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*Via Email*

October 16, 2023

Planning and Land Use Management Committee  
City of Los Angeles  
Councilmember Marqueece Harris-Dawson, Chair  
Councilmember Monica Rodriguez  
Councilmember Katy Yaroslavsky  
Councilmember John S. Lee  
Councilmember Heather Hutt  
John Ferraro Council Chamber  
200 N. Spring Street, Room 340  
Los Angeles, CA 90012  
c/o Candy Rosales, Deputy City Clerk  
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**Re: Comment on Sustainable Communities Environmental Assessment  
Exception on the 8141 Van Nuys Boulevard Project**

Dear Chair Harris-Dawson and Honorable Councilmembers of the PLUM Committee,

I am writing on behalf of Supporters Alliance for Environmental Responsibility (“SAFER”), and its members who live, work, and recreate in and around the City of Los Angeles. SAFER’s comment is with regard to the Sustainable Communities Environmental Assessment (“SCEA”) prepared for the project known as 8141 Van Nuys Boulevard Project (ENV-2020-4228-SCEA; DIR-2020-4227-CDO-SPR-HCA), including all actions referring or related to the construction of a 7-story mixed-use building, including 200 residential units and approximately 2,060 square feet of ground floor commercial, located at the southeast corner of 8141, 8155, and 8159 N. Van Nuys Boulevard and 14528 and 14550 W. Titus Street in the City of Los Angeles (“Project”). After reviewing the SCEA, SAFER requests that the City of Los Angeles (“City”) refrain from taking any action on the Project and SCEA at this time because the SCEA fails to incorporate all feasible mitigation measures from a prior environmental impact report (“EIR”).

SAFER previously submitted comments on April 3, 2023 which were supported by the expert comments of consulting firm Baseline Environmental Consulting (“Baseline”), and which argued that the SCEA (1) failed to adequately analyze the Project’s health risks (2) failed to adequately evaluate the Project’s consistency with the current 2022 Scoping Plan and

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California's long-term climate goal of carbon neutrality by 2045, and (3) inadequately mitigated the Project's noise impacts. SAFER incorporates those comments herein in their entirety.

## **LEGAL BACKGROUND**

### **I. Sustainable Communities Environmental Assessment under SB 375.**

CEQA allows for the streamlining of environmental review for "transit priority projects" meeting certain criteria. (Pub. Res. Code ("PRC") §§ 21155, 21155.1, 21155.2.) To qualify as a transit priority project, a project must

- (1) contain at least 50 percent residential use, based on total building square footage and, if the project contains between 26 percent and 50 percent nonresidential uses, a floor area ratio of not less than 0.75;
- (2) provide a minimum net density of at least 20 dwelling units per acre;  
and
- (3) be within one-half mile of a major transit stop or high-quality transit corridor included in a regional transportation plan.

(PRC § 21155(b).)

A transit priority project is eligible for CEQA's streamlining provisions where,

[The transit priority project] is consistent with the general use designation, density, building intensity, and applicable policies specified for the project area in either a sustainable communities strategy or an alternative planning strategy, for which the State Air Resources Board . . . has accepted a metropolitan planning organization's determination that the sustainable communities strategy or the alternative planning strategy would, if implemented, achieve the greenhouse gas emission reduction targets.

(PRC § 21155(a).)

In 2020, SCAG's Regional Council formally adopted the Connect SoCal 2020–2045 Regional Transportation Plan/Sustainable Communities Strategy ("2020 RTP/SCS"), which was accepted by CARB on October 30, 2020.

If "all feasible mitigation measures, performance standards, or criteria set forth in the prior applicable environmental impact reports and adopted in findings made pursuant to Section 21081" are applied to a transit priority project, the project is eligible to conduct environmental review using a SCEA. (PRC § 21155.2.) A SCEA must contain an initial study which "identif[ies] all significant or potentially significant impacts of the transit priority project . . . based on substantial evidence in light of the whole record." (PRC § 21155.2(b)(1).) The initial study must also "identify any cumulative effects that have been adequately addressed and mitigated pursuant to the requirements of this division in prior applicable certified environmental

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impact reports.” *Id.* The SCEA must then “contain measures that either avoid or mitigate to a level of insignificance all potentially significant or significant effects of the project required to be identified in the initial study.” (PRC §21155(b)(2).)

