location other than that of the quantity being measured for compliance. In this case, it is any sound or assemblage of sounds that are present but not radiating from inside the private property line of the Speedway. The ambient reading shall consist of samples of the prevailing noise sources. For example, the samples for traffic will be the maximum reading of passing cars.

Certified Acoustical Engineer -- A person who is a member of the Institute of Noise Control Engineers or who has been certified by the County.

Clean Measurement -- A Speedway-specific measurement that exceeds the ambient by five (5) dBA.

Compliance -- Compliance is defined to occur when the measurement result yields a value at the approved maximum level, or less, at 550 feet from the property line of the Speedway for the designated time durations as outlined in the table above. Please also see Notes 1 through 6 of the Noise Standard specification for specific compliance details.

County Land Use Services -- The Land Use Services Department of the County of San Bernardino.

Emergency -- Any occurrence or set of circumstances involving actual or imminent physical trauma or property damage which demands immediate action.

Emergency Work -- Any work performed for the purpose of preventing or alleviating an emergency.

Exempted Operations -- Emergencies, accidents and non-racing activities such as fireworks, railroads, aircraft, airships and helicopters.

Exterior Speedway Boundary Property Line -- The boundary of the Speedway.

Hard Copy -- Any permanent recording medium including paper, Compact Disk, DVD or magnetic chip. Electronic copies must be in a format that can be reproduced on paper or standard computer programs.

Maximum Value -- The maximum value of a measurement is the highest "A" weighted decibel value reached during a measurement interval.

Measurement Frequency -- At least one time taken at any time the Speedway is in operation.

Measurement Period -- One sample.

Measurement Sample -- An "A" weighted maximum reading taken in conformance with the measurement instructions.

Non-Compliance – Non-Compliance would occur if any non-emergency Speedway-associated sound source producing an "A" weighted sound level results if the following conditions are met:

(1) Sound level exceed at least 5 dBA above the ambient noise levels; and
(2) Sound level exceeds the approved maximum levels set forth in the noise standard (by 1 dBA or higher) at 550 feet from the property line of the Auto Club Speedway; or
(3) Results in a NIOSH dosage analysis of greater than 100% pursuant to the NIOSH 1998 criteria. document.

Ongoing Operations -- Any operation within the exterior Speedway boundary property line that can reasonably be construed to be part of the activities under the control of the Speedway.

Public Right-of-Way -- Any street, avenue, boulevard, highway, sidewalk, alley or similar place which is owned or controlled by a governmental agency.

Resolution -- The minimum increment which can be assigned to a measurement value. In this case, it is one (l) dBA.

Sound Level Meter -- An instrument which includes a microphone, amplifier, RMS detector, integrator or time averaging function, output meter and weighting networks used to measure the sound pressure level and which conforms to a specification for Type 1 or Type 2 meters as defined by the American National Standards Institute specification 51.4-1971, or later version.

Source -- The car or cars using the facilities of the Speedway.

Speedway --The Auto Club Speedway, including the drag way, speedway oval, parking lots and ancillary facilities.

All acoustical terminology not defined above shall be in conformance with the applicable American National Standards Institute publications.

4.0 INSTRUMENTATION

The instrumentation to be used for the measurement shall consist, as a minimum, of the following:

1. A sound level meter conforming to the specification for Type 1 or Type 2 instruments as defined by the American National Standards Institute specification Sl.4-1971, or the most recent update.

2. A portable acoustic calibrator with an accuracy of plus/minus 0.5 dB capable of producing a prescribed one (1) Kilohertz tone at a constant level.

3. A windscreen which does not affect the microphone response more than plus/minus one (1) dB for frequencies 63 to 4000 Hertz, and plus/minus 1.5 dB for frequencies above 4000 Hertz.

4. Meteorological instruments capable of measuring wind speed, wind direction, relative humidity and temperature with an accuracy of plus/minus ten percent (10%). The sound level meter, calibrator and recording device shall carry calibration certificates showing calibration within the past 365 days by a laboratory traceable to the National Bureau of Standards.

5.0 SETTINGS

The measurement system shall be set as follows:

Weighting: "A" Scale Dynamic Response: FAST Scale: As appropriate to cover the range of the expected sound levels.

