



T 510.836.4200
F 510.836.4205

1939 Harrison Street, Ste. 150
Oakland, CA 94612

www.lozeaudrury.com
Amalia@lozeaudrury.com

June 15, 2023

Via Email

Planning and Land Use Management Committee
City of Los Angeles
Councilmember Marqueece Harris-Dawson, Chair
Councilmember Monica Rodriguez
Councilmember Katy Yaroslavsky
Councilmember John S. Lee
Councilmember Heather Hutt
John Ferraro Council Chamber
200 N. Spring Street, Room 340
Los Angeles, CA 90012
c/o Candy Rosales, Legislative Assistant
clerk.plumcommittee@lacity.org

More Song, Planning Assistant
Department of City Planning
City of Los Angeles
200 N. Spring Street, Room 763
Los Angeles, CA. 90012
more.song@lacity.org

**Re: Comment on Categorical Exemption for the TENTEN Hollywood Project
(CPC-2020-3253-DB-SPR-HCA; ENV-2020-3254-CE)
June 20, 2023 PLUM Committee Hearing**

Dear Chair Harris-Dawson and Members of the Planning and Land Use Committee:

I am writing on behalf of Supporters Alliance for Environmental Responsibility ("SAFER"), regarding the California Environmental Quality Act ("CEQA") Class 32 (In-fill Development) Categorical Exemption prepared for the proposed TENTEN Hollywood Project (CPC-2020-3253-DB-SPR-HCA; ENV-2020-3254-CE), including all actions related or referring to the construction of two five- to six-story buildings with a total of 169 residential dwelling units and three levels of subterranean parking, located at 1125 North Gower Street in the City of Los Angeles ("Project"), which is scheduled to be heard by the PLUM Committee on June 20, 2023.

SAFER objects to the City's decision to exempt the Project from review under the California Environmental Quality Act ("CEQA") pursuant to Section 15332 of the CEQA Guidelines, also known as the "Class 32" or "infill exemption." SAFER requests that the PLUM Committee decline to approve the Project unless and until proper CEQA review is conducted. CEQA review is required to analyze the Project's significant impacts and to propose feasible mitigation measures.

On September 21, 2022, SAFER submitted comments providing substantial evidence of significant air quality impacts from the Project, and concluded that the City's determination that the Project qualified for an exemption was not supported by substantial evidence. (SAFER Comment, September 2022.) On March 24, 2023, the City prepared a response to comments, which SAFER responds to herein.

This comment is supported by the comments of expert wildlife biologist Dr. Shawn Smallwood, Ph.D., who concludes that the Project site has value as habitat for a rare species, and that the City's finding to the contrary is not supported by substantial evidence. Dr. Smallwood's comment and CV are attached to this comment as Exhibit A.

This comment is also supported by the comments of industrial hygienist, Francis Offermann, P.E., who rebuts the City's response to his comment in SAFER's September 2022 Comment, and again concludes that the Project may have significant indoor air quality impacts. The City still failed to adequately assess indoor air quality impacts, therefore its conclusion that the Project will not have impacts on air quality is not supported by substantial evidence. Mr. Offermann's comment and CV are attached to this comment as Exhibit B.

Based on these comments, the City of Los Angeles ("City") cannot rely on the Class 32 Categorical Exemption because the terms of the exemption do not apply and because its determination is not supported by substantial evidence. Since the Project is not exempt from CEQA, an initial study must be prepared to determine the appropriate level of CEQA review required.

LEGAL STANDARD

As the California Supreme Court has held, "[i]f no EIR has been prepared for a nonexempt project, but substantial evidence in the record supports a fair argument that the project may result in significant adverse impacts, the proper remedy is to order preparation of an EIR." (*Communities for a Better Env't v. South Coast Air Quality Mgmt. Dist.* (2010) 48 Cal.4th 310, 319-20 [citing *No Oil, Inc. v. City of Los Angeles* (1974) 13 Cal.3d 68, 75, 88]; *Brentwood Assn. for No Drilling, Inc. v. City of Los Angeles* (1982) 134 Cal.App.3d 491, 504-505). "Significant environmental effect" is defined very broadly as "a substantial or potentially substantial adverse change in the environment." (Pub. Res. Code ("PRC") § 21068; see also, 14 CCR § 15382). An effect on the environment need not be "momentous" to meet the CEQA test for significance; it is enough that the impacts are "not trivial." (*No Oil, Inc.*, 13 Cal.3d at 83). "The 'foremost principle' in interpreting CEQA is that the Legislature intended the act to be read so as to afford the fullest possible protection to the environment within the reasonable scope of the statutory language." (*Communities for a Better Env't v. Cal. Res. Agency* (2002) 103 Cal.App.4th 98, 109).

To achieve its objectives of environmental protection, CEQA has a three-tiered structure. (14 CCR § 15002(k); *Committee to Save the Hollywoodland Specific Plan v. City of Los Angeles*

(2008) 161 Cal.App.4th 1168, 1185-86). First, if a project falls into an exempt category, or it can be seen with certainty that the activity in question will not have a significant effect on the environment, no further agency evaluation is required. (*Id.*) Second, if there is a possibility the project will have a significant effect on the environment, the agency must perform an initial threshold study. (*Id.*; 14 CCR § 15063(a).) If the study indicates that there is no substantial evidence that the project or any of its aspects may cause a significant effect on the environment the agency may issue a negative declaration. (*Id.*; 14 CCR §§ 15063(b)(2), 15070.) Finally, if the project will have a significant effect on the environment, an EIR is required. (*Id.*)

The classes of projects which are exempt from the provisions of CEQA are called categorical exemptions. (14 CCR §§ 15300, 15354.) “Exemptions to CEQA are narrowly construed and ‘[e]xemption categories are not to be expanded beyond the reasonable scope of their statutory language.’ [Citations].” (*Mountain Lion Foundation v. Fish & Game Com.* (1997) 16 Cal.4th 105, 125.) The determination as to the appropriate scope of a categorical exemption is a question of law subject to independent, or de novo, review. (*San Lorenzo Valley Community Advocates for Responsible Education v. San Lorenzo Valley Unified School Dist.*, (2006) 139 Cal. App. 4th 1356, 1375 [“[Q]uestions of interpretation or application of the requirements of CEQA are matters of law. [Citations.] Thus, for example, interpreting the scope of a CEQA exemption presents ‘a question of law, subject to de novo review by this court.’ [Citations].”].) In addition, there are several exceptions to CEQA’s categorical exemptions. (See, 14 CCR § 15300.2.) The City has chosen to proceed under a Categorical Exemption for In-Fill Development, but as demonstrated below, the Project does not qualify for that exemption and the City must prepare an initial study and determine the appropriate level of CEQA review.

DISCUSSION

I. The Class 32 Exemption Does Not Apply on its Face.

The proposed Project does not qualify for a Class 32 categorical exemption under CEQA because the Project has value as habitat for a rare species. The City must prepare an Initial Study and a mitigated negative declaration or an environmental impact report to analyze the Project’s impacts and propose feasible mitigation measures.

The City is relying on the Class 32 (in-fill development) categorical exemption for this project. The Class 32 exemption provides:

Class 32 consists of projects characterized as in-fill development meeting the conditions described in this section.

- (a) The project is consistent with the applicable general plan designation and all applicable general plan policies as well as with applicable zoning designation and regulations.

- (b) The proposed development occurs within city limits on a project site of no more than five acres substantially surrounded by urban uses.
- (c) The project site *has no value, as habitat for endangered, rare or threatened species*.
- (d) Approval of the project would not result in any significant effects relating to traffic, noise, air quality, or water quality.
- (e) The site can be adequately served by all required utilities and public services.

(14 CCR § 15332 [emph. added]).

A key limitation of the Class 32 exemption is that it does not apply if the project has value as habitat for endangered, rare or threatened species. (14 CCR § 15332(c).) Here, the exemption cannot apply because there is substantial evidence which demonstrates that the Project has value as habitat for a rare species.

A. The Project Site Has Value as Habitat for a Rare Species, Precluding the Use of the CEQA Infill Exemption.

Shawn Smallwood, Ph.D. reviewed the City's analysis of the Project's biological impacts, reviewed wildlife databases, and conducted a site visit of the Project site along with a colleague. On his site visit, Dr. Smallwood observed three red-tailed hawks at and near the site. Red-tailed hawks are a rare species, therefore the site has value as habitat for a rare species, and the infill exemption is inapplicable. Dr. Smallwood's comment letter and CV are attached as Exhibit A and his comments are briefly summarized here.

Dr. Smallwood's analysis of the Project's impacts is supported by a site visit conducted by himself and by wildlife biologist Noriko Smallwood on September 20, 2022. (Ex. A, p. 1.) They reconnoitered the area for 1.1 hours with the use of binoculars to scan for wildlife. (*Id.*) During that visit, they observed the presence of seven species of vertebrate wildlife at the Project site, including American crows, common ravens, and Anna's hummingbirds. (*Id.*, see Ex. A, p. 2, Table 1 and Photo 2.) Dr. Smallwood and Noriko Smallwood also observed three red-tailed hawks flying near the site, dropping legs in courtship displays. (*Id.*, see Ex. A, p. 2, Photo 1.)

The red-tailed hawk is a raptor, and is therefore protected by California Fish and Game Code § 3503.5, also known as the Birds of Prey Code. (Ex. A, p. 6.) Dr. Smallwood states, "[r]aptors are protected by this Code because raptors are top predators wherever they live. Their positions in the food chain naturally require that they are rare . . . Raptors protected by CFG Code § 3503.5 are special-status species." (*Id.*) As one county explains, "'Special Status Species' is a universal term used in the scientific community for species that are considered

sufficiently rare that they require special consideration and/or protection and should be, or have been, listed as rare, threatened or endangered by the Federal and/or State governments.”¹

Dr. Smallwood’s observation of three red-tailed hawks flying at and near the site and engaging in courtship displays is therefore substantial evidence that the Project site has value as habitat for a rare species. In Dr. Smallwood’s expert opinion, “[t]here is no question that the site provides habitat value despite its urban setting and impervious ground surface. Habitat value to wildlife is maintained by the shrubs and trees around the site’s perimeter. Removal of these trees would eliminate all of the habitat value to wildlife except for the aerosphere of the site.” (Ex. A, p. 10.) The City is precluded from using the Class 32 Exemption.

B. The Unusual Circumstances Exception Precludes Reliance on the Class 32 Exemption.

A categorical exemption is inapplicable “where there is a reasonable possibility that the activity will have a significant effect on the environment due to unusual circumstances.” (14 CCR 15300.2(c)). Here, the Project does not present the same general risk of environmental impacts as other projects falling under Class 32 exemptions and therefore the exemption cannot apply.

In *Berkeley Hillside Preservation v. City of Berkeley*, the California Supreme Court explained that there are two ways a party may invoke the unusual circumstances exception. First, “a party may establish an unusual circumstance with evidence that the project *will* have a significant environmental effect. That evidence, if convincing, necessarily also establishes ‘a reasonable possibility that the activity will have a significant effect on the environment due to unusual circumstances.’” (*Berkeley Hillside Preservation v. City of Berkeley* (2015) 60 Cal.4th 1086, 1105 [emph. added]). Alternatively, “[a] party invoking the exception may establish an unusual circumstance without evidence of an environmental effect, by showing that the project has some feature that distinguishes it from others in the exempt class, such as its size or location. In such a case, to render the exception applicable, the party need only show a reasonable possibility of a significant effect due to that unusual circumstance.” (*Id.*).

As discussed above, we have submitted substantial evidence that the Project has value as habitat for a rare species, and would therefore significantly impact that species if constructed as proposed. The fact that this significant impact will occur constitutes an unusual circumstance, precluding the City’s reliance on an exemption.

II. The City Lacks Substantial Evidence to Support a Class 32 Exemption for the Project.

¹ Sacramento County, Planning and Environmental Review, “Special Status Species,” available at https://planning.saccounty.net/InterestedCitizens/Pages/ER_SpecialStatusSpecies.aspx (accessed on Oct. 11, 2022).

An agency's determination that a categorical exemption applies to a project must be supported by substantial evidence. (See, *Association for Protection etc. Values v. City of Ukiah* (1991) 2 Cal.App.4th 720, 728.) Substantial evidence is defined in the CEQA Guidelines as "enough relevant information and reasonable inferences from this information that a fair argument can be made to support a conclusion, even though other conclusions might also be reached," and includes "facts, reasonable assumptions predicated upon facts, and expert opinion supported by facts." (14 CCR § 15384.)

Here, the City has failed to provide substantial evidence that the Project meets the requirements of the Class 32 Exemption. The City failed to provide sufficient evidence to demonstrate that the Project site has no value as habitat for special-status species. The City also failed to provide sufficient evidence that the Project would have no significant noise impact or air quality impact. Approval of the Project based on an exemption without supporting evidence is an abuse of discretion.

A. The City failed to provide substantial evidence that the Project will not have significant noise impacts.

SAFER's September 2022 Comments included the comments of acoustical engineer Deborah Jue, M.S., of the consulting firm Wilson Ihrig, who concluded that the Project may have significant noise impacts. (SAFER Comment, September 2022, Exhibit C). The City prepared a response letter to this comment. (City RTC, March 2023, p.77 – 83.) After reviewing that response, SAFER reiterates that the Project may have significant noise impacts, and that the City's analysis of noise impacts is not supported by substantial evidence, precluding the use of the Infill Exemption.

Ms. Jue's September 2022 comment letter first found that the Project's baseline noise level characterizations were incomplete, specifically due to a lack of baseline data for nighttime noise. (SAFER Comment, September 2022, Exhibit C, p. 2.) Ms. Jue noted that "social events in the roof deck terrace with pool and lounge spaces could occur during evening hours, and rooftop equipment could also operate during evening and nighttime conditions." (*Id.* at p.1.) Ms. Jue also pointed out that the noise analysis relied on measurements taken only in the middle of the day (2 to 3 p.m.), and did not discuss how typical these data were for daytime conditions. (*Id.*)

The City responded by quoting the Los Angeles Municipal Code ("LAMC") Section 111.01, which states that "[a]mbient noise shall be averaged over a period of at least 15 minutes at a location and time of day comparable to that during which the measurement is taken of the particular noise source being measured." The City then stated that its noise measurements were taken "when all construction activities and a majority of operational activities would occur." (City RTC, p. 78.) The City went on to state that "[n]o construction activity would occur prior to 7:00 a.m. or after 6:00 p.m. so there is no reason to conduct ambient noise measurements for the nighttime hours." (*Id.*)

The City's response fails to address the issues raised by Ms. Jue. First of all, the City still

fails to explain how measurements taken only in the span of one hour are representative of daytime conditions, especially given that there are 10 other hours of the day in which construction activity could occur. Additionally, the City's assertion that there is "no reason" to take ambient noise measurements during nighttime hours completely ignores Ms. Jue's comment that there could be social events and rooftop equipment operating during the evening and nighttime which could cause noise impacts. The Categorical Exemption report ("CE") prepared by the City states that "residential amenity space would be located on the ground floor and the roof deck of the six-story structure." (CE, p. 19.) There is therefore ample reason to take additional ambient noise measurements, and without this information, the City has failed to support its findings with substantial evidence.

Ms. Jue's September 2022 comment letter also concluded that 50 voices on the rooftop deck/terraces proposed in the Project would generate 72 dBA of noise at a distance of 90 feet, which would be much higher than 5 dBA above daytime noise levels, and likely much higher than 5 dBA above nighttime ambient levels. (SAFER Comment, September 2022, Ex. C, p.3).

The City's response states that Ms. Jue's assertions "provide[] no calculations, references, or evidence to support these estimated noise levels." (City RTC, p. 80.) Ms. Jue has a B.S. in General Engineering: Acoustics, an M.S. in Mechanical Engineering, and over 30 years of experience providing noise measurement, analysis and recommendations to control noise and vibration. (*See*, Exhibit C [Deborah Jue resume].) Ms. Jue is well qualified to estimate the noise levels of the Project. Additionally, the City does not provide its own calculations of potential noise on the rooftop deck, stating only that Ms. Jue's claims are speculative, therefore Ms. Jue's findings constitute the only evidence of this potential, significant impact. (*See* City RTC, p. 80-81.)

Lastly, Ms. Jue's September 2022 comment pointed out that the Categorical Exemption's assumption that the HVAC equipment would be similar to that used at the existing building was erroneous, because the proposed Project would require nighttime ventilation for residents, in contrast to the existing commercial building. (SAFER Comment, September 2022, Exhibit C, p. 3.) Ms. Jue estimated that the nighttime HVAC would create noise at a level of 51 dBA at a distance of 100 feet, a potentially significant impact. (*Id.*) Ms. Jue based this calculation on Wilson Ihrig's experience of reviewing numerous projects over the course of decades of experience.

The City responded by stating that Ms. Jue estimated the noise impacts of certain types of equipment "with no evidence or references to whether these types of equipment may actually be used for the Proposed Project." (City RTC, p. 81.) The City states that "the design and placement of HVAC units and exhaust fan would be required to comply with the regulations under Section 112.02 of the LAMC, which prohibits noise from air conditioning, refrigeration, heating, pumping, and filtering equipment from exceeding the ambient noise level on the premises of other occupied properties by more than five decibels." (*Id.*) This statement fails to point to any evidence demonstrating which equipment will in fact be used, or the potential noise impacts of

that equipment. Ms. Jue's calculations remain un rebutted, and present substantial evidence of potential noise impacts from the Project. The City has failed to provide substantial evidence to the contrary, precluding the use of the Exemption.

B. The City failed to provide substantial evidence that the Project site has no value as habitat for rare, threatened, or endangered species.

Dr. Smallwood found that the City inadequately characterized the existing environmental setting as it relates to wildlife, and therefore failed to provide substantial evidence to support its finding that the site lacks value as habitat for species.

The City failed to complete the threshold steps necessary to characterize an environmental setting. Based on the information in the CE report, no biologist surveyed the site for wildlife to support the City's findings that the site has no value as habitat for rare, endangered, or threatened species. As Dr. Smallwood states, "[t]he surest way to see no wildlife is to not look for them." (Ex. A, p. 4.)

