LETTER 2

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September 19, 2022

Via E-mail

Jay Paul, Senior Planner
Planning Division
City of Escondido
201 North Broadway
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jpaul@escondido.org

Re: Meyers Avenue Industrial Project (Case No.: PL20-0654; APN Nos.: 228-312-05-00 and 228-312-06-00)

Dear Mr. Paul:

1 I am writing on behalf of Supporters Alliance for Environmental Responsibility ("SAFER") regarding the Initial Study and Mitigated Negative Declaration ("IS/MND" or "MND") prepared for the Meyers Avenue Industrial Project ("Project") (Case No.: PL20-0654), for Applicant Via West Group (VWP Escondido, LLP) (hereinafter the "Applicant"), including all actions related or referring to the proposed construction and operation of a 67,300-square-foot industrial building on a 4.26-acre vacant site, to be located at 2351 Meyers Avenue, within the City of Escondido, California (APN Nos.: 228-312-05-00 and 228-312-06-00).

2 SAFER is concerned that the IS/MND prepared for the Project is legally inadequate. SAFER's review of the Project has been assisted by wildlife biologist Dr. Shawn Smallwood, Ph.D; and air quality experts Matt Hagemann, P.G., C.Hg. and Paul E. Rosenfeld, Ph.D., of the environmental consulting firm, Soil/Water/Air Protection Enterprise ("SWAPE"). The expert comments of Dr. Smallwood and SWAPE are attached as Exhibit A and Exhibit B, respectively.

3 After reviewing the IS/MND, it is evident that it is inadequate and fails as an informational document. Also, there is a "fair argument" that the Project may have unmitigated adverse environmental impacts. Therefore, CEQA requires that the City of Escondido ("City") prepare an environmental impact report ("EIR") for the Project, pursuant to the California Environmental Quality Act ("CEQA"), Public Resources Code section 21000, et seq. SAFER respectfully requests that you do not adopt the IS/MND and instead undertake the necessary efforts to prepare an EIR, as required under CEQA.

PROJECT DESCRIPTION

4

The Applicant proposes to construct a 67,300-square-foot industrial building on a 4.26-acre vacant site, located at 2351 Meyers Avenue. The proposed development includes 55,300 square feet of manufacturing/warehouse space, 6,000 square feet of office on the first floor and 6,000 square feet of office space on the mezzanine level. It is anticipated that grading will include a combination of cut and fill, retaining walls, and blasting.

LEGAL STANDARD

5

As the California Supreme Court has held, "[i]f no EIR has been prepared for a nonexempt project, but substantial evidence in the record supports a fair argument that the project may result in significant adverse impacts, the proper remedy is to order preparation of an EIR." (*Communities for a Better Env't v. South Coast Air Quality Mgmt. Dist.* (2010) 48 Cal.4th 310, 319-320 (*CBE v. SCAQMD*) (citing *No Oil, Inc. v. City of Los Angeles* (1974) 13 Cal.3d 68, 75, 88; *Brentwood Assn. for No Drilling, Inc. v. City of Los Angeles* (1982) 134 Cal.App.3d 491, 504–505).) "Significant environmental effect" is defined very broadly as "a substantial or potentially substantial adverse change in the environment." (Pub. Res. Code ("PRC") § 21068; *see also* 14 CCR § 15382.) An effect on the environment need not be "momentous" to meet the CEQA test for significance; it is enough that the impacts are "not trivial." (*No Oil, Inc.*, 13 Cal.3d at 83.) "The 'foremost principle' in interpreting CEQA is that the Legislature intended the act to be read so as to afford the fullest possible protection to the environment within the reasonable scope of the statutory language." (*Communities for a Better Env't v. Cal. Res. Agency* (2002) 103 Cal.App.4th 98, 109 (*CBE v. CRA*).)

6

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

7

An EIR is required if "there is substantial evidence, in light of the whole record before the lead agency, that the project may have a significant effect on the environment." (PRC § 21080(d); *see also Pocket Protectors*, 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 (14 CCR § 15371), only if there is not even a "fair argument" that the project will have a significant environmental effect. (PRC §§ 21100, 21064.) Since "[t]he adoption of a negative declaration . . . has a terminal effect on the environmental review process," by allowing the agency "to

7 cont dispense with the duty [to prepare an EIR]," negative declarations are allowed only in cases where "the proposed project will not affect the environment at all." (*Citizens of Lake Murray v. San Diego* (1989) 129 Cal.App.3d 436, 440.)

