



August 3, 2022

Mr. Matthew Evans, Project Planner  
City of Perris, Planning Division  
135 North D Street  
Perris, CA 92570  
Email: [mevans@cityofperris.org](mailto:mevans@cityofperris.org)

**Subject:** EMWD Comments for the Ramona-Indian Warehouse Project (PLN21-00011) NOI to Adopt an MND

**APN:** 302-060-041

**Location:** North of Ramona Expressway, east of Indian Ave., and west of North Perris Blvd., in the city of Perris, Riverside County, California.

Dear Matthew Evans:

Eastern Municipal Water District (EMWD) thanks you for the opportunity to comment on the Notice of Intent (NOI) to Adopt a Mitigated Negative Declaration (MND) for the Ramona-Indian Warehouse Project. The project consists of a 13-acre industrial facility including a multi-tenant distribution building that allows for warehousing, showroom, and office uses, as well as 1.61 acres expected to be developed with a future commercial use. The Project includes the development of a rectangular 232,575-square foot (sf) warehouse building that includes 10,000 sf of office space, with 215 parking stalls, 52 trailer parking stalls, and 39 dock positions that would support warehousing, showroom, and office uses within a single building. Construction on the commercial pad is not proposed as part of this Project application; however, development of a 125-room hotel has been assumed as part of the environmental analysis.

Board of Directors

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2270 Trumble Road • P.O. Box 8300 • Perris, CA 92572-8300

T 951.928.3777 • F 951.928.6177 | [www.emwd.org](http://www.emwd.org)

EMWD offers the following comments:

To define the impact(s) on the environment and on existing EMWD facilities, and as development within this area occurs over time, the proponents of implementing development projects shall consult EMWD's Development Services Department to compare proposed and existing water demands and sewer flows, and prepare a Design Conditions report (DC), formally known as the Plan of Service (POS), to detail all pertinent facilities necessary to serve such implementing development projects, resulting in an approved DC, prior to final design and plan check of such facilities.

To help define EMWD's Design Conditions, EMWD requires beginning dialogue with project proponents at an early stage in the site design and development, via a one-hour complementary Due Diligence meeting. To set up this meeting the project proponent should complete a Project Questionnaire (form NBD-058) and submit to EMWD. To download this form or for additional information, please visit our web page [www.emwd.org](http://www.emwd.org), then select the "Developer" link, then select the "New Development Process Forms" link. This meeting will offer the following benefits:

1. Describe EMWD's development process
2. Identify project scope and parameters
3. Provide a preliminary review of the project within the context of existing infrastructure
4. Discuss potential candidacy for recycled water service
5. Identify project submittal requirements to start the Design Conditions review

Following the Due Diligence meeting, and to proceed with a project, the Design Conditions will need to be developed by the developer's engineer and reviewed/approved by EMWD prior to submitting improvement plans for Plan Check. The DC process and approval will provide the following:

1. Technical evaluation of the project's demands and existing system capacities
2. Identification of impacts to existing facilities
3. Identification of additional on-site and off-site facilities, necessary to serve the project
4. Identification of easement requirements, if necessary
5. Identification of potential EMWD's cost participation in facility oversizing, if applicable

Matthew Evans: EMWD Comment

August 3, 2022

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If you have questions or concerns, please do not hesitate to contact Maroun El-Hage at (951) 928-3777, extension 4468 or by e-mail at [El-hagem@emwd.org](mailto:El-hagem@emwd.org).

Sincerely,

Alfred Javier

Director of Environmental and Regulatory Compliance

ARJ:arj

Attachments: Copy of Public Notice

**NOTICE OF INTENT  
TO ADOPT A MITGATED NEGATIVE DECLARATION (MND) 2373  
RAMONA-INDIAN WAREHOUSE PROJECT**

**Project Title:** Ramona-Indian Warehouse Project (PLN21-00011)

**Lead Agency:**

City of Perris

Planning Division

135 North "D" Street

Perris, California 92570

(951) 943-5003 ext. 115

Contact: Mathew Evans, Project Planner

RECEIVED JUL 28 2022

**Project Location - City:** Perris

**Project Location - County:** Riverside

**Project Location – Specific** The Project site (APN 302-060-041) is in the central portion of the PVCCSP area within the City of Perris and includes approximately 15 acres (14.93 acres). It is located approximately 1.4 miles east of Interstate (I-) 215 and approximately 6.5 miles south of State Route (SR-) 60 and approximately 1.5 miles south of MARB/IPA. The Project site is located north of Ramona Expressway, east of Indian Avenue, and west of North Perris Boulevard. The project alignment is situated within in a land grant called San Jacinto Nuevo y Potrero, on the U.S. Geological Survey (USGS) 7.5' Perris quadrangle.

**Description of the Project:** The proposed Project involves the adoption of a Specific Plan Amendment to the PVCCSP and approval of a parcel map and Development Plan to allow the construction and operation of a 13-acre industrial facility including a multi-tenant distribution building that allows for warehousing, showroom, and office uses, as well as 1.61 acres expected to be developed with a future commercial use. The Project includes the development of a rectangular 232,575-square foot (sf) warehouse building that includes 10,000 sf of office space, with 215 parking stalls, 52 trailer parking stalls, and 39 dock positions that would support warehousing, showroom, and office uses within a single building. Construction on the commercial pad is not proposed as part of this Project application; however, development of a 125-room hotel has been assumed as part of the environmental analysis.

**Mitigation Measures:** The Initial Study evaluated potential environmental impacts to aesthetics, agricultural and forestry resources, air quality, biological resources, cultural resources, energy, geology and soils, greenhouse gas emissions, hazards and hazardous materials, hydrology and water quality, land use and planning, mineral resources, noise, population and housing, public services, recreation, transportation/traffic, tribal cultural resources, utilities and service systems and wildfires. As identified through the analysis presented in the Initial Study, with incorporation of applicable mitigation measures from the PVCCSP EIR and PVCCSP Standards and Guidelines, and compliance with regulatory requirements, the Project would have no impacts or less than significant impacts for each topic with the exception of Aesthetics, Cultural Resources, Geology and Soils (Paleontological Resources), and Tribal Cultural Resources. With the implementation of Project-specific mitigation measures, the Project's impacts related to these topics would be less than significant. The City did not identify any significant, unavoidable impacts.

**Address Where a Copy of the Mitigated Negative Declaration and Documents Incorporated by Reference are Available:**

**City of Perris**

Planning Division

135 North "D" Street

Perris, California 92570-2200

Phone: (951) 943-5003

FAX: (951) 943-8379

Monday – Friday 8:00 AM to 6:00 PM

**Electronic copies of documents can be viewed at:**

Initial Study/MND:

<https://www.cityofperris.org/departments/development-services/planning/environmental-documents-for-public-review>

General Plan and General Plan EIR:

<https://www.cityofperris.org/departments/development-services/general-plan>

Perris Municipal Code:

<https://www.cityofperris.org/departments/development-services/municipal-code>

Perris Valley Commerce Center Specific Plan and EIR:

<https://www.cityofperris.org/departments/development-services/specific-plans>

**Public Review Period:** The Draft MND/Initial Study is being circulated for a 30-day review period, estimated to start on July 29, 2022, and to close on August 29, 2022. Due to the time limits mandated by State Law, your comments must be received at the earliest date, but

not later than August 29, 2022 at 6:00 PM. Please send your comments to Mathew Evans, City of Perris Planning Division, 135 North "D" Street, Perris, California 92570-2200. Mr. Evans may be reached by phone at (951) 943-5003 Ext. 115, or via e-mail at [mevans@cityofperris.org](mailto:mevans@cityofperris.org).

**Public Hearing:** Written and oral comments regarding the MND/Initial Study and project may also be submitted at public hearings that will be held before the City of Perris Planning Commission. The date, time, and place of future public hearings will be appropriately notified per City and CEQA requirements. Copies of all relevant material, including the project specifications, the MND, and supporting documents, are available for review at the City of Perris Planning Division located at the address stated above.

**Hazardous Materials Statement:** The Project site is not listed on any list of hazardous waste sites prepared pursuant to Government Code Section 65962.5.

To Mary Blais;  
City of Perris Planning Division  
101 North "D" Street  
Perris Ca. 92570

8/25/22

Re: "Ramona-Indiann Warehouse Project MND"

I recently received a proposal from Douglas J. Dennington,

RUTAN & TUCKER,LLP  
18575 Jamboree,9th floor

Irvine, Ca. 92612  
O. (714) 641-5100  
D. (714) 641-3419

appears to be the Legal representative for Mr McKay. Their proposal is to install a 20 foot gate at the far east portion of my property. There was no mention about my concerns as to the "Quit Title/Prescriptive Easement" I have brought to the City's attention.

In their proposal a photo was provided showing the proposed gate along with some erroneous captions. They claim the area in the photo is non-buildable and can not be obstructed. That is incorrect. They also claim I have encroached on my own property.

The ingress/egress easement recorded on the 4111 Barrett Ave. Perris City Property title for the benefit of all the property owners East of my property all the way to Perris Boulevard became null and void 15 + years ago.

The original 30 foot ingress/egress easement was created by a residential developer who intended to subdivide the entire block and provide a 30 foot future roads around the block.

When the City of Perris chose to relocate the Indian Avenue road to Barrett Avenue, and raise the road elevation 8 feet, 800 feet of Barrett Avenue was eliminated. The ingress/egress aspect of the 4111 easement became null and void and no longer enforceable.

I have lived at the 4111 Barrett Avenue residence for over 40 years. I have been using the road South of my property for the same 40 years. I never claimed the property is mine, I only claim that after 15, 30, 40, years, The "Quit Title/Prescriptive Easement" does exist and I want to maintain its use.

I want to maintain my quality of life and use of the area as I have done for 40 years.

To mitigate my concerns and maintain my life style, I only ask that the developer move his 14 foot North/West side wall ,30 feet to the South, providing me access to the 30 foot ingress/egress easement on the East side of my property. The wall would have to extent approximately 320 feet to the East. That's the area I have been accustom to.

If the developer choses, he could build his wall East 300 feet and 45 degree his wall North/East to allow my ingress/egress access.

Respectfully Submitted'



Kelly Kaus.  
PO Box 1441  
Perris Cal 92572

kellykaus@me.com  
(951) 422-4555

Development Services Department  
Building Division

AUG 25 2022



Kaus construction on **non-buildable** easement

Screening Wall for  
New Duke-Realty  
Industrial Bldg

Encroachment

Potential Gate  
Location for Ingress  
and Egress

Easement Area

McKay  
Property

PROPERTY LINE

1

2013



Printed 11/2013



2016





*Easement in question*





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Oakland, CA 94612

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[Amalia@lozeaudrury.com](mailto:Amalia@lozeaudrury.com)

*Via Email*

August 29, 2022

Mathew Evans  
City of Perris Planning Division  
135 North "D" Street  
Perris, CA 92570  
[mevans@cityofperris.org](mailto:mevans@cityofperris.org)

**Re: Comment on Mitigated Negative Declaration, Ramona-Indian Warehouse Project (PLN21-00011)**

Dear Mr. Evans:

I am writing on behalf of Supporters Alliance for Environmental Responsibility ("SAFER"), regarding the Mitigated Negative Declaration for the Project known as Ramona-Indian Warehouse Project, including all actions referring or related to the development of a 232,575 square foot warehouse with 10,000 square feet of ancillary office space located at Ramona Expressway (APN 302-060-041) in the City of Perris ("Project").

After reviewing the MND, we conclude that the MND fails as an informational document, fails to adequately analyze the Project's environmental impacts, and fails to impose all feasible mitigation measures to reduce the Project's impacts. SAFER requests that the Planning Division address these shortcomings in an environmental impact report ("EIR") and circulate the EIR prior to considering approvals for the Project.

This comment has been prepared with the assistance of Certified Industrial Hygienist, Francis "Bud" Offermann, PE, CIH (Exhibit A), and wildlife biologist Shawn Smallwood (Exhibit B). We incorporate the Offermann and Smallwood comments herein by reference.

**I. Project Description.**

The applicant is proposing to construct a 232,575 square foot warehouse with 10,000 square feet of ancillary office space, 215 parking stalls, 52 trailer parking stalls, and 39 dock positions. The Project would develop 13 acres of the 15-acre site, and the remaining portion would be reserved for a commercial development pad, although no

commercial development is proposed as part of the project. The MND's analysis assumed development of a 125-room hotel as part of the environmental assessment. Construction of the proposed project is anticipated to last 18 months, and construction of the hotel is estimated to last approximately 2 additional years. The Project will require a specific plan amendment to change the land use from commercial to light industrial, and approval of a parcel map and development plan.

## II. Legal Background.

As the Supreme Court held, "If 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 Environment v. South Coast Air Quality Management Dist. (ConocoPhillips)* (2010) 48 Cal. 4th 310, 319-320, citing, *No Oil, Inc. v. City of Los Angeles*, 13 Cal.3d at pp. 75, 88; *Brentwood Assn. for No Drilling, Inc. v. City of Los Angeles* (1982) 134 Cal. App. 3d 491, 504–505.) "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 Environment v. Calif. Resources 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 1214; *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*, 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 University of California* (1988) 47 Cal.3d 376, 392.) The EIR process "protects not only the environment but also informed self-government." (*Pocket Protectors*, 124 Cal.App.4th 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." (Pub. Res. Code § 21080(d) (emphasis added); see also *Pocket Protectors*, 124 Cal.App.4th at 927.) In very limited circumstances, an agency may avoid preparing an EIR by issuing a negative declaration, a written statement briefly indicating that a project will have no significant impact thus requiring no EIR (CEQA Guidelines § 15371), only if there is not even a "fair argument" that the project will have a significant environmental effect. (Pub. Res. Code §§ 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*, 129 Cal.App.3d 436, 440 (1989).) CEQA contains a “**preference for resolving doubts in favor of environmental review.**” (*Pocket Protectors*, 124 Cal.App.4th at 927 (emphasis in original).)

### III. DISCUSSION

#### A. There is Substantial Evidence that the Project Will Have a Significant Health Risk Impact from its Indoor Air Quality Impacts.

Certified Industrial Hygienist, Francis “Bud” Offermann, PE, CIH, has conducted a review of the proposed Project and relevant documents regarding the Project’s indoor air emissions. Indoor Environmental Engineering Comments (August 20,2022) (Exhibit A). Mr. Offermann concludes that it is likely that the Project will expose commercial employees of the Project to significant impacts related to indoor air quality, and in particular, emissions of the cancer-causing chemical formaldehyde. Mr. Offermann is a leading expert on indoor air quality and has published extensively on the topic. Mr. Offermann’s expert comments and curriculum vitae are attached as Exhibit A.

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 time 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.” (Ex. A, p. 2-3.)

Formaldehyde is a known human carcinogen. Mr. Offermann states that future employees of the commercial component of the Project would be exposed to a cancer risk of 17.7 in one million. (Ex. A, p. 4.) This calculation **assumes that all materials will be compliant with the California Air Resources Board’s formaldehyde airborne toxics control measure.** (*Id.* at 5.) These potential exposure levels exceed the South Coast Air Quality Management District’s (“SCAQMD”) CEQA significance threshold for airborne cancer risk of 10 per million. (*Id.*)

Mr. Offermann concludes that these significant environmental impacts should be analyzed in an appropriate CEQA document and mitigation measures should be imposed to reduce the risk of formaldehyde exposure. (*Id.* at 5.) Mr. Offermann identifies mitigation measures that are available to reduce these significant health risks, including the installation of air filters and a requirement that the applicant 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 or ultra-low emitting formaldehyde (ULEF) resins in the buildings' interiors. (*Id.* at 11-13.)

Mr. Offermann's comments are substantial evidence of a fair argument that the Project may cause significant impacts on indoor air quality. The City must prepare an EIR to disclose and mitigate the potential environmental impacts to future users of the building.

**B. The Project Will Have Significant Adverse Biological Resources Impacts That the IS/MND Fails to Adequately Analyze and Mitigate.**

Shawn Smallwood, Ph.D. reviewed the IS/MND's analysis of the Project's biological impacts, in addition to having his associate conduct a site visit of the Project site. Dr. Smallwood's comment letter and CV are attached as Exhibit B and his comments are briefly summarized here.

**1. The IS/MND is inadequate in its characterization of the existing environmental setting as it relates to wildlife.**

Dr. Smallwood's analysis of the Project's impacts is supported by a site visit by Noriko Smallwood, a wildlife biologist with a Master's Degree from California State University Los Angeles. Noriko visited the site on August 24, 2022 for 2.75 hours, from 06:17 to 09:02 with the use of binoculars. (Ex. B at 1.) During that visit, she observed the presence of 20 species of vertebrate wildlife at and near the Project site, five of which are special-status species. (*Id.*, see Ex. B, Table 1, p. 3.) Species observed include harvester ants, which Dr. Smallwood states are "significant ecological keystone species for their roles in soil bioturbation and as prey to Blainville's horned lizards and other species, and which the IS/MND implies were eliminated by disking." (*Id.* at 1-2.) Other species observed include ground squirrels, American kestrel, California gulls, barn swallows, and cliff swallows. (*Id.* at 2.)

Every CEQA document must start from a "baseline" assumption. The CEQA "baseline" is the set of environmental conditions against which to compare a project's anticipated impacts. (*Communities for a Better Env't. v. So. Coast Air Qual. Mgmt. Dist.* (2010) 48 Cal. 4th 310, 321.) Dr. Smallwood found that the IS/MND was incomplete and inaccurate in its characterization of the environmental setting due to an inadequate biological survey and a review of literature and databases that was too cursory. (Ex. B, p. 12-21.) The biological resources assessment for the IS/MND was prepared by Helix Environmental Planning, Inc. (Helix Report). The Helix Report only detected a fraction of the species identified by Noriko Smallwood, despite having surveyed the area on more days for a longer period of time and having had direct access to the site. (Ex. B, p. 12-13.) Notably, Dr. Smallwood pointed out that the Helix report was missing key information regarding its surveys, including standards of how special-status species were identified with potential for occurrence, how vegetation types were mapped, and

how mapped vegetation was assessed for its potential to support special-status species. (Ex. B, p. 12.) Dr. Smallwood also noted that although “focused” surveys were purportedly conducted for burrowing owls and MSHCP Riparian/Riverine plant species, those surveys occurred on the same days, and it is unclear whether the surveys were performed simultaneously, thus rendering them not “focused.” (*Id.*)

Dr. Smallwood also identified flaws in the IS/MND’s review of databases. (Ex. B, p. 13-15.) The Helix Report failed to explain how its literature and database review were used to identify species for analysis of occurrence potential. (*Id.* at 13.) Based on what Dr. Smallwood was able to infer, the Helix Report improperly used the California Natural Diversity Data Base (“CNDDDB”) to screen out special-status species from further consideration, a determination that CNDDDB was not designed to support. (*Id.*) Dr. Smallwood looked at additional databases that are useful to determine presence and likelihood of presence, such as eBird and iNaturalist. (*Id.* at 14.) Based on that review, he identified 115 special-status species that could potentially occur on-site, a mere 37 for which Helix addressed occurrence likelihoods. (*Id.* at 15; see also Table 2, p. 17-21.) Ultimately, Dr. Smallwood found that there are “numerous special-status species at risk of significant impacts caused by the proposed project.” (*Id.* at 16.)

A skewed baseline such as the one used by the City here ultimately “mislead(s) the public” by engendering inaccurate analyses of environmental impacts, mitigation measures and cumulative impacts for biological resources. (See *San Joaquin Raptor Rescue Center v. County of Merced*, 149 Cal.App.4th 645, 656; *Woodward Park Homeowners Assn., Inc. v. City of Fresno*, 150 Cal.App.4th 683, 708-711.) This inaccurate baseline and the species identified by Noriko and Dr. Smallwood warrant discussion and analysis in an EIR to ensure species are accurately detected and that any impacts are mitigated to a less than significant level.

## **2. The IS/MND fails to analyze the Project’s impact on lost breeding capacity.**

Dr. Smallwood found that the Project would contribute to a decline in birds in North America, a trend that has been happening over the last approximately 50 years largely due to habitat loss and fragmentation and would be further exacerbated by this project. (Ex. B at 28.) Based on studies on the subject, Dr. Smallwood estimates that the presence of the Project on the site could lead to as many as 103 bird nests lost annually. (*Id.*) He further found that the reproductive capacity of the site would be lost, as the Project would prevent 299 fledglings per year, which would in turn contribute to the lost capacity of 340 birds per year. (*Id.*)

Because this impact was not addressed in the IS/MND and Dr. Smallwood has presented substantial evidence of a fair argument that habitat loss will impact species, the City must prepare an EIR to analyze the impact.



### **3. The IS/MND fails to analyze the project's impact to wildlife movement.**

Dr. Smallwood found that the IS/MND's analysis of whether the Project would interfere with wildlife movement was fundamentally flawed. (Ex. B at 28.) The IS/MND found that the Project site did not support wildlife movement because it is not located near any open space or native habitats and does not represent a wildlife corridor. (*Id.*; MND, p. 51). However, Dr. Smallwood states that "the primary phrase of the CEQA standard [for wildlife movement] goes to wildlife movement regardless of whether the movement is channeled by a corridor." (Ex. B at 28.) He then concluded that "[a] site such as the proposed project site is critically important for wildlife movement because it composes an increasingly diminishing area of open space within a growing expanse of anthropogenic uses, forcing more species of volant wildlife to use the site for stopover and staging during migration, dispersal, and home range patrol." (*Id.*) An EIR should be prepared to properly analyze this impact.

### **4. The IS/MND fails to analyze the project's impacts on wildlife from additional traffic generated by the Project.**

According to the IS/MND, the Project will generate 2,911,669 annual Vehicle Miles Traveled ("VMT") for the warehouse portion of the project, and 2,386,171 for the hotel portion of the project. (Ex. B. p. 31.) Yet the IS/MND provides no analysis of the impacts on wildlife that will be caused by the traffic on the roadways servicing the Project.

Vehicle collisions with special-status species is not a minor issue, but rather results in the death of millions of species each year. Dr. Smallwood explains:

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).

(Ex. B at 29.)

Using the IS/MND's estimates of VMT as a basis, Dr. Smallwood was able to predict the impacts to wildlife that could be caused by the project. (*Id.* at 31.) Using the data from the Mendelsohn et al. (2009) study, Dr. Smallwood calculates that operation of the Project over 50 years would cause an accumulated 145,150 wildlife fatalities. (*Id.*) He therefore states that "the project-generated traffic would cause substantial, significant impacts to wildlife." (*Id.*) An EIR should be prepared which includes an analysis and mitigation of the result increased traffic from the Project will have on wildlife.

### **5. The IS/MND fails to analyze the Project's potential impacts on bird species from window collisions.**

The Project will have a significant impact on birds as a result of window collisions. The City has not analyzed or mitigated these potential impacts to special-status birds. Analyzing the potential impact on wildlife of window collisions is especially important because “[w]indow collisions are often characterized as either the second or third largest source of human-caused bird mortality.” (Ex. B at 32.)

Dr. Smallwood reviewed a number of studies in order to calculate the number of bird collisions that would occur annually as a result of the Project. (Ex. B at 34.) According to his calculations, each m<sup>2</sup> of glass would result in 0.073 bird deaths per year. (*Id.*) Dr. Smallwood then looked at the building design for the Project and estimated that the Project would include approximately 2,943 m<sup>2</sup> of glass windows. (*Id.*) Based on the estimated 2,943 m<sup>2</sup> of glass windows and the 0.073 bird deaths per m<sup>2</sup> of glass windows, Dr. Smallwood estimates that the project could result in 215 bird deaths per year. (*Id.*)

These bird deaths constitute a significant impact that must be analyzed. The City must prepare an EIR to disclose, analyze, and mitigate the full scope of the Project's impact resulting from window collisions.

### **6. The IS/MND fails to adequately address the cumulative impacts of the Project on wildlife.**

The IS/MND did not provide a discussion of cumulative impacts specific to biological resources. (Ex. B, p. 35.) The MND states that cumulative impacts were previously analyzed in the Perris Valley Commerce Center Specific Plan (“PVCCSP”), but does not explain how implementing the requirements of the PVCCSP would minimize, avoid, or offset the project's contributions to cumulative impacts to wildlife other than birds. (*Id.*) This is improper under CEQA Guidelines, which state that “[w]hen relying on a plan, regulation or program, the lead agency should explain how implementing the particular requirements in the plan, regulation, or program ensure that the project's incremental contribution to the cumulative effect is not cumulatively considerable.” (CA Code Regs. Tit. 14 § 15064(h)(3).) An EIR should be prepared to adequately analyze potential cumulative impacts to wildlife caused by the Project.

As for the proposed mitigation measures, Dr. Smallwood states that while he concurs with MM Bio 1: Construction Timing and Pre-Construction Nesting Bird Survey, it would not prevent the loss of productive capacity. (Ex. B at 35.) He also concurs with the part of MM Bio 2 which recommends a burrowing owl preconstruction survey, but disagrees with the relocation of burrowing owls because the California Department of Fish and Wildlife (CDFW) does not regard passive relocation as a valid mitigation measure, and in fact sees it as potentially causing more harm to burrowing owls. (*Id.*)

As for the mitigation measure to pay MSHCP a mitigation fee, Dr. Smallwood notes that only 44 of the 115 special-status species with the potential to occur onsite are covered by the MSHCP, and 62% of species would therefore would not benefit from this measure. (*Id.* at 36.)

Dr. Smallwood recommends several measures, including detection surveys, construction monitoring and compensatory mitigation, which should be considered in an EIR for the Project. (*Id.* at 36-39.)

#### **IV. CONCLUSION**

For the foregoing reasons, SAFER believes that the MND is wholly inadequate. SAFER urges the Planning Division to direct staff to address the concerns raised herein. Thank you for considering our comments and please include this letter in the record of proceedings for this project.

Sincerely,

A handwritten signature in black ink, appearing to read "Amalia Bowley Fuentes". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

Amalia Bowley Fuentes  
Lozeau Drury LLP

# EXHIBIT A



# INDOOR ENVIRONMENTAL ENGINEERING



1448 Pine Street, Suite 103 San Francisco, California 94109

Telephone: (415) 567-7700

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Date: August 20, 2022

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

From: Francis J. Offermann PE CIH

Subject: Indoor Air Quality: Ramona-Indian Warehouse Project, Perris, CA  
(IEE File Reference: P-4624)

Pages: 18

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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 OEHHA 10 in a million cancer risk threshold (OEHHA, 2017a).

With respect to the Ramona-Indian Warehouse Project, Perris, CA the buildings consist of commercial spaces.

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.

Because the commercial spaces 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  $\mu\text{g}/\text{m}^3$  (Singer et. al., 2020)

Assuming that the employees of commercial spaces work 8 hours per day and inhale 20  $\text{m}^3$  of air per day, the formaldehyde dose per work-day at the offices is 161  $\mu\text{g}/\text{day}$ .

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  $\mu\text{g}/\text{day}$ .

This is 1.77 times the NSRL (OEHHA, 2017a) of 40  $\mu\text{g}/\text{day}$  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 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 (µg/h) from the product of the area-specific formaldehyde emission rate (µg/m<sup>2</sup>-h) and the area (m<sup>2</sup>) 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.,  $\mu\text{g}/\text{m}^2\text{-h}$ ) 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.

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

where:

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

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

$Q_{oa}$  = 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.

The Ramona-Indian Warehouse Project is close to roads with moderate to high traffic (e.g., Ramona Freeway, Perris Boulevard, Escondido Freeway (215), Redlands Avenue, Indian Avenue etc.) and thus the Project site is a sound impacted site.

In order to design the building for this Project such that interior noise levels are acceptable, an acoustic study of the existing and future ambient noise levels needs to be conducted.

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

**PM<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 Initial Study/Mitigated Negative Declaration - Ramona-Indian Warehouse Project (Helix Environmental Planning, 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>.

An air quality analyses should to 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 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<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 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<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.

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### **Education**

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

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

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

### **Professional Experience**

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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



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

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

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

### **PROFESSIONAL ORGANIZATION MEMBERSHIP**

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

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

American Society for Testing and Materials (ASTM)

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

American Board of Industrial Hygiene (ABIH)

American Conference of Governmental Industrial Hygienists (ACGIH)

- Bioaerosols Committee (2007-2013)

American Industrial Hygiene Association (AIHA)

Cal-OSHA Indoor Air Quality Advisory Committee

International Society of Indoor Air Quality and Climate (ISIAQ)

- Co-Chairman of Task Force on HVAC Hygiene

U. S. Green Building Council (USGBC)

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

Western Construction Consultants (WESTCON)

## **PROFESSIONAL CREDENTIALS**

Licensed Professional Engineer - Mechanical Engineering

Certified Industrial Hygienist - American Board of Industrial Hygienists

## **SCIENTIFIC MEETINGS AND SYMPOSIA**

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

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

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

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

Controlling Microbial Moisture Problems in Buildings, Walnut Creek, CA, February 27, 1997.

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

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

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

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

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

Healthy Indoor Environments, Anaheim, CA, April 2003.

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

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

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

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

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

### **SPECIAL CONSULTATION**

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

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

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

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

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

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

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

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

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

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

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

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

#### **PEER-REVIEWED PUBLICATIONS :**

F.J.Offermann, C.D.Hollowell, and G.D.Roseme, "Low-Infiltration Housing in Rochester, New York: A Study of Air Exchange Rates and Indoor Air Quality," *Environment International*, 8, pp. 435-445, 1982.

W.W.Nazaroff, F.J.Offermann, and A.W.Robb, "Automated System for Measuring Air Exchange Rate and Radon Concentration in Houses," *Health Physics*, 45, pp. 525-537, 1983.

F.J.Offermann, W.J.Fisk, D.T.Grimrud, B.Pedersen, and K.L.Revzan, "Ventilation Efficiencies of Wall- or Window-Mounted Residential Air-to-Air Heat Exchangers," *ASHRAE Annual Transactions*, 89-2B, pp 507-527, 1983.

W.J.Fisk, K.M.Archer, R.E Chant, D. Hekmat, F.J.Offermann, and B.Pedersen, "Onset of Freezing in Residential Air-to-Air Heat Exchangers," *ASHRAE Annual Transactions*, 91-1B, 1984.

W.J.Fisk, K.M.Archer, R.E Chant, D. Hekmat, F.J.Offermann, and B.Pedersen, "Performance of Residential Air-to-Air Heat Exchangers During Operation with Freezing and Periodic Defrosts," *ASHRAE Annual Transactions*, 91-1B, 1984.

F.J.Offermann, R.G.Sextro, W.J.Fisk, D.T.Grimrud, W.W.Nazaroff, A.V.Nero, and K.L.Revzan, "Control of Respirable Particles with Portable Air Cleaners," *Atmospheric Environment*, Vol. 19, pp.1761-1771, 1985.

R.G.Sextro, F.J.Offermann, W.W.Nazaroff, A.V.Nero, K.L.Revzan, and J.Yater, "Evaluation of Indoor Control Devices and Their Effects on Radon Progeny Concentrations," *Atmospheric Environment*, *12*, pp. 429-438, 1986.

W.J. Fisk, R.K.Spencer, F.J.Offermann, R.K.Spencer, B.Pedersen, R.Sextro, "Indoor Air Quality Control Techniques," *Noyes Data Corporation*, Park Ridge, New Jersey, (1987).

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

F.J.Offermann and D. Int-Hout "Ventilation Effectiveness Measurements of Three Supply/Return Air Configurations," *Environment International* , Volume 15, pp 585-592 1989.

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

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

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

F.J.Offermann, S.A.Loiselle, A.T.Hodgson, L.A. Gundel, and J.M. Daisey, "A Pilot Study to Measure Indoor Concentrations and Emission Rates of Polycyclic Aromatic Compounds", *Indoor Air* , Vol 4, pp 497-512, 1991.

F.J. Offermann, S. A. Loiselle, R.G. Sextro, "Performance Comparisons of Six Different Air Cleaners Installed in a Residential Forced Air Ventilation System," *IAQ'91*, Healthy Buildings, pp 342-350, ASHRAE, Atlanta, GA (1991).

F.J. Offermann, J. Daisey, A. Hodgson, L. Gundell, and S. Loiselle, "Indoor Concentrations and Emission Rates of Polycyclic Aromatic Compounds", *Indoor Air*, Vol 4, pp 497-512 (1992).

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

F.J. Offermann and S. A. Loiselle, "Performance of an Air-Cleaning System in an Archival Book Storage Facility," *IAQ'92*, ASHRAE, Atlanta, GA, 1992.

S.B. Hayward, K.S. Liu, L.E. Alevantis, K. Shah, S. Loiselle, F.J. Offermann, Y.L. Chang, L. Webber, "Effectiveness of Ventilation and Other Controls in Reducing Exposure to ETS in Office Buildings," *Indoor Air '93*, Helsinki, Finland, July 4-8, 1993.

F.J. Offermann, S. A. Loiselle, G. Ander, H. Lau, "Indoor Contaminant Emission Rates Before and After a Building Bake-out," *IAQ'93*, Operating and Maintaining Buildings for Health, Comfort, and Productivity, pp 157-163, ASHRAE, Atlanta, GA, 1993.

L.E. Alevantis, Hayward, S.B., Shah, S.B., Loiselle, S., and Offermann, F.J. "Tracer Gas Techniques for Determination of the Effectiveness of Pollutant Removal From Local Sources," *IAQ '93*, Operating and Maintaining Buildings for Health, Comfort, and Productivity, pp 119-129, ASHRAE, Atlanta, GA, 1993.

L.E. Alevantis, Liu, L.E., Hayward, S.B., Offermann, F.J., Shah, S.B., Leiserson, K. Tsao, E., and Huang, Y., "Effectiveness of Ventilation in 23 Designated Smoking Areas in California Buildings," *IAQ '94*, Engineering Indoor Environments, pp 167-181, ASHRAE, Atlanta, GA, 1994.

L.E. Alevantis, Offermann, F.J., Loiselle, S., and Macher, J.M., "Pressure and Ventilation Requirements of Hospital Isolation Rooms for Tuberculosis (TB) Patients: Existing Guidelines in the United States and a Method for Measuring Room Leakage", Ventilation and Indoor air quality in Hospitals, M. Maroni, editor, Kluwer Academic publishers, Netherlands, 1996.

F.J. Offermann, M. A. Waz, A.T. Hodgson, and H.M. Ammann, "Chemical Emissions from a Hospital Operating Room Air Filter," *IAQ'96*, Paths to Better Building Environments, pp 95-99, ASHRAE, Atlanta, GA, 1996.

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

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

F. J. Offermann, A. T. Hodgson, and J. P. Robertson, "Contaminant Emission Rates from PVC Backed Carpet Tiles on Damp Concrete", Healthy Buildings 2000, Espoo, Finland, August 2000.

K.S. Liu, L.E. Alevantis, and F.J. Offermann, "A Survey of Environmental Tobacco Smoke Controls in California Office Buildings", *Indoor Air*, Vol 11, pp. 26-34, 2001.

F.J. Offermann, R. Colfer, P. Radzinski, and J. Robertson, "Exposure to Environmental Tobacco Smoke in an Automobile", *Indoor Air 2002*, Monterey, California, July 2002.

F. J. Offermann, J.P. Robertson, and T. Webster, "The Impact of Tracer Gas Mixing on Airflow Rate Measurements in Large Commercial Fan Systems", *Indoor Air 2002*, Monterey, California, July 2002.

M. J. Mendell, T. Brennan, L. Hathon, J.D. Odom, F.J. Offermann, B.H. Turk, K.M. Wallingford, R.C. Diamond, W.J. Fisk, "Causes and prevention of Symptom Complaints

in Office Buildings: Distilling the Experience of Indoor Environmental Investigators”, submitted to Indoor Air 2005, Beijing, China, September 4-9, 2005.

F.J. Offermann, “Ventilation and IAQ in New Homes With and Without Mechanical Outdoor Air Systems”, Healthy Buildings 2009, Syracuse, CA, September 14, 2009.

F.J. Offermann, “ASHRAE 62.2 Intermittent Residential Ventilation: What’s It Good For, Intermittently Poor IAQ”, IAQVEC 2010, Syracuse, CA, April 21, 2010.

