LOZEAU DRURY LLP
T 510.836.4200
F 510.836.4205
1939 Harrison Street, Ste. 150
Oakland, CA 94612
www.lozeaudrury.com
brian@lozeaudrury.com

VIA EMAIL ONLY

April 5, 2022

Sylvia Do, Division Manager
Department of Planning, Building
& Code Enforcement
City of San José
200 East Santa Clara Street, 3rd Floor
San José, CA 95113
Sylvia.Do@sanjoseca.gov

Maira Blanco, Planner II
Department of Planning, Building
& Code Enforcement
City of San José
200 East Santa Clara Street, 3rd Floor
San José, CA 95113
Maira.Blanco@sanjoseca.gov

Re: Alviso Hotel Project (File No. PD19-031)
LIUNA Supplemental Comment- Mitigated Negative Declaration
DIRECTOR HEARING AGENDA ITEM 4.a (April 6, 2022)

Dear Ms. Do and Ms. Blanco,

I am writing on behalf of the Laborers International Union of North America, Local Union 270 and its members ("LIUNA") living in and around the City of San Jose ("City") regarding the Initial Study and Mitigated Negative Declaration ("MND") prepared for the Alviso Hotel Project ("Project") (Project File No. PD19-031) to be heard as Agenda Item 4.a at the Planning Director Hearing on April 6, 2022.

This comment letter is a supplement to the previous comment letter submitted by LIUNA to Maira Blanco and the Department of Planning, Building & Code Enforcement on November 11, 2021 (attached hereto as Exhibit 3). LIUNA's November 11 comment included the expert opinions of expert wildlife biologist Dr. Shawn Smallwood, Ph.D., indoor air quality expert Francis Offerman, CIH, and air quality experts Matt Hagemann, P.G., C.Hg., and Paul E. Rosenfeld, Ph.D., of the Soil/Water/Air Protection Enterprise ("SWAPE"). LIUNA's November 11 comment objected to the City's use of an MND rather than an EIR for this Project because (1) LIUNA's experts established fair argument that the Project would result in significant impacts to biological resources and air quality and (2) the MND's conclusions were not supported by substantial evidence.

On March 24, 2022, the City released its "Responses to Public Comments and Text Changes" for the MND. Dr. Smallwood and Mr. Offerman have reviewed the City's Responses to their comments and have each prepared a Reply. Dr. Smallwood's Reply is attached hereto as Exhibit 1. Mr. Offerman's Reply is attached hereto as Exhibit 2.

For the reasons discussed in LIUNA's November 11 comment and in the Replies of Dr. Smallwood and Mr. Offerman, LIUNA maintains that there is a fair argument that the Project will result in significant impacts to biological resources and indoor air quality and that the MND's conclusion are not supported by substantial evidence. LIUNA respectfully requests that the City prepare an EIR rather than an MND prior to approval of the Project.

Sincerely,

Brian B. Flynn
Lozeau Drury LLP

EXHIBIT 1

Shawn Smallwood, PhD
3108 Finch Street
Davis, CA 95616

Maira Blanco, Planner II
Department of Planning, Building & Code Enforcement
City of San José
200 East Santa Clara Street
San Jose, California 95113

4 April 2022

RE: Alviso Hotel Project

Dear Ms. Blanco,

I write to reply to responses to my comments in my letter of 6 November 2021 regarding the draft Initial Study/Mitigated Negative Declaration (IS/MND) prepared for the proposed Alviso Hotel Project. My replies follow the City of San Jose's responses, which I numbered to be consistent with the numbers the City assigned my comments. Some responses raised multiple issues. In these cases, I separated out the text directed to each separate issue and presented them under the same numbered response. For example, Response B.2 appears multiple times, but each occurrence of it raises a different issue.

Response B.2: WRA and the City acknowledge that biological observations, particularly those of species composition, are highly dependent on many factors outside of the control of the observer regardless of their level of experience. As accurately stated by Dr. Smallwood, species composition on a given day may vary widely dependent on various factors, including time of year, time of day, weather, and others. While he may be correct in stating that additional survey time would likely yield additional species observations, projections made by Dr. Smallwood regarding species diversity within the project area are largely speculative, …

Reply: The projection (singular, not plural) I made regarding species richness[1] within the project area was not speculative, as characterized in the Response. It was made from a pattern in the data to which I fit a least-squares nonlinear model and from which I drew scientific inference (see Figure 1 and related text in my 6 November 2021 comment letter). I used the model to make a prediction. Scientific inference is not the same as speculation. Scientific inference has contributed much more to the growth of knowledge than ever accomplished by speculation, and it usually contributes to more accurate predictions.

Another tenet of the scientific method, in addition to that of inference drawn from patterns of observed phenomena, is that of repeatability. Since I submitted my comments, the City of San Jose could have repeated its wildlife survey to determine

[1] Note that species richness is not the same as species diversity. I use the term richness to refer to the number of species. Species diversity refers to the suite of species and their relative abundances within a place or time, and conveys the degree of evenness, or of information, of the species under consideration (Smallwood 1992, 2002). Species richness, not species diversity, pertains to my comments.

whether the outcome was more consistent with WRA's or my own. Considering the large disparity in survey outcomes, a test of repeatability was warranted. Instead, the City mischaracterizes my comments as speculative, thereby implying that species richness at the site is not as high as I predict. Although the City did not follow through with another survey, I did.

I surveyed the project site again on 1 April 2022, beginning at 06:44 hours and lasting 3.25 hours. The sky was clear, no wind, and the starting temperature was 44° F. Vegetation cover appeared little changed from my initial survey on 30 October 2021. However, I noticed that the footprint of the homeless camps had at least quadrupled since my first survey, and the pond that is internal to the project site is filled with much more trash including plastics and bottles. Otherwise, I repeated the methods I used in October, though I continued the survey another 81 minutes.

Whereas I detected 34 species on 30 October 2021, I detected 55 species on 1 April 2022 for a total combined 62 species of vertebrate wildlife after both surveys (Table 1). I detected 7 species on 30 October 2021 that I did not detect on 1 April 2022, and I detected 29 species on 1 April 2022 that I had not detected on 30 October 2021. The outcome of my repeated survey was more consistent with my original survey than it was WRA's. It nearly doubled my species detections, which also lent support to my original prediction of more species using the project site than I had detected on 30 October 2021.

Species I saw on 1 April that I had not seen on 30 October included killdeer (Photo 1), which nested near the pond on site as well as on the graded area referred to as "developed" by WRA, San Francisco common yellowthroats and house finches (Photo 2 and 3), great blue herons (Photo 4), bufflehead and cinnamon teal (Photos 5 and 6), lesser scaup (Photo 7), sora and muskrat (Photos 8 and 9), and northern mockingbirds and red-winged blackbirds (Photos 10 and 11), among other species. I also photographed Anna's hummingbirds (Photo 12), which I was unable to photograph in October.

With another survey completed, the projection of species richness I made from the pattern of the data on 30 October 2021 can be compared to another projection from the pattern of the data on 1 April 2022. Figure 1 depicts the patterns of increase in cumulative species richness with time into the survey for both the October and April surveys, and it further compares them to the 95% confidence interval of the increase in mean cumulative species richness across another 132 surveys I completed at proposed project sites across California over the last several years. Whereas the pattern observed in October trended along the upper bound of the 95% CI, and for a time even exceeding it, the pattern observed in April far exceeded the upper bound of the 95% CI from start to finish (and beyond). Whereas the model fit to the data from 30 October predicted 54 species of wildlife could have been detected that day, the model fit to the data from 1 April indicated that I spent insufficient time at the site for the model to estimate a realistic asymptote. In other words, I could not predict the total number of species I likely would have detected had I committed more survey time to 1 April. I am confident, however, that the predicted number would have far exceeded the 55 species I detected.

Table 1. *Species of vertebrate wildlife detected by WRA at the project site on 17 December 2019 and by myself (KSS) on 30 October 2021 and 1 April 2022, where X indicates occurrence on the ground or in vegetation within the footprint of the proposed project, F indicates flight over the site, and A indicates occurrence adjacent to the site.*

Common name	**Species name**	**Status[1]**	**WRA 17 DEC 2019**	**KSS 30 OCT 2021**	**KSS 1 APR 2022**
Canada goose	*Branta canadensis*		X	F	X
Cinnamon teal	*Spatula cyanoptera*				A
Mallard	*Anas platyrhynchos*		X	F	F
Green-winged teal	*Anas crecca*				A
Lesser scaup	*Aythya affinis*				X
Bufflehead	*Bucephala albeola*				A
Pied-billed grebe	*Podilymbus podiceps*				A
Rock pigeon	*Columba livia*	Non-native		F	
Eurasian collared-dove	*Streptopelia decaocto*	Non-native			A
Mourning dove	*Zenaida macroura*			F	A
White-throated swift	*Aeronautes saxatalis*				A
Anna's hummingbird	*Calypte anna*		X	X	X
Sora	*Porzana carolina*				A
American coot	*Fulica americana*			A	A
Killdeer	*Charadrius vociferus*		X		X
Short-billed dowitcher	*Limnodromus griseus*	BCC			F
Spotted sandpiper	*Actitis macularius*				A
Greater yellowlegs	*Tringa melanoleuca*			X	A
Ring-billed gull	*Larus delawarensis*				X
Western gull	*Larus occidentalis*	BCC		F	F
California gull	*Larus californicus*	BCC, WL		F	F
Herring gull	*Larus argentatus*			F	
Double-crested cormorant	*Phalacrocorax auritus*	WL		F	F
California brown pelican	*Pelicanus occidentalis californicus*	CFP		A	
Great blue heron	*Ardea herodias*				X
Great egret	*Ardea alba*			F	F
Snowy Egret	*Egretta thula*			F	F

Common name	Species name	Status[1]	WRA 17 DEC 2019	KSS 30 OCT 2021	KSS 1 APR 2022
Turkey vulture	*Cathartes aura*	BOP	X	F	
White-tailed kite	*Elanus leucurus*	CFP, BOP		A	
Red-tailed hawk	*Buteo jamaicensis*	BOP		A	A
American kestrel	*Falco sparverius*	BOP			A
Black phoebe	*Sayornis nigricans*		X	X	X
Say's phoebe	*Sayornis saya*				X
American crow	*Corvus brachyrhynchos*		X	X	F
Common raven	*Corvus corax*			X	A
Northern rough-winged swallow	*Stelgidopteryx serripennis*				A
Barn swallow	*Hirundo rustica*				A
Cliff swallow	*Petrochelidon pyrrhonota*				F
Bushtit	*Psaltriparus minimus*				X
Marsh wren	*Cistothorus palustris*				A
Bewick's wren	*Thryomanes bewickii*				A
Northern mockingbird	*Mimus polyglottos*				X
European starling	*Sturnus vulgaris*	Non-native		F	A
House finch	*Haemorhous mexicanus*		X		X
Lesser goldfinch	*Spinus psaltria*			X	X
American goldfinch	*Spinus tristis*			X	X
White-crowned sparrow	*Zonotrichia leucophrys*		X	X	X
Golden-crowned sparrow	*Zonotrichia atricapilla*			X	
Bryant's savannah sparrow	*Passerculus sandwichensis alaudinus*	SSC3		X	X
Alameda song sparrow	*Melospiza melodia pusillula*	BCC, SSC2			X
Lincoln's sparrow	*Melospiza lincolni*			X	X
California towhee	*Pipilo crissalis*			X	
Blackbirds	*Agelaius sp.*			F	
Red-winged blackbird	*Agelaius phoeniceus*				X
Brown-headed cowbird	*Molothrus ater*				X
Brewer's blackbird	*Euphagus cyanocephalus*				A
Great-tailed grackle	*Quiscalus mexicanus*			F	A

Common name	Species name	Status[1]	WRA 17 DEC 2019	KSS 30 OCT 2021	KSS 1 APR 2022
San Francisco common yellowthroat	*Geothlypis trichas sinuosa*	BCC, SSC3			A
Yellow-rumped warbler	*Dendroica coronata*			X	X
House cat	*Felis catus*	Non-native		X	X
Muskrat	*Ondatra zibethicus*				A
California ground squirrel	*Otospermophilus beecheyi*			X	A
Black-tailed jackrabbit	*Lepus californicus*			X	A

[1] Listed as BCC = U.S. Fish and Wildlife Service Bird Species of Conservation Concern, CFP = California Fully Protected (California Fish and Game Code 3511), BOP = California Fish and Game Code 3503.5 (Birds of prey), 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).

Photo 1. *One member of 2 pairs of killdeer nesting on site during my survey of 1 April 2022. This one circled me while calling in defense of its nest territory on a part of the project that WRA inaccurately characterized as "developed."*

Photos 2 and 3. *One of multiple San Francisco common yellow-throats calls from the Guadalupe River (left) and house finches in breeding plumage on the border between the project site and the Guadalupe River, between which house finches and other birds flew back and forth, 1 April 2022.*

Photo 4. *Great blue heron arrives to the project site from along the Guadalupe River, 1 April 2022.*

Photos 5 and 6. *Bufflehead (top) and cinnamon teal (bottom) on Guadalupe River adjacent to the project site, 1 April 2022.*

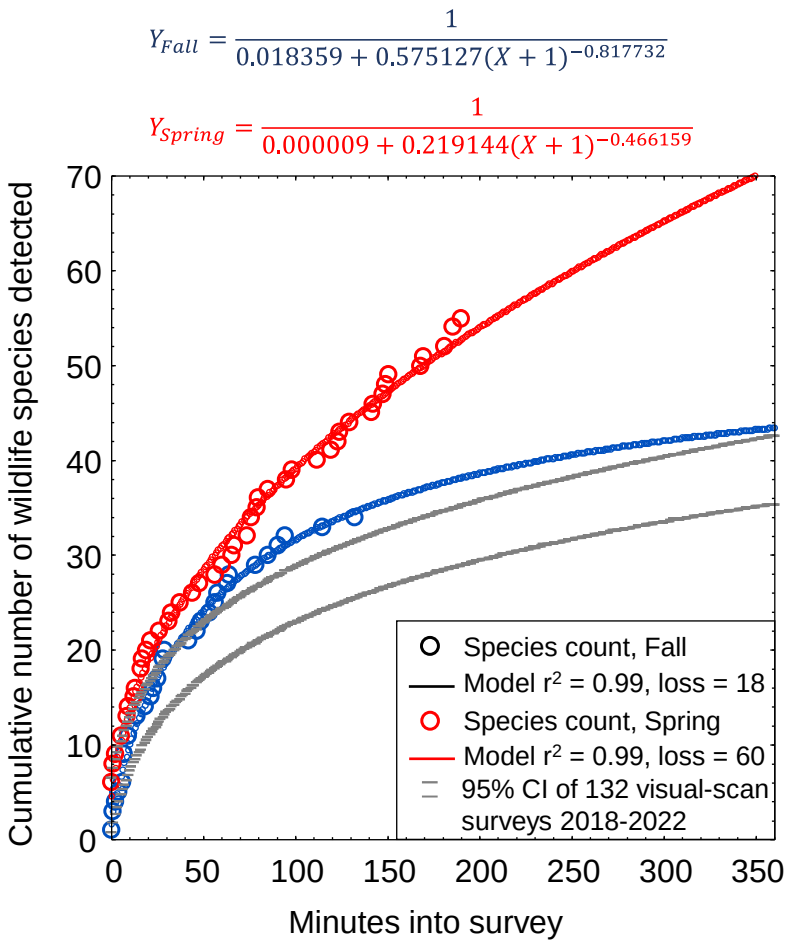
Photo 7. *Lesser scaup on the Guadalupe River adjacent to the project site, 1 April 2022.*

Photos 8 and 9. *Sora (left) and muskrat (right) on Guadalupe River adjacent to the project site, 1 April 2022.*

Photos 10 and 11. *Northern mockingbird on the project site (left) and red-winged blackbirds adjacent to the site on either side of the TopGolf net (right), 1 April 2022. The bird on this side of the net guided the other to freedom over the top of the net.*

Photo 12. *One of at least 2 male Anna's hummingbirds defending nest territories on the project site, 1 April 2022.*

Figure 1. *Actual and predicted relationships between the number of vertebrate wildlife species detected and the elapsed survey time based on visual scans on 30 October 2021 (blue) and on 1 April 2022 (red) at the project site.*



One need not speculate that the project site is much richer in wildlife than depicted in the IS/MND. The evidence is substantial, and frankly, overwhelming that the site is used by many more species of wildlife than reported in the IS/MND. Not only did I see and photograph many more species there than did WRA, but models fit to the data predict many additional species that I did not detect. As I commented in my letter of 6 November 2021, "the results of one reconnaissance-level survey qualify as thin empirical foundation for characterizing the environmental setting of a proposed project site." WRA and the City apparently agree with me that a survey on a single date is unlikely to detect all of the species that rely on the site, and they agree with me that the site is likely richer in wildlife than the 10 species reported by WRA, but they nevertheless allege my analysis is faulty. The fault they allege is that it is speculative, but speculative it certainly is not.

Response B.2: The response goes on to say "projections made by Dr. Smallwood … do not appear to take into account factors such as time of year; this in particular is an important factor when considering species richness at a location given spring and fall migratory periods, generalized summer versus winter distributions, etc."

Reply: This response mischaracterizes my comments in my 6 November 2021 letter. For example, I wrote the following caveat, "*I would have been remiss to have reported*

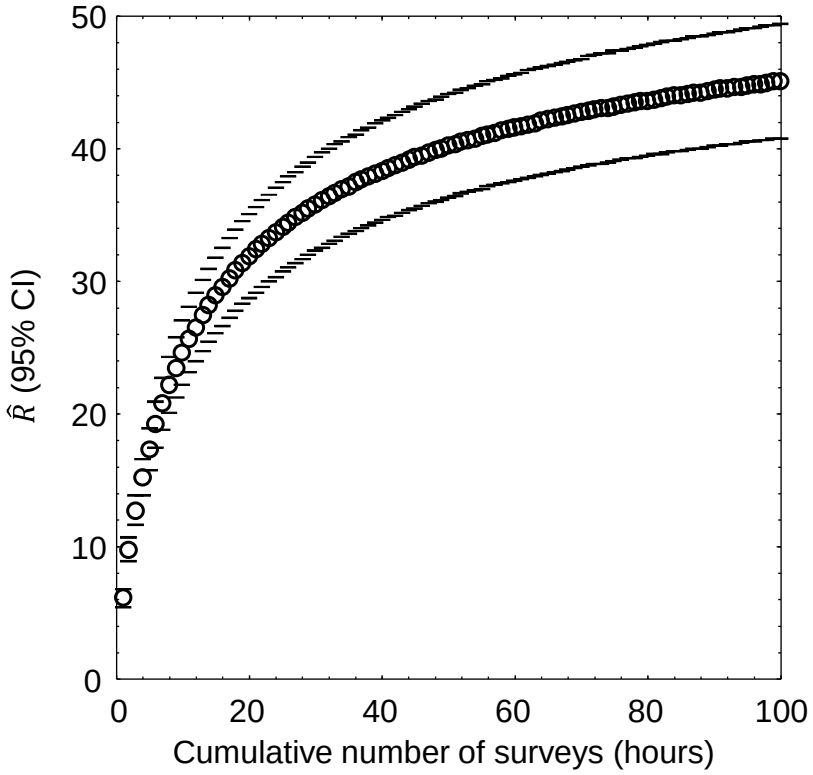
that only 34 species of wildlife occur in the area," and to my original Figure 1, "*Note that the relationships would differ if the survey was based on another method or during night or another season. Also note that the cumulative number of vertebrate species across all methods, times of day, and seasons would increase substantially*." On page 9 of my 6 November 2021 letter, I wrote "*I could have detected many more species than predicted by also performing surveys at other times of day to detect nocturnal and crepuscular species, or surveys in different seasons and years to detect migrants and species with multi-annual cycles of abundance, or surveys of different methods such as se of acoustic detectors or thermal-imaging for bats, owls, and nocturnally migratory birds, and live-trapping for small mammals*." The main message of my comments regarding the reconnaissance-level survey was the very point WRA and the City allege I neglected – that survey outcomes would vary by season of the year and time of day (or night). What I said, and what I will repeat here, is that a survey – WRA's survey -- completed on one day in December cannot possibly represent the use of the site by wildlife.

The scope of my inference was constrained to the time of day of the particular day when I completed my survey. I made no claims that it represented other times during the same day, or other days or other seasons or years. A more accurate way of looking at my projection, aka prediction, is in terms of additional person-minutes committed simultaneously to the period of the survey I completed. My model-prediction applied to the appropriate scope of inference works by assuming that the additional person-minutes are expended simultaneous to my survey effort, but by additional observers perhaps stationed at other locations around the project site (or ideally by additional copies of myself, but that would be impossible). This is how my model is intended to be applied, and not in the manner implied by WRA and the City. And as I commented, performing the survey on different dates and times of day over different seasons would add additional species that my model in Figure 1 could not predict. However, the outcomes of additional surveys over additional dates can also be predicted by bridging my survey results to the outcomes of surveys performed elsewhere (see below).

As part of my research, I completed a much larger survey effort across 167 km^2 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 I use for surveys at proposed project sites, including at the Alviso Hotel site. 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 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. Mean model predictions of species richness at each incremental increase of number of surveys, i.e., number of hours, is shown in Figure 2. Via an analytical bridge, these mean model predictions can add inference from longer-term survey efforts at other sites to the outcomes of my brief reconnaissance-level surveys at the project site, thereby enabling empirically-founded estimates of the number of vertebrate species using the site over the longer-term, say a year to several years.

Figure 2. *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.*



Relevant to my first survey at the project site on 30 October 2021, on average I detected 9.6 species over the first 1.96 hours of surveys in the Altamont Pass (1.96 hours to match the number of hours I surveyed at the project site), which composed 16.8% of the total predicted species I would detect with a much larger survey effort. Given the example illustrated in Figure 2, the 34 species I detected after my 1.96 hours of survey at the project site likely represented 16.8% 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, I would likely detect $^{34}/_{0.168} = 202$ species of vertebrate wildlife at the site.

Relevant to my second survey at the project site on 1 April 2022, on average I detected 13.3 species over the first 3.25 hours of surveys in the Altamont Pass (3.25 hours to match the number of hours I surveyed at the project site), which composed 23.3% of the total predicted species I would detect with a much larger survey effort. Given the example illustrated in Figure 2, the 55 species I detected after my 3.25 hours of survey at the project site likely represented 23.3% 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, I would likely detect $^{55}/_{0.233} = 236$ species of vertebrate wildlife at the site. My springtime survey led to a predicted richer species in the project area over the longer term, but was not very different from the prediction based on my fall survey.

Again, however, my predictions of 202 or 236 species of vertebrate wildlife are derived from visual-scan surveys during the daytime and from the project's periphery, so would not include nocturnal mammals or herpetofauna that are best detected at night or on site, respectively. The true number of species composing the wildlife community of the site must be larger than my predictions based on diurnal visual-scan surveys. A reconnaissance-level survey should serve only as a starting point toward characterization of a site's wildlife community, and it certainly cannot alone inform of the inventory of species that use the site. Without careful interpretation, WRA's survey outcome should not serve as the foundation for characterizing baseline conditions, because there were truly many more species that used the site at the time of the survey than the 10 detected by WRA. WRA managed to detect but a very small fraction of the wildlife community that occurs at the site, having detected only 10 of ≥236, or ≤4%.

Response B.2: … It is important to note that while WRA's site visit included observations of species present within the project area, this effort was not intended to constitute a dedicated bird/wildlife survey (e.g., a point-count survey). As stated on page one of the Biological Resources Assessment (BRA) prepared for the project (refer to Appendix B of the IS/MND): "A BRA provides general information on the potential presence of sensitive species and habitats. The BRA is not an official protocol-level survey for listed species that may be required for project approval by local, state, or federal agencies. Our determinations regarding the potential of the Project Area to support special-status plant and wildlife species were based primarily on the suitability of habitats within the Project Area, the proximity of known occurrences, and an on-site inspection. This assessment is based on information available at the time of the study and onsite conditions that were observed during the site visit conducted in December 2019."

Reply: WRA and the City explain that they reported what WRA saw of species on site, but that their objective was really to provide "general information on the potential presence of sensitive species and habitats." Their stated objective, however, is too vague to be of informative value to the readers of the IS/MND, and it misrepresents the habitat concept, and it is inappropriate for determining the likelihoods of occurrence of special-status species. It is vulnerable to preconceptions and speculations over which environmental conditions serve as habitat.

WRA (2020:1) provided a more explicit statement of objectives for the reconnaissance-level survey, which was to assess "*the Project Area and immediately adjacent areas for: (1) the potential to support special-status plant and wildlife species; (2) the potential presence of sensitive biological communities such as wetlands or riparian habitats; and (3) the potential presence of other sensitive biological resources protected by local, state, and federal laws and regulations*." Later in Response B2, WRA and the City explain that they did not survey for any wildlife outside the project footprint or in the

airspace above the site, so it is unclear what WRA meant by assessing the project area and adjacent areas. But most vague – and most vulnerable to bias and abuse – is the assessment of the site's potential to support special-status species of wildlife. The need for this type of assessment is the very reason for the formulation of protocol-level detection surveys, which are designed to either detect the species – and by definition its habitat – or to support a determination of absence. WRA completed no detection surveys, which means WRA could not have achieved their stated objective. Unless the potentially-occurring special-status species are fortuitously detected, one cannot accomplish with a reconnaissance-level survey what can only be accomplished with a protocol-level detection survey.

Given that habitat is defined by a species' use of the environment (Hall et al. 1997, Morrison et al. 1998, Krausman 2016), the most effective habitat assessment of a site is to detect species using the site. The most effective forms of habitat assessment, and the only forms that are scientifically verifiable, are the detection of species at a site and the measurement of the species' use of the site (Smallwood 2002). WRA's and the City's response implies that a shortcut suffices – that examining ground cover can inform the biologist of the likelihood of occurrence of wildlife species. To a degree this indicator-level approach can inform by ruling out certain species that require specific resources unavailable at the site, such as water for fish or friable soil for fossorial mammals. But for most species, this indicator-level shortcut is unreliable. It is especially unreliable on landscapes undergoing severe habitat fragmentation, on which special-status species are left with few viable options in their struggles to persist (Smallwood 2015). If the objective is to either detect a species when it is present or to support negative findings when it is absent from the site, then the acceptable approach is to complete protocol-level detection surveys. If the objective is to detect as many species as reasonably feasible for the purpose of predicting how many others were likely undetected, then the approach I used in my original comment letter, and in this one (see Figures 1 and 2), is far superior to WRA's and the City's approach in support of the IS/MND. With my approach, not only did I verify that the site serves as habitat for the 62 species of wildlife I detected, but I predicted how many additional species compose the wildlife community.

The main purposes of reconnaissance-level surveys are (1) to document as many of the species using the site as reasonably feasible, and (2) to determine which species' detection surveys are warranted. Each species detected on site confirms the site's use as habitat by that species, so if a special-status species is detected, then no protocol-level detection survey need follow the reconnaissance-level surveys. Each species not detected on site confirms nothing other than the need for additional surveys, protocol-level detection surveys, or cautious interpretation of occurrence likelihoods of those species not detected. Additional survey effort is far more efficient than cross-walking onsite vegetation cover types with cover types listed as "habitats" in a canned table. The cross-walk approach, which is the approach used in the IS/MND, relies on assumptions, qualitative judgements and guesswork over how to categorize vegetation cover on site, and whether the canned descriptions of habitat are accurate. Actual sightings of members of a species cut through the guesswork and bypass the assumptions, because they go directly to sound interpretation of what is habitat at the project site.

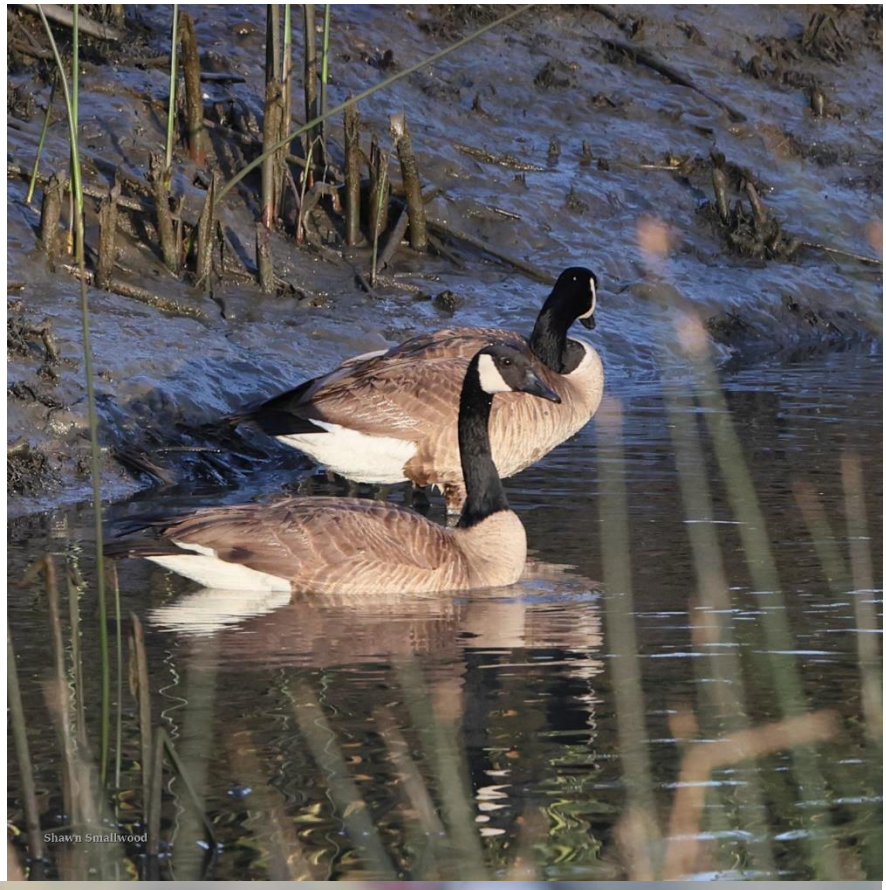
For the reasons just stated, it is routine of reconnaissance-level surveys to culminate with the reporting of species detected during the survey. And for these reasons, WRA reported a list of species detected at the project site. A problem with WRA's (2020) species list was that it was reported without meeting minimum professional standards of reporting. Another problem with it was that it was unbelievably short. But the most important problem was its interpretation. Its interpretation was pseudoscientific by reporting that no special-status species were seen at the site, because the survey did not meet the minimum standards of any of the available detection surveys.

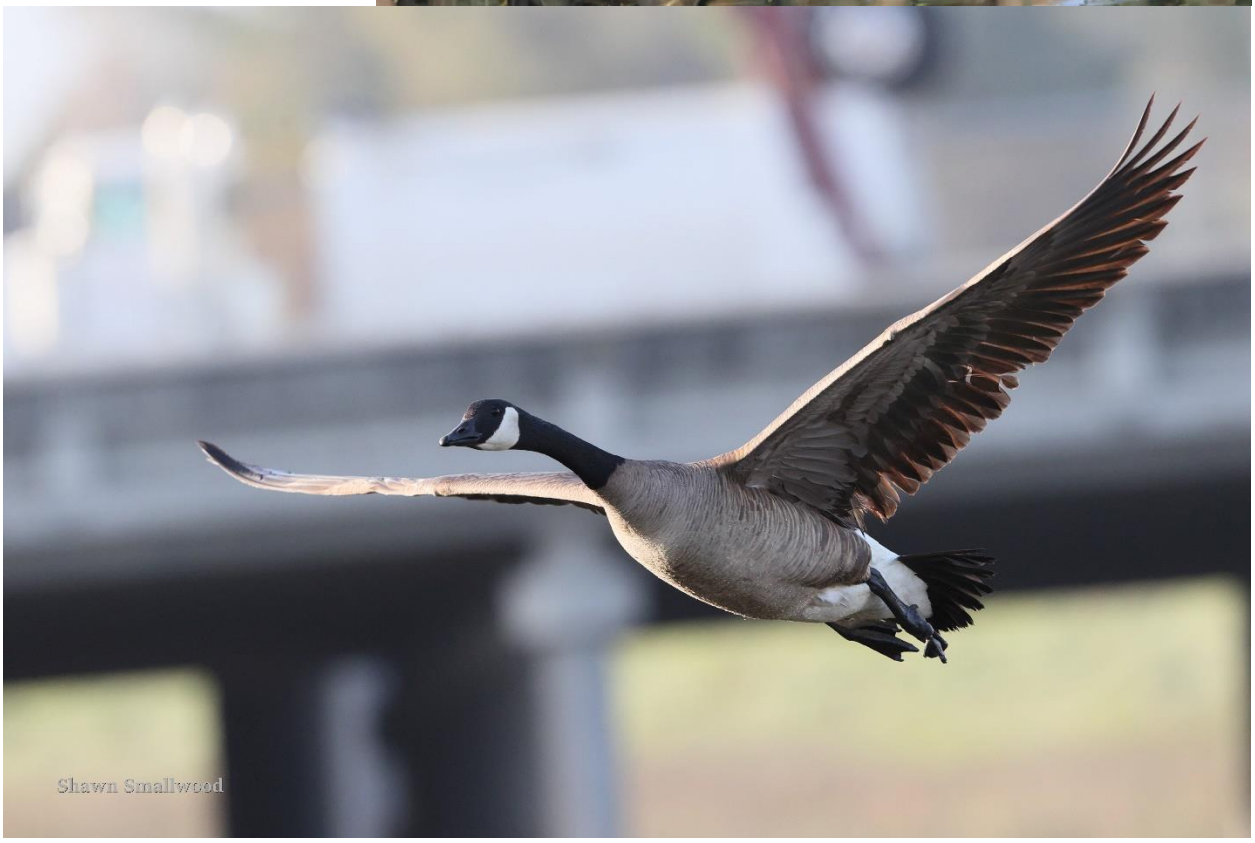
Response B.2: Additionally, WRA only recorded species that were observed in direct association with the site. WRA does not typically consider species that are observed only in aerial transit well above a given site to be present there. Similarly, this includes species that may be observed on nearby sites. Aerial foraging within the project area's airspace would warrant inclusion in many cases, e.g., for raptors (birds of prey), and bats, if relevant. However, waterbirds (e.g., double-crested cormorant, brown pelican) flying from one habitat patch to another generally do not warrant such inclusion, or at least such observations should be clarified that the birds involved were clearly in aerial transit, and that the observations at the focal site were largely incidental. For these reasons, bird species (and other wildlife) are generally assessed based on the likelihood of a site to support critical life functions (e.g., breeding or nesting), rather than the potential for the species to simply fly over.

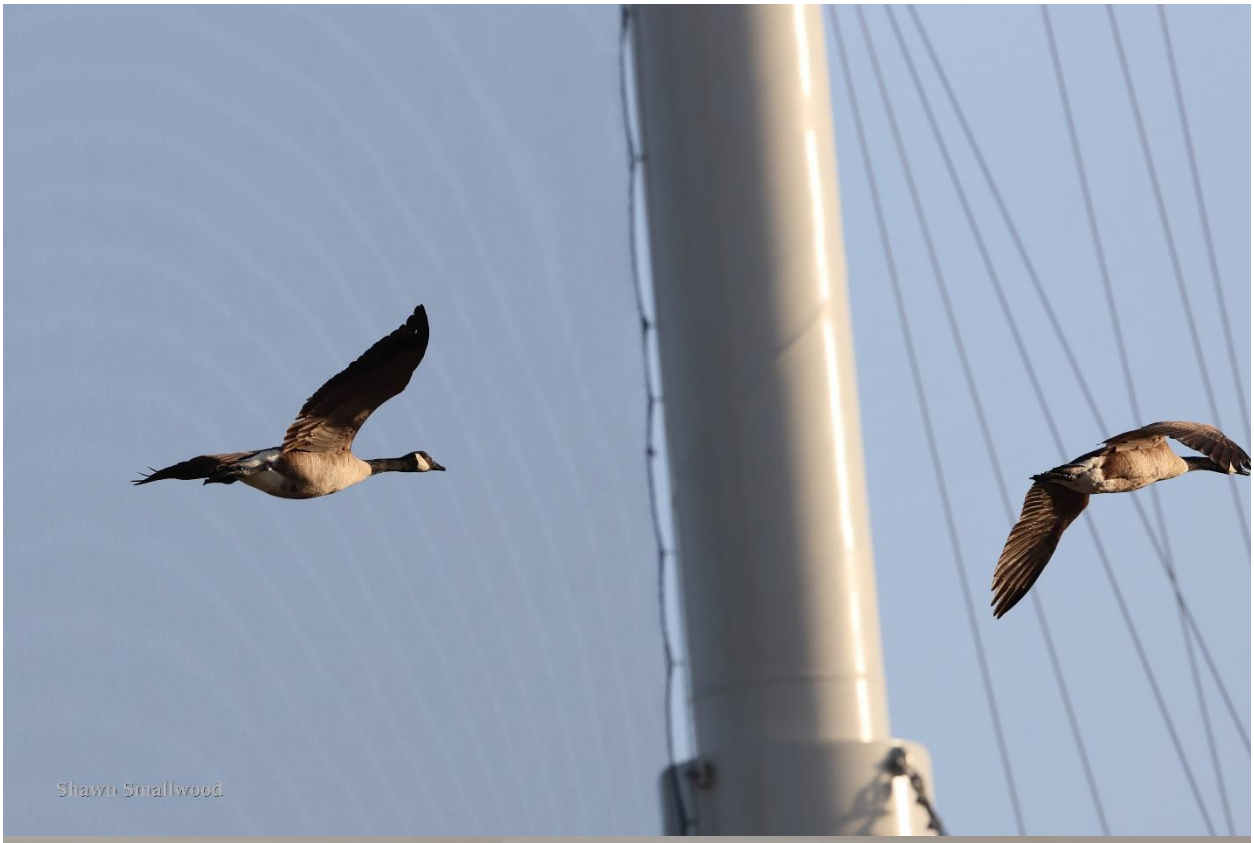
Reply: As I replied earlier, WRA's (2020:1) stated objective was to assess "*the Project Area and immediately adjacent areas for: (1) the potential to support special-status plant and wildlife species…*" This stated objective is inconsistent with the response that WRA "*only recorded species that were observed in direct association with the site*" and ignored animals flying over the site as incidental. The response's version does not include the project *area* nor the immediate adjacent areas. Considering that WRA only recorded 10 species of vertebrate wildlife, I assume that the objective described in the response was more accurate than that of WRA (2020). But this highly restrictive scope of survey was inappropriate, because most wildlife are far from static and are not prone to remaining within the lanes prescribed by the consulting biologist.

WRA and the City should have paid attention to the animals flying over the project site, and to those volant animals that occurred near the site. This is because the project would insert a tall structure into a very important portion of habitat to volant species. Volant species have wings; they fly, and they have to fly to survive. Volant species seen at the Guadalupe River are the same species that will fly over the project site at one time or another, or even repeatedly throughout one or more days (Photos 4 and 13-20). During the breeding season, many of these flights would be more dangerous if a glass-facaded building replaces that part of the aerosphere that these species need to sort out their social relationships and to forage and travel.

Photos 13–17*. Canada geese nest along the Guadalupe River, but they also periodically fly up and chase each other around the project site in efforts to sort out social relationships, flying awfully close by the TopGolf net and neighboring buildings, and even landing on the pond that is interior to the site. I saw these and many other flights by breeding Canada geese over the project site, 1 April 2022. Ignoring volant animals at the River is ill-advised.*



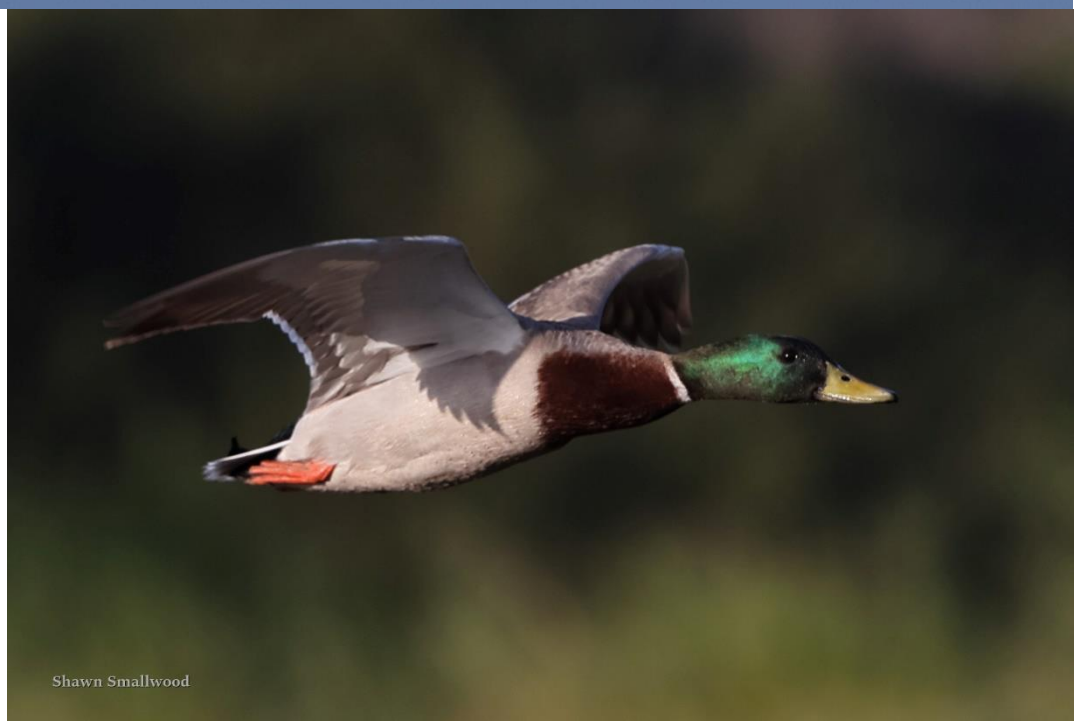



Shawn Smallwood


Shawn Smallwood

Every species on Earth is morphologically adapted through thousands of generations of life and death to exist within an environmental medium. The central medium for many species is life itself: mosses grown on trees, barnacles on whales, tapeworms in gut. For many other species it is soil, including for many species of nematode, pocket gophers, and even California tiger salamander. For a vast number of species, it is water. Indeed, most people do not hesitate to characterize whales, fishes, squid, and shrimp as aquatic animals living in aquatic habitats. Less often appreciated is the gaseous atmosphere as a medium of life (Davy et al. 2017, Diehl et al. 2017), but it is one of the most important habitat mediums of our planet. Indeed, an entire discipline of ecology has emerged to study this essential aspect of habitat – the discipline of aeroecology (Kunz et al. 2008).

Many species of flora and fauna are morphologically adapted to living in that part of the atmosphere referred to as the aerosphere. Plants disseminate pollen via the aerosphere. Plant pollinators travel from one plant to the next via the aerosphere. Spiders disperse by deploying web-parachutes to catch the winds of the aerosphere. Vast numbers of insects disperse and migrate through it. Many species of vertebrate wildlife depend on it for olfactory and acoustic communication, forage, dispersal, migration, and home range patrol. Birds and bats evolved two of their four ambulatory limbs into wings that are specifically adapted to particular uses of the aerosphere: short powerful wings for speed, long slender wings for glide, and broad wings for maneuverability, as examples. The atmosphere is so important an element of habitat to wildlife that some birds sleep while in flight, and bats and owls hunt in it, even in the pitch-dark of the moonless night. The aerosphere is an essential element of habitat for many species of wildlife.



Photos 18 and 19. *Snowy egret and mallards both flew along the River and over the site multiple times, 1 April 2022.*

Photo 20. *One of multiple double-crested cormorants I saw fly low and fast over the project site, usually engaged in social drama related to breeding, 1 April 2022.*

Certainly, we have all witnessed plants and animals using the aerosphere as habitat. All of us have seen birds flying from one place to another. Some of us have also had the privilege to study volant animals – animals that fly. As one of the privileged, I have observed and recorded flights of birds and bats across thousands of hours of directed surveys. I have recorded flight patterns in behavior surveys and in 1,000 hours of nocturnal surveys by use of a thermal-imaging camera, and I have studied flying golden eagles using GPS-telemetry. My studies have particularly focused on how flights result in collisions with anthropogenic structures. I study impacts to wildlife caused by insertions of human structures into the aerosphere.

Most insertions of anthropogenic structures into the aerosphere are inserted without a thought given to their potential impacts to volant wildlife. Impacts can include habitat loss, energetic costs of having to navigate around the structure, increased predation risk from predators using the structures as hunting perches or foraging screens, and collision mortality. An example would be the tall net installed around TopGolf next to the project site, where I witnessed a red-winged blackbird trapped for about 10 minutes before a conspecific helped guide it over the net (Photo 11). Electric transmission and distribution lines are hung from towers and poles with little regard for their near invisibility to birds. And during my time at the project site, I witnessed multiple near-miss collisions with unmarked, dangerously-sited transmission lines (Photos 21-28). Communication towers are likewise installed where convenient rather than where least harmful to volant wildlife. The same is true for wind turbines (Smallwood et al. 2017) and utility-scale solar projects (Smallwood 2020). Buildings also go up without much of a thought to wildlife impacts. But buildings often pose a second, and perhaps more deadly, threat to volant wildlife, and that is their windows. Without evolutionary experience with windows, birds are vulnerable to the transparency of many windows, to the reflectance of vegetation and other birds in many windows, to the false perception of cavity space of some windows, and to confusion caused by interior lighting issuing from windows at night.

Photos 21–24. *Top to bottom, Canada geese flap hard to ascend above transmission lines, but barely succeed at clearing the lines, Alviso Hotel project site, 1 April 2022.*

Photos 25–28. *Top to bottom, Canada geese barely clear transmission lines just south of the Alviso Hotel project site, 1 April 2022.*

Response B.2: Dr. Smallwood states that he observed three special-status species on-site, including Fish and Game Code (FGC) Birds of Prey and TWL ("Taxa to Watch List"; Shuford and Gardali 2008). Although methodological details may vary somewhat, species typically regarded as "special-status" in this context include: those that have been formally listed, or are candidates for such listing, under the federal Endangered Species Act (ESA) and/or California Endangered Species Act (CESA); CDFW Fully Protected Species (CFP); and, CDFW Species of Special Concern (SSC). Although SSCs generally have no special legal status, they are given special consideration under CEQA. Many of the observed species that Dr. Smallwood classifies as "special-status" are common and widespread species that are not typically given special consideration under CEQA or even included on CDFW's highly inclusive Special Animals List. For example, simply being referenced in the California Fish and Game Code (e.g., all birds of prey) does not indicate that a species is special-status. Of the species observed by Dr. Smallwood, white-tailed kite (CFP) is the only species that should clearly be considered special-status.

Reply: Contrary to the response, I did not state that I had observed 3 special-status species of wildlife. I reported having observed 8 of them. Since my letter of 6 November 2021, the number of special-status species I observed at and near the project site grew to 12.

The number of special-status species attributed to my observations was inaccurate, but there are multiple additional inaccuracies in this response. Regarding the definition of special-status species, WRA and the City conflate frequent industry practice to supposed CEQA Guidelines. However, §15380 of the CEQA Guidelines defines special-status species as Endangered, Rare, or Threatened. WRA and the City seem to have noticed the terms Endangered and threatene3d in this section, but overlooked Rare.

The CEQA definition is consistent with how I identified special-status species in Table 3 of my original comment letter. I relied on the status assigned each species in California's Special Animal List (California Department of Fish and Wildlife, Natural Diversity Database. November 2020. [and herein updated to 2022] Special Animals List. Periodic publication.) – a list that is often relied upon for CEQA reviews. The Special Animals List compiles designations of special status to species from various agencies and for various reasons. According to policy of the California Department of Fish and Wildlife regarding species of special concern (SSC) (https://www.wildlife.ca.gov/Conservation/SSC#394871319-how-are-sscs-addressed-under-the-california-environmental-quality-act), *"SSCs should be considered during the environmental review process. The California Environmental Quality Act (CEQA; California Public Resources Code §§ 21000-21177) requires State agencies, local governments, and special districts to evaluate and disclose impacts from "projects" in the State. Section 15380 of the CEQA Guidelines clearly indicates that species of special concern should be included in an analysis of project impacts if they can be shown to meet the criteria of sensitivity outlined therein. Sections 15063 and 15065 of the CEQA Guidelines, which address how an impact is identified as significant, are particularly relevant to SSCs. Project-level impacts to listed (rare, threatened, or endangered species) species*

are generally considered significant thus requiring lead agencies to prepare an Environmental Impact Report to fully analyze and evaluate the impacts. In assigning "impact significance" to populations of non-listed species, analysts usually consider factors such as population-level effects, proportion of the taxon's range affected by a project, regional effects, and impacts to habitat features."

Raptors are 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.

Some species of bat are listed or designated as California Species of Special Concern, but others are assigned conservation priority rankings the Western Bat Working Group (WBWG), which California Department of Fish and Wildlife relies upon and which CDFW tracks in its list of California' special animals.

And then there are the bird species assigned to the Taxa to Watch List in California. These assignments are again assignments of special status; otherwise, there would be no point to assigning them to the Taxa to Watch List. Specifically, they are species that were assigned prior concern, but which did not rank as high as those species currently on the Species of Special Concern list (Shuford and Gardali 2008). Nevertheless, CDFW commissioned the development of this list, and would not have done so without concern for the rarity of the species listed.