8 Mitigation measures may not be construed as project design elements or features in an environmental document under CEQA. The IS/MND must "separately identify and analyze the significance of the impacts … before proposing mitigation measures […]." (*Lotus vs. Department of Transportation* (2014) 223 Cal.App.4th 645, 658.) A "mitigation measure" is a measure designed to minimize a project's significant environmental impacts, (PRC § 21002.1(a)), while a "project" is defined as including "the whole of an action, which has a potential for resulting in either a direct physical change in the environment, or a reasonably foreseeable indirect physical change in the environment." (CEQA Guidelines § 15378(a).) Unlike mitigation measures, project elements are considered prior to making a significance determination. Measures are not technically "mitigation" under CEQA unless they are incorporated to avoid or minimize "significant" impacts. (PRC § 21100(b)(3).)

9 To ensure that the project's potential environmental impacts are fully analyzed and disclosed, and that the adequacy of proposed mitigation measures is considered in depth, mitigation measures that are not included in the project's design should not be treated as part of the project description. (*Lotus*, 223 Cal.App.4th at 654-55, 656 fn.8.) Mischaracterization of a mitigation measure as a project design element or feature is "significant," and therefore amounts to a material error, "when it precludes or obfuscates required disclosure of the project's environmental impacts and analysis of potential mitigation measures." (*Mission Bay Alliance v. Office of Community Investment & Infrastructure* (2016) 6 Cal.App.5th 160, 185.)

10 Where an initial study shows that the project may have a significant effect on the environment, a mitigated negative declaration may be appropriate. However, a mitigated negative declaration is proper *only* if the project revisions would avoid or mitigate the potentially significant effects identified in the initial study "to a point where clearly no significant effect on the environment would occur, and…there is no substantial evidence in light of the whole record before the public agency that the project, as revised, may have a significant effect on the environment." (PRC §§ 21064.5, 21080(c)(2); *Mejia v. City of Los Angeles* (2005) 130 Cal.App.4th 322, 331.) In that context, "may" means a reasonable possibility of a significant effect on the environment. (PRC §§ 21082.2(a), 21100, 21151(a); *Pocket Protectors*, 124 Cal.App.4th at 927; *League for Protection of Oakland's etc. Historic Res. v. City of Oakland* (1997) 52 Cal.App.4th 896, 904–05.)

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

exemption from CEQA. (*Pocket Protectors*, 124 Cal.App.4th at 928.)

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

> This 'fair argument' standard is very different from the standard normally followed by public agencies in their decision making. Ordinarily, public agencies
> 11 cont weigh the evidence in the record and reach a decision based on a preponderance of the evidence. [Citation]. The fair argument standard, by contrast, prevents the lead agency from weighing competing evidence to determine who has a better argument concerning the likelihood or extent of a potential environmental impact.

(Kostka & Zishcke*, Practice Under the California Environmental Quality Act*, §6.37 (2d ed. Cal. CEB 2021).) The Courts have explained that "it is a question of law, not fact, whether a fair argument exists, and the courts owe no deference to the lead agency's determination. Review is de novo, with *a preference for resolving doubts in favor of environmental review*." (*Pocket Protectors*, 124 Cal.App.4th at 928 (emphasis in original).)

For over forty years the courts have consistently held that an accurate and stable project description is a bedrock requirement of CEQA—the *sine qua non* (that without which there is nothing) of an adequate CEQA document:

> Only through an accurate view of the project may affected outsiders and public decision-makers balance the proposal's benefit against its environmental cost, consider mitigation measures, assess the advantage of terminating the proposal (i.e., the "no project" alternative) and weigh other alternatives in the balance. An accurate, stable and finite project description is the *sine qua non* of an informative and legally sufficient EIR.

(*County of Inyo v. City of Los Angeles* (1977) 71 Cal.App.3d 185 at 192–93.) CEQA therefore requires that an environmental review document provide an adequate description of the project to
12 allow for the public and government agencies to participate in the review process through submitting public comments and making informed decisions.

Lastly, CEQA requires that an environmental document include a description of the project's environmental setting or "baseline." (CEQA Guidelines § 15063(d)(2).) The CEQA "baseline" is the set of environmental conditions against which to compare a project's anticipated impacts. (*CBE v. SCAQMD*, 48 Cal.4th at 321.) CEQA Guidelines section 15125(a) states, in pertinent part, that a lead agency's environmental review under CEQA:

> …must include a description of the physical environmental conditions in the vicinity of the project, as they exist at the time [environmental analysis] is commenced, from both a local and regional perspective. This environmental setting will normally constitute the baseline physical conditions by which a Lead

Agency determines whether an impact is significant.