In its Response to Comments, the City stated that according to its consultant's biological review, "[t]he site does not contain any native habitat capable of supporting state or federally listed rare, threatened, or endangered species, or other special-status species." (RTC, p. 18.) However, Dr. Smallwood points out that this is an inaccurate and misleading conclusion, because there are many examples of special-status species occurring in areas covered by non-native vegetation and on anthropogenic structures. (Ex. A, p. 6.) Based on Dr. Smallwood's site visit and database reviews, there are 77 special-status species which have been documented on occurrence databases as having occurred within 4 miles of the Project site. (Ex. A, p. 6, *see* p. 7-9, Table 2.) Most importantly, the City ignores the fact that Dr. Smallwood positively identified special status species on the Project site.

Dr. Smallwood notes that the City also failed to assess how construction of the Project would increase the likelihood of bird-window collisions, and interfere with the aerosphere, another key aspect of species habitat. (Ex. A, p. 10). The aerosphere is "a principal medium of life to volant animals such as birds," and is "where birds and bats and other volant animals with wings migrate, disperse, forage, perform courtship and where some of them mate." (*Id.*) Dr. Smallwood's database review and site visit indicated that there are 86 special-status species of birds with the potential to use the site's aerosphere. (*Id.* at 11.) He notes that window collisions are often characterized as either the second or third largest source of human-caused bird mortality, and that glass facades of buildings intercept and kill birds by the millions. (*Id.*) Based on Dr. Smallwood's review and processing of bird collision monitoring results from over 200 projects, and based on the Project's proposed building height and renderings, he estimates that the Project could cause up to 412 bird deaths per year. (*Id.* at 13.)

The City's unsupported conclusions regarding biological resources onsite and the Project's potential impact on them are directly negated by Dr. Smallwood's expert findings, which include expert opinion and photographs of species observed on and near the Project site.

The City's use of an exemption is unsupported, and an MND or an EIR should be prepared for the Project to ensure species are accurately detected and that any impacts are mitigated to a less than significant level.

C. The Project may have a significant health risk impact from indoor air quality impacts which the City failed to analyze, precluding reliance on the Class 32 exemption.

Certified Industrial Hygienist, Francis "Bud" Offermann, PE, CIH, prepared comments on the Project which were included as Exhibit A to SAFER's September 2022 comment letter. In his comments, Mr. Offermann concluded that it is likely that the Project will expose residents and commercial employees of the Project to significant impacts related to indoor air quality, and in particular, emissions of the cancer-causing chemical formaldehyde. The City prepared a response to Mr. Offermann's comments, which Mr. Offermann reviewed and provided a rebuttal to, attached hereto as Exhibit B. The City's responses and Mr. Offermann's rebuttals are summarized below.

The City's response to comments stated that Mr. Offermann's comment was speculative and based on incorrect assumptions. (City RTC, p. 24.) In rebuttal, Mr. Offermann pointed to the portion of his comment letter in which he stated that he was not asking the builder to speculate on how much composite material would be used, but rather "at the design stage to select composite wood materials based on the formaldehyde emission rates that manufacturers routinely conduct using the California Department of Health "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions for Indoor Sources Using Environmental Chambers," (CDPH, 2017), and use the procedure described earlier above (i.e., Pre-Construction Building Material/Furnishing Formaldehyde Emissions Assessment) to insure that the materials selected achieve acceptable cancer risks from material off gassing of formaldehyde." (Ex. B, p. 3; quoting SAFER comment, September 2022, Exhibit A, p. 16.)

The City's RTC also stated that building materials would be in compliance with the LAMC, CALGreen, the L.A. Green Building Code, California Code of Regulations Title 17, Sections 93120 through 93120.12, and other applicable regulations. (City RTC, p. 27.) Mr. Offermann stated in rebuttal that, as he stated in his initial comments, "even if the Project uses composite wood products that meet CARB ATCM regulation for formaldehyde emissions from composite wood products, and as required in the CALGreen Code and other California regulations, the ensuing indoor concentrations of formaldehyde will result in cancer risks that exceed 10 per million." (Ex. B, p. 4; quoting SAFER comment, September 2022, Exhibit A, p. 11-12.)

Mr. Offermann's comments demonstrate that the Project will have significant air quality impacts which were not analyzed by the City, precluding the applicability of the Class 32 Exemption. (14 CCR § 15332(d).) Mr. Offermann's comments point out feasible mitigation measures which would drastically reduce formaldehyde exposure and have been implemented in many similar projects. CEQA review is required to analyze such mitigation measures.

CONCLUSION

The City cannot rely on a Class 32 exemption because the Project does not meet the terms of the exemption. Accordingly, the City must prepare an initial study followed by a mitigated negative declaration or EIR. The CEQA document must analyze the Project's environmental impacts and propose feasible mitigation measures. Thank you for considering these comments.

Sincerely,

A handwritten signature in black ink, appearing to read "Amalia Bowley Fuentes", with a stylized, flowing script.

Amalia Bowley Fuentes
Lozeau Drury LLP

EXHIBIT A

Shawn Smallwood, PhD
3108 Finch Street
Davis, CA 95616

The City of Los Angeles
Department of City Planning
City Hall 200 North Spring Street
Los Angeles, CA 90012

13 June 2023

RE: TenTen Hollywood Project

To Whom It May Concern,

I write to comment on a proposed Categorical Exclusion for the TenTen Hollywood project, which I understand would add 58.5- and 73.5-foot-tall, 5- and 6-story, buildings with 249,741 square feet of residential floor space on 2.09 acres in Hollywood, California. The project would remove 22 on-site trees and 3 street trees. My comments also reply to responses to comments prepared by Glenn Lukos Associates (GLA 2023).

My qualifications for preparing expert comments are the following. I hold a Ph.D. degree in Ecology from University of California at Davis, where I also worked as a post-graduate researcher in the Department of Agronomy and Range Sciences. My research has been on animal density and distribution, habitat selection, wildlife interactions with the anthrosphere, and conservation of rare and endangered species. I authored many papers on these and other topics. I served as Chair of the Conservation Affairs Committee for The Wildlife Society – Western Section. I am a member of The Wildlife Society and Raptor Research Foundation, and I've lectured part-time at California State University, Sacramento. I was Associate Editor of wildlife biology's premier scientific journal, The Journal of Wildlife Management, as well as of Biological Conservation, and I was on the Editorial Board of Environmental Management. I have performed wildlife surveys in California for thirty-seven years. My CV is attached.

SITE VISIT

I surveyed the site along with Noriko Smallwood, a wildlife biologist with a Master's Degree from California State University Los Angeles. We surveyed the site of the proposed project for 1.1 hours from 11:53 to 12:59 hours on 20 September 2022. We walked around the parking lot that would be the project's footprint, and we scanned for wildlife with use of binoculars. Conditions were clear, 78° F, and no wind. The site was covered by asphalt, but surrounded by ornamental shrubs and trees including palms, crape myrtle, weeping bottlebrush, and paper bark tea tree among other species.

We saw seven species of vertebrate wildlife at the project site (Table 1), including 3 red-tailed hawks that were dropping legs in courtship displays (Photo 1). American crows and common ravens made ample use of the site, including for caching food (Photo 2). Anna's hummingbirds were also intensively using the site, often defending territories.

Noriko Smallwood certifies that the foregoing and following survey results are true and accurately reported.


Noriko Smallwood

Table 1. Species of wildlife Noriko and I observed during 1.1 hours of survey on 20 September 2022.

| Common name | Species name | Status ¹ | Notes |
|--------------------|------------------------------|---------------------|-----------------|
| Rock pigeon | <i>Columba livia</i> | Non-native | |
| Anna's hummingbird | <i>Calypte anna</i> | | |
| Red-tailed hawk | <i>Buteo jamaicensis</i> | BOP | 3 flying nearby |
| American crow | <i>Corvus brachyrhynchos</i> | | |
| Common raven | <i>Corvus corax</i> | | |
| House sparrow | <i>Passer domesticus</i> | Non-native | |
| House finch | <i>Haemorphous mexicanus</i> | | |

¹ Listed as BOP = Birds of Prey (California Fish and Game Code 3503.5).



Photos 1 and 2. Red-tailed hawks dropping legs in courtship display (left) and common raven (right) on the project site, 20 September 2022.

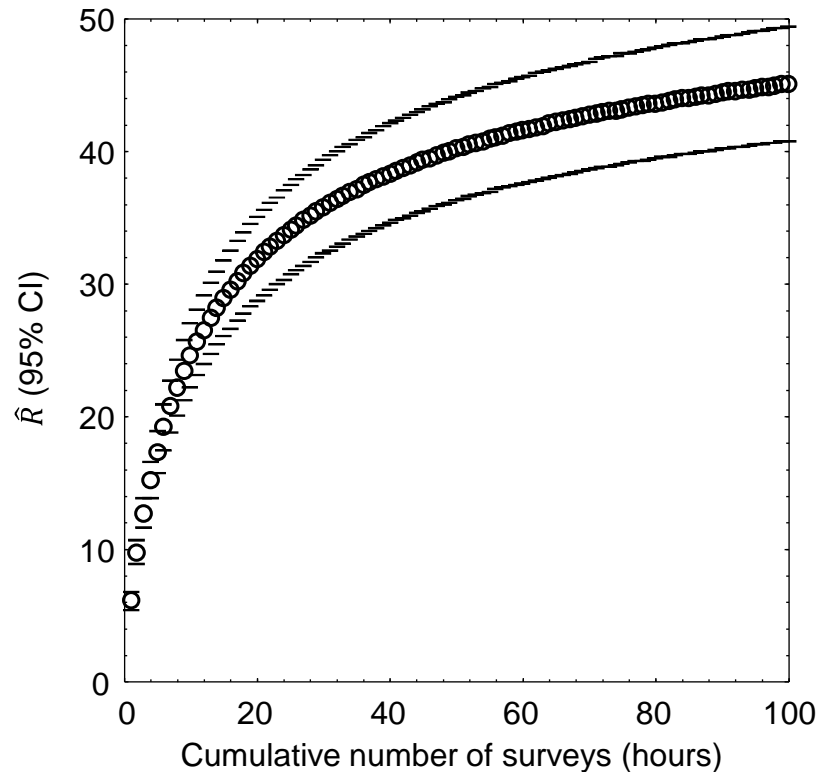
Our survey was only a reconnaissance-level survey that we performed in the noon-hour, close to the least productive time of day for detecting birds (it was the only time we could visit the site). Reconnaissance-level surveys can be useful for confirming presence of species that are detected, but they can also be useful for estimating the number of

species that were not detected. By use of an analytical bridge, a modeling effort applied to a much larger, more robust data set at a research site can predict the number of vertebrate wildlife species likely making use of the site over the longer term. As part of my research, I completed a much larger survey effort across 167 km² of annual grasslands of the Altamont Pass Wind Resource Area, where from 2015 through 2019 I performed 721 1-hour visual-scan surveys, or 721 hours of surveys, at 46 stations. I used binoculars and otherwise the methods were the same as the methods Noriko and I and other consulting biologists use for surveys at proposed project sites. At each of the 46 survey stations, I tallied new species detected with each sequential survey at that station, and then related the cumulative species detected to the hours (number of surveys, as each survey lasted 1 hour) used to accumulate my counts of species detected. I used combined quadratic and simplex methods of estimation in Statistica to estimate least-squares, best-fit nonlinear models of the number of cumulative species detected regressed on hours of survey (number of surveys) at the station: $\hat{R} = \frac{1}{1/a+b \times (Hours)^c}$, where \hat{R} represented cumulative species richness detected. The coefficients of determination, r^2 , of the models ranged 0.88 to 1.00, with a mean of 0.97 (95% CI: 0.96, 0.98); or in other words, the models were excellent fits to the data.

I projected the predictions of each model to thousands of hours to find predicted asymptotes of wildlife species richness. The mean model-predicted asymptote of species richness was 57 after 11,857 hours of visual-scan surveys among the 46 stations. I also averaged model predictions of species richness at each incremental increase of number of surveys, i.e., number of hours (Figure 1). On average I detected 6.45 species over the first 1.1 hours of surveys in my Altamont Pass research site (1.1 hours to match the number of hours Noriko and I surveyed at the project site), which composed 11.3% of the total predicted species I would detect with a much larger survey effort. Given the example illustrated in Figure 1, the 7 species Noriko and I detected after our 1.1 hours of survey at the project site likely represented 11.3% of the species to be detected after many more visual-scan surveys over another year or longer. With many more repeat surveys through the year, Noriko and I would likely detect $7/0.113 = 62$ species of vertebrate wildlife at the site. Assuming our ratio of special-status to non-special-status species was to hold with through the detections of all 62 predicted species, then continued surveys would eventually detect 9 special-status species of vertebrate wildlife.

My prediction of 62 species of vertebrate wildlife, including 9 special-status species, is derived from a visual-scan survey during the daytime, and would not detect nocturnal mammals such as bats. The true number of species composing the wildlife community of the site must be larger. A single reconnaissance-level survey should serve only as a starting point toward characterization of a site's wildlife community, but it certainly cannot alone inform of the inventory of species that use the site. What we did see of the site, the site provides habitat value to a confirmed list of 7 species of wildlife, and a predicted list of at least 62 species, including a predicted 9 special-status species of wildlife.

Figure 1. Mean (95% CI) predicted wildlife species richness, \hat{R} , as a nonlinear function of hour-long survey increments across 46 visual-scan survey stations across the Altamont Pass Wind Resource Area, Alameda and Contra Costa Counties, 2015–2019.



EXISTING ENVIRONMENTAL SETTING

The first step in analysis of potential project impacts to biological resources is to accurately characterize the existing environmental setting, including the biological species that use the site, their relative abundances, how they use the site, key ecological relationships, and known and ongoing threats to those species with special status. A reasonably accurate characterization of the environmental setting can provide the basis for determining whether the site holds habitat value to wildlife, as well as a baseline against which to analyze potential project impacts. For these reasons, characterization of the environmental setting, including the project's site's regional setting, is one of CEQA's essential analytical steps (§15125). Methods to achieve this first step typically include (1) surveys of the site for biological resources, and (2) reviews of literature, databases and local experts for documented occurrences of special-status species. In the case of this project, these essential steps were not completed.

No biologists surveyed the site for wildlife in support of the Categorical Exclusion. The surest way to see no wildlife is to not look for them. Noriko Smallwood and I looked, however briefly, but we found 7 species of wildlife within only one hour.

The Categorical Exclusion includes the results of a query of the U.S. Fish & Wildlife Service's Information for Planning and Consultation (iPAC) database. iPAC is a positive sighting database, which means that a species not appearing in the query output is insufficient evidence for concluding that the species is absent from the site in question. The iPAC output includes a warning to this effect in its very first paragraph:

“determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.” Also on the first page of output is the warning, “To fully determine any potential effects to species, additional site-specific and project-specific information is often required.” The Categorical Exclusion misapplies iPAC.

In addition to the misuse of iPAC, as noted above, the iPAC query results include a list of 14 special-status species that are documented to occur in the project area. None of the species on the list necessarily occur on the project site, although all of them might at times pass through the airspace over the site’s footprint on their ways to or from habitat patches or while on migration. The list is mostly intended as an aide to biologists who are sent to survey the site. For this purpose, and for the larger purpose of assessing occurrence likelihoods of special-status species, additional data bases are available, and should have been consulted.

To analyze occurrence likelihoods of special-status species on the project site, GLA (2023) reviewed on-line aerial photographs, maps, and databases, one of which was iPAC as used above, and another was California Natural Diversity Data Base (CNDDB). A more reliable approach would have been to survey the site for wildlife like Noriko and I did. CNDDB is not designed to support absence determinations or to screen out species from characterization of a site’s wildlife community. As noted by CNDDB, *“The CNDDB is a positive sighting database. It does not predict where something may be found. We map occurrences only where we have documentation that the species was found at the site. There are many areas of the state where no surveys have been conducted and therefore there is nothing on the map. That does not mean that there are no special status species present.”* GLA (2023) misuses CNDDB.

CNDDB relies entirely on volunteer reporting from biologists who were allowed access to whatever properties they report from. Many properties have never been surveyed by biologists. Many properties have been surveyed, but the survey outcomes never reported to CNDDB. Many properties have been surveyed multiple times, but not all survey outcomes reported to CNDDB. Furthermore, CNDDB is interested only in the findings of special-status species, which means that species more recently assigned special status will have been reported many fewer times to CNDDB than were species assigned special status since the inception of CNDDB. The lack of many CNDDB records for species recently assigned special status had nothing to do with whether the species’ geographic ranges overlapped the project site, but rather more to do with the brief time for records to have accumulated since the species were assigned special status. And because negative findings are not reported to CNDDB, CNDDB cannot provide the basis for estimating occurrence likelihoods, either.

In my assessment based on database reviews and site visits, 108 special-status species of wildlife are known to occur near enough to the site to be analyzed for occurrence potential at one time or another (Table 2). Of these, 40 (37%) have been documented in data bases within 1.5 miles of the site (‘Very close’), 37 (34%) within 1.5 and 4 miles (‘Nearby’), and another 23 (21%) within 4 to 30 miles (‘In region’). More than two-thirds

(71%) of the species in Table 2 have been reportedly seen within 4 miles of the project site. The site therefore carries a lot of potential for supporting special-status species of wildlife either in ground vegetation or in the aerosphere above the project footprint. On any given day, one or more of these species likely make use of the project site, but being there to document that use probably requires multiple surveys (see Figure 1). On the day Noriko and I surveyed, 7 species were detected. If biologists were to survey on another day, one to several additional species would likely be detected. The occurrence databases inform us that many special-status species occur near the project site, which means these species likely make use of the project site, and sufficient survey effort should be directed to the site to either confirm these species use the site or to support absence determinations. But a brief survey cannot support the absence determination of any of these species, nor can the absence of a survey support such determinations.

According to GLA (2023), “The site does not contain any native habitat capable of supporting state or federally listed rare, threatened, or endangered species, or other special-status species.” However, the implication that native habitat is required for rare species to occur is inaccurate and misleading. Many examples exist of special-status species of wildlife occurring in areas covered by non-native vegetation and even on anthropogenic structures. For example, peregrine falcons often nest on buildings and water towers. In other examples, white-tailed kites and Swainson’s hawks often nest in ornamental trees on residential properties, sometimes in town. Habitat is defined by use of the environment by members of a species (Hall et al. 1997, Smallwood 2002), but not by whatever the consulting biologist decides. Therefore, the term “native habitat” is inconsistent with the habitat concept and makes little sense.