After circulating the SCEA for public review and considering all comments, a lead agency may approve the SCEA with findings that all potentially significant impacts have been identified and mitigated to a less-than-significant level. (PRC § 21155(b)(3), (b)(4), (b)(5).) A lead agency’s approval of a SCEA must be supported by substantial evidence. (PRC § 21155(b)(7).)

## **DISCUSSION**

### **I. Substantial Evidence Shows that the Project Will Likely Have Significantly Adverse Indoor Air Quality and Health Impacts.**

Certified Industrial Hygienist, Francis “Bud” Offermann, PE, CIH, has reviewed the SCEA and all relevant documents regarding the Project’s indoor air emissions. Based on this review, Mr. Offermann concludes that the Project will likely expose future residents living at the Project to significant impacts related to indoor air quality, and in particular, emissions of the cancer-causing chemical formaldehyde. Mr. Offermann is one of the world’s leading experts on indoor air quality, particularly focusing on formaldehyde emissions, and has published extensively on the topic. Mr. Offermann found that the SCEA failed to address and mitigate the human health impacts from indoor emissions of formaldehyde, which is a public health concern. Mr. Offerman’s expert reviews and CV are attached as Exhibit A.

#### **a. Future Residents of the Project Will Face Elevated Cancer Risks from Indoor Formaldehyde Emissions.**

Formaldehyde is a known human carcinogen and is listed by the State of California as a Toxic Air Contaminant (“TAC”). The South Coast Air Quality Management District (“SCAQMD”), the agency responsible for regulating air quality within the South Coast Air Basin—which includes the City of Los Angeles—has established a cancer risk significance threshold from human exposure to carcinogenic TACs of 10 per million. (Ex. A, p. 2.). Here, Project’s emissions of formaldehyde to air will result in very significant cancer risks to future residents of the Project.

Mr. Offermann states that future residents of the Project would be exposed to a 120 in one million risk, even assuming all materials are compliant with the California Air Resources Board’s formaldehyde airborne toxics control measure. (Ex. A, p. 3). This potential exposure level exceeds the South Coast Air Quality Management District’s (“SCAQMD”) CEQA significance threshold for airborne cancer risk by 12 times the amount.

The California Supreme Court has emphasized the importance of air district significance thresholds in providing substantial evidence of a significant adverse environmental impact under CEQA. (*Communities for a Better Environment v. South Coast Air Quality Management Dist.*

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(2010) 48 Cal.4th 310, 327 (“As the (South Coast Air Quality Management) 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 SCAQMD’s CEQA significance threshold, there is substantial evidence that an “unstudied, potentially significant environmental effect[]” exists. (See, *Friends of College of San Mateo Gardens v. San Mateo County Community College Dist.* (2016) 1 Cal.5th 937, 958.)

Mr. Offermann’s observations constitute substantial evidence that the Project will produce potentially significant air quality and health impacts which the SCEA has failed to address. Therefore, the City must prepare and recirculate an updated SCEA to fully evaluate and mitigate these impacts on the Project’s future residents.

**b. The SCEA fails to discuss and mitigate the Project’s significant indoor air quality impacts.**

The SCEA fails to discuss, disclose, analyze, and mitigate the significant health risks posed by the Project from formaldehyde, a toxic air contaminant (“TAC”). 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 of the Project’s residential component and employees in the Project’s commercial components. Mr. Offermann’s expert opinion demonstrates the Project’s significant health risk impacts, which the City has a duty to investigate, disclose, and mitigate in the SCEA prior to approval.

Mr. Offermann explains that many composite wood products used in building materials and furnishings commonly found in offices, warehouses, residences, and hotels contain formaldehyde-based glues which off-gas formaldehyde over a very long period. He states, “[t]he 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.” (*Id.*, pp. 2-3) To reiterate, Mr. Offermann therefore concludes that future residents of the Project would be exposed to a level of formaldehyde that exceeds the significance threshold under SCAQMD. Mr. Offermann proposes feasible mitigation measures to reduce the Project’s indoor air quality impacts. However, since the SCEA does not analyze this impact at all, none of these or other mitigation measures have been considered.