12 cont (*See Save Our Peninsula Committee v. County of Monterey* (2001) 87 Cal.App.4th 99, 124-25 ("*Save Our Peninsula*").) As the court of appeal has explained, "the impacts of the project must be measured against the 'real conditions on the ground,'" and not against hypothetical permitted levels. (*Id*. at 121-23.)

I. The Project Will Result in Significant Impacts to Biological Resources.

13 Expert wildlife biologist Dr. Shawn Smallwood, Ph.D., reviewed the IS/MND, as well as the July 2021 biological resources technical report, and the 2018 Focused California Gnatcatcher Survey Report for the adjacent Sunrise Specific Plan project (attached to the technical report as Appendix A), both prepared by Dudek, to inform his comments (hereinafter, "Dudek reports"). Dr. Smallwood's comments are attached as Exhibit A.

14 Dr. Smallwood's associate, Noriko Smallwood, a wildlife biologist, surveyed the Project site and took photos of existing wildlife and habitat there on August 26, 2022. (Ex. A., p. 1.) During her site visit, Ms. Smallwood "detected 13 species of vertebrate wildlife at or near the site (Table 1), 1 of which was a special-status species." (*Id*., p. 1.) Among the species Ms. Smallwood identified on the Project site are western fence lizard, snowy egret, American crows, mourning doves, and burrows of Botta's pocket gopher. (*Id*., pp. 1-2 [see photos 4-8].) "Fewer species than expected were detected," however, most likely because of "the construction activity at the Sunrise Project and the use of the southern half (ca. 60%) of the site of the proposed project as a construction staging area for the Sunrise Project." (*Id*., p. 2.) Nonetheless, Dr. Smallwood observed, the site remains "inherently rich in wildlife." (*Id.*) Based on these observations, and his independent review of the IS/MND, Dr. Smallwood concluded that the Project would likely result in significant impacts to existing biological resources. CEQA requires the preparation of an EIR to fully assess and more extensively mitigate these impacts.

15 Dr. Smallwood identified numerous areas of concern, including deep methodological flaws underlying the conclusions of the Dudek reports and likely impacts to biological resources which the IS/MND failed to consider or appropriately mitigate. Alarmingly, Dr. Smallwood also found that the Project would conflict with existing provisions of the North County Multiple Habitat Conservation Plan ("MHCP"), which protects threatened plant and animal species throughout Northwestern San Diego County. (*Id*., pp. 19-20.) Dr. Smallwood identified additional likely impacts to wildlife, including habitat loss, interference with movement, traffic impacts, and cumulative impacts. (*Id*., pp. 18-23). Finally, Dr. Smallwood proposed a comprehensive series of wildlife mitigation measures to minimize the Project's likely impacts on biological resources (*Id*., pp. 23-25). Dr. Smallwood's findings constitute substantial evidence of a fair argument that the Project may have adverse, unmitigated environmental impacts to biological resources.

16 A. The IS/MND Failed to Properly Analyze Scientific Database Records and Mischaracterized the Project's Current Environmental Setting.

16 cont

The Dudek report "inappropriately uses California Natural Diversity Data Base (CNDDB) to determine which species have potential to occur in the project area." (*Id*., p. 11.) This database was "not designed to support absence determinations or to screen out species from characterization of a site's wildlife community." (*Id.*) As a result of its imprecise interpretation of CNDBB records, the "IS/MND neglects to analyze the occurrence potentials of 79 (64%) of the special-status species in Table 2, [the list compiled by Dr. Smallwood]. Of these, 10 were confirmed on site, and databases include occurrence records of 17 within 1.5 miles and 21 within 1.5 and 4 miles of the site. The IS/MND made insufficient use of the wildlife occurrence databases, and is not supported by due diligence." (*Id*., p. 18.)

17

The IS/MND's significant oversight here is problematic because, "under CEQA, the lead agency bears a burden to investigate potential environmental impacts. 'If the local agency has failed to study an area of possible environmental impact, a fair argument may be based on the limited facts in the record. Deficiencies in the record may actually enlarge the scope of fair argument by lending a logical plausibility to a wider range of inferences.'" (*Sundstrom v. County of Mendocino* (1988) 202 Cal. App. 3d 296, 311; *County Sanitation Dist. No. 2 v. County of Kern* (2005) 127 Cal. App. 4th 1544.). Since the City has failed to sufficiently account for the presence of special-status species on the Project site and surrounding areas, a fair argument can be made that broader deficiencies underlie the IS/MND's assessment of the Project's likely impacts to biological resources.