GLA (2023) argues against the potential occurrence of California gnatcatcher, which is a species that I agree is highly unlikely to occur at the project site (except for those passing through during dispersal or migration, as noted earlier). GLA (2023) writes, “In particular, the comment that the Project Site could provide habitat for the coastal California gnatcatcher is completely without merit.” Just to be clear, it was the City of Los Angeles’s proposed Categorical Exclusion that raised the possibility of occurrence of California gnatcatcher at the project site. Confusion over the occurrence potential of California gnatcatcher could have been avoided had the appropriate CEQA review been completed with the help of professional wildlife biologists.

Other special-status species should have been identified in addition to, or even instead of, California gnatcatcher. As noted earlier, 77 special-status species of vertebrate wildlife have been documented on occurrence databases as having occurred within only 4 miles of the project site (Table 2). Noriko and I, during a brief survey, observed 3 red-tailed hawks over the site. The red-tailed hawk is a raptor, and therefore is protected by California Fish and Game Code §3503.5, otherwise known as the Birds of Prey Code. Raptors are protected by this Code because raptors are top predators wherever they live. Their positions in the food chain naturally require that they are rare, which is one of the key conditions – and one of the key words – that meets the CEQA definition of special-status species. Species that are naturally rare, such as species of raptor, are more likely identified as special-status species, e.g., California condor, bald eagle, peregrine falcon, burrowing owl, spotted owl, whereas fewer of the naturally abundant species are so

identified, such as songbirds. Raptors protected by CFG Code §3503.5 are special-status species.

Table 2. Occurrence likelihoods of special-status bird species at or near the proposed project site, according to eBird/iNaturalist records (<https://eBird.org>, <https://www.inaturalist.org>) and on-site survey findings. ‘Very close’ indicates within 1.5 miles of the site, “nearby” indicates within 1.5 and 4 miles, and “in region” indicates within 4 and 30 miles, and ‘in range’ means the species’ geographic range overlaps the site. The closer the documented observation to the project site, the higher is its occurrence potential, other factors not considered.

| Common name | Species name | Status ¹ | Database records |
|------------------------------|---|---------------------|------------------|
| Monarch | <i>Danaus plexippus</i> | FC | Very close |
| Crotch’s bumble bee | <i>Bombus crotchii</i> | CCE | Nearby |
| Brant | <i>Branta bernicla</i> | SSC2 | In region |
| Cackling goose (Aleutian) | <i>Branta hutchinsii leucopareia</i> | WL | Nearby |
| Redhead | <i>Aythya americana</i> | SSC3 | Very close |
| Western grebe | <i>Aechmophorus occidentalis</i> | BCC | Nearby |
| Clark’s grebe | <i>Aechmophorus clarkii</i> | BCC | Nearby |
| Western yellow-billed cuckoo | <i>Coccyzus americanus occidentalis</i> | FT, CE, BCC | In region |
| Black swift | <i>Cypseloides niger</i> | SSC, BCC | Very close |
| Vaux’s swift | <i>Chaetura vauxi</i> | SSC2 | Very close |
| Costa’s hummingbird | <i>Calypte costae</i> | BCC | Very close |
| Rufous hummingbird | <i>Selasphorus rufus</i> | BCC | Very close |
| Allen’s hummingbird | <i>Selasphorus sasin</i> | BCC | Very close |
| Snowy plover | <i>Charadrius nivosus</i> | BCC | In region |
| Whimbrel | <i>Numenius phaeopus</i> | BCC | Nearby |
| Long-billed curlew | <i>Numenius americanus</i> | BCC, WL | In region |
| Marbled godwit | <i>Limosa fedoa</i> | BCC | In region |
| Red knot (Pacific) | <i>Calidris canutus</i> | BCC | In region |
| Short-billed dowitcher | <i>Limnodromus griseus</i> | BCC | In region |
| Willet | <i>Tringa semipalmata</i> | BCC | Nearby |
| Laughing gull | <i>Leucophaeus atricilla</i> | WL | In region |
| Heermann’s gull | <i>Larus heermanni</i> | BCC | In region |
| Western gull | <i>Larus occidentalis</i> | BCC | Very close |
| California gull | <i>Larus californicus</i> | WL, BCC | Very close |
| California least tern | <i>Sternula antillarum browni</i> | FE, CE, FP | In region |
| Caspian tern | <i>Hydroprogne caspia</i> | BCC | Nearby |
| Black tern | <i>Chlidonias niger</i> | SSC, BCC | In region |
| Elegant tern | <i>Thalasseus elegans</i> | WL, BCC | Nearby |
| Black skimmer | <i>Rynchops niger</i> | SSC, BCC | In region |
| Common loon | <i>Gavia immer</i> | SSC | Nearby |
| Double-crested cormorant | <i>Phalacrocorax auritus</i> | WL | Very close |
| American white pelican | <i>Pelicanus erythrorhynchos</i> | SSC1 | Very close |

| Common name | Species name | Status¹ | Database records |
|------------------------|--------------------------------------|---------------------------|-------------------------|
| Least bittern | <i>Ixobrychus exilis</i> | SSC, BCC | In region |
| White-faced ibis | <i>Plegadis chihi</i> | WL | Nearby |
| Turkey vulture | <i>Cathartes aura</i> | BOP | Very close |
| Osprey | <i>Pandion haliaetus</i> | WL, BOP | Very close |
| White-tailed kite | <i>Elanus leucurus</i> | CFP, BOP | Nearby |
| Golden eagle | <i>Aquila chrysaetos</i> | BGEPA, CFP, BOP, BCC | Very close |
| Northern harrier | <i>Circus cyaneus</i> | SSC3, BOP | Very close |
| Sharp-shinned hawk | <i>Accipiter striatus</i> | WL, BOP | Very close |
| Cooper's hawk | <i>Accipiter cooperii</i> | WL, BOP | Very close |
| Bald eagle | <i>Haliaeetus leucocephalus</i> | BGEPA, BCC, CFP | Nearby |
| Red-shouldered hawk | <i>Buteo lineatus</i> | BOP | Very close |
| Swainson's hawk | <i>Buteo swainsoni</i> | CT, BOP, BCC | Nearby |
| Red-tailed hawk | <i>Buteo jamaicensis</i> | BOP | Very close |
| Ferruginous hawk | <i>Buteo regalis</i> | WL, BOP | Very close |
| Barn owl | <i>Tyto alba</i> | BOP | Very close |
| Western screech-owl | <i>Megascops kennicotti</i> | BOP | Nearby |
| Great horned owl | <i>Bubo virginianus</i> | BOP | Very close |
| Burrowing owl | <i>Athene cunicularia</i> | BCC, SSC2, BOP | Nearby |
| Long-eared owl | <i>Asio Otis</i> | SSC3, BCC, BOP | Nearby |
| Short-eared owl | <i>Asia flammeus</i> | SSC3, BOP | Nearby |
| Lewis's woodpecker | <i>Melanerpes lewis</i> | BCC | Nearby |
| Nuttall's woodpecker | <i>Picoides nuttallii</i> | BCC | Very close |
| American kestrel | <i>Falco sparverius</i> | BOP | Very close |
| Merlin | <i>Falco columbarius</i> | WL, BOP | Very close |
| Peregrine falcon | <i>Falco peregrinus</i> | CFP, BOP, BCC | Very close |
| Prairie falcon | <i>Falco mexicanus</i> | BCC, WL, BOP | Nearby |
| Olive-sided flycatcher | <i>Contopus cooperi</i> | BCC, SSC2 | Very close |
| Willow flycatcher | <i>Empidonax trailii</i> | CE, BCC | Very close |
| Vermilion flycatcher | <i>Pyrocephalus rubinus</i> | SSC2 | Nearby |
| Least Bell's vireo | <i>Vireo bellii pusillus</i> | FE, CE | Nearby |
| Loggerhead shrike | <i>Lanius ludovicianus</i> | BCC, SSC2 | Nearby |
| Oak titmouse | <i>Baeolophus inornatus</i> | BCC | Very close |
| California horned lark | <i>Eremophila alpestris actia</i> | WL | Nearby |
| Bank swallow | <i>Riparia riparia</i> | CT | Nearby |
| Purple martin | <i>Progne subis</i> | SSC2 | Nearby |
| Wrentit | <i>Chamaea fasciata</i> | BCC | Very close |
| California gnatcatcher | <i>Poliophtila c. californica</i> | CT, SSC | In region |
| Clark's marsh wren | <i>Cistothorus palustris clarkae</i> | SSC | In range |
| California thrasher | <i>Toxostoma redivivum</i> | BCC | Very close |
| Cassin's finch | <i>Haemorhous cassinii</i> | BCC | In region |
| Lawrence's goldfinch | <i>Spinus lawrencei</i> | BCC | Very close |
| Grasshopper sparrow | <i>Ammodramus savannarum</i> | SSC2 | Nearby |
| Black-chinned sparrow | <i>Spizella atrogularis</i> | BCC | In region |

| Common name | Species name | Status¹ | Database records |
|--|--|---------------------------|-------------------------|
| Brewer's sparrow | <i>Spizella breweri</i> | BCC | Nearby |
| Bell's sparrow | <i>Amphispiza b. belli</i> | WL, BCC | Nearby |
| Oregon vesper sparrow | <i>Pooecetes gramineus affinis</i> | SSC2, BCC | Nearby |
| Southern California rufous-crowned sparrow | <i>Aimophila ruficeps canescens</i> | WL | Very close |
| Yellow-breasted chat | <i>Icteria virens</i> | SSC3 | Nearby |
| Yellow-headed blackbird | <i>X. xanthocephalus</i> | SSC3 | Nearby |
| Bullock's oriole | <i>Icterus bullockii</i> | BCC | Very close |
| Tricolored blackbird | <i>Agelaius tricolor</i> | CT, BCC, SSC | Very close |
| Lucy's warbler | <i>Leiothlypis luciae</i> | SSC, BCC | Nearby |
| Virginia's warbler | <i>Leiothlypis virginiae</i> | WL, BCC | Nearby |
| Yellow warbler | <i>Dendroica petechia</i> | BCC, SSC2 | Very close |
| Hepatic tanager | <i>Piranga flava</i> | WL | In region |
| Summer tanager | <i>Piranga rubra</i> | SSC1 | Nearby |
| Pallid bat | <i>Antrozous pallidus</i> | SSC, WBWG:H | In region |
| Townsend's big-eared bat | <i>Corynorhinus townsendii</i> | SSC, WBWG:H | In region |
| Spotted bat | <i>Euderma maculatum</i> | SSC, WBWG:H | In range |
| Western red bat | <i>Lasiurus blossevillei</i> | SSC, WBWG:H | Very close |
| Hoary bat | <i>Lasiurus cinereus</i> | WBWG:M | Nearby |
| Western yellow bat | <i>Lasiurus xanthinus</i> | SSC, WBWG:H | In range |
| Western small-footed myotis | <i>Myotis cililabrum</i> | WBWG:M | In region |
| Miller's myotis | <i>Myotis evotis</i> | WBWG:M | In range |
| Fringed myotis | <i>Myotis thysanodes</i> | WBWG:H | In range |
| Long-legged myotis | <i>Myotis volans</i> | WBWG:H | In range |
| Yuma myotis | <i>Myotis yumanensis</i> | WBWG:LM | Nearby |
| Western mastiff bat | <i>Eumops perotis</i> | SSC, WBWG:H | Nearby |
| Silver-haired bat | <i>Lasionycteris noctivagans</i> | WBWG:M | In range |
| Western red bat | <i>Lasiurus blossevillei</i> | SSC, WBWG:H | Very close |
| Big brown bat | <i>Episticus fuscus</i> | WBWG:L | Very close |
| California myotis | <i>Myotis californicus</i> | WBWG:L | In region |
| Canyon bat | <i>Parastrellus hesperus</i> | WBWG:M | Very close |
| Big free-tailed bat | <i>Nyctinomops macrotis</i> | SSC, WBWG:MH | In region |
| Los Angeles pocket mouse | <i>Perognathus longimembris brevinasus</i> | SSC | In range |
| Southern grasshopper mouse | <i>Onychomys torridus ramona</i> | SSC | In region |

¹ Listed as FT or FE = federal threatened or endangered, BCC = U.S. Fish and Wildlife Service Bird of Conservation Concern, CT or CE = California threatened or endangered, SSC = California species of special concern (not threatened with extinction, but rare, very restricted in range, declining throughout range, peripheral portion of species' range, associated with habitat that is declining in extent), CFP = California Fully Protected (CFG Code 3511), BOP = Birds of prey (CFG Code 3503.5), and SSC1, SSC2 and SSC3 = California Bird Species of Special Concern

priorities 1, 2 and 3, respectively (Shuford and Gardali 2008), and WL = Taxa to Watch List (Shuford and Gardali 2008), WBWG = Western Bat Working Group listing as low, moderate or high priority.

GLA (2023) concludes that several special-status species of bats would not occur at the project site, but these conclusions are speculative and not based on any evidence. Having spent nearly 1,000 hours observing bats through a thermal-imaging camera, I am confident that bats routinely forage in close proximity to tall anthropogenic structures. Bats might very well forage next to a tall building.

BIOLOGICAL IMPACTS ASSESSMENT

Determination of occurrence likelihoods of special-status species is not, in and of itself, an analysis of potential project impacts. An impacts analysis should consider whether and how a proposed project would affect members of a species, larger demographic units of the species, or the whole of a species. In the following, I analyze two types of impacts likely to result from the project, one of which is unsoundly analyzed and the others not analyzed in the Categorical Exclusion or by GLA (2023).

HABITAT VALUE

The analyses in the Categorical Exclusion and in GLA (2023) are flawed regarding the site's capacity to support special-status species. The project area has been urbanized, as the Categorical Exclusion points out. However, many special-status species persist on urbanized landscapes, such as Cooper's hawks and peregrine falcons, which feed on rock pigeons and commensal rodents. While Noriko and I surveyed the site, 3 red-tailed hawks flew around it, dropping their legs in courtship behavior. And hummingbirds aggressively defended their territories on the site. There is no question that the site provides habitat value despite its urban setting and impervious ground surface. Habitat value to wildlife is maintained by the shrubs and trees around the site's perimeter. Removal of these trees would eliminate all of the habitat value to wildlife except for the aerosphere of the site (see below).

BIRD-WINDOW COLLISIONS

Considering the project would add a building 6 stories tall, along with many glass windows on the building's facades, the Categorical Exclusion neglects a large portion of habitat that is essential to many species. To understand this part of their habitat, one must consider the definition of habitat, which is a species' use of the environment (Hall et al. 1997, Morrison et al. 1998, Smallwood 2002). The gaseous atmosphere, or aerosphere, is a principal medium of life to volant animals such as birds (Davy et al. 2017, Diehl et al. 2017). The aerosphere is where birds and bats and other volant animals with wings migrate, disperse, forage, perform courtship and where some of them mate. Birds are some of the many types of animals that evolved wings as a morphological adaptation to thrive by moving through the medium of the aerosphere.

The aerosphere is habitat. Indeed, an entire discipline of ecology has emerged to study this essential aspect of habitat – the discipline of aeroecology (Kunz et al. 2008).

Many special-status species of birds have been recorded at or near the aerosphere of the project site. My database review and the site visits indicate there are 86 special-status species of birds with potential to use the site's aerosphere (Table 2). Of these, database records have documented 35 within 1.5 miles of the site ('Very close'), 38 within 1.5 and 4 miles ('Nearby'), and another 17 within 4 to 30 miles ('In region'). The birds reported within all these distance domains from the project site can quickly fly those distances, so they would all be within short flights of the proposed project's windows.

Window collisions are often characterized as either the second or third largest source or human-caused bird mortality. The numbers behind these characterizations are often attributed to Klem's (1990) and Dunn's (1993) estimates of about 100 million to 1 billion bird fatalities in the USA, or more recently by Loss et al.'s (2014) estimate of 365-988 million bird fatalities in the USA or Calvert et al.'s (2013) and Machtans et al.'s (2013) estimates of 22.4 million and 25 million bird fatalities in Canada, respectively. The proposed project would impose windows in the airspace normally used by birds.

Glass-façades of buildings intercept and kill many birds, but these façades are differentially hazardous to birds based on spatial extent, contiguity, orientation, and other factors. At Washington State University, Johnson and Hudson (1976) found 266 bird fatalities of 41 species within 73 months of monitoring of a three-story glass walkway (no fatality adjustments attempted). Prior to marking the windows to warn birds of the collision hazard, the collision rate was 84.7 per year. At that rate, and not attempting to adjust the fatality estimate for the proportion of fatalities not found, 4,574 birds were likely killed over the 54 years since the start of their study, and that's at a relatively small building façade. Accounting for the proportion of fatalities not found, the number of birds killed by this walkway over the last 54 years would have been about 14,270. And this is just for one 3-story, glass-sided walkway between two college campus buildings.

Klem's (1990) estimate was based on speculation that 1 to 10 birds are killed per building per year, and this speculated range was extended to the number of buildings estimated by the US Census Bureau in 1986. Klem's speculation was supported by fatality monitoring at only two houses, one in Illinois and the other in New York. Also, the basis of his fatality rate extension has changed greatly since 1986. Whereas his estimate served the need to alert the public of the possible magnitude of the bird-window collision issue, it was highly uncertain at the time and undoubtedly outdated more than three decades hence. Indeed, by 2010 Klem (2010) characterized the upper end of his estimated range – 1 billion bird fatalities – as conservative. Furthermore, the estimate lumped species together as if all birds are the same and the loss of all birds to windows has the same level of impact.