Response B.2: While California brown pelican is also designated as a CFP and was specifically mentioned by Dr. Smallwood in his report, it is WRA's professional opinion that the project area does not provide any substantial habitat value for this species. WRA completed a search of databases for special-status species with potential to occur in the project area (see Appendix C of Appendix B- Biological Resource Report). The California brown pelican was not included within these databases as having potential to occur on the site. However, as noted in Appendix B, animals may traverse the project area briefly during use of the Guadalupe River, seasonal wetlands, and the non-wetland water feature. Note also that WRA's assessment identified white-tailed kite as having the potential to occur on-site, which Dr. Smallwood specifically mentions observing on site.

Reply: WRA and the City disregard the project site as habitat for California brown pelican, but this is because WRA and the City misunderstand the habitat concept. Again, habitat is defined as that part of the environment used by a species. California brown pelicans use the aerosphere, including that portion of it which overlies the project site.

WRA and the City then commit the same type of error they did in the IS/MND, and that was to misuse the findings of queries of occurrence-databases. Regardless of the databases queried, lack of occurrence records does not mean lack of occurrence. Numerous species I detected at the site are also not recorded in the occurrence

databases as having been seen on site. These include black phoebe, savannah sparrow, white-crowned sparrow, Lincoln's sparrow, house finch, northern mockingbird, bushtit, greater yellowlegs, Anna's hummingbird, and well, nearly all of them. These and other species do not appear as occurrence records in the databases, but nevertheless I saw them there. The same is true of the species WRA reportedly saw at the project site. That these species do not appear in occurrence databases probably means nobody thought to survey the site and report their results to any of the databases.

Although the site lacks occurrence records of multiple species that WRA and I both saw on the site, multiple locations around the site do include occurrence records of these same species (such as on eBird). The same is true of California brown pelicans. Perhaps no observer has recorded this species on or over the project site, but sightings of them are recorded up and down the Guadalupe River and scattered around Alviso and San Jose.

Response B.2: It is important to note that while WRA's site visit included observation of species present within the project area, WRA's survey was not intended to constitute a dedicated bird/wildlife survey (e.g., a point-count survey). Additionally, for the purposes of assessing CEQA impacts, WRA's species list, compiled by experienced experts in Bay Area flora and fauna, was comprised only of species observed to be utilizing habitats within the project area.

Reply: So then, based on WRA's and the City's explanation, I assume the turkey vulture and the swallow were aground when WRA saw them. Had the swallow been perched, however, I would have expected the species to have been identified. Regardless, WRA and the City mistakenly dismiss the aerosphere as part of the habitat of birds, which is akin to dismissing the sea as part of the habitat of penguins. Any bird flying through the aerosphere over the project site is utilizing habitat on the project site, no matter how briefly. The project would remove this habitat, and furthermore would replace it with a substantial collision hazard, heightened by large glass windows and its location next to the Guadalupe River and a large net to contain golf balls.

Response B.2 and Response B.6: WRA and the City acknowledge that the CNDDB and reconnaissance-level site assessments cannot concretely determine the presence or absence of a species. However, the use of the word "absence" in the context described does not substantively change any of the conclusions made in the IS/MND, nor does it affect any of the impact determinations therein. Taking the example of tricolored blackbird, most mitigation measures for this species focus on impacts to nesting sites, which are always colonial in nature and situated in areas of dense emergent vegetation in or adjacent to freshwater. While such vegetation may be present in nearby wetland areas, none is present within the project area. As discussed in the Biological Resource Assessment (Appendix B), given that the nearest documented breeding location, based on the CNDDB, is three miles away from the project area, and no breeding habitat is present within the project area, the species is determined to have very little likelihood to establish a nesting colony in a location that could be impacted by the project. CEQA impacts are determined based on the likelihood of a species to occur and, while WRA and the City agree that a concrete absence determination is not appropriate based solely

on database results and/or limited field investigations, the analytical framework used in the biological report and IS/MND is not a "misappropriation" of data and is consistent with the typical level of assessment found in CEQA documents.

Reply: As I understand the response, which is pretty confusing, the analytical framework of the IS/MND is to exclude occurrence records of animals deemed unlikely to breed on the project site, and again the response defends this framework by referring to typical industry practice rather than to the meaning and intent of CEQA and to those who assigned special status to Endangered, Rare, or Threatened species. The assertion might be true that most mitigation for impacts to tricolored blackbird is directed toward those portions of habitat where the species nests, but if true, this trend does not mean that mitigation directed toward nest sites is more effective than mitigation directed toward foraging sites.

The response attempts to distinguish between breeding habitat and other types of habitat, but this distinction is contrived and has no foundation in science. No animal can successfully breed without having obtained sufficient forage, safely stopped over where needed during migration, and found safe travel routes. Some portions of habitat include nest sites and other portions include opportunities to forage, travel or socialize to support breeding attempts. Habitat is habitat, as recently noted again by Krausman (2016).

The response again misapplies CNDDB by asserting that CNDDB records of tricolored blackbird breeding locations are the only locations where the species breeds. I have found tricolored blackbird breeding sites where I am nearly 100% certain no records exist in CNDDB, partly because I have not had time to report them yet. One such location was a very remote site where I believe I am the only biologist to have visited it in many years. Again, take heed of CDFW's warning about the limitations of CNDDB – a warning I quoted in my comment letter.

Response B.2: Additionally, Dr. Smallwood's observations were made during the month of October, while WRA visited the site in December. This temporal difference (approximately seven weeks) could have influenced the number of species observed, particularly near the habitats of the San Francisco Bay; late October is the terminus of the bird fall migratory period in a typical year, when species richness in the region is often relatively high. As accurately stated by Dr. Smallwood, species composition on a given day may vary dependent on various factors, including time of year, time of day, weather, and others. As such, WRA and the City maintain that although WRA's biologists observed fewer species within the project area than Dr. Smallwood, this fact does not call into question the credibility of the biological report.

Reply: It appears that WRA and the City and I all agree that the suite of wildlife species detected will vary by date. I very clearly wrote this in my comment letter of 6 November 2021, and WRA and the City state that they concur. Where we disagree is on the credibility of the biological report. WRA's survey outcome of only 10 species of wildlife is suspicious unless it was truly based on the unreasonable constraints that an earlier WRA and City response said was imposed on which species to record. That response

specified that the only species of wildlife recorded were those seen utilizing habitat within the project footprint, and by habitat, it appeared they meant the ground or vegetation on site. But even with these restrictions, WRA's reported detection of 10 species numbers fewer than half of the species I detected on the ground or on vegetation within the project footprint (I detected 23 species on the ground or within vegetation on the project site). But it is not simply the difference in species detected that goes to the credibility of WRA's report, but rather it is the implications that the 10 species found were the only species to be found, and that the site's wildlife community is depressed due to its "developed" condition, and it is the conclusions that most special-status species are unlikely to occur on site and that potential impacts to wildlife would be less than significant.

WRA and the City could have and should have committed more effort to survey the site, especially after having seen my comment letter. The survey did not have to end after only 2 hours on one day in December. And even if the survey did have to end with such a cursory effort, WRA's and the City's interpretation of the survey outcome should have been consistent with the precautionary principle in risk assessment. Instead, WRA and the City chooses to imply that the reconnaissance-level survey suitably substitutes for protocol-level detection surveys, and chooses to report pseudoscientific results such as 'no special-status species were seen.' I call into question the credibility of the biological resources report, and I further call into question the credibility of WRA's and the City's responses to my comments.

Response B.2: Lastly, Dr. Smallwood's claim that it is "not credible" to have observed no special-status species within the project area is speculative. As stated in Response B.2 above, the only species observed by Dr. Smallwood that would be considered special-status within the context outlined above was the white-tailed kite. While WRA did not observe this species during site visits, the IS/MND acknowledged that it has the potential to occur on the site and includes mitigation measures to avoid significant impacts to white-tailed kites (refer to MM BIO-1.2). This comment does not provide substantial evidence supporting a fair argument that the project would result in significant impacts to special status species.

Reply: Again, my claim is not speculative; it is based on scientific inference. Over my last 169 surveys at proposed project sites across California, totaling 620.75 hours, I averaged 1.53 special-status species detections per hour, or >3 per 2 hours – the time committed by WRA at the project site. At only two sites did I detect 0 special-status species, so this outcome is very rare (1%). But the project site is unlike most other sites I have visited. At the project site, I saw 6 special-status species when I visited the site on 30 October 2021, and I saw 9 when I visited on 1 April 2022. Harvey & Associates (2016) also detected 6 special-status species at the project site. Based on the evidence, I find WRA's survey outcome not credible, unless WRA severely restricted the scope of its survey contrary to its stated objectives in WRA (2020:1) but consistent with WRA's and the City's responses to my comments.

Response B.2: The IS/MND accurately described the potential for special status species (as defined under CEQA) to utilize the site. This comment does not provide

substantial evidence supporting a fair argument that the project would result in significant impacts to special status species.

Reply: The IS/MND inaccurately characterizes the occurrence potentials of special-status species, and I did provide substantial evidence in support of my conclusions about the likely impacts and the need for an EIR. I detected 12 special-status species of wildlife at or next to the project site. Even the occurrence of one of these species is enough to warrant the preparation of an EIR.

As I commented in my 6 November 2021 letter, "Of the 15 species that WRA determined to have no chance of occurrence or unlikely to occur, 1 was seen on site, 6 were reported in eBird within a mile or so of the site, and 2 species were reported within several miles…" and "Of the 68 special-status species that appear in Table 3 but which were not addressed by WRA, 13 have been detected at the project site, 38 have been detected within 1 mile of the site, and another 24 have been reportedly detected within several miles of the site." I had also reported that the IS/MND failed to assess the occurrence likelihoods of 68 special-status species of wildlife that available databases indicate should have been considered.

Response B.3: "Developed" is an industry term for land that has been heavily graded and/or disturbed, and no longer supports native vegetation. It can be used to refer to areas with or without impervious surface. The description of developed portions of the site were described as observed during the December 17, 2019 site visit. At that time, developed portions of the project area appeared to have been recently graded and consisted of mostly bare ground, with sparse cover by annual grass seedlings. The Biological Resources Assessment and IS/MND do not describe developed portions of the project area as devoid of vegetation or wildlife, although heavy grading and disturbance does have a significant effect on vegetation structure, species composition, species abundance, and habitat suitability for special-status plant and wildlife species.

Reply: When I began my career as an environmental consultant in 1994, I began by working with GIS analysts to map vegetation cover types over large study areas (e.g., Smallwood et al. 1998), and I have been involved with this type of work ever since. I am unaware of "developed" serving as an industry term for graded land lacking impervious surface. I would have mapped such soil as barren or graded, but not developed because it is not developed. In the case of what is mapped by WRA as developed is now populated by plants and a breeding pair of killdeer. Plants and killdeer do not populate impervious surfaces.

Response B.4: The botanical portion of the WRA reconnaissance site visit was conducted on April 13, 2018 by Scott Batiuk, a botanist who is experienced with the common and special-status flora of the South Bay, and has more than 8 years of botanical survey experience, including 6 years of experience in the San Francisco Bay Area, at the time of the site visit. Scott Batiuk was on site for approximately two (2) hours. The wildlife portion of the WRA reconnaissance site visit was conducted on December 17, 2019 by Dr. Brian Kearns, who is an experienced wildlife biologist with a specifically avian focus. Dr. Kearns was on site for approximately two (2) hours. This

site visit was conducted during morning hours when wildlife species would generally be sufficiently active to be easily observed.

Reply: The response improves on WRA's (2020) reporting of the biological resources surveys. It would be helpful to report the time when the survey began and to more completely explain the standards of reporting of species detections.

Response B.4: Dr. Smallwood states that he observed 34 vertebrate wildlife species on-site during his site visits on October 30, 2021. It is again important to note that while WRA's site visit included observation of species present within the project area, WRA's survey was not intended to constitute a dedicated bird/wildlife survey (e.g., a point-count survey). Additionally, for the purposes of assessing CEQA impacts, WRA's species list, compiled by experienced experts in Bay Area flora and fauna, was comprised only of species observed to be utilizing habitats within the project area.

Reply: Most of the response is redundant with earlier responses, to which I will not repeat my replies. I will note two points, however. First, the methods I used were essentially the same as those used by WRA, except that WRA had the benefit of direct access to the site whereas I did not. There was no methodological difference between WRA's survey and mine that can explain the large difference in species detected.

Second, point-count surveys would not be the best approach for inventorying wildlife at the project site. Point counts are performed to support standardized comparisons of species richness and species diversity between sites and dates, but they are not specifically intended to inventory wildlife at a site. Point counts are typically standardized by fixed duration and search radius. To most effectively inventory wildlife at a place, the biologists need greater flexibility to implement sufficient survey effort and appropriate survey methods. Where limited by time and budget, I apply visual-scan and encounter surveys, but where I am able, I add trapping, remote photo-capture, and thermal-imaging at night.

Response B.4: Additionally, Dr. Smallwood's observations were made during the month of October, while WRA visited the site in December. This temporal difference (approximately seven weeks) could have influenced the number of species observed, particularly near the habitats of the San Francisco Bay; late October is the terminus of the bird fall migratory period in a typical year, when species richness in the region is often relatively high. As accurately stated by Dr. Smallwood, species composition on a given day may vary dependent on various factors, including time of year, time of day, weather, and others. As such, WRA and the City maintain that although WRA's biologists observed fewer species within the project area than Dr. Smallwood, this fact does not call into question the credibility of the biological report…

Reply: That WRA observed so many fewer species than I did calls into question the credibility of the IS/MND. Upon receipt of my comment letter, which raised the issue of this large discrepancy in species detected and further predicted the detections of many more species with additional survey effort, WRA and the City could have and should have performed additional surveys. Instead, WRA and the City committed no more

effort to learning how many species likely use the site, and which species these might be. And instead, WRA and the City allege that I speculated, thereby implying my comments could have been inaccurate, and they themselves speculate that the differences could have resulted from seasonality or because WRA applied a different set of reporting standards other than those described in WRA (2020:1). WRA and the City also dismiss the difference as insubstantial because only species occurring on nesting habitat count. However, all of these arguments and assertions undermine the credibility of the IS/MND, which could have been better informed by the additional survey effort that was obviously needed. A fair argument can be made for the need to prepare an EIR to more carefully and more completely characterize the current environmental setting.

Response B.5: The CNDDB is a widely used tool in CEQA-level analyses, largely due to its inclusion of species that are protected through the CEQA process. WRA and the City acknowledge that the CNDDB is not inclusive of all occurrences of wild animals, and additionally acknowledge the utility that citizen science tools such as eBird and iNaturalist can provide when considering site biodiversity. eBird in particular is relatively robust when used appropriately, given both the high level of peer review applied to data and typical standards of accuracy that serious recreational birders adhere to. iNaturalist, however, is less reliable as a resource due to the often questionable and un-reviewed nature (e.g., regarding location) of the observations. Regardless, CEQA biological site assessments focus on potential habitat for special-status species that are documented regionally (see Response B.2 for further discussion on species typically considered "special-status" in CEQA analyses) or species groups with specific protections (e.g., nesting native birds) based on existing conditions.

Reply: I could not understand this response, especially the part about CEQA assessments focusing on potential habitat based on regional documentation. To reiterate my comments and replies, CNDDB is useful for confirming species occurrences where such occurrences have been reported. It is also useful for determining whether protocol-level surveys are warranted, which would be the case where the special-status species at issue has been documented near the project site. But its multiple limitations prevent it from being relied upon to determine species as being unlikely to occur or to have low likelihood of occurrence. Yet another limitation I neglected to mention in my comments is the fact that CNDDB cares about the recording of special-status species, but species too often are assigned special status more recently. For example, the 2021 version of the US Fish and Wildlife Service's list of Birds of Conservation Concern included new species for this region, such as Bullock's oriole, Clark's grebe, western grebe, western gull, wrentit, willet and others. These added species would lack records in CNDDB because they were added to the list only last year. Therefore, lack of records of these species is even more meaningless with respect to the occurrence likelihoods of any of them at the project site.

Response B.5: Additionally, a literature and database search for potential occurrence of special-status species in the project area reviewed the following sources, in addition to the CNDDB: A Field Guide to Western Reptiles and Amphibians, Aerial photographs (Google Earth 2019, NETR 2019), CNPS Inventory, CDFG publication "California's Wildlife, Volumes I – III", CDFW and University of California Press publication

California Amphibian and Reptile Species of Special Concern, CDFW publication *California Bird Species of Special Concern in California*, Final Santa Clara Valley Habitat Plan, Historic Aerials (NETR 2019), USFWS National Wetland Inventory, USFWS Information for Conservation and Planning Database, Online Soil Survey, and WBWG Species Accounts Region 5.

Reply: It is helpful to learn of these other sources that were consulted, but none of them inform directly of wildlife species occurrences.

Response B.5: Presumably, many of the additional special-status species described by Dr. Smallwood above as being omitted in the WRA report are the result of being overly inclusive of statuses not typically considered in CEQA-level analyses, as previously described.

Reply: Alternatively, and more likely, the difference is due to WRA being overly exclusive of statuses of species that ought to be considered in CEQA-level analysis. The CEQA standard is Endangered, Rare, or Threatened (§15380 of the CEQA Guidelines). I admit that I take the Rare part of the standard seriously, but I also believe that doing so is consistent with the precautionary principle in risk assessment. Doing so is consistent with one of CEQA's primary objectives to publicly disclose potential environmental impacts of a proposed project so that decision-makers and the public can make more informed decisions over whether and how to proceed with a proposed project. Erring on the side of caution is more consistent with this objective then erring the side of abandon. Erring on the side of caution could result in additional unnecessary conservation concern and mitigation, neither of which would adversely affect wildlife in the project area. Erring on the side of abandon could result in insufficient conservation concern and mitigation, which would cause significant unmitigated impacts to wildlife in the project area.

Response B.8: The comment's assertion that construction of the project would result in substantial habitat loss is incorrect.

Reply: This response is not credible. The project would eliminate 6.23 acres of natural vegetation that grows on natural soils to be replaced by a hotel and parking lot. I have seen 62 species of wildlife on, over, or around this site, and the patterns in the data predict that at least 236 species of wildlife use this site over the longer term. Only one or a few species would be able to use the ornamental trees that might be planted as landscaping for the hotel, so the overall impact of habitat loss would be substantial.

Response B.8: Firstly, the comment supports its claims of reproductive impact on avian species using nesting density numbers obtained from studies conducted by Young (1948) and Yahner (1982) in "grassland/wetland/woodland complexes", which Dr. Smallwood likens to the habitats present within the project area. While it is true that the project area is located adjacent to ruderal open space where birds may be present, it is a misleading extrapolation to use density numbers from the aforementioned studies to determine how many nests will be lost as a result of the proposed project. First, the project area and vicinity does not contain any woodlands, …

Reply: Actually, trees do occur on the site, so some woodland element is present. There are also plenty of shrubs on site, so ample nest substrate for birds that prefer to nest above ground.

As for WRA's and the City's assertion that I inappropriately extended density estimates from one place to another, this is the very purpose of making density estimates. Densities are estimated for the purpose of comparing the spatial intensities of a species between times and places. M y extrapolation of total nest density is another example of the use of scientific inference for making predictions – predictions which are readily testable if WRA and the City would oblige. This said, extrapolations of density estimates are indeed vulnerable to error and bias, which is a topic I researched and published on many times and which has been central to my research program since 1994. The farther the extrapolations of density estimates, the more vulnerable the extrapolations are to error and bias. I am well aware of this vulnerability, which is why I stated my use of the density estimate as an assumption along with a couple more assumptions related to terms that informed my prediction. And it is why I performed my analysis as an indicator-level analysis, and why I did not include confidence limits. Just to assure myself that my approach is reasonable, however, I submitted it to scientific peer-review as part of a paper reporting on the impacts to wildlife of utility-scale solar projects. It passed peer-review at wildlife biology's premier journal (Smallwood 2022).

Nevertheless, my prediction could be inaccurate. But just how inaccurate? I doubt my prediction would be wrong by 50%, but let us examine the consequences of this level of error. If my prediction is inaccurate by 50%, then my prediction of the project's contribution to California's annual deficit of birds would have to be reduced from 707 to 353.5, or from one very large number of birds to another very large number of birds. Alternatively, my prediction of the project's contribution to California's annual deficit of birds would have to be increased from 707 to 1,060.5, and even larger number. This latter alternative points to a direction of potential error that WRA and the City did not consider, but it is equally possible to the first scenario of extrapolation error.

As a reality check to my extrapolated estimate of 214 nest sites on the project site (see my letter of 6 November 2021), I reviewed my list of bird species I saw at the site on 1 April 2022, and I considered the numbers of birds I saw for each species and took a guess as to how many nest sites might have been represented by those birds on site. As examples, I estimated the site minimally supports 2 nest sites of Anna's hummingbirds (I saw 2 males defending nest territories, but I was too far from the other side of the site to see whether Anna's hummingbirds also nest there), 2 nest sites of killdeer, 10 of house finch, 12 of white-crowned sparrow, 5 of Lincoln's sparrow, 1 of black phoebe, 1 of northern mockingbird, and so on. My estimated count reached 90 nest sites without inclusion of the species I did not detect and the site's contribution to the many nesting pairs (possibly hundreds) of cliff swallows under the Highway 237 overpass over the Guadalupe River. Considering the numbers of birds I saw at the site, and the likely numbers of nest sites they represent, the numbers of birds lost to the project would be very many regardless of the accuracy of my prediction, but my reality check fails to refute my prediction.

In their response, WRA and the City offer no alternative estimates for the terms that inform my prediction of the birds potentially lost to the project due to loss of habitat. Nor did WRA and the City offer an alternative prediction. They offer no analysis at all.

Response B.8: …and direct and indirect impacts to wetlands within the project area would be avoided via the implementation of mitigation measures MM BIO-3.1 and MM BIO-3.2.

Reply: Measure BIO-3.1 would only negligibly reduce the impacts of habitat loss, conserving about 0.44 acres or 7% of the project area. BIO-3.2 would prevent no loss of on-site habitat.

Response B.8: The majority of the project area contains either bare ground or ruderal, weedy vegetation, rather than pristine or native grassland. Both studies cited by Dr. Smallwood were conducted on ecological reserve areas or agricultural research stations, and, despite any potential habitat similarities, are not considered by WRA to be representative of the urban-open space landscape present within the project area and in the immediate vicinity. Second, both of these studies were conducted in the Midwestern region of the United States (Wisconsin and Minnesota, respectively). Geographic location is important to consider with regard to biological resources, as it dictates differences in species assemblage, differences in ecosystem productivity, and the difference in the length of the available nesting season in a Mediterranean climate versus a climate where harsh winters would preclude bird nesting until late spring.

Reply: I concur with WRA and the City regarding the differences in vegetation structure and landscape setting, but the WRA and the City contemplate only one possible consequence of the differences, and that is that my impact prediction must be too high. But it could also be 100% accurate or too low. My reality check, which I summarized in a previous reply, suggests to me that my prediction is reasonably accurate. The composition of vegetation at the site is not pristine, but birds make do with what is available. Killdeer are nesting on the previously graded area, and Anna's hummingbirds are nesting on the ornamental trees. A large number of cliff swallows are nesting on the Guadalupe River undercrossing of Highway 237, but are supporting their nest attempts by foraging over the project site. The site is also right next to the Guadalupe River, and birds nesting on the River are flying to the project site for resources, and birds nesting on the project site are flying to the River. In other words, the site offers benefits to birds that my source study sites in the Midwest did not offer, and vice versa. Just because there are differences between my source sites and the study site does not mean that total nest density at the study site must be lower than I predicted.

Response B.8: Although the proposed project will remove a small amount of potential bird nesting habitat, such as small shrubs and one palm tree (see Figure 6 of Appendix B for a graphic of the project's footprint relative to the biological communities on site), the overall impact of the project to available habitat and wildlife resources in the vicinity is not considered significant under CEQA. When considered in the overall regional context, activities on the project area will not have a significant impact on

available nesting habitat for avian species. The project will persist adjacent to habitat that is generally similar to the project area or, in fact, of higher quality, indicating that birds that might otherwise nest within the project area will not be forced to make large movements to find suitable habitat after the project is completed.

Reply: WRA and the City conveniently omit grassland and bare ground as nest substrates. Most of the birds nesting on site are grassland nesters. The response is either ill-informed or misleading. And the amount of habitat the project would remove is not small. My predicted impact to birds alone is a loss of 707 birds annually due to habitat loss caused by the project. But my prediction does not even consider the impacts the project would have on birds nesting along the Guadalupe River.

Response B.8: In fact, many of the species observed during WRA's and Dr. Smallwood's site visits are known to be tolerant of anthropogenic disturbance and development, and would not experience significant displacement effects as a result of the proposed project.

Reply: Some of the bird species I saw at the site are tolerant of anthropogenic disturbance, and some are much less tolerant, but few would persist in the space taken by a hotel. This claim that the on-site wildlife are tolerant and therefore the project would have no impact on wildlife is nothing new from environmental consultants and project proponents. But it is readily testable. As an antidote, I can point to the outcomes of a project that was developed in San Jose. When I surveyed a site proposed for the Brokaw Campus in 2018, I detected 12 species of vertebrate wildlife on site. When I surveyed it in 2021 after several mid- to high-rise buildings were constructed, and having done so at the same time of year, the same start time, the same survey duration, and the same methods, I detected 5 species of vertebrate wildlife. I saw 58% fewer species after construction than I had before. But the real impact was evident in the numbers of each species I saw before and after development. I saw 200 white-crowned sparrows before development, and 1 lonely white-crowned sparrow afterwards. I saw 50 house finches before and none after, and 50 mourning doves before and none after. I saw a total 415 birds before and 26 after for a 94% reduction in the number of birds on site. At this project site, wildlife were not as tolerant as WRA and the City would have the reader believe.

I have often encountered the Response's displacement argument from environmental consultants and project proponents, claiming that the animals on site will simply move over when construction begins. The consultants should know better, having been introduced in their schooling to the concept of ecological carrying capacity and the effects of habitat fragmentation. Neighboring habitat can support only so many members of each species, and at the time of construction those neighboring habitats are already at their carrying capacities. Any animals that are not killed during construction will attempt to establish home ranges in areas already occupied by conspecifics. Temporary crowding can result, but invariably, and often horribly, the numbers of each species occupying the neighboring site returns to the site's carrying capacity, or due to the effects of habitat fragmentation and other impacts of the project (such as collision mortality), the numbers diminish to less than the former carrying capacity.

Response B.8: Furthermore, Mitigation Measures included in the MND (i.e., MM BIO-1.2 which requires nesting bird surveys and associated disturbance buffers if active nests are discovered) will prevent significant impacts to any birds that may be actively nesting within the project area.

Reply: MM BIO-1.2 would not avoid or minimize the level of habitat impact I predict. MM BIO-1.2 is a preconstruction take-avoidance measure that has no bearing on the annual deficit of birds that would follow the loss of bird habitat following construction.

Response B.9: Based on surrounding land uses and the prevalence of non-developed (natural/semi-natural) land covers, it is not warranted to consider the site critical to wildlife movement in the area. While some species, particularly volant (i.e., flying) species, can use "stepping stone" dispersal habitats, or closely spaced pockets of habitat between larger core habitat, above all wildlife corridors must link two areas of core habitat and should not direct wildlife to developed areas or areas that are otherwise void of core habitat. The project area does not serve these functions, and the "more than a million birds" presumably tend to select higher quality habitats such as the nearby marshes of Don Edwards National Wildlife Refuge. The project area is adjacent to several consistently trafficked roadways (including a state highway), and a significant amount of residential, commercial, and light industrial development. The site is located within 0.5 mile of marsh areas along the south arm of the San Francisco Bay, and several other large and small patches of undeveloped land that provide higher quality habitat and are more likely to facilitate movement of wildlife species. It should be noted as well that the majority of the bird species observed within the project area by Dr. Smallwood and WRA are tolerant of anthropogenic activities and disturbance; indeed, these species often occur year-round, inclusive of successful breeding, in developed/urban areas (e.g., Anna's hummingbird, American crow, mourning dove, etc.). Based on WRA's observations, although nearby habitats may provide high quality movement habitat, the project area itself is mainly used for foraging or short-distance dispersal for small numbers of urban-adapted species. Therefore, the proposed project is not anticipated to result in any significant impacts to local or regional wildlife movement, let alone result in the loss of critically important movement habitat. Window collisions are addressed in more detail in Response B.11 below.

Reply: The response is almost entirely speculative. The only portion of it that was based on observation was WRA's observations of avian movements which WRA says to have appeared local rather than migratory. However, WRA observed birds there for 2 hours one morning in December. I visited the site towards the ends of the fall and spring migrations. Some of the birds I saw might have been on migration, but most appeared to be moving locally or regionally. But whether the movements were local, regional or migratory is immaterial to the CEQA standard. Inserting a hotel into the airspace used by birds, and doing so next to the Guadalupe River and next to a tall golf ball net and next to other buildings, would interfere with wildlife movement in the region.

Response B.10: The comment estimates the number of animals killed per year from vehicles travelling to and from the project area. The data upon which the comment is

based is from a study of road mortality along a 2.5 mile stretch of Vasco Road in Contra Costa County. Vasco Road is located in a rural, undeveloped area, and traverses the Diablo Range. The rate of mortalities of animals along this stretch of road cannot be meaningfully compared to the project, which is located in an urban area surrounded by development. Vehicles travelling to and from the site would utilize existing roads in highly urbanized areas. The comment provides no evidence that special-status species have been killed on the urban roadways that would be utilized by vehicles travelling to and from the site. Furthermore, it would be speculative to try and estimate the number of wildlife individuals (special-status or otherwise) that would be injured or killed based purely on the additional vehicle trips from the proposed project as opposed to existing traffic or new trips from other development projects. Per Section 15145 of the CEQA guidelines, speculative analysis is not acceptable. Lastly, although the project and its proponents will seek to minimize incidences of traffic-related mortality of all species, the threshold for CEQA significance is not applicable to non-status species unless the project would have a regional impact on the viability of the species or species group. Due to the factors described above, no reasonable argument can be made that vehicle traffic to and from the site will have an impact of this kind and thus the impact is not considered significant under CEQA. The comment does not provide substantial evidence supporting a fair argument that the project would result in significant impacts to special status species as a result of roadway mortality.

Reply: This Response, like others before it, attempts to characterize scientific inference as speculation. I applied scientific inference just as it is intended. It is not the same thing as speculation, which is really what the Response relies upon. The Response singles out the Vasco Road study to support its speculative argument, but the other studies I cited in my comment letter of 6 November 2021 summarized wildlife fatality rates that had been enumerated on all sorts of roads in many environmental settings.

The Response argues that wildlife mortality on local roads must be lower than it was on Vasco Road, but the Response offers no evidence in support of its argument. Even if road mortality on local roads is half what it was measured on Vasco Road, my fatality prediction for the project would need to be reduced from the range of 4,926 to 8,210 wildlife fatalities per year to the range of 2,463 to 4,105 wildlife fatalities per year. In other words, predicted mortality would lessen from one very substantial number of annual deaths to another very substantial number of annual deaths. There is no way that the level of increased traffic generated from the project is going to avoid killing a very large number of wild animals on the roadways.

WRA and the City continue to neglect the potential impact of traffic-generated mortality, which is an impact that has been studied at many locations by many investigators, and has a strong foundation in evidence.

Response B.11: WRA has conducted numerous bird-safe design analyses for projects around the Bay Area, and is well-versed in various city and regional guidelines dictating best design practices to minimize bird strikes, including, in part, those mentioned by Dr. Smallwood. There is increasing awareness that collision with buildings and structures is

a noteworthy cause of avian mortality worldwide. As noted by Dr. Smallwood, a number of design factors are associated with the average rate of bird collisions, including the total extent of exterior glazing (glass; e.g., windows), size of individual contiguous glazing panels, glazing reflectivity, placement and types of landscaping, details of on-site artificial night lighting, building shape, and other factors. As such, and per requirements to which the project is beholden, WRA conducted the bird safe design analysis to which Dr. Smallwood repeatedly refers to in his comment letter. The outcome of this analysis was that, based on the City of San José Downtown Design Guidelines (hereafter "Guidelines"), City Council Policy 6-34 (Riparian Corridor Protection and Bird-Safe Design), and mitigation measures for this project, the building's design was determined to be sufficient to reduce bird collision risk to a less than significant level. The Downtown Design Guidelines contain the City's most up to date guidance on bird-safe design.

Reply: Considering WRA's stated experience with bird-safe design analysis, I find it curious that flying birds were not recorded during WRA's reconnaissance-level survey, at least according to Response B2. After all, it is flying birds that collide with windows, and a building with large windows is proposed for the site.

Otherwise, the response addresses nothing specific; it simply states WRA's experience and that the City liked their bird-safe plan.

Response B.11: WRA first assessed the plans for this project in December of 2019, wherein recommendations were made to alter some aspects of the building design in favor of more stringent compliance with bird safe design guidelines set forth in City of San José Downtown Design Guidelines (hereafter "Guidelines") and City Council Policy 6-34 (Riparian Corridor Protection and Bird-Safe Design). The applicant, following this feedback, redesigned the hotel to better adhere to glazing, lighting, landscaping, and design requirements identified by WRA as being of relatively high risk for bird collisions.

Reply: Whereas it is gratifying to learn that the City listened to WRA and made some changes to the building design, this outcome does nothing to address the issues I raised in my comment letter of 6 November 2021.

Response B.11: The building proposed by the project presents a relatively low risk for bird collisions for several major reasons: surface glazing is relatively minimal, and comprises less than 50 percent of all elevations of the building; the elevations all exhibit "architectural relief", which creates visual noise that is likely to be visible to dispersing birds; landscape trees are oriented parallel to the building elevations, which reduces risk relative to a perpendicular orientation; the building is devoid of identified high-hazard features such as glass guardrails, rooftop gardens, transparent corners, etc.. Additionally, as per MM BIO-4.1 in the IS/MND, the entire elevation of the building facing the Guadalupe River will be constructed using treated glazing materials, and only 10 percent of any other building elevation may be comprised of untreated glazing. This represents a very low percentage of the overall glazing that may be left untreated. Dr. Smallwood also makes several mentions of ways in which birds may collide with opaque

surfaces on the building. While birds may, under certain circumstances, collide with an opaque and visible surface, WRA and the City do not agree that this presents a significant risk for bird collisions. Bird-safe standards are chiefly concerned with regulating glazed surfaces largely because it is widely accepted that these surfaces provide the greatest risk for collisions. The analysis included here is concerned with assessing whether the building in question will present a significant impact to biological resources, and in the case of bird collisions, it will not. While Dr. Smallwood may advocate for a more conservative approach with reducing bird collision risk, it is WRA's and the City's assertion that the applicant has exceeded standard expectations with a design that will present a relatively low, and certainly less-than-significant, collision risk for birds; furthermore, this design conforms to relevant guidelines and regulations applicable to this project, regardless of personal opinions as to the adequacy of the regulations.

Reply: The response, which is heavy on certainty, sure looks uncertain. WRA and the City cite several design features they are certain would prevent collision fatalities to achieve less-than-significant impacts, but these appear speculative. For example, the response's explanation about how the arrangement of trees would minimize collision risk seems to lack basis in the scientific literature; I certainly cannot recall seeing any scientific support for the response's claim. I posit that none of the cited design features can be linked to effects measured in scientific research, and I cannot recall any studies that did so. There have been many studies directed toward bird-window collision mortality, but most of it is weak regarding the effects of specific design features. This weakness results from an abundance of confounding factors. Whereas the estimates of fatality estimates are reasonably accurate, the allocation of effects to design features is relatively uncertain. The largest effects measured have been attributed to window transparency and reflectance, and then on the spatial extent on window, and some on the occurrence and distance from building of vegetation such as trees.

After having seen in person and having reviewed images of buildings known to have killed many birds, the available depictions of the hotel show me a great deal of collision hazard to birds. Some of the architectural relief noted by WRA and the City as adding visibility to birds looks to me like they will pose "black-hole" or passage effects many times over. Depictions of the hotel show the windows as large and reflective. And again, as I commented in my letter of 6 November 2021, I did not see any of the features recommended in the City of San Jose (2014) Downtown Design Guidelines depicted in renderings of the project in the IS/MND. Nor are any of the features noted in the response consistent with the features recommended in the City of San Jose (2014) Downtown Design Guidelines.

WRA and the City express an unearned level of confidence in their bird-safe design for the proposed project. If the project goes forward, their confidence ought to be put to the test by monitoring the project for collision fatalities as I recommended in my 6 November 2021 comment letter.

Response B.11: Additionally, the City would like to specifically address concerns raised by Dr. Smallwood regarding the "interaction" between the TopGolf net and the

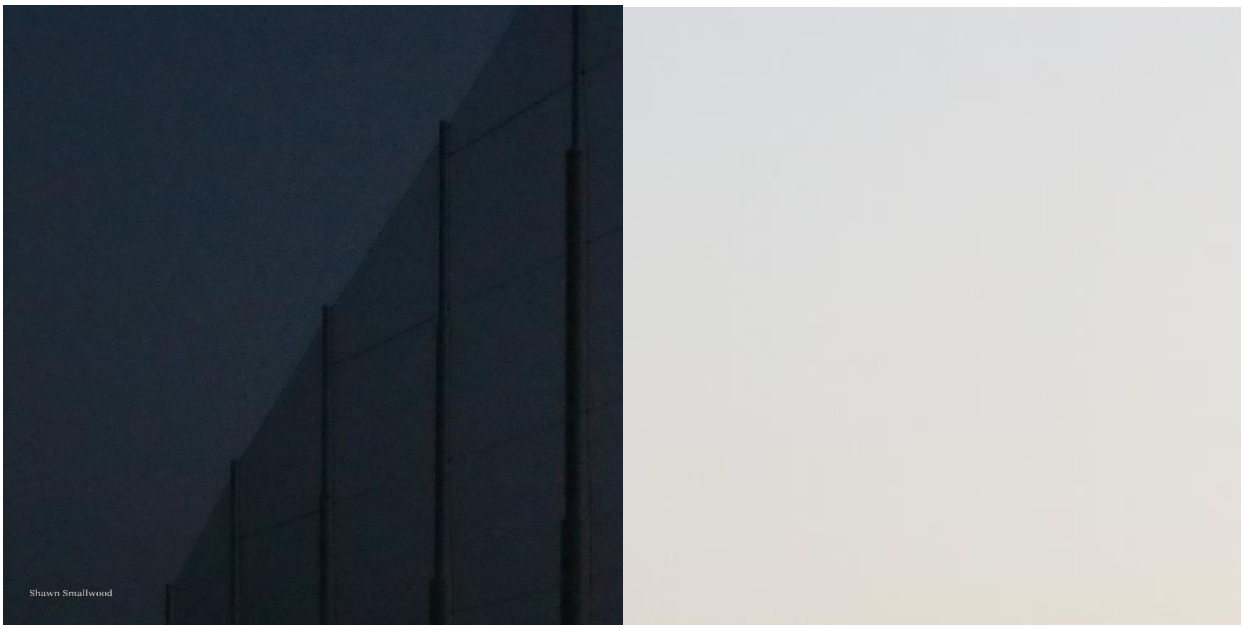
proposed hotel building. First, the net in question is not associated with the current development. However, in pictures included in Dr. Smallwood's comment letter, the net is very obviously visible even from a distance, suggesting that birds would be likely to detect it while in flight. He has also failed to provide any evidence that the net itself poses any inherent collision risk. Assuming that birds were indeed "funneled" between the hotel building and the TopGolf net as Dr. Smallwood describes, only a very small and minimally glazed portion of the building comes within the 26 meters identified in the comment. At this location, where only a small corner of the building is present, only 10 percent of the elevation would potentially be comprised of untreated glazing, as per MM BIO-4.1, making the opportunity for strikes quite limited. The rest of the building extends back away from the net, and as aforementioned provides a relatively low collision risk in and of itself. Any funneling that may occur is confined to an extremely small area, and is unlikely, given the setting, to cause a significant increase in bird collisions.

Reply: The Response says the TopGolf net is not associated with the current development. I never commented that it was, but it is part of the current environmental setting of the proposed project, and if the project goes forward as proposed, it very likely would contribute to impacts caused by interactions between the net and the very proximal hotel building.

According to the response, the net is very obviously visible even from a distance and is therefore readily detectable by birds. The response is truer in the daytime than at night, which is when many birds fly. Even as late as 2 minutes before sunrise, the net is much less visible (Photo 29), but before this time the net was nearly completely invisible. I did not try photographing it earlier because it was too dark to see the net. Furthermore, the guy cables are unmarked, and no markers have been placed on the net (Photo 29), even though the Harvey & Associates (2016:43) reported they would be marked and even though I commented on 6 November 2021 that the net remained unmarked. Viewed northward against the darker sky (Photo 30), or viewed eastward through the net (Photo 31), the net is much harder to see.

The impacts of the TopGolf net are also more complex than has been considered by Harvey & Associates (2016), City of San Jose, and WRA. As shown in Figure 11 and further shown in Photos 32-34, I saw one bird trapped within the net for a long time (my photos span 2 minutes and 14 seconds, but the bird was trapped at least twice this time while I did not photograph it), while a conspecific worked frantically to help extricate the trapped bird. During the entire incident, both birds were vulnerable to entanglement with the net and with predation. The latter threat would also endanger the predatory bird, which could collide with the net or become entangled with it during its predatory attack. I saw other birds become trapped within the net, but they flapped hard to ascend while circling to eventually get clear of the net. One was a great egret that flew in from the north while headed straight for the project site. Others were California gulls that flew in from the northwest and had to ascend while circling to get out. The fact that I witnessed these entrapments during my short time at the site suggests that it happens many times per day and endangers many birds.

Photo 29. *The TopGolf net viewed towards the glow of the rising sun at 06:42 hours, 1 April 2022. Note that the net would be less visible when viewed from the north or east. Also note that the guy cables are unmarked, and no markers are on the net.*



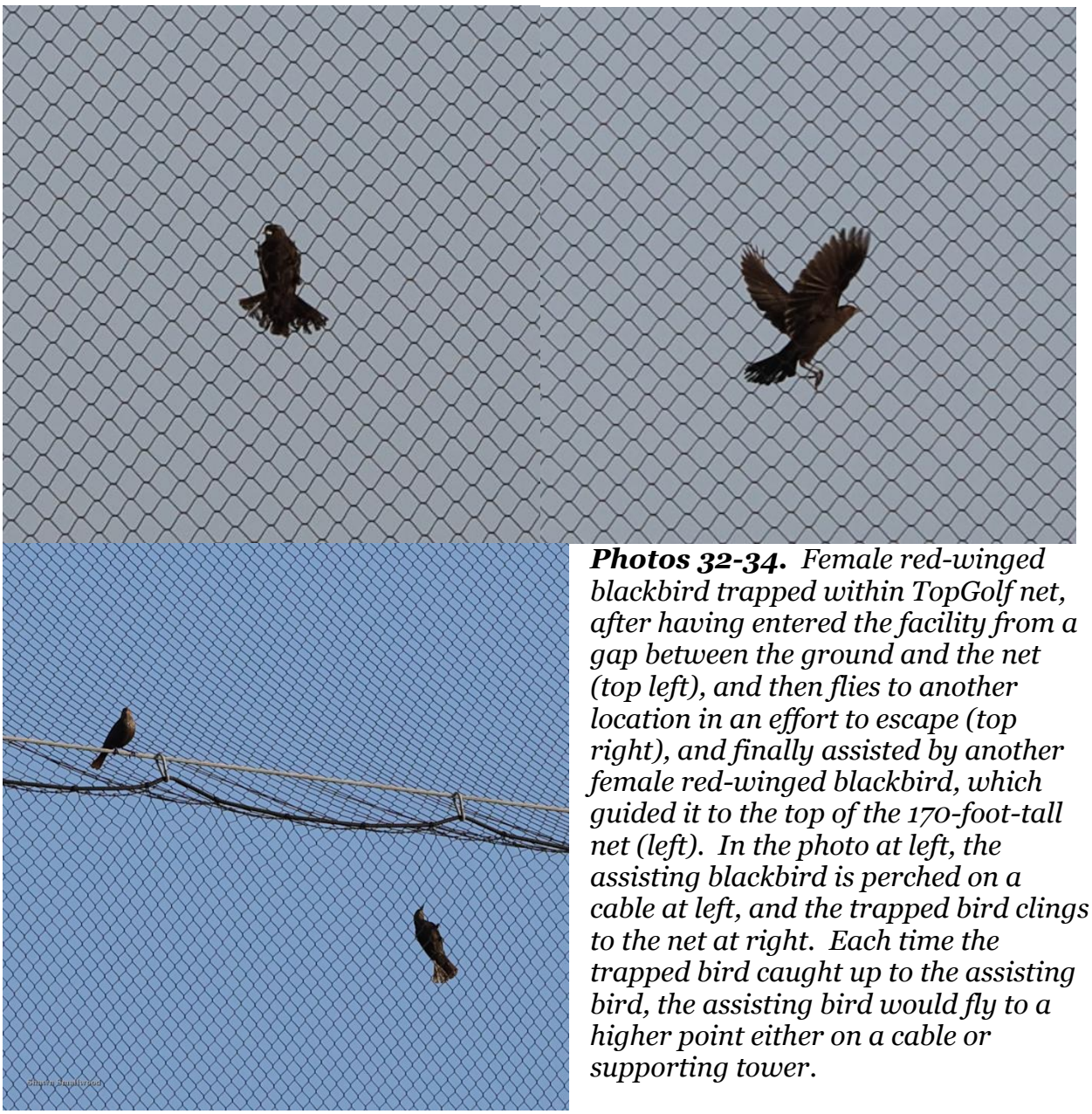
Photos 30 and 31. *Close-up views of the TopGolf net at 06:42 hours, 1 April 2022, northward to the top of the net (left) and directly through the net toward the east-northeast. The latter view is through two layers of net, one on either side of the golfing green. The net is nearly completely invisible in this view, but the pattern of it can be discerned through careful examination.*

My larger point is that this type of impact was not considered by City of San Jose, just as the City is refusing to consider the interaction effects I warn of between the net and the hotel building planned only 23 m away. Even now, birds are flying along the very corridor I pointed out in my comment letter of 6 November 2021. The killdeer in Photo 1 repeatedly flew parallel to the net and close to the net's unmarked guy cables, and Canada geese repeatedly flew the same path, one chasing the other per their social drama and therefore distracted from the threat posed by the net and its guy cables (see Photo 15). The current environmental setting is already hazardous to flying birds that must fly amid an unmarked 170-foot-tall net and its unmarked guy cables a very short distance to the north, and unmarked transmission lines to the south. The hotel, with its expansive windows, would add significantly to the collision risk faced by birds.

Response B.12: Section 4.4, Biological Resources, in the IS/MND accurately describes that the project would implement measures to reduce impacts to biological resources which, combined with the requirements of all projects in the area to implement best management practices (BMPs) and compliance with applicable regulations protecting biological resources, would result in a less than significant cumulative impact. … Further, the project would implement a number of BMPs and mitigation measures to reduce impacts on sensitive habitats and to both common and special-status species, as described in Section 4.4 Biological Resources.

Reply: The proposed BMPs would not mitigate the major impacts of the project that I addressed in my comment letter of 6 November 2021. They would do nothing to avoid, minimize, reduce or compensate for impacts to wildlife caused by habitat loss,

interference with wildlife movement, and collision mortality with project-generated traffic and the hotel's windows.



Photos 32-34. *Female red-winged blackbird trapped within TopGolf net, after having entered the facility from a gap between the ground and the net (top left), and then flies to another location in an effort to escape (top right), and finally assisted by another female red-winged blackbird, which guided it to the top of the 170-foot-tall net (left). In the photo at left, the assisting blackbird is perched on a cable at left, and the trapped bird clings to the net at right. Each time the trapped bird caught up to the assisting bird, the assisting bird would fly to a higher point either on a cable or supporting tower.*

Response B.12: For example, other projects in the region may impact suitable habitat for the burrowing owl and Congdon's tarplant; however, the Santa Clara Valley Habitat Plan (SCVHP) will require implementation of conservation measures for the burrowing owl and the SCVHP land conservation plan. The SCVHP is an adopted Habitat Conservation Plan and has been developed over many years by a group of experts specifically to facilitate local conservation of covered species that are subject to decline due at least in part to land conversion actions. The SCVHP will help to ensure the conservation of the burrowing owl and its habitat throughout the project region. Many

projects in the region that impact resources similar to those impacted by the proposed project will be covered activities under the SCVHP and will mitigate impacts on sensitive habitats and many special-status species through that program, which will require payment of fees for habitat restoration and conservation. Although Congdon's tarplant is not covered specifically in the SCVHP, through its land conservation plan, suitable habitat for the species may be preserved. The SCVHP calls for protection of 13,300 acres of California annual grassland and 15 acres of wetlands (perennial or seasonal), potentially suitable habitat for the Congdon's tarplant. … Thus, the project will not make a cumulatively considerable contribution to substantial cumulative effects on biological resources.