In its response to SAFER’s comments, CAJA Environmental Services, LLC (“CAJA”) justifies their decision not prepare a construction HRA by explaining how “[t]he Project would not produce emissions that exceed the SCAQMD’s recommended localized standards of significance for NO2, CO, PM10 and/or PM2.5. Thus, the analysis correctly concluded that construction impacts to the localized air quality would be less than significant.” (June 2023 Response to Comments, p. 16.) However, as Baseline had clearly expressed in their April 2023 comment, CAJA improperly utilizes localized significance thresholds (“LST”) since they were not designed for this purpose and cannot be relied upon when reaching this conclusion about

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whether an HRA is required. Such reliance is clearly improper and making this health-based determination on the Project is insufficient.

The City has a duty to investigate issues relating to a project's potential environmental impacts, especially those issues raised by an expert's comments. (See *Cty. Sanitation Dist. No. 2 v. Cty. of Kern*, (2005) 127 Cal.App.4th 1544, 1597–98 (“under CEQA, the lead agency bears a burden to investigate potential environmental impacts”).) 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.’” *California Bldg Indus. Ass’n v. Bay Area Air Quality Mgmt. Dist.*, (2015) 62 Cal.4th 369, 384 (“*CBLA*”). 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 future residents and employees of the Project are human beings, and the health and safety of those workers is as important to CEQA's safeguards as that of nearby residents currently living near the project site.

The proposed buildings will have significant impacts on air quality and public health risks by emitting cancer-causing levels of formaldehyde into the air that will expose future residents and employees to cancer risks potentially in excess of SCAQMD's threshold of significance for cancer health risks of 10 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 because it failed to consider them. However, the SCEA recognizes the Project site as falling within “one of the most pollution-burdened tracts in the state” given its location within the CalEnviroScreen toolkit. (SCEA, p. 5-22.) As a result, the City must include an analysis and discussion in an updated SCEA which discloses and analyzes the health risks that the Project's formaldehyde emissions, including any other health hazards associated with an environmentally burdened community, may have on residents and employees and identifies mitigation measures appropriate for implementation.

**c. The SCEA fails to analyze the Project's significant outdoor air quality impacts.**

Given the Project site's location, the SCEA fails to adequately review and analyze the additional impacts of motor vehicle traffic and the subsequent increase in exposure to particulate matter (“PM2.5”). As the SCEA notes and Mr. Offermann highlights, the Project site is within the South Coast Air Basin, a state and federal non-attainment area for PM2.5, and in an area with moderate to high traffic. (*Id.*, p. 2) “Additionally, the SCAQMD's Multiple Air Toxics Exposure Study (MATES V) study cites an existing cancer risk of 294 per million at the Project site due to the site's high concentration of ambient air contaminants resulting from the area's high levels of motor vehicle traffic. (*Id.*, p. 4)

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Mr. Offermann predicts that the projected traffic noise levels, the annual average PM<sub>2.5</sub> concentrations will exceed both state and federal standards, thereby necessitating installation of technology to reduce the impacts to a less-than-significant level. However, the SCEA fails to analyze these issues, as well as the cumulative impacts associated with the Project's emissions. As such, the City should not proceed with any Project approvals and to instead prepare and recirculate an updated SCEA that adequately analyzes and addresses these impacts.

## **II. The SCEA is not adequate under CEQA because the Project is inconsistent with applicable policies from the 2020-2045 RTP/SCS.**

CEQA makes clear that a transit priority project is only eligible for streamlining pursuant to a SCEA when the project is "consistent with the general use designation, density, building intensity, and applicable policies specified for the project area in either a sustainable communities strategy or an alternative planning strategy." (PRC § 21155(a).) As applied here, the applicable sustainable communities strategy here is the 2020-2045 Regional Transportation Plan/Sustainable Communities Strategy prepared by SCAG Connect SoCal ("2020 RTP/SCS").