F.J. Offermann and A.T. Hodgson, “Emission Rates of Volatile Organic Compounds in New Homes”, Indoor Air 2011, Austin, TX, June, 2011.

P. Jenkins, R. Johnson, T. Phillips, and F. Offermann, “Chemical Concentrations in New California Homes and Garages”, Indoor Air 2011, Austin, TX, June, 2011.

W. J. Mills, B. J. Grigg, F. J. Offermann, B. E. Gustin, and N. E. Spingarm, “Toluene and Methyl Ethyl Ketone Exposure from a Commercially Available Contact Adhesive”, Journal of Occupational and Environmental Hygiene, 9:D95-D102 May, 2012.

F. J. Offermann, R. Maddalena, J. C. Offermann, B. C. Singer, and H. Wilhelm, “The Impact of Ventilation on the Emission Rates of Volatile Organic Compounds in Residences”, HB 2012, Brisbane, AU, July, 2012.

F. J. Offermann, A. T. Hodgson, P. L. Jenkins, R. D. Johnson, and T. J. Phillips, “Attached Garages as a Source of Volatile Organic Compounds in New Homes”, HB 2012, Brisbane, CA, July, 2012.

R. Maddalena, N. Li, F. Offermann, and B. Singer, “Maximizing Information from Residential Measurements of Volatile Organic Compounds”, HB 2012, Brisbane, AU, July, 2012.

W. Chen, A. Persily, A. Hodgson, F. Offermann, D. Poppendieck, and K. Kumagai, “Area-Specific Airflow Rates for Evaluating the Impacts of VOC emissions in U.S. Single-Family Homes”, Building and Environment, Vol. 71, 204-211, February, 2014.

F. J. Offermann, A. Eagan A. C. Offermann, and L. J. Radonovich, “Infectious Disease Aerosol Exposures With and Without Surge Control Ventilation System Modifications”, Indoor Air 2014, Hong Kong, July, 2014.

F. J. Offermann, “Chemical Emissions from E-Cigarettes: Direct and Indirect Passive Exposures”, Building and Environment, Vol. 93, Part 1, 101-105, November, 2015.

F. J. Offermann, “Formaldehyde Emission Rates From Lumber Liquidators Laminate Flooring Manufactured in China”, Indoor Air 2016, Belgium, Ghent, July, 2016.

F. J. Offermann, “Formaldehyde and Acetaldehyde Emission Rates for E-Cigarettes”, Indoor Air 2016, Belgium, Ghent, July, 2016.

## **OTHER REPORTS:**

W.J.Fisk, P.G.Cleary, and F.J.Offermann, "Energy Saving Ventilation with Residential Heat Exchangers," a Lawrence Berkeley Laboratory brochure distributed by the Bonneville Power Administration, 1981.

F.J.Offermann, J.R.Girman, and C.D.Hollowell, "Midway House Tightening Project: A Study of Indoor Air Quality," Lawrence Berkeley Laboratory, Berkeley, CA, Report LBL-12777, 1981.

F.J.Offermann, J.B.Dickinson, W.J.Fisk, D.T.Grimrud, C.D.Hollowell, D.L.Krinkle, and G.D.Roseme, "Residential Air-Leakage and Indoor Air Quality in Rochester, New York," Lawrence Berkeley Laboratory, Berkeley, CA, Report LBL-13100, 1982.

F.J.Offermann, W.J.Fisk, B.Pedersen, and K.L.Revzan, Residential Air-to-Air Heat Exchangers: A Study of the Ventilation Efficiencies of Wall- or Window- Mounted Units," Lawrence Berkeley Laboratory, Berkeley, CA, Report LBL-14358, 1982.

F.J.Offermann, W.J.Fisk, W.W.Nazaroff, and R.G.Sextro, "A Review of Portable Air Cleaners for Controlling Indoor Concentrations of Particulates and Radon Progeny," An interim report for the Bonneville Power Administration, 1983.

W.J.Fisk, K.M.Archer, R.E.Chant, D.Hekmat, F.J.Offermann, and B.S. Pedersen, "Freezing in Residential Air-to-Air Heat Exchangers: An Experimental Study," Lawrence Berkeley Laboratory, Berkeley, CA, Report LBL-16783, 1983.

R.G.Sextro, W.W.Nazaroff, F.J.Offermann, and K.L.Revzan, "Measurements of Indoor Aerosol Properties and Their Effect on Radon Progeny," Proceedings of the American Association of Aerosol Research Annual Meeting, April, 1983.

F.J.Offermann, R.G.Sextro, W.J.Fisk, W.W. Nazaroff, A.V.Nero, K.L.Revzan, and J.Yater, "Control of Respirable Particles and Radon Progeny with Portable Air Cleaners," Lawrence Berkeley Laboratory, Berkeley, CA, Report LBL-16659, 1984.

W.J.Fisk, R.K.Spencer, D.T.Grimrud, F.J.Offermann, B.Pedersen, and R.G.Sextro, "Indoor Air Quality Control Techniques: A Critical Review," Lawrence Berkeley Laboratory, Berkeley, CA, Report LBL-16493, 1984.

F.J.Offermann, J.R.Girman, and R.G.Sextro, "Controlling Indoor Air Pollution from Tobacco Smoke: Models and Measurements," Indoor Air, Proceedings of the 3rd International Conference on Indoor Air Quality and Climate, Vol 1, pp 257-264, Swedish Council for Building Research, Stockholm (1984), Lawrence Berkeley Laboratory, Berkeley, CA, Report LBL-17603, 1984.



R.Otto, J.Girman, F.Offermann, and R.Sextro, "A New Method for the Collection and Comparison of Respirable Particles in the Indoor Environment," Lawrence Berkeley Laboratory, Berkeley, CA, Special Director Fund's Study, 1984.

A.T.Hodgson and F.J.Offermann, "Examination of a Sick Office Building," Lawrence Berkeley Laboratory, Berkeley, CA, an informal field study, 1984.

R.G.Sextro, F.J.Offermann, W.W.Nazaroff, and A.V.Nero, "Effects of Aerosol Concentrations on Radon Progeny," *Aerosols, Science, & Technology, and Industrial Applications of Airborne Particles*, editors B.Y.H.Liu, D.Y.H.Pui, and H.J.Fissan, p525, Elsevier, 1984.

K.Sexton, S.Hayward, F.Offermann, R.Sextro, and L.Weber, "Characterization of Particulate and Organic Emissions from Major Indoor Sources, Proceedings of the Third International Conference on Indoor Air Quality and Climate, Stockholm, Sweden, August 20-24, 1984.

F.J.Offermann, "Tracer Gas Measurements of Laboratory Fume Entrainment at a Semiconductor Manufacturing Plant," an Indoor Environmental Engineering R&D Report, 1986.

F.J.Offermann, "Tracer Gas Measurements of Ventilation Rates in a Large Office Building," an Indoor Environmental Engineering R&D Report, 1986.

F.J.Offermann, "Measurements of Volatile Organic Compounds in a New Large Office Building with Adhesive Fastened Carpeting," an Indoor Environmental Engineering R&D Report, 1986.

F.J.Offermann, "Designing and Operating Healthy Buildings", an Indoor Environmental Engineering R&D Report, 1986.

F.J.Offermann, "Measurements and Mitigation of Indoor Spray-Applied Pesticides", an Indoor Environmental Engineering R&D Report, 1988.

F.J.Offermann and S. Loiselle, "Measurements and Mitigation of Indoor Mold Contamination in a Residence", an Indoor Environmental Engineering R&D Report, 1989.

F.J.Offermann and S. Loiselle, "Performance Measurements of an Air Cleaning System in a Large Archival Library Storage Facility", an Indoor Environmental Engineering R&D Report, 1989.

F.J. Offermann, J.M. Daisey, L.A. Gundel, and A.T. Hodgson, S. A. Loiselle, "Sampling, Analysis, and Data Validation of Indoor Concentrations of Polycyclic Aromatic Hydrocarbons", Final Report, Contract No. A732-106, California Air Resources Board, March, 1990.

L.A. Gundel, J.M. Daisey, and F.J. Offermann, "A Sampling and Analytical Method for Gas Phase Polycyclic Aromatic Hydrocarbons", Proceedings of the 5th International Conference on Indoor Air Quality and Climate, Indoor Air '90, July 29-August 1990.

A.T. Hodgson, J.M. Daisey, and F.J. Offermann "Development of an Indoor Sampling and Analytical Method for Particulate Polycyclic Aromatic Hydrocarbons", Proceedings of the 5th International Conference on Indoor Air Quality and Climate, Indoor Air '90, July 29-August, 1990.

F.J. Offermann, J.O. Sateri, "Tracer Gas Measurements in Large Multi-Room Buildings", Indoor Air '93, Helsinki, Finland, July 4-8, 1993.

F.J. Offermann, M. T. O'Flaherty, and M. A. Waz "Validation of ASHRAE 129 - Standard Method of Measuring Air Change Effectiveness", Final Report of ASHRAE Research Project 891, December 8, 1997.

S.E. Guffey, F.J. Offermann et. al., "Proceedings of the Workshop on Ventilation Engineering Controls for Environmental Tobacco smoke in the Hospitality Industry", U.S. Department of Labor Occupational Safety and Health Administration and ACGIH, 1998.

F.J. Offermann, R.J. Fiskum, D. Kosar, and D. Mudaari, "A Practical Guide to Ventilation Practices & Systems for Existing Buildings", *Heating/Piping/Air Conditioning Engineering* supplement to April/May 1999 issue.

F.J. Offermann, P. Pasanen, "Workshop 18: Criteria for Cleaning of Air Handling Systems", Healthy Buildings 2000, Espoo, Finland, August 2000.

F.J. Offermann, Session Summaries: Building Investigations, and Design & Construction, Healthy Buildings 2000, Espoo, Finland, August 2000.

F.J. Offermann, "The IAQ Top 10", Engineered Systems, November, 2008.

L. Kincaid and F.J. Offermann, "Unintended Consequences: Formaldehyde Exposures in Green Homes, AIHA Synergist, February, 2010.

F.J. Offermann, "IAQ in Air Tight Homes", ASHRAE Journal, November, 2010.

F.J. Offermann, "The Hazards of E-Cigarettes", ASHRAE Journal, June, 2014.

### **PRESENTATIONS :**

"Low-Infiltration Housing in Rochester, New York: A Study of Air Exchange Rates and Indoor Air Quality," Presented at the International Symposium on Indoor Air Pollution, Health and Energy Conservation, Amherst, MA, October 13-16, 1981.

"Ventilation Efficiencies of Wall- or Window-Mounted Residential Air-to-Air Heat Exchangers," Presented at the American Society of Heating, Refrigeration, and Air Conditioning Engineers Summer Meeting, Washington, DC, June, 1983.

"Controlling Indoor Air Pollution from Tobacco Smoke: Models and Measurements," Presented at the Third International Conference on Indoor Air Quality and Climate, Stockholm, Sweden, August 20-24, 1984.

"Indoor Air Pollution: An Emerging Environmental Problem", Presented to the Association of Environmental Professionals, Bar Area/Coastal Region 1, Berkeley, CA, May 29, 1986.

"Ventilation Measurement Techniques," Presented at the Workshop on Sampling and Analytical Techniques, Georgia Institute of Technology, Atlanta, Georgia, September 26, 1986 and September 25, 1987.

"Buildings That Make You Sick: Indoor Air Pollution", Presented to the Sacramento Association of Professional Energy Managers, Sacramento, CA, November 18, 1986.

"Ventilation Effectiveness and Indoor Air Quality", Presented to the American Society of Heating, Refrigeration, and Air Conditioning Engineers Northern Nevada Chapter, Reno, NV, February 18, 1987, Golden Gate Chapter, San Francisco, CA, October 1, 1987, and the San Jose Chapter, San Jose, CA, June 9, 1987.

"Tracer Gas Techniques for Studying Ventilation," Presented at the Indoor Air Quality Symposium, Georgia Tech Research Institute, Atlanta, GA, September 22-24, 1987.

"Indoor Air Quality Control: What Works, What Doesn't," Presented to the Sacramento Association of Professional Energy Managers, Sacramento, CA, November 17, 1987.

"Ventilation Effectiveness and ADPI Measurements of a Forced Air Heating System," Presented at the American Society of Heating, Refrigeration, and Air Conditioning Engineers Winter Meeting, Dallas, Texas, January 31, 1988.

"Indoor Air Quality, Ventilation, and Energy in Commercial Buildings", Presented at the Building Owners & Managers Association of Sacramento, Sacramento, CA, July 21, 1988.

"Controlling Indoor Air Quality: The New ASHRAE Ventilation Standards and How to Evaluate Indoor Air Quality", Presented at a conference "Improving Energy Efficiency and Indoor Air Quality in Commercial Buildings," National Energy Management Institute, Reno, Nevada, November 4, 1988.

"A Study of Diesel Fume Entrainment Into an Office Building," Presented at Indoor Air '89: The Human Equation: Health and Comfort, American Society of Heating, Refrigeration, and Air Conditioning Engineers, San Diego, CA, April 17-20, 1989.

"Indoor Air Quality in Commercial Office Buildings," Presented at the Renewable Energy Technologies Symposium and International Exposition, Santa Clara, CA June 20, 1989.

"Building Ventilation and Indoor Air Quality", Presented to the San Joaquin Chapter of the American Society of Heating, Refrigeration, and Air Conditioning Engineers, September 7, 1989.

"How to Meet New Ventilation Standards: Indoor Air Quality and Energy Efficiency," a workshop presented by the Association of Energy Engineers; Chicago, IL, March 20-21, 1989; Atlanta, GA, May 25-26, 1989; San Francisco, CA, October 19-20, 1989; Orlando, FL, December 11-12, 1989; Houston, TX, January 29-30, 1990; Washington D.C., February 26-27, 1990; Anchorage, Alaska, March 23, 1990; Las Vegas, NV, April 23-24, 1990; Atlantic City, NJ, September 27-28, 1991; Anaheim, CA, November 19-20, 1991; Orlando, FL, February 28 - March 1, 1991; Washington, DC, March 20-21, 1991; Chicago, IL, May 16-17, 1991; Lake Tahoe, NV, August 15-16, 1991; Atlantic City, NJ, November 18-19, 1991; San Jose, CA, March 23-24, 1992.

"Indoor Air Quality," a seminar presented by the Anchorage, Alaska Chapter of the American Society of Heating, Refrigeration, and Air Conditioning Engineers, March 23, 1990.

"Ventilation and Indoor Air Quality", Presented at the 1990 HVAC & Building Systems Congress, Santa Clara, CA, March 29, 1990.

"Ventilation Standards for Office Buildings", Presented to the South Bay Property Managers Association, Santa Clara, May 9, 1990.

"Indoor Air Quality", Presented at the Responsive Energy Technologies Symposium & International Exposition (RETSIE), Santa Clara, CA, June 20, 1990.

"Indoor Air Quality - Management and Control Strategies", Presented at the Association of Energy Engineers, San Francisco Bay Area Chapter Meeting, Berkeley, CA, September 25, 1990.

"Diagnosing Indoor Air Contaminant and Odor Problems", Presented at the ASHRAE Annual Meeting, New York City, NY, January 23, 1991.

"Diagnosing and Treating the Sick Building Syndrome", Presented at the Energy 2001, Oklahoma, OK, March 19, 1991.

"Diagnosing and Mitigating Indoor Air Quality Problems" a workshop presented by the Association of Energy Engineers, Chicago, IL, October 29-30, 1990; New York, NY, January 24-25, 1991; Anaheim, April 25-26, 1991; Boston, MA, June 10-11, 1991; Atlanta, GA, October 24-25, 1991; Chicago, IL, October 3-4, 1991; Las Vegas, NV, December 16-17, 1991; Anaheim, CA, January 30-31, 1992; Atlanta, GA, March 5-6, 1992; Washington, DC, May 7-8, 1992; Chicago, IL, August 19-20, 1992; Las Vegas,

NV, October 1-2, 1992; New York City, NY, October 26-27, 1992, Las Vegas, NV, March 18-19, 1993; Lake Tahoe, CA, July 14-15, 1994; Las Vegas, NV, April 3-4, 1995; Lake Tahoe, CA, July 11-12, 1996; Miami, FL, December 9-10, 1996.

"Sick Building Syndrome and the Ventilation Engineer", Presented to the San Jose Engineers Club, May, 21, 1991.

"Duct Cleaning: Who Needs It ? How Is It Done ? What Are The Costs ?" What Are the Risks ?, Moderator of Forum at the ASHRAE Annual Meeting, Indianapolis ID, June 23, 1991.

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

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

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

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

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

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

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

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

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

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

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

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

ASHRAE 62 Standard “Ventilation for Acceptable IAQ”, ASCR Convention; San Francisco, CA, March 16, 1995.

“New Developments in Indoor Air Quality: Protocol for Diagnosing IAQ Problems”, AIHA-NC; March 25, 1995.

"Experimental Validation of ASHRAE SPC 129, Standard Method of Measuring Air Change Effectiveness", 16th AIVC Conference, Palm Springs, USA, September 19-22, 1995.

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

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

“Diagnostic Protocols for Solving IAQ Problems”, CSU-PPD Conference; October 24, 1995.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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



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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

# EXHIBIT B

Shawn Smallwood, PhD  
3108 Finch Street  
Davis, CA 95616

City of Perris  
5510 135 North D Street  
City of Perris, CA 92570

27 August 2022

RE: Ramona-Indian Warehouse Project

To Whom it May Concern,

I write to comment on the Initial Study and Mitigated Negative Declaration (IS/MND) prepared for the proposed Ramona-Indian Warehouse Project, which I understand would add a warehouse with 232,575 sf of floor space and a 4-story hotel on 15 acres between Indian Ave and Perris Blvd north of Ramona Expressway (City of Perris 2022). In support of my comments, I reviewed a biological resources report (Helix 2022).

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

### **SITE VISIT**

On my behalf, Noriko Smallwood, a wildlife biologist with a Master's Degree from California State University Los Angeles, visited the site of the proposed project for 2.75 hours from 06:17 to 09:02 hours on 24 August 2022. She walked the site's perimeter, stopping to scan for wildlife with use of binoculars. Conditions were clear with no wind and temperatures ranged 70–79° F. The site had been disked to remove nearly all vegetation, and certainly had the effect of suppressing wildlife (Photos 1 – 3). However, some species of wildlife thrive on the open space provided by efforts to suppress vegetation. Other species thrive in the neighboring trees and shrubs. Even where suppressed, wildlife struggle to persist.

Noriko detected 20 species of vertebrate wildlife at or near the site (Table 1), 5 of which were special-status species. Noriko saw harvester ants (*Pogonomermyx californicus*) (Photo 4), which are significant ecological keystone species for their roles in soil bioturbation and as prey to Blainville's horned lizards and other species, and which the

IS/MND implies were eliminated by disking (harvester ants thrive in disturbed topsoils). She saw ground squirrels (Photo 5 and 6), raising the possibility of use of the site by burrowing owls. She also saw American kestrel and California gulls (Photos 7 and 8), barn swallows and cliff swallows (Photos 9 and 10), a Cooper's hawk that was hunting European starlings (Photos 11 and 12), mourning doves and horned larks (Photos 13 and 14), and house finches and American crows (Photos 15 and 16), among other species. She saw quite a few species of wildlife on the site despite that it had been disked.



**Photos 1 – 3.** Views of the site from the site's corners: top = from NW, middle = from SW, bottom = from SE, 24 August 2022.

**Table 1.** Species of wildlife Noriko observed during 2.75 hours of survey on 24 August 2022.

Common name	Species name	Status <sup>1</sup>	Notes
Harvester ant	<i>Pogonomermyx californicus</i>		
Rock pigeon	<i>Columba livia</i>	Non-native	
Eurasian collared-dove	<i>Streptopelia decaocto</i>	Non-native	Just off site
Mourning dove	<i>Zenaida macroura</i>		Flock; foraging
Anna's hummingbird	<i>Calypte anna</i>		Just off site
California gull	<i>Larus californicus</i>	BCC, TWL	
Cooper's hawk	<i>Accipiter cooperii</i>	TWL, BOP	Hunting birds just off site
Red-tailed hawk	<i>Buteo jamaicensis</i>	BOP	Off site
American kestrel	<i>Falco sparverius</i>	BOP	
Say's phoebe	<i>Sayornis saya</i>		Just off site
American crow	<i>Corvus brachyrhynchos</i>		
Common raven	<i>Corvus corax</i>		
California horned lark	<i>Eremophila alpestris actia</i>	TWL	Flock foraging
Barn swallow	<i>Hirundo rustica</i>		Foraging
Cliff swallow	<i>Petrochelidon pyrrhonota</i>		Foraging
European starling	<i>Sturnus vulgaris</i>	Non-native	
House sparrow	<i>Passer domesticus</i>	Non-native	Just off site
House finch	<i>Haemorphous mexicanus</i>		Flock; foraging
California vole	<i>Microtus californicus</i>		Burrows just off site
Botta's pocket gopher	<i>Thomomys bottae</i>		Burrows just off site
California ground squirrel	<i>Otospermophilus beecheyi</i>		≥2 squirrels on site

<sup>1</sup> Listed as BCC = U.S. Fish and Wildlife Service Bird of Conservation Concern, TWL = Taxa to Watch List (Shuford and Gardali 2008), and BOP = Birds of Prey (California Fish and Game Code 3503.5).

**Photo 4.** Harvester ants on the project site, 24 August 2022. Helix (2022) implies harvester ants are absent from the site.





**Photos 5 and 6.** California ground squirrels off and on the project site, 24 August 2022.



**Photos 7 and 8.** American kestrel (left) and California gull (right) on site.



**Photos 9 and 10.** Barn swallow (left) and cliff swallow (right) on the project site, 24 August 2022.





**Photos 11 and 12.** *Cooper's hawk next to the project site, 24 August 2022.*



**Photo 13.** *Mourning doves on the project site, 24 August 2022.*



**Photo 14.** *Horned lark on the project site, 24 August 2022.*



**Photos 15 and 16.** *House finch (left) and American crow (right) on the edge of the project site, 24 August 2022.*

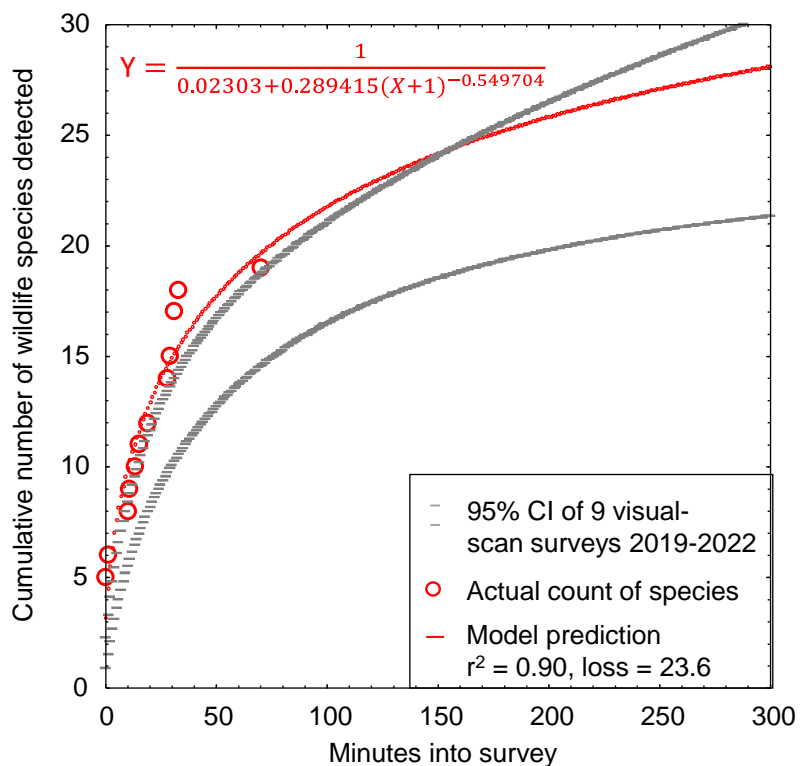
Noriko Smallwood certifies that the foregoing survey results are true and accurate.

*Noriko Smallwood*

Noriko Smallwood

Reconnaissance-level surveys can be useful for confirming presence of species that were detected, but they can also be useful for estimating the number of species that were not detected. One can model the pattern in species detections during a survey as a means to estimate the number of species that used the site but were undetected during the survey. To support such a modeling effort, the observer needs to record the times into the survey when each species was first detected. The cumulative number of species' detections increases with increasing survey time, but eventually with diminishing returns (Figure 1). In the case of Noriko's survey, the pattern in the data (Figure 1) predicts that had she spent more time on site, or had she help from additional biologists, she would have detected 43 species of vertebrate wildlife, which is twice the number she detected. The pattern in the data indicates that the site's richness of wildlife species at the site exceeds the upper bound of the 95% confidence interval estimated from other project sites we have surveyed in the region. The site is relatively richer in wildlife species as compared to other sites we have visited in the area (Figure 1).

**Figure 1.** Actual (red circles) and predicted (red line) relationships between the number of vertebrate wildlife species detected and the elapsed survey time based on Noriko's visual-scan survey on 24 August 2022, and compared to the mean and 95% CI of surveys at 9 sites she and I completed at proposed project sites in the Inland Empire region. Note that the relationship would differ if the survey was based on another method or during another season.



The site supports many species of wildlife, including many more than we could detect during a couple of brief reconnaissance-level surveys. However, although this modeling approach is useful for more realistically representing the species richness of the site at the time of a survey, it cannot represent the species richness throughout the year or

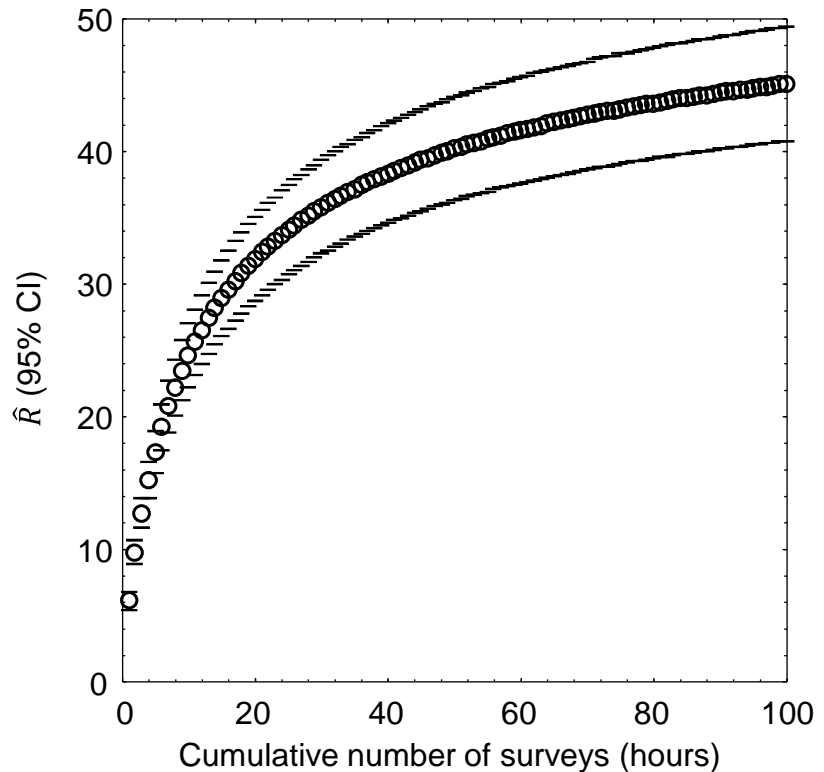
across multiple years because many species are seasonal or even multi-annual in their movement patterns and in their occupancy of habitat.

By use of an analytical bridge, a modeling effort applied to data collected elsewhere can predict the number of vertebrate wildlife species likely making use of the site over the longer term. As part of my research, I completed a much larger survey effort across 167 km<sup>2</sup> of annual grasslands of the Altamont Pass Wind Resource Area, where from 2015 through 2019 I performed 721 1-hour visual-scan surveys, or 721 hours of surveys, at 46 stations. I used binoculars and otherwise the methods were the same as the methods Noriko and I and other consulting biologists use for surveys at proposed project sites. At each of the 46 survey stations, I tallied new species detected with each sequential survey at that station, and then related the cumulative species detected to the hours (number of surveys, as each survey lasted 1 hour) used to accumulate my counts of species detected. I used combined quadratic and simplex methods of estimation in Statistica to estimate least-squares, best-fit nonlinear models of the number of cumulative species detected regressed on hours of survey (number of surveys) at the station:  $\hat{R} = \frac{1}{1/a + b \times (\text{Hours})^c}$ , where  $\hat{R}$  represented cumulative species richness detected. The coefficients of determination,  $r^2$ , of the models ranged 0.88 to 1.00, with a mean of 0.97 (95% CI: 0.96, 0.98); or in other words, the models were excellent fits to the data.

I projected the predictions of each model to thousands of hours to find predicted asymptotes of wildlife species richness. The mean model-predicted asymptote of species richness was 57 after 11,857 hours of visual-scan surveys among the 46 stations. I also averaged model predictions of species richness at each incremental increase of number of surveys, i.e., number of hours (Figure 2). On average I detected 12 species over the first 2.75 hours of surveys in the Altamont Pass (2.75 hours to match the number of hours I surveyed at the project site), which composed 21% of the total predicted species I would detect with a much larger survey effort. Given the example illustrated in Figure 2, the 20 species Noriko detected after her 2.75 hours of survey at the project site likely represented 21% of the species to be detected after many more visual-scan surveys over another year or longer. With many more repeat surveys through the year, Noriko would likely detect  $20/0.21 = 95$  species of vertebrate wildlife at the site. Assuming her ratio of special-status to non-special-status species was to hold with through the detections of all 95 predicted species, then continued surveys would eventually detect 24 special-status species of wildlife.

Again, however, my prediction of 95 species of vertebrate wildlife, including 24 special-status species of wildlife, is derived from a visual-scan survey during the daytime, and would not detect nocturnal mammals. The true number of species composing the wildlife community of the site must be larger. One or two reconnaissance-level surveys should serve only as a starting point toward characterization of a site's wildlife community, but they certainly cannot alone inform of the inventory of species that use the site.

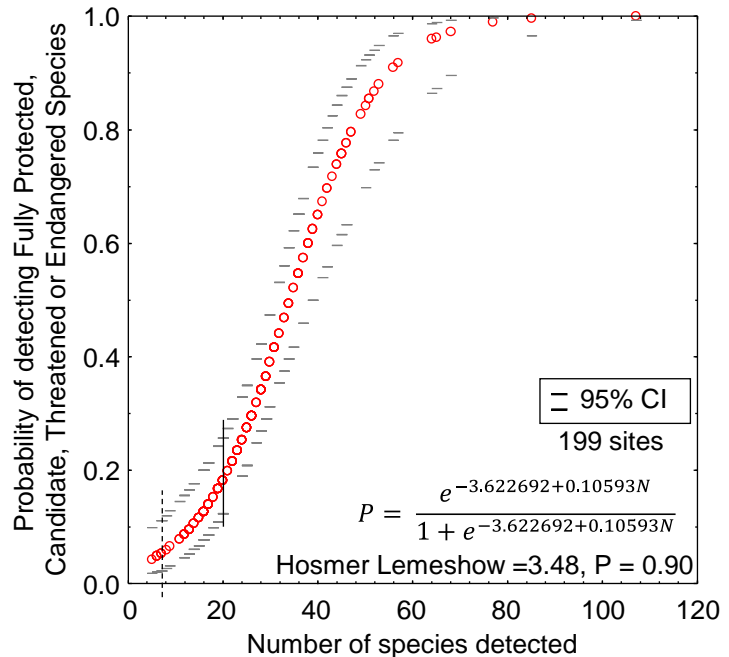
**Figure 2.** Mean (95% CI) predicted wildlife species richness,  $\hat{R}$ , as a nonlinear function of hour-long survey increments across 46 visual-scan survey stations across the Altamont Pass Wind Resource Area, Alameda and Contra Costa Counties, 2015–2019.



Additionally, the likelihood of detecting special-status species is typically lower than that of more common species. This difference can be explained by the fact that special-status species tend to be rarer and thus less detectable than common species. Special-status species 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 3). (Note that listed species number fewer than special-status species, which are inclusive of listed species. Also note that I include California Fully Protected species and federal Candidate species as “listed” species.)

As demonstrated in Figures 1 and 2, the number of species detected is largely a function of survey effort. Greater survey effort also 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 surveys earlier completed at 199 project sites, Noriko’s survey effort at the project site carried an 19% chance of detecting a listed species, whereas the survey effort of Helix (2022) carried a 5% chance. Listed species of vertebrate wildlife likely use the site, but conclusively documenting their use would take more survey effort to achieve a reasonable likelihood of detection. It is the rare reconnaissance-level survey that is capable of detecting enough of the wildlife species that occur at a site to realistically characterize the site’s wildlife community, including the site’s special-status species. A fair argument can be made for the need to prepare an EIR that is better informed by biological resources surveys and by appropriate interpretation of survey outcomes for the purpose of characterizing the wildlife community as part of the current environmental setting.

**Figure 3.** Probability of detecting  $\geq 1$  Candidate, Threatened or Endangered Species of wildlife listed under California or federal Endangered Species Acts, based on survey outcomes logit-regressed on the number of wildlife species Noriko Smallwood and I detected during surveys at 199 project sites in California, 1999-2022. The solid vertical line represents the number of species Noriko detected, and the dashed vertical line represents the number of species detected by Helix (2022).



## EXISTING ENVIRONMENTAL SETTING

The first step in analysis of potential project impacts to biological resources is to accurately characterize the existing environmental setting, including the biological species that use the site, their relative abundances, how they use the site, key ecological relationships, and known and ongoing threats to those species with special status. A reasonably accurate characterization of the environmental setting can provide the basis for determining whether the site holds habitat value to wildlife, as well as a baseline against which to analyze potential project impacts. For these reasons, characterization of the environmental setting, including the project’s site’s regional setting, is one of CEQA’s essential analytical steps (§15125). Methods to achieve this first step typically include (1) surveys of the site for biological resources, and (2) reviews of literature, databases and local experts for documented occurrences of special-status species. In the case of this project, these essential steps remain incomplete and misleading.

### Environmental Setting informed by Field Surveys

Ideally, the purpose of a field survey in support of environmental review is to identify which species use a project site, how they use it, and in what numbers. Identifying the presence of certain species – special-status species – is more important than the presence of others. Analysts need this information to identify the environmental baseline, and as a basis for opining on (predicting) potential project impacts to biological resources. In reality, a biological survey to inventory species is costly in time and effort, and its product uncertain. Some species are large or loud, and can be seen during diurnal surveys, whereas others are tiny and quiet and are detectable only by night, by trapping or by remote-sensing technology. Membership on an inventory can also carry different meanings based on how each species occurs at the site. Whereas

some species are resident year-round, others can be seasonal or ephemeral in their occurrences at a site. Should a species be included on an inventory depends on the investigator's standard of what counts as presence. Does a single 5-minute occurrence over a decade qualify a species as present? And if such a record was made, who can know whether many other brief occurrences truly occurred without having been documented?

The dilemma is that environmental review really needs species inventory, but biologists are imperfect observers of wildlife at any given site. Obtaining a true species inventory is unlikely, given the brief windows of time and budget that project applicants and their permitting authorities allow for biologists to surveil the site. The wildlife species that are detected by reconnaissance-level survey represent only a sampling of the species that truly use the site. This is because biologists vary in their skill at detecting wildlife species, and because species of wildlife vary in their detection probabilities during a typical reconnaissance-level survey, ranging from near 0% among rare or nocturnal species to 100% among species that consulting biologists often refer to as "common." In truth, "common" species can number fewer than the "rare" or cryptic species that are more difficult to detect. Rare or cryptic species often require specialized survey methods, begging the question of whether reconnaissance-level surveys can reveal any reliable information to readers of the environmental review.