Reply: Whereas the SCVHP calls for protection of 13,300 acres of California annual grassland and 15 acres of wetlands, it has yet to come anywhere close to accomplishing these protections. According to the 2021 Annual Report of the SCVHP, 3,042 acres of Reserve have been protected, of which 2,027.3 acres are in grassland and 2.6 acres are in seasonal wetland. For grassland and wetland respectively, the SCVHP is 15% and 17% toward the protection goals cited in the Response. In the meantime, burrowing owls are well on their way to extirpation from the SCVHP study area and from the Bay Area altogether. According to Menzel et al. (2021), burrowing owls in the Santa Clara Valley Habitat Plan study area declined from an estimated 43–47 pairs in 1991–1993 to 17 pairs in 2021. Menzel et al. (2021) conclude, "Currently, the goal of establishing a stable, then increasing owl population is not being met." Payment of the fee to the SCVHP would not mitigate for take of burrowing owls.

Response B.13: Dr. Smallwood's comments additionally suggest that preconstruction surveys for nesting birds will not sufficiently detect nests that are potentially present, and also do not sufficiently reduce the impact of this project, or projects in general, to a less-than-significant level. This statement is misleading. If special-status or common (i.e., those protected only by the Migratory Bird Treaty Act and California Fish and Game Code) avian species are nesting within the project area, adequately performed pre-construction surveys should detect active nests, and avoidance of these nests would consequently be required under mitigation measures MM BIO-1.2 and MM BIO-1.3. There is some limited potential for the site to support nesting by common raptors, i.e., via the few trees that are present. However, raptor nests are typically placed high in trees or on other large structures, and are usually detectable by a skilled observer. Vegetation within the site is not sufficiently dense to prohibit access of a surveying biologist at any location; thus, all areas could be surveyed thoroughly, and any nests present would likely be detected. In addition, pre-construction nesting bird survey best practices typically include behavioral observation as well as simply looking for nest structures, which greatly increases the likelihood of identifying active nests. A skilled surveyor would thus not be solely dependent on seeing the physical nest to assess a potential impact to an actively nesting bird. As such, Dr. Smallwood has mischaracterized the scope and purpose of the pre-construction surveys required by the IS/MND, which are in fact adequate to reduce impacts to potentially present avian species to a less than significant level.

Reply: I have witnessed multiple survey personnel walk right past burrowing owl nest sites that I had mapped and was monitoring as active nest sites, and these survey personnel -- on different dates and different places -- were specifically searching for burrowing owl nest sites. Searching for nests of other birds can be even more difficult. Anna's hummingbird nests are very difficult, and so are western meadowlark nests. Even killdeer, which nest on open ground, can be very difficult to detect (Photo 35).

Photo 35. *Killdeer nest on gravel. The eggs are camouflaged. Look to the center of the photo to find them. Good luck!*

I have also reviewed multiple construction monitoring reports which documented hundreds of birds killed by project construction after preconstruction surveys had been performed. WRA and the City accuse me of being misleading, but they offer no evidence to the contrary. Where is their evidence that preconstruction surveys detect more than a tiny fraction of the available bird nests?

But regardless of the effectiveness of preconstruction, take-avoidance surveys, they cannot prevent the massive loss of habitat and the deficit of birds that would follow. The preconstruction surveys would have no bearing on the birds that could not be produced in the nest 1 year after construction, or 2 years hence, 10 years hence, 100 years hence.

Response B.14: Please see Response B.11 above for a detailed description of bird-safe design considerations related to this project.

Reply: Response B11 does not address the Comment B14, which read "MM BIO-4.1 claims that requiring treated windows for the south-facing aspect of the hotel would mitigate window collision impacts for birds. However, as Dr. Smallwood notes, this mitigation measure ignores the fact that "[t]he north aspect is where the greatest extent of windows would occur, and it is where the building would curve around northward to funnel bird traffic into windows, and it is where the TopGolf net would channel birds through a narrow gap between the unmarked net and the hotel's windows." (Ex. A, p. 35.) As such, MM BIO-4.1 is inadequate to mitigate window collision impacts."

In my comment, I pointed out that the north side of the building takes a concave shape toward the north – a shape likely to trap birds in the same way that the TopGolf net traps birds traveling southward along Guadalupe River. More implementation of bird-safe design features are needed on the north side, and not just a glazing treatment.

Should the project go forward as proposed, I strongly recommend scientific monitoring for fatalities. At this point, the only way the City is going to learn from its mistakes is through monitoring by a qualified third party.

Response B.35: For the purposes of CEQA, the survey effort completed by WRA is sufficient to conduct an analysis of significance. Site visits for CEQA-level biological assessments are often conducted in one day for a site of this type and size, and are not expected to detect all species that could potentially occur on a site.

Reply: Whether a survey on day is sufficient for CEQA analysis depends on objectives of the study and the overall approach taken. If a survey on a single day is all that can be accomplished, then the survey outcome should be interpreted with the appropriate caution to the limits of the scope of the study. The CEQA review should error on the side of caution, consistent with the precautionary principle in risk assessment. The IS/MND does not apply due caution.

Response B.41: The comment discusses lighting from the existing TopGolf development adjacent to the project site. … Although Dr. Smallwood observed illumination of the TopGolf facility during the day, this practice is not in violation of any regulations to which developments in this area are subject and is unlikely to cause undue disturbance to movements of wildlife.

Reply: Just as I did on 30 October 2021, I arrived before light on 1 April 2022. Photos cannot do justice to the illumination generated by the TopGold facility, and aimed right to where the proposed hotel's windows would reflect it during the night and early morning. Photo 36 shows the first photo I took of the facility at 06:42 hours. The lights were on earlier than this, as well, because I could easily see them from Highway 237. The current environmental setting poses a serious hazard to birds once a hotel with large windows is built where these lights are aimed, because the lights will reflect off the windows. Birds might already be confused by the lights, which might have contributed to the great egret I saw get trapped within the netted area as discussed earlier, but the lights reflecting off the hotel windows might add significantly to the confusion of birds flying through the area.

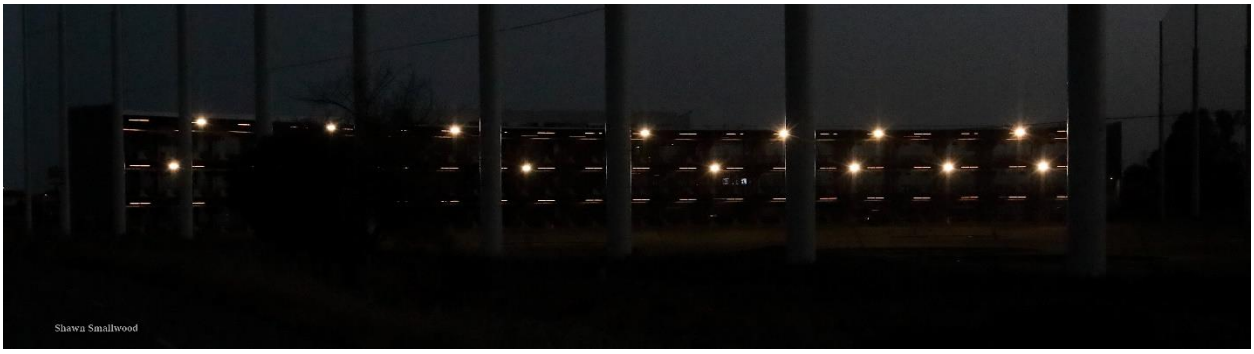


Photo 36. *Lights of the TopGolf facility during the early morning, 1 April 2022. The photo cannot do justice to the brightness of these lights. In person, I found it uncomfortable to look towards these lights when this photo was taken.*

Response B.44: In June 2019, the City completed an Addendum to the MND for the Topgolf @ Terra Project which evaluated a proposed change in the project to modify the mitigation measure requiring net marking devices. The mitigation measure (MM BIO-7.1) was modified to include an additional mitigation option (MM BIO-7.2) which allows implementation of a Monitoring Plan and Adaptive Management/Remedial Measures in lieu of installing net marking devices as prescribed in MM BIO-7.1.

Reply: I recommend that the monitoring plan and adaptive management/Remedial Measures be implemented immediately. From my observations, the net poses a serious hazard to birds, and the lights likely contribute to the hazard. Behavioral ecologists should be retained to study bird and bat behavior around the net, and fatality monitors should be retained to periodically search the base of the net for dead and injured birds and bats, and to surveil the net for entangled birds and bats. The fatality monitoring should also use scent-detection dogs, as well as integrated carcass detection trials.

Response B.49: …mitigation measure MM BIO-1.3 in the IS/MND requires pre-construction surveys based on the CDFW guidelines mentioned by Dr. Smallwood to assess whether owls are present at the time of construction. Detection surveys are not required prior to conducting the pre-construction survey per these CDFW guidelines, as the pre-construction surveys are designed specifically to detect owl presence (based on "sign" as well as observation of actual owls) as close as possible to the time work starts. These surveys are relatively conservative, and include a focused survey for this species within 24-48 hours of start of work, per the required mitigation measure. Pre-construction surveys of this kind are common to projects in this area, and are widely considered to reduce impacts to a less than significant level for burrowing owl, including any owls that may occur outside of the project footprint but within the survey buffer.

Reply: And yet burrowing owls are declining in the Bay Area, quickly approaching extirpation. The common practice in the project area is not working. I recommend that the CDFW (2012) guidelines be followed, and that detection surveys be performed. Preconstruction surveys are not detection surveys.

Response B.52: Please see Responses B.11, B.46 and B.43 above for justification as to how the project has a less than significant impact with respect to bird-safe design and road mortality, respectively. With regard to the funding of wildlife rehabilitation facilities, this comment appears to be contingent on an assumed substantial level of mortality from window collisions and vehicle-related incidents. Both of these factors are less than significant provided recommended mitigation measures and project design recommendations are adhered to going forward. Thus, asking the applicant to fund rehabilitation facilities based on the speculation of mortality that has not yet occurred is not reasonable.

Reply: Again, my recommended mitigation measure is not based on speculative impacts, bur on scientific inference. It is well documented that birds collide with windows as well as the building structure regardless of whether it has windows, and is well established that road traffic kills many wild animals. Predicting these impacts is not speculative. Doing nothing until they happen would be too late and irresponsible.

Thank you for your attention,

_____
Shawn Smallwood, Ph.D.

REFERENCES CITED

CDFW (California Department of Fish and Wildlife). 2012. Staff Report on Burrowing Owl Mitigation. Sacramento, California.

Davy, C. M., A. T. Ford, and K. C. Fraser. 2017. Aeroconservation for the fragmented skies. Conservation Letters 10(6): 773–780.

Diehl, R. H., A. C. Peterson, R. T. Bolus, and D. Johnson. 2017. Extending the habitat concept to the airspace. USGS Staff -- Published Research. 1129. https://digitalcommons.unl.edu/usgsstaffpub/1129

Hall, L. S., P. R. Krausman, and M. L. Morrison. 1997. "The Habitat Concept and a Plea for Standard Terminology." Wildlife Society Bulletin 25:173-82.

Harvey & Associates. 2016. TopGolf biological resources report. Prepared for David Power & Associates, San Jose, California.

Krausman, P. R. 2016. Another Plea for Standard Terminology. Journal of Wildlife Management 80:1143–1144. DOI: 10.1002/jwmg.21121

Kunz, T. H., S. A. Gauthreaux Jr., N. I. Hristov, J. W. Horn, G. Jones, E. K. V. Kalko, R. P. Larkin, G. F. McCracken, S. M. Swartz, R. B. Srygley, R. Dudley, J. K. Westbrook,

and M. Wikelski. 2008. Aeroecology: probing and modelling the aerosphere. Integrative and Comparative Biology 48:1-11. doi:10.1093/icb/icn037

Menzel, S., P. Higgins, R. Phillips, D. Chromczak, L. Trulio. 2021. Santa Clara Valley Habitat Plan 2021 Burrowing Owl Breeding Season Survey Report. Prepared for Santa Clara Valley Habitat Agency, Morgan Hill, California.

Morrison, M. L., B. G. Marcot, and R. W. Mannan. 1998. Wildlife-Habitat Relationships: Concepts and Applications. 2nd edition. University of Wisconsin Press Madison, WI.

Shuford, W. D., and T. Gardali, [eds.]. 2008. California bird species of special concern: a ranked assessment of species, subspecies, and distinct populations of birds of immediate conservation concern in California. Studies of Western Birds 1. Western Field Ornithologists, Camarillo, California.

Smallwood, K. S. 1993. Understanding ecological pattern and process by association and order. Acta Oecologica 14(3):443-462.

Smallwood, K.S. 2002. Habitat models based on numerical comparisons. Pages 83-95 in Predicting species occurrences: Issues of scale and accuracy, J. M. Scott, P. J. Heglund, M. Morrison, M. Raphael, J. Haufler, and B. Wall, editors. Island Press, Covello, California.

Smallwood, K. S. 2015. Habitat fragmentation and corridors. Pages 84-101 in M. L. Morrison and H. A. Mathewson, Eds., Wildlife habitat conservation: concepts, challenges, and solutions. John Hopkins University Press, Baltimore, Maryland, USA.

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., L. Neher, and D. A. Bell. 2017. Turbine siting for raptors: an example from Repowering of the Altamont Pass Wind Resource Area. M. Perrow, Ed., Wildlife and Wind Farms - Conflicts and Solutions, Volume 2. Pelagic Publishing, Exeter, United Kingdom. www.bit.ly/2v3cR9Q

Smallwood, K. S., B. Wilcox, R. Leidy, and K. Yarris. 1998. Indicators assessment for Habitat Conservation Plan of Yolo County, California, USA. Environmental Management 22: 947-958.

WRA. 2020. Biological Resources Assessment: Alviso Hotel, San Jose, Santa Clara County, California. Prepared for David J. Powers & Associates, Inc., San Jose, CA.

EXHIBIT 2

IEE INDOOR ENVIRONMENTAL ENGINEERING IEE
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: April 3, 2022

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

From: Francis J. Offermann PE CIH

Subject: Indoor Air Quality Rebuttal Comment: Alviso Hotel Project, San Jose, CA IAQ Letter (IEE File Reference: P-4511)

Pages: 23

The following are my rebuttal comments regarding Response to Comment B.15 (see below) contained in the City of San Jose Response to Public Comments and Text Changes for the Alviso Hotel Project, San Jose, CA, March 2022.

City of San Jose Response to Comment B.15-1. "The proposed project would be built in accordance to the most recent California Green Building Code (CALGreen), which specifies that composite wood products (such as hardwood, plywood, and particleboard) meet the requirements for formaldehyde as specified in the California Air Resources Board's (CARBs) Air Toxic Control Measures. In addition, the project would be required to comply with the City's Green Building Ordinance (Policy 6-32) and would be designed to achieve minimum LEED certification. LEED certification will require measures to improve indoor air quality."

IEE Rebuttal Comment to City of San Jose Response to Comment B.15-1. With respect to the comment above, I have the following rebuttal comment.

Composite wood products are manufactured to California Air Resource Board (CARB) Airborne Toxic Control Measures Phase II and the identical TSCA Title VI and CalGreen regulations, and "the City's Green Building Ordinance (Policy 6-32) and would be designed to achieve minimum LEED certification" do NOT insure that the cancer risk resulting from indoor formaldehyde exposure are less than the CEQA cancer risk of 10 per million. While the CARB, TSCA Title VI, CalGreen and the City's Green Building Ordinance (Policy 6-32) regulations do reduce the emissions of formaldehyde from composite wood products, these regulations do not insure compliance with the CEQA cancer risk of 10 per million. In my October 26, 2021 Indoor Air Quality: Alviso Hotel Project, San Jose, CA IAQ Letter (attached in the Appendix of this letter), I explained in Appendix A of that letter that the CARB ATCM regulations (and the identical TSCA Title VI and CalGreen regulations) do not "assure healthful indoor air quality", but rather "reduce formaldehyde emissions from composite wood products". 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 the meet the OEHHA cancer of 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 San Jose Response to Comment B-15-2. "Furthermore, the commenter is speculating in the assertion 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, and as stated above, these materials will be required to comply with CARB, 2019 CalGreen building code, and LEED certification requirements. Lastly, even with the regulations in place, if materials containing formaldehyde were to be used, it would be

speculative for the City to estimate the type and volume of building materials that may contain formaldehyde. Per Section 15145 of the CEQA guidelines, speculative analysis is not acceptable. Because there would be no way to quantify the off-gassing of materials, and because no thresholds exist, no additional CEQA analysis or mitigation measures related to formaldehyde would be required."

IEE Rebuttal Comment to City of San Jose Response to Comment B.15-2. With respect to the above comment, I have the following rebuttal comment.

In my October 26, 2021 Indoor Air Quality: Alviso Hotel Project, San Jose, CA IAQ Letter (attached in the Appendix of this letter), I explained in Appendix A of that letter 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."

APPENDIX

IEE INDOOR ENVIRONMENTAL ENGINEERING IEE
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: October 26, 2021

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

From: Francis J. Offermann PE CIH

Subject: Indoor Air Quality: Alviso Hotel Project, San Jose, CA.
(IEE File Reference: P-4489)

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 µg/day. The NSRL concentration of formaldehyde that represents a daily dose of 40 µg is 2 µg/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 µg/m^3. The median indoor formaldehyde concentration was 36 µg/m^3, and ranged from 4.8 to 136 µg/m^3, which corresponds to a median exceedance of the 2 µg/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 µg/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 (BAAQMD, 2017).

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 µg/m^3 to 28% for the Acute REL of 55 µg/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 $\mu g/m^3$ (18.2 ppb) as compared to a median of 36 $\mu g/m^3$ 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 $\mu g/m^3$, which is 33% lower than the 36 $\mu g/m^3$ 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 OEHHA 10 in a million cancer risk threshold (OEHHA, 2017a).

With respect to the Alviso Hotel Project, San Jose, CA, the building consists of a hotel building.

The employees of the hotel building are expected to experience significant indoor exposures (e.g., 40 hours per week, 50 weeks per year). These exposures for employees are anticipated to result in significant cancer risks resulting from exposures to formaldehyde released by the building materials and furnishing commonly found in offices, warehouses, residences and hotels.

Because the hotel will be constructed with CARB Phase 2 Formaldehyde ATCM materials, and be ventilated with the minimum code required amount of outdoor air, the indoor 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 $\mu g/m^3$ (Singer et. al., 2020)

Assuming that the hotel employees work 8 hours per day and inhale 20 m^3 of air per day, the formaldehyde dose per work-day at the offices is 161 µg/day.

Assuming that these employees work 5 days per week and 50 weeks per year for 45 years (start at age 20 and retire at age 65) the average 70-year lifetime formaldehyde daily dose is 70.9 µg/day.

This is 1.77 times the NSRL (OEHHA, 2017a) of 40 µg/day and represents a cancer risk of 17.7 per million, which exceeds the CEQA cancer risk of 10 per million. This impact should be analyzed in an environmental impact report ("EIR"), and the agency should impose all feasible mitigation measures to reduce this impact. Several feasible mitigation measures are discussed below and these and other measures should be analyzed in an EIR.

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 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.

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 (µg/h) from the product of the area-specific formaldehyde emission rate (µg/m^2-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 (µg/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., $\mu g/m^2$-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 $\mu g/m^2$-h, but not the actual measured specific emission rate, which may be 3, 18, or 30 $\mu g/m^2$-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. µg/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 (µg/m^3) from Equation 1 by dividing the total formaldehyde emission rates (i.e. µg/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 (µg/m^3)

E_{total} = total formaldehyde emission rate (µg/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.

The Project is close to roads with moderate to high traffic (e.g., North 1st Street, Southbay Freeway, etc.).

According to the Initial Study/Mitigated Negative Declaration – Alviso Hotel Project (City of San Jose, 2021), the Project would include areas that "would be exposed to future exterior noise levels of approximately 65 dBA DNL.". However this assessment is not based on any on-site sound level measurements. An acoustic study should be conducted to determine the existing and future exterior noise levels.

As a result of the anticipated 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 Initial Study/Mitigated Negative Declaration – Alviso Hotel Project (City of San Jose, 2021), the Project is located in the San Francisco Bay Area 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 $\mu g/m^3$, or the National 24-hour average exceedence concentration of 35 $\mu g/m^3$, 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/ft^2 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.

References

Bay Area Air Quality Management District (BAAQMD). 2017. California Environmental Quality Act Air Quality Guidelines. Bay Area Air Quality Management District, San Francisco, CA. http://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa_guidelines_may2017-pdf.pdf?la=en

BIFA. 2018. BIFMA Product Safety and Performance Standards and Guidelines. www.bifma.org/page/standardsoverview

California Air Resources Board. 2009. Airborne Toxic Control Measure to Reduce Formaldehyde Emissions from Composite Wood Products. California Environmental Protection Agency, Sacramento, CA. https://www.arb.ca.gov/regact/2007/compwood07/fro-final.pdf

California Air Resources Board. 2011. Toxic Air Contaminant Identification List. California Environmental Protection Agency, Sacramento, CA. https://www.arb.ca.gov/toxics/id/taclist.htm

California Building Code. 2001. California Code of Regulations, Title 24, Part 2 Volume 1, Appendix Chapter 12, Interior Environment, Division 1, Ventilation, Section 1207:

2001 California Building Code, California Building Standards Commission. Sacramento, CA.

California Building Standards Commission (2014). 2013 California Green Building Standards Code. California Code of Regulations, Title 24, Part 11. California Building Standards Commission, Sacramento, CA http://www.bsc.ca.gov/Home/CALGreen.aspx.

California Energy Commission, PIER Program. CEC-500-2007-033. Final Report, ARB Contract 03-326. Available at: www.arb.ca.gov/research/apr/past/03-326.pdf.

California Energy Commission, 2015. 2016 Building Energy Efficiency Standards for Residential and Nonresidential Buildings, California Code of Regulations, Title 24, Part 6. http://www.energy.ca.gov/2015publications/CEC-400-2015-037/CEC-400-2015-037-CMF.pdf

CDPH. 2017. Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions for Indoor Sources Using Environmental Chambers, Version 1.1. California Department of Public Health, Richmond, CA. https://www.cdph.ca.gov/Programs/CCDPHP/ DEODC/EHLB/IAQ/Pages/VOC.aspx.

City of San Jose. 2021. Initial Study/Mitigated Negative Declaration – Alviso Hotel Project. PROJECT FILE NUMBER**:** PD19-031.

EPA. 2011. Exposure Factors Handbook: 2011 Edition, Chapter 16 – Activity Factors. Report EPA/600/R-09/052F, September 2011. U.S. Environmental Protection Agency, Washington, D.C.

Hodgson, A. T., D. Beal, J.E.R. McIlvaine. 2002. Sources of formaldehyde, other aldehydes and terpenes in a new manufactured house. Indoor Air 12: 235–242.

OEHHA (Office of Environmental Health Hazard Assessment). 2015. Air Toxics Hot Spots Program Risk Assessment Guidelines; Guidance Manual for Preparation of Health Risk Assessments.

OEHHA (Office of Environmental Health Hazard Assessment). 2017a. Proposition 65 Safe Harbor Levels. No Significant Risk Levels for Carcinogens and Maximum Allowable Dose Levels for Chemicals Causing Reproductive Toxicity. Available at: http://www.oehha.ca.gov/prop65/pdf/safeharbor081513.pdf

OEHHA - Office of Environmental Health Hazard Assessment. 2017b. All OEHHA Acute, 8-hour and Chronic Reference Exposure Levels. Available at: http://oehha.ca.gov/air/allrels.html

Offermann, F. J. 2009. Ventilation and Indoor Air Quality in New Homes. California Air Resources Board and California Energy Commission, PIER Energy-Related Environmental Research Program. Collaborative Report. CEC-500-2009-085. https://www.arb.ca.gov/research/apr/past/04-310.pdf

Offermann, F. J. and A. T. Hodgson. 2011. Emission Rates of Volatile Organic Compounds in New Homes. Proceedings Indoor Air 2011 (12th International Conference on Indoor Air Quality and Climate 2011), June 5-10, 2011, Austin, TX.

Singer, B.C, Chan, W.R, Kim, Y., Offermann, F.J., and Walker I.S. 2020. Indoor Air Quality in California Homes with Code-Required Mechanical Ventilation. Indoor Air, Vol 30, Issue 5, 885-899.

USGBC. 2014. LEED BD+C Homes v4. U.S. Green Building Council, Washington, D.C. http://www.usgbc.org/credits/homes/v4

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 $\mu g/m^3$ (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 m^3/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 ft^2 (0.7% of the floor area), or
Particle Board – 30 ft^2 (1.3% of the floor area), or
Hardwood Plywood – 54 ft^2 (2.4% of the floor area), or
Thin MDF – 46 ft^2 (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 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.

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.

EXHIBIT 3

LOZEAU DRURY LLP
T 510.836.4200
F 510.836.4205
1939 Harrison Street, Ste. 150
Oakland, CA 94612
www.lozeaudrury.com
brian@lozeaudrury.com

VIA EMAIL

November 10, 2021

Maira Blanco, Planner II
Department of Planning, Building & Code Enforcement
City of San José
200 East Santa Clara Street, 3rd Floor
San José, CA 95113
Maira.Blanco@sanjoseca.gov

Re: Alviso Hotel Project (File No. PD19-031)
LIUNA Comment- Mitigated Negative Declaration

Dear Ms. Blanco and Department of Planning, Building & Code Enforcement,

I am writing on behalf of the Laborers International Union of North America, Local Union 270 and its members ("LIUNA") living in and around the City of San Jose ("City") to comment on the Initial Study and Mitigated Negative Declaration ("MND") prepared for the Alviso Hotel Project ("Project") (Project File No. PD19-031).

LIUNA's review of the MND was assisted by expert wildlife biologist Dr. Shawn Smallwood, Ph.D., indoor air quality expert Francis Offermann, PE, CIH, and air quality experts Matt Hagemann, P.G., C.Hg., and Paul E. Rosenfeld, Ph.D., of the Soil/Water/Air Protection Enterprise ("SWAPE"). The written comments of Dr. Smallwood, Mr. Offermann, and SWAPE are attached hereto as Exhibit A, Exhibit B, and Exhibit C, respectively. Based on their review, it appears that several of the MND's conclusions are not supported by substantial evidence and, moreover, there is a "fair argument" that the Project may have unmitigated adverse environmental impacts. As required by CEQA, LIUNA requests that the City prepare an environmental impact report ("EIR") rather than an MND prior to approving the Project.

PROJECT DESCRIPTION

The project proposes the construction of a hotel on an undeveloped 6.23-acre site (APN 015-48-006) located south of North First Street and north of Highway 237. The site is bound by the Guadalupe River to the south, State-owned open space to the east, and privately-owned parcels to the north and west. The proposed 5-story hotel would be 112,463-square feet with 214 rooms. The northeast and northwest sections of the site would include surface parking with 21 parking spaces, and a four-story parking garage with 213 spaces, for a total of 234 parking spaces. The proposed five-story building would reach a maximum height of 65 feet including

architectural elements, mechanical equipment screens, and elevator shafts. The four-story parking garage would reach a maximum height of 40 feet.

LEGAL STANDARD FOR NEGATIVE DECLARATIONS

As the California Supreme Court 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.) "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. v. City of Los Angeles* (1974) 13 Cal.3d 68, 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.)

The EIR is the very heart of CEQA. (*Bakersfield Citizens for Local Control v. City of Bakersfield (*2004) 124 Cal.App.4th 1184, 1214 (*Bakersfield Citizens*); *Pocket Protectors v. City of Sacramento* (2004) 124 Cal.App.4th 903, 927.) The EIR is an "environmental 'alarm bell' whose purpose is to alert the public and its responsible officials to environmental changes before they have reached the ecological points of no return." (*Bakersfield Citizens, supra*, 124 Cal.App.4th at 1220.) The EIR also functions as a "document of accountability," intended to "demonstrate to an apprehensive citizenry that the agency has, in fact, analyzed and considered the ecological implications of its action." (*Laurel Heights Improvements Assn. v. Regents of Univ. of Cal.* (1988) 47 Cal.3d 376, 392.) The EIR process "protects not only the environment but also informed self-government." (*Pocket Protectors*, *supra*, 124 Cal.App.4th at 927.)

An EIR is required if "there is substantial evidence, in light of the whole record before the lead agency, that the project may have a significant effect on the environment." (PRC § 21080(d); see also *Pocket Protectors*, *supra*, 124 Cal.App.4th at 927.) In very limited circumstances, an agency may avoid preparing an EIR by issuing a negative declaration unless there is a "fair argument" that the project will have a significant environmental effect. (PRC, §§ 21100, 21064.) Since "[t]he adoption of a negative declaration . . . has a terminal effect on the environmental review process," by allowing the agency "to dispense with the duty [to prepare an EIR]," negative declarations are allowed only in cases where "the proposed project will not affect the environment at all." (*Citizens of Lake Murray v. San Diego* (1989) 129 Cal.App.3d 436, 440.) A mitigated negative declaration is proper only if the project revisions would avoid or mitigate the potentially significant effects identified in the initial study "to a point where clearly no significant effect on the environment would occur, and . . . there is no substantial evidence in light of the whole record before the public agency that the project, as revised, may have a significant effect on the environment." (*Mejia v. City of Los Angeles* (2005) 130 Cal.App.4th 322, 331 [quoting PRC §§ 21064.5, 21080(c)(2)].) In that context, "may" means a reasonable

possibility of a significant effect on the environment. (PRC §§ 21082.2(a), 21100, 21151(a); *Pocket Protectors, supra*, 124 Cal.App.4th at 927; *League for Protection of Oakland's etc. Historic Res. v. City of Oakland* (1997) 52 Cal.App.4th 896, 904-05.)

Under the "fair argument" standard, an EIR is required if any substantial evidence in the record indicates that a project may have an adverse environmental effect—even if contrary evidence exists to support the agency's decision. (14 CCR § 15064(f)(1); *Pocket Protectors*, *supra*, 124 Cal.App.4th at 931; *Stanislaus Audubon Society v. County of Stanislaus* (1995) 33 Cal.App.4th 144, 150-51; *Quail Botanical Gardens Found., Inc. v. City of Encinitas* (1994) 29 Cal.App.4th 1597, 1602.) The "fair argument" standard creates a "low threshold" favoring environmental review through an EIR rather than through issuance of negative declarations or notices of exemption from CEQA. (*Pocket Protectors*, *supra*, 124 Cal.App.4th at 928.)

The "fair argument" standard is virtually the opposite of the typical deferential standard accorded to agencies. As a leading CEQA treatise explains:

> This 'fair argument' standard is very different from the standard normally followed by public agencies in making administrative determinations. Ordinarily, public agencies weigh the evidence in the record before them and reach a decision based on a preponderance of the evidence. [Citations]. The fair argument standard, by contrast, prevents the lead agency from weighing competing evidence to determine who has a better argument concerning the likelihood or extent of a potential environmental impact. The lead agency's decision is thus largely legal rather than factual; it does not resolve conflicts in the evidence but determines only whether substantial evidence exists in the record to support the prescribed fair argument.

(Kostka & Zischke*, Practice Under CEQA*, §6.29, pp. 273-74.) The Courts have explained that "it is a question of law, not fact, whether a fair argument exists, and the courts owe no deference to the lead agency's determination. Review is de novo, with a preference for resolving doubts in favor of environmental review." (*Pocket Protectors*, *supra*, 124 Cal.App.4th at 928.)

DISCUSSION

I. An EIR Is Required to Disclose and Mitigate the Project's Impacts to Biological Resources.

Expert wildlife biologist Dr. Shawn Smallwood, Ph.D., found several deficiencies in the MND's analysis of the Project's impacts on wildlife species. Dr. Smallwood's comment and CV are attached as Exhibit A. As discussed below, Dr. Smallwood concluded: (1) the MND's biological report underestimated the diversity of species and the Project's likely impacts to those species; (2) the MND's biological report failed to provide substantial evidence of the Project's impacts; (3) the MND failed to assess or mitigate the Project's impacts to species from habitat

fragmentation, movement restriction, road mortality, and window collisions; and (4) the MND's mitigation measures were inadequate to reduce the Project's impacts to biological resources.

A. The MND underestimated the diversity of species using the Project site.

Dr. Smallwood performed an approximately two-hour site visit to the Project site on October30, 2021. (Ex. A, p. 1.) Dr. Smallwood detected "detected 34 species of vertebrate wildlife, including at least 8 special-status species" such as the California brown pelican, double-crested cormorant, and red-tailed hawk. (*Id*. at pp. 3, 8.) The Biological Resources Assessment prepared for the MND by WRA Environmental Consultants ("WRA Report") identified less than a third of the species identified by Dr. Smallwood. (*Id*. at p. 12; WRA Report, Appx. B, p. B-4 [identifying ten wildlife species observed in Project area].) Twenty-four of the species detected by Dr. Smallwood had not been identified in the WRA report. (Ex. A, p. 3.) For example, Dr. Smallwood took photographs of California brown pelicans and white-tailed kites:

Both species are fully protected under California law (*Id*. at p. 8.) This failure of the WRA Report to detect special-status species and an abundance of other wildlife at the Project site underscores the inadequacy of the MND's analysis and the need for an EIR. (*Id.* at p. 12.)

Although Dr. Smallwood's site visit lasted only 2 hours, Dr. Smallwood calculated that more thorough site visits would reveal an even greater diversity of wildlife. (Ex. A, p. 9.) Given more time to survey the site, Dr. Smallwood's predicts that he would have observed an additional 20 species (54 species total) compared to the 34 species observed on October 30. (*Id.* at pp. 9-10.) Based on his review of the MND and his site visit, Dr. Smallwood concluded, "the wildlife community of the project site is incompletely and inaccurately characterized in the IS/MND . . . [and] the biological resources survey provided an unacceptably poor basis for an analysis of potential project impacts to wildlife." (*Id*. at p. 12.)

B. The MND relied on an inadequate biological report.

In addition to the WRA Report failing to adequately disclose the diversity of species that would be impacted by the Project, Dr. Smallwood's review also found numerous other deficiencies in the WRA Report. (Ex. A, pp. 11-17.)

First, Dr. Smallwood found that the WRA Report provided an inaccurate description of the Project site. (Ex. A, p. 11.) According to the WRA Report, 48% of the site is "developed." That is not so. It is true that a portion of the site has been graded, however, as Dr. Smallwood explains, "[g]raded land without impervious surface can support vegetation and wildlife, and it does so at this project site." (Ex. A, pp. 11-12.)

Second, the WRA Report "neglected to report the most basic information needed to assess the rigor of the biological survey." (Ex. A, p. 12.) There was no indication in the WRA Report as to who performed the survey, what qualifications the surveyors had, what time of day the survey took place and for how long, and what methods were used to survey the Project site. (*Id*.) Such information may have provided some insight into why the WRA Report found less than a third of the species on the Project site as Dr. Smallwood and less than a quarter of the species found in a survey conducted for the adjacent Topgolf facility. However, without such details, the MND fails to provide substantial evidence in support of its conclusions about impacts to biological resources. As Dr. Smallwood concluded, "It is not credible to have detected no special-status species of birds, whereas [the Topgolf survey] and I detected 13 special-status bird species on the site and another special-status species of bird just north of the site." (*Id*.)

Third, the WRA Report's review of available literature and databases were "much too cursory to support an analysis of potential project impacts." (Ex. A, p. 12.) The WRA Report relied on one database, the California Natural Diversity Data Base ("CNNBD"), to conclude that only 42 special-status of wildlife had been recorded in the vicinity of the Project site. However, Dr. Smallwood explains that CNNBD "is not the only resource available, nor is it the best resource for certain taxa such as birds." (*Id*.) By including additional databases in the review, such as eBird and iNaturalist, Dr. Smallwood found that 87 special-status species (as opposed to the 42 species in the WRA Report) were known to occur in the area. (*Id*. at pp. 12-13.) By relying on cursory review of one database, the MND "has left the characterization of the project site's wildlife community incomplete and inaccurate." (*Id*. at p. 13.)

Fourth, the WRA Report's surveys and database review were improperly used to support the MND's conclusions. (Ex. A, p. 13.) The WRA Report expressly noted that its survey was "not intended to determine the actual presence or absence of a species." (WRA Report, p. 8.) Despite that disclaimer, the MND used the results of the WRA survey to conclude that species were absent from the Project site. (See, e.g., MND, p. 68 ["no tricolored blackbirds were observed . . . during the site survey . . . , and the species is determined to be absent."].) Similarly, the WRA Report used CNNDB data to determine whether a species was absent from the Project site even though CNNDB "is inappropriate for determining absence." (Ex. A, p. 13.)

By misappropriating data in this way, the MND fails to provide substantial evidence for its conclusions regarding the Project's impacts on biological resources.

C. The MND failed to disclose and mitigate the Project's impacts on habitat loss, wildlife movement, road mortality, and window collisions.

Dr. Smallwood found that the MND failed to discuss numerous significant impacts that the Project may have on biological resources, including habitat loss, wildlife movement, road mortality, and window collisions. (Ex. A, pp. 17-25.) Dr. Smallwood's analysis constitutes a fair argument that the Project may have significant unmitigated impacts and, as such, an EIR is required prior to approval of the Project.

1. Habitat loss and fragmentation.

The MND does not analyze and disclose the impact to wildlife due to habitat loss. As Dr. Smallwood explains, "Habitat loss not only results in the immediate numerical decline of wildlife, but also in permanent loss of productive capacity." (Ex. A, p. 18.) Dr. Smallwood calculated that the Project would result in a birth-reduction of 70,660 birds over the next century due to the loss of terrestrial habitat. (*Id.* at p. 18.) He concluded that this impact "would be substantial, and would qualify as significant impacts that have yet to be addressed by the IS/MND." (*Id*.) However, the MND failed to address or analyze this potentially significant impact. (*Id*.) An EIR is necessary to ensure the impact to wildlife from habitat loss is mitigated to the fullest extent.

2. Wildlife Movement

The MND's analysis of the Project's impacts to wildlife movement is flawed. Although the MND acknowledges that "[t]he project site is in the vicinity of known avian breeding and migratory habitat," the MND then only discusses building design standards related to bird-window collisions with no further discussion of wildlife movement. (MND, p. 63.) A proper analysis of the Project's impacts on wildlife movement is crucial because "the project site is located right where the western and eastern shores of the San Francisco Bay funnel shore-hugging migratory birds toward their passage through the Santa Clara Valley." (Ex. A, p. 20.) More than a million birds pass through greater San Jose each year, which are protected under various federal and state laws. (*Id*.) Dr. Smallwood recommends that a more thorough analysis of the Project's impacts to wildlife movement be included in an EIR. (*Id*.)

3. Road Mortality.

The impacts to wildlife from collision with traffic generated by the Project was not addressed in the MND. According to the MND, the Project would result in 599,330 vehicle miles traveled annually and 1,642 daily trips. (Ex. A, p. 20.) Dr. Smallwood estimates that collisions with vehicles as a result of the Project would kill between 4,926 and 8,2010 animals annually (over 246,300-410,500 animals over 50 years of Project operation). (*Id.* at p. 23.) Especially due

to the special-status species likely to occur at or near the Project, these collisions represent a significant impact to wildlife that has not been addressed, discussed, or mitigated in the MND. Dr. Smallwood's calculations constitute a fair argument that an EIR is necessary to address and mitigate this impact.

4. Window Collisions.

The relationship of the Project's structures to the adjacent Topgolf creates intensifies the Prjoect's likely impacts to bird species from window collisions. Topgolf is required to place glow-in-the-dark markers along the net surrounding the driving range. As Dr. Smallwood notes, the proposed hotel's windows would be located only 23 meters from the Topgolf net, creating a visual interaction between the net and windows which increases collision risks for birds. (Ex. A, p. 24.) Reviewing the renderings for the Project, Dr. Smallwood noted "its liberal use of structural glass on its facades," which "would introduce substantial collision hazards to an aerosphere that currently provides critically important habitat to birds, and which would act as lethal traps to flying birds." (*Id*.)

The impacts from window collisions are important because such collisions "are often characterized as either the second or third largest source or human-caused bird mortality." (Ex. A, p. 24.) Dr. Smallwood calculated that the glass facades of the hotel would result in 195 bird deaths per year. (Ex. A, p. 26.)

Even though the MND acknowledged that there may be an impact from window collisions, its analysis of the impact was inadequate. (See Ex. A, pp. 31-33.) For example, the WRA Report claimed that green walls on the parking garage would attract birds for foraging, a claim that Dr. Smallwood describes as "silly." (Ex. A, p. 33.) The WRA Report also claimed that window collisions would be reduced because the windows would have curtains or blinds. (Ex. A, p. 32.) However, the Report ignores the fact that there would be no requirement for hotel guests to draw their blinds or curtains at any point.

Notably, Dr. Smallwood concluded that "the location of the project within a known wildlife movement corridor, the large extent of its windows, the IS/MND's renderings of the windows as reflective on the upper floors and transparent on the bottom floor, the shape of the building that would funnel flying birds towards windows, and its location close to a 170-foot-tall net ***all point toward a high bird-window collision rate and a significant impact***." (Ex. A, p. 33.) Dr. Smallwood suggests a number of mitigation measures that would reduce the impact from window collisions. (Ex. A, pp. 30-31.) This impact and mitigation measures should be further considered in an EIR.

5. Cumulative Impacts.

Dr. Smallwood found the MND's discussion of cumulative impacts to wildlife to be inadequate. (Ex. A, p. 34.) The MND falsely assumes that cumulative impacts would be less than significant because the Project's impacts are less than significant. However, that is not the

standard under CEQA. Under CEQA, individually insignificant impacts can nevertheless be cumulatively considerable. The MND fails to provide "an appropriate, serious analysis of cumulative impacts." (Ex. A, p. 34.) Thus, the MND's conclusion that the cumulative impacts would be less than significant is unfounded and should be revised.

D. The MND's proposed mitigation measures are inadequate.

Dr. Smallwood critiqued the MND's proposed mitigation measures as being inadequate to reduce the Project's impacts to biological resources. (Ex. A, pp. 34-36.) Both MM BIO-1.2 and MM BIO-1.3 improperly rely on preconstruction surveys rather than detection surveys to protect special-status species. As Dr. Smallwood explains,

> Detection surveys were designed by species experts, often undergoing considerable deliberation and review before adoption. Detection surveys often require repeated efforts using methods known to maximize likelihoods of detection. Detection surveys are needed to assess impacts and to inform the formulation of appropriate mitigation measures, because preconstruction surveys are not intended for these roles either.

(Ex. A, p. 34.) In contrast, preconstruction surveys "are only intended as last-minute, one-time salvage and rescue operations targeting readily detectable nests or individuals before they are crushed under heavy construction machinery." (*Id*.) Instead of relying only on preconstruction surveys, an EIR should be prepared requiring detection surveys to be performed followed by preconstruction surveys. (*Id*.) Furthermore, the EIR should require that how the results of such surveys would be reported to avoid "serving as an empty gesture rather than a mitigation measure." (*Id*.)

MM BIO-4.1 claims that requiring treated windows for the south-facing aspect of the hotel would mitigate window collision impacts for birds. However, as Dr. Smallwood notes, this mitigation measure ignores the fact that "[t]he north aspect is where the greatest extent of windows would occur, and it is where the building would curve around northward to funnel bird traffic into windows, and it is where the TopGolf net would channel birds through a narrow gap between the unmarked net and the hotel's windows." (Ex. A, p. 35.) As such, MM BIO-4.1 is inadequate to mitigate window collision impacts.

II. An EIR is required to disclose and the Project's significant indoor air quality impacts from emissions of formaldehyde.

The MND fails to address the significant health risks posed by the Project from formaldehyde, a toxic air contaminant ("TAC"). Certified Industrial Hygienist, Francis Offermann, PE, CIH, has conducted a review of the Project, the MND, and relevant documents regarding the Project's indoor air emissions. Mr. Offermann is one of the world's leading experts on indoor air quality, in particular emissions of formaldehyde, and has published extensively on the topic. As discussed below and set forth in Mr. Offermann's comments, the Project's

emissions of formaldehyde to air will result in very significant cancer risks to future residents at the Project's apartments. Mr. Offermann's expert opinion and calculation present a "fair argument" that the Project may have significant health risk impacts as a result of these indoor air pollution emissions, which were not discussed, disclosed, or analyzed in the MND. These impacts must be addressed in an EIR. Mr. Offermann's comment and CV are attached as Exhibit B.

Formaldehyde is a known human carcinogen and listed by the State as a TAC. BAAQMD has established a significance threshold of health risks for carcinogenic TACs of 10 in a million and a cumulative health risk threshold of 100 in a million. The MND fails to acknowledge the significant indoor air emissions that will result from the Project. Specifically, there is no discussion of impacts or health risks, no analysis, and no identification of mitigations for significant emissions of formaldehyde to air from the Project.

Mr. Offermann explains that many composite wood products typically used building construction contain formaldehyde-based glues which off-gas formaldehyde over a very long time period. He states, "The primary source of formaldehyde indoors is composite wood products manufactured with urea-formaldehyde resins, such as plywood, medium density fiberboard, and particle board. These materials are commonly used in residential, office, and retail building construction for flooring, cabinetry, baseboards, window shades, interior doors, and window and door trims." (Ex. B, pp. 2-3.)

Mr. Offermann states that future employees of the Alviso Hotel will be exposed to a cancer risk from formaldehyde of approximately 17.7 per million, assuming all materials are compliant with the California Air Resources Board's formaldehyde airborne toxics control measure. (Ex. A, p. 3.) This exceeds BAAQMD's CEQA significance thresholds for airborne cancer risk of 10 per million. (*Id*.) Mr. Offermann concludes that these significant environmental impacts must be analyzed in an EIR and mitigation measures should be imposed to reduce the risk of formaldehyde exposure. (Ex. A, pp. 5, 11-13.) He prescribes a methodology for estimating the Project's formaldehyde emissions in order to do a more project-specific health risk assessment. (*Id*., pp. 6-9.). Mr. Offermann also suggests several feasible mitigation measures, such as requiring the use of no-added-formaldehyde composite wood products, which are readily available. (*Id*., pp. 11-13.) Mr. Offermann also suggests requiring air ventilation systems which would reduce formaldehyde levels. (*Id*.) Since the MND does not analyze this impact at all, none of these or other mitigation measures have been considered.

When a Project exceeds a duly adopted CEQA significance threshold, as here, this alone establishes substantial evidence that the project will have a significant adverse environmental impact. Indeed, in many instances, such air quality thresholds are the only criteria reviewed and treated as dispositive in evaluating the significance of a project's air quality impacts. (See, e.g. *Schenck v. County of Sonoma* (2011) 198 Cal.App.4th 949, 960 [County applies Air District's "published CEQA quantitative criteria" and "threshold level of cumulative significance"]; see also *Communities for a Better Environment v. California Resources Agency* (2002) 103 Cal.App.4th 98, 110-111 ["A 'threshold of significance' for a given environmental effect is

simply that level at which the lead agency finds the effects of the project to be significant"].) The California Supreme Court made clear the substantial importance that an air district significance threshold plays in providing substantial evidence of a significant adverse impact. (*Communities for a Better Environment v. South Coast Air Quality Management Dist.* (2010) 48 Cal.4th 310, 327 ["As the District's established significance threshold for NOx is 55 pounds per day, these estimates [of NOx emissions of 201 to 456 pounds per day] constitute substantial evidence supporting a fair argument for a significant adverse impact."].) Since expert evidence demonstrates that the Project will exceed the BAAQMD's CEQA significance threshold, there is substantial evidence that an "unstudied, *potentially significant environmental effect[]*" exists. (See *Friends of Coll. of San Mateo Gardens v. San Mateo Cty. Cmty. Coll. Dist.* (2016) 1 Cal.5th 937, 958 [emphasis added].) As a result, the City must prepare an EIR for the Project to address this impact and identify enforceable mitigation measures.

The failure of the MND to address the Project's formaldehyde emissions is contrary to the California Supreme Court's decision in *California Building Industry Ass'n v. Bay Area Air Quality Mgmt. Dist.* (2015) 62 Cal.4th 369, 386 ("*CBIA*"). In that case, the Supreme Court expressly holds that potential adverse impacts to future users and residents from pollution generated by a proposed project *must be addressed* under CEQA. At issue in *CBIA* was whether the Air District could enact CEQA guidelines that advised lead agencies that they must analyze the impacts of adjacent environmental conditions on a project. The Supreme Court held that CEQA does not generally require lead agencies to consider the environment's effects on a project. (*CBIA*, 62 Cal.4th at 800-01.) However, to the extent a project may exacerbate existing environmental conditions at or near a project site, those would still have to be considered pursuant to CEQA. (*Id*. at 801.) In so holding, the Court expressly held that CEQA's statutory language required lead agencies to disclose and analyze "impacts on *a project's users or residents* that arise *from the project's effects* on the environment." (*Id*. at 800 [emphasis added].)

The carcinogenic formaldehyde emissions identified by Mr. Offermann are not an existing environmental condition. Those emissions to the air will be from the Project. People will be residing in and using the Project once it is built and begins emitting formaldehyde. Once built, the Project will begin to emit formaldehyde at levels that pose significant direct and cumulative health risks. The Supreme Court in *CBIA* expressly finds that this type of air emission and health impact by the project on the environment and a "project's users and residents" must be addressed in the CEQA process. The existing TAC sources near the Project site would have to be considered in evaluating the cumulative effect on future residents of both the Project's TAC emissions as well as those existing off-site emissions.