Reiterating Baseline's findings from its April 3, 2023 comment letter, SAFER finds that the SCEA's analysis of health risks was incomplete, and that the SCEA failed to adequately analyze the Project's contribution to the state's long-term goal of carbon neutrality by 2045. Subsequent analysis performed by Mr. Offermann reveals that the Project would expose residents and future employees to formaldehyde. Based on these findings, the SCEA is inconsistent with several goals and guiding principles from the 2020 RTP/SCS, including the following:

- **Goal 5:** Reduce greenhouse gas emissions and improve air quality;
- **Goal 6:** Support healthy and equitable communities;
- **Guiding Principle 5:** Encourage transportation investments that will result in improved air quality and public health, and reduced greenhouse gas emissions
- **Guiding Principle 7:** Regionally, transportation investments should reflect best-known science regarding climate change vulnerability, in order to design for long-term resilience

Additionally, the SCEA's failure to adequately assess public health risks and contributions to carbon neutrality renders it inconsistent with the following strategies from the 2020 RTP/SCS:

- **Leverage Technology Innovations:** Promote low emission technologies such as neighborhood electric vehicles, shared rides hailing, car sharing, bike sharing and scooters by providing supportive and safe infrastructure such as dedicated lanes, charging and parking/drop-off space (SCEA, p. 3-13);
- **Support Implementation of Sustainability Policies:** Continue to support long range planning efforts by local jurisdictions (SCEA, p. 3-14);
- **Promote a Green Region:** Support development of local climate adaptation and hazard mitigation plans, as well as project implementation that improves community resiliency

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to climate change and natural hazards (SCEA, p. 3-15);

- **Promote a Green Region:** Support local policies for renewable energy production, reduction of urban heat islands and carbon sequestration (*Id.*); and
- **Promote a Green Region:** Promote more resource efficient development focused on conservation, recycling and reclamation (*Id.*).

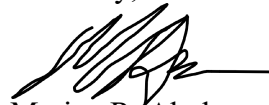
As discussed in Baseline's comment letter (Exhibit A to SAFER's April 3 comment letter), the SCEA should conduct further analysis of the Project's health risk impacts through a Health Risk Assessment and evaluate the effectiveness of implementing exhaust control measures such as the use of Tier 4 equipment.

Additionally, the SCEA should consider whether the Project can be designed to be carbon neutral by 2045, consistent with the state's long-term climate goal. This could include measures such as the use of all-electric buildings and the installation of additional EV charging infrastructure. Without this further analysis, the SCEA fails to meet the stringent requirements for streamlining environmental review, and the City should prepare an updated SCEA or an EIR for the Project.

## CONCLUSION

For the foregoing reasons, the SCEA for the Project should be revised or an EIR prepared prior to any further action on the Project by the City. Thank you for considering these comments.

Sincerely,

A handwritten signature in black ink, appearing to read 'Marjan R. Abubo', with a horizontal line extending to the right.

Marjan R. Abubo

LOZEAU DRURY LLP

# EXHIBIT A

Date: October 15, 2023

To: Marjan Kris Abubo  
Lozeau | Drury LLP  
1939 Harrison Street, Suite 150  
Oakland, California 94612

From: Francis J. Offermann PE CIH

Subject: Indoor Air Quality: Victoria Boulevard Apartments Project, Dana Point, CA  
(IEE File Reference: P-4755)

Pages: 20

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## 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<sup>3</sup>, assuming a continuous 24-hour exposure, a total daily inhaled air volume of 20 m<sup>3</sup>, and 100% absorption by the respiratory system. All of the CNHS homes exceeded this NSRL concentration of 2 µg/m<sup>3</sup>. The median indoor formaldehyde concentration was 36 µg/m<sup>3</sup>, and ranged from 4.8 to 136 µg/m<sup>3</sup>, which corresponds to a median exceedance of the 2 µg/m<sup>3</sup> 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<sup>3</sup>, is 180 per million as a result of formaldehyde alone. The CEQA significance threshold for airborne cancer risk is 10 per million, as established by the South Coast Air Quality Management District (SCAQMD, 2015).

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

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

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

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

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

With respect to the Victoria Boulevard Apartments, Dana Point, CA, the buildings consist of residential spaces.

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

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

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

The employees of the commercial spaces 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.