By the time Loss et al. (2014) performed their effort to estimate annual USA bird-window fatalities, many more fatality monitoring studies had been reported or were underway. Loss et al. (2014) incorporated many more fatality rates based on scientific

monitoring, and they were more careful about which fatality rates to include. However, they included estimates based on fatality monitoring by homeowners, which in one study were found to detect only 38% of the available window fatalities (Bracey et al. 2016). Loss et al. (2014) excluded all fatality records lacking a dead bird in hand, such as injured birds or feather or blood spots on windows. Loss et al.'s (2014) fatality metric was the number of fatalities per building (where in this context a building can include a house, low-rise, or high-rise structure), but they assumed that this metric was based on window collisions. Because most of the bird-window collision studies were limited to migration seasons, Loss et al. (2014) developed an admittedly assumption-laden correction factor for making annual estimates. Also, only 2 of the studies included adjustments for carcass persistence and searcher detection error, and it was unclear how and to what degree fatality rates were adjusted for these factors. Although Loss et al. (2014) attempted to account for some biases as well as for large sources of uncertainty mostly resulting from an opportunistic rather than systematic sampling data source, their estimated annual fatality rate across the USA was highly uncertain and vulnerable to multiple biases, most of which would have resulted in fatality estimates biased low.

In my review of bird-window collision monitoring, I found that the search radius around homes and buildings was very narrow, usually 2 meters. Based on my experience with bird collisions in other contexts, I would expect that a large portion of bird-window collision victims would end up farther than 2 m from the windows, especially when the windows are higher up on tall buildings. In my experience, searcher detection rates tend to be low for small birds deposited on ground with vegetation cover or woodchips or other types of organic matter. Also, vertebrate scavengers entrain on anthropogenic sources of mortality and quickly remove many of the carcasses, thereby preventing the fatality searcher from detecting these fatalities. Adjusting fatality rates for these factors – search radius bias, searcher detection error, and carcass persistence rates – would greatly increase nationwide estimates of bird-window collision fatalities.

Buildings can intercept many nocturnal migrants as well as birds flying in daylight. As mentioned above, Johnson and Hudson (1976) found 266 bird fatalities of 41 species within 73 months of monitoring of a four-story glass walkway at Washington State University (no adjustments attempted for undetected fatalities). Somerlot (2003) found 21 bird fatalities among 13 buildings on a university campus within only 61 days. Monitoring twice per week, Hager et al. (2008) found 215 bird fatalities of 48 species, or 55 birds/building/year, and at another site they found 142 bird fatalities of 37 species for 24 birds/building/year. Gelb and Delacretaz (2009) recorded 5,400 bird fatalities under buildings in New York City, based on a decade of monitoring only during migration periods, and some of the high-rises were associated with hundreds of fatalities each. Klem et al. (2009) monitored 73 building façades in New York City during 114 days of two migratory periods, tallying 549 collision victims, nearly 5 birds per day. Borden et al. (2010) surveyed a 1.8 km route 3 times per week during 12-month period and found 271 bird fatalities of 50 species. Parkins et al. (2015) found 35 bird fatalities of 16 species within only 45 days of monitoring under 4 building façades. From 24 days of survey over a 48-day span, Porter and Huang (2015) found 47 fatalities under 8 buildings on a university campus. Sabo et al. (2016) found 27 bird fatalities over 61 days of searches under 31 windows. In San Francisco, Kahle et al. (2016) found 355

collision victims within 1,762 days under a 5-story building. Ocampo-Peñuela et al. (2016) searched the perimeters of 6 buildings on a university campus, finding 86 fatalities after 63 days of surveys. One of these buildings produced 61 of the 86 fatalities, and another building with collision-deterrent glass caused only 2 of the fatalities, thereby indicating a wide range in impacts likely influenced by various factors. There is ample evidence available to support my prediction that the proposed project would result in many collision fatalities of birds.

Project Impact Prediction

By the time of these comments, I had reviewed and processed results of bird collision monitoring at 213 buildings and façades for which bird collisions per m² of glass per year could be calculated and averaged (Johnson and Hudson 1976, O'Connell 2001, Somerlot 2003, Hager et al. 2008, Borden et al. 2010, Hager et al. 2013, Porter and Huang 2015, Parkins et al. 2015, Kahle et al. 2016, Ocampo-Peñuela et al. 2016, Sabo et al. 2016, Barton et al. 2017, Gomez-Moreno et al. 2018, Schneider et al. 2018, Loss et al. 2019, Brown et al. 2020, City of Portland Bureau of Environmental Services and Portland Audubon 2020, Riding et al. 2020). These study results averaged 0.073 bird deaths per m² of glass per year (95% CI: 0.042-0.102). This average and its 95% confidence interval provide a robust basis for predicting fatality rates at a proposed new project.

The Categorical Exclusion does not disclose the extent of glass windows and glass railings on the proposed new buildings. However, based on reported building heights and the renderings of the buildings in the Categorical Exclusion, I estimated the extent of structural glass on the facades of the building to be about 5,630 m².

Applying the mean fatality rate (above) to my estimate of 5,630 m² of structural glass on the building facades of the project, I predict annual bird deaths of 412 (95% CI: 244–579). The vast majority of these deaths would be of birds protected under the Migratory Bird Treaty Act and under the recently revised California Fish and Game Code 3513, thus causing significant unmitigated impacts. Given the predicted level of bird-window collision mortality, and the lack of any proposed mitigation, it is my opinion that the proposed project would result in potentially significant adverse biological impacts. There is at least a fair argument to be made for the need to prepare an EIR to appropriately analyze the impact of bird-glass collisions that might be caused by the project.

MITIGATION MEASURES

The Categorical Exclusion proposes no mitigation for potential project impacts to wildlife. Below I recommend several mitigation measures that ought to be incorporated into an EIR.

RECOMMENDED MEASURES

Protocol-level Detection Surveys: If the project goes forward, bird nest detection surveys are needed to (1) inform preconstruction surveys to improve their efficacy, (2) estimate project impacts, and (3) inform compensatory mitigation. The trees on the project site should be thoroughly searched for nests by a qualified biologist.

Detection Surveys for Bats: Multiple special-status species of bats might occur on the project site. A qualified bat biologist should be tasked with completing protocol-level detection surveys for bats in the on-site and street trees and on adjacent buildings.

Construction Timing and Preconstruction survey for nesting birds: Construction should be restricted to the portion of the year that is outside the avian breeding season. The results of preconstruction surveys would be reported.

Construction Monitoring: If the project goes forward, a qualified biologist needs to serve as construction monitor. The biologist should have the authority to stop construction when construction poses a threat to wildlife, and the biologist should have the authority to rectify situations that pose threats to wildlife. The events associated with construction monitoring, such as efforts to avoid impacts and findings of dead and injured wildlife, need to be summarized in a report that is subsequently made available to the public.

Habitat Loss: If the project goes forward, compensatory mitigation would be warranted for habitat loss. An equal number of mature trees as the number to be removed should be protected in perpetuity as close to the project site as possible.

Pest Control: The project should commit to minimal use of rodenticides and avicides. It should commit to no placement of poison bait stations outside the buildings.

Guidelines on Building Design to Minimize Bird-Window Collisions: If the project goes forward, it should at a minimum adhere to available Bird-Safe Guidelines, such as those prepared by American Bird Conservancy and New York and San Francisco. The American Bird Conservancy (ABC) produced an excellent set of guidelines recommending actions to: (1) Minimize use of glass; (2) Placing glass behind some type of screening (grilles, shutters, exterior shades); (3) Using glass with inherent properties to reduce collisions, such as patterns, window films, decals or tape; and (4) Turning off lights during migration seasons (Sheppard and Phillips 2015). The City of San Francisco (San Francisco Planning Department 2011) also has a set of building design guidelines, based on the excellent guidelines produced by the New York City Audubon Society (Orff et al. 2007). The ABC document and both the New York and San Francisco documents provide excellent alerting of potential bird-collision hazards as well as many visual examples. The San Francisco Planning Department's (2011) building design guidelines are more comprehensive than those of New York City, but they could have gone further. For example, the San Francisco guidelines probably should have also covered scientific monitoring of impacts as well as compensatory mitigation for impacts that could not be avoided, minimized or reduced.

New research results inform of the efficacy of marking windows. Whereas Klem (1990) found no deterrent effect from decals on windows, Johnson and Hudson (1976) reported a fatality reduction of about 69% after placing decals on windows. In an experiment of opportunity, Ocampo-Peñuela et al. (2016) found only 2 of 86 fatalities at one of 6 buildings – the only building with windows treated with a bird deterrent film. At the building with fritted glass, bird collisions were 82% lower than at other buildings with untreated windows. Kahle et al. (2016) added external window shades to some windowed façades to reduce fatalities 82% and 95%. Brown et al. (2020) reported an 84% lower collision probability among fritted glass windows and windows treated with ORNILUX R UV. City of Portland Bureau of Environmental Services and Portland Audubon (2020) reduced bird collision fatalities 94% by affixing marked Solyx window film to existing glass panels of Portland’s Columbia Building. Many external and internal glass markers have been tested experimentally, some showing no effect and some showing strong deterrent effects (Klem 1989, 1990, 2009, 2011; Klem and Saenger 2013; Rössler et al. 2015).

Monitoring and the use of compensatory mitigation should be incorporated at any new building project because the measures recommended in the available guidelines remain of uncertain efficacy, and even if these measures are effective, they will not reduce collision fatalities to zero. The only way to assess mitigation efficacy and to quantify post-construction fatalities is to monitor the project for fatalities, including at residential dwelling units.

Fund Wildlife Rehabilitation Facilities: Compensatory mitigation ought also to include funding contributions to wildlife rehabilitation facilities to cover the costs of injured animals that will be delivered to these facilities for care. Many animals would likely be injured by collisions with windows.

Thank you for your attention,



Shawn Smallwood, Ph.D.

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Kenneth Shawn Smallwood

Curriculum Vitae

3108 Finch Street
Davis, CA 95616
Phone (530) 756-4598
Cell (530) 601-6857
puma@dcn.org

Born May 3, 1963 in
Sacramento, California.
Married, father of two.

Ecologist

Expertise

- Finding solutions to controversial problems related to wildlife interactions with human industry, infrastructure, and activities;
- Wildlife monitoring and field study using GPS, thermal imaging, behavior surveys;
- Using systems analysis and experimental design principles to identify meaningful ecological patterns that inform management decisions.

Education

Ph.D. Ecology, University of California, Davis. September 1990.
M.S. Ecology, University of California, Davis. June 1987.
B.S. Anthropology, University of California, Davis. June 1985.
Corcoran High School, Corcoran, California. June 1981.

Experience

- 762 professional reports, including:
 - 90 peer reviewed publications
 - 24 in non-reviewed proceedings
- 646 reports, declarations, posters and book reviews
- 8 in mass media outlets
- 92 public presentations of research results

Editing for scientific journals: Guest Editor, *Wildlife Society Bulletin*, 2012-2013, of invited papers representing international views on the impacts of wind energy on wildlife and how to mitigate the impacts. Associate Editor, *Journal of Wildlife Management*, March 2004 to 30 June 2007. Editorial Board Member, *Environmental Management*, 10/1999 to 8/2004. Associate Editor, *Biological Conservation*, 9/1994 to 9/1995.

Member, Alameda County Scientific Review Committee (SRC), August 2006 to April 2011. The five-member committee investigated causes of bird and bat collisions in the Altamont Pass Wind Resource Area, and recommended mitigation and monitoring measures. The SRC reviewed the science underlying the Alameda County Avian Protection Program, and advised

the County on how to reduce wildlife fatalities.

Consulting Ecologist, 2004-2007, California Energy Commission (CEC). Provided consulting services as needed to the CEC on renewable energy impacts, monitoring and research, and produced several reports. Also collaborated with Lawrence-Livermore National Lab on research to understand and reduce wind turbine impacts on wildlife.

Consulting Ecologist, 1999-2013, U.S. Navy. Performed endangered species surveys, hazardous waste site monitoring, and habitat restoration for the endangered San Joaquin kangaroo rat, California tiger salamander, California red-legged frog, California clapper rail, western burrowing owl, salt marsh harvest mouse, and other species at Naval Air Station Lemoore; Naval Weapons Station, Seal Beach, Detachment Concord; Naval Security Group Activity, Skaggs Island; National Radio Transmitter Facility, Dixon; and, Naval Outlying Landing Field Imperial Beach.

Part-time Lecturer, 1998-2005, California State University, Sacramento. Instructed Mammalogy, Behavioral Ecology, and Ornithology Lab, Contemporary Environmental Issues, Natural Resources Conservation.

Senior Ecologist, 1999-2005, BioResource Consultants. Designed and implemented research and monitoring studies related to avian fatalities at wind turbines, avian electrocutions on electric distribution poles across California, and avian fatalities at transmission lines.

Chairman, Conservation Affairs Committee, The Wildlife Society--Western Section, 1999-2001. Prepared position statements and led efforts directed toward conservation issues, including travel to Washington, D.C. to lobby Congress for more wildlife conservation funding.

Systems Ecologist, 1995-2000, Institute for Sustainable Development. Headed ISD's program on integrated resources management. Developed indicators of ecological integrity for large areas, using remotely sensed data, local community involvement and GIS.

Associate, 1997-1998, Department of Agronomy and Range Science, University of California, Davis. Worked with Shu Geng and Mingua Zhang on several studies related to wildlife interactions with agriculture and patterns of fertilizer and pesticide residues in groundwater across a large landscape.

Lead Scientist, 1996-1999, National Endangered Species Network. Informed academic scientists and environmental activists about emerging issues regarding the Endangered Species Act and other environmental laws. Testified at public hearings on endangered species issues.

Ecologist, 1997-1998, Western Foundation of Vertebrate Zoology. Conducted field research to determine the impact of past mercury mining on the status of California red-legged frogs in Santa Clara County, California.

Senior Systems Ecologist, 1994-1995, EIP Associates, Sacramento, California. Provided consulting services in environmental planning, and quantitative assessment of land units for their conservation and restoration opportunities based on ecological resource requirements of 29 special-status species. Developed ecological indicators for prioritizing areas within Yolo County

to receive mitigation funds for habitat easements and restoration.

Post-Graduate Researcher, 1990-1994, Department of Agronomy and Range Science, *U.C. Davis*. Under Dr. Shu Geng's mentorship, studied landscape and management effects on temporal and spatial patterns of abundance among pocket gophers and species of Falconiformes and Carnivora in the Sacramento Valley. Managed and analyzed a data base of energy use in California agriculture. Assisted with landscape (GIS) study of groundwater contamination across Tulare County, California.

Work experience in graduate school: Co-taught Conservation Biology with Dr. Christine Schonewald, 1991 & 1993, UC Davis Graduate Group in Ecology; Reader for Dr. Richard Coss's course on Psychobiology in 1990, UC Davis Department of Psychology; Research Assistant to Dr. Walter E. Howard, 1988-1990, UC Davis Department of Wildlife and Fisheries Biology, testing durable baits for pocket gopher management in forest clearcuts; Research Assistant to Dr. Terrell P. Salmon, 1987-1988, UC Wildlife Extension, Department of Wildlife and Fisheries Biology, developing empirical models of mammal and bird invasions in North America, and a rating system for priority research and control of exotic species based on economic, environmental and human health hazards in California. Student Assistant to Dr. E. Lee Fitzhugh, 1985-1987, UC Cooperative Extension, Department of Wildlife and Fisheries Biology, developing and implementing statewide mountain lion track count for long-term monitoring.

Fulbright Research Fellow, Indonesia, 1988. Tested use of new sampling methods for numerical monitoring of Sumatran tiger and six other species of endemic felids, and evaluated methods used by other researchers.

Projects

Repowering wind energy projects through careful siting of new wind turbines using map-based collision hazard models to minimize impacts to volant wildlife. Funded by wind companies (principally NextEra Renewable Energy, Inc.), California Energy Commission and East Bay Regional Park District, I have collaborated with a GIS analyst and managed a crew of five field biologists performing golden eagle behavior surveys and nocturnal surveys on bats and owls. The goal is to quantify flight patterns for development of predictive models to more carefully site new wind turbines in repowering projects. Focused behavior surveys began May 2012 and continue. Collision hazard models have been prepared for seven wind projects, three of which were built. Planning for additional repowering projects is underway.

Test avian safety of new mixer-ejector wind turbine (MEWT). Designed and implemented a before-after, control-impact experimental design to test the avian safety of a new, shrouded wind turbine developed by Ogin Inc. (formerly known as FloDesign Wind Turbine Corporation). Supported by a \$718,000 grant from the California Energy Commission's Public Interest Energy Research program and a 20% match share contribution from Ogin, I managed a crew of seven field biologists who performed periodic fatality searches and behavior surveys, carcass detection trials, nocturnal behavior surveys using a thermal camera, and spatial analyses with the collaboration of a GIS analyst. Field work began 1 April 2012 and ended 30 March 2015 without Ogin installing its MEWTs, but we still achieved multiple important scientific advances.

Reduce avian mortality due to wind turbines at Altamont Pass. Studied wildlife impacts caused by 5,400 wind turbines at the world's most notorious wind resource area. Studied how impacts are perceived by monitoring and how they are affected by terrain, wind patterns, food resources, range management practices, wind turbine operations, seasonal patterns, population cycles, infrastructure management such as electric distribution, animal behavior and social interactions.

Reduce avian mortality on electric distribution poles. Directed research toward reducing bird electrocutions on electric distribution poles, 2000-2007. Oversaw 5 founts of fatality searches at 10,000 poles from Orange County to Glenn County, California, and produced two large reports.

Cook *et al.* v. Rockwell International *et al.*, No. 90-K-181 (D. Colorado). Provided expert testimony on the role of burrowing animals in affecting the fate of buried and surface-deposited radioactive and hazardous chemical wastes at the Rocky Flats Plant, Colorado. Provided expert reports based on four site visits and an extensive document review of burrowing animals. Conducted transect surveys for evidence of burrowing animals and other wildlife on and around waste facilities. Discovered substantial intrusion of waste structures by burrowing animals. I testified in federal court in November 2005, and my clients were subsequently awarded a \$553,000,000 judgment by a jury. After appeals the award was increased to two billion dollars.

Hanford Nuclear Reservation Litigation. Provided expert testimony on the role of burrowing animals in affecting the fate of buried radioactive wastes at the Hanford Nuclear Reservation, Washington. Provided three expert reports based on three site visits and extensive document review. Predicted and verified a certain population density of pocket gophers on buried waste structures, as well as incidence of radionuclide contamination in body tissue. Conducted transect surveys for evidence of burrowing animals and other wildlife on and around waste facilities. Discovered substantial intrusion of waste structures by burrowing animals.