The Supreme Court's reasoning is well-grounded in CEQA's statutory language. CEQA expressly includes a project's effects on human beings as an effect on the environment that must be addressed in an environmental review. "Section 21083(b)(3)'s express language, for example, requires a finding of a 'significant effect on the environment' (§ 21083(b)) whenever the 'environmental effects of a project will cause substantial adverse effects *on human beings,* either directly or indirectly.'" (*CBIA*, 62 Cal.4th at 800 [emphasis in original].) Likewise, "the Legislature has made clear—in declarations accompanying CEQA's enactment—that public

health and safety are of great importance in the statutory scheme." (*Id*., citing e.g., §§ 21000, subds. (b), (c), (d), (g), 21001, subds. (b), (d).) It goes without saying that the thousands of future residents at the Project are human beings and the health and safety of those residents must be subjected to CEQA's safeguards.

The City has a duty to investigate issues relating to a project's potential environmental impacts. (*See County Sanitation Dist. No. 2 v. County of Kern*, (2005) 127 Cal.App.4th 1544, 1597–98. ["[U]nder CEQA, the lead agency bears a burden to investigate potential environmental impacts."].) The proposed office buildings will have significant impacts on air quality and health risks by emitting cancer-causing levels of formaldehyde into the air that will expose future residents to cancer risks potentially in excess of BAAQMD's threshold of significance for cancer health risks of 10 in a million. Likewise, when combined with the risks posed by the nearby TAC sources, the health risks inside the project may exceed BAAQMD's cumulative health risk threshold of 100 cancers in a million. Currently, outside of Mr. Offermann's comments, the City does not have any idea what risks will be posed by formaldehyde emissions from the Project or the residences. As a result, the City must include an analysis and discussion in an EIR which discloses and analyzes the health risks that the Project's formaldehyde emissions may have on future residents and identifies appropriate mitigation measures.

III. An EIR is Required to Disclose and Mitigate the Project's Significant Air Quality Impacts from Emissions of Diesel Particulate Matter.

Matt Hagemann, P.G., C.Hg., and Dr. Paul E. Rosenfeld, Ph.D., of the environmental consulting firm SWAPE reviewed the MND's analysis of the Project's impacts on air quality. SWAPE's comment letter and CVs are attached as Exhibit C. As discussed below, SWAPE concluded that the MND failed to identify a significant impact from emissions of diesel particulate matter. As such, an EIR is required to disclose and mitigate this impact.

A. The MND failed to analyze the Project's operational and cumulative air quality impacts on human health from emissions of diesel particulate matter.

The MND's analysis of the cancer risk posed by emissions of diesel particulate matter was inadequate. Although the MND provided a quantitative analysis for emissions during construction of the Project (MND, p. 47), there was no quantitative analysis of the emissions resulting from *operation* of the Project. Instead, the MND relied on a qualitative analysis to conclude that "[p]roject traffic was not considered a source of substantial TACs [toxic air contaminants] or $PM_{2.5}$." (MND, p. 44.) The MND's failure to conduct a quantified health risk assessment ("HRA") for the Project's operational emissions resulted in an inadequate evaluation of the Project's impacts and calls into question the MND's less-than-significant conclusion.

As noted by SWAPE, CEQA requires that that MND "correlate the increase in emissions that the Project would generate to the adverse impacts on human health caused by those emissions. (Ex. C, p. 12.) However, such an analysis is not possible without a quantified HRA.

Furthermore, the failure of the MND to provide a quantified HRA is inconsistent with the most recent guidance of the Office of Environmental Health Hazard Assessment ("OEHHA"). (Ex. C, p. 12.) OEHHA recommends that exposure from projects lasting more than 6 months (e.g. the Project's future years of operation) be evaluated for the duration of the project and recommends that an exposure duration of 30 years be used to estimate individual cancer risk for the maximally exposed individual resident ("MEIR"). (*Id*.) OEHHA additionally recommends that agencies evaluate the cumulative impact of construction and operation of the Project combined. (*Id.* at p. 13.) Thus, a quantified HRA is necessary to ensure that operational and cumulative health risks are disclosed, compared to the applicable BAAQMD significance thresholds, and properly mitigated.

B. SWAPE's analysis presents a fair argument that the Project will result in a potentially significant in a potentially significant impact to human health from emissions of diesel particulate matter.

SWAPE prepared a screening-level HRA to evaluate potential impacts to human health from diesel particulate matter emissions ("DPM") during operation of the Project. (Ex. C, pp. 14-16.) SWAPE used AERSCREEN, the leading screening-level air quality dispersion model. (*Id*. at p. 14.) SWAPE used a sensitive receptor distance of 300 meters (i.e. the single family residences located near the Project site) and analyzed impacts to individuals at different stages of life based on OEHHA guidance. (*Id*. at pp. 15-16.)

SWAPE found that cumulative risks of construction and operation of the Project combined resulted in an excess cancer risk of approximately 12.2 in one million over the course of a residential lifetime (i.e. 30 years). (Ex. C, p. 16.) As SWAPE concluded, "the lifetime cancer risks exceed the BAAQMD threshold of 10 in one million, thus resulting in a potentially significant impact not previously addressed or identified by the IS/MND." (Ex. C, p. 16.)

SWAPE's expert analysis of the Project's significant cancer risks established a fair argument that the Project may result in significant impacts. Under CEQA, SWAPE's fair argument requires that the City prepare an EIR to disclose and mitigate this impact.

IV. The MND's Analysis of the Project's Air Quality Impacts Is Not Supported by Substantial Evidence.

SWAPE found that the MND underestimated the Project's emissions and therefore cannot be relied upon to determine the significant of the Project's air quality impacts. (Ex. C, p. 2.) The MND relies on emissions calculated from the California Emissions Estimator Model Version CalEEMod.2016.3.2 ("CalEEMod"). (*Id*. at p. 1.) This model, which is used to generate a project's construction and operational emissions, relies on recommended default values based on site specific information related to a number of factors (*Id.*, pp. 1-2.) CEQA requires that any changes to the default values must be justified by substantial evidence. (*Id*. at p. 1.)

SWAPE reviewed the Project's CalEEMod output files and found that the values input

into the model were inconsistent with information provided in the MND. (Ex. C, p. 2.) This results in an underestimation of the Project's emissions. (*Id*.) As a result, an EIR should be prepared that adequately evaluates the Project's air quality impacts. (*Id.*)

Specifically, SWAPE found that the following values used in the MND's air quality analysis were either inconsistent with information provided in the MND or otherwise unjustified:

1. Underestimated Land Use Size (Ex. C, p. 2.)
2. Unsubstantiated Changes to Construction Phase Lengths (Ex. C, pp. 2-4.)
3. Underestimated Amount of Material Import (Ex. C, pp. 4-5.)
4. Unsubstantiated Changes to Off-Road Construction Units/Hours (Ex. C, pp. 5-6.)
5. Underestimated Hauling Trip Number (Ex. C, pp. 6-7.)
6. Unsubstantiated Change to Wastewater Treatment Percentages (Ex. C, pp. 7-8.)
7. Incorrect Application of Tier 3 Mitigation (Ex. C, pp. 8-10.)
8. Improper Application of Energy-Related Mitigation Measures (Ex. C, pp. 10-11.)

As a result of these errors, the MND underestimates the Project's construction and operational emissions and cannot be relied upon to determine the significance of the Project's air quality impacts.

V. The MND's Analysis of the Project's Greenhouse Gas Impacts is Not Supported by Substantial Evidence.

The MND uses the City's 2030 Greenhouse Gas Reduction Strategy ("GHGRS") to analyze the Project's impacts related to greenhouse gases ("GHGs"). As the MND explained,

> The 2030 GHGRS identifies required General Plan policies and strategies to be implemented by development projects in the areas of green building/energy use, multimodal transportation, water conservation, and solid waste reduction. Compliance with these mandatory policies and strategies and any voluntary measures proposed by the project ensure a project's consistency with the GHG Reduction Strategy.

(MND, p. 98.) The MND compared the Project to the GHGRS using a "Consistency Checklist" and concluded that the Project was consistent with all applicable policies/strategies and, therefore, that the Project's GHG impacts would be less than significant. (MND, pp. 98-104.) However, a closer look at the Consistency Checklist reveals that several consistency determinations are unfounded or otherwise unjustified. (See Ex. C, pp. 17-23.)

For example, MS-2.7 requires that the Project "[e]ncourage the installation of solar panles or other clean energy power generation sources ***over parking areas***." (MND, p. 99 [emphasis added].) The MND states that "[t]he project would not include solar panels over the parking garage" yet then concludes that the Project is nevertheless consistent with MS-2.7. (*Id*.) Without solar panels over the Project's parking garage, the Project is not consistent with MS-2.7.

The MND applies the same faulty logic to MS-2.2 which requires the Project to "[e]ncourage maximized use of on-site generation of renewable energy for all new and existing buildings." (*Id*.) The MND concludes that the Project is consistent with MS-2.2 yet makes no mention of the fat that solar panels are not required over the parking garage. (*Id*.) The MND claims that Project is consistent with MS-2.2 because "[t]he project applicant is committed to the project being compliant with all mandatory applicable state and local green building and energy codes." (*Id*.) Again, there is no basis for concluding that the Project is consistent with MS-2.2 when solar panels are not required over the garage and where compliance is assumed based on the applicant doing the bare minimum by complying with state and local regulation. (See Ex. C, pp. 17-18.)

The MND also concludes that the Project will be consistent with several measures on the Consistency Checklist based on speculative performance of non-mandatory measures by the applicant in the future. For example, MS-16.2 requires that the Project "[p]romote neighborhood-based distributed clean/renewable energy generation to improve local energy security and to reduce the amount of energy wasted in transmitting electricity over long distances." (MND, p. 99.) The MND concludes the Project is consistent because the applicant is "committed . . . towards supporting neighborhood-based distributed clean/ renewable energy generation ***when it becomes available in the area***." (*Id*. [emphasis added].) In other words, the MND is concluding the Project is consistent based on something that it admits does not exist yet. (Ex. C, pp.18-19.) \

Similarly, the MND concludes the Project is consistent with TR-7.1 and TR-8.5, which are related to traffic and parking, because the project would develop a transportation demand management ("TDM") plan in the future. (MND, pp. 101-02.) However, as noted by SWAPE, the MND makes no mention of requiring a TDM plan or what the elements of such a plan would be. (Ex. C, pp. 20-21.) Without knowing the details of these purported future events, the MND lacked any basis for concluding the Project was consistent with the GHGRS.

In addition to the above examples, SWAPE has outlined each alleged defect with the GHGRS Checklist in their comment letter. (Ex. C, pp. 17-23.) SWAPE's overall conclusion was that "the IS/MND fails to provide sufficient information and analysis to determine Project consistency with all of the measures required by the GHGRS." (*Id*. at p. 23.) Without more information, the MND's conclusion that the Project is consistent with the GHGRS and, therefore, that the Project's GHG impacts are less than significant is not supported by substantial evidence.

CONCLUSION

LIUNA's experts have established a fair argument that the Project may have significant impacts on biological resources and air quality. Furthermore, the MND's analyses of impacts to biological resources, air quality, and greenhouse gases are not supported by substantial evidence. Therefore, LIUNA respectfully requests that the City prepare and circulate an EIR for the Alviso Hotel Project prior to approval of the Project.

Sincerely,

Brian B. Flynn
Lozeau Drury LLP

EXHIBIT A

Shawn Smallwood, PhD
3108 Finch Street
Davis, CA 95616

Stephanie Hansen, Principal Planner
County of Santa Cruz Planning Department
701 Ocean Street, Fourth Floor
Santa Cruz California 95060

6 November 2021

RE: Alviso Hotel Project

Dear Ms. Hansen,

I write to comment on the draft Initial Study/Mitigated Negative Declaration (IS/MND) prepared for the proposed Alviso Hotel Project south of North First Street and north of Highway 237 in the Alviso area of San José (City of San José 2021). I understand this project would add 112,463 square feet of floor space in a 5-story hotel building and a 4-story parking garage on 6.23 acres. Unfortunately, the analysis of baseline conditions is incomplete and flawed, and the impacts analysis neglects potential impacts to wildlife that are both substantial and significant, including from glass windows and traffic.

My qualifications for assessing habitat and identifying potential impacts to wildlife are the following. I hold a Ph.D. degree in Ecology from University of California at Davis, where I also worked for four years as a post-graduate researcher in the Department of Agronomy and Range Sciences. My research has been on animal density and distribution, habitat selection, interactions between wildlife and human infrastructure and activities, and conservation of rare and endangered species. I authored numerous papers on wildlife conservation. 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 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 Biological Conservation, and I was on the Editorial Board of Environmental Management. I have surveyed for wildlife in California for 36 years. My CV is attached.

SITE VISIT

I visited the site of the proposed project for 115 minutes starting at 07:26 hours on 30 October 2021. Using binoculars, I scanned for wildlife from the Guadalupe River Trail. Conditions were overcast with coastal fog and mild temperature with no wind. My survey happened to coincide with the Dia de Los Muertos Run-walk, the 500 participants of which likely suppressed the number of wildlife species I could detect. The site was covered by annual grasses, salt grass (*Distichlis spicata*), alkali heath (*Frankenia salina*) and pickleweed (*Salicornia pacifica*) with a few coyote bush (*Baccharis pilularis*), other shrubs and a palm. On the north side of the project site was a brightly lit building with a 170-foot tall, unmarked net, and on the south side was a homeless encampment (Photos 1 and 2).

Photos 1 and 2. *Views of the project site looking northeast (top) and east (bottom), 30 October 2021.* The net on the north side of the project site belongs to the Topgolf facility that was recently built.

I saw multiple species of birds, including special-status species, on the project site and flying through the airspace over and next to the project site. Just north of the site I saw a flock of about 200 California brown pelicans (Photo 3), and many Canada geese flew over and near the site (Photo 4). Double-crested cormorants flew over the site (Photo 5), as did California gulls and herring gulls (Photos 6 and 7). A white-tailed kite hunted right next to the site (Photos 8 and 9). Greater yellowlegs and black phoebe foraged on the site (Photos 10 and 11), as did hundreds of white-crowned sparrows, golden-crowned sparrows, Lincoln's sparrows, and savannah sparrows (Photo 12). I also saw black-tailed jackrabbit on the site (Photo 13) as well as feral house cats (Photo 14). Altogether, I detected 34 species of vertebrate wildlife, including at least 8 special-status species (9 if the blackbirds were tricolored blackbirds or yellow-headed blackbirds) (Table 1).

Photo 3. *Twenty-one of about 200 California brown pelicans just north of the project site, 30 October 2021.*

Photo 4. *One of multiple flocks of Canada goose that flew over or by the project site on 30 October 2021.*

Photo 5. *One of multiple flocks of double-crested cormorants that flew over or by the project site on 30 October 2021.*

Photos 6 and 7. *One of multiple California gulls (left) and herring gulls (right) that flew over or by the project site on 30 October 2021.*

Photos 8 and 9. *White-tailed kite foraging next to the project site on 30 October 2021.*

Photos 10 and 11. *Greater yellowlegs (left) and black phoebe (right) on the project site, 30 October 2021.*

Photo 12. *Fifty-six sparrows composed of white-crowned sparrow, golden-crowned sparrow and savannah sparrow, and 1 lesser goldfinch, 30 October 2021.*

Photos 13 and 14. *Black-tailed jackrabbit (left) and feral house cat (right) on the project site, 30 October 2021.*

In addition to my site visit, I reviewed an Initial Study/Mitigated Negative Declaration that had been prepared for a Topgolf facility and hotel on the same property as the Aviso Hotel Project (Harvey & Associates 2016). Harvey & Associates performed biological surveys of the site on 29 June and 9 December 2015. Methodological details were not reported, and results were vaguely reported. As far as I could discern, Table 2 includes an additional 23 species of vertebrate wildlife that I did not detect on 30 October 2021. Between the Harvey & Associates surveys and my survey, at least 67 species of vertebrate wildlife were detected at the site, including at least 12 special-status species.

My detections of 34 species of vertebrate wildlife should be interpreted within the context of my survey effort. As the additional species detections from the Harvey & Associates' surveys confirm, the results of one reconnaissance-level survey qualify as thin empirical foundation for characterizing the environmental setting of a proposed project site. Such surveys better serve as starting points toward characterization of a site's wildlife community. With only so many species detectable in the short time I had to perform visual-scan surveys on 30 October 2021, I would have been remiss to have reported that only 34 species of wildlife occur in the area. However, when surveys are diligently performed, and when outcomes are analyzed appropriately and fully reported, the number of species detected within the survey effort can inform of the number of species likely to be detected with a larger survey effort during the same time of year. This potential is of critical importance when making determinations about occurrence likelihoods of special-status species, which I will discuss further below.

Table 1. *Species of vertebrate wildlife I detected at the project site, 30 October 2021.*

Common name	**Species name**	**Status**[1]	**Note**
House cat	*Felis catus*	Non-native	I counted 5
California ground squirrel	*Otospermophilus beecheyi*		On site
Black-tailed jackrabbit	*Lepus californicus*		Visible early morning
Canada goose	*Branta canadensis*		Multiple flocks
Mallard	*Anas platyrhynchos*		Pairs and flocks
American coot	*Fulica americana*		On Guadalupe River
California brown pelican	*Pelicanus occidentalis californicus*	CFP	200 just north
Double-crested cormorant	*Phalacrocorax auritus*	WL	Multiple flocks
Great egret	*Ardea alba*		Flyover
Snowy Egret	*Egretta thula*		Flyby
Turkey vulture	*Cathartes aura*	BOP	Flyover
Red-tailed hawk	*Buteo jamaicensis*	BOP	Perched nearby
White-tailed kite	*Elanus leucurus*	CFP, BOP	Hunted adjacent to site
Mourning dove	*Zenaida macroura*		Multiple fly-throughs
Rock pigeon	*Columba livia*	Non-native	1 flew over
Anna's hummingbird	*Calypte anna*		Harassing sparrows
Greater yellowlegs	*Tringa melanoleuca*		On pond
Herring gull	*Larus argentatus*		Flyover
California gull	*Larus californicus*	BCC, WL	Flyover
Western gull	*Larus occidentalis*	BCC	Flyover
Black phoebe	*Sayornis nigricans*		Hunted site
European starling	*Sturnus vulgaris*	Non-native	Flock flew over
Common raven	*Corvus corax*		Flyovers and stop-overs
American crow	*Corvus brachyrhynchos*		Flyovers and stop-overs
Yellow-rumped warbler	*Dendroica coronata*		On site
California towhee	*Pipilo crissalis*		On site
Golden-crowned sparrow	*Zonotrichia atricapilla*		On site
White-crowned sparrow	*Zonotrichia leucophrys*		On site
Lincoln's sparrow	*Melospiza lincolni*		On site
Bryant's savannah sparrow	*Passerculus sandwichensis alaudinus*	SSC3	On site
Great-tailed grackle	*Quiscalus mexicanus*		Flyover
Blackbirds	*Agelaius sp.*		Flyover
Lesser goldfinch	*Carduelis psaltria*		On site
American goldfinch	*Carduelis tristis*		On site

[1] See Table 2 for definitions of Status acronyms.

Table 2. *Additional species of vertebrate wildlife reported at the project site and its pre-Topgolf neighbor in 2015.*

Common name	**Species name**	**Status[1]**
Western fence lizard	*Sceloporus occidentalis*	
Gopher snake	*Pituophis melanoleucus*	
Common garter snake	*Thamnophis sirtalis*	
Striped skunk	*Mephitis mephitis*	
Raccoon	*Procyon lotor*	
Western harvest mouse	*Reithrodontomys megalotis*	
House mouse	*Mus musculus*	Non-native
California vole	*Microtus californicus*	
Great blue heron	*Ardea herodius*	
Northern harrier	*Circus cyaneus*	BCC, SSC3
Cooper's hawk	*Accipiter cooperi*	BOP, WL
American kestrel	*Falco sparverius*	BOP
Barn owl	*Tyto alba*	BOP
Cliff swallow	*Petrochelidon pyrrhonota*	
Barn swallow	*Hirundo rustica*	
Bushtit	*Psaltriparus minimus*	
American robin	*Turdus migratorius*	
San Francisco common yellowthroat	*Geothlypis trichas sinuosa*	BCC, SSC3
Alameda song sparrow	*Melospiza melodia pusillula*	SSC2
Western meadowlark	*Sturnella neglecta*	
Red-winged blackbird	*Agelaius phoeniceus*	
Brewer's blackbird	*Euphagus cyanocephalus*	
House finch	*Haemorhous mexicanus*	

[1] See Table 2 for definitions of Status acronyms.

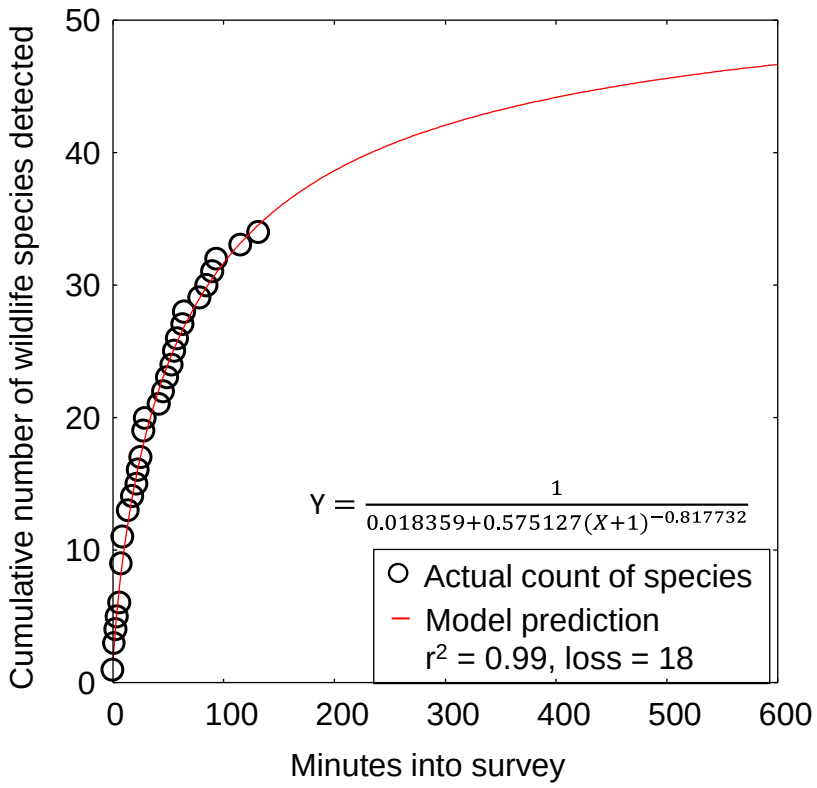
By recording when I detected each species, I was able to forecast the number of species likely to be detected with a longer effort using the same visual scan method. Figure 1 shows my cumulative counts of species detected with increasing time into both of my surveys. Just as I have seen for many other survey efforts, a nonlinear regression model fit the data very well, explaining 99% of the variation in the data, and the model showed progress towards the inevitable asymptote of the number of species detectable over a longer time period using the same survey method. In the case of this project site, my model predicted I would have eventually detected another 20 species, or 54 species of vertebrate wildlife in total, had I continued the survey using the same method on 30 October 2021.

I could have detected many more species than predicted by also performing surveys at other times of day to detect nocturnal and crepuscular species, or surveys in different seasons and years to detect migrants and species with multi-annual cycles of abundance, or surveys of different methods such as se of acoustic detectors or thermal-imaging for bats, owls, and nocturnally migratory birds, and live-trapping for small mammals. As it was, I detected 34 species. My reconnaissance-level survey, performed carefully and

analyzed appropriately, informs me that the site and its surrounds is rich in volant wildlife. What my survey data do not inform me, and what detection surveys could, is which of the potentially occurring special-status species actually occur at the site in addition to those I had the good fortune to detect.

The likelihood of detecting special-status species is typically lower than that of more common species. This difference can be explained by rarity of special-status species, which also tend to be more cryptic, fossorial, or active during nocturnal periods when reconnaissance surveys are not performed. Another useful relationship from careful recording of species detections and subsequent comparative analysis is the probability of detection of listed species as a function of an increasing number of vertebrate wildlife species detected (Figure 2). (Note that listed species number fewer than special-status species, which are inclusive of listed species.) As had been demonstrated in Figure 1, the number of species detected is largely a function of survey effort. Therefore, greater survey effort increases the likelihood that listed species will be detected (which is the first tenet of detection surveys for special-status species). Based on the outcomes of 152 previous surveys that I performed at sites of proposed projects, my survey effort at the project site carried a 43% chance of detecting a listed species and a 13% chance of detecting 2 listed species (Figure 2). As it turned out, I detected 2 listed species (California brown pelican and white-tailed kite) this time, although both were just outside the project boundary. WRA (2020) Detected 10 species of vertebrate wildlife, so their survey effort carried only a 12.5% chance of detecting a listed species and a 3% chance of detecting 2 listed species.

Figure 1. *Actual and predicted relationships between the number of vertebrate wildlife species detected and the elapsed survey time based on visual scans on 30 October 2021 at the project site. Note that the relationships would differ if the survey was based on another method or during night or another season. Also note that the cumulative number of vertebrate species across all methods, times of day, and seasons would increase substantially.*



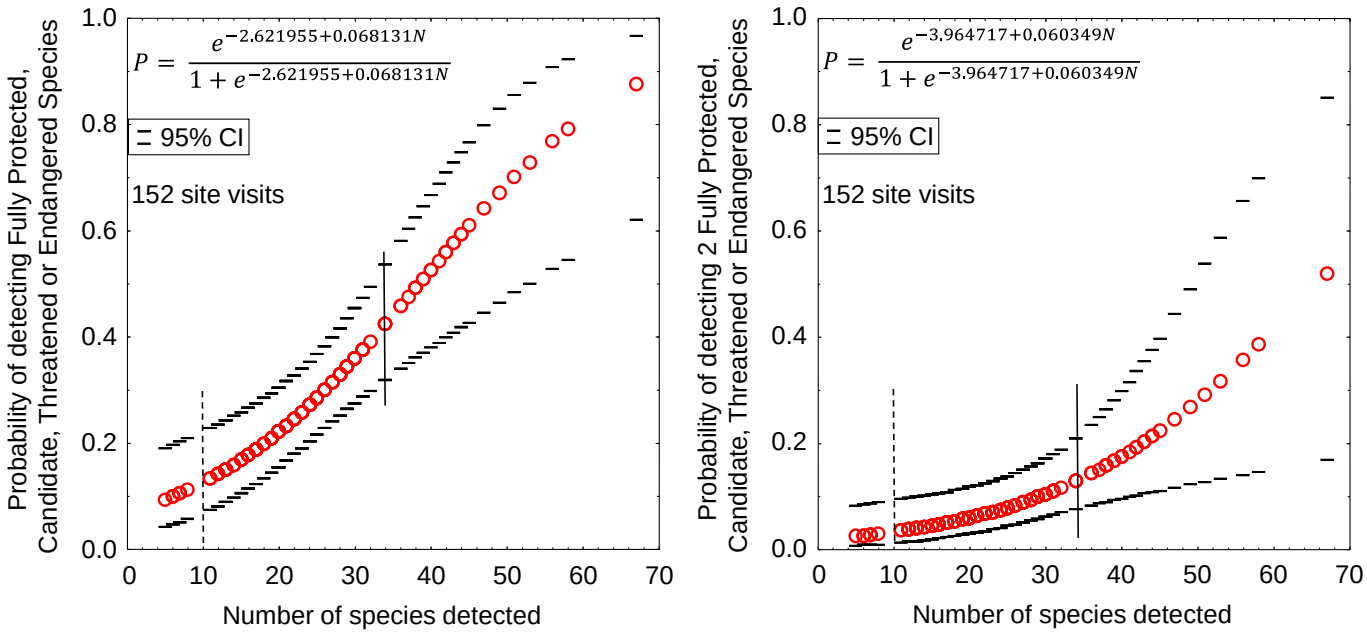


Figure 2. *Probability of detecting ≥1 Candidate, Threatened or Endangered Species of wildlife listed under California or federal Endangered Species Acts, based on survey outcomes that I logit-regressed on the number of wildlife species I detected as an expert witness during 152 site visits across California. Dashed vertical lines represent the numbers of species detected at the project site by WRA and solid vertical lines represent the numbers I detected on 30 October 2021.*

EXISTING ENVIRONMENTAL CONDITIONS

The first step in analysis of potential project impacts to biological resources is to accurately characterize the existing environmental setting, including the 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. Methods to achieve this first step typically include surveys of the site for biological resources and reviews of literature, data bases and local experts for documented occurrences of special-status species. The IS/MND, however, is both incomplete and inaccurate in its characterization of the environmental setting as it relates to wildlife. The summary of ground cover is misleading. The survey of the site for biological resources was too cursory. The supporting review of literature and data bases was also much too cursory. I found additional problems with the premises used to determine occurrence likelihoods, and with the interpretation of available information. I will comment on these problems, but first I will comment on the biological resources survey.

Based on WRA's (2020) report, the IS/MND claims that 48% of the site is developed. This is not true. The so-called developed portion of the site was graded, but not developed. Developed land begins with the imposition of impervious surface, and often includes building structures. Graded land without impervious surface can support

vegetation and wildlife, and it does so at this project site. The land at issue at the project site was temporarily disturbed, but it is not developed.

In support of the IS/MND, WRA (2020) performed a biological resources survey at the site on 17 December 2019. Other than reporting the date of the survey, that it was traversed on foot, and its three objectives, WRA (2020) neglected to report the most basic information needed to assess the rigor of the biological survey. Decision-makers and the public ought to be informed about how many biologists performed the survey, names and qualifications of survey personnel, time of day the survey took place, how long the survey lasted, and which specific methods were used. Consumers of the IS/MND need to know these fundamentals because as I pointed out earlier, the number of wildlife species detected is largely a function of survey effort. WRA (2020) should have reported the level of effort committed to the project site and the methods used.

WRA reported their detections of 10 species of vertebrate wildlife. Given the 34 species I saw at the site during my <2-hour visit, and given the 41 or more species detected by Harvey & Associates (2016) over 2 surveys in 2015, I am astounded that the WRA biologist(s) who surveyed the site in 2019 detected a mere 10 species of wildlife (WRA 2020). WRA detected less than a third of the species I detected within a grassland/marsh filled with the sights and sounds of wildlife. WRA detected less than a fourth of the species characterized at the site by Harvey & Associates (2016). Within 9 minutes of my arrival the site, I detected more species of wildlife than did WRA. Why were the outcomes of my survey and the surveys of Harvey & Associates so different from WRA's? Without knowing how WRA performed their survey or who did it, I am at a loss for explanation. But I can conclude that the wildlife community of the project site is incompletely and inaccurately characterized in the IS/MND. I can also conclude that the biological resources survey provided an unacceptably poor basis for an analysis of potential project impacts to wildlife.

The IS/MND (page 58) states, "No special-status birds were observed within the project area during the site assessment." This statement exemplifies pseudoscience. It might be true on its face, but it represents a grossly deficient survey. Something is amiss with WRA's survey outcome, perhaps due to insufficient survey effort, or survey by an unqualified person, or survey at the wrong time of day. In my experience, so long as survey efforts and methods used are roughly equivalent between surveys, multiple surveys of a site tend to result in the same numbers of species and the same numbers of special-status species. It is not credible to have detected no special-status species of birds, whereas Harvey & Associates (2016) and I detected 13 special-status bird species on the site and another special-status species of bird just north of the site.

The literature and database reviews were also much too cursory to support an analysis of potential project impacts. WRA reported no interviews with local experts. Although other sources were listed by WRA, it appeared to me that the only source used was California Natural Diversity Data Base (CNDDB). CNDDB can be a helpful resource, but it is not the only resource available, nor is it the best resource for certain taxa such as birds. Whereas WRA (2020:12) reported, "42 special-status wildlife species have been recorded in the vicinity of the Project Area," my reviews of eBird and iNaturalist

combined with my own surveys in the area reveal 87 special-status species of wildlife known to occur in the area (Table 3).

The cursory approach taken by WRA resulted in many odd contradictions between WRA's occurrence-likelihood determinations and what members of the public have reported seeing at and near the project site. Of the 15 species that WRA determined to have no chance of occurrence or unlikely to occur, 1 was seen on site, 6 were reported in eBird within a mile or so of the site, and 2 species were reported within several miles (Table 3). Of the 68 special-status species that appear in Table 3 but which were not addressed by WRA, 13 have been detected at the project site, 38 have been detected within 1 mile of the site, and another 24 have been reportedly detected within several miles of the site. Again, the incomplete review of available information has left the characterization of the project site's wildlife community incomplete and inaccurate.

Earlier I mentioned that I would comment on additional problems I noticed with WRA's analysis of species' occurrence likelihoods. Here forth I add those comments.

According to WRA (2020:8), "The site visit does not constitute a protocol-level survey and is not intended to determine the actual presence or absence of a species." But in fact, WRA relied on the outcome of their site visit to determine presence and absence of species – just what WRA (2020) said they would not do. As WRA (2020:7) explained, "The December 2019 site visit was conducted to search for suitable habitats for listed species. Habitat conditions observed at the Project Area were used to evaluate the potential for presence of listed species based on these searches…" Thus, the site visit was intended to determine species presence or absence.

An even more clear example of the WRA survey being used to conclude species' absence could be found in the IS/MND. According to the IS/MND (page 68), "no tricolored blackbirds were observed within or immediately adjacent to the project site during the site survey conducted during the breeding season, and the species is determined to be absent." WRA's survey was on 17 December 2019, which was not during the breeding season. The IS/MND's finding is factually incorrect. More importantly, the IS/MND's finding contradicts WRA's assurance that "The site visit does not constitute a protocol-level survey and is not intended to determine the actual presence or absence of a species." The IS/MND's conclusion about tricolored blackbird presence was unfounded and misleading. WRA's assurance proved empty, but it was not the only empty assurance.

Although CNDDB was reportedly not used to determine occurrence likelihoods other than to confirm presence based on existing CNDDB records of a species on the project site (WRS 2020:7-8), absence of CNDDB records was used to determine no potential and unlikely occurrence likelihoods for multiple species (see WRA 2020: App. C). However, using CNDDB records this way was inappropriate because this was not what CNDDB was designed to do. Lack of CNDDB records does not mean a species is absent from a site nor from the area around the site. Consulting CNDDB is fine for confirming presence of a species, but it is inappropriate for determining absence and hence to narrow a list of potentially occurring species. CNDDB relies on voluntary reporting, but

Table 3. *Occurrence likelihoods of special-status species as determined by site visits (by Harvey & Associates or myself) or reports to eBird (https://eBird.org) and iNaturalist (https://www. inaturalist.org/observations).*

Species	***Scientific name***	**Status[1]**	**Data base, Site visits**	**Occurrence likelihood**	
				WRA	**KSS**
Western pond turtle	*Actinemys pallida*	SSC	Nearby	Unlikely	Possible
Brant	*Branta bernicla*	SSC2	Nearby		Possible
Aleutian cackling goose	*Branta hutchinsonii leucopareia*	WL	Nearby		Possible
Redhead	*Aythya americana*	SSC2	Very close		Probable
Clark's grebe	*Aechmophorus clarkii*	BCC	Very close		Probable
Western grebe	*Aechmophorus occidentalis*	BCC	Very close		Probable
Double-crested cormorant	*Phalacrocorax auritus*	WL	On site		Certain
Brandt's cormorant	*Phalacrocorax penicillatus*	BCC	Very close		Probable
American white pelican	*Pelecanus erythrorhynchos*	SSC1	Very close		Probable
California brown pelican	*Pelecanus occidentalis californicus*	CFP	Very close		Probable
Turkey vulture	*Cathartes aura*	BOP	On site		Certain
Osprey	*Pandion haliaetus*	WL, BOP	Very close		Probable
Golden eagle	*Aquila chrysaetos*	BGEPA, BCC, CFP	Very close	Unlikely	Probable
Bald eagle	*Haliaeetus leucocephalus*	BGEPA, BCC, CFP	Very close		Probable
Red-tailed hawk	*Buteo jamaicensis*	BOP	On site		Certain
Red-shouldered hawk	*Buteo lineatus*	BOP	Very close		Probable
Ferruginous hawk	*Buteo regalis*	BCC, WL, BOP	Very close		Probable
Swainson's hawk	*Buteo swainsoni*	BCC, CT, BOP	Very close	No potential	Probable
Sharp-shinned hawk	*Accipiter striatus*	BOP, WL	Very close		Probable
Cooper's hawk	*Accipiter cooperi*	BOP, WL	On site		Certain
Northern harrier	*Circus cyaneus*	SSC3, BOP	On site	Moderate	Certain
White-tailed kite	*Elanus leucurus*	CFP, WL, BOP	On site	Moderate	Certain
American kestrel	*Falco sparverius*	BOP	On site		Certain
Merlin	*Falco columbarius*	BOP, WL	Very close		Probable
Peregrine falcon	*Falco peregrinus*	CFP, BCC, BOP	Very close	Unlikely	Probable
Prairie falcon	*Falco mexicanus*	BCC, WL, BOP	Very close		Probable
Sandhill crane	*Grus c. canadensis*	CT, CFP, SSC3	Nearby		Possible
Snowy plover	*Charadrius alexandrinus*	FT, BCC, SSC	Nearby	No potential	Possible
Black oystercatcher	*Haematopus bachmani*	BCC	Nearby		Possible
Willet	*Tringa semipalmata*	BCC	Very close		Probable

Species	*Scientific name*	Status[1]	Data base, Site visits	Occurrence likelihood	
				WRA	KSS
Whimbrel	*Numenius phaeopus*	BCC	Very close		Probable
Long-billed curlew	*Numenius americanus*	BCC, WL	Very close		Probable
Marbled godwit	*Limosa fedua*	BCC	Very close		Probable
Red knot	*Calidris canutus*	BCC	Very close		Probable
Short-billed dowitcher	*Limnodromus griseus*	BCC	Very close		Probable
Heermann's gull	*Larus heermannii*	BCC	Nearby		Possible
California gull	*Larus californicus*	WL	On site		Certain
Western gull	*Larus occidentalis*	BCC	On site		Certain
Caspian tern	*Hydroprogne caspia*	WL	Very close		Probable
Elegant tern	*Thalasseus elegans*	BCC	Very close		Probable
Black tern	*Chlidonias niger*	BCC, SSC2	Very close		Probable
California least tern	*Sternula antillarum browni*	FE, CE	Very close	No potential	Probable
Black skimmer	*Rynchops niger*	BCC, SSC3	Very close	No potential	Possible
Western burrowing owl	*Athene cunicularia*	BCC, SSC2, BOP	Very close	Moderate	Probable
Barn owl	*Tyto alba*	BOP	On site		Certain
Great-horned owl	*Bubo virginianus*	BOP	Nearby		Probable
Short-eared owl	*Asio flammeus*	BCC, SSC3, BOP	Very close		Probable
Long-eared owl	*Asio otus*	BCC, SSC3, BOP	Nearby		Possible
Western screech-owl	*Megascops kennicotti*	BOP	Nearby		Probable
Northern pygmy-owl	*Glaucidium gnoma*	BOP	Nearby		Possible
Black swift	*Cypseloides niger*	BCC, SSC3	Nearby		Possible
Vaux's swift	*Chaetura vauxi*	SCC2	Very close		Probable
Purple martin	*Progne subis*	SCC2	Nearby		Possible
Allen's hummingbird	*Selasphorus sasin*	BCC	Nearby		Possible
Rufous hummingbird	*Selasphorus rufus*	BCC	Nearby		Probable
Costa's hummingbird	*Calypte costae*	BCC	In region		Possible
Nuttall's woodpecker	*Picoides nuttallii*	BCC	Very close		Probable
Olive-sided flycatcher	*Contopus cooperi*	SSC2	Nearby		Possible
Willow flycatcher	*Empidonax traillii*	CE, BCC	Very close		Probable
Vermilion flycatcher	*Pyrocephalus rubinus*	SSC2	Nearby		Possible
Oak titmouse	*Baeolophus inornatus*	BCC	Very close		Probable
Wrentit	*Chamaea fasciata*	BCC	Nearby		Possible

Species	*Scientific name*	Status[1]	Data base, Site visits	Occurrence likelihood	
				WRA	KSS
Loggerhead shrike	*Lanius ludovicianus*	BCC, SSC2	Very close		Probable
California thrasher	*Toxostoma redivivum*	BCC	Nearby		Possible
Yellow-billed magpie	*Pica nuttalli*	BCC	Nearby		Possible
Yellow warbler	*Setophaga petechia*	BCC, SSC2	Very close		Probable
Yellow-breasted chat	*Icteria virens*	SSC3	Nearby		Possible
San Francisco common yellowthroat	*Geothlypis trichas sinuosa*	BCC, SSC3	On site	Moderate	Certain
Bryant's savannah sparrow	*Passerculus sandwichensis alaudinus*	SSC3	On site		Certain
Vesper sparrow	*Pooecetes gramineus affinis*	SSC2	Nearby		Possible
Alameda song sparrow	*Melospiza melodia pusillula*	SSC2	On site	Unlikely	Certain
Grasshopper sparrow	*Ammodramus savannarum*	SSC2	Nearby		Possible
Tricolored blackbird	*Agelaius tricolor*	CT, BCC	Very close	Unlikely	Probable
Yellow-headed blackbird	*X. xanthocephalus*	SSC3	Very close		Probable
Bullock's oriole	*Icterus bullockii*	BCC	Very close		Probable
Lawrence's goldfinch	*Carduelis lawrencei*	BCC	nearby		Possible
Pallid bat	*Antrozous pallidus*	SSC, WBWG:H	In region	Unlikely	Possible
Townsend's big-eared bat	*Corynorhinus townsendii*	SSC, WBWG:H	In region	No potential	Possible
Western red bat	*Lasiurus blossevillii*	SSC, WBWG:H	In region		Possible
Fringed myotis	*Myotis thysanodes*	WBWG:H	In range		Possible
Yuma myotis	*Myotis yumanesis*	WBWG:H	In region		Possible
Long-legged myotis	*Myotis volans*	WBWG:M	In region		Possible
Miller's myotis	*Myotis evotis*	WBWG:M	In region	Unlikely	Possible
Western small-footed myotis	*Myotis cililabrum*	WBWG:M	In region		Possible
Hoary bat	*Lasiurus cinereus*	WBWG:M	In region	No potential	Possible
Salt-marsh wandering shrew	*Sorex vagrans halicoetes*	SSC	No records	Unlikely	Possible
Salt marsh harvest mouse	*Reithrodontomys raviventris*	FE, CE, CFP	In region	Unlikely	Possible

[1] Listed as BCC = U.S. Fish and Wildlife Service Bird Species of Conservation Concern, CE = California endangered, CT = California threatened, CFP = California Fully Protected (California Fish and Game Code 3511), BOP = California Fish and Game Code 3503.5 (Birds of prey), 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).

not on scientific sampling or access to all properties. The limitations of CNDDB are well-known, and summarized by California Department of Fish and Wildlife in a warning presented on its CNDDB web site (https://wildlife.ca.gov/Data/CNDDB/Maps-and-Data): "*We work very hard to keep the CNDDB and the Spotted Owl Database as current and up-to-date as possible given our capabilities and resources. However, we cannot and do not portray the CNDDB as an exhaustive and comprehensive inventory of all rare species and natural communities statewide. Field verification for the presence or absence of sensitive species will always be an important obligation of our customers…*" WRA's use of CNDDB records as a standard condition for determining species are unlikely to occur or have no potential to occur is inconsistent with CNDDB's purpose and therefore pseudoscientific.

Another flaw in WRA's analysis of occurrence likelihoods was its premise was that only impacts to breeding habitat qualify as significant impacts. For multiple species, such as for peregrine falcon and tricolored blackbird, WRA (2020) contrives a distinction between nesting habitat and non-nesting habitat. WRA then states that because nesting substrate needed by the species is unavailable at the project site, the species cannot breed there and thus project impacts would be less than significant. In reality, all of a species' habitat is of critical importance to the species regardless of where breeding sites are located. After all, no matter where a species breeds, members of the species cannot breed successfully without also surviving migration and the non-breeding season. Animals cannot breed successfully with insufficient forage or opportunities for stopover refugia during migration or opportunities for staging areas or for mate-selection and all the other functions the animal must perform to successfully breed. Species for which WRA determined occurrence likelihood based on whether it would breed on site were inaccurately and incompletely characterized as part of the wildlife community at the project site.

My determinations of species occurrence likelihoods are much more optimistic, and I believe more accurate, than those of WRA. Of the special-status species in Table 3, I conclude 13 certainly occur at the site, 40 probably occur, and 34 possibly occur. Of the 6 species WRA determined to have no chance of occurring, I conclude 3 are possible and 3 are probable. With additional site visits, I am confident that I could replace most of the many possible and probable occurrence likelihoods with certainty of occurrence of special-status species listed in Table 3. Existing conditions at the site have not been sufficiently nor accurately characterized – not by me and mostly certainly not by WRA nor the IS/MND. There is at least a fair argument to be made for the need to prepare an EIR to more accurately and thoroughly characterize the environmental setting in support of the impacts analysis that is needed for the project.

BIOLOGICAL IMPACTS ANALYSIS

The IS/MND provides no serious analysis of potential impacts to biological resources caused by habitat loss, window collision mortality, nor automobile collision mortality. A serious analysis of these impacts would begin with predictions of the magnitudes of the impacts. The IS/MND provides no such predictions, but I do so in the following comments.

HABITAT LOSS

Habitat loss not only results in the immediate numerical decline of wildlife, but also in permanent loss of productive capacity (Smallwood 2015). For example, two study sites in grassland/wetland/woodland complexes had total bird nesting densities of 32.8 and 35.8 nests per acre (Young 1948, Yahner 1982) for an average 34.3 nests per acre. Applying this density to the project site, 34.3 nests/acre multiplied against 6.23 acres would predict a loss of 214 bird nests. The average number of fledglings per nest in Young's (1948) study was 2.9. Assuming Young's (1948) study site typifies bird productivity, then the project would prevent the production of 621 fledglings per year. After 100 years and assuming an average generation time of 5 years, the lost capacity of both breeders and annual fledgling production can be estimated from the following formula: {(nests/year × chicks/nest × number of years) + ((2 adults/nest × nests/year) × (number of years ÷ years/generation))}. In the case of this project, this formula predicts **the project would deny California 70,660 birds over the next century due solely to loss of terrestrial habitat**. This predicted loss would be substantial, and would qualify as significant impacts that have yet to be addressed by the IS/MND. A fair argument can be made for the need to prepare an EIR to appropriately analyze potential project impacts to wildlife.

Additional habitat loss can be expected from artificial light pollution that would emanate from the project. The IS/MND dismisses this impact by claiming that lighting from the project would not exceed the ambient light of neighboring projects. This is an interesting claim because light pollution from neighboring projects appeared substantial to me when I arrived to the project site early on the morning of 30 October 2021. The project site was lit by floodlamps directed right at it from the TopGolf facility (see Photos 15 and 16). The TopGolf lights were so bright that the poles supporting the 170-foot-tall net were brightly lit right next to the project site (Photo 16). The light reaching the marsh on the project site likely degraded the habitat there for multiple species of wildlife. The added lights of the hotel would add to this degradation.

In its report of potential impacts of the TopGolf facility, Harvey & Associates (2016:32) wrote, "The photometric plan shows that no light will travel beyond the property line (shown as 0.0). Thus, impacts from increased lighting would be less than significant." What I saw of the light management at the project site was just as contrary to Harvey & Associates' assurance as was the IS/MND's depiction of the moon north rather than south of the TopGolf facility (Photo 15).

Despite the false claim that half the site is developed (WRA 2020), which it clearly is not, the proposed project would take habitat and it would further degrade what little habitat would remain next to Guadalupe River. It would reduce the productive capacity of birds and other wildlife, many species of which are special-status species. There is at least a fair argument to be made for the need to prepare an EIR to more carefully and appropriately analyze potential impacts to wildlife that would be caused by habitat loss, habitat fragmentation, and habitat degradation.

Photos 15 and 16. *Depiction of the TopGolf site's illumination at night, according to the IS/MND prepared for the TopGolf project (top), and the actual type of illumination visible on the morning of 30 October 2021 (bottom). The lights on the building were sufficiently powerful to illuminate the poles supporting the net at the southern end of the project, and when I first arrived, the site of the proposed project was also lit by the TopGolf project. The lights appeared much brighter than could be shown in a photo. Note also that the moon would never occur where the IS/MND depicted it, which was north of the project.*

WILDLIFE MOVEMENT

The IS/MND does not really analyze the project's potential impacts to wildlife movement in the region. Instead, it addresses bird-window collision mortality. On page 63, it explains "The project site is in the vicinity of known avian breeding and migratory habitat. Building features, most often those associated with lighting or glass components (i.e., glazing), can attract birds from these nearby habitats and cause mortality in the form of collisions resulting from confusion." Following this strange shifting of issues from wildlife movement to bird-window collisions, the IS/MND discusses building design standards and how they relate to bird-window collision mortality.