Reconnaissance-level surveys occasionally reveal the presence of special-status species, sometimes due to the skill of the observer but often due to luck of survey timing. What these surveys cannot reveal is the absences of any species whose geographic ranges overlap the site and whose habitat associations at all resemble conditions of the site. And it is habitat associations that consulting biologists often rely upon to determine likelihoods of occurrence of special-status species. Unfortunately, habitat associations often poorly comport with the habitat concept, which is that habitat is that part of the environment that is used by a species (Hall et al. 1997), and which is described by scientists through measurement (Smallwood 2002). Habitat associations defined by consulting biologists typically lack foundation in actual measurements of habitat use, and are therefore speculative and prone to error. One source of error is to map vegetation complexes as habitat types, to which consulting biologists assign species by association without concern for the unrealistically hard boundaries that divide the mapped habitat types. Another source of error is to pigeon-hole species into unrealistically narrow portions of the environment, which can then be said not to exist on the project site. A third source of error is to assign functions to habitat for the purpose of dividing habitat into unrealistic functional parts, such as between breeding habitat versus foraging habitat. Primacy is assigned to breeding habitat, which often can be said not to exist on the project site. In reality, all parts of an animal's habitat are essential to breeding success, regardless of where breeding opportunities occur.<sup>1</sup>

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<sup>1</sup> Animals unable to find sufficient forage, refugia, or travel opportunities are just as unable to reproduce as those unable to find sufficient nest-site opportunities. Per the precautionary principle of risk analysis and consistent with the habitat concept, CEQA review should be based on the broadest of available habitat characterizations, which should be interpreted on the whole rather than contrived functional parts. Any detections of a species on or over a site, regardless of time of year, should be interpreted as that species' use of habitat, any part of which is critical to breeding success.

Given the true cost of species inventory, the temptation to shortcut the analysis of occurrence likelihoods is understandable. In the spirit and intent of CEQA, a reasonably feasible species inventory should be the first objective of reconnaissance-level surveys. But a reasonably feasible inventory is only a sampling of the inventory and not a true inventory. What, then, is the appropriate approach for informing a CEQA review with a reconnaissance-level biological survey? One is to commit to a survey effort that results in the detection of a sufficient number of species to accurately estimate the number of species yet to be detected. Another is to honestly report the uncertainties of the characterizations of the species inventory and of the likelihoods of occurrence of special-status species. The analyst can also assume species are present until suitable evidence is acquired in support of an absence determination. This last approach would be consistent with the precautionary principle of risk analysis directed toward rare and precious resources (National Research Council 1986).

***How did the consulting biologists address the wildlife species inventory and special-status species occurrence likelihoods at the project site?***

Helix (2022) performed a wildlife survey to map “the vegetation types and land uses that occur in the study area,” and “list animal species seen.” Helix (2022) reports no standards related to how special-status species are identified with potential for occurrence, nor how vegetation types are mapped nor how mapped vegetation was assessed for potential to support special-status species of wildlife. The implied level of knowledge over habitat and occurrence potential is unrealistic. Even those of us who measure habitat use to better characterize habitat of any given species remain surprisingly ignorant of habitat. Except for certain species in certain environmental settings, the notion that a consulting biologist can walk over a site for a couple of hours and determine whether habitat occurs for a potentially long list of species is at odds with the purpose of protocol-level detection surveys that have been developed for special-status species.

A biologist walked over the site for an unreported period of time on 5 October 2020. No start time was reported, nor was anything else about the survey method reported. Helix (2022) did not report the basic methodological details that the reader needs to know in order to assess the usefulness of the report.

The same biologist completed “focused” surveys for burrowing owl on 2 February, 9, 22, 31 March, and 6 April 2021, totaling 5.17 person-hours. However, this same biologist completed focused surveys for MSHCP Riparian/Riverine plant species on 9 and 22 March – the same days he completed focused surveys for burrowing owls. It would help for Helix (2022) to report whether surveys for burrowing owls and MSHCP Riparian/Riverine plant species were performed simultaneously or at different times of day on 9 and 22 March 2021, so that the reader can determine whether the surveys were truly focused.

Across multiple surveys – the general wildlife survey of 5 October 2020, 5.17 hours of burrowing owl surveys, and surveys on 9 additional dates for wetlands delineation and



for vernal pool arthropods – Helix (2022) detected only 9 species of vertebrate wildlife, or 45% of the number of species that Noriko detected from the perimeter of the same site in only 2.75 hours. Considering the number of surveys completed, Helix (2022) did not see much -- certainly not as much as Noriko did, and Noriko's effort was minimal. This disparity of detection is important, because detecting members of a species at a site is the surest way to identify the species' habitat. Not seeing members of the species when they were in fact present contributes to the type of habitat association error discussed earlier.

### **Environmental Setting informed by Desktop Review**

The purpose of literature and database review, and of consulting with local experts, is to inform the reconnaissance-level survey, to augment it, and to help determine which protocol-level detection surveys should be implemented. Analysts need this information to identify which species are known to have occurred at or near the project site, and to identify which other special-status species could conceivably occur at the site due to geographic range overlap and site conditions. This step is important because the reconnaissance-level survey is not going to detect all of the species of wildlife that make use of the site. This step can identify those species yet to be detected at the site but which have been documented to occur nearby or whose available habitat associations are consistent with site conditions. Some special-status species can be ruled out of further analysis, but only if compelling evidence is available in support of such determinations (see below).

The IS/MND is inadequately informed by a literature and database review. Helix (2022) neglects to explain how the literature and database review was used to identify species for analysis of occurrence potential, but the approach is somewhat revealed in the footnotes of Appendices E and F. Helix assigned occurrence likelihoods based on how many records of a species occurred within 3 miles of the project site. That it was California Natural Diversity Data Base (CNDDDB) that was used to do this was revealed by reference to CNDDDB in one of the species' accounts in the Appendices and by the fact that eBird would have resulted in different occurrence likelihoods based on the 3-mile standard. For example, eBird includes 3 records of Cooper's hawk within 1 mile of the site, yet Helix (2022) determines Cooper's hawk "not likely to occur." The IS/MND screens out many special-status species from further consideration in its characterization of the wildlife community as a component of the baseline biological setting. Neither CNDDDB nor any other occurrence data base was designed to support absence determinations or to screen out species from characterization of a site's wildlife community. The IS/MND misuses CNDDDB.

CNDDDB, like other occurrence databases, is not designed to support any occurrence likelihood other than confirmation of presence of a species. As noted by CNDDDB, "*The CNDDDB is a positive sighting database. It does not predict where something may be found. We map occurrences only where we have documentation that the species was found at the site. There are many areas of the state where no surveys have been conducted and therefore there is nothing on the map. That does not mean that there are no special status species present.*" CNDDDB relies entirely on volunteer reporting

from biologists who were allowed access to whatever properties they report from. Many properties have never been surveyed by biologists. Many properties have been surveyed, but the survey outcomes never reported to CNDDDB. Many properties have been surveyed multiple times, but not all survey outcomes reported to CNDDDB. Furthermore, CNDDDB is interested only in the findings of special-status species, which means that species more recently assigned special status will have been reported many fewer times to CNDDDB than were species assigned special status since the inception of CNDDDB. Because Bullock's oriole and multiple other species were not assigned special status until 2021, these species would have lacked records in CNDDDB when Helix (2022) reviewed database records. This lack of CNDDDB records would have had nothing to do with true geographic distributions. And because negative findings are not reported to CNDDDB, CNDDDB cannot provide the basis for estimating occurrence likelihoods, either.

Negative findings from CNDDDB queries are inappropriate as a basis for narrowing a list of potentially occurring species, or for assigning levels of occurrence likelihood. The limitations of CNDDDB are well-known, and summarized by California Department of Fish and Wildlife in a warning presented on its CNDDDB web site (<https://wildlife.ca.gov/Data/CNDDDB/Maps-and-Data>): *“CNDDDB staff work very hard to keep the database as current and up-to-date as possible given our capabilities and resources. However, we cannot and do not portray the CNDDDB as an exhaustive and comprehensive inventory of all rare species statewide. Field verification for the presence or absence of sensitive species will always be an important obligation of our users.”* The IS/MND's use of CNDDDB records to filter out species from its characterization of the baseline biological setting is therefore inconsistent with CNDDDB's purpose, and is its use of CNDDDB records to rank occurrence likelihoods. If CNDDDB or other occurrence databases were appropriate to the task to which Helix (2022) applies it, then there would be no need for implementation of protocol-level detection surveys for special-status species. But this is not the case. For the above-stated reasons, Helix's (2022) list of special-status species assessed for occurrence likelihoods is misleading and unsupported. Assuming absence of any special-status species based on absence of occurrence records is inappropriate.

In my assessment based on database reviews and our site visits, 115 special-status species of wildlife potentially use the site or its overlying airspace at one time or another (Table 2). Of these, 5 were confirmed onsite or immediately next to the site by survey visits, and 21 (18%) have been documented in data bases within 1.5 miles of the site ('Very close'), 54 (47%) within 1.5 and 4 miles ('Nearby'), and another 27 (23%) within 4 to 30 miles ('In region'). More than two-thirds (70%) of the special-status species in Table 2 have been recorded within only 4 miles of the project site, which means the site carries a lot of potential for supporting special-status species of wildlife. On any given day, one or more of these species like make use of the project site, but being there to document that use probably requires multiple surveys (see Figures 1 through 3). On the days Helix (2022) surveyed, only 1 was detected. On the day Noriko surveyed, 5 were detected. If biologists were to survey on another day, one to several additional special-status species might be detected. The occurrence databases inform us that many special-status species occur near the project site, which means these species likely make

use of the project site. Sufficient survey effort should be directed to the site to either confirm these species use the site or to support absence determinations.

Helix (2022) addresses the occurrence likelihoods of only 37 (32%) of the special-status species listed in my Table 2. Of the 37 species that Helix (2022) addresses and which appear in Table 2, 3 have been documented on or next to the site, 8 within 1.5 miles of the site, 16 have been documented within 1.5 and 4 miles of the site, and 8 have been documented within 4 and 30 miles of the site. These distances are not great, putting 27 special-status species of wildlife in close proximity to a site where Helix (2022) concludes nearly all of them are not likely to occur. One of these species Helix (2022) determines unlikely to occur is Cooper's hawk, which eBird shows multiple sightings near the site, and which Noriko recorded hunting for birds only 80 m from the project site (Photos 11 and 12). The absence determinations that Helix (2022) applies to 33 of these 37 species are premature and unfounded, given the short distances these species are known to occur relative to the project site.

The explanations Helix (2022) provides for dismissing the likelihood of occurrence of multiple special-status species commit the errors I earlier described, such as pigeon-holing species into unrealistically narrow portions of the environment and dividing habitat into functional parts to focus solely on that part linked to reproduction. For example, Helix (2022) claims that Cooper's hawk "requires mature forest, open woodlands, and river groves habitat," which Helix then points out is absent from the site. In my experience, Cooper's hawks occur wherever they can find birds to catch and consume, including over disked fields. And then there is the Cooper's hawk Noriko recorded only 80 m from the site.

In two other examples, Helix claims that bald eagle and peregrine falcon – both MSHCP Riparian Birds -- "primarily occur adjacent to open water habitats." But in my experience, both of these species often occur far from water. I studied bald eagle and peregrine falcon for years in the Altamont Pass Wind Resource Area, far from open water. Just last year, Noriko photographed a peregrine falcon only 1,100 m (0.68 miles) due north of the project site (Photo 17). The IS/MND pigeon-holes these species and misleads the reader as a result.

Helix (2022) reports that ferruginous hawk is not likely to occur because the "Site lacks significant vegetation and elevated nest sites." Whether nest sites are available is irrelevant, because ferruginous hawks do not nest in the region. Ferruginous hawks migrate to this region over the winter months in order to find sufficient prey to support their breeding where it is they breed up north. Note that ferruginous hawk is one of multiple species that is assigned special status in California even though they largely do not breed in California. As for lacking vegetation, I have many times recorded ferruginous hawk foraging where vegetation is sparse, for example see Photo 18, which shows a ferruginous hawk grabbing a pocket gopher from a dirt field north of the project site. There is no valid reason to dismiss ferruginous hawk as unlikely to occur.

**Photo 17.** *The back end of a fast-flying peregrine falcon over the project site, 21 November 2021. Photo by Noriko Smallwood.*



**Photo 18.** *A ferruginous hawk attempts to grab a pocket gopher on winter grass growing on a field that had been frequently disked to suppress vegetation.*



The environmental baseline needs to be better informed by both on-site surveys and occurrence database review. Absence determinations need to be founded on substantial evidence. Without such evidence, the precautionary principle in risk analysis calls for erring on the side of caution, which in this application means assuming presence of each potentially occurring special-status species. What little Noriko did to survey the site, and what little I did to review occurrence databases, reveals numerous special-status species at risk of significant impacts caused by the proposed project. A fair argument can be made for the need to prepare an EIR to appropriately characterize existing conditions so that impacts analysis can proceed from a sound footing.

**Table 2.** Occurrence likelihoods of wildlife species at the project site, as determined by the IS/MND and as indicated by eBird/iNaturalist records (<https://eBird.org>, <https://www.inaturalist.org>) and on-site survey findings. ‘Very close’ indicates sightings within about 1.5 miles of the site, ‘Nearby’ indicates sightings within 4 miles, ‘In region’ indicates sightings within 4 and 30 miles, and ‘in range’ means the species’ geographic range overlaps the site.

Common name	Species name	Status <sup>1</sup>	Occurrence likelihood		MSHCP cover
			IS/MND	Databases, Site visits	
Monarch	<i>Danaus plexippus</i>	FC		Nearby	
Quino checkerspot butterfly	<i>Euphydryas editha quino</i>	FE	Not Likely	In region	Yes
Crotch’s bumblebee	<i>Bombus crotchii</i>	CCE	Not Likely	Nearby	
Coast Range newt	<i>Taricha torosa</i>	SSC		In region	Yes
Western spadefoot	<i>Scaphiophis hammondi</i>	SSC	Not Likely	Nearby	Yes
Arroyo toad	<i>Anaxyrus californicus</i>	FE, SSC		In region	Yes
Blainville’s horned lizard	<i>Phrynosoma blainvillii</i>	SSC	Not Likely	Very close	Yes
Orange-throated whiptail	<i>Aspidoscelis hyperythrus</i>	WL	Not Likely	Very close	Yes
Coastal whiptail	<i>Aspidoscelis tigris stejnegeri</i>	SSC	Not Likely	Nearby	Yes
Southern California legless lizard	<i>Anniella stebbinsi</i>	SSC	Not Likely	Nearby	
California glossy snake	<i>Arizona elegans occidentalis</i>	SSC	Not Likely	Nearby	
Coast patch-nosed snake	<i>Salvadora hexalepis virgultea</i>	SSC	Not Likely	Very close	
Two-striped gartersnake	<i>Thamnophis hammondi</i>	SSC		In region	
Red-diamond rattlesnake	<i>Crotalus ruber</i>	SSC	Not Likely	Very close	Yes
Western pond turtle	<i>Emys marorata</i>	SSC	Not Likely	In region	Yes
Brant	<i>Branta bernicla</i>	SSC <sup>2</sup>		Nearby	
Redhead	<i>Aythya americana</i>	SSC <sup>3</sup>		Nearby	
Western grebe	<i>Aechmophorus occidentalis</i>	BCC		Nearby	
Clark’s grebe	<i>Aechmophorus clarkii</i>	BCC		Nearby	
Black swift	<i>Cypseloides niger</i>	BCC, SSC		Nearby	Yes
Vaux’s swift	<i>Chaetura vauxi</i>	SSC <sup>2</sup>		Nearby	
Costa’s hummingbird	<i>Calypte costae</i>	BCC		Very close	
Rufous hummingbird	<i>Selasphorus rufus</i>	BCC		Nearby	
Allen’s hummingbird	<i>Selasphorus sasin</i>	BCC		Very close	
Mountain plover	<i>Charadrius montanus</i>	SSC, BCC		Nearby	Yes
Snowy plover	<i>Charadrius nivosus</i>	BCC		Nearby	

Common name	Species name	Status <sup>1</sup>	Occurrence likelihood		MSHCP cover
			IS/MND	Databases, Site visits	
Western snowy plover	<i>Charadrius nivosus nivosus</i>	FT, SSC, BCC		In region	
Long-billed curlew	<i>Numenius americanus</i>	BCC, WL		Nearby	
Marbled godwit	<i>Limosa fedoa</i>	BCC		Nearby	
Short-billed dowitcher	<i>Limnodromus griseus</i>	BCC		In region	
Willet	<i>Tringa semipalmata</i>	BCC		Nearby	
Western gull	<i>Larus occidentalis</i>	BCC		Nearby	
California gull	<i>Larus californicus</i>	WL, BCC		<b>On site</b>	
Caspian tern	<i>Hydropogone caspia</i>	BCC		Nearby	
Black tern	<i>Chlidonias niger</i>	SSC, BCC		Nearby	
Common loon	<i>Gavia immer</i>	SSC		Nearby	
Double-crested cormorant	<i>Phalacrocorax auritus</i>	WL		Very close	Yes
American white pelican	<i>Pelacanus erythrorhynchos</i>	SSC <sup>1</sup>		Nearby	
Least bittern	<i>Ixobrychus exilis</i>	SSC, BCC		In region	
White-faced ibis	<i>Plegadis chihi</i>	WL		Nearby	Yes
Turkey vulture	<i>Cathartes aura</i>	BOP		Very close	Yes
Osprey	<i>Pandion haliaetus</i>	BOP, WL		Nearby	Yes
White-tailed kite	<i>Elanus leucurus</i>	CFP, BOP	Low	Very close	Yes
Golden eagle	<i>Aquila chrysaetos</i>	BGEPA, CFP, BOP		Nearby	Yes
Northern harrier	<i>Circus cyaneus</i>	SSC <sup>3</sup> , BOP		Very close	Yes
Sharp-shinned hawk	<i>Accipiter striatus</i>	WL, BOP		Nearby	Yes
Cooper's hawk	<i>Accipiter cooperi</i>	WL, BOP	Not Likely	<b>Just off site</b>	Yes
Bald eagle	<i>Haliaeetus leucocephalus</i>	BGEPA, BCC, CFP	Not Likely	Nearby	Yes
Red-shouldered hawk	<i>Buteo lineatus</i>	BOP		Very close	
Swainson's hawk	<i>Buteo swainsoni</i>	CT, BOP		Nearby	Yes
Red-tailed hawk	<i>Buteo jamaicensis</i>	BOP	Present	On site	
Ferruginous hawk	<i>Buteo regalis</i>	WL, BOP	Not Likely	Very close	Yes
Barn owl	<i>Tyto alba</i>	BOP		Very close	
Western screech-owl	<i>Megascops kennicotti</i>	BOP		Nearby	
Great horned owl	<i>Bubo virginianus</i>	BOP		Nearby	

Common name	Species name	Status <sup>1</sup>	Occurrence likelihood		MSHCP cover
			IS/MND	Databases, Site visits	
Burrowing owl	<i>Athene cunicularia</i>	BCC, SSC <sub>2</sub> , BOP	Low	Nearby	Yes
Long-eared owl	<i>Asio otus</i>	SSC, BOP	Not Likely	Nearby	
Short-eared owl	<i>Asio flammeus</i>	BCC, SSC <sub>3</sub> , BOP		Nearby	
Lewis's woodpecker	<i>Melanerpes lewis</i>	BCC		In region	
Nuttall's woodpecker	<i>Picoides nuttallii</i>	BCC		Very close	
American kestrel	<i>Falco sparverius</i>	BOP		<b>On site</b>	
Merlin	<i>Falco columbarius</i>	WL, BOP		Nearby	Yes
Peregrine falcon	<i>Falco peregrinus</i>	BCC, CFP, BOP		Very close	Yes
Prairie falcon	<i>Falco mexicanus</i>	WL, BCC, BOP		Nearby	Yes
Olive-sided flycatcher	<i>Contopus cooperi</i>	SSC <sub>2</sub> , BCC		In region	
Willow flycatcher	<i>Empidonax traillii</i>	BCC, CE		Nearby	
Southwestern willow flycatcher	<i>Empidonax traillii extimus</i>	FE, CE		In region	Yes
Vermilion flycatcher	<i>Pyrocephalus rubinus</i>	SSC <sub>2</sub>		Nearby	
Least Bell' vireo	<i>Vireo belli pusillus</i>	FE, CE	Not Likely	Nearby	Yes
Loggerhead shrike	<i>Lanius ludovicianus</i>	BCC, SSC <sub>2</sub>	Not Likely	Very close	Yes
Oak titmouse	<i>Baeolophus inornatus</i>	BCC		Nearby	
California horned lark	<i>Eremophila alpestris actia</i>	WL	Present	<b>On site</b>	Yes
Bank swallow	<i>Riparia riparia</i>	CT		Nearby	
Purple martin	<i>Progne subis</i>	SSC <sub>2</sub>		Nearby	Yes
Wrentit	<i>Chamaea fasciata</i>	BCC		Nearby	
California gnatcatcher	<i>Polioptila californica californica</i>	CT, SSC	Not Likely	Very close	Yes
California thrasher	<i>Toxostoma redivivum</i>	BCC		Very close	
Cassin's finch	<i>Haemorphous cassinii</i>	BCC		In region	
Lawrence's goldfinch	<i>Carduelis lawrencei</i>	BCC	Not Likely	Very close	
Grasshopper sparrow	<i>Ammodramus savannarum</i>	SSC <sub>2</sub>	Not Likely	Nearby	Yes
Black-chinned sparrow	<i>Spizella atrogularis</i>	BCC		Nearby	
Brewer's sparrow	<i>Spizella breweri</i>	BCC		Nearby	
Bell's sage sparrow	<i>Amphispiza b. belli</i>	WL, BCC	Not Likely	Nearby	Yes

Common name	Species name	Status <sup>1</sup>	Occurrence likelihood		MSHCP cover
			IS/MND	Databases, Site visits	
Southern California rufous-crowned sparrow	<i>Aimophila ruficeps canescens</i>	WL	Not Likely	Nearby	Yes
Yellow-breasted chat	<i>Icteria virens</i>	SSC <sub>3</sub>	Not Likely	In region	Yes
Yellow-headed blackbird	<i>X. xanthocephalus</i>	SSC <sub>3</sub>		Nearby	
Bullock's oriole	<i>Icterus bullockii</i>	BCC		Very close	
Tricolored blackbird	<i>Agelaius tricolor</i>	CT, BCC, SSC	Not Likely	Nearby	Yes
Lucy's warbler	<i>Leiothlypis luciae</i>	SSC, BCC		In region	
Virginia's warbler	<i>Leiothlypis virginiae</i>	Nearby WL, BCC		In region	
Yellow warbler	<i>Dendroica petachia</i>	BCC, SSC <sub>2</sub>		Very close	Yes
Summer tanager	<i>Piranga rubra</i>	SSC <sub>1</sub>		Nearby	
Western mastiff bat	<i>Eumops perotis californicus</i>	SSC, WBWG:H	Not Likely	In range	
Pocketed free-tailed bat	<i>Nyctinomops femorosaccus</i>	SSC, WBWG:M	Not Likely	In range	
Big free-tailed bat	<i>Nyctinomops macrotis</i>	SSC, WBWG:MH		In range	
Pallid bat	<i>Antrozous pallidus</i>	SSC, WBWG:H		In region	
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>	SSC, WBWG:H		In region	
Spotted bat	<i>Euderma maculatum</i>	SSC, WBWG:H		In range	
Silver-haired bat	<i>Lasionycteris noctivagans</i>	WBWG:M		In range	
Western red bat	<i>Lasiurus blossevillii</i>	SSC, WBWG:H		In region	
Hoary bat	<i>Lasiurus cinereus</i>	WBWG:M		In region	
Western yellow bat	<i>Lasiurus xanthinus</i>	SSC, WBWG:H	Not Likely	In region	
Western small-footed myotis	<i>Myotis ciliolabrum</i>	WBWG:M		In range	
Fringed myotis	<i>Myotis thysanodes</i>	WBWG:H		In region	
Miller's myotis	<i>Myotis evotis</i>	WBWG:M		In range	
Long-legged myotis	<i>Myotis volans</i>	WBWG:H		In region	
Yuma myotis	<i>Myotis yumanensis</i>	SSC, WBWG:LM		Nearby	
San Diego black-tailed jackrabbit	<i>Lepus californicus bennettii</i>	SSC	Not Likely	In region	Yes
Los Angeles pocket mouse	<i>Perognathus longimembris brevinasus</i>	SSC		In region	Yes
Northwestern San Diego pocket mouse	<i>Chaetodipus fallax fallax</i>	SSC	Not Likely	In region	



Common name	Species name	Status <sup>1</sup>	Occurrence likelihood		MSHCP cover
			IS/MND	Databases, Site visits	
San Bernardino kangaroo rat	<i>Dipodomys merriami parvus</i>	FE, CCE, SSC	Not Likely	In region	Yes
Stephens' kangaroo rat	<i>Dipodomys stephensi</i>	FE, CT	Not Likely	Nearby	Yes
San Diego desert woodrat	<i>Neotoma lepida intermedia</i>	SSC	Not Likely	Nearby	Yes
Southern grasshopper mouse	<i>Onychomys torridus ramona</i>	SSC		In range	
American badger	<i>Taxidea taxus</i>	SSC	Not Likely	In region	

<sup>1</sup> Listed as FT or FE = federal threatened or endangered, FC federal Candidate for listing, BGEPA = Bald and Golden Eagle Protection Act, BCC = U.S. Fish and Wildlife Service Bird of Conservation Concern, CT or CE = California threatened or endangered, CCT or CCE = Candidate California Threatened or Endangered, CFP = California Fully Protected (CFG Code 3511), SSC = California species of special concern (not threatened with extinction, but rare, very restricted in range, declining throughout range, peripheral portion of species' range, associated with habitat that is declining in extent), SSC1, SSC2 and SSC3 = California Bird Species of Special Concern priorities 1, 2 and 3, respectively (Shuford and Gardali 2008), WL = Taxa to Watch List (Shuford and Gardali 2008), BOP = Birds of Prey (California Fish and Game Code 3503.5), and WBWG = Western Bat Working Group with priority rankings, of L (low), M (moderate), and H (high).

## **Detection Surveys for Special-Status Species**

For those special-status species determined to be potentially present, the analyst can either assume presence or complete protocol-level detection surveys for the purpose of supporting absence determinations. Species experts and resource agencies committed much time and consideration to the formulation of the detection survey guidelines that are available for various special-status species. Detection surveys are intended to provide biologists with reasonable likelihood of detection of the target species where and when the target species is present. Hence, failure to detect the species despite completion of the appropriate detection surveys qualifies as evidence of absence.

I dispute many of the “not likely” to occur determinations made by Helix (2022), as commented above. In the case of western spadefoot, the IS/MND (p. 47) explains, “Although pools on-site represent potential habitat for western spadefoot, no species [sic] were observed during focused surveys of the pools on the Project site. Western spadefoot is considered to be absent from the site and no additional surveys or mitigation are required.” In other words, despite the availability of pools typical of where western spadefoot are found, protocol-level detection surveys were not completed for western spadefoot. The IS/MND’s conclusion of absence is not supported by substantial evidence, and is therefore conclusory. In this case, the IS/MND fails the precautionary principle in risk analysis.

The IS/MND determines low likelihood of occurrence of white-tailed kite. Given its determination, detection surveys for this California Fully Protected species were warranted, yet none were completed.

In the case of burrowing owl, which the IS/MND determined to have low likelihood of occurrence, detection surveys were again warranted. Helix (2022) completed what they referred to as “focused” surveys for burrowing owl, and these surveys were reported to have been consistent with the Burrowing Owl Survey Instructions for the Western Riverside MSHCP Area (County of Riverside 2006). The surveys should have been performed to meet the standards of CDFW (2012). The CDFW (2012) guidelines are far superior to the MSHCP protocol, as they are up to date and their standards more explicitly described (compare standards between Tables 3 and 4). Therefore, to have been consistent with CEQA’s primary objective that the environmental review be informative of the current environmental setting and potential project impacts, the most up-to-date and effective survey protocol should have been applied to burrowing owls, and that survey protocol was CDFW (2012).

**Table 3.** Assessment of whether burrowing owl surveys achieved the standards in CDFW's (2012) recommended survey protocol. Standards are numbered to match those in CDFW (2012).

Standard in CDFG (2012)	Assessment of surveys completed	Was the standard met?
<b>Minimum qualifications of biologists performing surveys and impact assessments</b>		
(1) Familiarity with the species and local ecology	No information was summarized	Unknown
(2) Experience conducting habitat assessments and breeding and non-breeding season surveys	No information was summarized	Unknown
(3) Familiarity with regulatory statutes, scientific research and conservation related to burrowing owls	No information was summarized	Unknown
(4) Experience with analyzing impacts on burrowing owls	No information was summarized	Unknown
<b>Habitat assessment</b>		
(1) Conduct at least 1 visit covering entire site and offsite buffer to 150 m		Yes
(2) Prior to site visit, compile relevant biological information on site and surrounding area	No summary provided	No
(3) Check available sources for occurrence records	Except for CNDDDB review, no additional evidence this step was accomplished	Partial
(4) Identify vegetation cover potentially supporting burrowing owls on site and vicinity	Vegetation is described	Yes
(5a) Describe project and timeline of activities	Project described	Yes
(5b) Regional setting map showing project location		Yes
(5c) Detailed map with project footprint, topography, landscape and potential vegetation-altering activities	Site map provided, plus foundation of the project	Yes
(5d) Biological setting including location, acreage, terrain, soils, geography, hydrology, land use and management history	Location and acreage are described	Partial
(5e) Analysis of relevant historical information concerning burrowing owl use or occupancy	None	No
(5f) Vegetation cover and height typical of temporal and spatial scales relevant to the assessment	Vaguely	Partial
(5g) Presence of burrowing owl individuals, pairs or sign	None seen	Yes

<b>Standard in CDFG (2012)</b>	<b>Assessment of surveys completed</b>	<b>Was the standard met?</b>
(5h) Presence of suitable burrows or burrow surrogates	Suitable burrows noted on site	Yes
<b>Breeding season surveys</b>		
Perform 4 surveys separated by at least 3 weeks	4 surveys within 1 month	No
1 survey between 15 February and 15 April	4 surveys completed in this period, and 1 earlier	Yes
2-3 surveys between 15 April and 15 July	No surveys completed during this period	No
1 survey following June 15		No
Walk transects spaced 7 m to 20 m apart	Transects 30 m apart	No
Scan entire viewable area using binoculars at start of each transect and at 100 m intervals	Reported completing this step, but time taken for surveys would not have allowed for any serious visual scans	No
Record all potential burrow locations determined by presence of owls or sign	Found none	---
Survey when temperature >20° C (68° F), winds <12 km/hr, and cloud cover <75%	None of the surveys met the temperature standard, half did not meet the cloudiness standard	No
Survey between dawn and 10:00 hours or within 2 hours before sunset	One continued after 10:00	Partial
Identify and discuss any adverse conditions such as disease, predation, drought, high rainfall or site disturbance	No discussion except for noting of homeless encampments speculated to have discouraged burrowing owls.	Partial
Survey several years where activities will be ongoing, annual or start-and-stop to cover high nest site fidelity		---
<b>Reporting should include:</b>		
(1) Survey dates with start and end times and weather conditions		Yes
(2) Qualifications of surveyor(s)	None provided	No
(3) Discussion of how survey timing affected comprehensiveness and detection probability	None provided	No
(4) Description of survey methods including point count dispersal and duration	Survey methods described, but they would have been difficult to complete within the survey times reported	Partial
(5) Description and justification of the area surveyed		Yes

<b>Standard in CDFG (2012)</b>	<b>Assessment of surveys completed</b>	<b>Was the standard met?</b>
(6) Numbers of nestlings or juveniles associated with each pair and whether adults were banded or marked		---
(7) Descriptions of behaviors of burrowing owls observed		---
(8) List of possible burrowing owl predators in the area, including any signs of predation of burrowing owls		No
(9) Detailed map showing all burrowing owl locations and potential or occupied burrows		Yes
(10) Signed field forms, photos, etc.	None	No
(11) Recent color photos of project site		Yes
(12) Copies of CNDDDB field forms		---

**Table 4.** Assessment of whether burrowing owl surveys achieved the standards in Burrowing Owl Survey Instructions for the Western Riverside MSHCP Area. Standards are numbered to match those in County of Riverside (2006).

<b>Standard in County of Riverside (2006)</b>	<b>Assessment of surveys completed</b>	<b>Standard met?</b>
<b>Minimum qualifications of biologists performing surveys and impact assessments</b>		
Surveys should be conducted by biologist knowledgeable in burrowing owl habitat, ecology, and field identification of the species and sign	No information provided	No
<b>Habitat assessment</b>		
Walk entire site and 150-m buffer to identify burrowing owl habitat	Reportedly yes.	Yes
Written report with site photos, detailed results of habitat assessment, indicating whether the site contains burrowing owl habitat	Few details provided in one brief paragraph of results	No
If no potential burrows detected, no further surveys are required	Potential burrows were detected	Yes
<b>Breeding season surveys</b>		
Perform 4 surveys between 1 March and 31 August		Yes
Walk transects spaced $\leq 30$ m apart or spaced to allow 100% visual coverage of the ground surface		Yes
Scan entire viewable area using binoculars at start of each day's survey	Unlikely due to brief times on site	No
Survey when temperature $\leq 90^\circ$ F, winds $< 20$ mph, and no rain or fog		Yes
Survey within 1 hour before to 2 hours after sunrise or 2 hours before to 1 hour after sunset		Yes
Count and map all burrowing owl sightings, occupied burrows, and burrows with owl sign		---
Map the extent of all suitable habitat		No
Record and map locations of all burrowing owl habitat, potential owl burrows, sign, and any owls observed, including GPS coordinates	Potential burrows mapped	Partial
<b>Reporting should include:</b>		
Submit final report to Riverside County Environmental Programs Department and RCA Monitoring Program Administrator, discussing survey methodology, transect width, duration, conditions, and results. Appropriate maps showing burrow locations shall be included	"This report is intended to comply with reporting requirement Step III." A report needs to be submitted where the protocol stipulates.	No

According to Helix (2022:29), “The survey area was slowly walked and assessed for suitable BUOW habitat...” However, based on the reported survey times committed to these surveys (Helix 2022: Table 7), and assuming the transects were maximally spaced 30 m apart per the MSHCP Part B breeding-season survey standard, the biologist averaged 1.6 mph among the 4 surveys. The final survey was reportedly completed in only 30 min, which translates to a walking speed of >3 mph. My normal straight-line walking pace on flat impervious surface is 3.5 mph, and fast walking is 3.9 mph. It is therefore hard to believe that a biologist walking on uneven ground at >3 mph is taking the time to check for sign at burrows, let alone having spent any time using binoculars to scan for burrowing owls prior to walking. Even the average pace of 1.6 mph among the 4 surveys was too fast to have spent enough time to scan for owls and to have checked burrows for sign. If I had done the surveys, I would have spent at least 30 min scanning for burrowing owls before walking transects. The time Helix (2022) reports having committed to the breeding-season surveys does not comport with having met the standards of either CDFW (2012) or County of Riverside (2006).

In addition to their telltale brevity, the Helix (2022) surveys fell short of 22 of the 34 relevant standards of the CDFW (2012) survey guidelines (Table 3). They also fell short of 6 of the 12 relevant standards of the MSHCP survey protocol (Table 4). The standards of these guidelines should be met, especially those of CDFW (2012), as they were formulated by experts on burrowing owls. In my own research on burrowing owls, I always exceed the breeding-season survey standards of CDFW (2012), because, based on my experience, even the CDFW standards are minimal, having been formulated to balance detection likelihood against cost.

During March, which is when Helix completed most of their surveys, most burrowing owls have yet to commit to a nest site. It is not until May when I see large-scale commitment to nest sites. Additionally, nest sites are often selected late in the season by widowed and divorced burrowing owls or by pairs whose first nest attempt failed. For these reasons, surveys at a given site in March can readily result in negative findings, but repeated in May or June can result in presence of burrowing owls. It is for this reason CDFW (2012) recommends 3-week spacing between surveys and one survey is completed after 15 June. All factors considered, the Helix (2022) surveys for burrowing owls were grossly inadequate, and cannot serve as substantial evidence in support of the IS/MND’s conclusion that burrowing owls are absent from the project site.