Expert testimony and declarations on proposed residential and commercial developments, gas-fired power plants, wind, solar and geothermal projects, water transfers and water transfer delivery systems, endangered species recovery plans, Habitat Conservation Plans and Natural Communities Conservation Programs. Testified before multiple government agencies, Tribunals, Boards of Supervisors and City Councils, and participated with press conferences and depositions. Prepared expert witness reports and court declarations, which are summarized under Reports (below).

Protocol-level surveys for special-status species. Used California Department of Fish and Wildlife and US Fish and Wildlife Service protocols to search for California red-legged frog, California tiger salamander, arroyo southwestern toad, blunt-nosed leopard lizard, western pond turtle, giant kangaroo rat, San Joaquin kangaroo rat, San Joaquin kit fox, western burrowing owl, Swainson's hawk, Valley elderberry longhorn beetle and other special-status species.

Conservation of San Joaquin kangaroo rat. Performed research to identify factors responsible for the decline of this endangered species at Lemoore Naval Air Station, 2000-2013, and implemented habitat enhancements designed to reverse the trend and expand the population.

Impact of West Nile Virus on yellow-billed magpies. Funded by Sacramento-Yolo Mosquito and Vector Control District, 2005-2008, compared survey results pre- and post-West Nile Virus epidemic for multiple bird species in the Sacramento Valley, particularly on yellow-billed magpie and American crow due to susceptibility to WNV.

Workshops on HCPs. Assisted Dr. Michael Morrison with organizing and conducting a 2-day workshop on Habitat Conservation Plans, sponsored by Southern California Edison, and another 1-day workshop sponsored by PG&E. These Workshops were attended by academics, attorneys, and consultants with HCP experience. We guest-edited a Proceedings published in Environmental Management.

Mapping of biological resources along Highways 101, 46 and 41. Used GPS and GIS to delineate vegetation complexes and locations of special-status species along 26 miles of highway in San Luis Obispo County, 14 miles of highway and roadway in Monterey County, and in a large area north of Fresno, including within reclaimed gravel mining pits.

GPS mapping and monitoring at restoration sites and at Caltrans mitigation sites. Monitored the success of elderberry shrubs at one location, the success of willows at another location, and the response of wildlife to the succession of vegetation at both sites. Also used GPS to monitor the response of fossorial animals to yellow star-thistle eradication and natural grassland restoration efforts at Bear Valley in Colusa County and at the decommissioned Mather Air Force Base in Sacramento County.

Mercury effects on Red-legged Frog. Assisted Dr. Michael Morrison and US Fish and Wildlife Service in assessing the possible impacts of historical mercury mining on the federally listed California red-legged frog in Santa Clara County. Also measured habitat variables in streams.

Opposition to proposed No Surprises rule. Wrote a white paper and summary letter explaining scientific grounds for opposing the incidental take permit (ITP) rules providing ITP applicants and holders with general assurances they will be free of compliance with the Endangered Species Act once they adhere to the terms of a “properly functioning HCP.” Submitted 188 signatures of scientists and environmental professionals concerned about No Surprises rule US Fish and Wildlife Service, National Marine Fisheries Service, all US Senators.

Natomas Basin Habitat Conservation Plan alternative. Designed narrow channel marsh to increase the likelihood of survival and recovery in the wild of giant garter snake, Swainson’s hawk and Valley Elderberry Longhorn Beetle. The design included replication and interspersions of treatments for experimental testing of critical habitat elements. I provided a report to Northern Territories, Inc.

Assessments of agricultural production system and environmental technology transfer to China. Twice visited China and interviewed scientists, industrialists, agriculturalists, and the Directors of the Chinese Environmental Protection Agency and the Department of Agriculture to assess the need and possible pathways for environmental clean-up technologies and trade opportunities between the US and China.

Yolo County Habitat Conservation Plan. Conducted landscape ecology study of Yolo County to spatially prioritize allocation of mitigation efforts to improve ecosystem functionality within the County from the perspective of 29 special-status species of wildlife and plants. Used a hierarchically structured indicators approach to apply principles of landscape and ecosystem ecology, conservation biology, and local values in rating land units. Derived GIS maps to help guide the conservation area design, and then developed implementation strategies.

Mountain lion track count. Developed and conducted a carnivore monitoring program throughout California since 1985. Species counted include mountain lion, bobcat, black bear, coyote, red and gray fox, raccoon, striped skunk, badger, and black-tailed deer. Vegetation and land use are also monitored. Track survey transect was established on dusty, dirt roads within randomly selected quadrats.

Sumatran tiger and other felids. Upon award of Fulbright Research Fellowship, I designed and initiated track counts for seven species of wild cats in Sumatra, including Sumatran tiger, fishing cat, and golden cat. Spent four months on Sumatra and Java in 1988, and learned Bahasa Indonesia, the official Indonesian language.

Wildlife in agriculture. Beginning as post-graduate research, I studied pocket gophers and other wildlife in 40 alfalfa fields throughout the Sacramento Valley, and I surveyed for wildlife along a 200 mile road transect since 1989 with a hiatus of 1996-2004. The data are analyzed using GIS and methods from landscape ecology, and the results published and presented orally to farming groups in California and elsewhere. I also conducted the first study of wildlife in cover crops used on vineyards and orchards.

Agricultural energy use and Tulare County groundwater study. Developed and analyzed a data base of energy use in California agriculture, and collaborated on a landscape (GIS) study of groundwater contamination across Tulare County, California.

Pocket gopher damage in forest clear-cuts. Developed gopher sampling methods and tested various poison baits and baiting regimes in the largest-ever field study of pocket gopher management in forest plantations, involving 68 research plots in 55 clear-cuts among 6 National Forests in northern California.

Risk assessment of exotic species in North America. Developed empirical models of mammal and bird species invasions in North America, as well as a rating system for assigning priority research and control to exotic species in California, based on economic, environmental, and human health hazards.

Peer Reviewed Publications

Smallwood, K. S. 2022. Utility-scale solar impacts to volant wildlife. *Journal of Wildlife Management*: e22216. <https://doi.org/10.1002/jwmg.22216>

Smallwood, K. S., and N. L. Smallwood. 2021. Breeding Density and Collision Mortality of Loggerhead Shrike (*Lanius ludovicianus*) in the Altamont Pass Wind Resource Area. *Diversity* 13, 540. <https://doi.org/10.3390/d13110540>.

Smallwood, K. S. 2020. USA wind energy-caused bat fatalities increase with shorter fatality search intervals. *Diversity* 12(98); <https://doi.org/10.3390/d12030098>

Smallwood, K. S., D. A. Bell, and S. Standish. 2020. Dogs detect larger wind energy impacts on bats and birds. *Journal of Wildlife Management* 84:852-864. DOI: 10.1002/jwmg.21863.

Smallwood, K. S., and D. A. Bell. 2020. Relating bat passage rates to wind turbine fatalities.

- Diversity 12(84); doi:10.3390/d12020084.
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EXHIBIT B



INDOOR ENVIRONMENTAL ENGINEERING



1448 Pine Street, Suite 103 San Francisco, California 94109

Telephone: (415) 567-7700

E-mail: offer mann@IEE-SF.com

<http://www.iee-sf.com>

Date: June 8, 2023

To: Amalia Bowley Fuentes
Lozeau | Drury LLP
1939 Harrison Street, Suite 150
Oakland, California 94612

From: Francis J. Offermann PE CIH

Subject: Indoor Air Quality Rebuttal Comment: TENTEN Hollywood Project - Los Angeles, CA (IEE File Reference: P-4631)

Pages: 25

The following are my rebuttal comments regarding the responses contained in the City of Los Angeles, March, 2023 Appeal Letter No. 1A for the TENTEN Hollywood Project – Los Angeles, CA to my September 12, 2022 Indoor Air Quality letter for the TENTEN Hollywood Project - Los Angeles, CA (attached in Appendix A).

City of Los Angeles Response to Comment 1A.1

The above information summarizes certain findings and studies pertaining to the health risks posed by formaldehyde exposure in residential buildings. As this information does not directly address the Proposed Project or impact analysis in the Categorical Exemption and raises no environmental issues specific to the Proposed Project, no further response is warranted.

IEE Rebuttal Comments to Comment 1A.1

In my September 12, 2022 Indoor Air Quality letter for the TENTEN Hollywood Project, Los Angeles, CA (attached in Appendix A) I showed that for the Project occupants to not be exposed to formaldehyde concentrations that exceed the Proposition NSRL for formaldehyde, the Project must either commit to only using composite wood products that have no added formaldehyde (NAF), or commit to using composite wood products for the construction of the building that collectively had formaldehyde emissions that result in indoor formaldehyde concentrations that did not exceed the Proposition NSRL for formaldehyde.

In addition, I showed that the Justification to Support a Categorical Exemption – TENTEN Hollywood Project (Parker Environmental Consultants, 2022) contained only short-term monitoring periods of just 15 minutes and do not report the CNEL or Ldn dBA sound levels. In order to design the building such that the interior noise levels are acceptable, long-term one-week measurements need to be conducted to assess the ambient CNEL or Ldn dBA sound levels for the purpose of selecting the appropriate STC for the windows.

Also, since the Project is located in the South Coast Air Basin, which is a State and Federal non-attainment area for PM_{2.5}, an air quality analyses needs to be conducted to determine what MERV rating filters are required to maintain indoor concentrations of PM_{2.5} less than the California and National PM_{2.5} annual and 24-hour standards.

These are environmental issues specific to the Proposed Project that need to be addressed.

City of Los Angeles Response to Comment 1A.2

The above comment speculates that the future resident's exposure to formaldehyde would be consistent with a 24 hour per day, 70-year lifetime dose. As described in Response to Comment 1.4 in Appeal Letter No. 1, above, the analysis is based upon a series of incorrect assumptions.

The interior building materials have not been selected and would change from time to time over the life of the Proposed Project as a result of residents making home improvements to replace flooring and cabinetry in interior units as a result of wear and style preferences. However, as required by law, the Proposed Project would be built with materials that are compliant with current regulations, which establish appropriate levels of formaldehyde in composite wood materials. See Response to Comment 1.4 in Appeal Letter No. 1, above, for further detail.

In addition, the Appellant is speculating that composite wood materials would be used in the interior of the building. Indoor building materials will not be known until the building permit stage. As such, it is speculative to provide any further analysis on the content of indoor building materials, and the Appellant has not provided credible evidence that the Proposed Project would cause significant impacts related to indoor air quality.

IEE Rebuttal Comments to Comment 1A.2

In my September 12, 2022 Indoor Air Quality letter for the TENTEN Hollywood Project, Los Angeles, CA (attached in Appendix A) I explained that “Further, we are not asking that the builder ‘speculate’ on what and how much composite materials be used, but rather at the design stage to select composite wood materials based on the formaldehyde emission rates that manufacturers routinely conduct using the California Department of Health “Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions for Indoor Sources Using Environmental Chambers,” (CDPH, 2017), and use the procedure described earlier above (i.e., Pre-Construction Building Material/Furnishing Formaldehyde Emissions Assessment) to insure that the materials selected achieve acceptable cancer risks from material off gassing of formaldehyde.”

City of Los Angeles Response to Comment 1A.3

The above comment proposes a methodology for analyzing carcinogenic risks in a multi-family residential building. Interior finishes for the residential component and all furnishings would be subject to tenant specifications that would not be known until after

the Proposed Project is approved and constructed. Thus, any analysis regarding such materials would be speculative, and CEQA does not require speculation. Further, as specified above, the building materials would be compliant with the LAMC, CALGreen, the L.A. Green Building Code, California Code of Regulations Title 17, Sections 93120 through 93120.12, and other applicable regulations, which provide specifications for acceptable formaldehyde concentrations in composite wood products. See Response to Comment 1.4 in Appeal Letter No. 1, above. The Proposed Project would be compliant with these specifications and would not cause any significant environmental impact related to indoor air quality.

IEE Rebuttal Comments to Comment 1A.3

See by rebuttal comment above for Comment 1A.2 where I discuss that we “are not asking that the builder ‘speculate’ on what and how much composite materials be used, but rather at the design stage to select composite wood materials based on the formaldehyde emission rates that manufacturers routinely conduct using the California Department of Health “Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions for Indoor Sources Using Environmental Chambers,” (CDPH, 2017), and use the procedure described earlier above (i.e., Pre-Construction Building Material/Furnishing Formaldehyde Emissions Assessment) to insure that the materials selected achieve acceptable cancer risks from material off gassing of formaldehyde.”

Also, in my September 12, 2022 Indoor Air Quality letter for the TENTEN Hollywood Project, Los Angeles, CA (attached in Appendix A), I showed that using standard engineering mass balance calculations, the even if the Project uses composite wood products that meet CARB ATCM regulation for formaldehyde emissions from composite wood products, and as required in the CALGreen Code and other California regulations, the ensuing indoor concentrations of formaldehyde will result in cancer risks that exceed 10 per million.

Even composite wood products manufactured with CARB certified ultra-low emitting formaldehyde (ULEF) resins do not insure that the indoor air will have concentrations of formaldehyde the meet the OEHHA cancer risks that substantially exceed 10 per million.

The permissible emission rates for ULEF composite wood products are only 11-15% lower than the CARB Phase 2 emission rates. Only use of composite wood products made with no-added formaldehyde resins (NAF), such as resins made from soy, polyvinyl acetate, or methylene diisocyanate can insure that the OEHHA cancer risk of 10 per million is met.

City of Los Angeles Response to Comment 1A.4

Pursuant to Section 99.04.504.6 of the LAMC, mechanically ventilated buildings are required to meet the air filtration requirements of the 2019 California Energy Code, or 2019 Building Energy Efficiency Standards. The 2019 Building Energy Efficiency Standards includes requirements for mandatory mechanical ventilation intended to improve indoor air quality (IAQ) in homes, and requirements for Minimum Efficiency Reporting Values (MERV) 13 air filtration on space conditioning systems and ventilation systems that provide outside air to the occupiable space of a dwelling. As such, the Proposed Project would already provide for the mechanical supply of outdoor air ventilation suggested by the Appellant, to the specifications of the required state efficiency standards, and the Appellant does not provide any credible evidence of indoor air quality impacts from the Proposed Project.

IEE Rebuttal Comments to Comment 1A.4

Yes, the 2019 Building Energy Efficiency Standards do require mechanical outdoor air ventilation with air filters with a MERV 13 rating, however air filters with a higher filter efficiency than MERV 13 (e.g. MERV 14 or 15) may be required to maintain indoor concentrations of PM_{2.5} less than the California and National PM_{2.5} annual and 24-hour standards.

As discussed in my September 12, 2022 Indoor Air Quality letter for the TENTEN Hollywood Project, Los Angeles, CA (attached in Appendix A), since this Project is located in the South Coast Air Basin, which is a State and Federal non-attainment area for PM_{2.5}, as well as surrounded by roads with high vehicular traffic that create high PM_{2.5}

ambient concentrations, that an air quality analyses needs to be conducted to determine the concentrations of PM_{2.5} in the outdoor and indoor air that people inhale each day. This air quality analyses needs to consider the cumulative impacts of the project related emissions, existing and projected future emissions from local PM_{2.5} sources (e.g. stationary sources, motor vehicles, and airport traffic) upon the outdoor air concentrations at the Project site. Based upon this air quality study, air filters with a sufficient MERV rating can be selected for filtering the mechanical supply of outdoor air.

City of Los Angeles Response to Comment 1A.5

As required by law, the Proposed Project would comply with Section 4.504.5, Finish Pollutant Material Control, of the L.A. Green Building Code, which requires hardwood plywood, particleboard and medium density fiberboard composite wood products used on the interior or exterior of the building shall meet the requirements for formaldehyde as specified in CALGreen Table 4.504.5, Formaldehyde Limits - Maximum Formaldehyde Emissions in Parts Per Million (for mandatory residential requirements). Compliance with these requirements would be verified by the Department of Building and Safety through the plan approval process and as noted in item 19 of the City of Los Angeles Building Code Plan Check Notes - Form GRN-14.12 See also Response to Comment 1.4 in Appeal Letter No. 1, above.

IEE Rebuttal Comments to Comment 1A.5

See my Rebuttal Comments to Comment 1A.3 as to why simply selecting composite wood products that meet the CALGreen Code and other California regulations for formaldehyde emissions, will not insure that indoor concentrations of formaldehyde will result in cancer risks that are below 10 per million.

City of Los Angeles Response to Comment 1A.7

As stated above, pursuant to Section 99.04.504.6 of the LAMC, mechanically ventilated buildings are required to meet the air filtration requirements of the 2019 California Energy

Code. The 2019 Building Energy Efficiency Standards include requirements for mandatory mechanical ventilation intended to improve indoor air quality (IAQ) in homes, and requirements for MERV 13 air filtration on space conditioning systems, and ventilation systems that provide outside air to the occupiable space of a dwelling. No mitigation measures are warranted as impacts are less than significant.

IEE Rebuttal Comments to Comment 1A.7

See my above IEE Rebuttal Comments to Comment 1A.4, where I discuss that since this Project is located in the South Coast Air Basin, which is a State and Federal non-attainment area for PM_{2.5}, as well as surrounded by roads with high vehicular traffic that create high PM_{2.5} ambient concentrations, an air quality study needs to be conducted to determine what MERV rating filters are required to maintain indoor concentrations of PM_{2.5} less than the California and National PM_{2.5} annual and 24-hour standards. While the building codes require MERV 13 air filters, MERV 14 or MERV 15 air filters may be required to maintain indoor concentrations of PM_{2.5} less than the California and National PM_{2.5} annual and 24-hour standards.

APPENDIX A



INDOOR ENVIRONMENTAL ENGINEERING



1448 Pine Street, Suite 103 San Francisco, California 94109

Telephone: (415) 567-7700

E-mail: offermann@IEE-SF.com

<http://www.iee-sf.com>

Date: September 12, 2022

To: Richard Drury
Lozeau | Drury LLP
1939 Harrison Street, Suite 150
Oakland, California 94612

From: Francis J. Offermann PE CIH

Subject: Indoor Air Quality: TENTEN Hollywood Project, Los Angeles, CA
(IEE File Reference: P-4631)

Pages: 18

Indoor Air Quality Impacts

Indoor air quality (IAQ) directly impacts the comfort and health of building occupants, and the achievement of acceptable IAQ in newly constructed and renovated buildings is a well-recognized design objective. For example, IAQ is addressed by major high-performance building rating systems and building codes (California Building Standards Commission, 2014; USGBC, 2014). Indoor air quality in homes is particularly important because occupants, on average, spend approximately ninety percent of their time indoors with the majority of this time spent at home (EPA, 2011). Some segments of the population that are most susceptible to the effects of poor IAQ, such as the very young and the elderly, occupy their homes almost continuously. Additionally, an increasing number of adults are working from home at least some of the time during the workweek. Indoor air quality also is a serious concern for workers in hotels, offices and other business establishments.