In addition, we note that the average outdoor air concentration of formaldehyde in California is 3 ppb, or 3.7  $\mu\text{g}/\text{m}^3$ , (California Air Resources Board, 2004), and thus represents an average pre-existing background airborne cancer risk of 1.85 per million.

Thus, the indoor air formaldehyde exposures describe above exacerbate this pre-existing risk resulting from outdoor air formaldehyde exposures.

Additionally, the SCAQMD's Multiple Air Toxics Exposure Study ("MATES V") identifies an existing cancer risk at the Project site of 294 per million due to the site's elevated ambient air contaminant concentrations, which are due to the area's high levels of vehicle traffic. These impacts would further exacerbate the pre-existing cancer risk to the building occupants, which result from exposure to formaldehyde in both indoor and outdoor air.

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

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

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

ventilation rates can be increased to achieve acceptable indoor concentrations and incorporated as mitigation measures for this project.

### Pre-Construction Building Material/Furnishing Formaldehyde Emissions Assessment

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

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

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

3.) Calculate the Formaldehyde Emission Rate. For each building material, calculate the

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

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

CDPH, BIFMA, and other chemical emission rate testing programs, typically certify that a material or furnishing does not create indoor chemical concentrations in excess of the maximum concentrations permitted by their certification. For instance, the CDPH emission rate testing requires that the measured emission rates when input into an office, school, or residential model do not exceed one-half of the OEHHA Chronic Exposure Guidelines (OEHHA, 2017b) for the 35 specific VOCs, including formaldehyde, listed in Table 4-1 of the CDPH test method (CDPH, 2017). These certifications themselves do not provide the actual area-specific formaldehyde emission rate (i.e.,  $\mu\text{g}/\text{m}^2\text{-h}$ ) of the product, but rather provide data that the formaldehyde emission rates do not exceed the maximum rate allowed for the certification. Thus, for example, the data for a certification of a specific type of flooring may be used to calculate that the area-specific emission rate of formaldehyde is less than  $31 \mu\text{g}/\text{m}^2\text{-h}$ , but not the actual measured specific emission rate, which may be 3, 18, or  $30 \mu\text{g}/\text{m}^2\text{-h}$ . These area-specific emission rates determined from the product certifications of CDPH, BIFA, and other certification programs can be used as an initial estimate of the formaldehyde emission rate.

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

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

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

5.) Calculate the Indoor Formaldehyde Concentration. For each IAQ Zone, calculate the indoor formaldehyde concentration ( $\mu\text{g/m}^3$ ) from Equation 1 by dividing the total formaldehyde emission rates (i.e.  $\mu\text{g/h}$ ) as determined in Step 4, by the design minimum outdoor air ventilation rate ( $\text{m}^3/\text{h}$ ) for the IAQ Zone.

(Equation 1)

where:

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

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

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

The above Equation 1 is based upon mass balance theory, and is referenced in Section 3.10.2 “Calculation of Estimated Building Concentrations” of the California Department

of Health “Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions for Indoor Sources Using Environmental Chambers”, (CDPH, 2017).

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

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

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

Source mitigation for formaldehyde may include:

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

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

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

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

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

**Outdoor Air Ventilation Impact.** Another important finding of the CNHS, was that the outdoor air ventilation rates in the homes were very low. Outdoor air ventilation is a very important factor influencing the indoor concentrations of air contaminants, as it is the primary removal mechanism of all indoor air generated contaminants. Lower outdoor air exchange rates cause indoor generated air contaminants to accumulate to higher indoor air concentrations. Many homeowners rarely open their windows or doors for ventilation as a result of their concerns for security/safety, noise, dust, and odor concerns (Price, 2007). In the CNHS field study, 32% of the homes did not use their windows during the 24-hour Test Day, and 15% of the homes did not use their windows during the entire preceding week. Most of the homes with no window usage were homes in the winter field session. Thus, a substantial percentage of homeowners never open their windows, especially in the winter season. The median 24-hour measurement was 0.26 air changes per hour (ach), with a range of 0.09 ach to 5.3 ach. A total of 67% of the homes had outdoor air exchange rates below the minimum California Building Code (2001) requirement of 0.35 ach. Thus, the relatively tight envelope construction, combined with the fact that many people never open their windows for ventilation, results in homes with low outdoor air exchange rates and higher indoor air contaminant concentrations.