In the above quoted statement, the IS/MND acknowledges that the project site is in the vicinity of migratory birds. It is on a major corridor on a major migratory route known as the Pacific Flyway. The project site is located right where the western and eastern shores of the San Francisco Bay funnel shore-hugging migratory birds toward their passage through the Santa Clara Valley. City of San Jose (2014) estimate that more than a million birds pass through greater San Jose each year. The project is proposed right where many of these birds likely pass during migration, and these are birds protected by the Migratory Bird Treaty Act, the recently amended California Fish and Game Code 3513 intended to further protect migratory birds, and additional statues that protect many of these species (see Table 3). A fair argument can be made for the need to prepare an EIR to appropriately analyze potential project impacts to wildlife movement in the region.

ROAD MORTALITY

As will be described below, a basis for predicting wildlife mortality can be found in the prediction of annual vehicle miles traveled (VMT). According to the IS/MND (page 82), the project would generate an annual VMT of 599,330. The traffic analysis, however, predicts the project would generate 1,642 daily trips (pages 165-167). One of these predictions must be in error, because 1,642 daily trips × 365 days in the year = 599,330, which would mean the average miles per trip would be 1. Either the traffic analysis is wrong or the fuel use analysis is wrong, but it is not my role to comment on these issues. For my issue, I will assume 15 miles per trip and 25 miles per trip as the bounds of a range representing the average number of miles per trip.

These vehicle trips – however far they would actually average -- would kill wildlife (Photos 17 through 19). A fundamental shortfall of the IS/MND is its failure to analyze the impacts of the project's added road traffic on special-status species of wildlife, including species such as western pond turtle (*Actinemys pallida*), American badger (*Taxidea taxus*), California red-legged frog (*Rana draytonii*) and California tiger salamander (*Ambystoma californiense*) among many others. Many animals that would be killed by the traffic generated from this project would be located far from the project's construction footprint; they would be crossing roads traversed from cars and trucks originating from or headed toward the project site. The project's impacts on wildlife would reach as far from the project as cars and trucks travel to or from the project site. Despite the obvious risk to wildlife, and despite the multiple papers and

books written about this type of impact and how to mitigate them, the IS/MND does not address impacts to wildlife caused by vehicles traveling to and from the project site.

Photo 17. *A Gambel's quail dashes across a road* on *3 April 2021. Such road crossings are usually successful, but too often prove fatal to the animal. Photo by Noriko Smallwood.*

Photo 18. *A mourning dove killed by vehicle traffic on a California road. Photo by Noriko Smallwood, 21 June 2020.*

Photo 19. *Raccoon killed on Road 31 just east of Highway 505 in Solano County. Photo taken on 10 November 2018.*

Vehicle collisions have accounted for the deaths of many thousands of amphibian, reptile, mammal, bird, and arthropod fauna, and the impacts have often been found to be significant at the population level (Forman et al. 2003). Across North America, traffic impacts have taken devastating tolls on wildlife (Forman et al. 2003). In Canada, 3,562 birds were estimated killed per 100 km of road per year (Bishop and Brogan 2013), and the US estimate of avian mortality on roads is 2,200 to 8,405 deaths per 100 km per year, or 89 million to 340 million total per year (Loss et al. 2014). Local impacts can be more intense than nationally.

The nearest study of traffic-caused wildlife mortality was performed only 33 miles from the project site, along a 2.5 mile stretch of Vasco Road in Contra Costa County, California. Fatality searches in this study found 1,275 carcasses of 49 species of mammals, birds, amphibians and reptiles over 15 months of searches (Mendelsohn et al. 2009). This fatality number needs to be adjusted for the proportion of fatalities that were not found due to scavenger removal and searcher error. This adjustment is typically made by placing carcasses for searchers to find (or not find) during their routine periodic fatality searches. This step was not taken at Vasco Road (Mendelsohn et al. 2009), but it was taken as part of another study right next to Vasco Road (Brown et al. 2016). The Brown et al. (2016) adjustment factors were similar to those for carcass persistence of road fatalities (Santos et al. 2011). Applying searcher detection rates estimated from carcass detection trials performed at a wind energy project immediately adjacent to this same stretch of road (Brown et al. 2016), the adjusted total number of fatalities was estimated at 12,187 animals killed by traffic on the road. This fatality number translates to a rate of 3,900 wild animals per mile per year killed along 2.5 miles of road in 1.25 years. In terms comparable to the national estimates, the estimates from the Mendelsohn et al. (2009) study would translate to 243,740 animals killed per 100 km of road per year, or 29 times that of Loss et al.'s (2014) upper bound estimate and 68 times the Canadian estimate. An analysis is needed of whether increased traffic on roads within the City of San Jose and the South Bay Area would similarly result in intense local impacts on wildlife.

Predicting project-generated traffic impacts to wildlife

The IS/MND predicts that the project would generate 1,642 trips per day. Assuming 15 to 25 miles per trip, annual VMT would be 8,989,950 to 14,983,250. This would be a lot of mileage to be driven at great peril to wildlife that must cross roads to go about their business of foraging, patrolling home ranges, dispersing and migrating. But it can also serve as a basis for predicting impacts to wildlife.

For wildlife vulnerable to front-end collisions and crushing under tires, road mortality can be predicted from the study of Mendelsohn et al. (2009) as a basis, although despite the nearness of the Mendelsohn et al. (2009) study to the project site, it would be helpful to have the availability of more studies like that of Mendelsohn et al. (2009) at additional locations. My analysis of the Mendelsohn et al. (2009) data resulted in an estimated 3,900 animals killed per mile along a county road in Contra Costa County. Two percent of the estimated number of fatalities were birds, and the balance was composed of 34% mammals (many mice and pocket mice, but also ground squirrels,

desert cottontails, striped skunks, American badgers, raccoons, and others), 52.3% amphibians (large numbers of California tiger salamanders and California red-legged frogs, but also Sierran treefrogs, western toads, arboreal salamanders, slender salamanders and others), and 11.7% reptiles (many western fence lizards, but also skinks, alligator lizards, and snakes of various species).

During the Mendelsohn et al. (2009) study, 19,500 cars traveled Vasco Road daily, so the vehicle miles that contributed to my estimate of non-volant fatalities was 19,500 cars and trucks × 2.5 miles × 365 days/year × 1.25 years = 22,242,187.5 vehicle miles per 12,187 wildlife fatalities, or 1,825 vehicle miles per fatality. This rate divided into the low and high ends of the annual VMT predicted above, I predict the project would cause 4,926 to 8,210 wildlife fatalities per year. **Operations over 50 years would accumulate 246,300 to 410,500 wildlife fatalities**. It remains unknown whether and to what degree vehicle tires contribute to carcass removals from the roadway, thereby contributing a negative bias to the fatality estimates I made from the Mendelsohn et al. (2009) fatality counts.

Based on my assumptions and simple calculations, the project-generated traffic would cause substantial, significant impacts to wildlife. There is at least a fair argument that can be made for the need to prepare an EIR to analyze this impact. Mitigation measures to improve wildlife safety along roads are available and are feasible, and they need exploration for their suitability with the proposed project.

BIRD-WINDOW COLLISION MORTALITY

Inserting multi-storied buildings onto the project site would intercept some portion of the birds flying through the project's airspace, and would otherwise interfere with movement of volant wildlife. It is also important to note that the hotel and garage buildings would be built next to an existing 170-foot tall net that surrounds the TopGolf facility. The combination of the TopGolf net and the project's buildings would pose a formidable barrier to wildlife trying to migrate along the Guadalupe River corridor and the greater Pacific Flyway. It would also pose formidable cumulative effects of collision mortality because TopGolf's net and its supporting guy cables remain unmarked and therefore difficult for birds to see and avoid.

According to the CEQA review prepared for the TopGolf facility, the net surrounding the facility was supposed to be visible to birds. Harvey & Associates (2016:43) assured, "Net marking devices, such as FireFlys (http://www.slatercom.com/datasheets/PR-Firefly.pdf) or BirdMark BM-AG (After Glow) (http://www.slatercom.com/datasheets/PR-BirdMark.pdf) that glow in the dark will be placed along all sections of the netting perimeter rope and rib lines, to form vertical rows of flight diverters in the center of each area of netting between support poles. The maximum distance between such marking devices, and/or between such marking devices and support poles, will be 15 ft." According to the IS/MND (p. 100) prepared for the TopGolf project, "Net marking devices, such as FireFlys or BirdMark BM-AG, shall be placed along all sections of the netting perimeter rope and rib lines to form vertical rows of flight diverters in the center of each area of netting between support poles. The maximum distance between such

marking devices, and/or between such marking devices and support poles, shall be 15 feet. [Less Than Significant Impact With Mitigation]" The markers identified for use in the TopGolf IS/MND are shown in Figure 3. I did not see any of these markers on TopGolf's net, nor do any of them appear in Photo 16.

TopGolf's net, which poses a serious collision risk to migratory and resident birds, is likely even more dangerous without the promised marking devices. If the hotel project is constructed as proposed, then windows of the hotel would be only 23 m from TopGolf's net. There could be a visual interaction effect between the net and the hotel's windows that increases collision risk. There would likely be a severe funneling bird traffic between TopGolf's net and the hotel.

Figure 3. *Line markers identified in the TopGolf IS/MND for deployment on the net surrounding the project site, but which in fact did not occur during my site visit on 30 October 2021. The unmarked net and all of its supporting guy cables were unmarked and difficult to see against a sky background. Against the backdrop of a glass-facaded building, these nets and guy cables might prove even more difficult for birds to see.*

Photo 4.4-3: Examples of net marking devices

One of the most prominent features of the proposed hotel building is its liberal use of structural glass on its facades. Renderings of the building depict facades composed of extensive transparent and reflective glass. The project as depicted would introduce substantial collision hazards to an aerosphere that currently provides critically important habitat to birds, and which would act as lethal traps to flying birds. The IS/MND claims that non-reflective glass would be used, but the renderings of the project in the same document depict reflective glass on the hotel.

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 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.

However, these estimates were likely biased too low, because they were based on opportunistic sampling, volunteer study participation, fatality monitoring by more inexperienced than experienced searchers, and usually no adjustments made for scavenger removals of carcasses before searchers could detect them (Bracey et al. 2016).

Hundreds of thousands of birds migrate along the Pacific Flyway. My observations during my visit to the site confirmed that birds fly through the airspace of the project, even during the nonmigratory season. At least 75 special-status species of bird are known to the project area (Table 3). According to the scientific literature, most of the special-status species in Table 3 have been documented as window collision fatalities and are therefore susceptible to new structural glass installations (Supplemental Material to Basilio et al. 2020; Smallwood unpublished review). Many more species of migratory birds, newly protected by California's revised Fish and Game Code section 3513, have also been documented as window collision victims (Basilio et al. 2020).

I am concerned about the extent and context of glass proposed for the project. Recent advances in structural glass engineering have contributed to a proliferation of glass windows on building façades. This proliferation is readily observable in newer buildings and in recent project planning documents, and it is represented by a worldwide 20% increase in glass manufacturing for building construction since 2016. Glass markets in the USA experienced 5% growth in both 2011 and 2016, and was forecast to grow 2.3% per year since 2016 (TMCapital 2019). Increasing window to wall ratios and glass façades have become popular for multiple reasons, including a growing demand for 'daylighting.' Consistent with the trends just outlined, and as highlighted in the IS/MND's renderings of the project, glass windows comprise a major feature of the proposed project.

The proposed hotel could be designed to be safter to birds. The depictions of the building's façades are inconsistent with standards identified in Bird-Safe Guidelines I have reviewed. The depictions of the project show that large windows would reflect outdoor vegetation, and large transparent windows would give birds the false sense of open space. WRA (2020) provides a brief analysis of bird-window collision impacts, but touches on only a few of the known causal factors. As I will show in the next section, many birds can be expected to be killed by the many large windows of the proposed project. A fair argument can be made for the need to prepare an EIR to adequately address this potential impact.

Project Impact Prediction

Predicting the impacts caused by loss of aerial habitat and the energetic costs of birds having to navigate around the buildings is possible, but I am unprepared to make such predictions. However, I am prepared to predict bird-window collision mortality. 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 m^2 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 m^2 of glass per year (95% CI: 0.042-0.102). Based on schematics of the project in the IS/MND, I estimated the proposed medical office building would include at least 2,661 m^2 of glass panels, which applied to the mean fatality rate would predict at least **195 bird deaths per year (95% CI: 115-274)** at the building. The 100-year toll from this average annual fatality rate would be at least **19,452 bird deaths (95% CI: 11,549-27,355)**. These estimates would be perhaps 3 times higher after accounting for the proportions of fatalities removed by scavengers or missed by fatality searchers where studies have been performed. Collision fatalities would continue until the buildings are either renovated to reduce bird collisions or they come down. If the project moves forward as proposed, and annually kills 195 birds protected by state and federal laws, then the project would cause significant unmitigated impacts.

Bird-Window Collision Factors

Below is a list of collision factors I found in the scientific literature, and which I suggest ought to be used to improve San Jose's Bird-Safe Guidelines. Following this list are specific notes and findings taken from the literature and my own experience.

(1) Inherent hazard of a structure in the airspace used for nocturnal migration or other flights
(2) Window transparency, falsely revealing passage through structure or to indoor plants
(3) Window reflectance, falsely depicting vegetation, competitors, or open airspace
(4) Black hole or passage effect
(5) Window or façade extent, or proportion of façade consisting of window or other reflective surface
(6) Size of window
(7) Type of glass
(8) Lighting, which is correlated with window extent and building operations
(9) Height of structure (collision mechanisms shift with height above ground)
(10) Orientation of façade with respect to winds and solar exposure
(11) Structural layout causing confusion and entrapment
(12) Context in terms of urban-rural gradient, or surrounding extent of impervious surface vs vegetation
(13) Height, structure, and extent of vegetation grown near home or building
(14) Presence of birdfeeders or other attractants
(15) Relative abundance
(16) Season of the year
(17) Ecology, demography and behavior
(18) Predatory attacks or cues provoking fear of attack
(19) Aggressive social interactions

(1) Inherent hazard of structure in airspace.—Not all of a structure's collision risk can be attributed to windows. Overing (1938) reported 576 birds collided with the Washington

Monument in 90 minutes on one night, 12 September 1937. The average annual fatality count had been 328 birds from 1932 through 1936. Gelb and Delacretaz (2009) and Klem et al. (2009) also reported finding collision victims at buildings lacking windows, although many fewer than they found at buildings fitted with widows. The takeaway is that any building going up at the project site would likely kill birds, although mortality would increase with larger expanses of glass.

(2) Window transparency.—Widely believed as one of the two principal factors contributing to avian collisions with buildings is the transparency of glass used in windows on the buildings (Klem 1989). Gelb and Delacretaz (2009) felt that many of the collisions they detected occurred where transparent windows revealed interior vegetation.

(3) Window reflectance.—Widely believed as one of the two principal factors contributing to avian collisions with buildings is the reflectance of glass used in windows on the buildings (Klem 1989). Reflectance can deceptively depict open airspace, vegetation as habitat destination, or competitive rivals as self-images (Klem 1989). Gelb and Delacretaz (2009) felt that many of the collisions they detected occurred toward the lower parts of buildings where large glass exteriors reflected outdoor vegetation. Klem et al. (2009) and Borden et al. (2010) also found that reflected outdoor vegetation associated positively with collisions.

(4) Black hole or passage effect.—Although this factor was not often mentioned in the bird-window collision literature, it was suggested in Sheppard and Phillips (2015). The black hole or passage effect is the deceptive appearance of a cavity or darkened ledge that certain species of bird typically approach with speed when seeking roosting sites. The deception is achieved when shadows from awnings or the interior light conditions give the appearance of cavities or protected ledges. This factor appears potentially to be nuanced variations on transparency or reflectance or possibly an interaction effect of both of these factors.

(5) Window or façade extent.—Klem et al. (2009), Borden et al. (2010), Hager et al. (2013), Ocampo-Peñuela et al. (2016), Loss et al. (2019), Rebolo-Ifrán et al. (2019), and Riding et al. (2020) reported increased collision fatalities at buildings with larger reflective façades or higher proportions of façades composed of windows. However, Porter and Huang (2015) found a negative relationship between fatalities found and proportion of façade that was glazed.

(6) Size of window.—According to Kahle et al. (2016), collision rates were higher on large-pane windows compared to small-pane windows.

(7) Type of glass.—Klem et al. (2009) found that collision fatalities associated with the type of glass used on buildings. Otherwise, little attention has been directed towards the types of glass in buildings.

(8) Lighting.—Parkins et al. (2015) found that light emission from buildings correlated positively with percent glass on the façade, suggesting that lighting is linked to the

extent of windows. Zink and Eckles (2010) reported fatality reductions, including an 80% reduction at a Chicago high-rise, upon the initiation of the Lights-out Program. However, Zink and Eckles (2010) provided no information on their search effort, such as the number of searches or search interval or search area around each building.

(9) Height of structure.—Except for Riding et al. (2020), I found little if any hypothesis-testing related to building height, including whether another suite of factors might relate to collision victims of high-rises. Are migrants more commonly the victims of high-rises or of smaller buildings? Some of the most notorious buildings are low-rise buildings.

(10) Orientation of façade.—Some studies tested façade orientation, but not convincingly. Some evidence that orientation affects collision rates was provided by Winton et al. (2018). Confounding factors such as the extent and types of windows would require large sample sizes of collision victims to parse out the variation so that some portion of it could be attributed to orientation of façade. Whether certain orientations cause disproportionately stronger or more realistic-appearing reflections ought to be testable through measurement, but counting dead birds under façades of different orientations would help.

(11) Structural layout.—Bird-safe building guidelines have illustrated examples of structural layouts associated with high rates of bird-window collisions, but little attention has been directed towards hazardous structural layouts in the scientific literature. An exception was Johnson and Hudson (1976), who found high collision rates at 3 stories of glassed-in walkways atop an open breezeway, located on a break in slope with trees on one side of the structure and open sky on the other, Washington State University.

(12) Context in urban-rural gradient.—Numbers of fatalities found in monitoring have associated negatively with increasing developed area surrounding the building (Hager et al. 2013), and positively with more rural settings (Kummer et al. 2016).

(13) Height, structure and extent of vegetation near building.—Correlations have sometimes been found between collision rates and the presence or extent of vegetation near windows (Hager et al. 2008, Borden et al. 2010, Kummer et al. 2016, Ocampo-Peñuela et al. 2016). However, Porter and Huang (2015) found a negative relationship between fatalities found and vegetation cover near the building. In my experience, what probably matters most is the distance from the building that vegetation occurs. If the vegetation that is used by birds is very close to a glass façade, then birds coming from that glass will be less likely to attain sufficient speed upon arrival at the façade to result in a fatal injury. Too far away and there is probably no relationship. But 30 to 50 m away, and birds alighting from vegetation can attain lethal speeds by the time they arrive at the windows.

(14) Presence of birdfeeders.—Dunn (1993) reported a weak correlation ($r = 0.13$, $P < 0.001$) between number of birds killed by home windows and the number of birds counted at feeders. However, Kummer and Bayne (2015) found that experimental installment of birdfeeders at homes increased bird collisions with windows 1.84-fold.

(15) Relative abundance.—Collision rates have often been assumed to increase with local density or relative abundance (Klem 1989), and positive correlations have been measured (Dunn 1993, Hager et al. 2008). However, Hager and Craig (2014) found a negative correlation between fatality rates and relative abundance near buildings.

(16) Season of the year.—Borden et al. (2010) found 90% of collision fatalities during spring and fall migration periods. The significance of this finding is magnified by 7-day carcass persistence rates of 0.45 and 0.35 in spring and fall, rates which were considerably lower than during winter and summer (Hager et al. 2012). In other words, the concentration of fatalities during migration seasons would increase after applying seasonally-explicit adjustments for carcass persistence. Fatalities caused by collisions into the glass façades of the project's building would likely be concentrated in fall and spring migration periods.

(17) Ecology, demography and behavior.—Klem (1989) noted that certain types of birds were not found as common window-caused fatalities, including soaring hawks and waterbirds. Cusa et al. (2015) found that species colliding with buildings surrounded by higher levels of urban greenery were foliage gleaners, and species colliding with buildings surrounded by higher levels of urbanization were ground foragers. Sabo et al. (2016) found no difference in age class, but did find that migrants are more susceptible to collision than resident birds.

(18) Predatory attacks.—Panic flights caused by raptors were mentioned in 16% of window strike reports in Dunn's (1993) study. I have witnessed Cooper's hawks chasing birds into windows, including house finches next door to my home and a northern mocking bird chased directly into my office window. Predatory birds likely to collide with the project's windows would include Peregrine falcon, red-shouldered hawk, Cooper's hawk, and sharp-shinned hawk.

(19) Aggressive social interactions.—I found no hypothesis-testing of the roles of aggressive social interactions in the literature other than the occasional anecdotal account of birds attacking their self-images reflected from windows. However, I have witnessed birds chasing each other and sometimes these chases resulting in one of the birds hitting a window.

For most of the known or suspected collision risk factors, the proposed project's design would either contribute amply to collision risk, or its contribution remains unknown due to insufficient reporting of existing environmental conditions and project design (Table 4). Focused study of birds in the area could reduce the uncertainty of potential project impacts. Such studies could make use of radar (Gauthreaux et al. 2008) or visual scan surveys (Smallwood 2017). Key information useful for impacts assessment and mitigation would include intensity and timing of bird traffic, heights above ground, travel trajectories, and specific behaviors of birds in flight.

Table 4. *Window collision risk factors, their weightings based on the scientific literature, and the level of risk introduced by the proposed project.*

Collision risk to volant wildlife		
Factor	**Weighting**	**Added by project**
Inherent hazard of structure	Universal	Amply
Window transparency	Very high	Amply
Window reflectance	Very high	Amply
Black hole or passage effect	High	Possible with reflection of TopGolf net
Window or façade extent	Very high	Amply
Size of window	High	Amply
Type of glass	High	Likely but unknown
Lighting	High	Amply
Height of structure	High	Amply
Orientation of façade	Unknown	Amply
Structural layout	High	Amply with funnel effect
Context in urban-rural gradient	Likely high	Amply
Height, structure and extent of vegetation near building	High	Amply
Presence of birdfeeders	Moderate	Unknown
Relative abundance	Uncertain	Amply
Season of the year	Nonspatial	Not applicable
Ecology, demography and behavior	Uncertain	Amply
Predatory attacks	Uncertain	Unknown
Aggressive social interactions	Uncertain	Unknown

Window Collision Solutions

Given the magnitude of bird-window collision impacts, there are obviously great opportunities for reducing and minimizing these impacts going forward. Existing structures can be modified or retrofitted to reduce impacts, and proposed new structures can be more carefully sited, designed, and managed to minimize impacts. However, the costs of some of these measures can be high and can vary greatly, but most importantly the efficacies of many of these measures remain uncertain. Both the costs and effectiveness of all of these measures can be better understood through experimentation and careful scientific investigation. **Post-construction fatality monitoring should be an essential feature of any new building project**. Below is a listing of mitigation options, along with some notes and findings from the literature.

Any new project should be informed by preconstruction surveys of daytime and nocturnal flight activity. Such surveys can reveal the one or more façades facing the prevailing approach direction of birds, and these revelations can help prioritize where certain types of mitigation can be targeted. It is critical to formulate effective measures

prior to construction, because post-construction options will be limited, likely more expensive, and probably less effective.

(1) Retrofitting to reduce impacts
(1A) Marking windows
(1B) Managing outdoor landscape vegetation
(1C) Managing indoor landscape vegetation
(1D) Managing nocturnal lighting

(1A) 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).

Following up on the results of Johnson and Hudson (1976), I decided to mark windows of my home, where I have documented 5 bird collision fatalities between the time I moved in and 6 years later. I marked my windows with decals delivered to me via US Postal Service from a commercial vendor. I have documented no fatalities at my windows during the 10 years hence. In my assessment, markers can be effective in some situations.

(2) Siting and Designing to minimize impacts
(2A) Deciding on location of structure
(2B) Deciding on façade and orientation
(2C) Selecting type and sizes of windows
(2D) Designing to minimize transparency through two parallel façades
(2E) Designing to minimize views of interior plants
(2F) Landscaping to increase distances between windows and trees and shrubs

(3) Monitoring for adaptive management to reduce impacts
(3A) Systematic monitoring for fatalities to identify seasonal and spatial patterns
(3B) Adjust light management, window marking and other measures as needed.

WRA Analysis of Bird-Window Collision Risk

WRA is to be commended for addressing this issue. Its analysis, however, could be vastly improved with use of more literature on the topic. It relied on building design

guidelines, which is helpful, but it made no use of the literature including research studies. It also addressed only a few risk factors, and merely summarizes the City of San Jose (2014) Downtown Design Guidelines. This summary of guidelines seems empty considering lack of project adherence to the guidelines, as detailed below.

According to the Guidelines, "Bird safety treatments may include: exterior screens, louvers, grilles, shutters, sunshades, bird-safe patterns, or other methods to reduce the likelihood of bird collisions." I did not see any of these features depicted in renderings of the project in the IS/MND.

According to the Guidelines, "Exterior decorative lighting on these buildings should additionally be turned off between 2:00 AM and 6:00 AM, except during June, July, December, and January where birds may be migrating and constraints may be increased. This may involve turning non-emergency lighting off or shielding it at night (after sunset) to minimize light from buildings that is visible to birds." I saw no measure to this effect in the IS/MND.

The WRA analysis is flawed in several other ways. For example, it notes that "The amount of glazing proposed is relatively low overall in comparison to some similarly-scaled developments in the region." I do not agree with this assessment, but it is irrelevant. Potential impacts of a project should be analyzed specific to the project and not weighed against what other developers got away with.

WRA argues, "The percent of glazing on the exterior elevations is less than 50 percent overall and approximately the same on all faces. The remainder of the buildings' exteriors consist of opaque materials (e.g. cement and metal siding)." This argument neglects collision mortality known to occur at buildings without windows (e.g., Overing 1938). Nor can WRA link a specific percentage of glazed facade to levels of collision mortality.

WRA assures that "All residential units within the development will have interior blinds or curtains installed on windows." But residents would not have to close their blinds. The guidelines call for external features to the windows, not internal features such as blinds or curtains.

WRA points out that "Overhangs, spatially offset adjacent faces, and similar forms of architectural relief along the exterior of the building will "break up" the exterior of the building visually (providing "visual noise"), and increase the likelihood that flying birds will perceive the building as a solid surface. Shadows formed by these overhangs and relief will contribute to this perception." Actually, such overhangs and their shadows would create the black hole or passage effects I summarized earlier. They would likely increase rather than reduce risk.

WRA speculates that "Similar to the architectural relief elements described above, the buildings will feature different colors and textures across adjacent faces and sections, creating additional "visual noise"." WRA cites no evidence to support this notion that different colors on a facade would reduce collision mortality.

WRA points out that "While the original design included hotel room balconies with associated guardrails, the new design eliminates balconies on higher levels of the hotel." What the previous plans included is irrelevant to the analysis of impacts posed by the current project.

WRA speculates that "The parking garage designs … Green walls installed along the ground level … may attract some birds (e.g., for foraging opportunities)." WRA offers no evidence to support the notion that birds would be attracted to green walls to forage. Frankly, this notion is silly.

WRA speculates that "Though the Project Area is in relatively close proximity to wetlands associated with the Don Edwards National Wildlife Refuge Complex, it is surrounded on all other sides by urban (residential or light industrial) development. As such, it is unlikely to provide a collision risk to flocks of waterbirds (e.g., waterfowl, shorebirds) that congregate on San Francisco Bay and shoreline habitats during the winter period and spring-fall migration." In fact, the project site is not surrounded on all sides by urban development. One side is composed of the Guadalupe River. While I visited the site, I observed many birds flying across the project site.

WRA concludes "…the designs for the Project suggest a low overall risk for bird collisions…" I disagree. The shape of the building would funnel bird traffic along the north side of the building and into those portions of the north aspect that curve to the north. The TopGolf net would force birds to fly through a very narrow passage between the net and the hotel, thereby increasing collision risk. The ground floor would include extensive glass panes at just about the right distance from proposed landscaping to enable birds to reach lethal speeds before they hit those windows.

WRA offers recommendations for treating windows to make them safer to birds, but I am concerned that the TopGolf project was offered similar recommendations by Harvey & Associates (2016) to improve the safety of its net, which had not been followed by the time of this writing.

Overall, WRA's analysis of potential impacts caused by bird-window collisions was insufficiently informed, speculative in favor of minimalizing impacts, inconsistent in its logical flow from premise to conclusion, and too often irrelevant. Despite the arguments made by both WRA and the City (via the IS/MND), the location of the project within a known wildlife movement corridor, the large extent of its windows, the IS/MND's renderings of the windows as reflective on the upper floors and transparent on the bottom floor, the shape of the building that would funnel flying birds towards windows, and its location close to a 170-foot-tall net all point toward a high bird-window collision rate and a significant impact. A fair argument can be made for the need to prepare an EIR to more thoroughly and appropriately analyze potential impacts from bird-window collision injuries and mortality.

CUMULATIVE IMPACTS

The IS/MND argues that because impacts of the proposed project would be individually mitigated, and because "all projects are required to implement best management practices and comply with all federal, state, regional and local regulations," no significant cumulative impacts would result. With this argument, the IS/MND implies that cumulative impacts are really just residual impacts of incomplete mitigation of project-level impacts. If that was CEQA's standard, then cumulative effects analysis would be merely an analysis of mitigation efficacy. And if that was the standard, then I must point out that none of the project-level impacts would be offset to any degree by the proposed mitigation measures. The project's mitigation includes no avoidance measures and no compensatory measures. But anyway, the IS/MND's implied standard is not the standard of analysis of cumulative effects. CEQA defines cumulative impacts, and it outlines two general approaches for performing the analysis. Given that North American has lost nearly a third of its birds over the past half century (Rosenberg et al. 2019), an appropriate cumulative effects analysis is warranted. An EIR needs to be prepared, and it needs to include an appropriate, serious analysis of cumulative impacts. It needs to address cumulative impacts from habitat loss and habitat fragmentation, from bird-window collision mortality and from road mortality.

MITIGATION

MM BIO-1.2 Preconstruction Surveys for Nesting Birds

Preconstruction surveys should be performed, but not as a substitute for detection surveys. Preconstruction surveys are only intended as last-minute, one-time salvage and rescue operations targeting readily detectable nests or individuals before they are crushed under heavy construction machinery. Because most special-status species are rare and cryptic, and because most species are expert at hiding their nests lest they get predated, most of them will not be detected by preconstruction surveys. As a case in point, the reconnaissance-level surveys performed by WRA detected fewer than a third of the species I detected during one morning at the project site, and they detected none of the special-status species. A much more serious survey effort is needed in advance of the preconstruction surveys.

Detection surveys are also needed to inform preconstruction take-avoidance surveys by mapping out where biologists performing preconstruction surveys are most likely to find animals before the tractor blade finds them. Detection surveys were designed by species experts, often undergoing considerable deliberation and review before adoption. Detection surveys often require repeated efforts using methods known to maximize likelihoods of detection. Detection surveys are needed to assess impacts and to inform the formulation of appropriate mitigation measures, because preconstruction surveys are not intended for these roles either. What is missing from the IS/MND, and what is in greater need than preconstruction surveys, are detection surveys consistent with guidelines and protocols that wildlife ecologists have uniquely developed for use with

each special-status species. What is also missing is compensatory mitigation of unavoidable impacts.

Following detection surveys, preconstruction surveys should be performed. However, an EIR should be prepared, and it should detail how the results of preconstruction surveys would be reported. Without reporting the results, preconstruction surveys are vulnerable to serving as an empty gesture rather than a mitigation measure. For these reasons, this mitigation measure is insufficient to reduce the project's impacts to special-status species to less than significant.

MM BIO-1.3 Burrowing owl

The IS/MND claims "Although ground squirrels are not active on the site…" This is not what I saw at the site. Ground squirrels are present, and burrowing owls are known to occur in the area (see WRA 2020). Detection surveys for burrowing owl need to be performed to be consistent with CDFW (2012) guidelines. Performing a preconstruction survey without first having performed detection surveys would be inconsistent with CDFW's guidelines.

MM BIO-4.1 Bird-Window Collisions

The IS/MND promises to treat windows only on the south-facing aspect of the building and no more than 10% of the window area on the remaining facades. This measure is deficient because most of bird-window collision threat would occur on the north aspect of the building. The north aspect is where the greatest extent of windows would occur, and it is where the building would curve around northward to funnel bird traffic into windows, and it is where the TopGolf net would channel birds through a narrow gap between the unmarked net and the hotel's windows.

The IS/MND concludes that "With incorporation of MM BIO-4.1, the project would not interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors…" But this measure does not mitigate impacts to wildlife movement. The building would still impede movement of migratory and resident wildlife, regardless of its windows and how they might be treated. The IS/MND conflates the issue of bird-window collisions with bird movement in the region.

MM BIO-6 Habitat Conservation Plan

The IS/MND concludes, "MM BIO-1.1 through 4.1 would ensure the project complies with Condition 1 of the Habitat Plan" [Santa Clara Valley Habitat Conservation Plan]. Condition 1 of the Habitat Plan is to avoid direct impacts on Legally Protected Plant and Wildlife Species. Consisting of preconstruction surveys and a few window treatments to slightly minimize impacts, MM BIO 1.1 through 4.1 clearly would not avoid direct impacts to special-status species. Avoidance means planning a project to avoid impacts by not causing the impacts in the first place; see the definition provided by CEQA

Guidelines. The IS/MND inaccurately characterizes avoidance, and therefore its conclusion of compliance with Condition 1 of the Habitat Plan is in error.

The IS/MND concludes, "The project would pay all applicable fees and implement mitigation measure MM BIO-1.2 to ensure compliance with Condition 15 of the Habitat Plan." In the case of burrowing owls, paying the fee to the Habitat Plan would not conserve the species. Burrowing owls are nearly extirpated from the Bay Area despite the Habitat Plan. I am aware of this because in 2017 I was one of four experts invited to advise the Santa Clara Valley Habitat Agency to avoid what all signs indicated to be an pending extirpation of burrowing owls from the south Bay Area. Only a few dozen breeding pairs remained. The principal pressure on the remaining owls was habitat loss due to ongoing and planned projects. The Habitat Plan had been unable to halt or to even slow the decline of burrowing owls while development and its takings of habitat raced onward. Simply paying a fee to the Habitat Plan would not mitigate the project's impacts to burrowing owl.

The IS/MND addresses Condition 17 of the Habitat Plan, which covers tricolored blackbirds. As noted earlier in my comments, the IS/MND inappropriately determines tricolored blackbirds to be absent from the site. The survey performed by WRA at the site was insufficient for supporting this determination, and it was performed at the wrong time of year for determining the presence of a breeding colony. Even if tricolored blackbirds were absent during the breeding season following WRA's December 2017 survey, in my decade of experience tracking the locations of tricolored blackbird breeding colonies in the Altamont Pass, I found that breeding colonies were spatially dynamic. Breeding colonies did not use the same sites in all years, but instead shifted from site to site. Absence one year is not permanent absence.

Neither a preconstruction survey for the timing of construction would avoid the ultimate taking of habitat needed for the continued survival of tricolored blackbirds in the south Bay. The project site composes one of the last conceivable patches of tricolored blackbird habitat in the region. A stronger mitigation plan is warranted.

The proposed mitigation measures are founded on inaccurate analyses of impacts, and they would prove deficient at conserving wildlife that would be affected by the project. At least a fair argument can be made for the need to prepare an EIR to appropriately formulate mitigation measures to conserve special-status species of wildlife and all nesting birds protected by stated and federal statutes.

RECOMMENDED MEASURES

Guidelines on Building Design

If the project goes forward, it should adhere much more comprehensively and more carefully to the available guidelines prepared by American Bird Conservancy and New York and San Francisco. The American Bird Conservancy (ABC) produced an excellent set of guidelines that recommend 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.

City of San Jose's (2014) guidelines ought to be improved to be more consistent with the guidelines cited above.

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 efficacy and to quantify post-construction fatalities is to monitor the project for fatalities.

Road Mortality

Compensatory mitigation is needed for the increased wildlife mortality that would be caused by the project's contribution to increased road traffic in the region. I suggest that this mitigation can be directed toward funding research to identify fatality patterns and effective impact reduction measures. Compensatory mitigation can also be provided in the form of donations to wildlife rehabilitation facilities (see below).

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. Most of the injuries would likely be caused by bird-window collisions and animal-automobile collisions, but some would be injured for other reasons. Many of these animals would need treatment caused by collision injuries.

Thank you for your attention,

_____

Shawn Smallwood, Ph.D.

REFERENCES CITED

Barton, C. M., C. S. Riding, and S. R. Loss. 2017. Magnitude and correlates of bird collisions at glass bus shelters in an urban landscape. Plos One 12. (6): e0178667. https://doi.org/10.1371/journal.pone.0178667

Basilio, L. G., D. J. Moreno, and A, J. Piratelli. 2020. Main causes of bird-window collisions: a review. Anais da Academia Brasileira de Ciências 92(1): e20180745 DOI 10.1590/0001-3765202020180745.

Bishop, C. A. and J. M. Brogan. 2013. Estimates of avian mortality attributed to vehicle collisions in Canada. Avian Conservation and Ecology 8:2. http://dx.doi.org/10.5751/ACE-00604-080202.

Borden, W. C., O. M. Lockhart, A. W. Jones, and M. S. Lyons. 2010. Seasonal, taxonomic, and local habitat components of bird-window collisions on an urban university campus in Cleveland, OH. Ohio Journal of Science 110(3):44-52.

Bracey, A. M., M. A. Etterson, G. J. Niemi, and R. F. Green. 2016. Variation in bird-window collision mortality and scavenging rates within an urban landscape. The Wilson Journal of Ornithology 128:355-367.

Brown, B. B., L. Hunter, and S. Santos. 2020. Bird-window collisions: different fall and winter risk and protective factors. PeerJ 8:e9401 http://doi.org/10.7717/peerj.9401

Brown, K., K. S. Smallwood, J. Szewczak, and B. Karas. 2016. Final 2012-2015 Report Avian and Bat Monitoring Project Vasco Winds, LLC. Prepared for NextEra Energy Resources, Livermore, California.

CDFW (California Department of Fish and Wildlife). 2012. Staff Report on Burrowing Owl Mitigation. Sacramento, California.

Calvert, A. M., C. A. Bishop, R. D. Elliot, E. A. Krebs, T. M. Kydd, C. S. Machtans, and G. J. Robertson. 2013. A synthesis of human-related avian mortality in Canada. Avian Conservation and Ecology 8(2): 11. http://dx.doi.org/10.5751/ACE-00581-080211

City of Portland Bureau of Environmental Services and Portland Audubon. 2020. Collisions at the Columbia Building: A synthesis of pre- and post-retrofit monitoring. Environmental Services of City of Portland, Oregon.

City of San Jose. 2014. Bird-safe building design standards.

City of San Jose. 2021. Initial Study/Mitigated Negative Declaration: Alviso Hotel Project, File Numbers: PD19-031. San Jose, California.

Cusa M, Jackson DA, Mesure M. 2015. Window collisions by migratory bird species: urban geographical patterns and habitat associations. Urban Ecosystems 18(4):1–20. DOI 10.1007/s11252-015-0459-3.

Dunn, E. H. 1993. Bird mortality from striking residential windows in winter. Journal of Field Ornithology 64:302-309.

Forman, T. T., D. Sperling, J. A. Bisonette, A. P. Clevenger, C. D. Cutshall, V. H. Dale, L. Fahrig, R. France, C. R. Goldman, K. Heanue, J. A. Jones, F. J. Swanson, T. Turrentine, and T. C. Winter. 2003. Road Ecology. Island Press, Covello, California.

Gauthreaux, Jr., S. A., J. W. Livingston, and C. G. Belser. 2008. Detection and discrimination of fauna in the aerosphere using Doppler weather surveillance radar. Integrative and Comparative Biology 48:12-23.

Gelb, Y. and N. Delacretaz. 2009. Windows and vegetation: Primary factors in Manhattan bird collisions. Northeastern Naturalist 16:455-470.

Gómez-Moreno, V. del C., J. R. Herrera-Herrera, and S. Niño-Maldonado. 2018. Bird collisions in windows of Centro Universitario Victoria, Tamaulipas, México. Huitzil, Revista Mexicana de Ornitología 19(2): 227-236. https://doi.org/10.28947/hrmo.2018.19.2.347

Hager, S. B, and M. E. Craig. 2014. Bird-window collisions in the summer breeding season. PeerJ 2:e460 DOI 10.7717/peerj.460.

Hager, S. B., H. Trudell, K. J. McKay, S. M. Crandall, and L. Mayer. 2008. Bird density and mortality at windows. Wilson Journal of Ornithology 120:550-564.

Hager, S. B., B. J. Cosentino, and K. J. McKay. 2012. Scavenging effects persistence of avian carcasses resulting from window collisions in an urban landscape. Journal of Field Ornithology 83:203-211.

Hager S. B., B. J. Cosentino, K J. McKay, C. Monson, W. Zuurdeeg, and B. Blevins. 2013. Window area and development drive spatial variation in bird-window collisions in an urban landscape. PLoS ONE 8(1): e53371. doi:10.1371/journal.pone.0053371

Harvey & Associates. 2016. TopGolf biological resources report. Prepared for David Power & Associates, San Jose, California.

Johnson, R. E., and G. E. Hudson. 1976. Bird mortality at a glassed-in walkway in Washington State. Western Birds 7:99-107.

Kahle, L. Q., M. E. Flannery, and J. P. Dumbacher. 2016. Bird-window collisions at a west-coast urban park museum: analyses of bird biology and window attributes

from Golden Gate Park, San Francisco. PLoS ONE 11(1):e144600 DOI 10.1371/journal.pone.0144600.

Klem, D., Jr. 1989. Bird-window collisions. Wilson Bulletin 101:606-620.

Klem, D., Jr. 1990. Collisions between birds and windows: mortality and prevention. Journal of Field Ornithology 61:120-128.

Klem, D., Jr. 2009. Preventing bird-window collisions. The Wilson Journal of Ornithology 121:314-321.

Klem, D., Jr. 2010. Avian mortality at windows: the second largest human source of bird mortality on earth. Pages 244-251 in Proc. Fourth Int. Partners in Flight Conference: Tundra to Tropics.

Klem, D., Jr. 2011. Evaluating the effectiveness of Acopian Birdsavers to deter or prevent bird-glass collisions. Unpublished report.

Klem, D., Jr. and P. G. Saenger. 2013. Evaluating the effectiveness of select visual signals to prevent bird-window collisions. The Wilson Journal of Ornithology 125:406–411.

Klem, D. Jr., C. J. Farmer, N. Delacretaz, Y. Gelb and P. G. Saenger. 2009. Architectural and landscape risk factors associated with bird-glass collisions in an urban environment. Wilson Journal of Ornithology 121:126-134.

Kummer J. A., and E. M. Bayne. 2015. Bird feeders and their effects on bird-window collisions at residential houses. Avian Conservation and Ecology 10(2):6 DOI 10.5751/ACE-00787-100206.

Kummer, J. A., E. M. Bayne, and C. S. Machtans. 2016. Use of citizen science to identify factors affecting bird-window collision risk at houses. The Condor: Ornithological Applications 118:624-639. DOI: 10.1650/CONDOR-16-26.1

Loss, S. R., T. Will, and P. P. Marra. 2014. Estimation of bird-vehicle collision mortality on U.S. roads. Journal of Wildlife Management 78:763-771.

Loss, S. R., T. Will, S. S. Loss, and P. P. Marra. 2014. Bird–building collisions in the United States: Estimates of annual mortality and species vulnerability. The Condor: Ornithological Applications 116:8-23. DOI: 10.1650/CONDOR-13-090.1

Loss, S. R., S. Lao, J. W. Eckles, A. W. Anderson, R. B. Blair, and R. J. Turner. 2019. Factors influencing bird-building collisions in the downtown area of a major North American city. PLoS ONE 14(11): e0224164. https://doi.org/10.1371/journal.pone.0224164

Machtans, C. S., C. H. R. Wedeles, and E. M. Bayne. 2013. A first estimate for Canada of the number of birds killed by colliding with building windows. Avian Conservation and Ecology 8(2):6. http://dx.doi.org/10.5751/ACE-00568-080206

Mendelsohn, M., W. Dexter, E. Olson, and S. Weber. 2009. Vasco Road wildlife movement study report. Report to Contra Costa County Public Works Department, Martinez, California.

Ocampo-Peñuela, N., R. S. Winton, C. J. Wu, E. Zambello, T. W. Wittig and N. L. Cagle . 2016. Patterns of bird-window collisions inform mitigation on a university campus. PeerJ4:e1652;DOI10.7717/peerj.1652

O'Connell, T. J. 2001. Avian window strike mortality at a suburban office park. The Raven 72:141-149.

Orff, K., H. Brown, S. Caputo, E. J. McAdams, M. Fowle, G. Phillips, C. DeWitt, and Y. Gelb. 2007. Bird-safe buildings guidelines. New York City Audubon, New York.

Overing, R. 1938. High mortality at the Washington Monument. The Auk 55:679.

Parkins, K. L., S. B. Elbin, and E. Barnes. 2015. Light, glass, and bird–building collisions in an urban park. Northeastern Naturalist 22:84-94.

Porter, A., and A. Huang. 2015. Bird collisions with glass: UBC pilot project to assess bird collision rates in Western North America. UBC Social Ecological Economic Development Studies (SEEDS) Student Report. Report to Environment Canada, UBC SEEDS and UBC BRITE.

Rebolo-Ifrán, N., A. di Virgilio, and S. A. Lambertucci. 2019. Drivers of bird-window collisions in southern South America: a two-scale assessment applying citizen science. Scientific Reports 9:18148 | https://doi.org/10.1038/s41598-019-54351-3

Riding, C. S., T. J. O'Connell, and S. R. Loss. 2020. Building façade-level correlates of bird–window collisions in a small urban area. The Condor: Ornithological Applications 122:1–14.

Rosenberg, K. V., A. M. Dokter, P. J. Blancher, J. R. Sauer, A. C. Smith, P. A. Smith, J. C. Stanton, A. Panjabi , L. Helft , M. Parr, and P. P. Marra. 2019. Decline of the North American avifauna. Science 10.1126/science.aaw1313 (2019).

Rössler, M., E. Nemeth, and A. Bruckner. 2015. Glass pane markings to prevent bird-window collisions: less can be more. Biologia 70: 535—541. DOI: 10.1515/biolog-2015-0057

Sabo, A. M., N. D. G. Hagemeyer, A. S. Lahey, and E. L. Walters. 2016. Local avian density influences risk of mortality from window strikes. PeerJ 4:e2170; DOI 10.7717/peerj.2170

San Francisco Planning Department. 2011. Standards for bird-safe buildings. San Francisco Planning Department, City and County of San Francisco, California.

Santos, S. M., F. Carvalho, and A. Mira. 2011. How Long Do the Dead Survive on the Road? Carcass Persistence Probability and Implications for Road-Kill Monitoring Surveys. PLoS ONE 6(9): e25383. doi:10.1371/journal.pone.0025383

Schneider, R. M., C. M. Barton, K. W. Zirkle, C. F. Greene, and K. B. Newman. 2018. Year-round monitoring reveals prevalence of fatal bird-window collisions at the Virginia Tech Corporate Research Center. *PeerJ* 6:e4562 https://doi.org/10.7717/peerj.4562

Sheppard, C., and G. Phillips. 2015. Bird-friendly building design, 2nd Ed., American Bird Conservancy, The Plains, Virginia.

Shuford, W. D., and T. Gardali, [eds.]. 2008. California bird species of special concern: a ranked assessment of species, subspecies, and distinct populations of birds of immediate conservation concern in California. Studies of Western Birds 1. Western Field Ornithologists, Camarillo, California.

Smallwood, K. S. 2015. Habitat fragmentation and corridors. Pages 84-101 in M. L. Morrison and H. A. Mathewson, Eds., Wildlife habitat conservation: concepts, challenges, and solutions. John Hopkins University Press, Baltimore, Maryland, USA.

Smallwood, K. S. 2017. Monitoring birds. M. Perrow, Ed., Wildlife and Wind Farms - Conflicts and Solutions, Volume 2. Pelagic Publishing, Exeter, United Kingdom. www.bit.ly/2v3cR9Q

Somerlot, K. E. 2003. Survey of songbird mortality due to window collisions on the Murray State University campus. Journal of Service Learning in Conservation Biology 1:1–19.

TMCapital. 2019. 2019 Building products report: enduring growth beyond short-term challenges. https://www.tmcapital.com/wp-content/uploads/2019/08/BuildingProd_AnnualReport_2019-08-14.pdf

Winton, R. S., N. Ocampo-Peñuela, and N. Cagle. 2018. Geo-referencing bird-window collisions for targeted mitigation. PeerJ 6:e4215; DOI 10.7717/peerj.4215

WRA. 2020. Biological Resources Assessment: Alviso Hotel, San Jose, Santa Clara County, California. Prepared for David J. Powers & Associates, Inc., San Jose, CA.

Yahner, R. H. 1982. Avian nest densities and nest-site selection in farmstead shelterbelts. The Wilson Bulletin 94:156-175.

Young, H. 1948. A comparative study of nesting birds in a five-acre park. The Wilson Bulletin 61:36-47.

Zink, R. M., and J. Eckles. 2010. Twin cities bird-building collisions: a status update on "Project Birdsafe." The Loon 82:34-37.