## **BIOLOGICAL IMPACTS ASSESSMENT**

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

## **HABITAT LOSS**

The IS/MND does not address the loss of wildlife that would result from habitat loss caused by the project. No mention is made of the project site's role as stopover and staging opportunities for migratory wildlife. The IS/MND does not address potential impacts of habitat loss to breeding birds, or the loss of productive capacity to birds. Habitat loss has been recognized as the most likely leading cause of a documented 29% decline in overall bird abundance across North America over the last 48 years (Rosenberg et al. 2019). Habitat loss not only results in the immediate numerical decline of wildlife, but it also results in permanent loss of productive capacity. 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. Assuming the project site supports a fifth of the total nesting density of the above-referenced study sites, and applying this adjusted density to the 15-acre project site, one can predict a loss of 103 bird nests.

The loss of 103 nest sites of birds would qualify as a significant project impact that has not been addressed in the IS/MND. But the impact does not end with the immediate loss of nest sites as the site is graded in preparation for impervious surfaces. The reproductive capacity of the site would be lost. The average number of fledglings per nest in Young's (1948) study was 2.9. Assuming Young's (1948) study site typifies bird productivity, the project would prevent the production of 299 fledglings per year. After 100 years and further assuming an average bird generation time of 5 years, the lost capacity of both breeders and annual fledgling production would total 34,020 birds  $\{(nests/year \times chicks/nest \times number\ of\ years) + (2\ adults/nest \times nests/year) \times (number\ of\ years \div years/generation)\}$ . The project's denial to California of 340 birds per year has not been analyzed as a potential impact in the IS/MND, nor does the IS/MND provide any compensatory mitigation for this impact. A fair argument can be made for the need to prepare an EIR to appropriately analyze the project's impacts to wildlife caused by habitat loss and habitat fragmentation.

## **WILDLIFE MOVEMENT**

The IS/MND's analysis of whether the project would interfere with wildlife movement in the region is fundamentally flawed. According to the IS/MND (page 51), "the Project site is not located near any open space or native habitats and does not represent a wildlife corridor between large open space habitats." The implied premise is that only disruption of the function of a wildlife corridor can interfere with wildlife movement in the region. This premise, however, represents a false CEQA standard, and is therefore inappropriate to the analysis. The primary phrase of the CEQA standard goes to wildlife movement regardless of whether the movement is channeled by a corridor. A site such as the proposed project site is critically important for wildlife movement because it composes an increasingly diminishing area of open space within a growing expanse of anthropogenic uses, forcing more species of volant wildlife to use the site for stopover and staging during migration, dispersal, and home range patrol (Warnock 2010, Taylor et al. 2011, Runge et al. 2014). The project would cut wildlife off from stopover and



staging opportunities, forcing volant wildlife to travel even farther between remaining stopover sites.

## **TRAFFIC IMPACTS TO WILDLIFE**

The IS/MND neglects to address one of the project's most obvious, substantial impacts to wildlife, and that is wildlife mortality and injuries caused by project-generated traffic. Project-generated traffic would endanger wildlife that must, for various reasons, cross roads used by the project's traffic (Photos 19-22), including along roads far from the project footprint. 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 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 generated by the project site would similarly result in local impacts on wildlife.

**Photo 19.** 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 21.** Mourning dove killed by vehicle on a California road. Photo by Noriko Smallwood, 21 June 2020.



**Photo 22.** Raccoon killed on Road 31 just east of Highway 505 in Solano County. Photo taken on 10 November 2018.



**Photo 20.** Great-tailed grackle walks onto a rural road in Imperial County, 4 February 2022.



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 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). VMT is useful for predicting wildlife mortality because I was able to quantify miles traveled along the studied reach of Vasco Road during the time period of the Mendelsohn et al. (2009), hence enabling a rate of fatalities per VMT that can be projected to other sites, assuming similar collision fatality rates.

### Predicting project-generated traffic impacts to wildlife

The IS/MND predicts 2,911,669 annual vehicle miles traveled (VMT) for the warehouse portion of the project, and 2,386,171 sf for the 4-story hotel portion of the project, totaling 5,297,840. 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  $\times$  2.5 miles  $\times$  365 days/year  $\times$  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 IS/MND's prediction of 5,297,840 annual VMT due to the project predicts 2,903 vertebrate wildlife fatalities per year. **Operations over 50 years would accumulate 145,150 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. The IS/MND does not address this potential impact, let alone propose to mitigate it. 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 COLLISIONS**

The IS/MND neglects a large portion of habitat that is essential to many species. To understand this part of their habitat, one must consider the definition of habitat, which is that portion of the environment that is used by members of a species (Hall et al. 1997, Morrison et al. 1998, Smallwood 2002). Every species on Earth is morphologically adapted through thousands of generations of life and death to exist within an environmental medium. The gaseous atmosphere is a principal medium of life to volant

animals such as birds (Davy et al. 2017, Diehl et al. 2017). The aerosphere is where birds and bats and other volant animals with wings migrate, disperse, forage, perform courtship and where some of them mate. Birds are some of the many types of animals that evolved wings as a morphological adaptation to thrive by moving through the medium of the aerosphere. Not only do portions of the ground and vegetation contribute to a species' habitat, but the aerosphere is also habitat. Indeed, an entire discipline of ecology has emerged to study this essential aspect of habitat – the discipline of aeroecology (Kunz et al. 2008).

Many special-status species of birds have been recorded at or near the aerosphere of the project site. My database review and the site visits indicate there are 77 special-status species of birds with potential to use the site's aerosphere (Table 2). Of these, 5 have been recorded over or adjacent to the project site, 17 within 1.5 miles of the site ('Very close'), 45 within 1.5 and 4 miles ('Nearby'), and another 10 within 4 to 30 miles ('In region'). The birds reported within all these distance domains from the project site can quickly fly those distances, so they would all be within short flights of the proposed hotel's windows.

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

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

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

end of his estimated range – 1 billion bird fatalities – as conservative. Furthermore, the estimate lumped species together as if all birds are the same and the loss of all birds to windows has the same level of impact.

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

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

Buildings can intercept many nocturnal migrants as well as birds flying in daylight. As mentioned above, Johnson and Hudson (1976) found 266 bird fatalities of 41 species within 73 months of monitoring of a four-story glass walkway at Washington State University (no adjustments attempted for undetected fatalities). Somerlot (2003) found 21 bird fatalities among 13 buildings on a university campus within only 61 days. Monitoring twice per week, Hager et al. (2008) found 215 bird fatalities of 48 species, or 55 birds/building/year, and at another site they found 142 bird fatalities of 37 species for 24 birds/building/year. Gelb and Delacretaz (2009) recorded 5,400 bird fatalities under buildings in New York City, based on a decade of monitoring only during migration periods, and some of the high-rises were associated with hundreds of fatalities each. Klem et al. (2009) monitored 73 building façades in New York City

during 114 days of two migratory periods, tallying 549 collision victims, nearly 5 birds per day. Borden et al. (2010) surveyed a 1.8 km route 3 times per week during 12-month period and found 271 bird fatalities of 50 species. Parkins et al. (2015) found 35 bird fatalities of 16 species within only 45 days of monitoring under 4 building façades. From 24 days of survey over a 48-day span, Porter and Huang (2015) found 47 fatalities under 8 buildings on a university campus. Sabo et al. (2016) found 27 bird fatalities over 61 days of searches under 31 windows. In San Francisco, Kahle et al. (2016) found 355 collision victims within 1,762 days under a 5-story building. Ocampo-Peñuela et al. (2016) searched the perimeters of 6 buildings on a university campus, finding 86 fatalities after 63 days of surveys. One of these buildings produced 61 of the 86 fatalities, and another building with collision-deterrent glass caused only 2 of the fatalities, thereby indicating a wide range in impacts likely influenced by various factors. There is ample evidence available to support my prediction that the proposed project would result in many collision fatalities of birds.

### Project Impact Prediction

By the time of these comments, I had reviewed and processed results of bird collision monitoring at 213 buildings and façades for which bird collisions per m<sup>2</sup> 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<sup>2</sup> of glass per year (95% CI: 0.042-0.102). This average and its 95% confidence interval provide a robust basis for predicting fatality rates at a proposed new project, so long as the extent of glass on the building's facades is known or can be predicted.

The IS/MND provides no illustration of the proposed 125-room hotel, but the traffic analysis reports that it would include 181,500 square feet of floor space on 1.04 acres, which equates to a 4-story building. Based on the mean m<sup>2</sup> of glass per square-foot of floor space among 3 other hotels of which I provided expert testimony, I estimate the new glass windows added by the project would total 2,943 m<sup>2</sup> (95% CI: 2,129, 3,757 m<sup>2</sup>).

Applying the mean fatality rate (above) to my estimate of 2,943 m<sup>2</sup> of glass on the façades of the project's buildings predicts **215 bird deaths per year (95% CI: 128–303)**. The 100-year toll from this average annual fatality rate would be 21,513 bird deaths (95% CI: 12,773–30,254), which would continue until the structures are either renovated to reduce bird collisions or they come down. The vast majority of these deaths would be of birds protected under the Migratory Bird Treaty Act and under the California Migratory Bird Protection Act, thus causing significant unmitigated impacts. Given the predicted level of bird-window collision mortality, and the lack of any proposed mitigation, it is my opinion that the proposed project would result in potentially significant adverse biological impacts. A fair argument can be made for the

need to prepare an EIR to appropriately analyze bird-window collision impacts and how to mitigate them.

### **CUMULATIVE IMPACTS**

The IS/MND provides a flawed analysis. It provides no analysis of cumulative impacts specific to biological resources. The IS/MND asserts that project contributions to cumulative impacts would have been generally analyzed in the Perris Valley Commerce Center Specific Plan (PVCCSP), which also includes mitigation measures. But according to CEQA Guidelines §15064(h)(3), “a project’s incremental contribution to a cumulative impact can be found not cumulatively considerable if the project would comply with an approved plan or mitigation program that provides specific requirements that would avoid or substantially lessen the cumulative problem within the geographic area of the project.” And “When relying on a plan, regulation or program, the lead agency should explain how implementing the particular requirements in the plan, regulation or program ensure that the project’s incremental contribution to the cumulative effect is not cumulatively considerable.” The IS/MND provides no explanation of how implementing the particular requirements of the PVCCSP would minimize, avoid or offset the project’s contributions to cumulative impacts to any wildlife other than birds. The only PVCCS measures that are mentioned are minimization measures such as construction timing outside the breeding season, if feasible, and preconstruction surveys. A fair argument can be made for the need to prepare an EIR to appropriately analyze potential contributions to cumulative impacts and how to mitigate them.

### **MITIGATION MEASURES**

The IS/MND presents a confusing summary of proposed mitigation measures, two of them linked to the PVCCSP and one consisting of a compensatory mitigation ratio for an on-site wetland pool. The two measures linked to the PVCCSP are summarized below with comments.

#### **MM Bio 1: Construction Timing and Pre-Construction Nesting Bird Survey**

I concur with the measure, but I must point out that it would not prevent the loss of productive capacity which I discuss under Habitat Loss.

#### **MM Bio 2: Burrowing Owl Preconstruction Survey and Passive Relocation**

I concur with the preconstruction survey, but not with relocation of burrowing owls. CDFW (2012) does not regard passive relocation as a valid mitigation measure, and instead views it as a potential additional impact to burrowing owls. I agree with CDFW (2012). I will add that preconstruction survey should follow the completion of protocol-level detection surveys consistent with the survey guidelines of CDFW (2012).

## MSHCP Mitigation Fee

According to the IS/MND (p. 51), “With payment to the LDMF, impacts would be less than significant and no mitigation would be required.” However, only 44 of 115 special-status species in Table 2 are covered by the take permit of the West Riverside County MSHCP. Therefore, 71 (62%) of the special-status species in Table 2 are not covered by the MSHCP, and would not necessarily benefit from the mitigation in the MSHCP.

That 62% of the special-status species in the project area lack coverage under the MSHCP is ample evidence of a rapid deterioration of conditions for wildlife in the MSHCP study area. Many species that were common at the time of the certification of the MSHCP have recently been listed as candidates for listing or as California Species of Special Concern or as US Fish and Wildlife Service Birds of Conservation Concern. Just last year, Bullock’s oriole was designated as Birds of Conservation Concern, and so were wren-tit and California gull, the latter of which Noriko Smallwood saw at the project site. In fact, at the project site Noriko saw 3 special-status species which lack coverage under the MSHCP.

But what of the species that *are* covered? Of the 146 species addressed in the Western Riverside County MSHCP, 118 are adequately conserved, according to the MSHCP. The remaining 28 species are inadequately conserved. However, whether any of the species covered by the MSHCP are adequately conserved or partially conserved is questionable. The growing list of species assigned special status is indicative of worsening conditions for wildlife. And the evidence of the MSHCP’s conservation efficacy is discouraging.

The evidence indicates the MSHCP is failing to meet its conservation goals and objectives while at the same time frontloading development. The biological goal of the MSHCP is to “...*conserve covered species and their habitats...*” by acquiring 153,000 acres of additional reserve land and meeting species-specific numerical thresholds of abundance. According to the 2018 annual report, additional acreage acquired through 2018 totaled 60,336 acres, or 39% of the goal. Only 38,767 acres were managed under Regional Conservation Authority (RCA), or 25% of the goal. Over the same time period, habitat losses totaled 83,975 acres, of which 16,161 acres (19%) were inside Criteria Cells. The MSHCP is failing to meet goals and objectives. Until it can demonstrate success, a return to conventional mitigation strategies under CEQA is warranted.

Nor was the mitigation of the MSHCP formulated in response to consideration of all of the impacts I outlined in my comments. The strategy of the MSHCP is to preserve patches of habitat as mitigation for the habitat that will be lost to development. This strategy failed to consider the chronic impacts of the ecological sinks created by the projects’ habitat destruction. One such ecological sink includes road traffic, which chronically take members of species targeted for protection in the preserved habitat. The MSHCP fails to consider that wildlife are mobile, and wildlife cannot persist without expressing their mobility. To migrate, disperse, forage, and patrol home ranges, wildlife must cross roads, and those that are volant must fly through the airspaces that energy conservation and instinct dictate. Furthermore, the consigning of wildlife to the preserved habitat patches per the MSHCP’s strategy exposes those “preserved” wildlife



to catastrophic losses from wildfire. Having worked with endangered species in small, isolated habitat patches, I have witnessed what happens when fire burns all the vegetation remaining in the patch, or when drought destroys all of a species' forage. The species isolated to small isolated habitat patches are extinguished. The MSHCP cannot alone mitigate the impacts of this or all the other projects participating with it.

## **RECOMMENDED MEASURES**

Other than payment of \$500/acre for Stephens' kangaroo rat habitat loss per the Stephens' Kangaroo Rat Habitat Conservation Plan and the payment of the MSHCP mitigation fee, the IS/MND proposes no compensatory mitigation for habitat loss or losses of wildlife from project-generated traffic and bird-window collisions on the hotel. A fair argument can be made for the need to prepare an EIR to formulate appropriate measures to mitigate project impacts to wildlife. Below are few suggestions of measures that ought to be considered in an EIR.

**Detection Surveys:** If the project goes forward, species detection surveys are needed to (1) support negative findings of species when appropriate, (2) inform preconstruction surveys to improve their efficacy, (3) estimate project impacts, and (4) inform compensatory mitigation and other forms of mitigation. Detection survey protocols and guidelines are available from resource agencies for most special-status species. Otherwise, professional standards can be learned from the scientific literature and species' experts. An example of a survey protocol that needs to be implemented is the CDFW (2012) survey guidelines for burrowing owl. Ground squirrels occur around the site, so burrows and squirrels are available in support of burrowing owls. The space of the site is also open, which provides burrowing owls the field of view they need to avoid predation. The survey guidelines should be implemented, including within the recommended buffer space around the project site. The guidelines call for multiple surveys throughout the breeding season.

**Detection Surveys for Bats:** Multiple special-status species of bats likely occur on and around the project site. A qualified bat biologist should be tasked with completing protocol-level detection surveys for bats. It needs to be learned whether bats roost nearby and forage on site.

**Preconstruction surveys:** Reports of the methods and outcomes of preconstruction surveys should be required. The reports should be made available to the public.

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

**Habitat Loss:** If the project goes forward, compensatory mitigation would be warranted for habitat loss. An equal area of land should be protected in perpetuity as close to the project site as possible. Additional compensatory mitigation should be linked to impacts identified in construction monitoring.

**Road Mortality:** Compensatory mitigation is needed for the increased wildlife mortality that would be caused by the project-generated 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 such as reduced speed limits and wildlife under-crossings or overcrossings of particularly dangerous road segments. Compensatory mitigation can also be provided in the form of donations to wildlife rehabilitation facilities (see below).

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

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

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

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

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

Thank you for your attention,



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Shawn Smallwood, Ph.D.

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*Mourning dove on the project site, 24 August 2022.*



*California gull on the project site, 24 August 2022.*



# Kenneth Shawn Smallwood

## Curriculum Vitae

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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

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

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

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

the County on how to reduce wildlife fatalities.

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

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

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

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

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

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

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

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

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

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

to receive mitigation funds for habitat easements and restoration.

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

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

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

## **Projects**

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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Smallwood, K. S. 2022. Utility-scale solar impacts to volant wildlife. *Journal of Wildlife Management*: In press.

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

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Smallwood, K. S. 2009. Mitigation in U.S. Wind Farms. Pages 68-76 in H. Hötter (Ed.), Birds of Prey and Wind Farms: Analysis of problems and possible solutions. Documentation of an International Workshop in Berlin, 21st and 22nd October 2008. Michael-Otto-Institut im NABU, Goosstrook 1, 24861 Bergenhusen, Germany. <http://bergenhusen.nabu.de/forschung/greifvoegel/>

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### Comments on Environmental Documents (Year; pages)

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- Shirk & Riggin Industrial Park Application, Visalia (2022; 22);
- Duarte Industrial Application, Visalia (2022; 17);
- Amond World Cold Storage Warehouse IS/MND, Madera (2022; 23);
- Replies on Schulte Logistics Centre EIR, Tracy (2022; 28);
- Alta Cuvee Mixed Use Project Recirculated IS/MND, Ranch Cucamonga (2022; 8);
- Fourth visit, Veterans Affairs Site Plan Review No. 20-0102 MND, Bakersfield (2022; 9);
- Replies on 1242 20<sup>th</sup> Street Wellness Center Project FEIR, Santa Monica (2022; 5);
- 656 South San Vicente Medical Office Project EIR, Los Angeles (2022; 21);
- UCSF New Hospital at Parnassus Heights DEIR. San Francisco (2022; 40);
- DPR-21-021 Warehouse IS, Modesto (2022; 19);
- Ormat Brawley Solar Project DEIR, Brawley (2022; 37);
- Site visits to Heber 1 Geothermal Repower Project IS/MND (2022; 31);
- Heritage Industrial Center Design Review, Chula Vista (2022; 13);
- Temporary Outdoor Vehicle Storage DEIR, Port of Hueneme (2022; 29);
- CNU Medical Center and Innovation Park DEIR, Natomas (2022; 35);
- Beverly Boulevard Warehouse IS/MND, Pico Rivera (2021; 28);
- Hagemon Properties IS/MND Amendment, Bakersfield (2022; 23);
- Airport Distribution Center IS/MND, Redding (2021; 22);
- Orchard on Nevada Warehouse Staff Report, Redlands (2021; 24);
- Landings Logistics Center Exemption, Bakersfield (2021; 19);
- Replies on Hearn Veterans Village IS/MND, Santa Rosa (2021; 22);
- North Central Valley BESS Project IS/MND, Stockton (2021; 37);
- 2<sup>nd</sup> Replies on Heber 1 Geothermal Repower Project IS/MND (2022; 21);
- Stagecoach Solar DEIR, Barstow (2021; 24);
- Updated Sun Lakes Village North EIR Amendment 5, Banning, Riverside County (2021; 35);
- Freedom Circle Focus Area and Greystar General Plan Amendment Project EIR, San Jose (2021; 43);
- Operon HKI Warehouse IS/MND, Perris (2021; 26);
- Fairway Business Park Phase III IS/MND, Lake Elsinore (2021; 23);
- South Stockton Commerce Center IS/MND, Stockton (2021; 31);
- Starpoint Warehouse IS/MND, San Bernardino (2021; 24);
- Replies on Heber 1 Geothermal Repower Project IS/MND (2021; 15);
- Heber 1 Geothermal Repower Project IS/MND (2021; 11);
- Alviso Hotel Project IS/MND, San Jose (2021; 43);
- Replies on Easton Research Park West IS/MND, Rancho Cordova (2021; 3);
- Easton Research Park West IS/MND, Rancho Cordova (2021; 31);
- US Cold Storage DEIR, Hesperia (2021; 30);
- 1242 20<sup>th</sup> Street Wellness Center Project FEIR, Santa Monica (2021; 23);

- Third visit, Veterans Affairs Site Plan Review No. 20-0102 MND, Bakersfield (2021; 10);
- Roseland Creek Community Park Project IS/MND, Santa Rosa (2021; 23);
- Vista Mar Declaration of Irreparable Harm, Pacifica (2021; 3);
- LogistiCenter at Fairfield IS/MND (2021; 25);
- Alta Cuvee Mixed Use Project IS/MND, Ranch Cucamonga (2021; 29);
- Caligrows Architectural and Site Plan Review, Patterson (2021; 21);
- 1055 E. Sandhill Avenue Warehouse IS/MND, Carson (2021; 10);
- Chestnut & Tenth Street Commercial Project IS/MND, Gilroy (2021; 27);
- Libitzky Management Warehouse IS/MND, Modesto (2021; 20);
- 3rd Replies on Heber 2 Geothermal Repower Project IS/MND, El Centro (2021; 10);
- Medical Office Building DEIR, Santa Cruz (2021; 30);
- Scannell Warehouse DEIR, Richmond (2021; 24);
- Diamond Heights Application, San Francisco (2021; 24);
- Costa Azul Mixed-Use EIR Addendum, San Diego (2021; 25);
- Woodland Research Park DEIR (2021; 45);
- 2<sup>nd</sup> Replies on Diamond Street Industrial IS/MND, San Marcos (2021; 9);
- Replies on Diamond Street Industrial IS/MND, San Marcos (2021; 3);
- Diamond Street Industrial IS/MND, San Marcos (2021; 28);
- DHS 109 Industrial Park IS/MND, Desert Hot Springs (2021; 33);
- Jersey Industrial Complex Rancho Cucamonga (2022; 22);
- 1188 Champions Drive Parking Garage Staff Report, San Jose (2021; 5);
- San Pedro Mountain, Pacifica (2021; 22);
- Pixior Warehouse IS/MND, Hesperia (2021; 29);
- 2<sup>nd</sup> Replies on Heber 2 Geothermal Repower Project IS/MND, El Centro (2021; 9);
- Hearn Veterans Village IS/MND, Santa Rosa (2021; 23);
- Second visit, Veterans Affairs Site Plan Review No. 20-0102 MND, Bakersfield (2021; 11);
- Replies on Station East Residential/Mixed Use EIR, Union City (2021; 26);
- Schulte Logistics Centre EIR, Tracy (2021; 30);
- 4150 Point Eden Way Industrial Development EIR, Hayward (2021; 13);
- Airport Business Centre IS/MND, Manteca (2021; 27);
- Dual-branded Hotel IS/MND, Santa Clara (2021; 26);
- Legacy Highlands Specific Plan EIR, Beaumont (2021; 47);
- UC Berkeley LRDP and Housing Projects #1 and #2 EIR (2021; 27);
- Santa Maria Airport Business Park EIR, Santa Maria (2021; 27);
- Replies on Coachella Valley Arena EIR Addendum, Thousand Palms (2021; 20);
- Coachella Valley Arena EIR Addendum, Thousand Palms (2021; 35);
- Inland Harbor Warehouse NOD, Ontario (2021; 8);
- Alvarado Specific Plan DEIR, La Mesa (2021; 35);
- Harvill Avenue and Rider Street Terminal Project MND, Riverside (2021; 23);
- Gillespie Field EIR Addendum, El Cajon (2021; 28);
- Heritage Wind Energy Project section 94-c siting process, New York (2021; 99);
- Commercial Street Hotels project Site Plans, Oakland (2021; 19);
- Heber 1 Geothermal Repower Project MND, El Centro (2021; 11);
- Citrus-Slover Warehouse Project MND, Fontana (2021; 20);

- Scott Ranch Project RDEIR (Davidon Homes), Petaluma (2021; 31);
- Replies on StratosFuel Renewable H2 Project MND, Victorville (2021; 5);
- StratosFuel Renewable H2 Project MND, Victorville (2021; 25);
- Replies on PARS Global Storage MND, Murietta (2021; 22);
- Baldwin-Zacharias Master Plans EIR, Patterson (2021; 38);
- 1000 Gibraltar Drive EIR, Milpitas (2021; 20);
- Mango Avenue Industrial Warehouse Project, Fontana, MND (2021; 20);
- Veterans Affairs Site Plan Review No. 20-0102 MND, Bakersfield (2021; 25);
- Replies on UCSF Comprehensive Parnassus Heights Plan EIR (2021; 13);
- 14 Charles Hill Circle Design Review (2021; 11);
- SDG Commerce 217 Warehouse IS, American Canyon (2021; 26);
- Mulqueeney Ranch Wind Repowering Project DSEIR (2021; 98);
- Clawiter Road Industrial Project IS/MND, Hayward (2021; 18);
- Garnet Energy Center Stipulations, New York (2020);
- Heritage Wind Energy Project, New York (2020: 71);
- Ameresco Keller Canyon RNG Project IS/MND, Martinez (2020; 11);
- Cambria Hotel Project Staff Report, Dublin (2020; 19);
- Central Pointe Mixed-Use Staff Report, Santa Ana (2020; 20);
- Oak Valley Town Center EIR Addendum, Calimesa (2020; 23);
- Coachillin Specific Plan MND Amendment, Desert Hot Springs (2020; 26);
- Stockton Avenue Hotel and Condominiums Project Tiering to EIR, San Jose (2020; 19);
- Cityline Sub-block 3 South Staff Report, Sunnyvale (2020; 22);
- Station East Residential/Mixed Use EIR, Union City (2020; 21);
- Multi-Sport Complex & Southeast Industrial Annexation Suppl. EIR, Elk Grove (2020; 24);
- Sun Lakes Village North EIR Amendment 5, Banning, Riverside County (2020; 27);
- 2<sup>nd</sup> comments on 1296 Lawrence Station Road, Sunnyvale (2020; 4);
- 1296 Lawrence Station Road, Sunnyvale (2020; 16);
- Mesa Wind Project EA, Desert Hot Springs (2020; 31);
- 11th Street Development Project IS/MND, City of Upland (2020; 17);
- Vista Mar Project IS/MND, Pacifica (2020; 17);
- Emerson Creek Wind Project Application, Ohio (2020; 64);
- Replies on Wister Solar Energy Facility EIR, Imperial County (2020; 12);
- Wister Solar Energy Facility EIR, Imperial County (2020; 28);
- Crimson Solar EIS/EIR, Mojave Desert (2020, 35) not submitted;
- Sakioka Farms EIR tiering, Oxnard (2020; 14);
- 3440 Wilshire Project IS/MND, Los Angeles (2020; 19);
- Replies on 2400 Barranca Office Development Project EIR, Irvine (2020; 8);
- 2400 Barranca Office Development Project EIR, Irvine (2020; 25);
- Replies on Heber 2 Geothermal Repower Project IS/MND, El Centro (2020; 4);
- 2<sup>nd</sup> comments on Heber 2 Geothermal Repower Project IS/MND, El Centro (2020; 8);
- Heber 2 Geothermal Repower Project IS/MND, El Centro (2020; 3);
- Lots 4-12 Oddstad Way Project IS/MND, Pacifica (2020; 16);
- Declaration on DDG Visalia Warehouse project (2020; 5);
- Terraces of Lafayette EIR Addendum (2020; 24);



- AMG Industrial Annex IS/MND, Los Banos (2020; 15);
- Replies to responses on Casmalia and Linden Warehouse, Rialto (2020; 15);
- Clover Project MND, Petaluma (2020; 27);
- Ruby Street Apartments Project Env. Checklist, Hayward (2020; 20);
- Replies to responses on 3721 Mt. Diablo Boulevard Staff Report (2020; 5);
- 3721 Mt. Diablo Boulevard Staff Report (2020; 9);
- Steeno Warehouse IS/MND, Hesperia (2020; 19);
- UCSF Comprehensive Parnassus Heights Plan EIR (2020; 24);
- North Pointe Business Center MND, Fresno (2020; 14);
- Casmalia and Linden Warehouse IS, Fontana (2020; 15);
- Rubidoux Commerce Center Project IS/MND, Jurupa Valley (2020; 27);
- Haun and Holland Mixed Use Center MND, Menifee (2020; 23);
- First Industrial Logistics Center II, Moreno Valley IS/MND (2020; 23);
- GLP Store Warehouse Project Staff Report (2020; 15);
- Replies on Beale WAPA Interconnection Project EA & CEQA checklist (2020; 29);
- 2<sup>nd</sup> comments on Beale WAPA Interconnection Project EA & CEQA checklist (2020; 34);
- Beale WAPA Interconnection Project EA & CEQA checklist (2020; 30);
- Levine-Fricke Softball Field Improvement Addendum, UC Berkeley (2020; 16);
- Greenlaw Partners Warehouse and Distribution Center Staff Report, Palmdale (2020; 14);
- Humboldt Wind Energy Project DEIR (2019; 25);
- Sand Hill Supplemental EIR, Altamont Pass (2019; 17);
- 1700 Dell Avenue Office Project, Campbell (2019, 28);
- 1180 Main Street Office Project MND, Redwood City (2019; 19);
- Summit Ridge Wind Farm Request for Amendment 4, Oregon (2019; 46);
- Shafter Warehouse Staff Report (2019; 4);
- Park & Broadway Design Review, San Diego (2019; 19);
- Pinnacle Pacific Heights Design Review, San Diego (2019; 19);
- Pinnacle Park & C Design Review, San Diego (2019; 19);
- Preserve at Torrey Highlands EIR, San Diego (2019; 24);
- Santana West Project EIR Addendum, San Jose (2019; 18);
- The Ranch at Eastvale EIR Addendum, Riverside County (2020; 19);
- Hageman Warehouse IS/MND, Bakersfield (2019; 13);
- Oakley Logistics Center EIR, Antioch (2019; 22);
- 27 South First Street IS, San Jose (2019; 23);
- 2<sup>nd</sup> replies on Times Mirror Square Project EIR, Los Angeles (2020; 11);
- Replies on Times Mirror Square Project EIR, Los Angeles (2020; 13);
- Times Mirror Square Project EIR, Los Angeles (2019; 18);
- East Monte Vista & Aviator General Plan Amend EIR Addendum, Vacaville (2019; 22);
- Hillcrest LRDP EIR, La Jolla (2019; 36);
- 555 Portola Road CUP, Portola Valley (2019; 11);
- Johnson Drive Economic Development Zone SEIR, Pleasanton (2019; 27);
- 1750 Broadway Project CEQA Exemption, Oakland (2019; 19);
- Mor Furniture Project MND, Murietta Hot Springs (2019; 27);
- Harbor View Project EIR, Redwood City (2019; 26);

- Visalia Logistics Center (2019; 13);
- Cordelia Industrial Buildings MND (2019; 14);
- Scheu Distribution Center IS/ND, Rancho Cucamonga (2019; 13);
- Mills Park Center Staff Report, San Bruno (2019; 22);
- Site visit to Desert Highway Farms IS/MND, Imperial County (2019; 9);
- Desert Highway Farms IS/MND, Imperial County (2019; 12);
- ExxonMobil Interim Trucking for Santa Ynez Unit Restart SEIR, Santa Barbara (2019; 9);
- Olympic Holdings Inland Center Warehouse Project MND, Rancho Cucamonga (2019; 14);
- Replies to responses on Lawrence Equipment Industrial Warehouse, Banning (2019; 19);
- PARS Global Storage MND, Murietta (2019; 13);
- Slover Warehouse EIR Addendum, Fontana (2019; 16);
- Seefried Warehouse Project IS/MND, Lathrop (2019; 19)
- World Logistics Center Site Visit, Moreno Valley (2019; 19);
- Merced Landfill Gas-To-Energy Project IS/MND (2019; 12);
- West Village Expansion FEIR, UC Davis (2019; 11);
- Site visit, Doheny Ocean Desalination EIR, Dana Point (2019; 11);
- Replies to responses on Avalon West Valley Expansion EIR, San Jose (2019; 10);
- Avalon West Valley Expansion EIR, San Jose (2019; 22);
- Sunroad – Otay 50 EIR Addendum, San Diego (2019; 26);
- Del Rey Pointe Residential Project IS/MND, Los Angeles (2019; 34);
- 1 AMD Redevelopment EIR, Sunnyvale (2019; 22);
- Lawrence Equipment Industrial Warehouse IS/MND, Banning (2019; 14);
- SDG Commerce 330 Warehouse IS, American Canyon (2019; 21);
- PAMA Business Center IS/MND, Moreno Valley (2019; 23);
- Cupertino Village Hotel IS (2019; 24);
- Lake House IS/ND, Lodi (2019; 33);
- Campo Wind Project DEIS, San Diego County (DEIS, (2019; 14);
- Stirling Warehouse MND site visit, Victorville (2019; 7);
- Green Valley II Mixed-Use Project EIR, Fairfield (2019; 36);
- We Be Jammin rezone MND, Fresno (2019; 14);
- Gray Whale Cove Pedestrian Crossing IS/ND, Pacifica (2019; 7);
- Visalia Logistics Center & DDG 697V Staff Report (2019; 9);
- Mather South Community Masterplan Project EIR (2019; 35);
- Del Hombro Apartments EIR, Walnut Creek (2019; 23);
- Otay Ranch Planning Area 12 EIR Addendum, Chula Vista (2019; 21);
- The Retreat at Sacramento IS/MND (2019; 26);
- Site visit to Sunroad – Centrum 6 EIR Addendum, San Diego (2019; 9);
- Sunroad – Centrum 6 EIR Addendum, San Diego (2018; 22);
- North First and Brokaw Corporate Campus Buildings EIR Addendum, San Jose (2018; 30);
- South Lake Solar IS, Fresno County (2018; 18);
- Galloo Island Wind Project Application, New York (not submitted) (2018; 44);
- Doheny Ocean Desalination EIR, Dana Point (2018; 15);
- Stirling Warehouse MND, Victorville (2018; 18);
- LDK Warehouse MND, Vacaville (2018; 30);

- Gateway Crossings FEIR, Santa Clara (2018; 23);
- South Hayward Development IS/MND (2018; 9);
- CBU Specific Plan Amendment, Riverside (2018; 27);
- 2<sup>nd</sup> replies to responses on Dove Hill Road Assisted Living Project MND (2018; 11);
- Replies to responses on Dove Hill Road Assisted Living Project MND (2018; 7);
- Dove Hill Road Assisted Living Project MND (2018; 12);
- Deer Ridge/Shadow Lakes Golf Course EIR, Brentwood (2018; 21);
- Pyramid Asphalt BLM Finding of No Significance, Imperial County (2018; 22);
- Amáre Apartments IS/MND, Martinez (2018; 15);
- Petaluma Hill Road Cannabis MND, Santa Rosa (2018; 21);
- 2<sup>nd</sup> comments on Zeiss Innovation Center IS/MND, Dublin (2018; 12);
- Zeiss Innovation Center IS/MND, Dublin (2018; 32);
- City of Hope Campus Plan EIR, Duarte (2018; 21);
- Palo Verde Center IS/MND, Blythe (2018; 14);
- Logisticcenter at Vacaville MND (2018; 24);
- IKEA Retail Center SEIR, Dublin (2018; 17);
- Merge 56 EIR, San Diego (2018; 15);
- Natomas Crossroads Quad B Office Project P18-014 EIR, Sacramento (2018; 12);
- 2900 Harbor Bay Parkway Staff Report, Alameda (2018; 30);
- At Dublin EIR, Dublin (2018; 25);
- Fresno Industrial Rezone Amendment Application No. 3807 IS (2018; 10);
- Nova Business Park IS/MND, Napa (2018; 18);
- Updated Collision Risk Model Priors for Estimating Eagle Fatalities, USFWS (2018; 57);
- 750 Marlborough Avenue Warehouse MND, Riverside (2018; 14);
- Replies to responses on San Bernardino Logistics Center IS (2018; 12);
- San Bernardino Logistics Center IS (2018; 19);
- CUP2017-16, Costco IS/MND, Clovis (2018; 11);
- Desert Land Ventures Specific Plan EIR, Desert Hot Springs (2018; 18);
- Ventura Hilton IS/MND (2018; 30);
- North of California Street Master Plan Project IS, Mountain View (2018; 11);
- Tamarind Warehouse MND, Fontana (2018; 16);
- Lathrop Gateway Business Park EIR Addendum (2018; 23);
- Centerpointe Commerce Center IS, Moreno Valley (2019; 18);
- Amazon Warehouse Notice of Exemption, Bakersfield (2018; 13);
- CenterPoint Building 3 project Staff Report, Manteca (2018; 23);
- Cessna & Aviator Warehouse IS/MND, Vacaville (2018; 24);
- Napa Airport Corporate Center EIR, American Canyon (2018, 15);
- 800 Opal Warehouse Initial Study, Mentone, San Bernardino County (2018; 18);
- 2695 W. Winton Ave Industrial Project IS, Hayward (2018; 22);
- Trinity Cannabis Cultivation and Manufacturing Facility DEIR, Calexico (2018; 15);
- Shoe Palace Expansion IS/MND, Morgan Hill (2018; 21);
- Newark Warehouse at Morton Salt Plant Staff Report (2018; 15);
- Northlake Specific Plan FEIR “Peer Review”, Los Angeles County (2018; 9);
- Replies to responses on Northlake Specific Plan SEIR, Los Angeles County (2018; 13);