According to the Draft Environmental Impact Report – Victoria Boulevard Apartments, Dana Point, CA (Michael Baker International, 2023), the Project is close to roads with moderate to high traffic (e.g., Pacific Coast Highway, Victoria Boulevard, Sepulveda Avenue, etc.).

In Table 5.11-13 of the Draft Environmental Impact Report the future cumulative noise levels with the Project ranges from 37.9 to 69.5 dBA within 100 feet of the roadways.

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.

In addition, in order to design the building for this Project such that interior noise levels are acceptable, an acoustic study with actual on-site measurements of the existing ambient noise levels and modeled future ambient noise levels needs to be conducted. The acoustic study of the existing ambient noise levels should be conducted over a one-week period. and report the dBA CNEL or Ldn. This study will allow for the selection of a building envelope and windows with a sufficient STC such that the indoor noise levels are acceptable. A mechanical supply of outdoor air ventilation to allow for a habitable interior environment with closed windows and doors will also be requires. 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<sub>2.5</sub> Outdoor Concentrations Impact.** An additional impact of the nearby motor vehicle traffic associated with this project, are the outdoor concentrations of PM<sub>2.5</sub>. According to the Draft Environmental Impact Report – Victoria Boulevard Apartments, Dana Point, CA (Michael Baker International, 2023), the Project is located in the South Coast Air Basin, which is a State and Federal non-attainment area for PM<sub>2.5</sub>.

Additionally, the SCAQMD's MATES V study cites an existing cancer risk of 297 per million at the Project site due to the site's high concentration of ambient air contaminants resulting from the area's high levels of motor vehicle traffic.

An air quality analyses should be conducted to determine the concentrations of PM<sub>2.5</sub> 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<sub>2.5</sub> 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<sub>2.5</sub> exceedence concentration of 12 µg/m<sup>3</sup>, or the National 24-hour average exceedence concentration of 35 µg/m<sup>3</sup>, 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<sub>2.5</sub> particles is less than the California and National PM<sub>2.5</sub> annual and 24-hour standards.



It is my experience that based on the projected high traffic noise levels, the annual average concentration of PM<sub>2.5</sub> will exceed the California and National PM<sub>2.5</sub> 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 OEHHHA 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<sup>2</sup> 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<sub>2.5</sub> Outdoor Air Concentration Mitigation. Install air filtration with sufficient PM<sub>2.5</sub> 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<sub>2.5</sub> particles are less than the California and National PM<sub>2.5</sub> annual and 24-hour standards. Install the air filters in the system such that they are accessible for replacement by the occupants or maintenance personnel. Include in the mechanical outdoor air

ventilation system manual instructions on how to replace the air filters and the estimated frequency of replacement.

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## APPENDIX A

### INDOOR FORMALDEHYDE CONCENTRATIONS AND THE CARB FORMALDEHYDE ATCM

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

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

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

For this calculation I utilized the floor area (2,272  $\text{ft}^2$ ), 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<sup>3</sup>/h) calculated for this model residence. For the composite wood formaldehyde emission rate 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<sup>2</sup> (0.7% of the floor area), or

Particle Board – 30 ft<sup>2</sup> (1.3% of the floor area), or

Hardwood Plywood – 54 ft<sup>2</sup> (2.4% of the floor area), or

Thin MDF – 46 ft<sup>2</sup> (2.0 % of the floor area).

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

Medium Density Fiberboard (MDF) – 3.6 % (offices) and 4.6% (hotel rooms), or

Particle Board – 7.2 % (offices) and 9.4% (hotel rooms), or

Hardwood Plywood – 13 % (offices) and 17% (hotel rooms), or

Thin MDF – 11 % (offices) and 14 % (hotel rooms)

Clearly the CARB ATCM does not regulate the formaldehyde emissions from composite wood products such that the potentially large areas of these products, such as for flooring, baseboards, interior doors, window and door trims, and kitchen and bathroom cabinetry, could be used without causing indoor formaldehyde concentrations that result in CEQA

cancer risks that substantially exceed 10 per million for occupants with continuous occupancy.

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

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

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