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

- 477 professional publications, including:
- 81 peer reviewed publications
- 24 in non-reviewed proceedings
- 370 reports, declarations, posters and book reviews
- 8 in mass media outlets
- 87 public presentations of research results at meetings
- Reviewed many professional papers and reports
- Testified in 4 court cases.

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.

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.

Peer Reviewed Publications

Smallwood, K. S. 2017. Long search intervals under-estimate bird and bat fatalities caused by wind turbines. Wildlife Society Bulletin 41:224-230.

Smallwood, K. S. 2017. The challenges of addressing wildlife impacts when repowering wind energy projects. Pages 175-187 in Köppel, J., Editor, Wind Energy and Wildlife Impacts: Proceedings from the CWW2015 Conference. Springer. Cham, Switzerland.

May, R., Gill, A. B., Köppel, J. Langston, R. H.W., Reichenbach, M., Scheidat, M., Smallwood, S., Voigt, C. C., Hüppop, O., and Portman, M. 2017. Future research directions to reconcile wind turbine–wildlife interactions. Pages 255-276 in Köppel, J., Editor, Wind Energy and Wildlife Impacts: Proceedings from the CWW2015 Conference. Springer. Cham, Switzerland.

Smallwood, K. S. 2017. Monitoring birds. M. Perrow, Ed., Wildlife and Wind Farms - Conflicts and Solutions, Volume 2. Pelagic Publishing, Exeter, United Kingdom. www.bit.ly/2v3cR9Q

Smallwood, K. S., L. Neher, and D. A. Bell. 2017. Siting to Minimize Raptor Collisions: an example from the Repowering Altamont Pass Wind Resource Area. M. Perrow, Ed., Wildlife and Wind Farms - Conflicts and Solutions, Volume 2. Pelagic Publishing, Exeter, United Kingdom. www.bit.ly/2v3cR9Q

Johnson, D. H., S. R. Loss, K. S. Smallwood, W. P. Erickson. 2016. Avian fatalities at wind energy facilities in North America: A comparison of recent approaches. Human–Wildlife Interactions 10(1):7-18.

Sadar, M. J., D. S.-M. Guzman, A. Mete, J. Foley, N. Stephenson, K. H. Rogers, C. Grosset, K. S. Smallwood, J. Shipman, A. Wells, S. D. White, D. A. Bell, and M. G. Hawkins. 2015. Mange Caused by a novel Micnemidocoptes mite in a Golden Eagle (*Aquila chrysaetos*). Journal of Avian Medicine and Surgery 29(3):231-237.

Smallwood, K. S. 2015. Habitat fragmentation and corridors. Pages 84-101 in M. L. Morrison and H. A. Mathewson, Eds., Wildlife habitat conservation: concepts, challenges, and solutions. John Hopkins University Press, Baltimore, Maryland, USA.

Mete, A., N. Stephenson, K. Rogers, M. G. Hawkins, M. Sadar, D. Guzman, D. A. Bell, J. Shipman, A. Wells, K. S. Smallwood, and J. Foley. 2014. Emergence of Knemidocoptic mange in wild Golden Eagles (Aquila chrysaetos) in California. Emerging Infectious Diseases 20(10):1716-1718.

Smallwood, K. S. 2013. Introduction: Wind-energy development and wildlife conservation. Wildlife Society Bulletin 37: 3-4.

Smallwood, K. S. 2013. Comparing bird and bat fatality-rate estimates among North American wind-energy projects. Wildlife Society Bulletin 37:19-33. + Online Supplemental Material.

Smallwood, K. S., L. Neher, J. Mount, and R. C. E. Culver. 2013. Nesting Burrowing Owl Abundance in the Altamont Pass Wind Resource Area, California. Wildlife Society Bulletin: 37:787-795.

Smallwood, K. S., D. A. Bell, B. Karas, and S. A. Snyder. 2013. Response to Huso and Erickson Comments on Novel Scavenger Removal Trials. Journal of Wildlife Management 77: 216-225.

Bell, D. A., and K. S. Smallwood. 2010. Birds of prey remain at risk. Science 330:913.

Smallwood, K. S., D. A. Bell, S. A. Snyder, and J. E. DiDonato. 2010. Novel scavenger removal trials increase estimates of wind turbine-caused avian fatality rates. Journal of Wildlife Management 74: 1089-1097 + Online Supplemental Material.

Smallwood, K. S., L. Neher, and D. A. Bell. 2009. Map-based repowering and reorganization of a wind resource area to minimize burrowing owl and other bird fatalities. Energies 2009(2):915-943. http://www.mdpi.com/1996-1073/2/4/915

Smallwood, K. S. and B. Nakamoto. 2009. Impacts of West Nile Virus Epizootic on Yellow-Billed Magpie, American Crow, and other Birds in the Sacramento Valley, California. The Condor 111:247-254.

Smallwood, K. S., L. Rugge, and M. L. Morrison. 2009. Influence of Behavior on Bird Mortality in Wind Energy Developments: The Altamont Pass Wind Resource Area, California. Journal of Wildlife Management 73:1082-1098.

Smallwood, K. S. and B. Karas. 2009. Avian and Bat Fatality Rates at Old-Generation and

Repowered Wind Turbines in California. Journal of Wildlife Management 73:1062-1071.

Smallwood, K. S. 2008. Wind power company compliance with mitigation plans in the Altamont Pass Wind Resource Area. Environmental & Energy Law Policy Journal 2(2):229-285.

Smallwood, K. S., C. G. Thelander. 2008. Bird Mortality in the Altamont Pass Wind Resource Area, California. Journal of Wildlife Management 72:215-223.

Smallwood, K. S. 2007. Estimating wind turbine-caused bird mortality. Journal of Wildlife Management 71:2781-2791.

Smallwood, K. S., C. G. Thelander, M. L. Morrison, and L. M. Rugge. 2007. Burrowing owl mortality in the Altamont Pass Wind Resource Area. Journal of Wildlife Management 71:1513-1524.

Cain, J. W. III, K. S. Smallwood, M. L. Morrison, and H. L. Loffland. 2005. Influence of mammal activity on nesting success of Passerines. J. Wildlife Management 70:522-531.

Smallwood, K.S. 2002. Habitat models based on numerical comparisons. Pages 83-95 *in* Predicting species occurrences: Issues of scale and accuracy, J. M. Scott, P. J. Heglund, M. Morrison, M. Raphael, J. Haufler, and B. Wall, editors. Island Press, Covello, California.

Morrison, M. L., K. S. Smallwood, and L. S. Hall. 2002. Creating habitat through plant relocation: Lessons from Valley elderberry longhorn beetle mitigation. Ecological Restoration 21: 95-100.

Zhang, M., K. S. Smallwood, and E. Anderson. 2002. Relating indicators of ecological health and integrity to assess risks to sustainable agriculture and native biota. Pages 757-768 *in* D.J. Rapport, W.L. Lasley, D.E. Rolston, N.O. Nielsen, C.O. Qualset, and A.B. Damania (eds.), Managing for Healthy Ecosystems, Lewis Publishers, Boca Raton, Florida USA.

Wilcox, B. A., K. S. Smallwood, and J. A. Kahn. 2002. Toward a forest Capital Index. Pages 285-298 *in* D.J. Rapport, W.L. Lasley, D.E. Rolston, N.O. Nielsen, C.O. Qualset, and A.B. Damania (eds.), Managing for Healthy Ecosystems, Lewis Publishers, Boca Raton, Florida USA.

Smallwood, K.S. 2001. The allometry of density within the space used by populations of Mammalian Carnivores. Canadian Journal of Zoology 79:1634-1640.

Smallwood, K.S., and T.R. Smith. 2001. Study design and interpretation of Sorex density estimates. Annales Zoologi Fennici 38:141-161.

Smallwood, K.S., A. Gonzales, T. Smith, E. West, C. Hawkins, E. Stitt, C. Keckler, C. Bailey, and K. Brown. 2001. Suggested standards for science applied to conservation issues. Transactions of the Western Section of the Wildlife Society 36:40-49.

Geng, S., Yixing Zhou, Minghua Zhang, and K. Shawn Smallwood. 2001. A Sustainable Agro-ecological Solution to Water Shortage in North China Plain (Huabei Plain). Environmental Planning and Management 44:345-355.

Smallwood, K. Shawn, Lourdes Rugge, Stacia Hoover, Michael L. Morrison, Carl Thelander. 2001. Intra- and inter-turbine string comparison of fatalities to animal burrow densities at Altamont Pass. Pages 23-37 in S. S. Schwartz, ed., Proceedings of the National Avian-Wind Power Planning Meeting IV. RESOLVE, Inc., Washington, D.C.

Smallwood, K.S., S. Geng, and M. Zhang. 2001. Comparing pocket gopher (*Thomomys bottae*) density in alfalfa stands to assess management and conservation goals in northern California. Agriculture, Ecosystems & Environment 87: 93-109.

Smallwood, K. S. 2001. Linking habitat restoration to meaningful units of animal demography. Restoration Ecology 9:253-261.

Smallwood, K. S. 2000. A crosswalk from the Endangered Species Act to the HCP Handbook and real HCPs. Environmental Management 26, Supplement 1:23-35.

Smallwood, K. S., J. Beyea and M. Morrison. 1999. Using the best scientific data for endangered species conservation. Environmental Management 24:421-435.

Smallwood, K. S. 1999. Scale domains of abundance among species of Mammalian Carnivora. Environmental Conservation 26:102-111.

Smallwood, K.S. 1999. Suggested study attributes for making useful population density estimates. Transactions of the Western Section of the Wildlife Society 35: 76-82.

Smallwood, K. S. and M. L. Morrison. 1999. Estimating burrow volume and excavation rate of pocket gophers (Geomyidae). Southwestern Naturalist 44:173-183.

Smallwood, K. S. and M. L. Morrison. 1999. Spatial scaling of pocket gopher (*Geomyidae*) density. Southwestern Naturalist 44:73-82.

Smallwood, K. S. 1999. Abating pocket gophers (*Thomomys* spp.) to regenerate forests in clearcuts. Environmental Conservation 26:59-65.

Smallwood, K. S. 1998. Patterns of black bear abundance. Transactions of the Western Section of the Wildlife Society 34:32-38.

Smallwood, K. S. 1998. On the evidence needed for listing northern goshawks (*Accipter gentilis*) under the Endangered Species Act: a reply to Kennedy. J. Raptor Research 32:323-329.

Smallwood, K. S., B. Wilcox, R. Leidy, and K. Yarris. 1998. Indicators assessment for Habitat Conservation Plan of Yolo County, California, USA. Environmental Management 22: 947-958.

Smallwood, K. S., M. L. Morrison, and J. Beyea. 1998. Animal burrowing attributes affecting hazardous waste management. Environmental Management 22: 831-847.

Smallwood, K. S, and C. M. Schonewald. 1998. Study design and interpretation for mammalian

carnivore density estimates. Oecologia 113:474-491.

Zhang, M., S. Geng, and K. S. Smallwood. 1998. Nitrate contamination in groundwater of Tulare County, California. Ambio 27(3):170-174.

Smallwood, K. S. and M. L. Morrison. 1997. Animal burrowing in the waste management zone of Hanford Nuclear Reservation. Proceedings of the Western Section of the Wildlife Society Meeting 33:88-97.

Morrison, M. L., K. S. Smallwood, and J. Beyea. 1997. Monitoring the dispersal of contaminants by wildlife at nuclear weapons production and waste storage facilities. The Environmentalist 17:289-295.

Smallwood, K. S. 1997. Interpreting puma (*Puma concolor*) density estimates for theory and management. Environmental Conservation 24(3):283-289.

Smallwood, K. S. 1997. Managing vertebrates in cover crops: a first study. American Journal of Alternative Agriculture 11:155-160.

Smallwood, K. S. and S. Geng. 1997. Multi-scale influences of gophers on alfalfa yield and quality. Field Crops Research 49:159-168.

Smallwood, K. S. and C. Schonewald. 1996. Scaling population density and spatial pattern for terrestrial, mammalian carnivores. Oecologia 105:329-335.

Smallwood, K. S., G. Jones, and C. Schonewald. 1996. Spatial scaling of allometry for terrestrial, mammalian carnivores. Oecologia 107:588-594.

Van Vuren, D. and K. S. Smallwood. 1996. Ecological management of vertebrate pests in agricultural systems. Biological Agriculture and Horticulture 13:41-64.

Smallwood, K. S., B. J. Nakamoto, and S. Geng. 1996. Association analysis of raptors on an agricultural landscape. Pages 177-190 in D.M. Bird, D.E. Varland, and J.J. Negro, eds., Raptors in human landscapes. Academic Press, London.

Erichsen, A. L., K. S. Smallwood, A. M. Commandatore, D. M. Fry, and B. Wilson. 1996. White-tailed Kite movement and nesting patterns in an agricultural landscape. Pages 166-176 in D. M. Bird, D. E. Varland, and J. J. Negro, eds., Raptors in human landscapes. Academic Press, London.

Smallwood, K. S. 1995. Scaling Swainson's hawk population density for assessing habitat-use across an agricultural landscape. J. Raptor Research 29:172-178.

Smallwood, K. S. and W. A. Erickson. 1995. Estimating gopher populations and their abatement in forest plantations. Forest Science 41:284-296.

Smallwood, K. S. and E. L. Fitzhugh. 1995. A track count for estimating mountain lion *Felis*

concolor californica population trend. Biological Conservation 71:251-259

Smallwood, K. S. 1994. Site invasibility by exotic birds and mammals. Biological Conservation 69:251-259.

Smallwood, K. S. 1994. Trends in California mountain lion populations. Southwestern Naturalist 39:67-72.

Smallwood, K. S. 1993. Understanding ecological pattern and process by association and order. Acta Oecologica 14(3):443-462.

Smallwood, K. S. and E. L. Fitzhugh. 1993. A rigorous technique for identifying individual mountain lions *Felis concolor* by their tracks. Biological Conservation 65:51-59.

Smallwood, K. S. 1993. Mountain lion vocalizations and hunting behavior. The Southwestern Naturalist 38:65-67.

Smallwood, K. S. and T. P. Salmon. 1992. A rating system for potential exotic vertebrate pests. Biological Conservation 62:149-159.

Smallwood, K. S. 1990. Turbulence and the ecology of invading species. Ph.D. Thesis, University of California, Davis.

EXHIBIT B

IEE INDOOR ENVIRONMENTAL ENGINEERING IEE
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: October 26, 2021

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

From: Francis J. Offermann PE CIH

Subject: Indoor Air Quality: Alviso Hotel Project, San Jose, CA.
(IEE File Reference: P-4489)

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 µg/day. The NSRL concentration of formaldehyde that represents a daily dose of 40 µg is 2 µg/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 µg/m^3. The median indoor formaldehyde concentration was 36 µg/m^3, and ranged from 4.8 to 136 µg/m^3, which corresponds to a median exceedance of the 2 µg/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 µg/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 (BAAQMD, 2017).

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 µg/m^3 to 28% for the Acute REL of 55 µg/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 $\mu g/m^3$ (18.2 ppb) as compared to a median of 36 $\mu g/m^3$ 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 $\mu g/m^3$, which is 33% lower than the 36 $\mu g/m^3$ 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 OEHHA 10 in a million cancer risk threshold (OEHHA, 2017a).

With respect to the Alviso Hotel Project, San Jose, CA, the building consists of a hotel building.

The employees of the hotel building are expected to experience significant indoor exposures (e.g., 40 hours per week, 50 weeks per year). These exposures for employees are anticipated to result in significant cancer risks resulting from exposures to formaldehyde released by the building materials and furnishing commonly found in offices, warehouses, residences and hotels.

Because the hotel will be constructed with CARB Phase 2 Formaldehyde ATCM materials, and be ventilated with the minimum code required amount of outdoor air, the indoor 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 $\mu g/m^3$ (Singer et. al., 2020)

Assuming that the hotel employees work 8 hours per day and inhale 20 m^3 of air per day, the formaldehyde dose per work-day at the offices is 161 µg/day.

Assuming that these employees work 5 days per week and 50 weeks per year for 45 years (start at age 20 and retire at age 65) the average 70-year lifetime formaldehyde daily dose is 70.9 µg/day.

This is 1.77 times the NSRL (OEHHA, 2017a) of 40 µg/day and represents a cancer risk of 17.7 per million, which exceeds the CEQA cancer risk of 10 per million. This impact should be analyzed in an environmental impact report ("EIR"), and the agency should impose all feasible mitigation measures to reduce this impact. Several feasible mitigation measures are discussed below and these and other measures should be analyzed in an EIR.

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 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.

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 (µg/h) from the product of the area-specific formaldehyde emission rate (µg/m^2-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 (µg/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., $\mu g/m^2$-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 $\mu g/m^2$-h, but not the actual measured specific emission rate, which may be 3, 18, or 30 $\mu g/m^2$-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. µg/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 (µg/m^3) from Equation 1 by dividing the total formaldehyde emission rates (i.e. µg/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 (µg/m^3)

E_{total} = total formaldehyde emission rate (µg/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.

The Project is close to roads with moderate to high traffic (e.g., North 1st Street, Southbay Freeway, etc.).

According to the Initial Study/Mitigated Negative Declaration – Alviso Hotel Project (City of San Jose, 2021), the Project would include areas that "would be exposed to future exterior noise levels of approximately 65 dBA DNL.". However this assessment is not based on any on-site sound level measurements. An acoustic study should be conducted to determine the existing and future exterior noise levels.

As a result of the anticipated 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 Initial Study/Mitigated Negative Declaration – Alviso Hotel Project (City of San Jose, 2021), the Project is located in the San Francisco Bay Area 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 $\mu g/m^3$, or the National 24-hour average exceedence concentration of 35 $\mu g/m^3$, 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/ft^2 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.

References

Bay Area Air Quality Management District (BAAQMD). 2017. California Environmental Quality Act Air Quality Guidelines. Bay Area Air Quality Management District, San Francisco, CA. http://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa_guidelines_may2017-pdf.pdf?la=en

BIFA. 2018. BIFMA Product Safety and Performance Standards and Guidelines. www.bifma.org/page/standardsoverview

California Air Resources Board. 2009. Airborne Toxic Control Measure to Reduce Formaldehyde Emissions from Composite Wood Products. California Environmental Protection Agency, Sacramento, CA. https://www.arb.ca.gov/regact/2007/compwood07/fro-final.pdf

California Air Resources Board. 2011. Toxic Air Contaminant Identification List. California Environmental Protection Agency, Sacramento, CA. https://www.arb.ca.gov/toxics/id/taclist.htm

California Building Code. 2001. California Code of Regulations, Title 24, Part 2 Volume 1, Appendix Chapter 12, Interior Environment, Division 1, Ventilation, Section 1207: 2001 California Building Code, California Building Standards Commission. Sacramento, CA.

California Building Standards Commission (2014). 2013 California Green Building Standards Code. California Code of Regulations, Title 24, Part 11. California Building Standards Commission, Sacramento, CA http://www.bsc.ca.gov/Home/CALGreen.aspx.

California Energy Commission, PIER Program. CEC-500-2007-033. Final Report, ARB Contract 03-326. Available at: www.arb.ca.gov/research/apr/past/03-326.pdf.

California Energy Commission, 2015. 2016 Building Energy Efficiency Standards for Residential and Nonresidential Buildings, California Code of Regulations, Title 24, Part 6. http://www.energy.ca.gov/2015publications/CEC-400-2015-037/CEC-400-2015-037-CMF.pdf

CDPH. 2017. Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions for Indoor Sources Using Environmental Chambers, Version 1.1. California Department of Public Health, Richmond, CA. https://www.cdph.ca.gov/Programs/CCDPHP/ DEODC/EHLB/IAQ/Pages/VOC.aspx.

City of San Jose. 2021. Initial Study/Mitigated Negative Declaration – Alviso Hotel Project. PROJECT FILE NUMBER**:** PD19-031.

EPA. 2011. Exposure Factors Handbook: 2011 Edition, Chapter 16 – Activity Factors. Report EPA/600/R-09/052F, September 2011. U.S. Environmental Protection Agency, Washington, D.C.

Hodgson, A. T., D. Beal, J.E.R. McIlvaine. 2002. Sources of formaldehyde, other aldehydes and terpenes in a new manufactured house. Indoor Air 12: 235–242.

OEHHA (Office of Environmental Health Hazard Assessment). 2015. Air Toxics Hot Spots Program Risk Assessment Guidelines; Guidance Manual for Preparation of Health Risk Assessments.

OEHHA (Office of Environmental Health Hazard Assessment). 2017a. Proposition 65 Safe Harbor Levels. No Significant Risk Levels for Carcinogens and Maximum Allowable Dose Levels for Chemicals Causing Reproductive Toxicity. Available at: http://www.oehha.ca.gov/prop65/pdf/safeharbor081513.pdf

OEHHA - Office of Environmental Health Hazard Assessment. 2017b. All OEHHA Acute, 8-hour and Chronic Reference Exposure Levels. Available at: http://oehha.ca.gov/air/allrels.html

Offermann, F. J. 2009. Ventilation and Indoor Air Quality in New Homes. California Air Resources Board and California Energy Commission, PIER Energy-Related Environmental Research Program. Collaborative Report. CEC-500-2009-085. https://www.arb.ca.gov/research/apr/past/04-310.pdf

Offermann, F. J. and A. T. Hodgson. 2011. Emission Rates of Volatile Organic Compounds in New Homes. Proceedings Indoor Air 2011 (12th International Conference on Indoor Air Quality and Climate 2011), June 5-10, 2011, Austin, TX.

Singer, B.C, Chan, W.R, Kim, Y., Offermann, F.J., and Walker I.S. 2020. Indoor Air Quality in California Homes with Code-Required Mechanical Ventilation. Indoor Air, Vol 30, Issue 5, 885-899.

USGBC. 2014. LEED BD+C Homes v4. U.S. Green Building Council, Washington, D.C. http://www.usgbc.org/credits/homes/v4

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 $\mu g/m^3$ (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 m^3/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 ft^2 (0.7% of the floor area), or
Particle Board – 30 ft^2 (1.3% of the floor area), or
Hardwood Plywood – 54 ft^2 (2.4% of the floor area), or
Thin MDF – 46 ft^2 (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 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.

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.

Home
Company Profile
Healthy Building Services
Diagnostic Services
Laboratory Services
Workshops & Seminars
Expert Witness Services
Resources
News & Events
Employment
Contact Us

Expert Witness Services

View Curriculum Vitae (PDF)

Francis (Bud) J. Offermann PE CIH

President: Indoor Environmental Engineering,
San Francisco, CA. December, 1981 - present.
e-mail: offermann@iee-sf.com

Education

- M.S. Mechanical Engineering Stanford University, Stanford, CA.
- Graduate Studies in Air Pollution Monitoring and Control University of California, Berkeley, CA.
- B.S. in Mechanical Engineering Rensselaer Polytechnic Institute, Troy, N.Y.

Professional Affiliations

ACGIH, AIHA, ASHRAE, CSI, ASTM, ISIAQ, PARMA, and USGBC

Work Experience

Mr. Offermann PE, CIH, has 36 years experience as an IAQ researcher, technical author, and workshop instructor. He is president of Indoor Environmental Engineering, a San Francisco based IAQ R&D consulting firm. As president of Indoor Environmental Engineering, Mr. Offermann directs an interdisciplinary team of environmental scientists, chemists, and mechanical engineers in indoor air quality building investigations. Under Mr. Offermann's supervision, IEE has developed both pro-active and reactive IAQ measurement methods and diagnostic protocols. He has supervised over 2,000 IAQ investigations in commercial, residential, and institutional buildings and conducted numerous forensic investigations related to IAQ.

Litigation Experience

Mr. Offermann has been qualified numerous times in court as an expert in the field of indoor air quality and ventilation for both plaintiffs and defendants. He has been deposed over 150 times in cases involving indoor air quality/ventilation issues in commercial, residential, and institutional buildings involving construction defects, and/or operation and maintenance problems. Examples of indoor air quality cases he has worked on are alleged personal injury and/or property damages from mold and bacterial contamination/moisture intrusion, building renovation activities, insufficient outdoor air ventilation, off gassing of volatile organic compounds from building materials and coatings, malfunctioning gas heaters and carbon monoxide poisoning, and applications of pesticides. Mr. Offermann has testified with respect to the scientific admissability of expert testimony regarding indoor air quality issues via Daubert and Kelly-Frye motions.

EXHIBIT C

SWAPE Technical Consultation, Data Analysis and Litigation Support for the Environment

2656 29th Street, Suite 201
Santa Monica, CA 90405

Matt Hagemann, P.G, C.Hg.
(949) 887-9013
mhagemann@swape.com

Paul E. Rosenfeld, PhD
(310) 795-2335
prosenfeld@swape.com

November 8, 2021

Brian Flynn
Lozeau | Drury LLP
1939 Harrison Street, Suite 150
Oakland, CA 94612

Subject: Comments on the Alviso Hotel Project

Dear Mr. Flynn,

We have reviewed the October 2021 Initial Study/Mitigated Negative Declaration ("IS/MND") for the Alviso Hotel Project ("Project") located in the City of San Jose ("City"). The Project proposes to construct a 112,463-SF hotel, comprising of 214 rooms, and 234 parking spaces on the 6.23-acre site.

Our review concludes that the IS/MND fails to adequately evaluate the Project's air quality, health risk, and greenhouse gas impacts. As a result, emissions and health risk impacts associated with construction and operation of the proposed Project are underestimated and inadequately addressed. An Environmental Impact Report ("EIR") should be prepared to adequately assess and mitigate the potential air quality, health risk, and greenhouse gas impacts that the project may have on the surrounding environment.

Air Quality

Unsubstantiated Input Parameters Used to Estimate Project Emissions

The IS/MND's air quality analysis relies on emissions calculated with CalEEMod.2016.3.2 (p. 42).[1] CalEEMod provides recommended default values based on site-specific information, such as land use type, meteorological data, total lot acreage, project type and typical equipment associated with project type. If more specific project information is known, the user can change the default values and input project-specific values, but the California Environmental Quality Act ("CEQA") requires that such changes be justified by substantial evidence. Once all of the values are inputted into the model, the Project's

[1] CAPCOA (November 2017) CalEEMod User's Guide, http://www.aqmd.gov/docs/default-source/caleemod/01_user-39-s-guide2016-3-2_15november2017.pdf?sfvrsn=4.

construction and operational emissions are calculated, and "output files" are generated. These output files disclose to the reader what parameters are utilized in calculating the Project's air pollutant emissions and make known which default values are changed as well as provide justification for the values selected.

When reviewing the Project's CalEEMod output files, provided in The Estuary @ Terra Air Quality & Greenhouse Gas Assessment ("AQ & GHG Assessment") as Appendix A to the IS/MND, we found that several model inputs were not consistent with information disclosed in the IS/MND. As a result, the Project's construction and operational emissions are underestimated. As such, an EIR should be prepared to include an updated air quality analysis that adequately evaluates the impacts that construction and operation of the Project will have on local and regional air quality.

Underestimated Land Use Size

According to the IS/MND:

> "The project proposes construction of an approximately 112,463-square foot, 214-room hotel in a five-story building" (p. 8).

As such, the models should have included 112,463-SF of hotel space. However, review of the CalEEMod output files demonstrates that the "Alviso Hotel, San Jose" and "Alviso Hotel, San Jose – 2030" models include only 108,702-SF of hotel land use (see excerpt below) (Appendix A, pp. 30, 77).

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Parking Lot	43.00	Space	0.00	17,200.00	0
Unenclosed Parking with Elevator	192.00	Space	0.00	70,757.00	0
Hotel	215.00	Room	1.92	108,702.00	0
Other Asphalt Surfaces	22.97	1000sqft	0.00	22,973.00	0
Other Non-Asphalt Surfaces	187.79	1000sqft	4.31	187,792.00	0

As you can see in the excerpt above, the proposed hotel is underestimated by 3,761-SF.[2] This underestimation presents an issue, as the land use size feature is used throughout CalEEMod to determine default variable and emission factors that go into the model's calculations. The square footage of a land use is used for certain calculations such as determining the wall space to be painted (i.e., VOC emissions from architectural coatings) and volume that is heated or cooled (i.e., energy impacts).[3] Thus, by underestimating the size of the proposed hotel, the models underestimate the Project's construction and operational emissions and should not be relied upon to determine Project significance.

Unsubstantiated Changes to Individual Construction Phase Lengths

Review of the CalEEMod output files demonstrates that the "Alviso Hotel, San Jose" model includes several changes to the default individual construction phase lengths (see excerpt below) (Appendix A, pp. 32).

[2] Calculated: 112,463-SF – 108,702-SF = 3,761-SF.
[3] CalEEMod User Guide, *available at:* http://www.caleemod.com/, p. 28.

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	10.00	11.00
tblConstructionPhase	NumDays	20.00	44.00
tblConstructionPhase	NumDays	230.00	142.00
tblConstructionPhase	NumDays	20.00	8.00
tblConstructionPhase	NumDays	20.00	85.00

As a result of these changes, the model includes the following construction schedule (see excerpt below) (Appendix A, pp. 53):

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days
1	Site Preparation	Site Preparation	2/1/2021	2/15/2021	5	11
2	Grading	Grading	2/15/2021	4/15/2021	5	44
3	Trenching	Trenching	4/15/2021	6/30/2021	5	55
4	Building Construction	Building Construction	7/1/2021	1/15/2022	5	142
5	Architectural Coating	Architectural Coating	1/15/2022	5/15/2022	5	85
6	Paving	Paving	5/15/2022	5/25/2022	5	8

As you can see in the excerpt above, the site preparation phase was increased by 10%, from the default value of 10 to 11 days; the grading phase was increased by 120%, from the default value of 20 to 44 days; the building construction phase was decreased by 38%, from the default value of 230 to 142 days; the architectural coating phase was increased by approximately 325%, from the default value of 20 to 85 days, and the paving phase was decreased by 60%, from the default value of 20 to 8 days. As previously mentioned, the CalEEMod User's Guide requires any changes to model defaults be justified.[4] According to the "User Entered Comments & Non-Default Data" table, the justification provided for these changes is: "Provided construction schedule 9/8/2020" (Appendix A, pp. 30). Furthermore, regarding the Project's anticipated construction schedule, the IS/MND states:

> "The construction schedule assumed that the project would be built over a period of approximately 15 months, or 343 construction workdays. The first full year of operation was assumed to be 2023" (p. 42).

However, these justifications remain insufficient. While the IS/MND indicates the total construction duration, the IS/MND fails to mention or justify the individual construction phase lengths. This is incorrect, as according to the CalEEMod User's Guide:

> "CalEEMod was also designed to allow the user to change the defaults to reflect site- or project-specific information, when available, provided that the information is supported by substantial evidence as required by CEQA." [5]

[4] CalEEMod User Guide, *available at:* http://www.caleemod.com/, p. 2, 9
[5] CalEEMod User Guide, *available at:* http://www.caleemod.com/, p. 12.

Here, as the IS/MND only justifies the total construction duration of 15 months, the IS/MND fails to provide substantial evidence to support the revised individual construction phase lengths. As such, we cannot verify the changes.

These unsubstantiated changes present an issue, as the construction emissions are improperly spread out over a longer period of time for some phases, but not for others. According to the CalEEMod User's Guide, each construction phase is associated with different emissions activities (see excerpt below).[6]

> ***Demolition*** involves removing buildings or structures.
>
> ***Site Preparation*** involves clearing vegetation (grubbing and tree/stump removal) and removing stones and other unwanted material or debris prior to grading.
>
> ***Grading*** involves the cut and fill of land to ensure that the proper base and slope is created for the foundation.
>
> ***Building Construction*** involves the construction of the foundation, structures and buildings.
>
> ***Architectural Coating*** involves the application of coatings to both the interior and exterior of buildings or structures, the painting of parking lot or parking garage striping, associated signage and curbs, and the painting of the walls or other components such as stair railings inside parking structures.
>
> ***Paving*** involves the laying of concrete or asphalt such as in parking lots, roads, driveways, or sidewalks.

As such, by disproportionately altering the individual construction phase lengths without proper justification, the model may underestimate the peak daily emissions associated with some phases of construction. Thus, the model should not be relied upon to determine Project significance.

Underestimated Amount of Material Import

Regarding the amount of material import required for Project construction, the IS/MND states:

> "The project would not involve demolition since the project site is currently undeveloped. Grading of the site would import approximately 1,000 cubic yards of fill" (p. 13).

As such, the model should have included 1,000 cubic yards ("cy") of material import. However, review of the CalEEMod output files demonstrates that the "Alviso Hotel, San Jose" model includes only 900 cy of material import (Appendix A, pp. 35, 82).

Table Name	Column Name	Default Value	New Value
tblGrading	MaterialImported	0.00	900.00

As you can see from the excerpt above, the amount of material import required for Project construction is underestimated by 100 cy in the model.[7]

[6] "CalEEMod User's Guide." CAPCOA, November 2017, *available at:* http://www.aqmd.gov/docs/default-source/caleemod/01_user-39-s-guide2016-3-2_15november2017.pdf?sfvrsn=4, p. 31.

[7] Calculated: 1,000 cy – 900 cy = 100 cy.

This underestimation presents an issue, as material import is used to calculate emissions produced from material movement, including truck loading and unloading, and additional hauling truck trips.[8] Thus, by failing to include the full amount of material import required for Project construction, the model underestimates the Project's construction-related emissions and should not be relied upon to determine Project significance.

Unsubstantiated Changes to Off-Road Construction Unit Amounts and Usage Hours

Review of the CalEEMod output files demonstrates that the "Alviso Hotel, San Jose" model includes several changes to the default off-road construction equipment unit amounts and usage hours (see excerpt below) (Appendix A, pp. 35-36, 82-83).

Table Name	Column Name	Default Value	New Value
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	UsageHours	6.00	2.90
tblOffRoadEquipment	UsageHours	7.00	3.40
tblOffRoadEquipment	UsageHours	8.00	0.70
tblOffRoadEquipment	UsageHours	8.00	3.40
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.30
tblOffRoadEquipment	UsageHours	8.00	2.60
tblOffRoadEquipment	UsageHours	8.00	2.60
tblOffRoadEquipment	UsageHours	8.00	2.60
tblOffRoadEquipment	UsageHours	8.00	1.10
tblOffRoadEquipment	UsageHours	8.00	2.70
tblOffRoadEquipment	UsageHours	7.00	1.70
tblOffRoadEquipment	UsageHours	8.00	1.10
tblOffRoadEquipment	UsageHours	8.00	2.70
tblOffRoadEquipment	UsageHours	8.00	0.00

As previously mentioned, the CalEEMod User's Guide requires any changes to model defaults be justified.[9] According to the "User Entered Comments and Non-Default Data" table, the justification provided for these changes is: "Provided construction equip & hours 9/8/2020" (Appendix A, pp. 31, 78). Furthermore, the IS/MND states:

[8] CalEEMod User's Guide, *available at:* http://www.caleemod.com/, p. 2, 34.
[9] CalEEMod User Guide, *available at:* http://www.caleemod.com/, p. 1, 13-14.

> "The construction build-out scenario, including equipment list and schedule, were based on construction information provided by the project applicant" (p. 42).

However, these justifications remain insufficient, as the IS/MND and associated documents fail to provide the above-mentioned equipment list. As such, until additional information becomes available that substantiates the revised unit amounts and usage hours, we are unable to verify the changes included in the model are an accurate reflection of the alleged Applicant-provided equipment list.

These unsubstantiated reductions present an issue, as CalEEMod uses the off-road equipment input parameters to calculate the emissions associated with off-road construction equipment.[10] By including unsubstantiated changes to the default off-road construction equipment unit amounts and usage hours, the model may underestimate the Project's construction-related emissions and should not be relied upon to determine Project significance.

Underestimated Hauling Trip Number

Review of the AQ & GHG Assessment demonstrates that construction-related mobile-source emissions are modeled outside of CalEEMod. Specifically, the AQ & GHG Assessment states:

> "CARB EMission FACtors 2017 (EMFAC2017) model was used to predict emissions from construction traffic, which includes worker travel, vendor trucks, and haul trucks" (p. 8-9).

Furthermore, the AQ & GHG Assessment provides the following input parameters used for the EMFAC2017 model runs (p. 10):

Table 2. Construction Traffic Data Used for EMFAC2017 Model Runs

CalEEMod Run/Land Uses and Construction Phase	Trips by Trip Type			Notes
	Total Worker[1]	Total Vendor[1]	Total Haul[2]	
Vehicle mix[1]	71.5% LDA 6.4% LDT1 22.1% LDT2	38.1% MHDT 61.9% HHDT	100% HHDT	
Trip Length (miles)	10.8	7.3	20.0 (Demo/Soil) 7.3 (Cement/Asphalt)	CalEEMod default distance with 5 Minute Truck Idle Time
Site Preparation	55	-	-	CalEEMod default worker trips
Grading	572	-	112	900-cy import. CalEEMod default worker trips
Trenching	520	-	-	CalEEMod default worker trips
Building Construction	24,282	9,514	200	Estimated 100 cement roundtrips. CalEEMod default worker and vendor trips
Architectural Coating	2,890	-	-	CalEEMod default worker trips
Paving	104	-	48	200-cy asphalt. CalEEMod default worker trips

Notes: [1] Based on 2021-2022 EMFAC2017 light-duty vehicle fleet mix for Santa Clara County.
[2] Includes grading trips estimated by CalEEMod based on amount of material to be removed.

[10] CalEEMod User Guide, *available at:* http://www.caleemod.com/, p. 32.

As you can see in the excerpt above, the number of grading hauling trips (as estimated by CalEEMod defaults based on 900 cy of material import) was included in the EMFAC2017 model runs. However, as previously discussed, the model should have included 1,000 cy of material import. According to the CalEEMod User's Guide:

> "Haul trips are based on the amount of material that is demolished, imported or exported assuming a truck can handle 16 cubic yards of material."[11]

Therefore, CalEEMod calculates a default number of hauling trips based upon the amount of material import inputted into the model. Thus, as the amount of material import is underestimated, the number of hauling trips is underestimated in the model as well.

This underestimation presents an issue, as CalEEMod uses the number of hauling trips to estimate the construction-related emissions associated with on-road vehicles.[12] By including an underestimated hauling trip number required for grading, the model may underestimate the Project's construction-related emissions and should not be relied upon to determine Project significance.

Unsubstantiated Change to Wastewater Treatment Percentages

Review of the CalEEMod output files demonstrates that the "Alviso Hotel, San Jose" and "Alviso Hotel, San Jose – 2030" models include several changes to the default wastewater treatment system percentages (see excerpt below) (Appendix A, pp. 97).

Table Name	Column Name	Default Value	New Value
tblWater	AerobicPercent	87.46	100.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00

As you can see in the excerpt above, the models assume that the Project's wastewater would be treated 100% aerobically. As previously mentioned, the CalEEMod User's Guide requires any changes to model

[11] Calculation Details for CalEEMod, *available at*: http://www.aqmd.gov/docs/default-source/caleemod/02_appendix-a2016-3-2.pdf?sfvrsn=6, p. 14

[12] CalEEMod User Guide, *available at:* http://www.caleemod.com/, p. 34.

defaults be justified.[13] According to the "User Entered Comments and Non-Default Data" table, the justification provided for these changes is: "WWTP 100% aerobic" (Appendix A, pp. 31, 78). Furthermore, the IS/MND states:

> "The project area is currently served by a six-inch sanitary sewer pipe in North First Street Wastewater in the project's surrounding area is treated at the San José/Santa Clara Regional Wastewater Facility (the Facility) in Alviso" (p. 176).

However, these changes remain unsupported. Review of the San José-Santa Clara Regional Wastewater Facilities treatment process reveals the use of anaerobic bacteria in the digesters phase of treatment. [14] As such, the assumption that the Project's wastewater would be treated 100% aerobically is incorrect and overestimated within the models.

This inconsistency presents an issue, as each type of wastewater treatment system is associated with different GHG emission factors, which are used by CalEEMod to calculate the Project's total GHG emissions.[15] Thus, by including incorrect wastewater treatment system percentages, the models may underestimate the Project's GHG emissions and should not be relied upon to determine Project significance.

Incorrect Application of Tier 3 Mitigation

Review of the CalEEMod output files demonstrates that the "Alviso Hotel, San Jose" model assumes that the Project's off-road construction equipment fleet would meet Tier 3 and Tier 4 Final emissions standards (see excerpt below) (Appendix A, pp. 31-32, 78-79).

[13] CalEEMod User Guide, *available at:* http://www.caleemod.com/, p. 1, 13-14.
[14] https://www.google.com/url?q=https://www.sanjoseca.gov/your-government/environment/water-utilities/regional-wastewater-facility/treatment-process&sa=D&source=docs&ust=1635443327123000&usg=AOvVaw3iBx5wItSPPUUcK4kJmjxv
[15] CalEEMod User Guide, *available at:* http://www.caleemod.com/, p. 45.

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3

As previously mentioned, the CalEEMod User's Guide requires any changes to model defaults be justified.[16] According to the "User Entered Comments and Non-Default Data" table, the justification provided for the inclusion of Tier 3 and Tier 4 Final mitigation is: "BMPs, Tier 3 mitigation" (Appendix A, pp. 31, 78). Furthermore, the IS/MND states:

> "Energy would not be wasted or used inefficiently by construction equipment, as the proposed project would include several measures to improve efficiency of the construction (e.g., limiting idling time or use U.S. EPA tiered equipment)" (p. 82).

However, the inclusion of Tier 3 and Tier 4 Final emissions standards remains unsupported for two reasons.

[16] CalEEMod User Guide, *available at:* http://www.aqmd.gov/docs/default-source/caleemod/01_user-39-s-guide2016-3-2_15november2017.pdf?sfvrsn=4, p. 1, 13-14.

First, while the IS/MND states that the Project would include U.S. EPA tiered equipment as a measure to improve construction efficiency, the inclusion of tiered equipment is not mentioned elsewhere. Furthermore, the IS/MND fails to specify which tier of construction equipment the Project would allegedly use during construction. As such, we cannot verify the inclusion of Tier 3 and Tier 4 Final emissions standards.

Second, according to the Association of Environmental Professionals ("AEP") *CEQA Portal Topic Paper* on mitigation measures:

> "While not 'mitigation', a good practice is to include those project design feature(s) that address environmental impacts in the mitigation monitoring and reporting program (MMRP). Often the MMRP is all that accompanies building and construction plans through the permit process. If the design features are not listed as important to addressing an environmental impact, it is easy for someone not involved in the original environmental process to approve a change to the project that could eliminate one or more of the design features without understanding the resulting environmental impact" (emphasis added).[17]

As you can see in the excerpts above, measures that are not formally included in the mitigation monitoring and reporting program ("MMRP") may be eliminated from the Project's design altogether. Thus, as the use of Tier 3 and Tier 4 Final construction equipment is not formally included as a mitigation measure, we cannot guarantee that the emission standards would be implemented, monitored, and enforced on the Project site. Thus, the model's assumption that the off-road construction equipment fleet would meet Tier 3 and Tier 4 emissions standards is incorrect.

Incorrect Application of Energy-Related Operational Mitigation Measure

Review of the CalEEMod output files demonstrates that the "Alviso Hotel, San Jose" and "Alviso Hotel, San Jose – 2030" models include the following energy-related mitigation measure (see excerpt below) (Appendix A, pp. 68, 100).

5.1 Mitigation Measures Energy

Percent of Electricity Use Generated with Renewable Energy

As previously mentioned, the CalEEMod User's Guide requires any changes to model defaults be justified.[18] According to the "User Entered Comments & Non-Default Data" table, the justification provided for this inclusion is:

> "SJCE is the electrciity provider in San Jose. Will provide 100% carbon free electricity from 2021 on" (Appendix A, pp. 31, 78).

[17] "CEQA Portal Topic Paper Mitigation Measures." AEP, February 2020, *available at:* https://ceqaportal.org/tp/CEQA%20Mitigation%202020.pdf, p. 6.
[18] CalEEMod User Guide, *available at:* http://www.caleemod.com/, p. 1, 13-14.

However, this justification remains insufficient, as the above-mentioned energy-related mitigation measure refers to renewable energy generation *on-site*.[19] As such, electricity from the grid is not applicable and the inclusion of the energy-related operational mitigation measure in the models is incorrect. By incorrectly including an operational mitigation measure, the models overestimate the reduction to the Project's operational emissions and should not be relied upon to determine Project significance.

Diesel Particulate Matter Health Risk Emissions Inadequately Evaluated

The IS/MND estimates that the maximum excess cancer risk posed to nearby, existing sensitive receptors as a result of Project construction would be 0.3 in one million, which would not exceed the BAAQMD significance threshold of 10 in one million (see excerpt below) (p. 47, Table 4.3-6).

Table 4.3-6: Construction Risk of Impacts at the Off-site Receptors

Source	Cancer Risk (per million)	Annual $PM_{2.5}$ ($\mu g/m^3$)	Hazard Index
Project Impacts			
Project Construction	0.3 (infant)	<0.01	<0.01
BAAQMD Single-Source Threshold	**>10.0**	**>0.3**	**>1.0**
Exceed Threshold?	No	No	No
Mayne Elementary School Student Receptors			
Project Construction	0.1 (child)	<0.01	<0.01
BAAQMD Single-Source Threshold	**>10.0**	**>0.3**	**>1.0**
Exceeds Threshold?	No	No	No
Cumulative Sources			
SR 237	9.4	0.19	--
South Bay Development, LLC	<0.1	--	--
Verizon Wireless	0.3	--	--
Combined Sources	10.1 (infant)	<0.20	<0.01
BAAQMD Cumulative Significance Threshold	**>100**	**>0.8**	**>10.0**
Exceed Threshold?	No	No	No

Furthermore, regarding the health risk impacts associated with Project operation, the IS/MND states:

> "The project would generate some traffic consisting of light-duty vehicles. However, the number of net daily trips generated by the project would be small in relation to existing traffic volumes on surrounding roadways (i.e., 1,642 daily trips, see Section 4.17 Transportation) and emissions from automobile traffic generated by the project would be spread out over a broad geographical area and would not be localized. Project traffic was not considered a source of substantial TACs or PM2.5" (p. 44).

As demonstrated above, the IS/MND concludes that the Project would result in a less-than-significant operational health risk impact because Project-generated traffic would not result in significant toxic air

[19] CalEEMod User Guide, *available at:* http://www.caleemod.com/, p. 58-59.

contaminant ("TAC") emissions. However, the IS/MND's evaluation of the Project's potential health risk impacts, as well as the subsequent less-than-significant impact conclusion, is incorrect for three reasons.

First, by failing to prepare a quantified operational HRA, the Project is inconsistent with CEQA's requirement to correlate the increase in emissions that the Project would generate to the adverse impacts on human health caused by those emissions. Despite the IS/MND's qualitative claim that daily trips generated by the project would be small in relation to existing traffic volumes, the Project's anticipated 1,642 average daily vehicle trips will generate additional exhaust emissions and expose nearby sensitive receptors to diesel particulate matter ("DPM") emissions regardless (p. 44). However, the IS/MND fails to evaluate the potential TACs associated with Project operation and the concentrations at which such pollutants would trigger adverse health effects. Thus, without making a reasonable effort to connect the Project's operational TAC emissions to the potential health risks posed to nearby receptors, the Project is inconsistent with CEQA's requirement to correlate the increase in TAC emissions with potential adverse impacts on human health.

Second, the Office of Environmental Health Hazard Assessment ("OEHHA"), the organization responsible for providing guidance on conducting HRAs in California, released its most recent *Risk Assessment Guidelines: Guidance Manual for Preparation of Health Risk Assessments* in February 2015, as referenced by the AQ & GHG Assessment (Appendix A, p. 2).[20] The OEHHA document recommends that exposure from projects lasting more than 6 months be evaluated for the duration of the project and recommends that an exposure duration of 30 years be used to estimate individual cancer risk for the maximally exposed individual resident ("MEIR").[21] Even though we were not provided with the expected lifetime of the Project, we can reasonably assume that the Project will operate for at least 30 years, if not more. Therefore, we recommend that health risk impacts from Project operation also be evaluated, as a 30-year exposure duration vastly exceeds the 6-month requirement set forth by OEHHA. This recommendation reflects the most recent state health risk policies, and as such, we recommend that an analysis of health risk impacts posed to nearby sensitive receptors from Project operation be included in an EIR for the Project.

Third, the BAAQMD requires projects within 1,000 feet of an existing sensitive receptor or source to evaluate the cancer risk associated with Project operation (see excerpt below):[22]

[20] "Risk Assessment Guidelines Guidance Manual for Preparation of Health Risk Assessments." OEHHA, February 2015, *available at:* http://oehha.ca.gov/air/hot_spots/hotspots2015.html

[21] "Risk Assessment Guidelines Guidance Manual for Preparation of Health Risk Assessments." OEHHA, February 2015, *available at:* http://oehha.ca.gov/air/hot_spots/2015/2015GuidanceManual.pdf, p. 8-6, 8-15

[22] "California Environmental Quality Act Air Quality Guidelines." BAAQMD, May 2017, *available at*: https://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa_guidelines_may2017-pdf.pdf?la=en, p. 2-2, Table 2-1.