- Northlake Specific Plan SEIR, Los Angeles County (2017; 27);
- Bogle Wind Turbine DEIR, east Yolo County (2017; 48);
- Ferrante Apartments IS/MND, Los Angeles (2017; 14);
- The Villages of Lakeview EIR, Riverside (2017; 28);
- Data Needed for Assessing Trail Management Impacts on Northern Spotted Owl, Marin County (2017; 5);
- Notes on Proposed Study Options for Trail Impacts on Northern Spotted Owl (2017; 4);
- Pyramid Asphalt IS, Imperial County (Declaration) (2017; 5);
- San Gorgonio Crossings EIR, Riverside County (2017; 22);
- Replies to responses on Jupiter Project IS and MND, Apple Valley (2017; 12);
- Proposed World Logistics Center Mitigation Measures, Moreno Valley (2017, 2019; 12);
- MacArthur Transit Village Project Modified 2016 CEQA Analysis (2017; 12);
- PG&E Company Bay Area Operations and Maintenance HCP (2017; 45);
- Central SoMa Plan DEIR (2017; 14);
- Suggested mitigation for trail impacts on northern spotted owl, Marin County (2016; 5);
- Colony Commerce Center Specific Plan DEIR, Ontario (2016; 16);
- Fairway Trails Improvements MND, Marin County (2016; 13);
- Review of Avian-Solar Science Plan (2016; 28);
- Replies on Pyramid Asphalt IS, Imperial County (2016; 5);
- Pyramid Asphalt IS, Imperial County (2016; 4);
- Agua Mansa Distribution Warehouse Project Initial Study (2016; 14);
- Santa Anita Warehouse MND, Rancho Cucamonga (2016; 12);
- CapRock Distribution Center III DEIR, Rialto (2016: 12);
- Orange Show Logistics Center IS/MND, San Bernardino (2016; 9);
- City of Palmdale Oasis Medical Village Project IS/MND (2016; 7);
- Comments on proposed rule for incidental eagle take, USFWS (2016, 49);
- Replies on Grapevine Specific and Community Plan FEIR, Kern County (2016; 25);
- Grapevine Specific and Community Plan DEIR, Kern County (2016; 15);
- Clinton County Zoning Ordinance for Wind Turbine siting (2016);
- Hallmark at Shenandoah Warehouse Project Initial Study, San Bernardino (2016; 6);
- Tri-City Industrial Complex Initial Study, San Bernardino (2016; 5);
- Hidden Canyon Industrial Park Plot Plan 16-PP-02, Beaumont (2016; 12);
- Kimball Business Park DEIR (2016; 10);
- Jupiter Project IS and MND, Apple Valley, San Bernardino County (2016; 9);
- Revised Draft Giant Garter Snake Recovery Plan of 2015 (2016, 18);
- Palo Verde Mesa Solar Project EIR, Blythe (2016; 27);
- Reply on Fairview Wind Project Natural Heritage Assessment, Ontario, Canada (2016; 14);
- Fairview Wind Project Natural Heritage Assessment, Ontario, Canada (2016; 41);
- Reply on Amherst Island Wind Farm Natural Heritage Assessment, Ontario (2015, 38);
- Amherst Island Wind Farm Natural Heritage Assessment, Ontario (2015, 31);
- Second Reply on White Pines Wind Farm, Ontario (2015, 6);
- Reply on White Pines Wind Farm Natural Heritage Assessment, Ontario (2015, 10);
- White Pines Wind Farm Natural Heritage Assessment, Ontario (2015, 9);
- Proposed Section 24 Specific Plan Agua Caliente Band of Cahuilla Indians DEIS (2015, 9);

- Replies on 24 Specific Plan Agua Caliente Band of Cahuilla Indians FEIS (2015, 6);
- Sierra Lakes Commerce Center Project DEIR, Fontana (2015, 9);
- Columbia Business Center MND, Riverside (2015; 8);
- West Valley Logistics Center Specific Plan DEIR, Fontana (2015, 10);
- Willow Springs Solar Photovoltaic Project DEIR (2015, 28);
- Alameda Creek Bridge Replacement Project DEIR (2015, 10);
- World Logistic Center Specific Plan FEIR, Moreno Valley (2015, 12);
- Elkhorn Valley Wind Power Project Impacts, Oregon (2015; 143);
- Bay Delta Conservation Plan EIR/EIS, Sacramento (2014, 21);
- Addison Wind Energy Project DEIR, Mojave (2014, 32);
- Replies on the Addison Wind Energy Project DEIR, Mojave (2014, 15);
- Addison and Rising Tree Wind Energy Project FEIR, Mojave (2014, 12);
- Palen Solar Electric Generating System FSA (CEC), Blythe (2014, 20);
- Rebuttal testimony on Palen Solar Energy Generating System (2014, 9);
- Seven Mile Hill and Glenrock/Rolling Hills impacts + Addendum, Wyoming (2014; 105);
- Rising Tree Wind Energy Project DEIR, Mojave (2014, 32);
- Replies on the Rising Tree Wind Energy Project DEIR, Mojave (2014, 15);
- Soitec Solar Development Project PEIR, Boulevard, San Diego County (2014, 18);
- Oakland Zoo expansion on Alameda whipsnake and California red-legged frog (2014; 3);
- Alta East Wind Energy Project FEIS, Tehachapi Pass (2013, 23);
- Blythe Solar Power Project Staff Assessment, California Energy Commission (2013, 16);
- Clearwater and Yakima Solar Projects DEIR, Kern County (2013, 9);
- West Antelope Solar Energy Project IS/MND, Antelope Valley (2013, 18);
- Cuyama Solar Project DEIR, Carrizo Plain (2014, 19);
- Desert Renewable Energy Conservation Plan (DRECP) EIR/EIS (2015, 49);
- Kingbird Solar Photovoltaic Project EIR, Kern County (2013, 19);
- Lucerne Valley Solar Project IS/MND, San Bernardino County (2013, 12);
- Tule Wind project FEIR/FEIS (Declaration) (2013; 31);
- Sunlight Partners LANDPRO Solar Project MND (2013; 11);
- Declaration in opposition to BLM fracking (2013; 5);
- Blythe Energy Project (solar) CEC Staff Assessment (2013;16);
- Rosamond Solar Project EIR Addendum, Kern County (2013; 13);
- Pioneer Green Solar Project EIR, Bakersfield (2013; 13);
- Replies on Soccer Center Solar Project MND (2013; 6);
- Soccer Center Solar Project MND, Lancaster (2013; 10);
- Plainview Solar Works MND, Lancaster (2013; 10);
- Alamo Solar Project MND, Mojave Desert (2013; 15);
- Replies on Imperial Valley Solar Company 2 Project (2013; 10);
- Imperial Valley Solar Company 2 Project (2013; 13);
- FRV Orion Solar Project DEIR, Kern County (PP12232) (2013; 9);
- Casa Diablo IV Geothermal Development Project (2013; 6);
- Reply on Casa Diablo IV Geothermal Development Project (2013; 8);
- Alta East Wind Project FEIS, Tehachapi Pass (2013; 23);
- Metropolitan Air Park DEIR, City of San Diego (2013; );

- Davidon Homes Tentative Subdivision Rezoning Project DEIR, Petaluma (2013; 9);
- Oakland Zoo Expansion Impacts on Alameda Whipsnake (2013; 10);
- Campo Verde Solar project FEIR, Imperial Valley (2013; 11pp);
- Neg Dec comments on Davis Sewer Trunk Rehabilitation (2013; 8);
- North Steens Transmission Line FEIS, Oregon (Declaration) (2012; 62);
- Summer Solar and Springtime Solar Projects IS/MND Lancaster (2012; 8);
- J&J Ranch, 24 Adobe Lane Environmental Review, Orinda (2012; 14);
- Replies on Hudson Ranch Power II Geothermal Project and Simbol Calipatria Plant II (2012; 8);
- Hudson Ranch Power II Geothermal Project and Simbol Calipatria Plant II (2012; 9);
- Desert Harvest Solar Project EIS, near Joshua Tree (2012; 15);
- Solar Gen 2 Array Project DEIR, El Centro (2012; 16);
- Ocotillo Sol Project EIS, Imperial Valley (2012; 4);
- Beacon Photovoltaic Project DEIR, Kern County (2012; 5);
- Butte Water District 2012 Water Transfer Program IS/MND (2012; 11);
- Mount Signal and Calexico Solar Farm Projects DEIR (2011; 16);
- City of Elk Grove Sphere of Influence EIR (2011; 28);
- Sutter Landing Park Solar Photovoltaic Project MND, Sacramento (2011; 9);
- Rabik/Gudath Project, 22611 Coleman Valley Road, Bodega Bay (CPN 10-0002) (2011; 4);
- Ivanpah Solar Electric Generating System (ISEGS) (Declaration) (2011; 9);
- Draft Eagle Conservation Plan Guidance, USFWS (2011; 13);
- Niles Canyon Safety Improvement Project EIR/EA (2011; 16);
- Route 84 Safety Improvement Project (Declaration) (2011; 7);
- Rebuttal on Whistling Ridge Wind Energy Power DEIS, Skamania County, (2010; 6);
- Whistling Ridge Wind Energy Power DEIS, Skamania County, Washington (2010; 41);
- Klickitat County's Decisions on Windy Flats West Wind Energy Project (2010; 17);
- St. John's Church Project DEIR, Orinda (2010; 14);
- Results Radio Zone File #2009-001 IS/MND, Conaway site, Davis (2010; 20);
- Rio del Oro Specific Plan Project FEIR, Rancho Cordova (2010; 12);
- Results Radio Zone File #2009-001, Mace Blvd site, Davis (2009; 10);
- Answers to Questions on 33% RPS Implementation Analysis Preliminary Results Report (2009; 9);
- SEPA Determination of Non-significance regarding zoning adjustments for Skamania County, Washington (Second Declaration) (2008; 17);
- Draft 1A Summary Report to CAISO (2008; 10);
- Hilton Manor Project Categorical Exemption, County of Placer (2009; 9);
- Protest of CARE to Amendment to the Power Purchase and Sale Agreement for Procurement of Eligible Renewable Energy Resources Between Hatchet Ridge Wind LLC and PG&E (2009; 3);
- Tehachapi Renewable Transmission Project EIR/EIS (2009; 142);
- Delta Shores Project EIR, south Sacramento (2009; 11 + addendum 2);
- Declaration in Support of Care's Petition to Modify D.07-09-040 (2008; 3);
- The Public Utility Commission's Implementation Analysis December 16 Workshop for the Governor's Executive Order S-14-08 to implement a 33% Renewable Portfolio Standard by 2020 (2008; 9);

- The Public Utility Commission’s Implementation Analysis Draft Work Plan for the Governor’s Executive Order S-14-08 to implement a 33% Renewable Portfolio Standard by 2020 (2008; 11);
- Draft 1A Summary Report to California Independent System Operator for Planning Reserve Margins (PRM) Study (2008; 7.);
- SEPA Determination of Non-significance regarding zoning adjustments for Skamania County, Washington (Declaration) (2008; 16);
- Colusa Generating Station, California Energy Commission PSA (2007; 24);
- Rio del Oro Specific Plan Project Recirculated DEIR, Mather (2008; 66);
- Replies on Regional University Specific Plan EIR, Roseville (2008; 20);
- Regional University Specific Plan EIR, Roseville (2008; 33);
- Clark Precast, LLC’s “Sugarland” project, ND, Woodland (2008; 15);
- Cape Wind Project DEIS, Nantucket (2008; 157);
- Yuba Highlands Specific Plan EIR, Spenceville, Yuba County (2006; 37);
- Replies to responses on North Table Mountain MND, Butte County (2006; 5);
- North Table Mountain MND, Butte County (2006; 15);
- Windy Point Wind Farm EIS (2006; 14 and Powerpoint slide replies);
- Shiloh I Wind Power Project EIR, Rio Vista (2005; 18);
- Buena Vista Wind Energy Project NOP, Byron (2004; 15);
- Callahan Estates Subdivision ND, Winters (2004; 11);
- Winters Highlands Subdivision IS/ND (2004; 9);
- Winters Highlands Subdivision IS/ND (2004; 13);
- Creekside Highlands Project, Tract 7270 ND (2004; 21);
- Petition to California Fish and Game Commission to list Burrowing Owl (2003; 10);
- Altamont Pass Wind Resource Area CUP renewals, Alameda County (2003; 41);
- UC Davis Long Range Development Plan: Neighborhood Master Plan (2003; 23);
- Anderson Marketplace Draft Environmental Impact Report (2003; 18);
- Negative Declaration of the proposed expansion of Temple B’nai Tikyah (2003; 6);
- Antonio Mountain Ranch Specific Plan Public Draft EIR (2002; 23);
- Replies on East Altamont Energy Center evidentiary hearing (2002; 9);
- Revised Draft Environmental Impact Report, The Promenade (2002; 7);
- Recirculated Initial Study for Calpine’s proposed Pajaro Valley Energy Center (2002; 3);
- UC Merced -- Declaration (2002; 5);
- Replies on Atwood Ranch Unit III Subdivision FEIR (2003; 22);
- Atwood Ranch Unit III Subdivision EIR (2002; 19);
- California Energy Commission Staff Report on GWF Tracy Peaker Project (2002; 20);
- Silver Bend Apartments IS/MND, Placer County (2002; 13);
- UC Merced Long-range Development Plan DEIR and UC Merced Community Plan DEIR (2001; 26);
- Colusa County Power Plant IS, Maxwell (2001; 6);
- Dog Park at Catlin Park, Folsom, California (2001; 5);
- Calpine and Bechtel Corporations’ Biological Resources Implementation and Monitoring Program (BRMIMP) for the Metcalf Energy Center (2000; 10);
- Metcalf Energy Center, California Energy Commission FSA (2000);
- US Fish and Wildlife Service Section 7 consultation with the California Energy Commission

- regarding Calpine and Bechtel Corporations' Metcalf Energy Center (2000; 4);
- California Energy Commission's Preliminary Staff Assessment of the proposed Metcalf Energy Center (2000: 11);
- Site-specific management plans for the Natomas Basin Conservancy's mitigation lands, prepared by Wildlands, Inc. (2000: 7);
- Affidavit of K. Shawn Smallwood in Spirit of the Sage Council, et al. (Plaintiffs) vs. Bruce Babbitt, Secretary, U.S. Department of the Interior, et al. (Defendants), Injuries caused by the No Surprises policy and final rule which codifies that policy (1999: 9).
- California Board of Forestry's proposed amended Forest Practices Rules (1999);
- Sunset Sky ranch Airport Use Permit IS/MND (1999);
- Ballona West Bluffs Project Environmental Impact Report (1999; oral presentation);
- Draft Recovery Plan for Giant Garter Snake (Fed. Reg. 64(176): 49497-49498) (1999; 8);
- Draft Recovery Plan for Arroyo Southwestern Toad (1998);
- Pacific Lumber Co. (Headwaters) HCP & EIR, Fortuna (1998; 28);
- Natomas Basin HCP Permit Amendment, Sacramento (1998);
- San Diego Multi-Species Conservation Program FEIS/FEIR (1997; 10);

**Comments on other Environmental Review Documents:**

- Proposed Regulation for California Fish and Game Code Section 3503.5 (2015: 12);
- Statement of Overriding Considerations related to extending Altamont Winds, Inc.'s Conditional Use Permit PLN2014-00028 (2015; 8);
- Covell Village PEIR, Davis (2005; 19);
- Bureau of Land Management Wind Energy Programmatic EIS Scoping (2003; 7.);
- NEPA Environmental Analysis for Biosafety Level 4 National Biocontainment Laboratory (NBL) at UC Davis (2003: 7);
- Notice of Preparation of UC Merced Community and Area Plan EIR, on behalf of The Wildlife Society—Western Section (2001: 8.);
- Preliminary Draft Yolo County Habitat Conservation Plan (2001; 2 letters totaling 35.);
- Merced County General Plan Revision, notice of Negative Declaration (2001: 2.);
- Notice of Preparation of Campus Parkway EIR/EIS (2001: 7.);
- Draft Recovery Plan for the bighorn sheep in the Peninsular Range (*Ovis candensis*) (2000);
- Draft Recovery Plan for the California Red-legged Frog (*Rana aurora draytonii*), on behalf of The Wildlife Society—Western Section (2000: 10.);
- Sierra Nevada Forest Plan Amendment Draft Environmental Impact Statement, on behalf of The Wildlife Society—Western Section (2000: 7.);
- State Water Project Supplemental Water Purchase Program, Draft Program EIR (1997);
- Davis General Plan Update EIR (2000);
- Turn of the Century EIR (1999: 10);
- Proposed termination of Critical Habitat Designation under the Endangered Species Act (Fed. Reg. 64(113): 31871-31874) (1999);
- NOA Draft Addendum to the Final Handbook for Habitat Conservation Planning and Incidental Take Permitting Process, termed the HCP 5-Point Policy Plan (Fed. Reg. 64(45): 11485 - 11490) (1999; 2 + attachments);
- Covell Center Project EIR and EIR Supplement (1997).



**Position Statements** I prepared the following position statements for the Western Section of The Wildlife Society, and one for nearly 200 scientists:

- Recommended that the California Department of Fish and Game prioritize the extermination of the introduced southern water snake in northern California. The Wildlife Society--Western Section (2001);
- Recommended that The Wildlife Society—Western Section appoint or recommend members of the independent scientific review panel for the UC Merced environmental review process (2001);
- Opposed the siting of the University of California’s 10th campus on a sensitive vernal pool/grassland complex east of Merced. The Wildlife Society--Western Section (2000);
- Opposed the legalization of ferret ownership in California. The Wildlife Society--Western Section (2000);
- Opposed the Proposed “No Surprises,” “Safe Harbor,” and “Candidate Conservation Agreement” rules, including permit-shield protection provisions (Fed. Reg. Vol. 62, No. 103, pp. 29091-29098 and No. 113, pp. 32189-32194). This statement was signed by 188 scientists and went to the responsible federal agencies, as well as to the U.S. Senate and House of Representatives.

### **Posters at Professional Meetings**

Leyvas, E. and K. S. Smallwood. 2015. Rehabilitating injured animals to offset and rectify wind project impacts. Conference on Wind Energy and Wildlife Impacts, Berlin, Germany, 9-12 March 2015.

Smallwood, K. S., J. Mount, S. Standish, E. Leyvas, D. Bell, E. Walther, B. Karas. 2015. Integrated detection trials to improve the accuracy of fatality rate estimates at wind projects. Conference on Wind Energy and Wildlife Impacts, Berlin, Germany, 9-12 March 2015.

Smallwood, K. S. and C. G. Thelander. 2005. Lessons learned from five years of avian mortality research in the Altamont Pass WRA. AWEA conference, Denver, May 2005.

Neher, L., L. Wilder, J. Woo, L. Spiegel, D. Yen-Nakafugi, and K.S. Smallwood. 2005. Bird’s eye view on California wind. AWEA conference, Denver, May 2005.

Smallwood, K. S., C. G. Thelander and L. Spiegel. 2003. Toward a predictive model of avian fatalities in the Altamont Pass Wind Resource Area. Windpower 2003 Conference and Convention, Austin, Texas.

Smallwood, K.S. and Eva Butler. 2002. Pocket Gopher Response to Yellow Star-thistle Eradication as part of Grassland Restoration at Decommissioned Mather Air Force Base, Sacramento County, California. White Mountain Research Station Open House, Barcroft Station.

Smallwood, K.S. and Michael L. Morrison. 2002. Fresno kangaroo rat (*Dipodomys nitratooides*) Conservation Research at Resources Management Area 5, Lemoore Naval Air Station. White Mountain Research Station Open House, Barcroft Station.

Smallwood, K.S. and E.L. Fitzhugh. 1989. Differentiating mountain lion and dog tracks. Third

Mountain Lion Workshop, Prescott, AZ.

Smith, T. R. and K. S. Smallwood. 2000. Effects of study area size, location, season, and allometry on reported *Sorex* shrew densities. Annual Meeting of the Western Section of The Wildlife Society.

### **Presentations at Professional Meetings and Seminars**

Long-Term Population Trend of Burrowing Owls in the Altamont. Golden Gate Audubon, 21 October 2020.

Long-Term Population Trend of Burrowing Owls in the Altamont. East Bay Regional Park District 2020 Stewardship Seminar, Oakland, California, 18 November 2020.

Smallwood, K.S., D.A. Bell, and S, Standish. Dogs detect larger wind energy effects on bats and birds. The Wildlife Society, 28 September 2020.

Smallwood, K.S. and D.A. Bell. Effects of wind turbine curtailment on bird and bat fatalities in the Altamont Pass Wind Resource Area. The Wildlife Society, 28 September 2020.

Smallwood, K.S., D.A. Bell, and S, Standish. Dogs detect larger wind energy effects on bats and birds. The Wildlife Survey, 7 February 2020.

Smallwood, K.S. and D.A. Bell. Effects of wind turbine curtailment on bird and bat fatalities in the Altamont Pass Wind Resource Area. The Wildlife Survey, 7 February 2020.

Dog detections of bat and bird fatalities at wind farms in the Altamont Pass Wind Resource Area. East Bay Regional Park District 2019 Stewardship Seminar, Oakland, California, 13 November 2019.

Repowering the Altamont Pass. Altamont Symposium, The Wildlife Society – Western Section, 5 February 2017.

Developing methods to reduce bird mortality in the Altamont Pass Wind Resource Area, 1999-2007. Altamont Symposium, The Wildlife Society – Western Section, 5 February 2017.

Conservation and recovery of burrowing owls in Santa Clara Valley. Santa Clara Valley Habitat Agency, Newark, California, 3 February 2017.

Mitigation of Raptor Fatalities in the Altamont Pass Wind Resource Area. Raptor Research Foundation Meeting, Sacramento, California, 6 November 2015.

From burrows to behavior: Research and management for burrowing owls in a diverse landscape. California Burrowing Owl Consortium meeting, 24 October 2015, San Jose, California.

The Challenges of repowering. Keynote presentation at Conference on Wind Energy and Wildlife Impacts, Berlin, Germany, 10 March 2015.

Research Highlights Altamont Pass 2011-2015. Scientific Review Committee, Oakland, California,

8 July 2015.

Siting wind turbines to minimize raptor collisions: Altamont Pass Wind Resource Area. US Fish and Wildlife Service Golden Eagle Working Group, Sacramento, California, 8 January 2015.

Evaluation of nest boxes as a burrowing owl conservation strategy. Sacramento Chapter of the Western Section, The Wildlife Society. Sacramento, California, 26 August 2013.

Predicting collision hazard zones to guide repowering of the Altamont Pass. Conference on wind power and environmental impacts. Stockholm, Sweden, 5-7 February 2013.

Impacts of Wind Turbines on Wildlife. California Council for Wildlife Rehabilitators, Yosemite, California, 12 November 2012.

Impacts of Wind Turbines on Birds and Bats. Madrone Audubon Society, Santa Rosa, California, 20 February 2012.

Comparing Wind Turbine Impacts across North America. California Energy Commission Staff Workshop: Reducing the Impacts of Energy Infrastructure on Wildlife, 20 July 2011.

Siting Repowered Wind Turbines to Minimize Raptor Collisions. California Energy Commission Staff Workshop: Reducing the Impacts of Energy Infrastructure on Wildlife, 20 July 2011.

Siting Repowered Wind Turbines to Minimize Raptor Collisions. Alameda County Scientific Review Committee meeting, 17 February 2011

Comparing Wind Turbine Impacts across North America. Conference on Wind energy and Wildlife impacts, Trondheim, Norway, 3 May 2011.

Update on Wildlife Impacts in the Altamont Pass Wind Resource Area. Raptor Symposium, The Wildlife Society—Western Section, Riverside, California, February 2011.

Siting Repowered Wind Turbines to Minimize Raptor Collisions. Raptor Symposium, The Wildlife Society - Western Section, Riverside, California, February 2011.

Wildlife mortality caused by wind turbine collisions. Ecological Society of America, Pittsburgh, Pennsylvania, 6 August 2010.

Map-based repowering and reorganization of a wind farm to minimize burrowing owl fatalities. California burrowing Owl Consortium Meeting, Livermore, California, 6 February 2010.

Environmental barriers to wind power. Getting Real About Renewables: Economic and Environmental Barriers to Biofuels and Wind Energy. A symposium sponsored by the Environmental & Energy Law & Policy Journal, University of Houston Law Center, Houston, 23 February 2007.

Lessons learned about bird collisions with wind turbines in the Altamont Pass and other US wind farms. Meeting with Japan Ministry of the Environment and Japan Ministry of the Economy, Wild

Bird Society of Japan, and other NGOs Tokyo, Japan, 9 November 2006.

Lessons learned about bird collisions with wind turbines in the Altamont Pass and other US wind farms. Symposium on bird collisions with wind turbines. Wild Bird Society of Japan, Tokyo, Japan, 4 November 2006.

Responses of Fresno kangaroo rats to habitat improvements in an adaptive management framework. California Society for Ecological Restoration (SERCAL) 13<sup>th</sup> Annual Conference, UC Santa Barbara, 27 October 2006.

Fatality associations as the basis for predictive models of fatalities in the Altamont Pass Wind Resource Area. EEI/APLIC/PIER Workshop, 2006 Biologist Task Force and Avian Interaction with Electric Facilities Meeting, Pleasanton, California, 28 April 2006.

Burrowing owl burrows and wind turbine collisions in the Altamont Pass Wind Resource Area. The Wildlife Society - Western Section Annual Meeting, Sacramento, California, February 8, 2006.

Mitigation at wind farms. Workshop: Understanding and resolving bird and bat impacts. American Wind Energy Association and Audubon Society. Los Angeles, CA. January 10 and 11, 2006.

Incorporating data from the California Wildlife Habitat Relationships (CWHR) system into an impact assessment tool for birds near wind farms. Shawn Smallwood, Kevin Hunting, Marcus Yee, Linda Spiegel, Monica Parisi. Workshop: Understanding and resolving bird and bat impacts. American Wind Energy Association and Audubon Society. Los Angeles, CA. January 10 and 11, 2006.

Toward indicating threats to birds by California's new wind farms. California Energy Commission, Sacramento, May 26, 2005.

Avian collisions in the Altamont Pass. California Energy Commission, Sacramento, May 26, 2005.

Ecological solutions for avian collisions with wind turbines in the Altamont Pass Wind Resource Area. EPRI Environmental Sector Council, Monterey, California, February 17, 2005.

Ecological solutions for avian collisions with wind turbines in the Altamont Pass Wind Resource Area. The Wildlife Society—Western Section Annual Meeting, Sacramento, California, January 19, 2005.

Associations between avian fatalities and attributes of electric distribution poles in California. The Wildlife Society - Western Section Annual Meeting, Sacramento, California, January 19, 2005.

Minimizing avian mortality in the Altamont Pass Wind Resources Area. UC Davis Wind Energy Collaborative Forum, Palm Springs, California, December 14, 2004.

Selecting electric distribution poles for priority retrofitting to reduce raptor mortality. Raptor Research Foundation Meeting, Bakersfield, California, November 10, 2004.

Responses of Fresno kangaroo rats to habitat improvements in an adaptive management framework.

Annual Meeting of the Society for Ecological Restoration, South Lake Tahoe, California, October 16, 2004.

Lessons learned from five years of avian mortality research at the Altamont Pass Wind Resources Area in California. The Wildlife Society Annual Meeting, Calgary, Canada, September 2004.

The ecology and impacts of power generation at Altamont Pass. Sacramento Petroleum Association, Sacramento, California, August 18, 2004.

Burrowing owl mortality in the Altamont Pass Wind Resource Area. California Burrowing Owl Consortium meeting, Hayward, California, February 7, 2004.

Burrowing owl mortality in the Altamont Pass Wind Resource Area. California Burrowing Owl Symposium, Sacramento, November 2, 2003.

Raptor Mortality at the Altamont Pass Wind Resource Area. National Wind Coordinating Committee, Washington, D.C., November 17, 2003.

Raptor Behavior at the Altamont Pass Wind Resource Area. Annual Meeting of the Raptor Research Foundation, Anchorage, Alaska, September, 2003.

Raptor Mortality at the Altamont Pass Wind Resource Area. Annual Meeting of the Raptor Research Foundation, Anchorage, Alaska, September, 2003.

California mountain lions. Ecological & Environmental Issues Seminar, Department of Biology, California State University, Sacramento, November, 2000.

Intra- and inter-turbine string comparison of fatalities to animal burrow densities at Altamont Pass. National Wind Coordinating Committee, Carmel, California, May, 2000.

Using a Geographic Positioning System (GPS) to map wildlife and habitat. Annual Meeting of the Western Section of The Wildlife Society, Riverside, CA, January, 2000.

Suggested standards for science applied to conservation issues. Annual Meeting of the Western Section of The Wildlife Society, Riverside, CA, January, 2000.

The indicators framework applied to ecological restoration in Yolo County, California. Society for Ecological Restoration, September 25, 1999.

Ecological restoration in the context of animal social units and their habitat areas. Society for Ecological Restoration, September 24, 1999.

Relating Indicators of Ecological Health and Integrity to Assess Risks to Sustainable Agriculture and Native Biota. International Conference on Ecosystem Health, August 16, 1999.

A crosswalk from the Endangered Species Act to the HCP Handbook and real HCPs. Southern California Edison, Co. and California Energy Commission, March 4-5, 1999.

Mountain lion track counts in California: Implications for Management. Ecological & Environmental Issues Seminar, Department of Biological Sciences, California State University, Sacramento, November 4, 1998.

“No Surprises” -- Lack of science in the HCP process. California Native Plant Society Annual Conservation Conference, The Presidio, San Francisco, September 7, 1997.

In Your Interest. A half hour weekly show aired on Channel 10 Television, Sacramento. In this episode, I served on a panel of experts discussing problems with the implementation of the Endangered Species Act. Aired August 31, 1997.

Spatial scaling of pocket gopher (*Geomys*) density. Southwestern Association of Naturalists 44th Meeting, Fayetteville, Arkansas, April 10, 1997.

Estimating prairie dog and pocket gopher burrow volume. Southwestern Association of Naturalists 44th Meeting, Fayetteville, Arkansas, April 10, 1997.

Ten years of mountain lion track survey. Fifth Mountain Lion Workshop, San Diego, February 27, 1996.

Study and interpretive design effects on mountain lion density estimates. Fifth Mountain Lion Workshop, San Diego, February 27, 1996.

Small animal control. Session moderator and speaker at the California Farm Conference, Sacramento, California, Feb. 28, 1995.

Small animal control. Ecological Farming Conference, Asylomar, California, Jan. 28, 1995.

Habitat associations of the Swainson's Hawk in the Sacramento Valley's agricultural landscape. 1994 Raptor Research Foundation Meeting, Flagstaff, Arizona.

Alfalfa as wildlife habitat. Seed Industry Conference, Woodland, California, May 4, 1994.

Habitats and vertebrate pests: impacts and management. Managing Farmland to Bring Back Game Birds and Wildlife to the Central Valley. Yolo County Resource Conservation District, U.C. Davis, February 19, 1994.

Management of gophers and alfalfa as wildlife habitat. Orland Alfalfa Production Meeting and Sacramento Valley Alfalfa Production Meeting, February 1 and 2, 1994.

Patterns of wildlife movement in a farming landscape. Wildlife and Fisheries Biology Seminar Series: Recent Advances in Wildlife, Fish, and Conservation Biology, U.C. Davis, Dec. 6, 1993.

Alfalfa as wildlife habitat. California Alfalfa Symposium, Fresno, California, Dec. 9, 1993.

Management of pocket gophers in Sacramento Valley alfalfa. California Alfalfa Symposium, Fresno, California, Dec. 8, 1993.

Association analysis of raptors in a farming landscape. Plenary speaker at Raptor Research Foundation Meeting, Charlotte, North Carolina, Nov. 6, 1993.

Landscape strategies for biological control and IPM. Plenary speaker, International Conference on Integrated Resource Management and Sustainable Agriculture, Beijing, China, Sept. 11, 1993.

Landscape Ecology Study of Pocket Gophers in Alfalfa. Alfalfa Field Day, U.C. Davis, July 1993.

Patterns of wildlife movement in a farming landscape. Spatial Data Analysis Colloquium, U.C. Davis, August 6, 1993.

Sound stewardship of wildlife. Veterinary Medicine Seminar: Ethics of Animal Use, U.C. Davis. May 1993.

Landscape ecology study of pocket gophers in alfalfa. Five County Grower's Meeting, Tracy, California. February 1993.

Turbulence and the community organizers: The role of invading species in ordering a turbulent system, and the factors for invasion success. Ecology Graduate Student Association Colloquium, U.C. Davis. May 1990.

Evaluation of exotic vertebrate pests. Fourteenth Vertebrate Pest Conference, Sacramento, California. March 1990.

Analytical methods for predicting success of mammal introductions to North America. The Western Section of the Wildlife Society, Hilo, Hawaii. February 1988.

A state-wide mountain lion track survey. Sacramento County Dept Parks and Recreation. April 1986.

The mountain lion in California. Davis Chapter of the Audubon Society. October 1985.

Ecology Graduate Student Seminars, U.C. Davis, 1985-1990: Social behavior of the mountain lion; Mountain lion control; Political status of the mountain lion in California.

### **Other forms of Participation at Professional Meetings**

- Scientific Committee, Conference on Wind energy and Wildlife impacts, Berlin, Germany, March 2015.
- Scientific Committee, Conference on Wind energy and Wildlife impacts, Stockholm, Sweden, February 2013.
- Workshop co-presenter at Birds & Wind Energy Specialist Group (BAWESG) Information sharing week, Bird specialist studies for proposed wind energy facilities in South Africa, Endangered Wildlife Trust, Darling, South Africa, 3-7 October 2011.
- Scientific Committee, Conference on Wind energy and Wildlife impacts, Trondheim,

Norway, 2-5 May 2011.

- Chair of Animal Damage Management Session, The Wildlife Society, Annual Meeting, Reno, Nevada, September 26, 2001.
- Chair of Technical Session: Human communities and ecosystem health: Comparing perspectives and making connection. Managing for Ecosystem Health, International Congress on Ecosystem Health, Sacramento, CA August 15-20, 1999.
- Student Awards Committee, Annual Meeting of the Western Section of The Wildlife Society, Riverside, CA, January, 2000.
- Student Mentor, Annual Meeting of the Western Section of The Wildlife Society, Riverside, CA, January, 2000.

### **Printed Mass Media**

Smallwood, K.S., D. Mooney, and M. McGuinness. 2003. We must stop the UCD biolab now. Op-Ed to the Davis Enterprise.