The concentrations of many air pollutants often are elevated in homes and other buildings

relative to outdoor air because many of the materials and products used indoors contain and release a variety of pollutants to air (Hodgson et al., 2002; Offermann and Hodgson, 2011). With respect to indoor air contaminants for which inhalation is the primary route of exposure, the critical design and construction parameters are the provision of adequate ventilation and the reduction of indoor sources of the contaminants.

Indoor Formaldehyde Concentrations Impact. In the California New Home Study (CNHS) of 108 new homes in California (Offermann, 2009), 25 air contaminants were measured, and formaldehyde was identified as the indoor air contaminant with the highest cancer risk as determined by the California Proposition 65 Safe Harbor Levels (OEHHA, 2017a), No Significant Risk Levels (NSRL) for carcinogens. The NSRL is the daily intake level calculated to result in one excess case of cancer in an exposed population of 100,000 (i.e., ten in one million cancer risk) and for formaldehyde is 40 $\mu\text{g}/\text{day}$. The NSRL concentration of formaldehyde that represents a daily dose of 40 μg is 2 $\mu\text{g}/\text{m}^3$, assuming a continuous 24-hour exposure, a total daily inhaled air volume of 20 m^3 , and 100% absorption by the respiratory system. All of the CNHS homes exceeded this NSRL concentration of 2 $\mu\text{g}/\text{m}^3$. The median indoor formaldehyde concentration was 36 $\mu\text{g}/\text{m}^3$, and ranged from 4.8 to 136 $\mu\text{g}/\text{m}^3$, which corresponds to a median exceedance of the 2 $\mu\text{g}/\text{m}^3$ NSRL concentration of 18 and a range of 2.3 to 68.

Therefore, the cancer risk of a resident living in a California home with the median indoor formaldehyde concentration of 36 $\mu\text{g}/\text{m}^3$, is 180 per million as a result of formaldehyde alone. The CEQA significance threshold for airborne cancer risk is 10 per million, as established by the South Coast Air Quality Management District (SCAQMD, 2015).

Besides being a human carcinogen, formaldehyde is also a potent eye and respiratory irritant. In the CNHS, many homes exceeded the non-cancer reference exposure levels (RELs) prescribed by California Office of Environmental Health Hazard Assessment (OEHHA, 2017b). The percentage of homes exceeding the RELs ranged from 98% for the Chronic REL of 9 $\mu\text{g}/\text{m}^3$ to 28% for the Acute REL of 55 $\mu\text{g}/\text{m}^3$.

The primary source of formaldehyde indoors is composite wood products manufactured with urea-formaldehyde resins, such as plywood, medium density fiberboard, and particleboard. These materials are commonly used in building construction for flooring, cabinetry, baseboards, window shades, interior doors, and window and door trims.

In January 2009, the California Air Resources Board (CARB) adopted an airborne toxics control measure (ATCM) to reduce formaldehyde emissions from composite wood products, including hardwood plywood, particleboard, medium density fiberboard, and also furniture and other finished products made with these wood products (California Air Resources Board 2009). While this formaldehyde ATCM has resulted in reduced emissions from composite wood products sold in California, they do not preclude that homes built with composite wood products meeting the CARB ATCM will have indoor formaldehyde concentrations below cancer and non-cancer exposure guidelines.

A follow up study to the California New Home Study (CNHS) was conducted in 2016-2018 (Singer et. al., 2019), and found that the median indoor formaldehyde in new homes built after 2009 with CARB Phase 2 Formaldehyde ATCM materials had lower indoor formaldehyde concentrations, with a median indoor concentrations of $22.4 \mu\text{g}/\text{m}^3$ (18.2 ppb) as compared to a median of $36 \mu\text{g}/\text{m}^3$ found in the 2007 CNHS. Unlike in the CNHS study where formaldehyde concentrations were measured with pumped DNPH samplers, the formaldehyde concentrations in the HENGH study were measured with passive samplers, which were estimated to under-measure the true indoor formaldehyde concentrations by approximately 7.5%. Applying this correction to the HENGH indoor formaldehyde concentrations results in a median indoor concentration of $24.1 \mu\text{g}/\text{m}^3$, which is 33% lower than the $36 \mu\text{g}/\text{m}^3$ found in the 2007 CNHS.

Thus, while new homes built after the 2009 CARB formaldehyde ATCM have a 33% lower median indoor formaldehyde concentration and cancer risk, the median lifetime cancer risk is still 120 per million for homes built with CARB compliant composite wood products. This median lifetime cancer risk is more than 12 times the OEHHHA 10 in a million cancer risk threshold (OEHHHA, 2017a).

With respect to the TENTEN Hollywood Project, Los Angeles, CA, the buildings consist of residential spaces.

The residential occupants will potentially have continuous exposure (e.g. 24 hours per day, 52 weeks per year). These exposures are anticipated to result in significant cancer risks resulting from exposures to formaldehyde released by the building materials and furnishing commonly found in residential construction.

Because these residences will be constructed with CARB Phase 2 Formaldehyde ATCM materials, and be ventilated with the minimum code required amount of outdoor air, the indoor residential formaldehyde concentrations are likely similar to those concentrations observed in residences built with CARB Phase 2 Formaldehyde ATCM materials, which is a median of 24.1 $\mu\text{g}/\text{m}^3$ (Singer et. al., 2020).

Assuming that the residential occupants inhale 20 m^3 of air per day, the average 70-year lifetime formaldehyde daily dose is 482 $\mu\text{g}/\text{day}$ for continuous exposure in the residences. This exposure represents a cancer risk of 120 per million, which is more than 12 times the CEQA cancer risk of 10 per million. For occupants that do not have continuous exposure, the cancer risk will be proportionally less but still substantially over the CEQA cancer risk of 10 per million (e.g. for 12/hour/day occupancy, more than 6 times the CEQA cancer risk of 10 per million).

Appendix A, Indoor Formaldehyde Concentrations and the CARB Formaldehyde ATCM, provides analyses that show utilization of CARB Phase 2 Formaldehyde ATCM materials will not ensure acceptable cancer risks with respect to formaldehyde emissions from composite wood products.

Even composite wood products manufactured with CARB certified ultra low emitting formaldehyde (ULEF) resins do not insure that the indoor air will have concentrations of formaldehyde that meet the OEHHA cancer risks that substantially exceed 10 per million. The permissible emission rates for ULEF composite wood products are only 11-15% lower than the CARB Phase 2 emission rates. Only use of composite wood products made with no-added formaldehyde resins (NAF), such as resins made from soy, polyvinyl

acetate, or methylene diisocyanate can insure that the OEHHA cancer risk of 10 per million is met.

The following describes a method that should be used, prior to construction in the environmental review under CEQA, for determining whether the indoor concentrations resulting from the formaldehyde emissions of specific building materials/furnishings selected exceed cancer and non-cancer guidelines. Such a design analyses can be used to identify those materials/furnishings prior to the completion of the City's CEQA review and project approval, that have formaldehyde emission rates that contribute to indoor concentrations that exceed cancer and non-cancer guidelines, so that alternative lower emitting materials/furnishings may be selected and/or higher minimum outdoor air ventilation rates can be increased to achieve acceptable indoor concentrations and incorporated as mitigation measures for this project.

Pre-Construction Building Material/Furnishing Formaldehyde Emissions Assessment

This formaldehyde emissions assessment should be used in the environmental review under CEQA to assess the indoor formaldehyde concentrations from the proposed loading of building materials/furnishings, the area-specific formaldehyde emission rate data for building materials/furnishings, and the design minimum outdoor air ventilation rates. This assessment allows the applicant (and the City) to determine, before the conclusion of the environmental review process and the building materials/furnishings are specified, purchased, and installed, if the total chemical emissions will exceed cancer and non-cancer guidelines, and if so, allow for changes in the selection of specific material/furnishings and/or the design minimum outdoor air ventilations rates such that cancer and non-cancer guidelines are not exceeded.

1.) Define Indoor Air Quality Zones. Divide the building into separate indoor air quality zones, (IAQ Zones). IAQ Zones are defined as areas of well-mixed air. Thus, each ventilation system with recirculating air is considered a single zone, and each room or group of rooms where air is not recirculated (e.g. 100% outdoor air) is considered a separate zone. For IAQ Zones with the same construction material/furnishings and design minimum outdoor air ventilation rates. (e.g. hotel rooms, apartments, condominiums,

etc.) the formaldehyde emission rates need only be assessed for a single IAQ Zone of that type.

2.) Calculate Material/Furnishing Loading. For each IAQ Zone, determine the building material and furnishing loadings (e.g., m^2 of material/ m^2 floor area, units of furnishings/ m^2 floor area) from an inventory of all potential indoor formaldehyde sources, including flooring, ceiling tiles, furnishings, finishes, insulation, sealants, adhesives, and any products constructed with composite wood products containing urea-formaldehyde resins (e.g., plywood, medium density fiberboard, particleboard).

3.) Calculate the Formaldehyde Emission Rate. For each building material, calculate the formaldehyde emission rate ($\mu\text{g}/\text{h}$) from the product of the area-specific formaldehyde emission rate ($\mu\text{g}/\text{m}^2\text{-h}$) and the area (m^2) of material in the IAQ Zone, and from each furnishing (e.g. chairs, desks, etc.) from the unit-specific formaldehyde emission rate ($\mu\text{g}/\text{unit-h}$) and the number of units in the IAQ Zone.

NOTE: As a result of the high-performance building rating systems and building codes (California Building Standards Commission, 2014; USGBC, 2014), most manufacturers of building materials furnishings sold in the United States conduct chemical emission rate tests using the California Department of Health “Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions for Indoor Sources Using Environmental Chambers,” (CDPH, 2017), or other equivalent chemical emission rate testing methods. Most manufacturers of building furnishings sold in the United States conduct chemical emission rate tests using ANSI/BIFMA M7.1 Standard Test Method for Determining VOC Emissions (BIFMA, 2018), or other equivalent chemical emission rate testing methods.

CDPH, BIFMA, and other chemical emission rate testing programs, typically certify that a material or furnishing does not create indoor chemical concentrations in excess of the maximum concentrations permitted by their certification. For instance, the CDPH emission rate testing requires that the measured emission rates when input into an office, school, or residential model do not exceed one-half of the OEHHA Chronic Exposure Guidelines (OEHHA, 2017b) for the 35 specific VOCs, including formaldehyde, listed in

Table 4-1 of the CDPH test method (CDPH, 2017). These certifications themselves do not provide the actual area-specific formaldehyde emission rate (i.e., $\mu\text{g}/\text{m}^2\text{-h}$) of the product, but rather provide data that the formaldehyde emission rates do not exceed the maximum rate allowed for the certification. Thus, for example, the data for a certification of a specific type of flooring may be used to calculate that the area-specific emission rate of formaldehyde is less than $31 \mu\text{g}/\text{m}^2\text{-h}$, but not the actual measured specific emission rate, which may be 3, 18, or $30 \mu\text{g}/\text{m}^2\text{-h}$. These area-specific emission rates determined from the product certifications of CDPH, BIFA, and other certification programs can be used as an initial estimate of the formaldehyde emission rate.

If the actual area-specific emission rates of a building material or furnishing is needed (i.e. the initial emission rates estimates from the product certifications are higher than desired), then that data can be acquired by requesting from the manufacturer the complete chemical emission rate test report. For instance if the complete CDPH emission test report is requested for a CDHP certified product, that report will provide the actual area-specific emission rates for not only the 35 specific VOCs, including formaldehyde, listed in Table 4-1 of the CDPH test method (CDPH, 2017), but also all of the cancer and reproductive/developmental chemicals listed in the California Proposition 65 Safe Harbor Levels (OEHHA, 2017a), all of the toxic air contaminants (TACs) in the California Air Resources Board Toxic Air Contamination List (CARB, 2011), and the 10 chemicals with the greatest emission rates.

Alternatively, a sample of the building material or furnishing can be submitted to a chemical emission rate testing laboratory, such as Berkeley Analytical Laboratory (<https://berkeleyanalytical.com>), to measure the formaldehyde emission rate.

4.) Calculate the Total Formaldehyde Emission Rate. For each IAQ Zone, calculate the total formaldehyde emission rate (i.e. $\mu\text{g}/\text{h}$) from the individual formaldehyde emission rates from each of the building material/furnishings as determined in Step 3.

5.) Calculate the Indoor Formaldehyde Concentration. For each IAQ Zone, calculate the indoor formaldehyde concentration ($\mu\text{g}/\text{m}^3$) from Equation 1 by dividing the total

formaldehyde emission rates (i.e. $\mu\text{g/h}$) as determined in Step 4, by the design minimum outdoor air ventilation rate (m^3/h) for the IAQ Zone.

$$C_{in} = \frac{E_{total}}{Q_{oa}} \quad (\text{Equation 1})$$

where:

C_{in} = indoor formaldehyde concentration ($\mu\text{g}/\text{m}^3$)

E_{total} = total formaldehyde emission rate ($\mu\text{g}/\text{h}$) into the IAQ Zone.

Q_{oa} = design minimum outdoor air ventilation rate to the IAQ Zone (m^3/h)

The above Equation 1 is based upon mass balance theory, and is referenced in Section 3.10.2 “Calculation of Estimated Building Concentrations” of the California Department of Health “Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions for Indoor Sources Using Environmental Chambers”, (CDPH, 2017).

6.) Calculate the Indoor Exposure Cancer and Non-Cancer Health Risks. For each IAQ Zone, calculate the cancer and non-cancer health risks from the indoor formaldehyde concentrations determined in Step 5 and as described in the OEHHA Air Toxics Hot Spots Program Risk Assessment Guidelines; Guidance Manual for Preparation of Health Risk Assessments (OEHHA, 2015).

7.) Mitigate Indoor Formaldehyde Exposures of exceeding the CEQA Cancer and/or Non-Cancer Health Risks. In each IAQ Zone, provide mitigation for any formaldehyde exposure risk as determined in Step 6, that exceeds the CEQA cancer risk of 10 per million or the CEQA non-cancer Hazard Quotient of 1.0.

Provide the source and/or ventilation mitigation required in all IAQ Zones to reduce the health risks of the chemical exposures below the CEQA cancer and non-cancer health risks.

Source mitigation for formaldehyde may include:

- 1.) reducing the amount materials and/or furnishings that emit formaldehyde
- 2.) substituting a different material with a lower area-specific emission rate of

formaldehyde

Ventilation mitigation for formaldehyde emitted from building materials and/or furnishings may include:

- 1.) increasing the design minimum outdoor air ventilation rate to the IAQ Zone.

NOTE: Mitigating the formaldehyde emissions through use of less material/furnishings, or use of lower emitting materials/furnishings, is the preferred mitigation option, as mitigation with increased outdoor air ventilation increases initial and operating costs associated with the heating/cooling systems.

Further, we are not asking that the builder “speculate” on what and how much composite materials be used, but rather at the design stage to select composite wood materials based on the formaldehyde emission rates that manufacturers routinely conduct using the California Department of Health “Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions for Indoor Sources Using Environmental Chambers,” (CDPH, 2017), and use the procedure described earlier above (i.e. Pre-Construction Building Material/Furnishing Formaldehyde Emissions Assessment) to insure that the materials selected achieve acceptable cancer risks from material off gassing of formaldehyde.

Outdoor Air Ventilation Impact. Another important finding of the CNHS, was that the outdoor air ventilation rates in the homes were very low. Outdoor air ventilation is a very important factor influencing the indoor concentrations of air contaminants, as it is the primary removal mechanism of all indoor air generated contaminants. Lower outdoor air exchange rates cause indoor generated air contaminants to accumulate to higher indoor air concentrations. Many homeowners rarely open their windows or doors for ventilation as a result of their concerns for security/safety, noise, dust, and odor concerns (Price, 2007). In the CNHS field study, 32% of the homes did not use their windows during the 24-hour Test Day, and 15% of the homes did not use their windows during the entire preceding week. Most of the homes with no window usage were homes in the winter field session. Thus, a substantial percentage of homeowners never open their windows, especially in the

winter season. The median 24-hour measurement was 0.26 air changes per hour (ach), with a range of 0.09 ach to 5.3 ach. A total of 67% of the homes had outdoor air exchange rates below the minimum California Building Code (2001) requirement of 0.35 ach. Thus, the relatively tight envelope construction, combined with the fact that many people never open their windows for ventilation, results in homes with low outdoor air exchange rates and higher indoor air contaminant concentrations.

According to the Justification to Support a Categorical Exemption – TENTEN Hollywood Project (Parker Environmental Consultants, 2022) the Project is close to roads with moderate to high traffic (e.g., Santa Monica Boulevard – Route 66, North Gower Street, Lexington Avenue, West Beachwood Lane, North El Centro Avenue etc.). As a result the Project site is a sound impacted site.

The Justification to Support a Categorical Exemption – TENTEN Hollywood Project (Parker Environmental Consultants, 2022) contains only short-term monitoring periods of just 15 minutes and do not report the CNEL or Ldn dBA sound levels. In order to design the building such that the interior noise levels are acceptable, long-term one-week measurements need to be conducted to assess the ambient CNEL or Ldn dBA sound levels for the purpose of selecting the appropriate STC for the windows.

As a result of the high outdoor noise levels, the current project will require a mechanical supply of outdoor air ventilation to allow for a habitable interior environment with closed windows and doors. Such a ventilation system would allow windows and doors to be kept closed at the occupant's discretion to control exterior noise within building interiors.

PM_{2.5} Outdoor Concentrations Impact. An additional impact of the nearby motor vehicle traffic associated with this project, are the outdoor concentrations of PM_{2.5}. According to the Justification to Support a Categorical Exemption – TENTEN Hollywood Project (Parker Environmental Consultants, 2022), the Project is located in the South Coast Air Basin, which is a State and Federal non-attainment area for PM_{2.5}.