Table 2-1 Air Quality CEQA Thresholds of Significance*		
Pollutant	**Construction-Related**	**Operational-Related**
Project-Level		
Risk and Hazards for new sources and receptors (Individual Project)*	Same as Operational Thresholds**	Compliance with Qualified Community Risk Reduction Plan OR Increased cancer risk of >10.0 in a million Increased non-cancer risk of > 1.0 Hazard Index (Chronic or Acute) Ambient $PM_{2.5}$ increase: > 0.3 µg/m^3 annual average Zone of Influence: 1,000-foot radius from property line of source or receptor

Furthermore, the IS/MND indicates that "[t]he closest sensitive receptors to the site are the children at the Mayne Elementary School, approximately 680 feet to the north, and the single-family residences, approximately 1,000 feet north of the site" (p. 45). As such, pursuant to the BAAQMD, an analysis of the health risk posed to nearby, existing receptors from both Project operation should have been conducted.

Fourth, by claiming a less than significant impact without conducting a quantified operational HRA for nearby, existing sensitive receptors, the IS/MND fails to compare the excess health risk impact to the applicable BAAQMD threshold of 10 in one million.[23] Specifically, regarding the operational TAC emissions threshold, the BAAQMD states:

> "The Lead Agency shall determine whether operational-related TAC and $PM_{2.5}$ emissions generated as part of a proposed project siting a new source or receptor would expose existing or new receptors to levels that exceed BAAQMD's applicable Thresholds of Significance stated below:
>
> - Compliance with a qualified Community Risk Reduction Plan;
> - An excess cancer risk level of more than 10 in one million…"[24]

Thus, pursuant to CEQA and the BAAQMD, an analysis of the health risk posed to nearby, existing receptors from Project operation should have been conducted.

Fifth, while the IS/MND includes an HRA evaluating the health risk impacts to nearby, existing receptors as a result of Project construction, the HRA fails to evaluate the cumulative lifetime cancer risk to nearby, existing receptors as a result of Project construction and operation together. According to OEHHA guidance, as referenced by the AQ & GHG Assessment, "the excess cancer risk is calculated separately for each age grouping and then summed to yield cancer risk at the receptor location"

[23] "California Environmental Quality Act Air Quality Guidelines." BAAQMD, May 2017, *available at*: https://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa_guidelines_may2017-pdf.pdf?la=en, p. 2-5.
[24] "California Environmental Quality Act Air Quality Guidelines." BAAQMD, May 2017, *available at*: https://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa_guidelines_may2017-pdf.pdf?la=en, p. 5-3.

(Appendix A, p. 2).[25] However, the IS/MND's HRA fails to sum each age bin to evaluate the total cancer risk over the course of the Project's total construction and operation. This is incorrect and thus, an updated analysis should quantify the entirety of the Project's construction and operational health risks and then sum them to compare to the BAAQMD threshold of 10 in one million, as referenced by the IS/MND (p. 39, Table 4.3-2).

Screening-Level Analysis Demonstrates Significant Impacts

In order to conduct our screening-level risk assessment, we relied upon AERSCREEN, a screening level air quality dispersion model.[26] The model replaced SCREEN3, and AERSCREEN is included in the OEHHA[27] and the California Air Pollution Control Officers Associated ("CAPCOA")[28] guidance as the appropriate air dispersion model for Level 2 health risk screening assessments ("HRSAs"). A Level 2 HRSA utilizes a limited amount of site-specific information to generate maximum reasonable downwind concentrations of air contaminants to which nearby sensitive receptors may be exposed. If an unacceptable air quality hazard is determined to be possible using AERSCREEN, a more refined modeling approach is required prior to approval of the Project.

We prepared a preliminary HRA of the Project's operational health risk impact to nearby sensitive receptors using the Project's annual PM_{10} exhaust estimates. Consistent with recommendations set forth by OEHHA, we assumed residential exposure begins during the third trimester stage of life. Subtracting the 478-day construction period from the total residential duration of 30 years, we assumed that after Project construction, the sensitive receptor would be exposed to the Project's operational DPM for an additional 28.69 years, approximately. The IS/MND's annual CalEEMod output file indicates that operational activities will generate approximately 53 pounds of DPM per year throughout operation.[29] The AERSCREEN model relies on a continuous average emission rate to simulate maximum downward concentrations from point, area, and volume emission sources. To account for the variability in equipment usage and truck trips over Project operation, we calculated an average DPM emission rate by the following equation:

$$Emission\ Rate\ \left(\frac{grams}{second}\right) = \frac{53.4\ lbs}{365\ days} \times \frac{453.6\ grams}{lbs} \times \frac{1\ day}{24\ hours} \times \frac{1\ hour}{3{,}600\ seconds} = 0.000768\ \boldsymbol{g/s}$$

Using this equation, we estimated an operational emission rate of 0.000768 g/s. Construction and operational activity was simulated as a 6.23-acre rectangular area source in AERSCREEN with approximate dimensions of 225 by 112 meters. A release height of three meters was selected to represent the height of exhaust stacks on operational equipment and other heavy-duty vehicles, and an

[25] "Guidance Manual for preparation of Health Risk Assessments." OEHHA, February 2015, *available at:* https://oehha.ca.gov/media/downloads/crnr/2015guidancemanual.pdf p. 8-4
[26] U.S. EPA (April 2011) AERSCREEN Released as the EPA Recommended Screening Model, http://www.epa.gov/ttn/scram/guidance/clarification/20110411_AERSCREEN_Release_Memo.pdf
[27] OEHHA (February 2015) Risk Assessment Guidelines Guidance Manual for Preparation of Health Risk Assessments, https://oehha.ca.gov/media/downloads/crnr/2015guidancemanual.pdf.
[28] CAPCOA (July 2009) Health Risk Assessments for Proposed Land Use Projects, http://www.capcoa.org/wp-content/uploads/2012/03/CAPCOA_HRA_LU_Guidelines_8-6-09.pdf.
[29] See Attachment A for calculations.

initial vertical dimension of one and a half meters was used to simulate instantaneous plume dispersion upon release. An urban meteorological setting was selected with model-default inputs for wind speed and direction distribution.

The AERSCREEN model generates maximum reasonable estimates of single-hour DPM concentrations from the Project site. EPA guidance suggests that in screening procedures, the annualized average concentration of an air pollutant be estimated by multiplying the single-hour concentration by 10%.[30] According to the IS/MND, the nearest sensitive receptors are single-family residences located approximately 1,000 feet, or 305 meters, from the Project (p. 45). Thus, the single-hour concentration estimated by AERSCREEN for Project construction is approximately 0.229 $\mu g/m^3$ DPM at approximately 300 meters downwind. Multiplying this single-hour concentration by 10%, we get an annualized average concentration of 0.0229 $\mu g/m^3$ for Project operation at the MEIR.

We calculated the excess cancer risk to the MEIR using applicable HRA methodologies prescribed by OEHHA, as referenced by the AQ & GHG Assessment (Appendix A, p. 2). Consistent with the 478-day construction schedule utilized in the Project's CalEEMod output files, the annualized averaged concentration for operation was used for the latter 0.94 years of the infant stage of life (0 – 2 years), as well as the entire child (2 – 16 years) and adult (16 – 30 years) stages of life.

Consistent with the IS/MND's construction HRA, provided in the AQ & GHG Report, we used Age Sensitivity Factors ("ASFs") to account for the heightened susceptibility of young children to the carcinogenic toxicity of air pollution (Appendix A, pp. 26). When applying ASFs, the quantified cancer risk should be multiplied by a factor of ten during the infant (0 – 2 years) stage of life, and a factor of three during the child stage of life (2 – 16 years). Furthermore, in accordance with the guidance set forth by OEHHA, we used the 95th percentile breathing rates for infants.[31] Finally, according to BAAQMD guidance, we used a Fraction of Time At Home ("FAH") value of 0.85 for the infant receptors, 0.72 for child receptors, and 0.73 for the adult receptors.[32] We also used a cancer potency factor of 1.1 $(mg/kg\text{-}day)^{-1}$ and an averaging time of 25,550 days. The results of our calculations are shown below.

[30] "Screening Procedures for Estimating the Air Quality Impact of Stationary Sources Revised." EPA, 1992, *available at*: http://www.epa.gov/ttn/scram/guidance/guide/EPA-454R-92-019_OCR.pdf; *see also* "Risk Assessment Guidelines Guidance Manual for Preparation of Health Risk Assessments." OEHHA, February 2015, *available at:* https://oehha.ca.gov/media/downloads/crnr/2015guidancemanual.pdf p. 4-36.

[31] SCAQMD (Jun 2015) Supplemental Guidelines for Preparing Risk Assessments for the Air Toxics 'Hot Spots' Information and Assessment Act, p. 19, http://www.aqmd.gov/docs/default-source/planning/risk-assessment/ab2588-risk-assessment-guidelines.pdf?sfvrsn=6;.

[32] "Air Toxics NSR Program Health Risk Assessment (HRA) Guidelines." BAAQMD, January 2016, *available at:* http://www.baaqmd.gov/~/media/files/planning-and-research/rules-and-regs/workshops/2016/reg-2-5/hra-guidelines_clean_jan_2016-pdf.pdf?la=en

The Maximally Exposed Individual at an Existing Residential Receptor							
Age Group	**Emissions Source**	**Duration** (years)	**Concentration** (ug/m3)	**Breathing Rate** (L/kg-day)	**Cancer Risk** (without ASFs*)	**ASF**	**Cancer Risk** (with ASFs*)
3rd Trimester	Construction	0.25	*	361	*	10	*
Infant (Age 0 - 2)	*Construction*	*1.06*	*	*1090*	*	10	**3.01E-06**
	Operation	*0.94*	*0.0229*	*1090*	*3.01E-07*		
	Total	2			3.01E-07		
Child (Age 2 - 16)	Operation	14	0.0229	572	1.99E-06	3	**5.97E-06**
Adult (Age 16 - 30)	Operation	14	0.0229	261	9.20E-07	1	**9.20E-07**
Lifetime		**30**			**3.21E-06**		**9.89E-06**

* Construction cancer risk calculated separately in the IS/MND.

As demonstrated in the table above, the excess cancer risks to infants, children, and adults at the MEIR located approximately 300 meters away, over the course of Project operation, are approximately 3.01, 5.97, and 0.92 in one million, respectively. The excess cancer risk associated with the Project operation over the course of a residential lifetime is approximately 9.89 in one million. When summing the Project's operational cancer risk, as estimated by SWAPE, with the IS/MND's construction-related cancer risk of 0.3 in one million, we estimate an excess cancer risk of approximately 10.19 in one million over the course of a residential lifetime (30 years) (p. 4.2-51, Table 4.2-14).[33] As such, the lifetime cancer risks exceed the BAAQMD threshold of 10 in one million, thus resulting in a potentially significant impact not previously addressed or identified by the IS/MND.

An agency must include an analysis of health risks that connects the Project's air emissions with the health risk posed by those emissions. Our analysis represents a screening-level HRA, which is known to be conservative and tends to err on the side of health protection. [34] The purpose of the screening-level construction and operational HRA shown above is to demonstrate the link between the proposed Project's emissions and the potential health risk. Our screening-level HRA demonstrates that construction and operation of the Project could result in a potentially significant health risk impact, when correct exposure assumptions and up-to-date, applicable guidance are used. Therefore, since our screening-level HRA indicates a potentially significant impact, an EIR should be prepared and include updated, quantified air pollution model as well as an updated, quantified refined HRA which adequately and accurately evaluates health risk impacts associated with both Project construction and operation.

[33] Calculated: 9.89 in one million + 0.3 in one million = 10.19 in one million.

[34] "Risk Assessment Guidelines Guidance Manual for Preparation of Health Risk Assessments." OEHHA, February 2015, *available at:* https://oehha.ca.gov/media/downloads/crnr/2015guidancemanual.pdf, p. 1-5

Greenhouse Gas

Failure to Adequately Evaluate Greenhouse Gas Impacts

The IS/MND relies upon the Project's consistency with the City's 2030 Greenhouse Gas Reduction Strategy ("GHGRS") in order to conclude that the Project would result in a less-than-significant greenhouse gas ("GHG") impact (p. 98-103, Table 4.8-1). However, review of the Greenhouse Gas Reduction Strategy Consistency Checklist ("Consistency Checklist"), provided as Appendix J to the IS/MND, reveals that the Project is inconsistent with numerous measures, including but not limited to those listed below:

City of San Jose 2030 Greenhouse Gas Reduction Strategy Compliance Checklist[35]	
Policies and Strategies	Consistency Discussion
2. Implementation of Green Building Measures ***MS-2.2:*** *Encourage maximized use of on-site generation of renewable energy for all new and existing buildings.*	Here, the Consistency Checklist states: "The project includes installation of solar panels on the rooftop of the hotel building. The project applicant is committed to the project being compliant with all mandatory applicable state and local green building and energy codes" (Appendix J, p. 1). However, this response is insufficient for two reasons. First, by simply stating that the Project would comply "with all mandatory applicable state and local green building and energy codes," the Project commits to the bare minimum requirements. As such, the Consistency Checklist fails to demonstrate that the Project would encourage maximized use of on-site renewable energy for all new and existing buildings. Second, the use of on-site renewable energy is not included as a formal mitigation measure. This is incorrect, as according to the AEP *CEQA Portal Topic Paper* on mitigation measures: "While not "mitigation", a good practice is to include those project design feature(s) that address environmental impacts in the mitigation monitoring and reporting program (MMRP). Often the MMRP is all that accompanies building and construction plans through the permit process. If the design features are not listed as important to addressing an environmental impact, it is easy for someone not involved in the original environmental process to approve a change to the project that could eliminate one or more of the design features without understanding the resulting environmental impact." [36] As you can see in the excerpt above, project design features

[35] "2030 Greenhouse Gas Reduction Strategy." City of San Jose, August 2020, *available at:* https://www.sanjoseca.gov/home/showpublisheddocument/63667/637347412207870000.
[36] "CEQA Portal Topic Paper Mitigation Measures." AEP, February 2020, *available at:* https://ceqaportal.org/tp/CEQA%20Mitigation%202020.pdf, p. 6.

	are not mitigation measures and may be eliminated from the Project's design. Here, as the IS/MND fails to require the Project to include solar panels on the rooftop of the hotel building, we cannot guarantee that this measure would be implemented, monitored, and enforced on the Project site. As a result, we are unable to verify the Project's consistency with the GHGRS, and the less-than-significant impact conclusion should not be relied upon.
2. Implementation of Green Building Measures ***MS-2.3:*** *Encourage consideration of solar orientation, including building placement, landscaping, design and construction techniques for new construction to minimize energy consumption.*	Here, the Consistency Checklist states: "The proposed project is located and designed to maximize sun exposure and reduce energy consumption. All building facades and hotel rooms include windows to maximize natural sunlight and reduce energy consumption for lighting and heating during winter months" (Appendix J, p. 1). However, this response is insufficient, as the IS/MND fails to mention any consideration of solar orientation in the Project Description. Furthermore, the IS/MND fails to indicate that the Project proposes to incorporate any actual design features to achieve this measure. As a result, we are unable to verify the Project's consistency with the GHGRS, and the less-than-significant impact conclusion should not be relied upon.
2. Implementation of Green Building Measures ***MS-2.7:*** *Encourage the installation of solar panels or other clean energy power generation sources over parking areas.*	Here, the Consistency Checklist states: "The project would not include solar panels over the parking garage; however, solar panels would be installed on the rooftop of the hotel building" (Appendix J, p. 1). However, this response is insufficient. By stating that the Project would not include solar panels over the parking garage, the Consistency Checklist indicates that the Project is inconsistent with this measure. As such, we are unable to verify the Project's consistency with the GHGRS, and the less-than-significant impact conclusion should not be relied upon.
2. Implementation of Green Building Measures ***MS-16.2:*** *Promote neighborhood-based distributed clean/renewable energy generation to improve local energy security and to reduce the amount of energy wasted in transmitting electricity over long distances.*	Here, the Consistency Checklist states: "The project applicant is committed to working with the city and the adjoining property owners towards supporting neighborhood-based distributed clean/ renewable energy generation when it becomes available in the area" (Appendix J, p. 2). However, this response is insufficient. Simply stating that the Project applicant would support neighborhood-based distributed clean/renewable energy generation fails to indicate any Project-specific measures that would encourage the promotion of this measure. Second, the Consistency Checklist states that the Project would promote neighborhood-based distributed clean/renewable energy "when it becomes available," but does not require it. As such, the Consistency Checklist fails to

	provide any evidence of concrete actions or measures proposed to satisfy this measure. As a result, we are unable to verify the Project's consistency with the GHGRS, and the less-than-significant impact conclusion should not be relied upon.
3. Pedestrian, Bicycle & Transit Site Design Measures ***CD-2.1:*** *Promote the Circulation Goals and Policies in the Envision San Jose 2040 General Plan. Create streets that promote pedestrian and bicycle transportation by following applicable and policies in the Circulation section of the Envision San Jose 2040 General Plan.* ***a)*** *Design the street network for its safe shared use by pedestrians, bicyclists, and vehicles. Include elements that increase driver awareness.* ***b)*** *Create a comfortable and safe pedestrian environment by implementing wider sidewalks, shade structures, attractive street furniture, street trees, reduced traffic speeds, pedestrian-oriented lighting, mid-block pedestrian crossings, pedestrian-activated crossing lights, bulb-outs and curb extensions at intersections, and on-street parking that buffers pedestrians from vehicles.* ***c)*** *Consider support for reduced parking requirements, alternative parking arrangements, and Transportation Demand Management strategies to reduce area dedicated to parking and increase area dedicated to employment, housing, parks, public art, or other amenities. Encourage de-coupled parking to ensure that the value and cost of parking are considered in real estate and business transactions.*	Here, the Consistency Checklist states: "The project includes an on-site connection to the Guadalupe River Trail at the southern limits of the site and currently proposes 20 long-term and six short-term bicycle parking spaces. Bicycle access would be provided via North First Street, where Class II bike lanes currently exist along the project frontage. Upon entering the project site at the Bay Vista driveway, a two-way path is provided along the east side of Bay Vista Drive. The path continues through the project site and provides access to the Guadalupe River Trail. This path would help prevent vehicle-bicycle conflicts on the project site. Pedestrian access would be provided via this path also. Within the project site, sidewalks would provide hotel access to and from the parking garage and surface parking areas. The project would not substantially increase hazards due to bicycles or pedestrians entering and exiting the project site" (Appendix J, p. 2). However, this response is insufficient, as the Consistency Checklist fails to mention elements that increase driver awareness, shade structures, attractive street furniture, street trees, reduced traffic speeds, pedestrian-oriented lighting, mid-block pedestrian crossings, pedestrian-activated crossing lights, bulb-outs and curb extensions at intersections, reduced parking requirements, Transportation Demand Management strategies, de-coupled parking, or on-street parking that buffers pedestrians from vehicles. As such, the Project fails to demonstrate consistency with all aspects of this measure. As a result, we are unable to verify the Project's consistency with the GHGRS, and the less-than-significant impact conclusion should not be relied upon.
3. Pedestrian, Bicycle & Transit Site Design Measures ***CD-2.5:*** *Integrate Green Building Goals and Policies of the Envision San José 2040 General Plan into site design to create healthful environments. Consider factors such as shaded parking areas, pedestrian connections, minimization of impervious surfaces, incorporation of stormwater treatment measures, appropriate building orientations, etc.*	Here, the Consistency Checklist states: "As discussed in Section 2.0, Project Information, the proposed project would include shaded parking in the lower levels of the parking structure, on-site bicycle parking, would plant 30 trees on-site and would include stormwater treatment measures consistent with City post construction requirements" (Appendix J, p. 3). However, this response is insufficient for two reasons. First, while the Consistency Checklist mentions shaded parking, on-site bicycle parking, planting trees, and

	stormwater treatment measures, these measures are not elaborated upon in Section 2.0 of the IS/MND. Second, as previously discussed, PDFs are not mitigation measures and may be eliminated from the Project's design. Here, the IS/MND fails to require any of the above-mentioned pedestrian, bicycle & transit site-design measures, we cannot guarantee that these measures would be implemented, monitored, and enforced on the Project site. As a result, we are unable to verify the Project's supposed consistency with this aspect of the GHGRS, and the less-than-significant impact conclusion should not be relied upon.
3. Pedestrian, Bicycle & Transit Site Design Measures ***CD-3.2:*** *Prioritize pedestrian and bicycle connections to transit, community facilities (including schools), commercial areas, and other areas serving daily needs. Ensure that the design of new facilities can accommodate significant anticipated future increases in bicycle and pedestrian activity.*	Here, the Consistency Checklist states: "The project includes an on-site connection to the Guadalupe River Trail at the southern limits of the site and currently proposes 20 long-term and three short-term bicycle parking spaces. Within the project site, sidewalks would provide hotel access to and from the parking garage and surface parking areas" (Appendix J, p. 7). However, this response is insufficient, as the Project fails to demonstrate that it would accommodate significant anticipated future increases in bicycle and pedestrian activity. As a result, we are unable to verify the Project's consistency with the GHGRS, and the less-than-significant impact conclusion should not be relied upon.
3. Pedestrian, Bicycle & Transit Site Design Measures ***TR-2.8:*** *Require new development to provide on-site facilities such as bicycle storage and showers, provide connections to existing and planned facilities, dedicate land to expand existing facilities or provide new facilities such as sidewalks and/or bicycle lanes/paths, or share in the cost of improvements.*	Here, the Consistency Checklist states: "The project would include 20 long-term and six short-term bicycle parking spaces" (Appendix J, p. 4). However, this response is insufficient. While the Consistency Checklist indicates that the Project would include bicycle parking, it fails to mention showers, connections to existing and planned facilities, expansions of existing facilities, new facilities, or contributing to the cost of improvements as required by the measure. As a result, we are unable to verify the Project's consistency with the GHGRS, and the less-than-significant impact conclusion should not be relied upon.
3. Pedestrian, Bicycle & Transit Site Design Measures ***TR-7.1:*** *Require large employers to develop TDM programs to reduce the vehicle trips and vehicle miles generated by their employees through the use of shuttles, provision for car-sharing, bicycle sharing, carpool, parking strategies, transit incentives and other measures.*	Here, the Consistency Checklist states: "The project would be required to implement a TDM program which would include measures to support reduced vehicle trips" (Appendix J, p. 4). However, this response is insufficient, as the IS/MND fails to mention or address a TDM program whatsoever. As a result, we are unable to verify the Project's consistency with the GHGRS, and the less-than-significant impact conclusion should not be relied upon.
3. Pedestrian, Bicycle & Transit Site Design Measures ***TR-8.5:*** *Promote participation in car share programs to minimize the need for parking spaces in new and existing development.*	Here, the Consistency Checklist states: "The project would be required to implement a TDM program which may include a car share program" (Appendix J, p. 4).

	However, this response is insufficient, as the IS/MND fails to mention or address a TDM program whatsoever. As a result, we are unable to verify the Project's consistency with the GHGRS, and the less-than-significant impact conclusion should not be relied upon.
4. Water Conservation and Urban Forestry Measures ***MS-3.1:*** *Require water-efficient landscaping, which conforms to the state's Model Water Efficient Landscape Ordinance (MWELO), for all new commercial, institutional, industrial, and developer-installed residential development unless for recreation needs or other area functions.*	Here, the Consistency Checklist states: "The proposed project would include use of low water use plants and irrigation systems consistent with the State's MWELO requirements" (Appendix J, p. 4). However, this response is insufficient for two reasons. First, simply stating that the Project would include low water use plants and water-efficient irrigation systems does not provide substantial evidence that these measures would be implemented, monitored, and enforced on the Project site. Second, even though the Project demonstrates consistency with the State's Model Water Efficient Landscape Ordinance does not guarantee that the Project would include water-efficient landscaping, as required by the measure. As such, we are unable to verify the Project's consistency with the GHGRS, and the less-than-significant impact conclusion should not be relied upon.
4. Water Conservation and Urban Forestry Measures ***MS-3.2:*** *Promote the use of green building technology or techniques that can help reduce the depletion of the City's potable water supply, as building codes permit. For example, promote the use of captured rainwater, graywater, or recycled water as the preferred source for non-potable water needs such as irrigation and building cooling, consistent with Building Codes or other regulations.*	Here, the Consistency Checklist states: "The project would utilize recycled water for landscape irrigation" (Appendix J, p. 4). However, this response is insufficient. Simply stating that the Project would "utilize recycled water for landscape irrigation" does not provide substantial evidence that this measure would be implemented, monitored, and enforced on the Project site. As a result, we are unable to verify the Project's consistency with the GHGRS, and the less-than-significant impact conclusion should not be relied upon.
4. Water Conservation and Urban Forestry Measures ***MS-19.4:*** *Require the use of recycled water wherever feasible and cost-effective to serve existing and new development.*	Here, the Consistency Checklist states: "The project would utilize recycled water for landscape irrigation" (Appendix J, p. 4). However, this response is insufficient. Simply stating that the Project would "utilize recycled water for landscape irrigation" does not provide substantial evidence that this measure would be implemented, monitored, and enforced on the Project site. As a result, we are unable to verify the Project's consistency with the GHGRS, and the less-than-significant impact conclusion should not be relied upon.
4. Water Conservation and Urban Forestry Measures ***MS-21.3:*** *Ensure that San José's Community Forest is comprised of species that have low water requirements and are well adapted to its Mediterranean climate. Select and plant diverse species to prevent monocultures that are vulnerable to pest invasions. Furthermore,*	Here, the Consistency Checklist states: "The proposed trees would have low water requirements and are suitable for San José's climate. The project would plant diverse species" (Appendix J, p. 5). However, this response is insufficient, as the IS/MND fails to mention or support the claim that the Project would incorporate trees that have low water requirements, and plant

consider the appropriate placement of tree species and their lifespan to ensure the perpetuation of the Community Forest.	diverse species. As a result, we cannot confirm that this measure would be implemented, monitored, and enforced on the Project site. Thus, we are unable to verify the Project's consistency with the GHGRS, and the less-than-significant impact conclusion should not be relied upon.
4. Water Conservation and Urban Forestry Measures ***MS-26.1:*** *As a condition of new development, require the planting and maintenance of both street trees and trees on private property to achieve a level of tree coverage in compliance with and that implements City laws, policies or guidelines.*	Here, the Consistency Checklist states: "The project would be required to comply with the City's tree replacement policy and would result in 30 trees being planted." (Appendix J, p. 5). However, this response is insufficient. Simply stating that the Project would comply with the City's tree replacement policy does not provide substantial evidence that this measure would be implemented, monitored, and enforced on the Project site. As a result, we are unable to verify the Project's consistency with the GHGRS, and the less-than-significant impact conclusion should not be relied upon.
4. Water Conservation and Urban Forestry Measures ***ER-8.7:*** *Encourage stormwater reuse for beneficial uses in existing infrastructure and future development through the installation of rain barrels, cisterns, or other water storage and reuse facilities.*	Here, the Consistency Checklist states: "The proposed project includes water-efficient landscaping that does not warrant use of irrigation such that rain barrels, cisterns, or water storage facilities would be necessary" (Appendix J, p. 5). However, this response is insufficient. Simply stating that the Project would include water-efficient landscaping does not excuse the installation of measures such as rain barrels, cisterns, or water storage facilities that would encourage stormwater reuse on the Project site. As a result, we are unable to verify the Project's consistency with the GHGRS, and the less-than-significant impact conclusion should not be relied upon.
Renewable Energy Development 1. *Install solar panels, solar hot water, or other clean energy power generation sources on development sites, or* 2. *Participate in community solar programs to support development of renewable energy in the community, or* 3. *Participate in San José Clean Energy at the Total Green level (i.e., 100% carbon-free electricity) for electricity accounts associated with the project.* 4. *Supports Strategies: GHGRS #1, GHGRS #3*	Here, the Consistency Checklist states: "The project includes installation of solar panels on the rooftop of the hotel building" (Appendix J, p. 5). However, this response is insufficient, as the use of on-site renewable energy is not included as a mitigation measure. As previously discussed, PDFs are not mitigation measures and may be eliminated from the Project's design. Here, the IS/MND fails to require the Project to install solar panels on the rooftop of the hotel building, we cannot guarantee that this measure would be implemented, monitored, and enforced on the Project site. As a result, we are unable to verify the Project's consistency with the GHGRS, and the less-than-significant impact conclusion should not be relied upon.
Zero Waste Goal 5. *Provide space for organic waste (e.g., food scraps, yard waste) collection containers, and/or* 6. *Exceed the City's construction &*	Here, the Consistency Checklist states: "Organic waste containers will not be provided for the proposed hotel. However, the proposed project would meet the City's construction and demolition waste diversion requirements" (Appendix J, p. 6). However, this response is insufficient, as the IS/MND only

demolition waste diversion requirement.	claims that the Project would "meet the City's construction and demolition waste diversion requirements," not exceed, as the measure mandates. As a result, we are unable to verify the Project's consistency with the GHGRS, and the less-than-significant impact conclusion should not be relied upon.
Caltrain Modernization 1. *For projects located within 1/2 mile of a Caltrain station, establish a program through which to provide project tenants and/or residents with free or reduced Caltrain passes; or* 2. *Develop a program that provides project tenants and/or residents with options to reduce their vehicle miles traveled (e.g., a TDM program), which could include transit passes, bike lockers and showers, or other strategies to reduce project related VMT.* 3. ***Supports Strategies: GHGRS #6***	Here, the Consistency Checklist states: "The project would be required to implement a TDM program which would include measures to support reduced vehicle trips" (Appendix J, p. 6). However, this justification is insufficient. While the Consistency Checklist mentions developing a TDM program, the IS/MND and associated documents fail to provide any evidence of concrete actions or proposed measures incorporating this strategy. As a result, we are unable to verify the Project's consistency with the GHGRS, and the less-than-significant impact conclusion should not be relied upon.
Water Conservation 1. *Install high-efficiency appliances/fixtures to reduce water use, and/or include water-sensitive landscape design, and/or* 2. *Provide access to reclaimed water for outdoor water use on the project site.*	Here, the Consistency Checklist states: "The proposed project would include high-efficiency fixtures to reduce water usage and would utilize recycled water for landscape irrigation." (Appendix J, p. 6). However, these responses are insufficient for two reasons. First, the IS/MND fails to mention or support the claim that the Project would "utilize recycled water for landscape irrigation." Second, as previously discussed, PDFs are not mitigation measures and may be eliminated from the Project's design. Here, the IS/MND fails to require "high-efficiency fixtures" or the use of "recycled water for landscape irrigation" through mitigation. As such, we cannot guarantee that this measure would be implemented, monitored, and enforced on the Project site. As a result, we are unable to verify the Project's consistency with the GHGRS, and the less-than-significant impact conclusion should not be relied upon.

As the above table indicates, the IS/MND fails to provide sufficient information and analysis to determine Project consistency with all of the measures required by the GHGRS. As a result, we cannot verify that the Project is consistent with the GHGRS, and the IS/MND's less-than-significant GHG impact conclusion should not be relied upon. We recommend that an EIR include further information and analysis demonstrating the Project's consistency with the GHGRS.

Design Features Should Be Included as Mitigation Measures

Our analysis demonstrates that the Project would result in potentially significant health risk and GHG impacts that should be mitigated further. We recommend that the IS/MND implement all project design features and regulatory compliance measures as formal mitigation measures. As a result, we could

guarantee that these measures would be implemented, monitored, and enforced on the Project site. Including formal mitigation measures by properly committing to their implementation would result in verifiable emissions reductions that may help reduce emissions to less-than-significant levels.

Disclaimer

SWAPE has received limited discovery regarding this project. Additional information may become available in the future; thus, we retain the right to revise or amend this report when additional information becomes available. Our professional services have been performed using that degree of care and skill ordinarily exercised, under similar circumstances, by reputable environmental consultants practicing in this or similar localities at the time of service. No other warranty, expressed or implied, is made as to the scope of work, work methodologies and protocols, site conditions, analytical testing results, and findings presented. This report reflects efforts which were limited to information that was reasonably accessible at the time of the work, and may contain informational gaps, inconsistencies, or otherwise be incomplete due to the unavailability or uncertainty of information obtained or provided by third parties.

Sincerely,

Matt Hagemann, P.G., C.Hg.

Paul E. Rosenfeld, Ph.D.

Attachment A: Health Risk Calculations
Attachment B: AERSCREEN Output Files
Attachment C: Matt Hagemann CV
Attachment D: Paul E. Rosenfeld CV

Operation	
Emission Rate	
Annual Emissions (tons/year)	0.0267
Daily Emissions (lbs/day)	0.14630137
Emission Rate (g/s)	0.000768082
Release Height (meters)	3
Total Acreage	6.23
Max Horizontal (meters)	224.55
Min Horizontal (meters)	112.28
Initial Vertical Dimension (meters)	1.5
Setting	Urban
Population	1,028,000
Total Pounds of DPM	
Total DPM (lbs)	53.4

Start date and time 11/10/21 12:22:35

AERSCREEN 16216

Alviso Hotel Operation

Alviso Hotel Operation

---------- DATA ENTRY VALIDATION ----------

	METRIC	ENGLISH
** AREADATA **	---	---
Emission Rate:	0.768E-03 g/s	0.610E-02 lb/hr
Area Height:	3.00 meters	9.84 feet
Area Source Length:	224.55 meters	736.71 feet
Area Source Width:	112.28 meters	368.37 feet
Vertical Dimension:	1.50 meters	4.92 feet
Model Mode:	URBAN	
Population:	1028000	
Dist to Ambient Air:	1.0 meters	3. feet

** BUILDING DATA **

No Building Downwash Parameters

** TERRAIN DATA **

No Terrain Elevations

Source Base Elevation: 0.0 meters 0.0 feet

Probe distance: 5000. meters 16404. feet

No flagpole receptors

No discrete receptors used

** FUMIGATION DATA **

No fumigation requested

** METEOROLOGY DATA **

Min/Max Temperature: 250.0 / 310.0 K -9.7 / 98.3 Deg F

Minimum Wind Speed: 0.5 m/s

Anemometer Height: 10.000 meters

Dominant Surface Profile: Urban

Dominant Climate Type: Average Moisture

Surface friction velocity (u*): not adjusted

DEBUG OPTION ON

AERSCREEN output file:

2021.11.10_AlvisoHotel_Operation.out

*** AERSCREEN Run is Ready to Begin

No terrain used, AERMAP will not be run

****

SURFACE CHARACTERISTICS & MAKEMET

Obtaining surface characteristics...

Using AERMET seasonal surface characteristics for Urban with Average Moisture

Season	Albedo	Bo	zo
Winter	0.35	1.50	1.000
Spring	0.14	1.00	1.000
Summer	0.16	2.00	1.000
Autumn	0.18	2.00	1.000

Creating met files aerscreen_01_01.sfc & aerscreen_01_01.pfl

Creating met files aerscreen_02_01.sfc & aerscreen_02_01.pfl

Creating met files aerscreen_03_01.sfc & aerscreen_03_01.pfl

Creating met files aerscreen_04_01.sfc & aerscreen_04_01.pfl

Buildings and/or terrain present or rectangular area source, skipping probe

FLOWSECTOR started 11/10/21 12:24:34

****

Running AERMOD

Processing Winter

Processing surface roughness sector 1

```
**************************************************
Processing wind flow sector   1

 AERMOD Finishes Successfully for FLOWSECTOR stage 2 Winter sector   0

    ********   WARNING MESSAGES   ********
               ***  NONE  ***

**************************************************
Processing wind flow sector   2

 AERMOD Finishes Successfully for FLOWSECTOR stage 2 Winter sector   5

    ********   WARNING MESSAGES   ********
               ***  NONE  ***

**************************************************
Processing wind flow sector   3

 AERMOD Finishes Successfully for FLOWSECTOR stage 2 Winter sector  10

    ********   WARNING MESSAGES   ********
               ***  NONE  ***
```

```
**************************************************

Processing wind flow sector   4

 AERMOD Finishes Successfully for FLOWSECTOR stage 2 Winter sector  15

    ********   WARNING MESSAGES   ********

               ***  NONE  ***

**************************************************

Processing wind flow sector   5

 AERMOD Finishes Successfully for FLOWSECTOR stage 2 Winter sector  20

    ********   WARNING MESSAGES   ********

               ***  NONE  ***

**************************************************

Processing wind flow sector   6

 AERMOD Finishes Successfully for FLOWSECTOR stage 2 Winter sector  25

    ********   WARNING MESSAGES   ********

               ***  NONE  ***

**************************************************
```

```
Processing wind flow sector   7

 AERMOD Finishes Successfully for FLOWSECTOR stage 2 Winter sector  30

    ********   WARNING MESSAGES   ********

               ***  NONE  ***

 *****************************************

  Running AERMOD

 Processing Spring

Processing surface roughness sector  1

**************************************************

Processing wind flow sector   1

 AERMOD Finishes Successfully for FLOWSECTOR stage 2 Spring sector   0

    ********   WARNING MESSAGES   ********

               ***  NONE  ***

**************************************************

Processing wind flow sector   2

 AERMOD Finishes Successfully for FLOWSECTOR stage 2 Spring sector   5
```

```
    ********   WARNING MESSAGES   ********

               ***  NONE  ***


**************************************************
Processing wind flow sector   3

 AERMOD Finishes Successfully for FLOWSECTOR stage 2 Spring sector  10

    ********   WARNING MESSAGES   ********

               ***  NONE  ***


**************************************************
Processing wind flow sector   4

 AERMOD Finishes Successfully for FLOWSECTOR stage 2 Spring sector  15

    ********   WARNING MESSAGES   ********

               ***  NONE  ***


**************************************************
Processing wind flow sector   5

 AERMOD Finishes Successfully for FLOWSECTOR stage 2 Spring sector  20
```

```
    ********   WARNING MESSAGES   ********

               ***  NONE  ***


**************************************************

Processing wind flow sector   6


 AERMOD Finishes Successfully for FLOWSECTOR stage 2 Spring sector  25


    ********   WARNING MESSAGES   ********

               ***  NONE  ***


**************************************************

Processing wind flow sector   7


 AERMOD Finishes Successfully for FLOWSECTOR stage 2 Spring sector  30


    ********   WARNING MESSAGES   ********

               ***  NONE  ***
 ****************************************


  Running AERMOD

 Processing Summer


Processing surface roughness sector  1
```

```
**************************************************

Processing wind flow sector   1

 AERMOD Finishes Successfully for FLOWSECTOR stage 2 Summer sector   0

    ********   WARNING MESSAGES   ********

               ***  NONE  ***

**************************************************

Processing wind flow sector   2

 AERMOD Finishes Successfully for FLOWSECTOR stage 2 Summer sector   5

    ********   WARNING MESSAGES   ********

               ***  NONE  ***

**************************************************

Processing wind flow sector   3

 AERMOD Finishes Successfully for FLOWSECTOR stage 2 Summer sector  10

    ********   WARNING MESSAGES   ********

               ***  NONE  ***

**************************************************
```

```
Processing wind flow sector   4

 AERMOD Finishes Successfully for FLOWSECTOR stage 2 Summer sector  15

    ********   WARNING MESSAGES   ********
               ***  NONE  ***

**************************************************
Processing wind flow sector   5

 AERMOD Finishes Successfully for FLOWSECTOR stage 2 Summer sector  20

    ********   WARNING MESSAGES   ********
               ***  NONE  ***

**************************************************
Processing wind flow sector   6

 AERMOD Finishes Successfully for FLOWSECTOR stage 2 Summer sector  25

    ********   WARNING MESSAGES   ********
               ***  NONE  ***

**************************************************
Processing wind flow sector   7
```

```
 AERMOD Finishes Successfully for FLOWSECTOR stage 2 Summer sector  30


    ********   WARNING MESSAGES   ********

               ***  NONE  ***

 *****************************************


  Running AERMOD

 Processing Autumn


Processing surface roughness sector  1


**************************************************

Processing wind flow sector   1


 AERMOD Finishes Successfully for FLOWSECTOR stage 2 Autumn sector   0


    ********   WARNING MESSAGES   ********

               ***  NONE  ***


**************************************************

Processing wind flow sector   2


 AERMOD Finishes Successfully for FLOWSECTOR stage 2 Autumn sector   5
```

```
    ********   WARNING MESSAGES   ********

               ***  NONE  ***


**************************************************

Processing wind flow sector   3


 AERMOD Finishes Successfully for FLOWSECTOR stage 2 Autumn sector  10


    ********   WARNING MESSAGES   ********

               ***  NONE  ***


**************************************************

Processing wind flow sector   4


 AERMOD Finishes Successfully for FLOWSECTOR stage 2 Autumn sector  15


    ********   WARNING MESSAGES   ********

               ***  NONE  ***


**************************************************

Processing wind flow sector   5


 AERMOD Finishes Successfully for FLOWSECTOR stage 2 Autumn sector  20


    ********   WARNING MESSAGES   ********
```

```
               ***  NONE  ***

**************************************************
Processing wind flow sector   6

 AERMOD Finishes Successfully for FLOWSECTOR stage 2 Autumn sector  25

    ********   WARNING MESSAGES   ********
               ***  NONE  ***

**************************************************
Processing wind flow sector   7

 AERMOD Finishes Successfully for FLOWSECTOR stage 2 Autumn sector  30

    ********   WARNING MESSAGES   ********
               ***  NONE  ***

FLOWSECTOR   ended 11/10/21 12:24:46

REFINE       started 11/10/21 12:24:46

 AERMOD Finishes Successfully for REFINE stage 3 Winter sector   0

    ********   WARNING MESSAGES   ********
```

*** NONE ***

REFINE ended 11/10/21 12:24:48

****

AERSCREEN Finished Successfully

With no errors or warnings

Check log file for details

****

Ending date and time 11/10/21 12:24:50

Concentration	Distance	Elevation	Diag	Season/Month	Zo sector	Date	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS	HT	REF TA	HT
0.77611E+00	1.00	0.00	0.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.50	0.35	0.50	10.0	310.0	2.0
0.83738E+00	25.00	0.00	0.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.50	0.35	0.50	10.0	310.0	2.0
0.88919E+00	50.00	0.00	0.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.50	0.35	0.50	10.0	310.0	2.0
0.94310E+00	75.00	0.00	0.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.50	0.35	0.50	10.0	310.0	2.0
0.98267E+00	100.00	0.00	5.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.50	0.35	0.50	10.0	310.0	2.0
* 0.10012E+01	113.00	0.00	5.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.50	0.35	0.50	10.0	310.0	2.0
0.93887E+00	125.00	0.00	25.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.50	0.35	0.50	10.0	310.0	2.0
0.61874E+00	150.00	0.00	20.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.50	0.35	0.50	10.0	310.0	2.0
0.47970E+00	175.00	0.00	0.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.50	0.35	0.50	10.0	310.0	2.0
0.39918E+00	200.00	0.00	0.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.50	0.35	0.50	10.0	310.0	2.0
0.33963E+00	225.00	0.00	0.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.50	0.35	0.50	10.0	310.0	2.0
0.29397E+00	250.00	0.00	0.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.50	0.35	0.50	10.0	310.0	2.0
0.25800E+00	275.00	0.00	0.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.50	0.35	0.50	10.0	310.0	2.0
0.22904E+00	300.00	0.00	0.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.50	0.35	0.50	10.0	310.0	2.0
0.20531E+00	325.00	0.00	0.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.50	0.35	0.50	10.0	310.0	2.0
0.18561E+00	350.00	0.00	0.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.50	0.35	0.50	10.0	310.0	2.0
0.16899E+00	375.00	0.00	0.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.50	0.35	0.50	10.0	310.0	2.0
0.15474E+00	400.00	0.00	0.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.50	0.35	0.50	10.0	310.0	2.0
0.14252E+00	425.00	0.00	0.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.50	0.35	0.50	10.0	310.0	2.0
0.13181E+00	450.00	0.00	0.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.50	0.35	0.50	10.0	310.0	2.0
0.12248E+00	475.00	0.00	0.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.50	0.35	0.50	10.0	310.0	2.0
0.11431E+00	500.00	0.00	0.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.50	0.35	0.50	10.0	310.0	2.0
0.10696E+00	525.00	0.00	0.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.50	0.35	0.50	10.0	310.0	2.0
0.10037E+00	550.00	0.00	0.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.50	0.35	0.50	10.0	310.0	2.0
0.94468E-01	575.00	0.00	0.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.50	0.35	0.50	10.0	310.0	2.0
0.89167E-01	600.00	0.00	0.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0							

1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.84381E-01 625.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.80016E-01 650.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.76006E-01 675.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.72342E-01 700.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.68983E-01 725.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.65868E-01 750.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.62994E-01 775.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.60335E-01 800.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.57869E-01 825.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.55576E-01 850.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.53421E-01 875.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.51403E-01 900.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.49515E-01 925.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.47746E-01 950.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.46086E-01 975.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.44524E-01 1000.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.43054E-01 1025.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.41667E-01 1050.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.40357E-01 1075.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.39118E-01 1100.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.37945E-01 1125.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.36827E-01 1150.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.35764E-01 1175.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.34755E-01 1200.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.33794E-01 1225.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.32879E-01 1250.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.32003E-01 1275.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0

1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.31164E-01 1300.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.30364E-01 1325.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.29598E-01 1350.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.28866E-01 1375.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.28165E-01 1400.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.27495E-01 1425.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.26851E-01 1450.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.26233E-01 1475.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.25639E-01 1500.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.25068E-01 1525.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.24519E-01 1550.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.23991E-01 1575.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.23483E-01 1600.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.22992E-01 1625.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.22520E-01 1650.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.22064E-01 1675.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.21624E-01 1700.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.21199E-01 1725.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.20789E-01 1750.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.20391E-01 1775.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.20006E-01 1800.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.19635E-01 1825.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.19276E-01 1850.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.18927E-01 1875.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.18590E-01 1900.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.18264E-01 1925.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.17947E-01 1950.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0

1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.17639E-01 1975.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.17341E-01 2000.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.17051E-01 2025.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.16770E-01 2050.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.16496E-01 2075.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.16311E-01 2100.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.16049E-01 2125.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.15793E-01 2150.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.15545E-01 2175.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.15304E-01 2200.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.15069E-01 2225.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.14840E-01 2250.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.14617E-01 2275.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.14400E-01 2300.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.14188E-01 2325.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.13982E-01 2350.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.13781E-01 2375.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.13584E-01 2400.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.13393E-01 2425.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.13206E-01 2450.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.13024E-01 2475.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.12846E-01 2500.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.12672E-01 2525.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.12502E-01 2550.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.12336E-01 2575.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.12174E-01 2600.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.12016E-01 2625.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0

1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.11861E-01 2650.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.11709E-01 2675.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.11561E-01 2700.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.11416E-01 2725.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.11274E-01 2750.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.11135E-01 2775.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.10999E-01 2800.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.10866E-01 2825.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.10736E-01 2850.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.10608E-01 2875.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.10483E-01 2900.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.10361E-01 2925.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.10241E-01 2950.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.10123E-01 2975.00 0.00 10.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.10008E-01 3000.00 0.00 10.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.98949E-02 3025.00 0.00 10.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.97840E-02 3050.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.96753E-02 3075.00 0.00 10.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.95687E-02 3100.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.94640E-02 3125.00 0.00 10.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.93614E-02 3150.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.92606E-02 3174.99 0.00 10.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.91617E-02 3199.99 0.00 10.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.90647E-02 3225.00 0.00 10.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.89693E-02 3250.00 0.00 10.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.88758E-02 3275.00 0.00 20.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.87839E-02 3300.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0

1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.86936E-02 3325.00 0.00 15.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.86049E-02 3350.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.85178E-02 3375.00 0.00 20.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.84322E-02 3400.00 0.00 20.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.83481E-02 3425.00 0.00 25.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.82654E-02 3450.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.81841E-02 3475.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.81042E-02 3500.00 0.00 20.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.80256E-02 3525.00 0.00 25.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.79484E-02 3550.00 0.00 25.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.78724E-02 3575.00 0.00 15.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.77977E-02 3600.00 0.00 15.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.77242E-02 3625.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.76519E-02 3650.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.75808E-02 3675.00 0.00 20.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.75107E-02 3700.00 0.00 20.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.74418E-02 3725.00 0.00 15.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.73740E-02 3750.00 0.00 25.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.73073E-02 3775.00 0.00 25.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.72416E-02 3800.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.71769E-02 3825.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.71132E-02 3849.99 0.00 15.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.70505E-02 3875.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.69887E-02 3900.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.69279E-02 3925.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.68679E-02 3950.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.68089E-02 3975.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0

1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.67507E-02 4000.00 0.00 10.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.66934E-02 4025.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.66370E-02 4050.00 0.00 30.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.65813E-02 4075.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.65265E-02 4100.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.64724E-02 4125.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.64191E-02 4149.99 0.00 20.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.63666E-02 4175.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.63148E-02 4200.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.62637E-02 4225.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.62134E-02 4250.00 0.00 10.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.61637E-02 4275.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.61147E-02 4300.00 0.00 10.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.60664E-02 4325.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.60188E-02 4350.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.59718E-02 4375.00 0.00 10.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.59254E-02 4400.00 0.00 10.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.58796E-02 4425.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.58345E-02 4449.99 0.00 10.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.57899E-02 4475.00 0.00 10.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.57460E-02 4500.00 0.00 10.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.57026E-02 4525.00 0.00 10.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.56598E-02 4550.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.56175E-02 4575.00 0.00 20.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.55758E-02 4600.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.55346E-02 4625.00 0.00 25.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.54939E-02 4650.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0

1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.54538E-02 4675.00 0.00 15.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.54141E-02 4700.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.53750E-02 4725.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.53363E-02 4750.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.52981E-02 4775.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.52604E-02 4800.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.52231E-02 4825.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.51864E-02 4850.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.51500E-02 4875.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.51141E-02 4900.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.50786E-02 4924.99 0.00 15.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.50436E-02 4950.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.50089E-02 4975.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.49747E-02 5000.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0

SWAPE Technical Consultation, Data Analysis and Litigation Support for the Environment

2656 29th Street, Suite 201
Santa Monica, CA 90405

Matt Hagemann, P.G, C.Hg.
(949) 887-9013
mhagemann@swape.com

Matthew F. Hagemann, P.G., C.Hg., QSD, QSP

Geologic and Hydrogeologic Characterization
Investigation and Remediation Strategies
Litigation Support and Testifying Expert
Industrial Stormwater Compliance
CEQA Review

Education:

M.S. Degree, Geology, California State University Los Angeles, Los Angeles, CA, 1984.
B.A. Degree, Geology, Humboldt State University, Arcata, CA, 1982.