Smallwood, K.S. 2002. Spring Lake threatens Davis. Op-Ed to the Davis Enterprise.

Smallwood, K.S. Summer, 2001. Mitigation of habitation. The Flatlander, Davis, California.

Entrikan, R.K. and K.S. Smallwood. 2000. Measure O: Flawed law would lock in new taxes. Op-Ed to the Davis Enterprise.

Smallwood, K.S. 2000. Davis delegation lobbies Congress for Wildlife conservation. Op-Ed to the Davis Enterprise.

Smallwood, K.S. 1998. Davis Visions. The Flatlander, Davis, California.

Smallwood, K.S. 1997. Last grab for Yolo's land and water. The Flatlander, Davis, California.

Smallwood, K.S. 1997. The Yolo County HCP. Op-Ed to the Davis Enterprise.

### **Radio/Television**

PBS News Hour,

FOX News, Energy in America: Dead Birds Unintended Consequence of Wind Power Development, August 2011.

KXJZ Capital Public Radio -- Insight (Host Jeffrey Callison). Mountain lion attacks (with guest Professor Richard Coss). 23 April 2009;

KXJZ Capital Public Radio -- Insight (Host Jeffrey Callison). Wind farm Rio Vista Renewable Power. 4 September 2008;



KQED QUEST Episode #111. Bird collisions with wind turbines. 2007;

KDVS Speaking in Tongues (host Ron Glick), Yolo County HCP: 1 hour. December 27, 2001;

KDVS Speaking in Tongues (host Ron Glick), Yolo County HCP: 1 hour. May 3, 2001;

KDVS Speaking in Tongues (host Ron Glick), Yolo County HCP: 1 hour. February 8, 2001;

KDVS Speaking in Tongues (host Ron Glick & Shawn Smallwood), California Energy Crisis: 1 hour. Jan. 25, 2001;

KDVS Speaking in Tongues (host Ron Glick), Headwaters Forest HCP: 1 hour. 1998;

Davis Cable Channel (host Gerald Heffernon), Burrowing owls in Davis: half hour. June, 2000;

Davis Cable Channel (hosted by Davis League of Women Voters), Measure O debate: 1 hour. October, 2000;

KXTV 10, In Your Interest, The Endangered Species Act: half hour. 1997.

### **Committees**

- Scientific Review Committee, Alameda County, Altamont Pass Wind Resource Area
- Ph.D. Thesis Committee, Steve Anderson, University of California, Davis
- MS Thesis Committee, Marcus Yee, California State University, Sacramento

### **Other Professional Activities or Products**

Testified in Federal Court in Denver during 2005 over the fate of radio-nuclides in the soil at Rocky Flats Plant after exposure to burrowing animals. My clients won a judgment of \$553,000,000. I have also testified in many other cases of litigation under CEQA, NEPA, the Warren-Alquist Act, and other environmental laws. My clients won most of the cases for which I testified.

Testified before Environmental Review Tribunals in Ontario, Canada regarding proposed White Pines, Amherst Island, and Fairview Wind Energy projects.

Testified in Skamania County Hearing in 2009 on the potential impacts of zoning the County for development of wind farms and hazardous waste facilities.

Testified in deposition in 2007 in the case of O'Dell et al. vs. FPL Energy in Houston, Texas.

Testified in Klickitat County Hearing in 2006 on the potential impacts of the Windy Point Wind Farm.

### **Memberships in Professional Societies**

The Wildlife Society  
Raptor Research Foundation

### **Honors and Awards**

Fulbright Research Fellowship to Indonesia, 1987  
J.G. Boswell Full Academic Scholarship, 1981 college of choice  
Certificate of Appreciation, The Wildlife Society—Western Section, 2000, 2001  
Northern California Athletic Association Most Valuable Cross Country Runner, 1984  
American Legion Award, Corcoran High School, 1981, and John Muir Junior High, 1977  
CIF Section Champion, Cross Country in 1978  
CIF Section Champion, Track & Field 2 mile run in 1981  
National Junior Record, 20 kilometer run, 1982  
National Age Group Record, 1500 meter run, 1978

### **Community Activities**

District 64 Little League Umpire, 2003-2007  
Dixon Little League Umpire, 2006-07  
Davis Little League Chief Umpire and Board member, 2004-2005  
Davis Little League Safety Officer, 2004-2005  
Davis Little League Certified Umpire, 2002-2004  
Davis Little League Scorekeeper, 2002  
Davis Visioning Group member  
Petitioner for Writ of Mandate under the California Environmental Quality Act against City of Woodland decision to approve the Spring Lake Specific Plan, 2002  
Served on campaign committees for City Council candidates



T 510.836.4200  
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[Amalia@lozeaudrury.com](mailto:Amalia@lozeaudrury.com)

BY E-MAIL and US MAIL

September 27, 2022

Mathew Evans  
City of Perris Planning Division  
135 North "D" Street  
Perris, CA 92570  
[mevans@cityofperris.org](mailto:mevans@cityofperris.org)

**Re: Ramona-Indian Warehouse Project – WITHDRAWAL OF APPEAL**

Dear Mr. Evans:

I am writing on behalf of Supporters Alliance for Environmental Responsibility ("SAFER"), a California nonprofit benefit corporation, regarding the proposed 232,575 square foot warehouse development with 10,000 square feet of ancillary office space at Ramona Expressway, known as the Ramona-Indian Warehouse Project, located in the City of Perris ("Project"). On August 29, 2022, SAFER filed comments on the Mitigated Negative Declaration for the Project, arguing that it was inadequate under the California Environmental Quality Act. We are pleased to inform you that SAFER and the Project developer have agreed to measures to address the issues raised in SAFER's comment letter and to render the Project's impacts less than significant. Therefore, SAFER withdraws its August 29, 2022 comments on the Project. SAFER fully supports the Project. Thank you.

Sincerely,

A handwritten signature in black ink, appearing to read "Amalia Bowley Fuentes".

Amalia Bowley Fuentes  
Lozeau Drury LLP



RIVERSIDE COUNTY FLOOD CONTROL  
AND WATER CONSERVATION DISTRICT

245123

August 4, 2022

City of Perris  
Planning Department  
135 North D Street  
Perris, CA 92570

Attention: Mathew Evans

Re: Ramona-Indian Warehouse Project  
APN 302-060-041

The Riverside County Flood Control and Water Conservation District (District) does not normally recommend conditions for land divisions or other land use cases in incorporated cities. The District also does not plan check City land use cases or provide State Division of Real Estate letters or other flood hazard reports for such cases. District comments/recommendations for such cases are normally limited to items of specific interest to the District including District Master Drainage Plan facilities, other regional flood control and drainage facilities which could be considered a logical component or extension of a master plan system, and District Area Drainage Plan fees (development mitigation fees). In addition, information of a general nature is provided.

The District's review is based on the above-referenced project transmittal, received August 2, 2022. The District **has not** reviewed the proposed project in detail, and the following comments do not in any way constitute or imply District approval or endorsement of the proposed project with respect to flood hazard, public health and safety, or any other such issue:

- This project would not be impacted by District Master Drainage Plan facilities, nor are other facilities of regional interest proposed.
- This project involves District proposed Master Drainage Plan facilities, namely, Perris Valley MDP – Line E, Lateral E-3, and Lateral E-11. The District will accept ownership of such facilities on written request by the City. The Project Applicant shall enter into a cooperative agreement establishing the terms and conditions of inspection, operation, and maintenance with the District and any other maintenance partners. Facilities must be constructed to District standards, and District plan check and inspection will be required for District acceptance. Plan check, inspection, and administrative fees will be required. All regulatory permits (and all documents pertaining thereto, e.g., Habitat Mitigation and Monitoring Plans, Conservation Plans/Easements) that are to be secured by the Applicant for both facility construction and maintenance shall be submitted to the District for review. The regulatory permits' terms and conditions shall be approved by the District prior to improvement plan approval, map recordation, or finalization of the regulatory permits. There shall be no unreasonable constraint upon the District's ability to operate and maintain the flood control facility(ies) to protect public health and safety.
- If this project proposes channels, storm drains 36 inches or larger in diameter, or other facilities that could be considered regional in nature and/or a logical extension a District's facility. The District would consider accepting ownership of such facilities on written request by the City. The Project Applicant shall enter into a cooperative agreement establishing the terms and conditions of inspection, operation, and maintenance with the District and any other maintenance partners. Facilities must be constructed to District standards, and District plan check and inspection will be required for District acceptance. Plan check, inspection, and administrative fees will be required. The regulatory permits' terms and conditions shall be approved by the District prior to improvement plan approval, map recordation, or finalization of the regulatory permits. There shall be no unreasonable constraint upon the District's ability to operate and maintain the flood control facility(ies) to protect public health and safety.

- This project is located within the limits of the District's Perris Valley San Jacinto River Homeland/Romoland Line A Homeland/Romoland Line B Area Drainage Plan for which drainage fees have been adopted. If the project is proposing to create additional impervious surface area, applicable fees should be paid (in accordance with the Rules and Regulations for Administration of Area Drainage Plans) to the Flood Control District or City prior to issuance of grading or building permits. Fees to be paid should be at the rate in effect at the time of issuance of the actual permit.
- An encroachment permit shall be obtained for any construction related activities occurring within District right of way or facilities, namely, Perris Valley MDP – Line E. If a proposed storm drain connection exceeds the hydraulic performance of the existing drainage facilities, mitigation will be required. For further information, contact the District's Encroachment Permit Section at 951.955.1266.
- The District's previous comments are still valid.

**GENERAL INFORMATION**

This project may require a National Pollutant Discharge Elimination System (NPDES) permit from the State Water Resources Control Board. Clearance for grading, recordation, or other final approval should not be given until the City has determined that the project has been granted a permit or is shown to be exempt.

If this project involves a Federal Emergency Management Agency (FEMA) mapped floodplain, then the City should require the applicant to provide all studies, calculations, plans, and other information required to meet FEMA requirements, and should further require the applicant obtain a Conditional Letter of Map Revision (CLOMR) prior to grading, recordation, or other final approval of the project and a Letter of Map Revision (LOMR) prior to occupancy.

The project proponent shall bear the responsibility for complying with all applicable mitigation measures defined in the California Environmental Quality Act (CEQA) document (i.e., Negative Declaration, Mitigated Negative Declaration, Environmental Impact Report) and/or Mitigation Monitoring and Reporting Program, if a CEQA document was prepared for the project. The project proponent shall also bear the responsibility for complying with all other federal, state, and local environmental rules and regulations that may apply.

If a natural watercourse or mapped floodplain is impacted by this project, the City should require the applicant to obtain a Section 1602 Agreement from the California Department of Fish and Wildlife and a Clean Water Act Section 404 Permit from the U.S. Army Corps of Engineers, or written correspondence from these agencies indicating the project is exempt from these requirements. A Clean Water Act Section 401 Water Quality Certification may be required from the local California Regional Water Quality Control Board prior to issuance of the Corps 404 permit.

Very truly yours,



AMY MCNEILL  
Engineering Project Manager

cc: Riverside County Planning Department  
Attn: Phayvanh Nanthavongdouangsy

WMC:blm

From: "[Mauricio Alvarez](mailto:malvarez@rivsidetransit.com)" <[malvarez@rivsidetransit.com](mailto:malvarez@rivsidetransit.com)>

To: "[Mathew Evans](mailto:mevans@cityofperris.org)" <[mevans@cityofperris.org](mailto:mevans@cityofperris.org)>

Date: 8/31/2022 9:23:07 AM

Subject: Ramona Indian Warehouse Project NMD

Good Morning Mathew,

Thank you for sending the notice of intent of the Ramona Indian Warehouse Project to Riverside Transit Agency to review. After reviewing the letter and the additional documentation that was made available on the City's website, there are no comments to submit at this time.

Thank you,

**Mauricio Alvarez, MBA**

Planning Analyst

Riverside Transit Agency

p: 951.565.5260 | e: [malvarez@rivsidetransit.com](mailto:malvarez@rivsidetransit.com)

[Website](#) | [Facebook](#) | [Twitter](#) | [Instagram](#)

1825 Third Street, Riverside, CA 92507

**Craig D. Miller**  
General Manager

**Mike Gardner**  
Division 1

**Gracie Torres**  
Division 2

**Brenda Dennstedt**  
Division 3

**Laura Roughton**  
Division 4

**Fauzia Rizvi**  
Division 5

August 16, 2022



**SENT VIA EMAIL**

Mathew Evans  
Project Planner  
City of Perris  
Planning Division  
135 North "D" Street  
Perris, CA 92570  
[mevans@cityofperris.org](mailto:mevans@cityofperris.org)

**NOTICE OF INTENT TO ADOPT A MITIGATED NEGATIVE DECLARATION (MND)2373 FOR RAMONA-INDIAN WAREHOUSE PROJECT**

This letter is in response to your Initial Case transmittal recieved July 28, 2022.

Western Municipal Water District (Western) has no comments on proposed 13-acre industrial facility including a multi-tenant distribution building. Western does not provide retail water service within the vicinity Ramona Express Way and Indian Avenue. Our records indicate Eastern Municipal Water District is the water and/or sewer purveyor for this area.

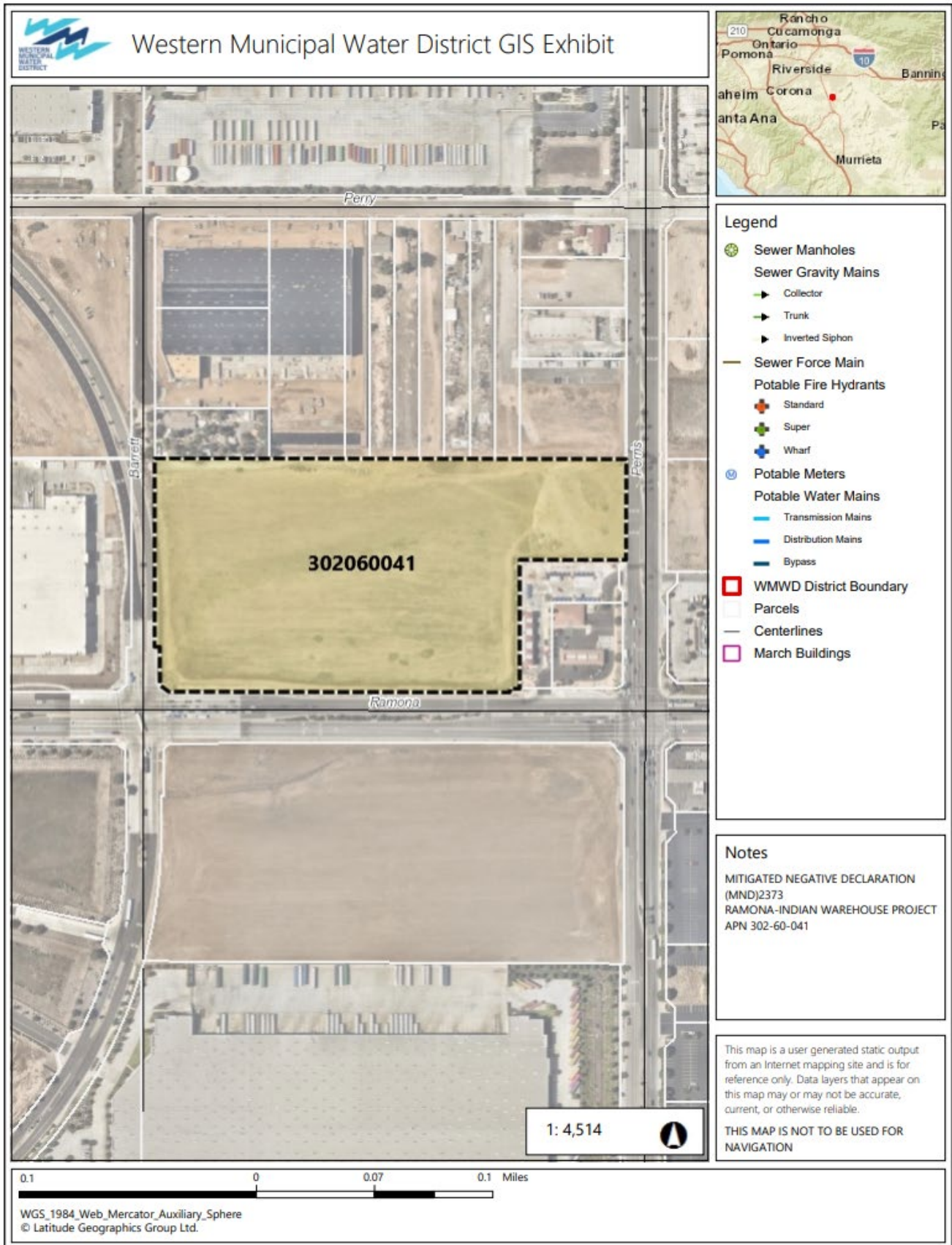
Should you have any questions regarding this matter, please contact Development Services at (951) 571-7100.



THOMAS G. SCOTT, P.E.  
Principal Engineer

TGS:bp:sc

Attachment(s): Western Municipal Water District GIS Exhibit





**BLUM COLLINS & HO, LLP  
ATTORNEYS AT LAW  
AON CENTER  
707 WILSHIRE BOULEVARD, SUITE 4880  
LOS ANGELES, CA 90017  
(213) 572-0400**

August 29, 2022

Mary Blais  
City of Perris  
Planning Division  
135 North "D" Street  
Perris, California 92570

*VIA EMAIL TO:*  
[mblais@cityofperris.org](mailto:mblais@cityofperris.org)

*Subject: Comments on Ramona-Indian Warehouse MND (SCH NO. 2022070543)*

Dear Ms. Blais,

Thank you for the opportunity to comment on the Mitigated Negative Declaration (MND) for the proposed Ramona-Indian Warehouse Project. Please accept and consider these comments on behalf of Golden State Environmental Justice Alliance (GSEJA). Also, GSEJA formally requests to be added to the public interest list regarding any subsequent environmental documents, public notices, public hearings, and notices of determination for this project. Send all communications to Golden State Environmental Justice Alliance P.O. Box 79222 Corona, CA 92877.

### **1.0 Summary**

The project proposes to develop light industrial uses and commercial uses in two phases. Phase 1 proposes the construction and operation of one approximately 232,575 total square-foot (sf) warehouse building with 10,000 sf of office space and 222,575 sf of warehouse space on approximately 13 acres of the project site. Phase 2 proposes to develop a commercial pad on the 1.61 acres in the northeastern portion of the project site with a 125-room hotel. The warehouse building is assumed to be operational 24 hours per day, seven days per week, with exterior loading and parking areas illuminated at night. The warehouse building includes 39 truck/trailer dock doors, 52 truck/trailer parking spaces, and 407 passenger car parking spaces.

The project is located within the Perris Valley Commercial Center Specific Plan (PVCCSP) area. An amendment to the PVCCSP is required to change the Commercial land use designation with a

Light Industrial land use for approximately 13 acres of the project site to accommodate the proposed warehouse building.

## **2.0 Project Description**

The MND does not include a floor plan, detailed site plan, or a conceptual grading plan. The basic components of a Planning Application include a detailed site plan, floor plan, conceptual grading plan, written narrative, and detailed elevations. Additionally, the site plan provided in Figure 4 has been edited to remove pertinent information from public view. For example, it does not provide any detailed information such as the floor area ratio, earthwork quantity notes, or maximum building height. Providing the grading plan and earthwork quantity notes is vital as the MND does not give any information regarding any necessary truck hauling trips due to soil import/export during the grading phase of construction. An EIR must be prepared to include wholly accurate and adequate detailed project site plan, floor plan, grading plan, elevations, and project narrative for public review.

Further, the MND does not include the proposed revisions to the PVCC SP as an attachment for public review. Providing the revised portions of the PVCC SP is vital as it contributes directly to the analysis of environmental impacts. An EIR must be prepared to include the proposed revisions to the PVCC SP document for public review in order to comply with CEQA's requirements for adequate informational documents and meaningful disclosure (CEQA § 15121 and 21003(b)).

## **3.3 Air Quality, 3.6 Energy, and 3.8 Greenhouse Gas Emissions**

Please refer to attachments from SWAPE for a complete technical commentary and analysis.

The MND does not include for analysis relevant environmental justice issues in reviewing potential impacts, including cumulative impacts from the proposed project. This is especially significant as the surrounding community is highly burdened by pollution. According to CalEnviroScreen 4.0<sup>1</sup>, CalEPA's screening tool that ranks each census tract in the state for pollution and socioeconomic vulnerability, the proposed project's census tract (6065042620) ranks worse than 69% of the rest of the state overall in pollution burden. The surrounding community, including residences adjacent to the north, the mobile home community to the south, and May Ranch Elementary School and residences to the southeast, bears the impact of multiple sources of pollution and is more polluted than average on every pollution indicator measured by

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<sup>1</sup> CalEnviroScreen 4.0 <https://oehha.ca.gov/calenviroscreen/report/calenviroscreen-40>

CalEnviroScreen. For example, the project census tract ranks in the 98th percentile for ozone burden, the 82nd percentile for traffic impacts, the 53rd percentile for PM 2.5 burden, and the 48th percentile for diesel particulate matter; all of these environmental factors are typically attributed to heavy truck activity in the area. Traffic impacts represent the vehicles in a specified area, resulting in human exposures to chemicals that are released into the air by vehicle exhaust, as well as other effects related to large concentrations of motor vehicles<sup>2</sup>.

Further, the census tract is a diverse community including 69% Hispanic, 13% African-American and 7% Asian-American residents, which are especially vulnerable to the impacts of pollution. The community has a high rate of low educational attainment, meaning 75% of the census tract over age 25 has not attained a high school diploma, which is an indication that they may lack health insurance or access to medical care. Medical care is vital for this census tract as it ranks in the 91st percentile for incidence of cardiovascular disease, 66th percentile for incidence of asthma, and 63rd percentile for babies born at a low birth weight. The community also has a high rate of linguistic isolation, meaning 65% of the census tract speaks little to no English and faces further inequities as a result.

Additionally, the project's census tract is identified as a SB 535 Disadvantaged Community<sup>3</sup>, which is not discussed or presented for analysis in the MND. Census tracts adjacent to the project site (6065048800 (north); 6065046700 (north); 6065042010 (west)) are also identified as SB 535 Disadvantaged Communities. This indicates that cumulative impacts of development and environmental impacts in the region are disproportionately impacting these communities.

California's Building Energy Code Compliance Software (CBECC) is the State's only approved energy compliance modeling software for non-residential buildings in compliance with Title 24<sup>4</sup>. CalEEMod is not listed as an approved software. The CalEEMod-based modeling in Appendix A does not comply with the 2022 Building Energy Efficiency Standards and under-reports the project's significant Energy impacts and fuel consumption to the public and decision makers. Since the MND did not accurately or adequately model the energy impacts in compliance with Title 24, a finding of significance must be made. An EIR with modeling using the approved software (CBECC) must be circulated for public review in order to adequately analyze the project's

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<sup>2</sup> OEHHA CalEnviroScreen Report

<https://oehha.ca.gov/media/downloads/calenviroscreen/report/calenviroscreen40reportf2021.pdf>

<sup>3</sup> OEHHA SB 535 Census Tracts <https://oehha.ca.gov/calenviroscreen/sb535>

<sup>4</sup> California Energy Commission 2022 Energy Code Compliance Software

<https://www.energy.ca.gov/programs-and-topics/programs/building-energy-efficiency-standards/2022-building-energy-efficiency-1>

significant environmental impacts. This is vital as the MND utilizes CalEEMod as a source in its methodology and analysis, which is clearly not the approved software.

There are multiple discrepancies in the metric tons of CO<sub>2</sub>e (MT CO<sub>2</sub>e) calculations for project construction and operations in the Air Quality analysis compared to the Greenhouse Gas Emissions analysis. For example, the CalEEMod output sheets in the Air Quality Appendix concludes the MT CO<sub>2</sub>e for warehouse operations is 15,767 MT CO<sub>2</sub>e (winter; 15,611 MTCO<sub>2</sub>e as a result from mobile source emissions (passenger cars and trucks)). A summer analysis was not included for public review. The annual analysis reduces these emissions to 2,970 MTCO<sub>2</sub>e (2,578 MTCO<sub>2</sub>e as a result from mobile source emissions). The GHG analysis utilizes the reduced 2,970 MTCO<sub>2</sub>e to determine the project will have a less than significant impact. The Air Quality/GHG analysis has reduced the warehouse MT CO<sub>2</sub>e by approximately 81% (an 83% reduction was applied to mobile sources) without an explanation for the reductions given or the manner in which the reductions were achieved.

Further, the CalEEMod output sheets in the Air Quality Appendix conclude the MT CO<sub>2</sub>e for hotel operations is 8,011 MT CO<sub>2</sub>e (winter; 4,512 MTCO<sub>2</sub>e as a result from mobile source emissions (passenger cars and trucks)). A summer analysis was not included for public review. The annual analysis reduces these emissions to 1,937 MTCO<sub>2</sub>e (756 MTCO<sub>2</sub>e as a result from mobile source emissions). The GHG analysis utilizes the reduced 1,937 MTCO<sub>2</sub>e to determine the project will have a less than significant impact. The Air Quality/GHG analysis has reduced the warehouse MT CO<sub>2</sub>e by approximately 75% (an 83% reduction was applied to mobile sources) without an explanation for the reductions given or the manner in which the reductions were achieved.

The emissions reductions listed above serve to skew emissions downwards, specifically below the 10,000 MTCO<sub>2</sub>e significance threshold. Additionally, modeling errors such as those noted regarding the Energy, Air Quality, and Transportation discussions must be corrected in order to adequately analyze the project's GHG emissions. An EIR must be prepared which presents this for analysis and a finding of significance, including in the context of consistency with the City's General Plan and SCAG RTP/SCS.

### **3.9 Hazards and Hazardous Materials**

The Project site is within Zone B1/APZ II and Zone C1 per the ALUCP for MARB/IPA. The Project site is bisected by the two zoning designations from the northwestern to southeastern portion of the Project site. The northwestern, western, and southwestern portion of the Project site fall within Zone B1/APZ II. Approximately 279,313 sf of land area and 119,650 sf of building area are located within this zoning designation. This includes a portion of the trailer parking lot,

Driveway 1 to Indian Avenue, Driveway 2 to Ramona Expressway, car parking, and approximately half of the warehouse building. The northern, northeastern, eastern, and southeastern portion of the Project site fall within Zone C1. Approximately 371,037 sf of land area and 118,237 sf of building area fall within this zoning designation. This includes the rest of the trailer parking lot, Driveway 3 to Perris Boulevard, car parking, the commercial area, and half of the warehouse building.

The MND states that the Riverside County ALUC (RCALUC) concluded that the proposed project is consistent with the ALUCP for MARB/IPA per a letter dated April 14, 2022. However, the RCALUC letter dated April 14, 2022 is not included for public review, which does not comply with CEQA's requirements for adequate informational documents and meaningful disclosure (CEQA § 15121 and 21003(b)). Incorporation by reference (CEQA § 15150 (f)) is not appropriate as this document contribute directly to analysis of the problem at hand. An EIR must be prepared to include the RCALUC letter dated April 14, 2022 for public review.

The RCALUC placed a condition to restrict building occupancy to 50 people in any given acre in APZ-II. The MND does not state the methods the City will use to enforce this requirement. An EIR must be prepared to include enforceable mitigation measures in compliance with CEQA § 21081.6 (b). This could include posting informational bulletins inside the building, requiring training on this topic for all employees and visitors, and providing an enforcement contact for violation reports to an enforcement entity of the lead agency.

Further, the future development of the commercial pad was not considered as part of the ALUC review. The MND is unable to conclude that the proposed project will not have significant and unavoidable impacts until and unless the RCALUC reviews the commercial portion of the proposed project. Development plans for the commercial portion of the proposed project are required to be reviewed by the RCALUC in order for the proposed project to proceed under CEQA. Because the RCALUC has not reviewed the commercial portion of the proposed project, a finding of significance must be made. The MND cannot conclude that the proposed CEQA project does not have significant impacts to Hazards and Hazardous Materials because the proposed CEQA project in its entirety has not been reviewed by the RCALUC.

Additionally, the MND is highly misleading in stating that “when a specific development is proposed for the commercial pad, it would be subject to the AOZ regulations and zoning restrictions. If it complies with these regulations, City staff could *voluntarily* provide the development plans to the ALUC for review.” The City’s General Plan requires City staff to provide RCALUC with development plans for review pursuant to the following:

- Land Use Element Implementation Measure V.C.I. Circulate all development plans within the Clear Zone and Accident Potential Zones of the March Air Reserve Base/Inland Port Plan to Department of the Air Force, MARCH Air Reserve Base to provide recommendations and guidance on land use compatibility in accordance with the policies of the most recent Air Force Instruction (AFI) 32-7063.
- Safety Element Implementation Measure I.D.2 Continue to notify March Air Reserve Base of new development project applications and consider their input prior to making land use decisions.

An EIR must be prepared to remove the statement that City staff may *voluntarily* send development plans to the RCALUC because this is contradictory the General Plan requirements that development plans are reviewed by RCALUC.

### **3.11 Land Use and Planning**

The Project requires a Specific Plan Amendment to change to change the site's land use designation from "Commercial" to "Light Industrial." The MND concludes that the project will not result in any significant impacts with "Land Use Policy III.A: Accommodate diversity in the local economy" because "it would be consistent with the surrounding land uses." The MND describes that the site is surrounded immediately by vacant land and commercial development; industrial uses exist further out from the project site. Based on the PVCC SP, properties at the intersection of Ramona Expressway and Perris Boulevard are currently designated as Commercial. It is clear that the PVCC SP mix of land uses designated the project site as Commercial to support the surrounding industrial uses. Changing the site's designation to Light Industrial will further homogenize the area with warehousing/distribution centers, reduce the mix of land uses in the PVCC SP, and eliminate a site that could provide supporting commercial services to reduce local VMT. The MND has excluded this information from analysis and must be revised to adequately and accurately describe the policy intent and mix of land uses in the PVCC SP. It must also provide a quantified analysis of the project's additional growth beyond the buildout scenario for its Planning Area within PVCC SP in accordance with Table LU-28: Building Area by Land Use Designation, Table LU-29: General Plan Population Projections, and Table LU-30: General Plan Employment Projections of the City's General Plan Land Use Element, including all cumulative development and projects "in the pipeline."

Further, the MND does not provide a consistency analysis with other General Plan goals and policies that the project has significant potential to conflict with, including but not limited to:

- Policy HC 1.5 On an ongoing basis, identify and address health inequities in Perris (i.e. unjust barriers that result in differences in environmental conditions and health outcomes) and strive to provide a high quality of life for all residents, regardless of income, age or ethnicity
- Goal HC-5: Healthy Economy – Encourage businesses to provide meaningful employment opportunities to residents.
- HC 5.1 Develop programs to attract and retain industries that can provide a living wage, provide health insurance benefits, and meet existing levels of workforce education.
- Policy HC 6.1. Support regional efforts to improve air quality through energy efficient technology, use of alternative fuels, and land use and transportation planning.

An EIR must be prepared to include an analysis of the project’s potential inconsistency with these goals and policies.

Additionally, the MND provides an erroneous and misleading consistency analysis with SCAG’s 2020-2045 Connect SoCal RTP/SCS. Due to errors in modeling and modeling without supporting evidence, as noted throughout this comment letter and attachments, the proposed project has significant potential for inconsistency with Goal 5 to reduce greenhouse gas emissions and improve air quality, Goal 6 to support healthy and equitable communities, and Goal 7 to adapt to a changing climate. For example, the MND concludes that the project will not have significant impacts to VMT even though Table 4.2 of Appendix A’s CalEEMod output sheets concludes that the hotel will generate 2,386,171 VMT annually and the warehouse will generate 2,911,669 VMT annually, for a total of 5,297,840 annual VMT (14,514 VMT per day). An EIR must be prepared to include revised, accurate modeling and a consistency analysis with all goals of the RTP/SCS.

### **3.14 Population and Housing**

The MND does not provide any quantified analysis of the construction or operational employees generated by either the warehouse or hotel phase of the proposed project. There is also no analysis of projects approved, proposed, or “in the pipeline” of the PVCCSP or the City to demonstrate that the combined workforce of all projects does not exceed the growth estimates analyzed by the PVCCSP EIR. This is especially vital given the 12 amendments that have been approved in the PVCCSP, including seven amendments to increase the amount of light industrial uses than originally planned for in the PVCCSP and its EIR:

1. Amendment No. 3 (approved February 9, 2016) to rezone 68.99 acres from commercial and business professional to light industrial;

2. Amendment No. 4 (approved February 9, 2016) to rezone 16 acres from general industrial to light industrial;
3. Amendment No. 6 (approved February 14, 2017) to rezone 23.66 acres from commercial to light industrial;
4. Amendment No. 7 (approved June 13, 2017) to rezone 7.48 acres from commercial to light industrial;
5. Amendment No. 8 (approved April 10, 2018) to rezone 16.22 acres from business professional office to light industrial;
6. Amendment No. 9 (approved August 28, 2018) to rezone 35 acres from business professional office to light industrial; and
7. Amendment No. 11 (approved October 26, 2021) to rezone 9.54 acres from business professional office to light industrial.

Overall, the PVCCSP has been amended seven times in the past six years to increase the amount of light industrial uses. This has increased the amount of light industrial acreage, uses, and employees within the PVCCSP by a cumulative 176.9 acres. This has increased the light industrial area within the 3,500 acre PVCCSP planning area by approximately 5%. Table 2.0-1, Land Use Comparison within the PVCCSP states that the original 2012 PVCCSP document planned for 1,866 acres of light industrial and it has increased to 2,040 acres through approval of the PVCCSP amendments. An EIR must be prepared with analysis of projects approved, proposed, or “in the pipeline” of the PVCCSP to demonstrate that the combined workforce of all projects does not exceed the growth estimates analyzed by the PVCCSP EIR.

The MND also utilizes uncertain and misleading language which does not provide any meaningful analysis of the project’s impacts to population and employment generation. For example, the MND states that the project “would not be of a magnitude to support additional population growth in the area.” The MND concludes that “Therefore, since the Project is intended to serve the existing population and has no other features that would directly or indirectly induce growth, impacts would be less than significant and no mitigation would be required.” The MND does not provide any discussion of the required PVCCSP Amendment. demographic and geographic information on the location of qualified workers to fill these positions. A construction worker employment analysis must also be included to adequately and accurately analyze all potentially significant environmental impacts. Relying on the entire labor force within an undefined distance, potentially the greater SCAG region, to fill the project’s construction and operational jobs will increase VMT and emissions during all phases of construction and operations and an EIR must be prepared to account for longer worker trip distances.



The MND has not provided any calculation of the jobs generated by the project or evidence that the region's workforce population is qualified for or interested in work in the industrial sector. SCAG's Employment Density Study<sup>5</sup> provides the following applicable employment generation rates for Riverside County:

Warehouse: 1 employee per 581 square feet  
Office: 1 employee per 481 square feet

Applying these ratios results in the following calculation:

Phase 1: Industrial

Warehouse:  $222,575 \text{ sf} / 581 \text{ sf} = 383$  employees  
Office (includes mezzanine):  $10,000 \text{ sf} / 481 \text{ sf} = 21$  employees

Phase 1 Total: 404 employees

Phase 2: Hotel

Hotel/Motel:  $125,000 \text{ sf} / 3,476 \text{ sf} = 36$

Total: 440 employees

Utilizing SCAG's Employment Density Study ratios, the proposed project will generate 440 employees. The MND utilizes uncertain and misleading language which does not provide any meaningful analysis of the project's population and employment generation. In order to comply with CEQA's requirements for meaningful disclosure, an EIR must be prepared to provide an accurate estimate of employees generated by all uses of the proposed project. It must also provide demographic and geographic information on the location of qualified workers to fill these positions in order to provide an accurate environmental analysis.