18

Dr. Smallwood concludes that the report's assumptions regarding the site's environmental baseline conditions are unsupported by scientific evidence. Therefore, 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." (*Id.*)

19

B. The Project Would Improperly Conflict with the North County Multiple Habitat Conservation Plan.

Dr. Smallwood found that the IS/MND fails to provide any compensatory mitigation to address the Project's substantial conflict with existing provisions of the North County Multiple Habitat Conservation Plan ("MHCP"). The MHCP "is a comprehensive conservation planning process that addresses the needs of multiple plant and animal species in North Western [*sic*] San Diego County[,]" and which "encompasses the cities of Carlsbad, Encinitas, Escondido, Oceanside, San Marcos, Solana Beach, and Vista."[1]

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The Dudek report notes that, while the City of Escondido "is no longer an active participant in the NCCP program and the subregional MHCP conservation planning effort," "it is the City's policy to comply with the conservation policies identified in the Draft Escondido

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[1] San Diego Association of Governments, *North County Multiple Habitat Conservation Program*, https://www.sandag.org/index.asp?projectid=97&fuseaction=projects.detail#:~:text=The%20Multiple%20Habitat%20Conservation%20Program,%2C%20Solana%20Beach%2C%20and%20Vista..

20 cont Subarea Plan, including an assessment of designated BCLA [Biological Core Linkage Area] or MHCP Focused Planning Area (FPA) in the context of the proposed project." (Dudek report, p. 9.) It then asserts, however, that the "Project site is located in an area mapped as Developed and Disturbed Land and is located outside the BCLA or MHCP FPAs (Ogden 2001)." (*Id.*, pp. 9-10.)

21 These conclusions are not supported by substantial evidence and directly conflict with Dr. Smallwood's findings. Notably, Dr. Smallwood writes, the Project "would potentially affect up to 21 special-status species of wildlife [shown] in Table 2 that are covered by the MHCP. Of these 21 species, 3 have been confirmed on the project site, and 5 have been documented within 1.5 miles of the site, 3 have been documented within 1.5 and 4 miles of the site, and 9 have been documented within 4 and 30 miles of the site." These are significant impacts that must be addressed in an EIR.

22 Furthermore, where a local or regional policy of general applicability, such as the MHCP, is adopted to avoid or mitigate environmental effects, a conflict with that policy constitutes a potentially significant impact on the environment. (*Pocket Protectors v. Sacramento* (2005) 124 Cal.App.4th 903.) Indeed, any inconsistencies between a proposed project and applicable local or regional plans must be discussed in an EIR. (14 CCR § 15125(d); *City of Long Beach v. Los Angeles Unif. School Dist.* (2009) 176 Cal. App. 4th 889, 918; *Friends of the Eel River v. Sonoma County Water Agency* (2003) 108 Cal. App. 4th 859, 874 (EIR inadequate when Lead Agency failed to identify relationship of project to relevant local plans).) A project's inconsistencies with local plans prepared outside of the CEQA process may similarly constitute significant impacts and require the preparation of an EIR. (*Endangered Habitats League, Inc. v. County of Orange* (2005) 131 Cal.App.4th 777, 783-4.) More recently, in *Georgetown Preservation Society v. County of El Dorado* (2018) 30 Cal.App.5th 358, 364, the court echoed this framework to hold that a "planning or zoning finding conducted outside the requirements of CEQA does not provide a substitute for CEQA review." In either scenario, the fair argument standard applies to the courts' evaluation of a project's potential inconsistencies with a previously adopted local plan or policy.

23 Therefore, "a fair argument can be made for the need to prepare an EIR to address the impacts of project noise to wildlife." (*Id.*) Any future environmental analysis should identify habitat areas that will be impacted by the Project's excess noise levels as habitat losses and must include compensatory mitigation measures for all impacted special-status wildlife species.

II. The Project Will have Significant Air Quality and Greenhouse Gas Impacts.

24 Air quality experts Matt Hagemann, P.G., C.Hg. and Dr. Paul E. Rosenfeld, Ph.D. of the environmental consulting firm SWAPE, reviewed the IS/MND and the associated Air Quality, Greenhouse Gas, and Energy Impact Study, attached as Appendix 3 to the IS/MND ("AQ Study"). SWAPE's comments are attached as Exhibit B.