Professional Certifications:

California Professional Geologist
California Certified Hydrogeologist
Qualified SWPPP Developer and Practitioner

Professional Experience:

Matt has 30 years of experience in environmental policy, contaminant assessment and remediation, stormwater compliance, and CEQA review. He spent nine years with the U.S. EPA in the RCRA and Superfund programs and served as EPA's Senior Science Policy Advisor in the Western Regional Office where he identified emerging threats to groundwater from perchlorate and MTBE. While with EPA, Matt also served as a Senior Hydrogeologist in the oversight of the assessment of seven major military facilities undergoing base closure. He led numerous enforcement actions under provisions of the Resource Conservation and Recovery Act (RCRA) and directed efforts to improve hydrogeologic characterization and water quality monitoring. For the past 15 years, as a founding partner with SWAPE, Matt has developed extensive client relationships and has managed complex projects that include consultation as an expert witness and a regulatory specialist, and a manager of projects ranging from industrial stormwater compliance to CEQA review of impacts from hazardous waste, air quality and greenhouse gas emissions.

Positions Matt has held include:

- Founding Partner, Soil/Water/Air Protection Enterprise (SWAPE) (2003 – present);
- Geology Instructor, Golden West College, 2010 – 2104, 2017;
- Senior Environmental Analyst, Komex H2O Science, Inc. (2000 -- 2003);

- Executive Director, Orange Coast Watch (2001 – 2004);
- Senior Science Policy Advisor and Hydrogeologist, U.S. Environmental Protection Agency (1989–1998);
- Hydrogeologist, National Park Service, Water Resources Division (1998 – 2000);
- Adjunct Faculty Member, San Francisco State University, Department of Geosciences (1993 – 1998);
- Instructor, College of Marin, Department of Science (1990 – 1995);
- Geologist, U.S. Forest Service (1986 – 1998); and
- Geologist, Dames & Moore (1984 – 1986).

Senior Regulatory and Litigation Support Analyst:

With SWAPE, Matt's responsibilities have included:

- Lead analyst and testifying expert in the review of over 300 environmental impact reports and negative declarations since 2003 under CEQA that identify significant issues with regard to hazardous waste, water resources, water quality, air quality, greenhouse gas emissions, and geologic hazards. Make recommendations for additional mitigation measures to lead agencies at the local and county level to include additional characterization of health risks and implementation of protective measures to reduce worker exposure to hazards from toxins and Valley Fever.
- Stormwater analysis, sampling and best management practice evaluation at more than 100 industrial facilities.
- Expert witness on numerous cases including, for example, perfluorooctanoic acid (PFOA) contamination of groundwater, MTBE litigation, air toxins at hazards at a school, CERCLA compliance in assessment and remediation, and industrial stormwater contamination.
- Technical assistance and litigation support for vapor intrusion concerns.
- Lead analyst and testifying expert in the review of environmental issues in license applications for large solar power plants before the California Energy Commission.
- Manager of a project to evaluate numerous formerly used military sites in the western U.S.
- Manager of a comprehensive evaluation of potential sources of perchlorate contamination in Southern California drinking water wells.
- Manager and designated expert for litigation support under provisions of Proposition 65 in the review of releases of gasoline to sources drinking water at major refineries and hundreds of gas stations throughout California.

With Komex H2O Science Inc., Matt's duties included the following:

- Senior author of a report on the extent of perchlorate contamination that was used in testimony by the former U.S. EPA Administrator and General Counsel.
- Senior researcher in the development of a comprehensive, electronically interactive chronology of MTBE use, research, and regulation.
- Senior researcher in the development of a comprehensive, electronically interactive chronology of perchlorate use, research, and regulation.
- Senior researcher in a study that estimates nationwide costs for MTBE remediation and drinking water treatment, results of which were published in newspapers nationwide and in testimony against provisions of an energy bill that would limit liability for oil companies.
- Research to support litigation to restore drinking water supplies that have been contaminated by MTBE in California and New York.

- Expert witness testimony in a case of oil production-related contamination in Mississippi.
- Lead author for a multi-volume remedial investigation report for an operating school in Los Angeles that met strict regulatory requirements and rigorous deadlines.
- Development of strategic approaches for cleanup of contaminated sites in consultation with clients and regulators.

Executive Director:

As Executive Director with Orange Coast Watch, Matt led efforts to restore water quality at Orange County beaches from multiple sources of contamination including urban runoff and the discharge of wastewater. In reporting to a Board of Directors that included representatives from leading Orange County universities and businesses, Matt prepared issue papers in the areas of treatment and disinfection of wastewater and control of the discharge of grease to sewer systems. Matt actively participated in the development of countywide water quality permits for the control of urban runoff and permits for the discharge of wastewater. Matt worked with other nonprofits to protect and restore water quality, including Surfrider, Natural Resources Defense Council and Orange County CoastKeeper as well as with business institutions including the Orange County Business Council.

Hydrogeology:

As a Senior Hydrogeologist with the U.S. Environmental Protection Agency, Matt led investigations to characterize and cleanup closing military bases, including Mare Island Naval Shipyard, Hunters Point Naval Shipyard, Treasure Island Naval Station, Alameda Naval Station, Moffett Field, Mather Army Airfield, and Sacramento Army Depot. Specific activities were as follows:

- Led efforts to model groundwater flow and contaminant transport, ensured adequacy of monitoring networks, and assessed cleanup alternatives for contaminated sediment, soil, and groundwater.
- Initiated a regional program for evaluation of groundwater sampling practices and laboratory analysis at military bases.
- Identified emerging issues, wrote technical guidance, and assisted in policy and regulation development through work on four national U.S. EPA workgroups, including the Superfund Groundwater Technical Forum and the Federal Facilities Forum.

At the request of the State of Hawaii, Matt developed a methodology to determine the vulnerability of groundwater to contamination on the islands of Maui and Oahu. He used analytical models and a GIS to show zones of vulnerability, and the results were adopted and published by the State of Hawaii and County of Maui.

As a hydrogeologist with the EPA Groundwater Protection Section, Matt worked with provisions of the Safe Drinking Water Act and NEPA to prevent drinking water contamination. Specific activities included the following:

- Received an EPA Bronze Medal for his contribution to the development of national guidance for the protection of drinking water.
- Managed the Sole Source Aquifer Program and protected the drinking water of two communities through designation under the Safe Drinking Water Act. He prepared geologic reports, conducted

public hearings, and responded to public comments from residents who were very concerned about the impact of designation.

- Reviewed a number of Environmental Impact Statements for planned major developments, including large hazardous and solid waste disposal facilities, mine reclamation, and water transfer.

Matt served as a hydrogeologist with the RCRA Hazardous Waste program. Duties were as follows:

- Supervised the hydrogeologic investigation of hazardous waste sites to determine compliance with Subtitle C requirements.
- Reviewed and wrote "part B" permits for the disposal of hazardous waste.
- Conducted RCRA Corrective Action investigations of waste sites and led inspections that formed the basis for significant enforcement actions that were developed in close coordination with U.S. EPA legal counsel.
- Wrote contract specifications and supervised contractor's investigations of waste sites.

With the National Park Service, Matt directed service-wide investigations of contaminant sources to prevent degradation of water quality, including the following tasks:

- Applied pertinent laws and regulations including CERCLA, RCRA, NEPA, NRDA, and the Clean Water Act to control military, mining, and landfill contaminants.
- Conducted watershed-scale investigations of contaminants at parks, including Yellowstone and Olympic National Park.
- Identified high-levels of perchlorate in soil adjacent to a national park in New Mexico and advised park superintendent on appropriate response actions under CERCLA.
- Served as a Park Service representative on the Interagency Perchlorate Steering Committee, a national workgroup.
- Developed a program to conduct environmental compliance audits of all National Parks while serving on a national workgroup.
- Co-authored two papers on the potential for water contamination from the operation of personal watercraft and snowmobiles, these papers serving as the basis for the development of nation-wide policy on the use of these vehicles in National Parks.
- Contributed to the Federal Multi-Agency Source Water Agreement under the Clean Water Action Plan.

Policy:

Served senior management as the Senior Science Policy Advisor with the U.S. Environmental Protection Agency, Region 9.

Activities included the following:

- Advised the Regional Administrator and senior management on emerging issues such as the potential for the gasoline additive MTBE and ammonium perchlorate to contaminate drinking water supplies.
- Shaped EPA's national response to these threats by serving on workgroups and by contributing to guidance, including the Office of Research and Development publication, Oxygenates in Water: Critical Information and Research Needs.
- Improved the technical training of EPA's scientific and engineering staff.
- Earned an EPA Bronze Medal for representing the region's 300 scientists and engineers in negotiations with the Administrator and senior management to better integrate scientific

principles into the policy-making process.
- Established national protocol for the peer review of scientific documents.

Geology:

With the U.S. Forest Service, Matt led investigations to determine hillslope stability of areas proposed for timber harvest in the central Oregon Coast Range. Specific activities were as follows:

- Mapped geology in the field, and used aerial photographic interpretation and mathematical models to determine slope stability.
- Coordinated his research with community members who were concerned with natural resource protection.
- Characterized the geology of an aquifer that serves as the sole source of drinking water for the city of Medford, Oregon.

As a consultant with Dames and Moore, Matt led geologic investigations of two contaminated sites (later listed on the Superfund NPL) in the Portland, Oregon, area and a large hazardous waste site in eastern Oregon. Duties included the following:

- Supervised year-long effort for soil and groundwater sampling.
- Conducted aquifer tests.
- Investigated active faults beneath sites proposed for hazardous waste disposal.

Teaching:

From 1990 to 1998, Matt taught at least one course per semester at the community college and university levels:

- At San Francisco State University, held an adjunct faculty position and taught courses in environmental geology, oceanography (lab and lecture), hydrogeology, and groundwater contamination.
- Served as a committee member for graduate and undergraduate students.
- Taught courses in environmental geology and oceanography at the College of Marin.

Matt is currently a part time geology instructor at Golden West College in Huntington Beach, California where he taught from 2010 to 2014 and in 2017.

Invited Testimony, Reports, Papers and Presentations:

Hagemann, M.F., 2008. Disclosure of Hazardous Waste Issues under CEQA. Presentation to the Public Environmental Law Conference, Eugene, Oregon.

Hagemann, M.F., 2008. Disclosure of Hazardous Waste Issues under CEQA. Invited presentation to U.S. EPA Region 9, San Francisco, California.

Hagemann, M.F., 2005. Use of Electronic Databases in Environmental Regulation, Policy Making and Public Participation. Brownfields 2005, Denver, Coloradao.

Hagemann, M.F., 2004. Perchlorate Contamination of the Colorado River and Impacts to Drinking Water in Nevada and the Southwestern U.S. Presentation to a meeting of the American Groundwater Trust, Las Vegas, NV (served on conference organizing committee).

Hagemann, M.F., 2004. Invited testimony to a California Senate committee hearing on air toxins at schools in Southern California, Los Angeles.

Brown, A., Farrow, J., Gray, A. and **Hagemann, M.**, 2004. An Estimate of Costs to Address MTBE Releases from Underground Storage Tanks and the Resulting Impact to Drinking Water Wells. Presentation to the Ground Water and Environmental Law Conference, National Groundwater Association.

Hagemann, M.F., 2004. Perchlorate Contamination of the Colorado River and Impacts to Drinking Water in Arizona and the Southwestern U.S. Presentation to a meeting of the American Groundwater Trust, Phoenix, AZ (served on conference organizing committee).

Hagemann, M.F., 2003. Perchlorate Contamination of the Colorado River and Impacts to Drinking Water in the Southwestern U.S. Invited presentation to a special committee meeting of the National Academy of Sciences, Irvine, CA.

Hagemann, M.F., 2003. Perchlorate Contamination of the Colorado River. Invited presentation to a tribal EPA meeting, Pechanga, CA.

Hagemann, M.F., 2003. Perchlorate Contamination of the Colorado River. Invited presentation to a meeting of tribal repesentatives, Parker, AZ.

Hagemann, M.F., 2003. Impact of Perchlorate on the Colorado River and Associated Drinking Water Supplies. Invited presentation to the Inter-Tribal Meeting, Torres Martinez Tribe.

Hagemann, M.F., 2003. The Emergence of Perchlorate as a Widespread Drinking Water Contaminant. Invited presentation to the U.S. EPA Region 9.

Hagemann, M.F., 2003. A Deductive Approach to the Assessment of Perchlorate Contamination. Invited presentation to the California Assembly Natural Resources Committee.

Hagemann, M.F., 2003. Perchlorate: A Cold War Legacy in Drinking Water. Presentation to a meeting of the National Groundwater Association.

Hagemann, M.F., 2002. From Tank to Tap: A Chronology of MTBE in Groundwater. Presentation to a meeting of the National Groundwater Association.

Hagemann, M.F., 2002. A Chronology of MTBE in Groundwater and an Estimate of Costs to Address Impacts to Groundwater. Presentation to the annual meeting of the Society of Environmental Journalists.

Hagemann, M.F., 2002. An Estimate of the Cost to Address MTBE Contamination in Groundwater (and Who Will Pay). Presentation to a meeting of the National Groundwater Association.

Hagemann, M.F., 2002. An Estimate of Costs to Address MTBE Releases from Underground Storage Tanks and the Resulting Impact to Drinking Water Wells. Presentation to a meeting of the U.S. EPA and State Underground Storage Tank Program managers.

Hagemann, M.F., 2001. From Tank to Tap: A Chronology of MTBE in Groundwater. Unpublished report.

Hagemann, M.F., 2001. Estimated Cleanup Cost for MTBE in Groundwater Used as Drinking Water. Unpublished report.

Hagemann, M.F., 2001. Estimated Costs to Address MTBE Releases from Leaking Underground Storage Tanks. Unpublished report.

Hagemann, M.F., and VanMouwerik, M., 1999. Potential Water Quality Concerns Related to Snowmobile Usage. Water Resources Division, National Park Service, Technical Report.

VanMouwerik, M. and **Hagemann, M.F**. 1999, Water Quality Concerns Related to Personal Watercraft Usage. Water Resources Division, National Park Service, Technical Report.

Hagemann, M.F., 1999, Is Dilution the Solution to Pollution in National Parks? The George Wright Society Biannual Meeting, Asheville, North Carolina.

Hagemann, M.F., 1997, The Potential for MTBE to Contaminate Groundwater. U.S. EPA Superfund Groundwater Technical Forum Annual Meeting, Las Vegas, Nevada.

Hagemann, M.F., and Gill, M., 1996, Impediments to Intrinsic Remediation, Moffett Field Naval Air Station, Conference on Intrinsic Remediation of Chlorinated Hydrocarbons, Salt Lake City.

Hagemann, M.F., Fukunaga, G.L., 1996, The Vulnerability of Groundwater to Anthropogenic Contaminants on the Island of Maui, Hawaii. Hawaii Water Works Association Annual Meeting, Maui, October 1996.

Hagemann, M. F., Fukanaga, G. L., 1996, Ranking Groundwater Vulnerability in Central Oahu, Hawaii. Proceedings, Geographic Information Systems in Environmental Resources Management, Air and Waste Management Association Publication VIP-61.

Hagemann, M.F., 1994. Groundwater Characterization and Cleanup at Closing Military Bases in California. Proceedings, California Groundwater Resources Association Meeting.

Hagemann, M.F. and Sabol, M.A., 1993. Role of the U.S. EPA in the High Plains States Groundwater Recharge Demonstration Program. Proceedings, Sixth Biennial Symposium on the Artificial Recharge of Groundwater.

Hagemann, M.F., 1993. U.S. EPA Policy on the Technical Impracticability of the Cleanup of DNAPL-contaminated Groundwater. California Groundwater Resources Association Meeting.

Hagemann, M.F., 1992. Dense Nonaqueous Phase Liquid Contamination of Groundwater: An Ounce of Prevention... Proceedings, Association of Engineering Geologists Annual Meeting, v. 35.

Other Experience:

Selected as subject matter expert for the California Professional Geologist licensing examinations, 2009-2011.

SWAPE Technical Consultation, Data Analysis and Litigation Support for the Environment

SOIL WATER AIR PROTECTION ENTERPRISE
2656 29th Street, Suite 201
Santa Monica, California 90405
Attn: Paul Rosenfeld, Ph.D.
Mobil: (310) 795-2335
Office: (310) 452-5555
Fax: (310) 452-5550
Email: prosenfeld@swape.com

Paul Rosenfeld, Ph.D.

Chemical Fate and Transport & Air Dispersion Modeling

Principal Environmental Chemist

Risk Assessment & Remediation Specialist

Education

Ph.D. Soil Chemistry, University of Washington, 1999. Dissertation on volatile organic compound filtration.

M.S. Environmental Science, U.C. Berkeley, 1995. Thesis on organic waste economics.

B.A. Environmental Studies, U.C. Santa Barbara, 1991. Thesis on wastewater treatment.

Professional Experience

Dr. Rosenfeld has over 25 years' experience conducting environmental investigations and risk assessments for evaluating impacts to human health, property, and ecological receptors. His expertise focuses on the fate and transport of environmental contaminants, human health risk, exposure assessment, and ecological restoration. Dr. Rosenfeld has evaluated and modeled emissions from oil spills, landfills, boilers and incinerators, process stacks, storage tanks, confined animal feeding operations, industrial, military and agricultural sources, unconventional oil drilling operations, and locomotive and construction engines. His project experience ranges from monitoring and modeling of pollution sources to evaluating impacts of pollution on workers at industrial facilities and residents in surrounding communities. Dr. Rosenfeld has also successfully modeled exposure to contaminants distributed by water systems and via vapor intrusion.

Dr. Rosenfeld has investigated and designed remediation programs and risk assessments for contaminated sites containing lead, heavy metals, mold, bacteria, particulate matter, petroleum hydrocarbons, chlorinated solvents, pesticides, radioactive waste, dioxins and furans, semi- and volatile organic compounds, PCBs, PAHs, creosote, perchlorate, asbestos, per- and poly-fluoroalkyl substances (PFOA/PFOS), unusual polymers, fuel oxygenates (MTBE), among other pollutants. Dr. Rosenfeld also has experience evaluating greenhouse gas emissions from various projects and is an expert on the assessment of odors from industrial and agricultural sites, as well as the evaluation of odor nuisance impacts and technologies for abatement of odorous emissions. As a principal scientist at SWAPE, Dr. Rosenfeld directs air dispersion modeling and exposure assessments. He has served as an expert witness and testified about pollution sources causing nuisance and/or personal injury at sites and has testified as an expert witness on numerous cases involving exposure to soil, water and air contaminants from industrial, railroad, agricultural, and military sources.

Professional History:

Soil Water Air Protection Enterprise (SWAPE); 2003 to present; Principal and Founding Partner
UCLA School of Public Health; 2007 to 2011; Lecturer (Assistant Researcher)
UCLA School of Public Health; 2003 to 2006; Adjunct Professor
UCLA Environmental Science and Engineering Program; 2002-2004; Doctoral Intern Coordinator
UCLA Institute of the Environment, 2001-2002; Research Associate
Komex H_2O Science, 2001 to 2003; Senior Remediation Scientist
National Groundwater Association, 2002-2004; Lecturer
San Diego State University, 1999-2001; Adjunct Professor
Anteon Corp., San Diego, 2000-2001; Remediation Project Manager
Ogden (now Amec), San Diego, 2000-2000; Remediation Project Manager
Bechtel, San Diego, California, 1999 – 2000; Risk Assessor
King County, Seattle, 1996 – 1999; Scientist
James River Corp., Washington, 1995-96; Scientist
Big Creek Lumber, Davenport, California, 1995; Scientist
Plumas Corp., California and USFS, Tahoe 1993-1995; Scientist
Peace Corps and World Wildlife Fund, St. Kitts, West Indies, 1991-1993; Scientist

Publications:

Remy, L.L., Clay T., Byers, V., **Rosenfeld P. E.** (2019) Hospital, Health, and Community Burden After Oil Refinery Fires, Richmond, California 2007 and 2012. *Environmental Health.* 18:48

Simons, R.A., Seo, Y. **Rosenfeld, P**., (2015) Modeling the Effect of Refinery Emission On Residential Property Value. Journal of Real Estate Research. 27(3):321-342

Chen, J. A, Zapata A. R., Sutherland A. J., Molmen, D.R., Chow, B. S., Wu, L. E., **Rosenfeld, P. E.,** Hesse, R. C., (2012) Sulfur Dioxide and Volatile Organic Compound Exposure To A Community In Texas City Texas Evaluated Using Aermod and Empirical Data. *American Journal of Environmental Science*, 8(6), 622-632.

Rosenfeld, P.E. & Feng, L. (2011). *The Risks of Hazardous Waste.* Amsterdam: Elsevier Publishing.

Cheremisinoff, N.P., & **Rosenfeld, P.E.** (2011). *Handbook of Pollution Prevention and Cleaner Production: Best Practices in the Agrochemical Industry*, Amsterdam: Elsevier Publishing.

Gonzalez, J., Feng, L., Sutherland, A., Waller, C., Sok, H., Hesse, R., **Rosenfeld, P.** (2010). PCBs and Dioxins/Furans in Attic Dust Collected Near Former PCB Production and Secondary Copper Facilities in Sauget, IL. *Procedia Environmental Sciences*. 113–125.

Feng, L., Wu, C., Tam, L., Sutherland, A.J., Clark, J.J., **Rosenfeld, P.E.** (2010). Dioxin and Furan Blood Lipid and Attic Dust Concentrations in Populations Living Near Four Wood Treatment Facilities in the United States. *Journal of Environmental Health*. 73(6), 34-46.

Cheremisinoff, N.P., & **Rosenfeld, P.E.** (2010). *Handbook of Pollution Prevention and Cleaner Production: Best Practices in the Wood and Paper Industries.* Amsterdam: Elsevier Publishing.

Cheremisinoff, N.P., & **Rosenfeld, P.E.** (2009). *Handbook of Pollution Prevention and Cleaner Production: Best Practices in the Petroleum Industry*. Amsterdam: Elsevier Publishing.

Wu, C., Tam, L., Clark, J., **Rosenfeld, P**. (2009). Dioxin and furan blood lipid concentrations in populations living near four wood treatment facilities in the United States. *WIT Transactions on Ecology and the Environment, Air Pollution,* 123 (17), 319-327.

Tam L. K.., Wu C. D., Clark J. J. and **Rosenfeld, P.E.** (2008). A Statistical Analysis Of Attic Dust And Blood Lipid Concentrations Of Tetrachloro-p-Dibenzodioxin (TCDD) Toxicity Equivalency Quotients (TEQ) In Two Populations Near Wood Treatment Facilities. *Organohalogen Compounds*, 70, 002252-002255.

Tam L. K.., Wu C. D., Clark J. J. and **Rosenfeld, P.E.** (2008). Methods For Collect Samples For Assessing Dioxins And Other Environmental Contaminants In Attic Dust: A Review. *Organohalogen Compounds*, 70, 000527-000530.

Hensley, A.R. A. Scott, J. J. J. Clark, **Rosenfeld, P.E.** (2007). Attic Dust and Human Blood Samples Collected near a Former Wood Treatment Facility. *Environmental Research*. 105, 194-197.

Rosenfeld, P.E., J. J. J. Clark, A. R. Hensley, M. Suffet. (2007). The Use of an Odor Wheel Classification for Evaluation of Human Health Risk Criteria for Compost Facilities. *Water Science & Technology* 55(5), 345-357.

Rosenfeld, P. E., M. Suffet. (2007). The Anatomy Of Odour Wheels For Odours Of Drinking Water, Wastewater, Compost And The Urban Environment. *Water Science & Technology* 55(5), 335-344.

Sullivan, P. J. Clark, J.J.J., Agardy, F. J., **Rosenfeld, P.E.** (2007). *Toxic Legacy, Synthetic Toxins in the Food, Water, and Air in American Cities.* Boston Massachusetts: Elsevier Publishing

Rosenfeld, P.E., and Suffet I.H. (2004). Control of Compost Odor Using High Carbon Wood Ash. *Water Science and Technology*. 49(9),171-178.

Rosenfeld P. E., J.J. Clark, I.H. (Mel) Suffet (2004). The Value of An Odor-Quality-Wheel Classification Scheme For The Urban Environment. *Water Environment Federation's Technical Exhibition and Conference (WEFTEC) 2004.* New Orleans, October 2-6, 2004.

Rosenfeld, P.E., and Suffet, I.H. (2004). Understanding Odorants Associated With Compost, Biomass Facilities, and the Land Application of Biosolids. *Water Science and Technology*. 49(9), 193-199.

Rosenfeld, P.E., and Suffet I.H. (2004). Control of Compost Odor Using High Carbon Wood Ash, *Water Science and Technology*, 49(9), 171-178.

Rosenfeld, P. E., Grey, M. A., Sellew, P. (2004). Measurement of Biosolids Odor and Odorant Emissions from Windrows, Static Pile and Biofilter. *Water Environment Research*. 76(4), 310-315.

Rosenfeld, P.E., Grey, M and Suffet, M. (2002). Compost Demonstration Project, Sacramento California Using High-Carbon Wood Ash to Control Odor at a Green Materials Composting Facility. *Integrated Waste Management Board Public Affairs Office*, Publications Clearinghouse (MS–6), Sacramento, CA Publication #442-02-008.

Rosenfeld, P.E., and C.L. Henry. (2001). Characterization of odor emissions from three different biosolids. *Water Soil and Air Pollution*. 127(1-4), 173-191.

Rosenfeld, P.E., and Henry C. L., (2000). Wood ash control of odor emissions from biosolids application. *Journal of Environmental Quality.* 29, 1662-1668.

Rosenfeld, P.E., C.L. Henry and D. Bennett. (2001). Wastewater dewatering polymer affect on biosolids odor emissions and microbial activity. *Water Environment Research*. 73(4), 363-367.

Rosenfeld, P.E., and C.L. Henry. (2001). Activated Carbon and Wood Ash Sorption of Wastewater, Compost, and Biosolids Odorants. *Water Environment Research*, 73, 388-393.

Rosenfeld, P.E., and Henry C. L., (2001). High carbon wood ash effect on biosolids microbial activity and odor. *Water Environment Research*. 131(1-4), 247-262.

Chollack, T. and **P. Rosenfeld. (**1998). Compost Amendment Handbook For Landscaping. Prepared for and distributed by the City of Redmond, Washington State.

Rosenfeld, P. E. (1992). The Mount Liamuiga Crater Trail. *Heritage Magazine of St. Kitts*, 3(2).

Rosenfeld, P. E. (1993). High School Biogas Project to Prevent Deforestation On St. Kitts. *Biomass Users Network*, 7(1).

Rosenfeld, P. E. (1998). Characterization, Quantification, and Control of Odor Emissions From Biosolids Application To Forest Soil. Doctoral Thesis. University of Washington College of Forest Resources.

Rosenfeld, P. E. (1994). Potential Utilization of Small Diameter Trees on Sierra County Public Land. Masters thesis reprinted by the Sierra County Economic Council. Sierra County, California.

Rosenfeld, P. E. (1991). How to Build a Small Rural Anaerobic Digester & Uses Of Biogas In The First And Third World. Bachelors Thesis. University of California.

Presentations:

Rosenfeld, P.E., "The science for Perfluorinated Chemicals (PFAS): What makes remediation so hard?" Law Seminars International, (May 9-10, 2018) 800 Fifth Avenue, Suite 101 Seattle, WA.

Rosenfeld, P.E., Sutherland, A; Hesse, R.; Zapata, A. (October 3-6, 2013). Air dispersion modeling of volatile organic emissions from multiple natural gas wells in Decatur, TX. *44th Western Regional Meeting, American Chemical Society.* Lecture conducted from Santa Clara, CA.

Sok, H.L.; Waller, C.C.; Feng, L.; Gonzalez, J.; Sutherland, A.J.; Wisdom-Stack, T.; Sahai, R.K.; Hesse, R.C.; **Rosenfeld, P.E.** (June 20-23, 2010). Atrazine: A Persistent Pesticide in Urban Drinking Water. *Urban Environmental Pollution*. Lecture conducted from Boston, MA.

Feng, L.; Gonzalez, J.; Sok, H.L.; Sutherland, A.J.; Waller, C.C.; Wisdom-Stack, T.; Sahai, R.K.; La, M.; Hesse, R.C.; **Rosenfeld, P.E.** (June 20-23, 2010). Bringing Environmental Justice to East St. Louis, Illinois. *Urban Environmental Pollution.* Lecture conducted from Boston, MA.

Rosenfeld, P.E. (April 19-23, 2009). Perfluoroctanoic Acid (PFOA) and Perfluoroactane Sulfonate (PFOS) Contamination in Drinking Water From the Use of Aqueous Film Forming Foams (AFFF) at Airports in the United States. *2009 Ground Water Summit and 2009 Ground Water Protection Council Spring Meeting*, Lecture conducted from Tuscon, AZ.

Rosenfeld, P.E. (April 19-23, 2009). Cost to Filter Atrazine Contamination from Drinking Water in the United States" Contamination in Drinking Water From the Use of Aqueous Film Forming Foams (AFFF) at Airports in the United States. *2009 Ground Water Summit and 2009 Ground Water Protection Council Spring Meeting*. Lecture conducted from Tuscon, AZ.

Wu, C., Tam, L., Clark, J., **Rosenfeld, P**. (20-22 July, 2009). Dioxin and furan blood lipid concentrations in populations living near four wood treatment facilities in the United States. Brebbia, C.A. and Popov, V., eds., *Air Pollution XVII: Proceedings of the Seventeenth International Conference on Modeling, Monitoring and Management of Air Pollution*. Lecture conducted from Tallinn, Estonia.

Rosenfeld, P. E. (October 15-18, 2007). Moss Point Community Exposure To Contaminants From A Releasing Facility. *The 23rd Annual International Conferences on Soils Sediment and Water.* Platform lecture conducted from University of Massachusetts, Amherst MA.

Rosenfeld, P. E. (October 15-18, 2007). The Repeated Trespass of Tritium-Contaminated Water Into A Surrounding Community Form Repeated Waste Spills From A Nuclear Power Plant. *The 23rd Annual International*

Conferences on Soils Sediment and Water. Platform lecture conducted from University of Massachusetts, Amherst MA.

Rosenfeld, P. E. (October 15-18, 2007). Somerville Community Exposure To Contaminants From Wood Treatment Facility Emissions. The *23rd Annual International Conferences on Soils Sediment and Water*. Lecture conducted from University of Massachusetts, Amherst MA.

Rosenfeld P. E. (March 2007). Production, Chemical Properties, Toxicology, & Treatment Case Studies of 1,2,3-Trichloropropane (TCP). *The Association for Environmental Health and Sciences (AEHS) Annual Meeting*. Lecture conducted from San Diego, CA.

Rosenfeld P. E. (March 2007). Blood and Attic Sampling for Dioxin/Furan, PAH, and Metal Exposure in Florala, Alabama. *The AEHS Annual Meeting.* Lecture conducted from San Diego, CA.

Hensley A.R., Scott, A., **Rosenfeld P.E.,** Clark, J.J.J. (August 21 – 25, 2006). Dioxin Containing Attic Dust And Human Blood Samples Collected Near A Former Wood Treatment Facility. *The 26th International Symposium on Halogenated Persistent Organic Pollutants – DIOXIN2006*. Lecture conducted from Radisson SAS Scandinavia Hotel in Oslo Norway.

Hensley A.R., Scott, A., **Rosenfeld P.E.,** Clark, J.J.J. (November 4-8, 2006). Dioxin Containing Attic Dust And Human Blood Samples Collected Near A Former Wood Treatment Facility. *APHA 134 Annual Meeting & Exposition.* Lecture conducted from Boston Massachusetts.

Paul Rosenfeld Ph.D. (October 24-25, 2005). Fate, Transport and Persistence of PFOA and Related Chemicals. Mealey's C8/PFOA. *Science, Risk & Litigation Conference.* Lecture conducted from The Rittenhouse Hotel, Philadelphia, PA.

Paul Rosenfeld Ph.D. (September 19, 2005). Brominated Flame Retardants in Groundwater: Pathways to Human Ingestion, *Toxicology and Remediation PEMA Emerging Contaminant Conference*. Lecture conducted from Hilton Hotel, Irvine California.

Paul Rosenfeld Ph.D. (September 19, 2005). Fate, Transport, Toxicity, And Persistence of 1,2,3-TCP. *PEMA Emerging Contaminant Conference.* Lecture conducted from Hilton Hotel in Irvine, California.

Paul Rosenfeld Ph.D. (September 26-27, 2005). Fate, Transport and Persistence of PDBEs. *Mealey's Groundwater Conference.* Lecture conducted from Ritz Carlton Hotel, Marina Del Ray, California.

Paul Rosenfeld Ph.D. (June 7-8, 2005). Fate, Transport and Persistence of PFOA and Related Chemicals. *International Society of Environmental Forensics: Focus On Emerging Contaminants*. Lecture conducted from Sheraton Oceanfront Hotel, Virginia Beach, Virginia.

Paul Rosenfeld Ph.D. (July 21-22, 2005). Fate Transport, Persistence and Toxicology of PFOA and Related Perfluorochemicals. *2005 National Groundwater Association Ground Water And Environmental Law Conference*. Lecture conducted from Wyndham Baltimore Inner Harbor, Baltimore Maryland.

Paul Rosenfeld Ph.D. (July 21-22, 2005). Brominated Flame Retardants in Groundwater: Pathways to Human Ingestion, Toxicology and Remediation. *2005 National Groundwater Association Ground Water and Environmental Law Conference.* Lecture conducted from Wyndham Baltimore Inner Harbor, Baltimore Maryland.

Paul Rosenfeld, Ph.D. and James Clark Ph.D. and Rob Hesse R.G. (May 5-6, 2004). Tert-butyl Alcohol Liability and Toxicology, A National Problem and Unquantified Liability. *National Groundwater Association. Environmental Law Conference*. Lecture conducted from Congress Plaza Hotel, Chicago Illinois.

Paul Rosenfeld, Ph.D. (March 2004). Perchlorate Toxicology. *Meeting of the American Groundwater Trust*. Lecture conducted from Phoenix Arizona.

Hagemann, M.F., **Paul Rosenfeld, Ph.D.** and Rob Hesse (2004). Perchlorate Contamination of the Colorado River. *Meeting of tribal representatives*. Lecture conducted from Parker, AZ.

Paul Rosenfeld, Ph.D. (April 7, 2004). A National Damage Assessment Model For PCE and Dry Cleaners. *Drycleaner Symposium. California Ground Water Association*. Lecture conducted from Radison Hotel, Sacramento, California.

Rosenfeld, P. E., Grey, M., (June 2003) Two stage biofilter for biosolids composting odor control. *Seventh International In Situ And On Site Bioremediation Symposium Battelle Conference* Orlando, FL.

Paul Rosenfeld, Ph.D. and James Clark Ph.D. (February 20-21, 2003) Understanding Historical Use, Chemical Properties, Toxicity and Regulatory Guidance of 1,4 Dioxane. *National Groundwater Association. Southwest Focus Conference. Water Supply and Emerging Contaminants*.. Lecture conducted from Hyatt Regency Phoenix Arizona.

Paul Rosenfeld, Ph.D. (February 6-7, 2003). Underground Storage Tank Litigation and Remediation. *California CUPA Forum*. Lecture conducted from Marriott Hotel, Anaheim California.

Paul Rosenfeld, Ph.D. (October 23, 2002) Underground Storage Tank Litigation and Remediation. *EPA Underground Storage Tank Roundtable*. Lecture conducted from Sacramento California.

Rosenfeld, P.E. and Suffet, M. (October 7- 10, 2002). Understanding Odor from Compost, *Wastewater and Industrial Processes. Sixth Annual Symposium On Off Flavors in the Aquatic Environment. International Water Association*. Lecture conducted from Barcelona Spain.

Rosenfeld, P.E. and Suffet, M. (October 7- 10, 2002). Using High Carbon Wood Ash to Control Compost Odor. *Sixth Annual Symposium On Off Flavors in the Aquatic Environment. International Water Association*. Lecture conducted from Barcelona Spain.

Rosenfeld, P.E. and Grey, M. A. (September 22-24, 2002). Biocycle Composting For Coastal Sage Restoration. *Northwest Biosolids Management Association*. Lecture conducted from Vancouver Washington..

Rosenfeld, P.E. and Grey, M. A. (November 11-14, 2002). Using High-Carbon Wood Ash to Control Odor at a Green Materials Composting Facility. *Soil Science Society Annual Conferenc*e. Lecture conducted from Indianapolis, Maryland.

Rosenfeld. P.E. (September 16, 2000). Two stage biofilter for biosolids composting odor control. *Water Environment Federation.* Lecture conducted from Anaheim California.

Rosenfeld. P.E. (October 16, 2000). Wood ash and biofilter control of compost odor. *Biofest.* Lecture conducted from Ocean Shores, California.

Rosenfeld, P.E. (2000). Bioremediation Using Organic Soil Amendments. *California Resource Recovery Association*. Lecture conducted from Sacramento California.

Rosenfeld, P.E., C.L. Henry, R. Harrison. (1998). Oat and Grass Seed Germination and Nitrogen and Sulfur Emissions Following Biosolids Incorporation With High-Carbon Wood-Ash. *Water Environment Federation 12th Annual Residuals and Biosolids Management Conference Proceedings*. Lecture conducted from Bellevue Washington.

Rosenfeld, P.E., and C.L. Henry. (1999). An evaluation of ash incorporation with biosolids for odor reduction. *Soil Science Society of America*. Lecture conducted from Salt Lake City Utah.

Rosenfeld, P.E., C.L. Henry, R. Harrison. (1998). Comparison of Microbial Activity and Odor Emissions from Three Different Biosolids Applied to Forest Soil. *Brown and Caldwell.* Lecture conducted from Seattle Washington.

Rosenfeld, P.E., C.L. Henry. (1998). Characterization, Quantification, and Control of Odor Emissions from Biosolids Application To Forest Soil. *Biofest.* Lecture conducted from Lake Chelan, Washington.

Rosenfeld, P.E, C.L. Henry, R. Harrison. (1998). Oat and Grass Seed Germination and Nitrogen and Sulfur Emissions Following Biosolids Incorporation With High-Carbon Wood-Ash. Water Environment Federation 12th Annual Residuals and Biosolids Management Conference Proceedings. Lecture conducted from Bellevue Washington.

Rosenfeld, P.E., C.L. Henry, R. B. Harrison, and R. Dills. (1997). Comparison of Odor Emissions From Three Different Biosolids Applied to Forest Soil. *Soil Science Society of America*. Lecture conducted from Anaheim California.

Teaching Experience:

UCLA Department of Environmental Health (Summer 2003 through 20010) Taught Environmental Health Science 100 to students, including undergrad, medical doctors, public health professionals and nurses. Course focused on the health effects of environmental contaminants.

National Ground Water Association, Successful Remediation Technologies. Custom Course in Sante Fe, New Mexico. May 21, 2002. Focused on fate and transport of fuel contaminants associated with underground storage tanks.

National Ground Water Association; Successful Remediation Technologies Course in Chicago Illinois. April 1, 2002. Focused on fate and transport of contaminants associated with Superfund and RCRA sites.

California Integrated Waste Management Board, April and May, 2001. Alternative Landfill Caps Seminar in San Diego, Ventura, and San Francisco. Focused on both prescriptive and innovative landfill cover design.

UCLA Department of Environmental Engineering, February 5, 2002. Seminar on Successful Remediation Technologies focusing on Groundwater Remediation.

University Of Washington, Soil Science Program, Teaching Assistant for several courses including: Soil Chemistry, Organic Soil Amendments, and Soil Stability.

U.C. Berkeley, Environmental Science Program Teaching Assistant for Environmental Science 10.

Academic Grants Awarded:

California Integrated Waste Management Board. $41,000 grant awarded to UCLA Institute of the Environment. Goal: To investigate effect of high carbon wood ash on volatile organic emissions from compost. 2001.

Synagro Technologies, Corona California: $10,000 grant awarded to San Diego State University.
Goal: investigate effect of biosolids for restoration and remediation of degraded coastal sage soils. 2000.

King County, Department of Research and Technology, Washington State. $100,000 grant awarded to University of Washington: Goal: To investigate odor emissions from biosolids application and the effect of polymers and ash on VOC emissions. 1998.

Northwest Biosolids Management Association, Washington State. $20,000 grant awarded to investigate effect of polymers and ash on VOC emissions from biosolids. 1997.

James River Corporation, Oregon: $10,000 grant was awarded to investigate the success of genetically engineered Poplar trees with resistance to round-up. 1996.

United State Forest Service, Tahoe National Forest: $15,000 grant was awarded to investigating fire ecology of the Tahoe National Forest. 1995.

Kellogg Foundation, Washington D.C. $500 grant was awarded to construct a large anaerobic digester on St. Kitts in West Indies. 1993

Deposition and/or Trial Testimony:

In the Circuit Court Of The Twentieth Judicial Circuit, St Clair County, Illinois
Martha Custer et al., Plaintiff vs. Cerro Flow Products, Inc., Defendants
Case No.: No. 0i9-L-2295
Rosenfeld Deposition, 5-14-2021
Trial, October 8-4-2021

In the Circuit Court of Cook County Illinois
Joseph Rafferty, Plaintiff vs. Consolidated Rail Corporation and National Railroad Passenger Corporation d/b/a AMTRAK,
Case No.: No. 18-L-6845
Rosenfeld Deposition, 6-28-2021

In the United States District Court For the Northern District of Illinois
Theresa Romcoe, Plaintiff vs. Northeast Illinois Regional Commuter Railroad Corporation d/b/a METRA Rail, Defendants
Case No.: No. 17-cv-8517
Rosenfeld Deposition, 5-25-2021

In the Superior Court of the State of Arizona In and For the Cunty of Maricopa
Mary Tryon et al., Plaintiff vs. The City of Pheonix v. Cox Cactus Farm, L.L.C., Utah Shelter Systems, Inc.
Case Number CV20127-094749
Rosenfeld Deposition: 5-7-2021

In the United States District Court for the Eastern District of Texas Beaumont Division
Robinson, Jeremy et al *Plaintiffs*, vs. CNA Insurance Company et al.
Case Number 1:17-cv-000508
Rosenfeld Deposition: 3-25-2021

In the Superior Court of the State of California, County of San Bernardino
Gary Garner, Personal Representative for the Estate of Melvin Garner vs. BNSF Railway Company.
Case No. 1720288
Rosenfeld Deposition 2-23-2021

In the Superior Court of the State of California, County of Los Angeles, Spring Street Courthouse
Benny M Rodriguez vs. Union Pacific Railroad, A Corporation, et al.
Case No. 18STCV01162
Rosenfeld Deposition 12-23-2020

In the Circuit Court of Jackson County, Missouri
Karen Cornwell, *Plaintiff,* vs. Marathon Petroleum, LP, *Defendant.*
Case No.: 1716-CV10006
Rosenfeld Deposition. 8-30-2019

In the United States District Court For The District of New Jersey
Duarte et al, *Plaintiffs,* vs. United States Metals Refining Company et. al. *Defendant.*
Case No.: 2:17-cv-01624-ES-SCM
Rosenfeld Deposition. 6-7-2019

In the United States District Court of Southern District of Texas Galveston Division
M/T Carla Maersk, *Plaintiffs,* vs. Conti 168., Schiffahrts-GMBH & Co. Bulker KG MS "Conti Perdido" *Defendant.*
Case No.: 3:15-CV-00106 consolidated with 3:15-CV-00237
Rosenfeld Deposition. 5-9-2019

In The Superior Court of the State of California In And For The County Of Los Angeles – Santa Monica
Carole-Taddeo-Bates et al., vs. Ifran Khan et al., Defendants
Case No.: No. BC615636
Rosenfeld Deposition, 1-26-2019

In The Superior Court of the State of California In And For The County Of Los Angeles – Santa Monica
The San Gabriel Valley Council of Governments et al. vs El Adobe Apts. Inc. et al., Defendants
Case No.: No. BC646857
Rosenfeld Deposition, 10-6-2018; Trial 3-7-19

In United States District Court For The District of Colorado
Bells et al. Plaintiff vs. The 3M Company et al., Defendants
Case No.: 1:16-cv-02531-RBJ
Rosenfeld Deposition, 3-15-2018 and 4-3-2018

In The District Court Of Regan County, Texas, 112th Judicial District
Phillip Bales et al., Plaintiff vs. Dow Agrosciences, LLC, et al., Defendants
Cause No.: 1923
Rosenfeld Deposition, 11-17-2017

In The Superior Court of the State of California In And For The County Of Contra Costa
Simons et al., Plaintiffs vs. Chevron Corporation, et al., Defendants
Cause No C12-01481
Rosenfeld Deposition, 11-20-2017

In The Circuit Court Of The Twentieth Judicial Circuit, St Clair County, Illinois
Martha Custer et al., Plaintiff vs. Cerro Flow Products, Inc., Defendants
Case No.: No. 0i9-L-2295
Rosenfeld Deposition, 8-23-2017

In United States District Court For The Southern District of Mississippi
Guy Manuel vs. The BP Exploration et al., Defendants
Case: No 1:19-cv-00315-RHW
Rosenfeld Deposition, 4-22-2020

In The Superior Court of the State of California, For The County of Los Angeles
Warrn Gilbert and Penny Gilber, Plaintiff vs. BMW of North America LLC
Case No.: LC102019 (c/w BC582154)
Rosenfeld Deposition, 8-16-2017, Trail 8-28-2018

In the Northern District Court of Mississippi, Greenville Division
Brenda J. Cooper, et al., *Plaintiffs,* vs. Meritor Inc., et al., *Defendants*
Case Number: 4:16-cv-52-DMB-JVM
Rosenfeld Deposition: July 2017

In The Superior Court of the State of Washington, County of Snohomish
Michael Davis and Julie Davis et al., Plaintiff vs. Cedar Grove Composting Inc., Defendants
Case No.: No. 13-2-03987-5
Rosenfeld Deposition, February 2017
Trial, March 2017

In The Superior Court of the State of California, County of Alameda
Charles Spain., Plaintiff vs. Thermo Fisher Scientific, et al., Defendants
Case No.: RG14711115
Rosenfeld Deposition, September 2015

In The Iowa District Court In And For Poweshiek County
Russell D. Winburn, et al., Plaintiffs vs. Doug Hoksbergen, et al., Defendants
Case No.: LALA002187
Rosenfeld Deposition, August 2015

In The Circuit Court of Ohio County, West Virginia
Robert Andrews, et al. v. Antero, et al.
Civil Action N0. 14-C-30000
Rosenfeld Deposition, June 2015

In The Iowa District Court For Muscatine County
Laurie Freeman et. al. Plaintiffs vs. Grain Processing Corporation, Defendant
Case No 4980
Rosenfeld Deposition: May 2015

In the Circuit Court of the 17th Judicial Circuit, in and For Broward County, Florida
Walter Hinton, et. al. Plaintiff, vs. City of Fort Lauderdale, Florida, a Municipality, Defendant.
Case Number CACE07030358 (26)
Rosenfeld Deposition: December 2014

In the County Court of Dallas County Texas
Lisa Parr et al, *Plaintiff*, vs. Aruba et al, *Defendant.*
Case Number cc-11-01650-E
Rosenfeld Deposition: March and September 2013
Rosenfeld Trial: April 2014

In the Court of Common Pleas of Tuscarawas County Ohio
John Michael Abicht, et al., *Plaintiffs,* vs. Republic Services, Inc., et al., *Defendants*
Case Number: 2008 CT 10 0741 (Cons. w/ 2009 CV 10 0987)
Rosenfeld Deposition: October 2012

In the United States District Court for the Middle District of Alabama, Northern Division
James K. Benefield, et al., *Plaintiffs*, vs. International Paper Company, *Defendant*.
Civil Action Number 2:09-cv-232-WHA-TFM
Rosenfeld Deposition: July 2010, June 2011

In the Circuit Court of Jefferson County Alabama
Jaeanette Moss Anthony, et al., *Plaintiffs*, vs. Drummond Company Inc., et al., *Defendants*
Civil Action No. CV 2008-2076
Rosenfeld Deposition: September 2010

In the United States District Court, Western District Lafayette Division
Ackle et al., *Plaintiffs*, vs. Citgo Petroleum Corporation, et al., *Defendants*.
Case Number 2:07CV1052
Rosenfeld Deposition: July 2009