SCAG's Connect SoCal Demographics and Growth Forecast<sup>6</sup> notes that the City will add 10,300 jobs between 2016 - 2045. Utilizing the SCAG Employment Density Study calculation of 440 employees, the project represents 4.3% of the City's employment growth from 2016 - 2045. A single project accounting for this amount of the projected employment and/or population over 29 years represents a significant amount of growth. An EIR must be prepared to include this analysis and also provide a cumulative analysis discussion of projects approved since 2016 and projects "in

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<sup>5</sup> SCAG Employment Density Study  
<http://www.mwcog.org/file.aspx?A=QTTITR24POOOUIw5mPNzK8F4d8djdJe4LF9Exj6lXOU%3D>

<sup>6</sup> SCAG Connect SoCal Demographics and Growth Forecast adopted September 3, 2020  
[https://scag.ca.gov/sites/main/files/file-attachments/0903fconnectsocial\\_demographics-and-growth-forecast.pdf?1606001579](https://scag.ca.gov/sites/main/files/file-attachments/0903fconnectsocial_demographics-and-growth-forecast.pdf?1606001579)

the pipeline” to determine if the project will exceed SCAG’s employment and/or population growth forecast for the City. For example, other recent industrial projects such as Harley Knox Commerce Center (152 employees), PVCCSP Amendment No. 13 (603 employees), Core 5 Rider Warehouse (432 employees), First Industrial Warehouse at Rider (562 employees), Perris and Morgan 3 Industrial Buildings (494 employees), First Industrial at Wilson 1 (526 employees), First Industrial at Wilson 2 (276 employees), and IDI Rider Warehouses 2 and 4 (1,313 employees) combined with the proposed project will cumulatively generate 4,798 employees, which is 46.5% of the City’s employment growth forecast over 29 years.

### **3.17 Transportation**

The project’s transportation impacts are not adequately analyzed in the MND or Appendix J: Traffic Study. The VMT analysis does not adequately or accurately represent the VMT impacts of the proposed project and an EIR must be prepared to reflect this. Appendix J analyzes and presents the proposed warehouse phase and the hotel phase as two separate projects in order to conclude the project will have less than significant impacts. This is misleading to the public and decision makers. The warehouse phase will generate 402 average daily trips (ADT). The hotel phase will generate 1,000 ADT. The overall proposed project will generate 1,402 ADT. The MND segments the project under separate VMT thresholds. The hotel phase is screened out from completing a project-specific VMT analysis because the MND concludes it is a “local serving land use.” However, the City’s Transportation Impact Analysis Guidelines for CEQA<sup>7</sup> includes a list of local serving land uses and it does not include hotels or any other type of similar land use. Hotels by nature serve visitors to an area and do not provide opportunities for residents and employees to shop, dine and obtain services closer to home and work, thereby increasing an area’s VMT. Further, the warehouse phase of the project was screened out because it generates less than 500 ADT. This is not an accurate environmental analysis as the proposed project will generate 1,402 ADT, which is nearly three times the 500 ADT threshold. An EIR must be prepared to reflect a project-specific quantified VMT analysis that includes truck/trailer activity for the proposed warehouse to adequately and accurately analyze the potentially significant project transportation impacts.

### **Conclusion**

For the foregoing reasons, GSEJA believes the MND is flawed and an EIR must be prepared for the proposed project and circulated for public review. Golden State Environmental Justice Alliance requests to be added to the public interest list regarding any subsequent environmental

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<sup>7</sup> Perris Transportation Impact Analysis Guidelines for CEQA  
<https://www.cityofperris.org/home/showpublisheddocument/13245/637274076384370000>

Mary Blais  
August 29, 2022  
Page 11

documents, public notices, public hearings, and notices of determination for this project. Send all communications to Golden State Environmental Justice Alliance P.O. Box 79222 Corona, CA 92877.

Sincerely,

A handwritten signature in black ink, appearing to be 'Gary Ho', with a stylized, cursive flourish.

Gary Ho  
Blum Collins & Ho, LLP

Attachments:

1. SWAPE Comment Letter



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August 26, 2022

Gary Ho  
Blum Collins LLP  
707 Wilshire Blvd, Ste. 4880  
Los Angeles, CA 90017

**Subject:           Comments on the Ramona-Indian Warehouse Project (SCH No. 2022070543)**

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Dear Mr. Ho,

We have reviewed the July 2022 Initial Study / Mitigated Negative Declaration (“IS/MND”) for the Ramona-Indian Warehouse Project (“Project”) located in the City of Perris (“City”). The Project proposes to construct 232,575-square-feet (“SF”) of warehouse space, 10,000-SF of office space, and a 125-room hotel, as well as 267 parking spaces, on the 15-acre site.

Our review concludes that the IS/MND fails to adequately evaluate the Project’s air quality and health risk 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 and health risk impacts that the project may have on the environment.

## **Air Quality**

### **Diesel Particulate Matter Emissions Inadequately Evaluated**

The IS/MND conducts a health risk assessment (“HRA”) evaluating the impacts from exposure to diesel particulate matter (“DPM”) emissions from diesel-powered trucks traveling to and from the Project site, circulating on the Project site, and parked while idling at the Project site during operation. Specifically, the IS/MND estimates that the maximum incremental cancer risk posed to nearby, existing sensitive receptors as a result of Project operation would be 1.1 in one million, which would not exceed the SCAQMD significance threshold of 10 in one million (see excerpt below) (p. 42, Table 9).

**Table 9  
MAXIMUM INCREMENTAL CANCER HEALTH RISK**

	<b>Maximally Exposed Individual Resident Cancer Risk (per million)</b>	<b>Maximally Exposed Individual Worker Cancer Risk (per million)</b>
Results	1.1	<0.1
Threshold	10	10
Exceed Threshold?	No	No

Source: Lakes AERMOD View and CARB ADMRT; Appendix B.

Regarding the health risk impacts associated with Project construction, the IS/MND states:

“The dose (of TAC) to which receptors are exposed is the primary factor used to determine health risk. Dose is a function of the concentration of a substance in the environment and the extent of exposure a person has with the substance; a longer exposure period to a fixed quantity of emissions would result in higher health risks. Current models and methodologies for conducting cancer health risk assessments are associated with longer-term exposure periods (typically 30 years for individual residents based on guidance from OEHHA) and are best suited for evaluation of long duration TAC emissions with predictable schedules and locations. These assessment models and methodologies do not correlate well with the temporary and highly variable nature of construction activities. Cancer potency factors are based on animal lifetime studies or worker studies where there is consistent long-term exposure to the carcinogenic agent. There is considerable uncertainty in trying to evaluate the cancer risk from projects that will only last a small fraction of a lifetime (OEHHA 2015). Considering this information, the highly dispersive nature of DPM, and the fact that construction activities would occur at various locations and varying intensities throughout the Project site, it is not anticipated that construction of the Project would expose sensitive receptors to substantial DPM concentrations” (p. 46).

As demonstrated above, the IS/MND concludes that the Project would result in a less-than-significant construction-related health risk impact because the variable nature of Project construction and highly dispersive nature of DPM would not result in substantial toxic air 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 five reasons.

First, the IS/MND’s operational HRA is incorrect, as it evaluates impacts from an underestimated number of truck trips. According to the Warehouse Operations Health Risk Assessment (“HRA Report”), provided as Appendix J to the IS/MND, the DPM emission rate accounts for 57 truck trips (p. 3). However, the HRA Report continues, stating:

“The truck fleet mix was estimated from the project Traffic Analysis which reported average daily trips (ADT; two trips per truck) of 24 two-axle trucks, 30 three-axle trucks, and 88 four or more axle trucks (142 total truck ADT; Urban Crossroads 2021)” (p. 19).

As indicated above, the Traffic Analysis (“TA”), provided as Appendix J to the IS/MND, estimates that the Project would generate 142 daily truck trips. Thus, the operational HRA only accounts for 57 daily truck trips and, consequently, utilizes an underestimated DPM emission rate. Therefore, the IS/MND’s operational HRA and resulting cancer risk should not be relied upon to determine Project significance.

Second, the IS/MND’s operational HRA is unsubstantiated, as the IS/MND fails to provide the input parameters and modeling assumptions. Specifically, upon review of the HRA, we found that the exposure parameters, such as the daily breathing rates (“BR/BW”), exposure duration (“ED”), age sensitivity factors (“ASF”), fraction of time at home (“FAH”), and exposure frequency (“EF”) are not disclosed. As such, we cannot verify the calculation of the Project’s cancer risk is accurate. As a result, the Project’s cancer risk may be underestimated and should not be relied upon to determine Project significance.

Third, by failing to prepare a quantified construction HRA, the Project is inconsistent with CEQA’s requirement to make “a reasonable effort to substantively connect a project’s air quality impacts to likely health consequences.”<sup>1</sup> This poses a problem, as construction of the Project would produce DPM emissions through the exhaust stacks of construction equipment over a duration of approximately 18 months (p. 15). However, the IS/MND fails to evaluate the TAC emissions associated with Project construction or indicate the concentrations at which such pollutants would trigger adverse health effects. Thus, without making a reasonable effort to connect the Project’s construction-related TAC emissions to the potential health risks posed to nearby receptors, the IS/MND is inconsistent with CEQA’s requirement to correlate Project-generated emissions with potential adverse impacts on human health.

Fourth, the State of California Department of Justice recommends that warehouse projects prepare a quantitative HRA pursuant to the Office of Environmental Health Hazard Assessment (“OEHHA”), the organization responsible for providing guidance on conducting HRAs in California, as well as local air district guidelines.<sup>2</sup> OEHHA released its most recent *Risk Assessment Guidelines: Guidance Manual for Preparation of Health Risk Assessments* in February 2015, as referenced by the IS/MND (p. 40). Specifically, OEHHA recommends that all short-term projects lasting at least 2 months assess cancer risks.<sup>3</sup> Furthermore, according to OEHHA:

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<sup>1</sup> “Sierra Club v. County of Fresno.” Supreme Court of California, December 2018, *available at*: <https://ceqaportal.org/decisions/1907/Sierra%20Club%20v.%20County%20of%20Fresno.pdf>.

<sup>2</sup> “Warehouse Projects: Best Practices and Mitigation Measures to Comply with the California Environmental Quality Act.” State of California Department of Justice, *available at*: <https://oag.ca.gov/sites/all/files/agweb/pdfs/environment/warehouse-best-practices.pdf>, p. 6.

<sup>3</sup> “Risk Assessment Guidelines: Guidance Manual for Preparation of Health Risk Assessments.” OEHHA, February 2015, *available at*: <https://oehha.ca.gov/media/downloads/cnr/2015guidancemanual.pdf>, p. 8-18.

“Exposure from projects lasting more than 6 months should be evaluated for the duration of the project. In all cases, for assessing risk to residential receptors, the exposure should be assumed to start in the third trimester to allow for the use of the ASFs (OEHHA, 2009).”<sup>4</sup>

Thus, as the Project’s anticipated construction duration exceeds the 2-month and 6-month requirements set forth by OEHHA, construction of the Project meets the threshold warranting a quantified HRA under OEHHA guidance and should be evaluated for the entire 18-month construction period. These recommendations reflect the most recent state health risk policies, and as such, an EIR should be prepared to include an analysis of health risk impacts posed to nearby sensitive receptors from Project-generated DPM emissions.

Fifth, while the IS/MND includes an HRA evaluating the health risk impacts to nearby, existing receptors as a result of Project operation, the HRA fails to evaluate the combined lifetime cancer risk to nearby, existing receptors as a result of Project construction and operation together. According to OEHHA guidance “the excess cancer risk is calculated separately for each age grouping and then summed to yield cancer risk at the receptor location.”<sup>5</sup> 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 and sum the entirety of the Project’s construction and operational cancer risks to compare to the SCAQMD specific numeric threshold of 10 in one million, as referenced by the IS/MND (p. 42, Table 9).

### Screening-Level Analysis Demonstrates Potentially Significant Health Risk Impact

In order to conduct our screening-level risk assessment we relied upon AERSCREEN, which is a screening level air quality dispersion model.<sup>6</sup> The model replaced SCREEN3, and AERSCREEN is included in the OEHHA and the California Air Pollution Control Officers Associated (“CAPCOA”) guidance as the appropriate air dispersion model for Level 2 health risk screening assessments (“HRSAs”).<sup>7, 8</sup> 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 construction-related health risk impact to residential sensitive receptors using the annual PM<sub>10</sub> exhaust estimates from the IS/MND’s CalEEMod output files. Consistent with recommendations set forth by OEHHA, we assumed residential exposure begins during

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<sup>4</sup> “Risk Assessment Guidelines: Guidance Manual for Preparation of Health Risk Assessments.” OEHHA, February 2015, available at: <https://oehha.ca.gov/media/downloads/cnr/2015guidancemanual.pdf>, p. 8-18.

<sup>5</sup> “Guidance Manual for preparation of Health Risk Assessments.” OEHHA, February 2015, available at: <https://oehha.ca.gov/media/downloads/cnr/2015guidancemanual.pdf> p. 8-4

<sup>6</sup> “AERSCREEN Released as the EPA Recommended Screening Model,” U.S. EPA, April 2011, available at: [http://www.epa.gov/ttn/scram/guidance/clarification/20110411\\_AERSCREEN\\_Release\\_Memo.pdf](http://www.epa.gov/ttn/scram/guidance/clarification/20110411_AERSCREEN_Release_Memo.pdf)

<sup>7</sup> “Risk Assessment Guidelines: Guidance Manual for Preparation of Health Risk Assessments.” OEHHA, February 2015, available at: <https://oehha.ca.gov/media/downloads/cnr/2015guidancemanual.pdf>.

<sup>8</sup> “Health Risk Assessments for Proposed Land Use Projects.” CAPCOA, July 2009, available at: [http://www.capcoa.org/wp-content/uploads/2012/03/CAPCOA\\_HRA\\_LU\\_Guidelines\\_8-6-09.pdf](http://www.capcoa.org/wp-content/uploads/2012/03/CAPCOA_HRA_LU_Guidelines_8-6-09.pdf).

the third trimester stage of life.<sup>9</sup> The IS/MND's CalEEMod model indicates that construction activities will generate approximately 313 pounds of DPM over the 940-day construction period.<sup>10</sup> 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 construction, we calculated an average DPM emission rate by the following equation:

$$\text{Emission Rate} \left( \frac{\text{grams}}{\text{second}} \right) = \frac{313.4 \text{ lbs}}{940 \text{ days}} \times \frac{453.6 \text{ grams}}{\text{lbs}} \times \frac{1 \text{ day}}{24 \text{ hours}} \times \frac{1 \text{ hour}}{3,600 \text{ seconds}} = 0.00175 \text{ g/s}$$

Using this equation, we estimated a construction emission rate of 0.00175 grams per second ("g/s"). Construction was simulated as a 15-acre rectangular area source in AERSCREEN, with approximate dimensions of 348- by 174-meters. A release height of three meters was selected to represent the height of stacks of operational equipment and other heavy-duty vehicles, and an 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 population of Perris was obtained from U.S. 2020 Census data.<sup>11</sup>

The AERSCREEN model generates maximum reasonable estimates of single-hour DPM concentrations from the Project Site. U.S. EPA guidance suggests that in screening procedures, the annualized average concentration of an air pollutant to be estimated by multiplying the single-hour concentration by 10%.<sup>12</sup> According to the IS/MND the nearest sensitive receptor is located approximately 420 feet, or 128 meters, from the Project site (p. 41). However, according to the AERSCREEN output files, the Maximally Exposed Individual Receptor ("MEIR") is located approximately 175 meters downwind of the Project site. Thus, the single-hour concentration estimated by AERSCREEN for Project construction is approximately 1.283 µg/m<sup>3</sup> DPM at approximately 175 meters downwind. Multiplying this single-hour concentration by 10%, we get an annualized average concentration of 0.1283 µg/m<sup>3</sup> for Project construction at the MEIR.

We calculated the excess cancer risk to the MEIR using applicable HRA methodologies prescribed by OEHHA, as recommended by SCAQMD.<sup>13</sup> Specifically, guidance from OEHHA and CARB recommends the use of a standard point estimate approach, including high-point estimate (i.e. 95<sup>th</sup> percentile) breathing rates and age sensitivity factors ("ASF") in order to account for the increased sensitivity to carcinogens during early-in-life exposure and accurately assess risk for susceptible subpopulations such as children.

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<sup>9</sup> "Risk Assessment Guidelines: Guidance Manual for Preparation of Health Risk Assessments." OEHHA, February 2015, available at: <https://oehha.ca.gov/media/downloads/cnr/2015guidancemanual.pdf>, p. 8-18.

<sup>10</sup> See Attachment A for health risk calculations.

<sup>11</sup> "Perris." U.S. Census Bureau, 2020, available at: <https://datacommons.org/place/geoid/0656700>.

<sup>12</sup> "Screening Procedures for Estimating the Air Quality Impact of Stationary Sources Revised." U.S. EPA, October 1992, available at: [http://www.epa.gov/ttn/scram/guidance/guide/EPA-454R-92-019\\_OCR.pdf](http://www.epa.gov/ttn/scram/guidance/guide/EPA-454R-92-019_OCR.pdf).

<sup>13</sup> "AB 2588 and Rule 1402 Supplemental Guidelines." SCAQMD, October 2020, available at: <http://www.aqmd.gov/docs/default-source/planning/risk-assessment/ab-2588-supplemental-guidelines.pdf?sfvrsn=19>, p. 2.



The residential exposure parameters utilized for the various age groups in our screening-level HRA are as follows:

Exposure Assumptions for Residential Individual Cancer Risk						
Age Group	Breathing Rate (L/kg-day) <sup>14</sup>	Age Sensitivity Factor <sup>15</sup>	Exposure Duration (years)	Fraction of Time at Home <sup>16</sup>	Exposure Frequency (days/year) <sup>17</sup>	Exposure Time (hours/day)
3 <sup>rd</sup> Trimester	361	10	0.25	1	350	24
Infant (0 – 2)	1090	10	2	1	350	24
Child (2 – 16)	572	3	14	1	350	24
Adult (16 – 30)	261	1	14	0.73	350	24

For the inhalation pathway, the procedure requires the incorporation of several discrete variates to effectively quantify dose for each age group. Once determined, contaminant dose is multiplied by the cancer potency factor (“CPF”) in units of inverse dose expressed in milligrams per kilogram per day (“mg/kg/day<sup>-1</sup>”) to derive the cancer risk estimate. Therefore, to assess exposures, we utilized the following dose algorithm:

$$Dose_{AIR,per\ age\ group} = C_{air} \times EF \times \left[ \frac{BR}{BW} \right] \times A \times CF$$

where:

- Dose<sub>AIR</sub> = dose by inhalation (mg/kg/day), per age group
- C<sub>air</sub> = concentration of contaminant in air (µg/m<sup>3</sup>)
- EF = exposure frequency (number of days/365 days)
- BR/BW = daily breathing rate normalized to body weight (L/kg/day)
- A = inhalation absorption factor (default = 1)
- CF = conversion factor (1x10<sup>-6</sup>, µg to mg, L to m<sup>3</sup>)

<sup>14</sup> “Supplemental Guidelines for Preparing Risk Assessments for the Air Toxics ‘Hot Spots’ Information and Assessment Act.” SCAQMD, October 2020, available at: <http://www.aqmd.gov/docs/default-source/planning/risk-assessment/ab-2588-supplemental-guidelines.pdf?sfvrsn=19>, p. 19; see also “Risk Assessment Guidelines Guidance Manual for Preparation of Health Risk Assessments.” OEHHA, February 2015, available at: <https://oehha.ca.gov/media/downloads/cnr/2015guidancemanual.pdf>.

<sup>15</sup> “Risk Assessment Guidelines Guidance Manual for Preparation of Health Risk Assessments.” OEHHA, February 2015, available at: <https://oehha.ca.gov/media/downloads/cnr/2015guidancemanual.pdf>, p. 8-5 Table 8.3.

<sup>16</sup> “Risk Assessment Procedures.” SCAQMD, August 2017, available at: [http://www.aqmd.gov/docs/default-source/rule-book/Proposed-Rules/1401/riskassessmentprocedures\\_2017\\_080717.pdf](http://www.aqmd.gov/docs/default-source/rule-book/Proposed-Rules/1401/riskassessmentprocedures_2017_080717.pdf), p. 7.

<sup>17</sup> “Risk Assessment Guidelines Guidance Manual for Preparation of Health Risk Assessments.” OEHHA, February 2015, available at: <https://oehha.ca.gov/media/downloads/cnr/2015guidancemanual.pdf>, p. 5-24.

To calculate the overall cancer risk, we used the following equation for each appropriate age group:

$$Cancer\ Risk_{AIR} = Dose_{AIR} \times CPF \times ASF \times FAH \times \frac{ED}{AT}$$

where:

- Dose<sub>AIR</sub> = dose by inhalation (mg/kg/day), per age group
- CPF = cancer potency factor, chemical-specific (mg/kg/day)<sup>-1</sup>
- ASF = age sensitivity factor, per age group
- FAH = fraction of time at home, per age group (for residential receptors only)
- ED = exposure duration (years)
- AT = averaging time period over which exposure duration is averaged (always 70 years)

Consistent with the 940-day construction schedule, the annualized average concentration for construction was used for the entire third trimester of pregnancy (0.25 years), infantile stage of life (0 – 2 years), and the first 0.33 years of the child stage of life (2 – 16 years). The results of our calculations are shown in the table below.

The Maximally Exposed Individual at an Existing Residential Receptor				
Age Group	Emissions Source	Duration (years)	Concentration (ug/m3)	Cancer Risk
3rd Trimester	Construction	0.25	0.1283	1.74E-06
Infant (0 - 2)	Construction	2	0.1283	4.21E-05
	<i>Construction</i>	<i>0.33</i>	<i>0.1283</i>	<i>1.08E-06</i>
	<i>Operation</i>	<i>13.67</i>	<i>*</i>	<i>*</i>
Child (2 - 16)	Total	14		1.08E-06
Adult (16 - 30)	Operation	14	*	*
<b>Lifetime</b>		<b>30</b>		<b>4.50E-05</b>

\*Operational health risk calculated separately in the IS/MND.

As demonstrated in the table above, the excess cancer risks to the 3<sup>rd</sup> trimester of pregnancy, infant, and child receptors at the MEIR located approximately 175 meters away, over the course of Project construction, are approximately 1.74, 42.1, and 1.08 in one million, respectively. The total excess cancer risk associated with Project construction is approximately 45.0 in one million. When summing the Project’s construction-related cancer risk, as estimated by SWAPE, with the IS/MND’s operational cancer

risk of 1.1 in one million, we estimate an excess cancer risk of approximately 46.1 in one million over the course of a 30-year residential lifetime (p. 42, Table 9).<sup>18</sup> As such, the infant and lifetime cancer risks exceed the SCAQMD threshold of 10 in one million, thus resulting in a potentially significant impact not previously addressed or identified by the IS/MND.

Our analysis represents a screening-level HRA, which is known to be conservative and tends to err on the side of health protection. The purpose of the screening-level HRA is to demonstrate the potential link between Project-generated emissions and adverse health risk impacts. According to the U.S. EPA:

*“EPA’s Exposure Assessment Guidelines recommend completing exposure assessments iteratively using a tiered approach to ‘strike a balance between the costs of adding detail and refinement to an assessment and the benefits associated with that additional refinement’ (U.S. EPA, 1992).*

In other words, an assessment using basic tools (e.g., simple exposure calculations, default values, rules of thumb, conservative assumptions) can be conducted as the first phase (or tier) of the overall assessment (i.e., a screening-level assessment).

The exposure assessor or risk manager can then determine whether the results of the screening-level assessment warrant further evaluation through refinements of the input data and exposure assumptions or by using more advanced models.”<sup>19</sup>

As demonstrated above, screening-level analyses warrant further evaluation in a refined modeling approach. Thus, as our screening-level HRA demonstrates that construction and operation of the Project could result in a potentially significant health risk impact, an EIR should be prepared to include a refined health risk analysis which adequately and accurately evaluates health risk impacts associated with both Project construction and operation.

## Mitigation

### Feasible Mitigation Measures Available to Reduce Emissions

Our analysis demonstrates that the Project would result in a potentially significant health risk impact that should be mitigated further. In an effort to reduce the Project’s emissions, we identified several mitigation measures that are applicable to the proposed Project. Feasible mitigation measures can be found in the Department of Justice Warehouse Project Best Practices document.<sup>20</sup> Therefore, to reduce the Project’s emissions, consideration of the following measures should be made:

- Requiring off-road construction equipment to be zero-emission, where available, and all diesel-fueled off-road construction equipment, to be equipped with CARB Tier IV-compliant engines or better, and including this requirement in applicable bid documents, purchase orders, and

<sup>18</sup> Calculated: 45.0 in one million + 1.1 in one million = 46.1 in one million.

<sup>19</sup> “Exposure Assessment Tools by Tiers and Types - Screening-Level and Refined.” U.S. EPA, *available at*: <https://www.epa.gov/expobox/exposure-assessment-tools-tiers-and-types-screening-level-and-refined>.

<sup>20</sup> “Warehouse Projects: Best Practices and Mitigation Measures to Comply with the California Environmental Quality Act.” State of California Department of Justice.

contracts, with successful contractors demonstrating the ability to supply the compliant construction equipment for use prior to any ground-disturbing and construction activities.

- Prohibiting off-road diesel-powered equipment from being in the “on” position for more than 10 hours per day.
- Requiring on-road heavy-duty haul trucks to be model year 2010 or newer if diesel-fueled.
- Providing electrical hook ups to the power grid, rather than use of diesel-fueled generators, for electric construction tools, such as saws, drills and compressors, and using electric tools whenever feasible.
- Limiting the amount of daily grading disturbance area.
- Prohibiting grading on days with an Air Quality Index forecast of greater than 100 for particulates or ozone for the project area.
- Forbidding idling of heavy equipment for more than two minutes.
- Keeping onsite and furnishing to the lead agency or other regulators upon request, all equipment maintenance records and data sheets, including design specifications and emission control tier classifications.
- Conducting an on-site inspection to verify compliance with construction mitigation and to identify other opportunities to further reduce construction impacts.
- Using paints, architectural coatings, and industrial maintenance coatings that have volatile organic compound levels of less than 10 g/L.
- Providing information on transit and ridesharing programs and services to construction employees.
- Providing meal options onsite or shuttles between the facility and nearby meal destinations for construction employees.
- Requiring that all facility-owned and operated fleet equipment with a gross vehicle weight rating greater than 14,000 pounds accessing the site meet or exceed 2010 model-year emissions equivalent engine standards as currently defined in California Code of Regulations Title 13, Division 3, Chapter 1, Article 4.5, Section 2025. Facility operators shall maintain records on-site demonstrating compliance with this requirement and shall make records available for inspection by the local jurisdiction, air district, and state upon request.
- Requiring all heavy-duty vehicles entering or operated on the project site to be zero-emission beginning in 2030.
- Requiring on-site equipment, such as forklifts and yard trucks, to be electric with the necessary electrical charging stations provided.
- Requiring tenants to use zero-emission light- and medium-duty vehicles as part of business operations.
- Forbidding trucks from idling for more than two minutes and requiring operators to turn off engines when not in use.
- Posting both interior- and exterior-facing signs, including signs directed at all dock and delivery areas, identifying idling restrictions and contact information to report violations to CARB, the air district, and the building manager.

- Installing and maintaining, at the manufacturer’s recommended maintenance intervals, air filtration systems at sensitive receptors within a certain radius of facility for the life of the project.
- Installing and maintaining, at the manufacturer’s recommended maintenance intervals, an air monitoring station proximate to sensitive receptors and the facility for the life of the project, and making the resulting data publicly available in real time. While air monitoring does not mitigate the air quality or greenhouse gas impacts of a facility, it nonetheless benefits the affected community by providing information that can be used to improve air quality or avoid exposure to unhealthy air.
- Constructing electric truck charging stations proportional to the number of dock doors at the project.
- Constructing electric plugs for electric transport refrigeration units at every dock door, if the warehouse use could include refrigeration.
- Constructing electric light-duty vehicle charging stations proportional to the number of parking spaces at the project.
- Installing solar photovoltaic systems on the project site of a specified electrical generation capacity, such as equal to the building’s projected energy needs.
- Requiring all stand-by emergency generators to be powered by a non-diesel fuel.
- Requiring facility operators to train managers and employees on efficient scheduling and load management to eliminate unnecessary queuing and idling of trucks.
- Requiring operators to establish and promote a rideshare program that discourages single-occupancy vehicle trips and provides financial incentives for alternate modes of transportation, including carpooling, public transit, and biking.
- Meeting CalGreen Tier 2 green building standards, including all provisions related to designated parking for clean air vehicles, electric vehicle charging, and bicycle parking.
- Achieving certification of compliance with LEED green building standards.
- Providing meal options onsite or shuttles between the facility and nearby meal destinations.
- Posting signs at every truck exit driveway providing directional information to the truck route.
- Improving and maintaining vegetation and tree canopy for residents in and around the project area.
- Requiring that every tenant train its staff in charge of keeping vehicle records in diesel technologies and compliance with CARB regulations, by attending CARB-approved courses. Also require facility operators to maintain records on-site demonstrating compliance and make records available for inspection by the local jurisdiction, air district, and state upon request.
- Requiring tenants to enroll in the United States Environmental Protection Agency’s SmartWay program, and requiring tenants to use carriers that are SmartWay carriers.
- Providing tenants with information on incentive programs, such as the Carl Moyer Program and Voucher Incentive Program, to upgrade their fleets.

These measures offer a cost-effective, feasible way to incorporate lower-emitting design features into the proposed Project, which subsequently, reduce emissions released during Project construction and

operation. An EIR should be prepared to include all feasible mitigation measures, as well as include an updated health risk analysis to ensure that the necessary mitigation measures are implemented to reduce emissions to below thresholds. The EIR should also demonstrate a commitment to the implementation of these measures prior to Project approval, to ensure that the Project's significant emissions are reduced to the maximum extent possible.

## 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

		Construction	
2022		Total	
Annual Emissions (tons/year)	0.0458	Total DPM (lbs)	313.4257534
Daily Emissions (lbs/day)	0.250958904	Total DPM (g)	142169.9218
Construction Duration (days)	92	Emission Rate (g/s)	0.001750516
Total DPM (lbs)	23.08821918	Release Height (meters)	3
Total DPM (g)	10472.81622	Total Acreage	15
Start Date	10/1/2022	Max Horizontal (meters)	348.43
End Date	1/1/2023	Min Horizontal (meters)	174.22
Construction Days	92	Initial Vertical Dimension (meters)	1.5
<b>2023</b>		Setting	Urban
Annual Emissions (tons/year)	0.1177	Population	79,835
Daily Emissions (lbs/day)	0.644931507	Start Date	10/1/2022
Construction Duration (days)	365	End Date	4/28/2025
Total DPM (lbs)	235.4	Total Construction Days	940
Total DPM (g)	106777.44	Total Years of Construction	2.58
Start Date	1/1/2023	Total Years of Operation	27.42
End Date	1/1/2024		
Construction Days	365		
<b>2024 (Phase 1)</b>			
Annual Emissions (tons/year)	0.0153		
Daily Emissions (lbs/day)	0.083835616		
Construction Duration (days)	88		
Total DPM (lbs)	7.377534247		
Total DPM (g)	3346.449534		
Start Date	1/1/2024		
End Date	3/29/2024		
Construction Days	88		
<b>2024 (Gap)</b>			
Annual Emissions (tons/year)	0		
Daily Emissions (lbs/day)	0		
Construction Duration (days)	94		
Total DPM (lbs)	0		
Total DPM (g)	0		
Start Date	3/29/2024		
End Date	7/1/2024		
Construction Days	94		
<b>2024 (Phase 2)</b>			
Annual Emissions (tons/year)	0.0349		
Daily Emissions (lbs/day)	0.191232877		
Construction Duration (days)	184		
Total DPM (lbs)	35.18684932		
Total DPM (g)	15960.75485		
Start Date	7/1/2024		
End Date	1/1/2025		
Construction Days	184		
<b>2025</b>			
Annual Emissions (tons/year)	0.0193		
Daily Emissions (lbs/day)	0.105753425		
Construction Duration (days)	117		
Total DPM (lbs)	12.37315068		
Total DPM (g)	5612.461151		
Start Date	1/1/2025		
End Date	4/28/2025		
Construction Days	117		

Start date and time 08/25/22 11:51:30

AERSCREEN 21112

Ramona-Indian Warehouse - Construction

Ramona-Indian Warehouse - Construction

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

METRIC

ENGLISH

\*\* AREADATA \*\*

Emission Rate:	0.175E-02 g/s	0.139E-01 lb/hr
Area Height:	3.00 meters	9.84 feet
Area Source Length:	348.43 meters	1143.14 feet
Area Source Width:	174.22 meters	571.59 feet
Vertical Dimension:	1.50 meters	4.92 feet
Model Mode:	URBAN	
Population:	79835	
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:

2022.08.25\_Ramona-IndianWarehouse\_AERSCREEN\_Construction.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 08/25/22 11:53:04

\*\*\*\*\*

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 08/25/22 11:53:19

REFINE started 08/25/22 11:53:19

AERMOD Finishes Successfully for REFINE stage 3 Winter sector 0

\*\*\*\*\* WARNING MESSAGES \*\*\*\*\*

\*\*\* NONE \*\*\*

REFINE ended 08/25/22 11:53:21

\*\*\*\*\*

AERSCREEN Finished Successfully

With no errors or warnings

Check log file for details

\*\*\*\*\*

Ending date and time 08/25/22 11:53:23

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											
	0.97923E+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												
	0.10348E+01		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												
	0.10866E+01		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												
	0.11334E+01		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												
	0.11757E+01		100.00	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												
	0.12141E+01		125.00	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												
	0.12500E+01		150.00	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												
*	0.12832E+01		175.00	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												
	0.11621E+01		200.00	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												
	0.86103E+00		225.00	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												
	0.72956E+00		250.00	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												
	0.64162E+00		275.01	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												
	0.57969E+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												
	0.52923E+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												
	0.48599E+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												
	0.44857E+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	0.41559E+00	400.00	0.00	0.00	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	0.38657E+00	425.00	0.00	0.00	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	0.36081E+00	450.00	0.00	0.00	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	0.33791E+00	475.00	0.00	0.00	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	0.31730E+00	500.00	0.00	0.00	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	0.29888E+00	525.00	0.00	0.00	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	0.28202E+00	550.00	0.00	0.00	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	0.26686E+00	575.00	0.00	0.00	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	0.25293E+00	600.00	0.00	0.00	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	0.24036E+00	625.00	0.00	0.00	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	0.22874E+00	650.00	0.00	0.00	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	0.21795E+00	675.00	0.00	0.00	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	0.20810E+00	700.00	0.00	0.00	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	0.19907E+00	725.00	0.00	0.00	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	0.19055E+00	750.00	0.00	0.00	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	0.18270E+00	775.00	0.00	0.00	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	0.17542E+00	800.00	0.00	0.00	Winter	0-360	10011001			





0.10061E+00	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						
0.97951E-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						
0.95414E-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						
0.92994E-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						
0.90682E-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						
0.88467E-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						
0.86332E-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						
0.84287E-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						
0.82328E-01	1425.00	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						
0.80449E-01	1450.00	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						
0.78645E-01	1475.00	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						
0.76913E-01	1500.00	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						
0.75248E-01	1525.00	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						
0.73642E-01	1550.00	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						
0.72080E-01	1575.00	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						
0.70576E-01	1600.00	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						
0.69127E-01	1625.00	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											
	0.67730E-01	1650.00	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											
	0.66383E-01	1675.00	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											
	0.65083E-01	1700.00	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											
	0.63827E-01	1725.00	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											
	0.62614E-01	1750.00	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											
	0.61441E-01	1775.00	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											
	0.60307E-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											
	0.59209E-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											
	0.58147E-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											
	0.57119E-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											
	0.56117E-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											
	0.55141E-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											
	0.54196E-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											
	0.53278E-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											
	0.52388E-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											
	0.51524E-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											
	0.50685E-01	2050.00	0.00	0.0		Winter	0-360	10011001				



0.39310E-01	2475.00	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						
0.38780E-01	2500.00	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						
0.38262E-01	2525.00	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						
0.37757E-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						
0.37264E-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						
0.36782E-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						
0.36311E-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						
0.35851E-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						
0.35401E-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						
0.34961E-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						
0.34530E-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						
0.34109E-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						
0.33696E-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						
0.33292E-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						
0.32897E-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						
0.32510E-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						
0.32131E-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										
	0.31759E-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										
	0.31392E-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										
	0.31034E-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										
	0.30682E-01	2975.00	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										
	0.30337E-01	3000.00	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										
	0.29999E-01	3025.00	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										
	0.29668E-01	3050.00	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										
	0.29342E-01	3075.00	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										
	0.29023E-01	3100.00	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										
	0.28708E-01	3125.00	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										
	0.28399E-01	3150.00	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										
	0.28096E-01	3175.00	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										
	0.27798E-01	3200.00	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										
	0.27851E-01	3225.00	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										
	0.27559E-01	3250.00	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										
	0.27271E-01	3275.00	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										
	0.26989E-01	3300.00	0.00	0.0		Winter	0-360	10011001			



0.22866E-01	3725.00	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						
0.22658E-01	3750.00	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						
0.22453E-01	3775.00	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						
0.22251E-01	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						
0.22052E-01	3825.00	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						
0.21856E-01	3850.00	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						
0.21664E-01	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						
0.21474E-01	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						
0.21287E-01	3925.00	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						
0.21103E-01	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						
0.20922E-01	3975.00	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						
0.20743E-01	4000.00	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						
0.20567E-01	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						
0.20394E-01	4050.00	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						
0.20222E-01	4075.00	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						
0.20054E-01	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						
0.19888E-01	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											
	0.19724E-01	4150.00	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											
	0.19563E-01	4175.00	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											
	0.19404E-01	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											
	0.19247E-01	4225.00	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											
	0.19092E-01	4250.00	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											
	0.18940E-01	4275.00	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											
	0.18789E-01	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											
	0.18641E-01	4325.00	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											
	0.18494E-01	4350.00	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											
	0.18350E-01	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											
	0.18207E-01	4400.00	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											
	0.18067E-01	4425.00	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											
	0.17928E-01	4450.00	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											
	0.17791E-01	4475.00	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											
	0.17656E-01	4500.00	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											
	0.17523E-01	4525.00	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											
	0.17391E-01	4550.00	0.00	0.0		Winter	0-360	10011001				



0.15392E-01	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					
0.15287E-01	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					



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## **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 – 2014, 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 nationwide 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, Colorado.