25 SWAPE's review identified numerous methodological flaws which call into question the IS/MND's conclusions and make clear that the Project is likely to result in significant air quality impacts. Additionally, SWAPE conducted its own modeling of the Project's air quality impacts and found that its emissions will far exceed applicable significance thresholds. Lastly, SWAPE produced a detailed list of comprehensive mitigation measures that go beyond the pollution reduction efforts proposed by the IS/MND. (Ex. B, pp. 15-17). SWAPE therefore concluded that an EIR "should be prepared to adequately assess and mitigate the potential air quality, health risk, and greenhouse gas impacts that the project may have on the environment." (*Id*., p. 1.)

26

A. The IS/MND Relies on Deeply Flawed Assumptions Regarding the Project's Likely Emissions.

Upon reviewing the Project's CalEEMod output files – the underlying data files used to estimate a project's air emissions – SWAPE found that "several model inputs were not consistent with [the] information disclosed" in the IS/MND. (*Id*., p. 2.) For instance, the AQ study ***failed to distinguish*** between the emissions that will likely result from future operation of the proposed warehouse space as distinguished from the proposed manufacturing space. (*Id*.) This is a substantial oversight which calls into question the AQ study's remaining findings.

27 Next, the AQ study improperly reduced the "default architectural and area coating emission factors" values in CalEEMod, the air modeling tool used to prepare its analysis. (*Id*., p. 3.) This is notable because the CalEEMod User Guide expressly "requires any changes to model defaults to be justified." (*Id*., p. 4.) Instead, the AQ study merely pointed to planned compliance with the San Diego County Air Pollution Control District's ("SDAPCD") Rule 67.0.1, which limits volatile organic compound ("VOC") contents in architectural coating materials. However, because it "fails to explicitly require the use of a specific type or types of coating," SWAPE was "unable to verify the revised emission factors assumed in the model." (*Id*., p. 4.) SWAPE similarly found that the AQ study improperly modeled the Project's emissions using the incorrect number of proposed parking spaces—by a reduction of 21 spaces from the number cited in the IS/MND—thus rendering its estimates of construction and operational emissions inaccurate. (*Id*., p. 3.)

28 Lastly, following its detailed review of the AQ study's modeling errors, SWAPE conducted an updated CalEEMod analysis of the Project's likely air emissions, determining the input values based on information presented in the IS/MND. Upon concluding its analysis, SWAPE found that the Project's construction-related VOC emissions exceed the SDAPCD significance threshold of 75 pounds per day. (*Id*., p. 5.) Notably, SWAPE's analysis found that the Project's emissions would be approximately ***320% greater*** than the AQ study estimates provided in support of the IS/MND. (*Id*.)

29 This finding makes clear that there is a fair argument that Project will have highly significant air quality impacts. Therefore, "an EIR should be prepared to adequately assess and mitigate the potential air quality impacts that the Project may have on the environment." (*Id*.)

B. The IS/MND Failed to Conduct a Health Risk Assessment to Evaluate the Project's Likely Impact on Human Health.

The IS/MND violates CEQA by failing to prepare a quantified construction and
30 operational Health Risk Assessment ("HRA"). (*Id*., p. 6.) CEQA requires "a reasonable effort to
substantively connect a project's air quality impacts to likely health consequences." (*Sierra Club
v. County of Fresno* (2018) 6 Cal.5th 502, 510.) According to SWAPE's analysis, the "IS/MND
fails to evaluate the TAC [toxic air contaminant] emissions associated with Project construction
and operation or indicate the concentrations at which such pollutants would trigger adverse
health effects." (*Id*., p. 7.)

Additionally, the AQ study failed to comply with applicable guidance by the Office of
Environmental Health Hazard Assessment ("OEHHA") indicating when an HRA is required.
Namely, current OEHHA guidance recommends that an HRA be conducted to assess cancer
risks for any Project lasting a minimum of two months, and that the HRA analysis for a Project
31 that will last six months or longer correspond to the entire expected "lifetime" of the Project.
(*Id*., p. 8.) Lastly, because the AQ study failed to conduct an HRA, it did not present an
estimated cancer risk associated to the Project. As such, it did not—and could not—determine
whether the Project would exceed the SDAPCD's significance threshold of 10 per million. (*Id*.)
The IS/MND's failure to account for – or even consider these risks – is a significant oversight.