An air quality analyses should to be conducted to determine the concentrations of PM_{2.5} in the outdoor and indoor air that people inhale each day. This air quality analyses needs to consider the cumulative impacts of the project related emissions, existing and projected future emissions from local PM_{2.5} sources (e.g. stationary sources, motor vehicles, and airport traffic) upon the outdoor air concentrations at the Project site. If the outdoor concentrations are determined to exceed the California and National annual average PM_{2.5} exceedence concentration of 12 µg/m³, or the National 24-hour average exceedence concentration of 35 µg/m³, then the buildings need to have a mechanical supply of outdoor air that has air filtration with sufficient removal efficiency, such that the indoor concentrations of outdoor PM_{2.5} particles is less than the California and National PM_{2.5} annual and 24-hour standards.

It is my experience that based on the projected high traffic noise levels, the annual average concentration of PM_{2.5} will exceed the California and National PM_{2.5} annual and 24-hour standards and warrant installation of high efficiency air filters (i.e. MERV 13 or higher) in all mechanically supplied outdoor air ventilation systems.

Indoor Air Quality Impact Mitigation Measures

The following are recommended mitigation measures to minimize the impacts upon indoor quality:

Indoor Formaldehyde Concentrations Mitigation. Use only composite wood materials (e.g. hardwood plywood, medium density fiberboard, particleboard) for all interior finish systems that are made with CARB approved no-added formaldehyde (NAF) resins (CARB, 2009). CARB Phase 2 certified composite wood products, or ultra-low emitting formaldehyde (ULEF) resins, do not insure indoor formaldehyde concentrations that are below the CEQA cancer risk of 10 per million. Only composite wood products manufactured with CARB approved no-added formaldehyde (NAF) resins, such as resins made from soy, polyvinyl acetate, or methylene diisocyanate can insure that the OEHHA cancer risk of 10 per million is met.

Alternatively, conduct the previously described Pre-Construction Building Material/Furnishing Chemical Emissions Assessment, to determine that the combination of formaldehyde emissions from building materials and furnishings do not create indoor formaldehyde concentrations that exceed the CEQA cancer and non-cancer health risks.

It is important to note that we are not asking that the builder “speculate” on what and how much composite materials be used, but rather at the design stage to select composite wood materials based on the formaldehyde emission rates that manufacturers routinely conduct using the California Department of Health “Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions for Indoor Sources Using Environmental Chambers”, (CDPH, 2017), and use the procedure described above (i.e. Pre-Construction Building Material/Furnishing Formaldehyde Emissions Assessment) to insure that the materials selected achieve acceptable cancer risks from material off gassing of formaldehyde.

Outdoor Air Ventilation Mitigation. Provide each habitable room with a continuous mechanical supply of outdoor air that meets or exceeds the California 2016 Building Energy Efficiency Standards (California Energy Commission, 2015) requirements of the greater of 15 cfm/occupant or 0.15 cfm/ft² of floor area. Following installation of the system conduct testing and balancing to insure that required amount of outdoor air is entering each habitable room and provide a written report documenting the outdoor airflow rates. Do not use exhaust only mechanical outdoor air systems, use only balanced outdoor air supply and exhaust systems or outdoor air supply only systems. Provide a manual for the occupants or maintenance personnel, that describes the purpose of the mechanical outdoor air system and the operation and maintenance requirements of the system.

PM_{2.5} Outdoor Air Concentration Mitigation. Install air filtration with sufficient PM_{2.5} removal efficiency (e.g. MERV 13 or higher) to filter the outdoor air entering the mechanical outdoor air supply systems, such that the indoor concentrations of outdoor PM_{2.5} particles are less than the California and National PM_{2.5} annual and 24-hour standards. Install the air filters in the system such that they are accessible for replacement

by the occupants or maintenance personnel. Include in the mechanical outdoor air ventilation system manual instructions on how to replace the air filters and the estimated frequency of replacement.

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APPENDIX A

INDOOR FORMALDEHYDE CONCENTRATIONS AND THE CARB FORMALDEHYDE ATCM

With respect to formaldehyde emissions from composite wood products, the CARB ATCM regulations of formaldehyde emissions from composite wood products, do not assure healthful indoor air quality. The following is the stated purpose of the CARB ATCM regulation - *The purpose of this airborne toxic control measure is to “reduce formaldehyde emissions from composite wood products, and finished goods that contain composite wood products, that are sold, offered for sale, supplied, used, or manufactured for sale in California”*. In other words, the CARB ATCM regulations do not “assure healthful indoor air quality”, but rather “reduce formaldehyde emissions from composite wood products”.

Just how much protection do the CARB ATCM regulations provide building occupants from the formaldehyde emissions generated by composite wood products? Definitely some, but certainly the regulations do not “*assure healthful indoor air quality*” when CARB Phase 2 products are utilized. As shown in the Chan 2019 study of new California homes, the median indoor formaldehyde concentration was of 22.4 $\mu\text{g}/\text{m}^3$ (18.2 ppb), which corresponds to a cancer risk of 112 per million for occupants with continuous exposure, which is more than 11 times the CEQA cancer risk of 10 per million.

Another way of looking at how much protection the CARB ATCM regulations provide building occupants from the formaldehyde emissions generated by composite wood products is to calculate the maximum number of square feet of composite wood product that can be in a residence without exceeding the CEQA cancer risk of 10 per million for occupants with continuous occupancy.

For this calculation I utilized the floor area (2,272 ft^2), the ceiling height (8.5 ft), and the number of bedrooms (4) as defined in Appendix B (New Single-Family Residence Scenario) of the Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions for Indoor Sources Using Environmental Chambers, Version 1.1, 2017, California

Department of Public Health, Richmond, CA. <https://www.cdph.ca.gov/Programs/CCDPHP/DEODC/EHLB/IAQ/Pages/VOC.aspx>.

For the outdoor air ventilation rate I used the 2019 Title 24 code required mechanical ventilation rate (ASHRAE 62.2) of 106 cfm (180 m³/h) calculated for this model residence. For the composite wood formaldehyde emission rates I used the CARB ATCM Phase 2 rates.

The calculated maximum number of square feet of composite wood product that can be in a residence, without exceeding the CEQA cancer risk of 10 per million for occupants with continuous occupancy are as follows for the different types of regulated composite wood products.

Medium Density Fiberboard (MDF) – 15 ft² (0.7% of the floor area), or
Particle Board – 30 ft² (1.3% of the floor area), or
Hardwood Plywood – 54 ft² (2.4% of the floor area), or
Thin MDF – 46 ft² (2.0 % of the floor area).

For offices and hotels the calculated maximum amount of composite wood product (% of floor area) that can be used without exceeding the CEQA cancer risk of 10 per million for occupants, assuming 8 hours/day occupancy, and the California Mechanical Code minimum outdoor air ventilation rates are as follows for the different types of regulated composite wood products.

Medium Density Fiberboard (MDF) – 3.6 % (offices) and 4.6% (hotel rooms), or
Particle Board – 7.2 % (offices) and 9.4% (hotel rooms), or
Hardwood Plywood – 13 % (offices) and 17% (hotel rooms), or
Thin MDF – 11 % (offices) and 14 % (hotel rooms)

Clearly the CARB ATCM does not regulate the formaldehyde emissions from composite wood products such that the potentially large areas of these products, such as for flooring, baseboards, interior doors, window and door trims, and kitchen and bathroom cabinetry,

could be used without causing indoor formaldehyde concentrations that result in CEQA cancer risks that substantially exceed 10 per million for occupants with continuous occupancy.

Even composite wood products manufactured with CARB certified ultra low emitting formaldehyde (ULEF) resins do not insure that the indoor air will have concentrations of formaldehyde that meet the OEHHA cancer risks that substantially exceed 10 per million. The permissible emission rates for ULEF composite wood products are only 11-15% lower than the CARB Phase 2 emission rates. Only use of composite wood products made with no-added formaldehyde resins (NAF), such as resins made from soy, polyvinyl acetate, or methylene diisocyanate can insure that the OEHHA cancer risk of 10 per million is met.

If CARB Phase 2 compliant or ULEF composite wood products are utilized in construction, then the resulting indoor formaldehyde concentrations should be determined in the design phase using the specific amounts of each type of composite wood product, the specific formaldehyde emission rates, and the volume and outdoor air ventilation rates of the indoor spaces, and all feasible mitigation measures employed to reduce this impact (e.g. use less formaldehyde containing composite wood products and/or incorporate mechanical systems capable of higher outdoor air ventilation rates). See the procedure described earlier (i.e. Pre-Construction Building Material/Furnishing Formaldehyde Emissions Assessment) to insure that the materials selected achieve acceptable cancer risks from material off gassing of formaldehyde.

Alternatively, and perhaps a simpler approach, is to use only composite wood products (e.g. hardwood plywood, medium density fiberboard, particleboard) for all interior finish systems that are made with CARB approved no-added formaldehyde (NAF) resins.

Francis (Bud) J. Offermann III PE, CIH

Indoor Environmental Engineering

1448 Pine Street, Suite 103, San Francisco, CA 94109

Phone: 415-567-7700

Email: Offermann@iee-sf.com

<http://www.iee-sf.com>

Education

M.S. Mechanical Engineering (1985)
Stanford University, Stanford, CA.

Graduate Studies in Air Pollution Monitoring and Control (1980)
University of California, Berkeley, CA.

B.S. in Mechanical Engineering (1976)
Rensselaer Polytechnic Institute, Troy, N.Y.

Professional Experience

President: Indoor Environmental Engineering, San Francisco, CA. December, 1981 - present.

Direct team of environmental scientists, chemists, and mechanical engineers in conducting State and Federal research regarding indoor air quality instrumentation development, building air quality field studies, ventilation and air cleaning performance measurements, and chemical emission rate testing.

Provide design side input to architects regarding selection of building materials and ventilation system components to ensure a high quality indoor environment.

Direct Indoor Air Quality Consulting Team for the winning design proposal for the new State of Washington Ecology Department building.

Develop a full-scale ventilation test facility for measuring the performance of air diffusers; ASHRAE 129, Air Change Effectiveness, and ASHRAE 113, Air Diffusion Performance Index.

Develop a chemical emission rate testing laboratory for measuring the chemical emissions from building materials, furnishings, and equipment.

Principle Investigator of the California New Homes Study (2005-2007). Measured ventilation and indoor air quality in 108 new single family detached homes in northern and southern California.

Develop and teach IAQ professional development workshops to building owners, managers, hygienists, and engineers.

Air Pollution Engineer: Earth Metrics Inc., Burlingame, CA, October, 1985 to March, 1987.

Responsible for development of an air pollution laboratory including installation a forced choice olfactometer, tracer gas electron capture chromatograph, and associated calibration facilities. Field team leader for studies of fugitive odor emissions from sewage treatment plants, entrainment of fume hood exhausts into computer chip fabrication rooms, and indoor air quality investigations.

Staff Scientist: Building Ventilation and Indoor Air Quality Program, Energy and Environment Division, Lawrence Berkeley Laboratory, Berkeley, CA. January, 1980 to August, 1984.

Deputy project leader for the Control Techniques group; responsible for laboratory and field studies aimed at evaluating the performance of indoor air pollutant control strategies (i.e. ventilation, filtration, precipitation, absorption, adsorption, and source control).

Coordinated field and laboratory studies of air-to-air heat exchangers including evaluation of thermal performance, ventilation efficiency, cross-stream contaminant transfer, and the effects of freezing/defrosting.

Developed an *in situ* test protocol for evaluating the performance of air cleaning systems and introduced the concept of effective cleaning rate (ECR) also known as the Clean Air Delivery Rate (CADR).

Coordinated laboratory studies of portable and ducted air cleaning systems and their effect on indoor concentrations of respirable particles and radon progeny.

Co-designed an automated instrument system for measuring residential ventilation rates and radon concentrations.

Designed hardware and software for a multi-channel automated data acquisition system used to evaluate the performance of air-to-air heat transfer equipment.

Assistant Chief Engineer: Alta Bates Hospital, Berkeley, CA, October, 1979 to January, 1980.

Responsible for energy management projects involving installation of power factor correction capacitors on large inductive electrical devices and installation of steam meters on physical plant steam lines. Member of Local 39, International Union of Operating Engineers.

Manufacturing Engineer: American Precision Industries, Buffalo, NY, October, 1977 to October, 1979.

Responsible for reorganizing the manufacturing procedures regarding production of shell and tube heat exchangers. Designed customized automatic assembly, welding, and testing equipment. Designed a large paint spray booth. Prepared economic studies justifying new equipment purchases. Safety Director.

Project Engineer: Arcata Graphics, Buffalo, N.Y. June, 1976 to October, 1977.

Responsible for the design and installation of a bulk ink storage and distribution system and high speed automatic counting and marking equipment. Also coordinated material handling studies which led to the purchase and installation of new equipment.

PROFESSIONAL ORGANIZATION MEMBERSHIP

American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE)

- Chairman of SPC-145P, Standards Project Committee - Test Method for Assessing the Performance of Gas Phase Air Cleaning Equipment (1991-1992)
- Member SPC-129P, Standards Project Committee - Test Method for Ventilation Effectiveness (1986-97)
 - Member of Drafting Committee
- Member Environmental Health Committee (1992-1994, 1997-2001, 2007-2010)
 - Chairman of EHC Research Subcommittee
 - Member of Man Made Mineral Fiber Position Paper Subcommittee
 - Member of the IAQ Position Paper Committee
 - Member of the Legionella Position Paper Committee
 - Member of the Limiting Indoor Mold and Dampness in Buildings Position Paper Committee
- Member SSPC-62, Standing Standards Project Committee - Ventilation for Acceptable Indoor Air Quality (1992 to 2000)
 - Chairman of Source Control and Air Cleaning Subcommittee
- Chairman of TC-4.10, Indoor Environmental Modeling (1988-92)
 - Member of Research Subcommittee
- Chairman of TC-2.3, Gaseous Air Contaminants and Control Equipment (1989-92)
 - Member of Research Subcommittee

American Society for Testing and Materials (ASTM)

- D-22 Sampling and Analysis of Atmospheres
 - Member of Indoor Air Quality Subcommittee
- E-06 Performance of Building Constructions

American Board of Industrial Hygiene (ABIH)

American Conference of Governmental Industrial Hygienists (ACGIH)

- Bioaerosols Committee (2007-2013)

American Industrial Hygiene Association (AIHA)

Cal-OSHA Indoor Air Quality Advisory Committee

International Society of Indoor Air Quality and Climate (ISIAQ)

- Co-Chairman of Task Force on HVAC Hygiene

U. S. Green Building Council (USGBC)

- Member of the IEQ Technical Advisory Group (2007-2009)
- Member of the IAQ Performance Testing Work Group (2010-2012)

Western Construction Consultants (WESTCON)

PROFESSIONAL CREDENTIALS

Licensed Professional Engineer - Mechanical Engineering

Certified Industrial Hygienist - American Board of Industrial Hygienists

SCIENTIFIC MEETINGS AND SYMPOSIA

Biological Contamination, Diagnosis, and Mitigation, Indoor Air'90, Toronto, Canada, August, 1990.

Models for Predicting Air Quality, Indoor Air'90, Toronto, Canada, August, 1990.

Microbes in Building Materials and Systems, Indoor Air '93, Helsinki, Finland, July, 1993.

Microorganisms in Indoor Air Assessment and Evaluation of Health Effects and Probable Causes, Walnut Creek, CA, February 27, 1997.

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Scientific Advisory Committee, Roomvent 98, 6th International Conference on Air Distribution in Rooms, KTH, Stockholm, Sweden, June 14-17, 1998.

Moisture and Mould, Indoor Air '99, Edinburgh, Scotland, August, 1999.

Ventilation Modeling and Simulation, Indoor Air '99, Edinburgh, Scotland, August, 1999.

Microbial Growth in Materials, Healthy Buildings 2000, Espoo, Finland, August, 2000.

Co-Chair, Bioaerosols X- Exposures in Residences, Indoor Air 2002, Monterey, CA, July 2002.

Healthy Indoor Environments, Anaheim, CA, April 2003.

Chair, Environmental Tobacco Smoke in Multi-Family Homes, Indoor Air 2008, Copenhagen, Denmark, July 2008.

Co-Chair, ISIAQ Task Force Workshop; HVAC Hygiene, Indoor Air 2002, Monterey, CA, July 2002.

Chair, ETS in Multi-Family Housing: Exposures, Controls, and Legalities Forum, Healthy Buildings 2009, Syracuse, CA, September 14, 2009.

Chair, Energy Conservation and IAQ in Residences Workshop, Indoor Air 2011, Austin, TX, June 6, 2011.

Chair, Electronic Cigarettes: Chemical Emissions and Exposures Colloquium, Indoor Air 2016, Ghent, Belgium, July 4, 2016.

SPECIAL CONSULTATION

Provide consultation to the American Home Appliance Manufacturers on the development of a standard for testing portable air cleaners, AHAM Standard AC-1.

Served as an expert witness and special consultant for the U.S. Federal Trade Commission regarding the performance claims found in advertisements of portable air cleaners and residential furnace filters.

Conducted a forensic investigation for a San Mateo, CA pro se defendant, regarding an alleged homicide where the victim was kidnapped in a steamer trunk. Determined the air exchange rate in the steamer trunk and how long the person could survive.

Conducted *in situ* measurement of human exposure to toluene fumes released during nailpolish application for a plaintiffs attorney pursuing a California Proposition 65 product labeling case. June, 1993.

Conducted a forensic *in situ* investigation for the Butte County, CA Sheriff's Department of the emissions of a portable heater used in the bedroom of two twin one year old girls who suffered simultaneous crib death.

Consult with OSHA on the 1995 proposed new regulation regarding indoor air quality and environmental tobacco smoke.

Consult with EPA on the proposed Building Alliance program and with OSHA on the proposed new OSHA IAQ regulation.

Johnson Controls Audit/Certification Expert Review; Milwaukee, WI. May 28-29, 1997.

Winner of the nationally published 1999 Request for Proposals by the State of Washington to conduct a comprehensive indoor air quality investigation of the Washington State Department of Ecology building in Lacey, WA.