6.0 METEOROLOGICAL CONDITIONS

The following conditions must exist for a valid measurement:

1.	Relative Humidity:	Higher than 30 percent.
2.	Temperature:	In excess of 45 degrees Fahrenheit.
3.	Wind:	Under ten miles per hour average.

7.0 MEASUREMENT REQUIREMENTS

1. The measurement resolution shall be taken to be one (1) decibel.

2. The microphone shall be no closer than ten (10) feet from any solid obstruction such as a wall, pole, fence, or any other object whose size, shape, and position could modify direct transmission of sound, or cause undesirable reflections of sound.

3. The microphone shall be set five (5) feet above the ground at the measurement location.

4. Each measurement shall be taken when the Speedway is in operation.

5. Fractional values are to be rounded up or down according to the convention that any value 0.5, or higher, shall be rounded up to the nearest integer and any value 0.4, or less, shall be rounded down to the nearest integer and identified with the appropriate “event” within levels in the Noise Standard.

6. Speedway noise emission values conforming to the Noise Standard of the approved maximum level and duration, or less, for the designated 35 days a year shall constitute evidence of compliance. Any value of one (1) dBA, or higher, above the approved maximum level and duration shall be considered possible evidence of noncompliance.

   Any Speedway noise emission value conforming to the Noise Standard of the approved maximum level and duration, or less for the designated 330 standard operation days a year shall constitute evidence of compliance. Any value of 86 dBA, or higher, shall be considered possible evidence of noncompliance.

   Any Speedway noise value not conforming to the Noise Standard and in excess of a NIOSH dosage analysis of greater than 100% pursuant to the NIOSH 1998 criteria document, shall be considered possible evidence of noncompliance.

7. At the start and finish of each measurement interval at each location, the equipment shall be calibrated using an acoustic calibrator.

8. At each measurement location, the events being measured shall be recorded to the extent that it is feasible to identify the exact source.

9. The temperature, relative humidity, wind speed and wind direction shall be recorded at each measurement location.

10. Measurements shall be recorded on a form.

11. More than a single measurement is permitted.

8.0 CALCULATION PROCEDURE

Two types of measurements shall be conducted at any location. Two conditions must be considered and are framed in the questions below. One measurement shall be of the ambient sound without the project sound sources in operation. The second measurement shall be made with the project sound sources in operation. Measurements shall be conducted in the manner prescribed in Section 7.0.

First Question: Is the Source more than 5 dBA above ambient noise levels?

Second Question: Is the Source greater than the approved maximum level (by 1 dBA, or higher) for the days and time duration for which the approved maximum level is the standard?

If the Source is more than 5 dBA above the ambient and if the Source is greater than the approved maximum level and duration, then there is a violation of the condition of compliance. If one or both conditions are not met, then there is no violation.

Third Question: Do the collective Source measurements not conform to the Noise Standard and do they exceed the NIOSH dosage analysis of greater than 100% pursuant to the NIOSH 1998 criteria document? If both of these conditions are not met, then there is no violation.

In the event that the ambient sound cannot be suitably separated from the measurement record in conformance with the specification for a clean measurement of the Source, the sound levels at that location shall be determined to be in compliance, consistent with the County’s existing noise standard.

9.0 REPORTING

When measurements are taken, a written report shall be filed with the County after any measurement period. The report shall contain the following information as a minimum:

1. Description of each measurement location and a map showing all such locations. Measurement locations shall be identified by a unique description such as a number that shall not be repeated for any other location. Additional locations or relocation of a measurement point shall be assigned a unique description in the same format as all others. No description may be used twice.

2. Date, start time and finish time of the measurement at each location.

3. Equipment settings as appropriate to the instrumentation used.

4. A hard copy of the record at each location used for determining the levels, including identification of the selected samples.

5. A listing of the ambient sound sources.

6. A description of the event being recorded at each location to the extent that is feasible.

7. The name of the person performing the measurements and the name of the author of the report.

8. A copy of the equipment calibration forms.

9. A certification that the measurements were performed in accordance with this specification.

The Certified Acoustical Engineer shall submit the written report to the County Land Use Services Department within five working days of the measurement.