**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 representatives, 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.**, Fukunaga, 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 Clean up 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.

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**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.



Technical Consultation, Data Analysis and  
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## ***Paul Rosenfeld, Ph.D.***

*Principal Environmental Chemist*

**Chemical Fate and Transport & Air Dispersion Modeling**

**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<sub>2</sub>O 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 Aermოდ 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.

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**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.

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**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). Perfluorooctanoic Acid (PFOA) and Perfluorooctane 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 23<sup>rd</sup> 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 23<sup>rd</sup> 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 23<sup>rd</sup> *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 Conference*. 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, 112<sup>th</sup> 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. 019-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 Gilbert, 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 NO. 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 17<sup>th</sup> 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  
Jaeonette 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



State of California – Natural Resources Agency  
DEPARTMENT OF FISH AND WILDLIFE  
Inland Deserts Region  
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[www.wildlife.ca.gov](http://www.wildlife.ca.gov)

**GAVIN NEWSOM, Governor**  
**CHARLTON H. BONHAM, Director**



August 26, 2022

Mr. Matthew Evans, Project Planner  
City of Perris  
135 North D Street  
Perris, CA 92570  
[Mevans@cityofperris.org](mailto:Mevans@cityofperris.org)

Subject: Mitigated Negative Declaration  
Ramona-Indian Warehouse Project  
State Clearinghouse No. 2022070543

Dear Mr. Evans:

The California Department of Fish and Wildlife (CDFW) received a Mitigated Negative Declaration (MND) from the City of Perris (City) for the Ramona-Indian Warehouse Project (Project) for JM Realty Group, Inc. (Project Applicant/Proponent) pursuant to the California Environmental Quality Act (CEQA) and CEQA Guidelines.<sup>1</sup>

Thank you for the opportunity to provide comments and recommendations regarding those activities involved in the Project that may affect California fish and wildlife. Likewise, we appreciate the opportunity to provide comments regarding those aspects of the Project that CDFW, by law, may be required to carry out or approve through the exercise of its own regulatory authority under the Fish and Game Code.

## **CDFW ROLE**

CDFW is California's Trustee Agency for fish and wildlife resources and holds those resources in trust by statute for all the people of the State. (Fish & G. Code, §§ 711.7, subd. (a) & 1802; Pub. Resources Code, § 21070; CEQA Guidelines § 15386, subd. (a)) CDFW, in its trustee capacity, has jurisdiction over the conservation, protection, and management of fish, wildlife, native plants, and habitat necessary for biologically sustainable populations of those species (Fish & G. Code, § 1802.). Similarly, for purposes of CEQA, CDFW provides, as available, biological expertise during public agency environmental review efforts, focusing specifically on projects and related activities that have the potential to adversely affect fish and wildlife resources.

CDFW is also submitting comments as a Responsible Agency under CEQA. (Pub. Resources Code, § 21069; CEQA Guidelines, § 15381.) CDFW expects that it may

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<sup>1</sup> CEQA is codified in the California Public Resources Code in section 21000 et seq. The "CEQA Guidelines" are found in Title 14 of the California Code of Regulations, commencing with section 15000.

need to exercise regulatory authority as provided by the Fish and Game Code. As proposed, for example, the Project may be subject to CDFW's lake and streambed alteration regulatory authority. (Fish & G. Code, § 1600 et seq.) Likewise, to the extent implementation of the Project as proposed may result in "take" as defined by State law of any species protected under the California Endangered Species Act (CESA) (Fish & G. Code, § 2050 et seq.), the project proponent may seek related take authorization as provided by the Fish and Game Code.

CDFW issued Natural Community Conservation Plan approval and take authorization in 2004 for the Western Riverside Multiple Species Habitat Conservation Plan (MSHCP), as per Section 2800, et seq., of the California Fish and Game Code. The MSHCP established a multiple species conservation program to minimize and mitigate habitat loss and the incidental take of covered species in association with activities covered under the permit. The City of Perris is a permittee to the MSHCP and is responsible for implementation of the MSHCP and its associated Implementation Agreement. CDFW is providing the following comments as they relate to the Project's consistency with the MSHCP and CEQA.

## **PROJECT DESCRIPTION SUMMARY**

### *Project Location*

The Project site comprises approximately 15 acres in the City of Perris within Riverside County, California, in the northwest quarter of Section 24, Township 4 South, Range 3 West, of the U.S. Geological Survey (USGS) 7.5" Sunnymead, California topographic quadrangle map. The Project is located north of Ramona Expressway, east of Indian Avenue, west of North Perris Boulevard, and approximately 1.5 miles south of March Air Reserve Base/Inland Port Airport. The Project is located within Assessor's Parcel Number (APN) 302-060-041.

### *Project Description*

The Project proposes the adoption of a Specific Plan Amendment to the Perris Valley Commerce Center Specific Plan (PVCCSP) and approval of a parcel map to allow the construction and operation of a 13-acre multi-tenant distribution building described for warehousing, showroom, and office uses. Also, 1.61 acres of the Project site are proposed for future commercial uses to be determined at a later date. In addition, Project activities are proposed to include the development of a rectangular 232,575-square foot (sf) warehouse building with 10,000 sf of office space, 215 parking stalls, 52 trailer parking stalls, and 39 dock positions.

## **COMMENTS AND RECOMMENDATIONS**

To assist the City of Perris in adequately mitigating the Project's potentially significant impacts to biological resources, CDFW offers the comments and recommendations

presented below, and in Attachment 1 “Mitigation Monitoring and Reporting Program” for consideration by the City of Perris prior to adoption of the MND for the Project.

### **Western Riverside County Multiple Species Habitat Conservation Plan**

#### *Western Riverside MSHCP Implementation:*

Compliance with approved habitat plans, such as the MSHCP, is discussed in CEQA. Specifically, Section 15125(d) of the CEQA Guidelines requires that the CEQA document discuss any inconsistencies between a proposed project and applicable general plans and regional plans, including habitat conservation plans and natural community conservation plans. An assessment of the impacts to the MSHCP as a result of this Project is necessary to address CEQA requirements.

The proposed Project occurs within the MSHCP area and is subject to the provisions and policies of the MSHCP. To be considered a covered activity, Permittees need to demonstrate that proposed actions are consistent with the MSHCP, the Permits, and the Implementing Agreement. The City of Perris the Lead Agency and is signatory to the Implementing Agreement of the MSHCP.

To demonstrate consistency with the MSHCP, as part of the CEQA review, the City shall ensure the Project implements the following:

1. Pays Local Development Mitigation Fees and other relevant fees as set forth in Section 8.5 of the MSHCP.
2. Demonstrates compliance with: 1) the Protection of Species Associated with Riparian/Riverine Areas and Vernal Pools, set forth in Section 6.1.2 of the MSHCP; 2) the Urban/Wildlands Interface Guidelines as set forth in Section 6.1.4 of the MSHCP; 3) the policies set forth in Section 6.3.2; and 4) the Best Management Practices and the siting, construction, design, operation and maintenance guidelines as set forth in Section 7.0 and Appendix C of the MSHCP.

The MSHCP identifies that the California Department of Fish and Wildlife and the U. S. Fish and Wildlife Service (collectively known as the Wildlife Agencies) shall be notified in advance of approval of public and private projects for the identified MSHCP activities which includes the Protection of Species Associated with Riparian/Riverine Areas and Vernal Pools (Section 6.11 of the MSHCP). Additionally, the City's MSHCP Implementation Resolution Number 3162 Sections 3-5 states that the City “shall be required to comply with the procedures set forth in the MSHCP Implementation Policy” and “no project requiring a discretionary, or certain ministerial permits or approvals that could have adverse impacts to species covered under the MSHCP shall be approved by the City, unless the project is consistent with the MSHCP”. CDFW requests that to demonstrate compliance with the MSHCP, the City complete MSHCP implementation prior to adoption of the MND for the Project.



*Protection of Species Associated with Riparian/Riverine Areas and Vernal Pools*

The MSHCP Protection of Species Associated with Riparian/Riverine and Vernal Pool Resources Section 6.1.2 indicates that if avoidance of onsite impacts to Section 6.1.2 resources is not feasible, then the impacts should be identified and mitigated for through a Determination of Biologically Equivalent or Superior Preservation (DBESP) process prior to or in parallel to CEQA. The assessment of Riparian/Riverine and Vernal Pool Resources should include mapping of riparian/riverine areas and vernal pools, species composition, topography/hydrology, and soil analysis which may be completed during the CEQA process (Section 6.1.2 of the MSHCP). If the mapping noted above identifies suitable Habitat for the species listed in the MSHCP and the proposed project design does not incorporate avoidance of the identified Habitat, focused surveys for those species shall be conducted, and avoidance and minimization measures implemented in accordance with the species-specific objectives for those species. The MSHCP identifies that the Wildlife Agencies **shall** be notified in advance of approval of public or private projects of draft determinations for the biologically equivalent or superior determination findings associated with the Protection of Wetland Habitats and Species policies presented in Section 6.1.2 of the MSHCP (MSHCP Section 6.11). As required by MSHCP, completion of the DBESP process prior to adoption of the environmental document ensures that the project is consistent with the MSHCP and provides public disclosure and transparency during the CEQA process by identifying the project impacts and mitigation for wetland habitat, a requirement of CEQA Guidelines, §§ 15071, subds. (a)-(e).

The MND and accompanying General Biological Resource Assessment (located in Appendix C) indicate that 0.58 acres of riparian/riverine or vernal pool resources are located with the proposed Project area. CDFW appreciates the analysis of impacts provided within the MND and General Biological Resource Assessment. However, the MSHCP implementation process is not complete because a DBESP has not been prepared, and has not been submitted to the Wildlife Agencies for review and response, to determine if the mitigation proposed for the impacts to riparian/riverine resources is biologically equivalent or superior preservation to avoidance. It is not appropriate for the City to adopt the MND until the DBESP is complete because the City is required to notify the Wildlife Agencies in advance of approval of public and private projects for identified MSHCP activities, such as completion of the DBESP for the riparian/riverine policy. CDFW requests that to demonstrate implementation of the MSHCP, the City of Perris complete the DBESP process and once the DBESP is complete, revise the Biological Mitigation Measure 4 (MM BIO 4) and update with the mitigation measures identified in the DBESP. CDFW recommends revising MM BIO 4 in the MND per the edits below (edits are in ~~strikethrough~~ and **bold**), and also included in Attachment 1 "Mitigation Monitoring and Reporting Program".:

MM Bio 4: ~~Project-specific mapping of riparian/and unvegetated riverine features will be required for implementing projects pursuant to Section 6.1.2 of the MSHCP. For areas not excluded as artificially created, the MSHCP requires 100~~

~~percent avoidance of riparian/riverine areas. If for any implementing project avoidance is not feasible, then such implementing projects will require the approval of a DBESP including appropriate mitigation to offset the loss of functions and values as they pertain to the MSHCP covered species least Bell's vireo, southwestern willow flycatcher, and western yellow-billed cuckoo.~~ [Update with DBESP results and findings]

### Lake and Streambed Alteration Program

Based on review of material submitted with the MND and review of aerial photography the Project has the potential to impact of fish and wildlife resources subject to Fish and Game Code section 1600 et seq. Depending on how the Project is designed and constructed, it is likely that the Project applicant will need to notify CDFW per Fish and Game Code section 1602. To ensure compliance with Fish and Game Code section 1602 CDFW recommends that the County condition the MND to include a mitigation measure for consultation with CDFW to determine if Fish and Game Code section 1600 et seq. resources may occur within the proposed Project alignment. Fish and Game Code section 1602 requires an entity to notify CDFW prior to commencing any activity that may do one or more of the following: substantially divert or obstruct the natural flow of any river, stream or lake; substantially change or use any material from the bed, channel or bank of any river, stream, or lake; or deposit debris, waste or other materials that could pass into any river, stream or lake. Please note that "any river, stream or lake" includes those that are episodic (i.e., those that are dry for periods of time) as well as those that are perennial (i.e., those that flow year-round). This includes ephemeral streams, desert washes, and watercourses with a subsurface flow.

Upon receipt of a complete notification, CDFW determines if the proposed Project activities may substantially adversely affect existing fish and wildlife resources and whether a Lake and Streambed Alteration (LSA) Agreement is required. An LSA Agreement includes measures necessary to protect existing fish and wildlife resources. CDFW may suggest ways to modify the project that would eliminate or reduce harmful impacts to fish and wildlife resources.

CDFW's issuance of an LSA Agreement is a "project" subject to CEQA (see Pub. Resources Code, § 21065). To facilitate issuance of an LSA Agreement, if necessary, the MND should fully identify the potential impacts to the lake, stream, or riparian resources, and provide adequate avoidance, mitigation, and monitoring and reporting commitments. Early consultation with CDFW is recommended, since modification of the proposed Project may be required to avoid or reduce impacts to fish and wildlife resources. To obtain a Lake or Streambed Alteration notification package, please go to <https://www.wildlife.ca.gov/Conservation/LSA/Forms>.

CDFW recommends the inclusion of the following revised measure in the MND per the edits below (edits are in ~~strikethrough~~ and **bold**), and also included in Attachment 1 "Mitigation Monitoring and Reporting Program".:

MM Bio 1: Prior to the City's issuance of a grading permit for the Project site **and prior to the start of Project activities**, the Applicant shall **notify the California Department of Fish and Wildlife (CDFW) for impacts to Fish and Game Code section 1602 resources. The applicant shall either receive a Streambed Alteration Agreement or written documentation from CDFW that a Streamed Alteration Agreement is not needed.** ~~and demonstrate proof of purchase of mitigation credits at a 2:1 ratio for impacts to~~ This 2:1 mitigation ratio and mitigation type are proposed, ~~given the flows on-site are mainly artificial and the adjacent lands resulted in an increase in elevation that contributed to the formation of Pool 12. Drainage 2 (sheet flow and channel) and the earthen bottom portions of Drainage 1 that are the result of storm drains flows are proposed to be mitigated with 1:1 rehabilitation credit. Purchase of mitigation credits is not proposed for the impacts to the concrete brow ditch of Drainage 1, as this will be replaced on-site with the construction of Line E.~~

## **Nesting Birds**

It is the Project proponent's responsibility to avoid Take of all nesting birds. Fish and Game Code section 3503 makes it unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by Fish and Game Code or any regulation made pursuant thereto. Fish and Game Code section 3513 makes it unlawful to take or possess any migratory nongame bird except as provided by the rules and regulations adopted by the Secretary of the Interior under provisions of the Migratory Bird Treaty Act of 1918, as amended (16 U.S.C. § 703 et seq.). Fish and Game Code section 3503.5 makes it unlawful to take, possess, or destroy any birds in the orders Falconiformes or Strigiformes (birds-of-prey) to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by Fish and Game Code or any regulation adopted pursuant thereto. These regulations apply anytime nests or eggs exist on the Project site.

The timing of the nesting season varies greatly depending on several factors, such as the bird species, weather conditions in any given year, and long-term climate changes (e.g., drought, warming, etc.). CDFW staff have observed that changing climate conditions may result in the nesting bird season occurring earlier and later in the year than historical nesting season dates. CDFW recommends the completion of nesting bird survey regardless of time of year to ensure compliance with all applicable laws pertaining to nesting.

The duration of a pair to build a nest and incubate eggs varies considerably, therefore, CDFW recommends surveying for nesting behavior and/or nests and construction within three days prior to start of Project construction.

CDFW is concerned that potential impacts to nesting birds are not identified or discussed within the MND and strongly suggests the City evaluate the direct, indirect,

and cumulative impacts to nesting birds, before approval and certification of the MND. Appropriate analysis would include conducting focused nesting bird surveys throughout the project site. To address the above issues and help the Project applicant avoid unlawfully taking of nests and eggs, CDFW requests the City revise the following mitigation measures included from the PVCCSP Environmental Impact Report, as per below (edits are in ~~strike through~~ and **bold**), and also included in Attachment 1 "Mitigation Monitoring and Reporting Program".

MM BIO-XX: Nesting Bird Survey. In order to avoid violation of the MBTA and the California Fish and Game Code, site preparation activities (**ground disturbance, construction activities**, and/or removal of trees and vegetation) for all PVCC implementing development and infrastructure projects shall be avoided, to the greatest extent possible, during the nesting season (~~generally February 1 to August 31~~) of potentially occurring native and migratory bird species.

If site-preparation activities, for an implementing project are proposed during the nesting/breeding season (~~February 1 to August 31~~), a pre-activity field survey shall be conducted by a qualified biologist prior to the issuance of grading permits for such project to determine if ~~active~~ nests of species protected by the MBTA or the California Fish and Game Code are present in the construction zone **in addition to ongoing monitoring, and if necessary, establishment of minimization measures. The Project Applicant shall adhere to the following:**

- 1. Applicant shall designate a biologist (Designated Biologist) experienced in: identifying local and migratory bird species of special concern; conducting bird surveys using appropriate survey methodology; nesting surveying techniques, recognizing breeding and nesting behaviors, locating nests and breeding territories, and identifying nesting stages and nest success; determining/establishing appropriate avoidance and minimization measures; and monitoring the efficacy of implemented avoidance and minimization measures.**
- 2. Pre-activity field surveys shall be conducted at the appropriate time of day/night, during appropriate weather conditions, no more than 3 days prior to the initiation of Project activities. Surveys shall encompass all suitable areas including trees, shrubs, bare ground, burrows, cavities, and structures. Survey duration shall take into consideration the size of the Project site; density, and complexity of the habitat; number of survey participants; survey techniques employed; and shall be sufficient to ensure the data collected is complete and accurate.**

If active nests are not located within the implementing project site and an appropriate buffer of 500 feet of an active listed species or raptor nest, 300 feet of other sensitive or protected bird nests (non-listed), or 100 feet of sensitive or protected songbird nests, construction may be conducted during the nesting/breeding season. However, if active nests are located during the pre-activity field survey, **the Designated Biologist shall immediately establish a conservative avoidance buffer surrounding the nest based on their best professional judgement and experience. The Designated Biologist shall monitor the nest at the onset of project activities, and at the onset of any changes in such project activities (e.g., increase in number or type of equipment, change in equipment usage, etc.) to determine the efficacy of the buffer. If the Designated Biologist determines that such project activities may be causing an adverse reaction, the Designated Biologist shall adjust the buffer accordingly or implement alternative avoidance and minimization measures, such as redirecting or rescheduling construction or erecting sound barriers. No grading or heavy equipment activity shall take place within at least 500 feet of an active listed species or raptor nest, 300 feet of other sensitive or protected (under MBTA or California Fish and Game Code) bird nests (non-listed), or within 100 feet of sensitive or protected songbird nests until the nest is no longer active. All work within these buffers will be halted until the nesting effort is finished (i.e., the juveniles are surviving independent from the nest). The onsite qualified biologist will review and verify compliance with these nesting avoidance buffers and will verify the nesting effort has finished. Work can resume within these avoidance areas when no other active nests are found. Upon completion of the survey and nesting bird monitoring, a report shall be prepared and submitted to City for mitigation monitoring compliance record keeping.**

## **Burrowing Owl**

For burrowing owl, suitable habitat surveys and focused burrowing owl surveys were completed. Suitable habitat for burrowing owl was found within the Project site but no owls were detected on the Project site. In California, burrowing owl are in decline primarily as a result of habitat loss, as well as disease, predation, and drought. CDFW recommends the inclusion of a process to avoid direct take of burrowing owls and to avoid project delays if the owls are detected during the pre-construction surveys.

CDFW requests the City evaluate the direct, indirect, and cumulative impacts to burrowing owl through the DBESP process, before approval and certification of the MND. Appropriate analysis would include a discussion of the results of the focused burrowing owl surveys and suitable habitat surveys for the Project site. To avoid take of active nests, appropriate avoidance and minimization measures need to be identified in

the MND to protect burrowing owl during the burrowing owl nesting season. CDFW recommends creation of a Burrowing Owl Plan if owls are detected on the Project Site.

To avoid take of active burrowing owl burrows (nests), CDFW requests the addition of the following mitigation measure. References to creating a DBESP are removed because the DBESP should have been sent to the Wildlife Agencies for 60-day review and response prior to approval of the Project. Requested additions are identified in **bold** and removed measures are in ~~strikeout~~.

MM BIO-XX: Burrowing Owl Preconstruction Survey. Project-specific habitats assessments and focused surveys for burrowing owls will be conducted for implementing development or infrastructure projects within ~~burrowing owl survey areas~~ **the Study Area (Project site and surrounding 500-foot buffer)**. A pre-construction survey for resident burrowing owls will also be conducted by a qualified biologist within 30 days prior to commencement of grading and construction activities within those portions of implementing project sites containing suitable burrowing owl habitat and for those properties within an implementing project site where the biologist could not gain access. **The results of the survey would be submitted to the City prior to obtaining a grading permit. In addition, a survey shall be conducted and reported to CDFW within three days of ground disturbance or vegetation clearance following the recommended guidelines of the MSHCP.** If ground disturbing activities in these areas are delayed or suspended for more than 30 days after the pre-construction survey, the area shall be resurveyed for owls. The pre-construction survey and any relocation activity will be conducted in accordance with the current Burrowing Owl Instruction for the Western Riverside MSHCP.

**If burrowing owl are detected, CDFW shall be sent written notification within three days of detection of burrowing owls.** If active nests are identified ~~on an implementing project site~~ during the pre-construction survey, the nests shall be avoided ~~or the owls actively or passively relocated,~~ **and the qualified biologist and Project Applicant shall coordinate with the City of Perris Planning Department, USFWS, and the CDFG CDFW to develop a Burrowing Owl Plan to approved by the City in consultation with CDFW and USFWS prior to commencing Project activities. The Burrowing Owl Plan shall be prepared in accordance with guidelines in the CDFW Staff Report on Burrowing Owl (March 2012) and MSHCP. The Burrowing Owl Plan shall describe proposed avoidance, minimization, relocation, and monitoring as applicable. The Burrowing Owl Plan shall include the number and location of occupied burrow sites and details on proposed buffers if avoiding the burrowing owls and/or information on the adjacent or nearby suitable habitat available to owls for relocation. If no suitable habitat is available nearby for relocation, details regarding the creation and funding of artificial**

**burrows (numbers, location, and type of burrows) and management activities for relocated owls may also be required in the Burrowing Owl Plan. The Permittee shall implement the Burrowing Owl Plan following CDFW and USFWS review and concurrence. A final letter report shall be prepared by the qualified biologist documenting the results of the Burrowing Owl Plan. The letter shall be submitted to CDFW prior to the start of Project activities. When a qualified biologist determines that burrowing owls are no longer occupying the Project site per the criteria in the Burrowing Owl Plan, Project activities may begin.** ~~To adequately avoid active nests, no grading or heavy equipment activity shall take place within at least 250 feet of an active nest during the breeding season (February 1 through August 31), and 160 feet during the non-breeding season.~~

**If burrowing owls occupy any implementing the project site after project activities have started and cannot be avoided, then construction activities shall be halted immediately. The Project proponent shall notify CDFW and USFWS within 48 hours of detection. A Burrowing Owl Plan, as detailed above, shall be implemented.** ~~active or passive relocation shall be used to exclude owls from their burrows, as agreed to by Relocation shall be conducted outside the breeding season or once the young are able to leave the nest and fly. Passive relocation is the exclusion of owls from their burrows (Outside the breeding season or once the young are able to leave the nest and fly) by installing one-way doors in burrow entrances. These one-way doors allow the owl to exit the burrow, but not enter it. These doors shall be left in place 48 hours to ensure owls have left the burrow. Artificial burrows shall be provided nearby.. Burrows shall be excavated using hand tools and refilled to prevent reoccupation. Sections of flexible pipe shall be inserted into the tunnels during excavation to maintain an escape route for any animals inside the burrow. The CDFG shall be consulted prior to any active relocation to determine acceptable receiving sites available where this species has a greater chance of successful long-term relocation. If avoidance is infeasible, then a DBESP will be required, including associated relocation of burrowing owls. If conservation is not required, then owl relocation will still be required following accepted protocols. Take of active nests will be avoided, so it is strongly recommended that any relocation occur outside the nesting season.~~

## **ENVIRONMENTAL DATA**

CEQA requires that information developed in environmental impact reports and negative declarations be incorporated into a database which may be used to make subsequent or supplemental environmental determinations. (Pub. Resources Code, § 21003, subd. (e).) Accordingly, please report any special status species and natural communities detected during Project surveys to the California Natural Diversity

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Database (CNDDDB). The CNDDDB field survey form can be filled out and submitted online at the following link: <https://wildlife.ca.gov/Data/CNDDDB/Submitting-Data>. The types of information reported to CNDDDB can be found at the following link: <https://www.wildlife.ca.gov/Data/CNDDDB/Plants-and-Animals>.

## ENVIRONMENTAL DOCUMENT FILING FEES


The Project, as proposed, would have an impact on fish and/or wildlife, and assessment of environmental document filing fees is necessary. Fees are payable upon filing of the Notice of Determination by the Lead Agency and serve to help defray the cost of environmental review by CDFW. Payment of the environmental document filing fee is required in order for the underlying project approval to be operative, vested, and final. (Cal. Code Regs, tit. 14, § 753.5; Fish & G. Code, § 711.4; Pub. Resources Code, § 21089.)

## CONCLUSION

CDFW appreciates the opportunity to comment on the MND for the Ramona-Indian Warehouse Project, State Clearinghouse No. 2022070543 to assist in identifying and mitigating Project impacts on biological resources. CDFW personnel are available for consultation regarding biological resources and strategies to minimize impacts. CDFW recommends that the City of Perris addresses CDFW's comments and concerns, which includes completion of the DBESP, prior to adoption of the MND for the Project.

Questions regarding this letter or further coordination should be directed to Katrina Rehrer, Environmental Scientist, at [katrina.rehrer@wildlife.ca.gov](mailto:katrina.rehrer@wildlife.ca.gov).

Sincerely,

DocuSigned by:  
  
84F92FFEEFD24C8...

Kim Freeburn,  
Acting Environmental Program Manager

ec: **California Department of Fish and Wildlife**  
Heather Pert, Senior Environmental Scientist Supervisory  
[Heather.Pert@wildlife.ca.gov](mailto:Heather.Pert@wildlife.ca.gov)

**U.S. Fish and Wildlife Service**  
Karin Cleary-Rose  
[Karin\\_Cleary-Rose@fws.gov](mailto:Karin_Cleary-Rose@fws.gov)

**Western Riverside County Regional Conservation Authority**



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Tricia Campbell  
[tcampbell@rctc.org](mailto:tcampbell@rctc.org)

**State Clearing House**  
Office of Planning and Research, State Clearinghouse, Sacramento  
[state.clearinghouse@opr.ca.gov](mailto:state.clearinghouse@opr.ca.gov)

## REFERENCES

California Department of Fish and Game (CDFG). 2012. Staff report on burrowing owl mitigation. State of California, Natural Resources Agency. Available for download at:  
<https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=83843&inline=true>

## ATTACHMENTS

Attachment 1: MMRP for CDFW-Proposed Mitigation Measures

**ATTACHMENT 1: MITIGATION MONITORING AND REPORTING PROGRAM (MMRP)**

**PURPOSE OF THE MMRP**

The purpose of the MMRP is to ensure compliance with mitigation measures during Project implementation. Mitigation measures must be implemented within the time periods indicated in the table below.

**TABLE OF MITIGATION MEASURES**

The following items are identified for each mitigation measure: Mitigation Measure, Implementation Schedule, and Responsible Party for implementing the mitigation measure. The Mitigation Measure column summarizes the mitigation requirements. The Implementation Schedule column shows the date or phase when each mitigation measure will be implemented. The Responsible Party column identifies the person or agency that is primarily responsible for implementing the mitigation measure.

<b>Biological (BIO) Mitigation Measures (MM)</b>	<b>Implementation Schedule</b>	<b>Responsible Party</b>
<p>MM BIO-XX: Nesting Bird Survey. In order to avoid violation of the MBTA and the California Fish and Game Code, site preparation activities (ground disturbance, construction activities, and/or removal of trees and vegetation) for all PVCC implementing development and infrastructure projects shall be avoided, to the greatest extent possible, during the nesting season of potentially occurring native and migratory bird species.</p> <p>If site-preparation activities, for an implementing project are proposed during the nesting/breeding season, a pre-activity field survey shall be conducted by a qualified biologist prior to the issuance of grading permits for such project to determine if active nests of species protected by the MBTA or the California Fish and Game Code are present in the construction zone in addition to ongoing monitoring, and if necessary, establishment of minimization measures. The Project Applicant shall adhere to the following:</p> <ol style="list-style-type: none"> <li>1. Applicant shall designate a biologist (Designated Biologist) experienced in: identifying local and migratory bird species of special concern; conducting bird surveys using appropriate survey methodology; nesting surveying techniques, recognizing breeding and nesting behaviors, locating nests and breeding territories, and identifying nesting stages and nest success; determining/establishing appropriate avoidance and minimization measures; and monitoring the</li> </ol>	<p>Prior to commencing ground- or vegetation disturbing activities</p>	<p>Project Proponent</p>

<p>efficacy of implemented avoidance and minimization measures.</p> <p>2. Pre-activity field surveys shall be conducted at the appropriate time of day/night, during appropriate weather conditions, no more than 3 days prior to the initiation of Project activities. Surveys shall encompass all suitable areas including trees, shrubs, bare ground, burrows, cavities, and structures. Survey duration shall take into consideration the size of the Project site; density, and complexity of the habitat; number of survey participants; survey techniques employed; and shall be sufficient to ensure the data collected is complete and accurate.</p> <p>If active nests are not located within the implementing project site and an appropriate buffer of 500 feet of an active listed species or raptor nest, 300 feet of other sensitive or protected bird nests (non-listed), or 100 feet of sensitive or protected songbird nests, construction may be conducted during the nesting/breeding season. However, if active nests are located during the pre-activity field survey, the Designated Biologist shall immediately establish a conservative avoidance buffer surrounding the nest based on their best professional judgement and experience. The Designated Biologist shall monitor the nest at the onset of project activities, and at the onset of any changes in such project activities (e.g., increase in number or type of equipment, change in equipment usage, etc.) to determine the efficacy of the buffer. If the Designated Biologist determines that such project activities may be causing an adverse reaction, the Designated Biologist shall adjust the buffer accordingly or implement alternative avoidance and minimization measures, such as redirecting or rescheduling construction or erecting sound barriers. All work within these buffers will be halted until the nesting effort is finished (i.e., the juveniles are surviving independent from the nest). The onsite qualified biologist will review and verify compliance with these nesting avoidance buffers and will verify the nesting effort has finished. Work can resume within these avoidance areas when no other active nests are found. Upon completion of the survey and nesting bird monitoring, a report</p>		
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<p>shall be prepared and submitted to City for mitigation monitoring compliance record keeping.</p>		
<p>MM BIO-XX: Burrowing Owl Preconstruction Survey. Project-specific habitats assessments and focused surveys for burrowing owls will be conducted for implementing development or infrastructure projects within the Study Area (Project site and surrounding 500-foot buffer). A pre-construction survey for resident burrowing owls will also be conducted by a qualified biologist within 30 days prior to commencement of grading and construction activities within those portions of implementing project sites containing suitable burrowing owl habitat and for those properties within an implementing project site where the biologist could not gain access. The results of the survey would be submitted to the City prior to obtaining a grading permit. In addition, a survey shall be conducted and reported to CDFW within three days of ground disturbance or vegetation clearance following the recommended guidelines of the MSHCP. If ground disturbing activities in these areas are delayed or suspended for more than 30 days after the pre-construction survey, the area shall be resurveyed for owls. The pre-construction survey and any relocation activity will be conducted in accordance with the current Burrowing Owl Instruction for the Western Riverside MSHCP.</p> <p>If burrowing owl are detected, CDFW shall be sent written notification within three days of detection of burrowing owls. If active nests are identified <del>on an implementing project site</del> during the pre-construction survey, the nests shall be avoided <del>or the owls actively or passively relocated</del>, and the qualified biologist and Project Applicant shall coordinate with the City of Perris Planning Department, USFWS, and CDFW to develop a Burrowing Owl Plan to approved by the City in consultation with CDFW and USFWS prior to commencing Project activities. The Burrowing Owl Plan shall be prepared in accordance with guidelines in the CDFW Staff Report on Burrowing Owl (March 2012) and MSHCP. The Burrowing Owl Plan shall</p>	<p>Prior to commencing ground- or vegetation disturbing activities</p>	<p>Project Proponent</p>

<p>describe proposed avoidance, minimization, relocation, and monitoring as applicable. The Burrowing Owl Plan shall include the number and location of occupied burrow sites and details on proposed buffers if avoiding the burrowing owls and/or information on the adjacent or nearby suitable habitat available to owls for relocation. If no suitable habitat is available nearby for relocation, details regarding the creation and funding of artificial burrows (numbers, location, and type of burrows) and management activities for relocated owls may also be required in the Burrowing Owl Plan. The Permittee shall implement the Burrowing Owl Plan following CDFW and USFWS review and concurrence. A final letter report shall be prepared by the qualified biologist documenting the results of the Burrowing Owl Plan. The letter shall be submitted to CDFW prior to the start of Project activities. When a qualified biologist determines that burrowing owls are no longer occupying the Project site per the criteria in the Burrowing Owl Plan, Project activities may begin.</p> <p>If burrowing owls occupy the project site after project activities have started, then construction activities shall be halted immediately. The Project proponent shall notify CDFW and USFWS within 48 hours of detection. A Burrowing Owl Plan, as detailed above, shall be implemented.</p>		
<p>MM Bio 1: Prior to the City's issuance of a grading permit for the Project site and prior to the start of Project activities, the Applicant shall notify the California Department of Fish and Wildlife (CDFW) for impacts to Fish and Game Code section 1602 resources. The applicant shall either receive a Streambed Alteration Agreement or written documentation from CDFW that a Streambed Alteration Agreement is not needed.</p>	<p>Prior to start of Project activities</p>	<p>Project Proponent</p>

MM Bio 4: [Update with DBESP results and findings]	Prior to start of Project activities	City of Perris
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