Selected by the State of California Attorney General's Office in August, 2000 to conduct a comprehensive indoor air quality investigation of the Tulare County Court House.

Lawrence Berkeley Laboratory IAQ Experts Workshop: "Cause and Prevention of Sick Building Problems in Offices: The Experience of Indoor Environmental Quality Investigators", Berkeley, California, May 26-27, 2004.

Provide consultation and chemical emission rate testing to the State of California Attorney General's Office in 2013-2015 regarding the chemical emissions from e-cigarettes.

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F.J.Offermann, "Ventilation Effectiveness and ADPI Measurements of a Forced Air Heating System," *ASHRAE Transactions* , Volume 94, Part 1, pp 694-704, 1988.

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F.J. Offermann, S.A. Loiselle, M.C. Quinlan, and M.S. Rogers, "A Study of Diesel Fume Entrainment in an Office Building," *IAQ '89*, The Human Equation: Health and Comfort, pp 179-183, ASHRAE, Atlanta, GA, 1989.

R.G.Sextro and F.J.Offermann, "Reduction of Residential Indoor Particle and Radon Progeny Concentrations with Ducted Air Cleaning Systems," submitted to *Indoor Air*, 1990.

S.A.Loiselle, A.T.Hodgson, and F.J.Offermann, "Development of An Indoor Air Sampler for Polycyclic Aromatic Compounds", *Indoor Air* , Vol 2, pp 191-210, 1991.

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F.J. Offermann, S. A. Loiselle, R.G. Sextro, "Performance of Air Cleaners Installed in a Residential Forced Air System," *ASHRAE Journal*, pp 51-57, July, 1992.

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F.J. Offermann, "Professional Malpractice and the Sick Building Investigator," *IAQ'96*, Paths to Better Building Environments, pp 132-136, ASHRAE, Atlanta, GA, 1996.

F.J. Offermann, "Standard Method of Measuring Air Change Effectiveness," *Indoor Air*, Vol 1, pp.206-211, 1999.

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"Operating Healthy Buildings", Association of Plant Engineers, Oakland, CA, November 14, 1991.

"Duct Cleaning Perspectives", Moderator of Seminar at the ASHRAE Semi-Annual Meeting, Indianapolis, IN, June 24, 1991.

"Duct Cleaning: The Role of the Environmental Hygienist," ASHRAE Annual Meeting, Anaheim, CA, January 29, 1992.

"Emerging IAQ Issues", Fifth National Conference on Indoor Air Pollution, University of Tulsa, Tulsa, OK, April 13-14, 1992.

"International Symposium on Room Air Convection and Ventilation Effectiveness", Member of Scientific Advisory Board, University of Tokyo, July 22-24, 1992.

"Guidelines for Contaminant Control During Construction and Renovation Projects in Office Buildings," Seminar paper at the ASHRAE Annual Meeting, Chicago, IL, January 26, 1993.

"Outside Air Economizers: IAQ Friend or Foe", Moderator of Forum at the ASHRAE Annual Meeting, Chicago, IL, January 26, 1993.

"Orientation to Indoor Air Quality," an EPA two and one half day comprehensive indoor air quality introductory workshop for public officials and building property managers; Sacramento, September 28-30, 1992; San Francisco, February 23-24, 1993; Los Angeles, March 16-18, 1993; Burbank, June 23, 1993; Hawaii, August 24-25, 1993; Las Vegas, August 30, 1993; San Diego, September 13-14, 1993; Phoenix, October 18-19, 1993; Reno, November 14-16, 1995; Fullerton, December 3-4, 1996; Fresno, May 13-14, 1997.

"Building Air Quality: A Guide for Building Owners and Facility Managers," an EPA one half day indoor air quality introductory workshop for building owners and facility managers. Presented throughout Region IX 1993-1995.

"Techniques for Airborne Disease Control", EPRI Healthcare Initiative Symposium; San Francisco, CA; June 7, 1994.

“Diagnosing and Mitigating Indoor Air Quality Problems”, CIHC Conference; San Francisco, September 29, 1994.

”Indoor Air Quality: Tools for Schools,” an EPA one day air quality management workshop for school officials, teachers, and maintenance personnel; San Francisco, October 18-20, 1994; Cerritos, December 5, 1996; Fresno, February 26, 1997; San Jose, March 27, 1997; Riverside, March 5, 1997; San Diego, March 6, 1997; Fullerton, November 13, 1997; Santa Rosa, February 1998; Cerritos, February 26, 1998; Santa Rosa, March 2, 1998.

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“Diagnostic Protocols for Building IAQ Assessment”, American Society of Safety Engineers Seminar: ‘Indoor Air Quality – The Next Door’; San Jose Chapter, September 27, 1995; Oakland Chapter, 9, 1997.

“Diagnostic Protocols for Building IAQ Assessment”, Local 39; Oakland, CA, October 3, 1995.

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“Demonstrating Compliance with ASHRAE 62-1989 Ventilation Requirements”, AIHA; October 25, 1995.

“IAQ Diagnostics: Hands on Assessment of Building Ventilation and Pollutant Transport”, EPA Region IX; Phoenix, AZ, March 12, 1996; San Francisco, CA, April 9, 1996; Burbank, CA, April 12, 1996.

“Experimental Validation of ASHRAE 129P: Standard Method of Measuring Air Change Effectiveness”, Room Vent ‘96 / International Symposium on Room Air Convection and Ventilation Effectiveness”; Yokohama, Japan, July 16-19, 1996.

“IAQ Diagnostic Methodologies and RFP Development”, CCEHSA 1996 Annual Conference, Humboldt State University, Arcata, CA, August 2, 1996.

“The Practical Side of Indoor Air Quality Assessments”, California Industrial Hygiene Conference ‘96, San Diego, CA, September 2, 1996.

“ASHRAE Standard 62: Improving Indoor Environments”, Pacific Gas and Electric Energy Center, San Francisco, CA, October 29, 1996.

“Operating and Maintaining Healthy Buildings”, April 3-4, 1996, San Jose, CA; July 30, 1997, Monterey, CA.

“IAQ Primer”, Local 39, April 16, 1997; Amdahl Corporation, June 9, 1997; State Compensation Insurance Fund’s Safety & Health Services Department, November 21, 1996.

“Tracer Gas Techniques for Measuring Building Air Flow Rates”, ASHRAE, Philadelphia, PA, January 26, 1997.

“How to Diagnose and Mitigate Indoor Air Quality Problems”; Women in Waste; March 19, 1997.

“Environmental Engineer: What Is It?”, Monte Vista High School Career Day; April 10, 1997.

“Indoor Environment Controls: What’s Hot and What’s Not”, Shaklee Corporation; San Francisco, CA, July 15, 1997.

“Measurement of Ventilation System Performance Parameters in the US EPA BASE Study”, Healthy Buildings/IAQ’97, Washington, DC, September 29, 1997.

“Operations and Maintenance for Healthy and Comfortable Indoor Environments”, PASMA; October 7, 1997.

“Designing for Healthy and Comfortable Indoor Environments”, Construction Specification Institute, Santa Rosa, CA, November 6, 1997.

“Ventilation System Design for Good IAQ”, University of Tulsa 10th Annual Conference, San Francisco, CA, February 25, 1998.

“The Building Shell”, Tools For Building Green Conference and Trade Show, Alameda County Waste Management Authority and Recycling Board, Oakland, CA, February 28, 1998.

“Identifying Fungal Contamination Problems In Buildings”, The City of Oakland Municipal Employees, Oakland, CA, March 26, 1998.

“Managing Indoor Air Quality in Schools: Staying Out of Trouble”, CASBO, Sacramento, CA, April 20, 1998.

“Indoor Air Quality”, CSOOC Spring Conference, Visalia, CA, April 30, 1998.

“Particulate and Gas Phase Air Filtration”, ACGIH/OSHA, Ft. Mitchell, KY, June 1998.

“Building Air Quality Facts and Myths”, The City of Oakland / Alameda County Safety Seminar, Oakland, CA, June 12, 1998.

“Building Engineering and Moisture”, Building Contamination Workshop, University of California Berkeley, Continuing Education in Engineering and Environmental Management, San Francisco, CA, October 21-22, 1999.

“Identifying and Mitigating Mold Contamination in Buildings”, Western Construction Consultants Association, Oakland, CA, March 15, 2000; AIG Construction Defect Seminar, Walnut Creek, CA, May 2, 2001; City of Oakland Public Works Agency, Oakland, CA, July 24, 2001; Executive Council of Homeowners, Alamo, CA, August 3, 2001.

“Using the EPA BASE Study for IAQ Investigation / Communication”, Joint Professional Symposium 2000, American Industrial Hygiene Association, Orange County & Southern California Sections, Long Beach, October 19, 2000.

“Ventilation,” Indoor Air Quality: Risk Reduction in the 21st Century Symposium, sponsored by the California Environmental Protection Agency/Air Resources Board, Sacramento, CA, May 3-4, 2000.

“Workshop 18: Criteria for Cleaning of Air Handling Systems”, Healthy Buildings 2000, Espoo, Finland, August 2000.

“Closing Session Summary: ‘Building Investigations’ and ‘Building Design & Construction’”, Healthy Buildings 2000, Espoo, Finland, August 2000.

“Managing Building Air Quality and Energy Efficiency, Meeting the Standard of Care”, BOMA, MidAtlantic Environmental Hygiene Resource Center, Seattle, WA, May 23rd, 2000; San Antonio, TX, September 26-27, 2000.

“Diagnostics & Mitigation in Sick Buildings: When Good Buildings Go Bad,” University of California Berkeley, September 18, 2001.

“Mold Contamination: Recognition and What To Do and Not Do”, Redwood Empire Remodelers Association; Santa Rosa, CA, April 16, 2002.

“Investigative Tools of the IAQ Trade”, Healthy Indoor Environments 2002; Austin, TX; April 22, 2002.

“Finding Hidden Mold: Case Studies in IAQ Investigations”, AIHA Northern California Professionals Symposium; Oakland, CA, May 8, 2002.

“Assessing and Mitigating Fungal Contamination in Buildings”, Cal/OSHA Training; Oakland, CA, February 14, 2003 and West Covina, CA, February 20-21, 2003.

“Use of External Containments During Fungal Mitigation”, Invited Speaker, ACGIH Mold Remediation Symposium, Orlando, FL, November 3-5, 2003.

Building Operator Certification (BOC), 106-IAQ Training Workshops, Northwest Energy Efficiency Council; Stockton, CA, December 3, 2003; San Francisco, CA, December 9, 2003; Irvine, CA, January 13, 2004; San Diego, January 14, 2004; Irwindale, CA, January 27, 2004; Downey, CA, January 28, 2004; Santa Monica, CA, March 16, 2004; Ontario, CA, March 17, 2004; Ontario, CA, November 9, 2004, San Diego, CA, November 10, 2004; San Francisco, CA, November 17, 2004; San Jose, CA, November 18, 2004; Sacramento, CA, March 15, 2005.

“Mold Remediation: The National QUEST for Uniformity Symposium”, Invited Speaker, Orlando, Florida, November 3-5, 2003.

“Mold and Moisture Control”, Indoor Air Quality workshop for The Collaborative for High Performance Schools (CHPS), San Francisco, December 11, 2003.

“Advanced Perspectives In Mold Prevention & Control Symposium”, Invited Speaker, Las Vegas, Nevada, November 7-9, 2004.

“Building Sciences: Understanding and Controlling Moisture in Buildings”, American Industrial Hygiene Association, San Francisco, CA, February 14-16, 2005.

“Indoor Air Quality Diagnostics and Healthy Building Design”, University of California Berkeley, Berkeley, CA, March 2, 2005.

“Improving IAQ = Reduced Tenant Complaints”, Northern California Facilities Exposition, Santa Clara, CA, September 27, 2007.

“Defining Safe Building Air”, Criteria for Safe Air and Water in Buildings, ASHRAE Winter Meeting, Chicago, IL, January 27, 2008.

“Update on USGBC LEED and Air Filtration”, Invited Speaker, NAFA 2008 Convention, San Francisco, CA, September 19, 2008.

“Ventilation and Indoor air Quality in New California Homes”, National Center of Healthy Housing, October 20, 2008.

“Indoor Air Quality in New Homes”, California Energy and Air Quality Conference, October 29, 2008.

“Mechanical Outdoor air Ventilation Systems and IAQ in New Homes”, ACI Home Performance Conference, Kansas City, MO, April 29, 2009.

“Ventilation and IAQ in New Homes with and without Mechanical Outdoor Air Systems”, Healthy Buildings 2009, Syracuse, CA, September 14, 2009.

“Ten Ways to Improve Your Air Quality”, Northern California Facilities Exposition, Santa Clara, CA, September 30, 2009.

“New Developments in Ventilation and Indoor Air Quality in Residential Buildings”, Westcon meeting, Alameda, CA, March 17, 2010.

“Intermittent Residential Mechanical Outdoor Air Ventilation Systems and IAQ”, ASHRAE SSPC 62.2 Meeting, Austin, TX, April 19, 2010.

“Measured IAQ in Homes”, ACI Home Performance Conference, Austin, TX, April 21, 2010.

“Respiration: IEQ and Ventilation”, AIHce 2010, How IH Can LEED in Green buildings, Denver, CO, May 23, 2010.

“IAQ Considerations for Net Zero Energy Buildings (NZEB)”, Northern California Facilities Exposition, Santa Clara, CA, September 22, 2010.

“Energy Conservation and Health in Buildings”, Berkeley High School Green Career Week, Berkeley, CA, April 12, 2011.

“What Pollutants are Really There ?”, ACI Home Performance Conference, San Francisco, CA, March 30, 2011.

“Energy Conservation and Health in Residences Workshop”, Indoor Air 2011, Austin, TX, June 6, 2011.

“Assessing IAQ and Improving Health in Residences”, US EPA Weatherization Plus Health, September 7, 2011.

“Ventilation: What a Long Strange Trip It’s Been”, Westcon, May 21, 2014.

“Chemical Emissions from E-Cigarettes: Direct and Indirect Passive Exposures”, Indoor Air 2014, Hong Kong, July, 2014.

“Infectious Disease Aerosol Exposures With and Without Surge Control Ventilation System Modifications”, Indoor Air 2014, Hong Kong, July, 2014.

“Chemical Emissions from E-Cigarettes”, IMF Health and Welfare Fair, Washington, DC, February 18, 2015.

“Chemical Emissions and Health Hazards Associated with E-Cigarettes”, Roswell Park Cancer Institute, Buffalo, NY, August 15, 2014.

“Formaldehyde Indoor Concentrations, Material Emission Rates, and the CARB ATCM”, Harris Martin’s Lumber Liquidators Flooring Litigation Conference, WQ Minneapolis Hotel, May 27, 2015.

“Chemical Emissions from E-Cigarettes: Direct and Indirect Passive Exposure”, FDA Public Workshop: Electronic Cigarettes and the Public Health, Hyattsville, MD June 2, 2015.

“Creating Healthy Homes, Schools, and Workplaces”, Chautauqua Institution, Athenaeum Hotel, August 24, 2015.

“Diagnosing IAQ Problems and Designing Healthy Buildings”, University of California Berkeley, Berkeley, CA, October 6, 2015.

“Diagnosing Ventilation and IAQ Problems in Commercial Buildings”, BEST Center Annual Institute, Lawrence Berkeley National Laboratory, January 6, 2016.

“A Review of Studies of Ventilation and Indoor Air Quality in New Homes and Impacts of Environmental Factors on Formaldehyde Emission Rates From Composite Wood Products”, AIHce2016, May, 21-26, 2016.

“Admissibility of Scientific Testimony”, Science in the Court, Proposition 65 Clearinghouse Annual Conference, Oakland, CA, September 15, 2016.

“Indoor Air Quality and Ventilation”, ASHRAE Redwood Empire, Napa, CA, December 1, 2016.

EXHIBIT C



DEBORAH JUE

Principal

Since joining Wilson Ihrig in 1990, Ms. Jue has been involved in with many projects from environmental assessments and entitlements, through design development, construction documents and construction administration support. As an acoustical consultant, she has provided noise measurement, analysis and recommendations to control noise and vibration both at the interior of the project and at the neighboring properties. She has authored many reports concerning compliance with the requirements of California Noise Insulation Standards, Title 24, local Noise Elements, environmental assessments and Federal noise criteria, and is well aware of the additional design and construction technique requirements to achieve industry standards. Ms. Jue has authored or provided input for many environmental documents and technical studies in accordance with NEPA and California's CEQA regulations, most of them related to surface transportation, and she gives presentations to public officials when necessary to explain construction noise problems, noise mitigation goals, and noise control methods. She can develop construction noise and vibration criteria to address vibration damage potential to nearby buildings and sensitive structures, and vibration annoyance or disruption potential for occupants of nearby buildings.

Education

- M.S. in Mechanical Engineering, University of California, Berkeley, 1998
- B.S. in General Engineering: Acoustics, Stanford University, 1988

Professional Associations (Member)

- American Society of Mechanical Engineers
- Acoustical Society of America
- National Council of Acoustical Consultants
- Institute of Noise Control Engineering
- WTS
- Transportation Research Board, AEP80 Standing Committee Member (2021-2024)

Research and Published Papers

- ACRP Report 175, ACRP 07-14, *Improving Intelligibility of Airport Terminal Public Address Systems*
- NCHRP 25-25, *Current Practices to Address Construction Vibration and Potential Effects to Historic Buildings Adjacent to Transportation Projects*
- *Transportation Research Record*, V. 2502, "Considerations to Establish Ground-Borne Noise Criteria to Define Mitigation for Noise-Sensitive Spaces"

Relevant Experience

- California High Speed Rail Caltrain Corridor EIR/EIS, San Francisco to San Jose
- UC Berkeley Northgate Hall A/V Renovations, Berkeley
- MacArthur Station, *long-term construction noise and vibration monitoring*, Oakland
- Safeway @ Claremont & College, *HVAC noise and construction noise monitoring*, Oakland
- ACTC I-80/Ashby, *interchange traffic noise analysis*, Berkeley and Emeryville
- ACTC I-680 Express Lanes, *traffic noise analysis*, Contra Costa County, CA
- Chase Arena, *construction noise and vibration monitoring*, San Francisco