"[U]nder CEQA, the lead agency bears a burden to investigate potential environmental
impacts. 'If the local agency has failed to study an area of possible environmental impact, a fair
32 argument may be based on the limited facts in the record. Deficiencies in the record may actually
enlarge the scope of fair argument by lending a logical plausibility to a wider range of
inferences.'" (*County Sanitation Dist. No. 2 v. County of Kern* (2005) 127 Cal.App. 4th 1544,
1597 (citing *Sundstrom v. County of Mendocino* (1988) 202 Cal.App.3d 296, 311).)

Furthermore, "CEQA places the burden of environmental investigation on government
rather than the public. If the local agency has failed to study an area of possible environmental
impact, a fair argument may be based on the limited facts in the record." (*Gentry v. City of
Murrieta* (1995) 36 Cal.App.4th 1359, 1378–79 [quotations omitted].) Indeed, "[d]eficiencies in
the record may actually enlarge the scope of fair argument by lending a logical plausibility to a
33 wider range of inferences." (*Id*.; *See* also, *Christward Ministry v. Superior Court* (1986) 184
Cal.App.3d 180, 197 [holding that city's failure to undertake adequate environmental analysis
further supported fair argument that project would have significant impacts].) Since the IS/MND
fails to conduct a proper health risk assessment, a fair argument may be based on the inadequate
analysis.

C. The IS/MND Improperly Estimated the Project's Likely Greenhouse Gas Emissions.

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SWAPE rejects the IS/MND's unfounded assertion that the Project's greenhouse gas
("GHG") emissions will be less than significant. (*Id*., p. 14.) Specifically, SWAPE found that
because the "IS/MND's quantitative GHG analysis relies upon an incorrect and unsubstantiated

34 cont

air model," an "EIR should be prepared that adequately assesses the potential GHG impacts that construction and operation of the proposed Project may have on the environment." (*Id.*)

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Next, SWAPE notes, the IS/MND incorrectly asserted that the Project would be consistent with the California Air Resources Board's ("CARB") 2017 Climate Change Scoping Plan. (*Id.*) This claim is unfounded, however, because the IS/MND failed to implement CARB's *performance-based standards* for estimating emissions from daily per capita vehicle miles traveled ("VMT") when estimating the Project's GHG emissions. (*Id*. pp. 14-15.) Because the IS/MND's GHG emissions estimates are unfounded, and not supported by substantial evidence, an "EIR should be prepared for the proposed Project to provide additional information and analysis to conclude less-than-significant GHG impacts." (*Id*., p. 15.)

36

III. The Project's Energy Analysis Is Insufficient and Improperly Relies on Legally Unenforceable Mitigation Measures.

CEQA provides that all Projects must include "measures to reduce the wasteful, inefficient, and unnecessary consumption of energy." (PRC § 21100(b)(3).) Energy conservation under CEQA is defined as the "wise and efficient use of energy." (CEQA Guidelines, app. F, § I.) The "wise and efficient use of energy" is achieved by "(1) decreasing overall per capita energy consumption, (2) decreasing reliance on fossil fuels such as coal, natural gas and oil, and (3) increasing reliance on renewable energy resources." (*Id.*) The IS/MND's analysis of the Project's energy impacts is conclusory and fails to provide the necessary analysis.

37

A failure to undertake "an investigation into renewable energy options that might be available or appropriate for a project" violates CEQA. (*California Clean Energy Committee v. City of Woodland* (2014) 225 Cal.App.4th 173, 213 ("*Clean Energy*.") Additionally, compliance with the California Building Energy Efficiency Standards (Cal. Code Regs., tit. 24, part 6 ("Title 24")) does not, in and of itself, constitute an adequate energy analysis under CEQA. (*Ukiah Citizens for Safety First v. City of Ukia*h (2016) 248 Cal.App.4th 256, 264-65.) For instance, in *Clean Energy*, the court held unlawful an energy analysis which relied solely on a project's compliance with Title 24, but which failed to assess the project's transportation energy impacts and lacked any discussion regarding possible uses of renewable energy. (225 Cal.App.4th at pp. 209, 213.) Therefore, the IS/MND's reliance on Title 24 compliance does not satisfy CEQA's requirement to provide a detailed assessment of the Project's likely energy impacts. (IS/MND, p. 45)

38

The IS/MND provides ***no details whatsoever*** regarding the Project's planned renewable energy use—if any—as required under *Clean Energy*. Instead, it refers to planned compliance with Title 24 and with the "reduction strategies of the City of Escondido Climate Action Plan (CAP)." (*Id*., p. 46.) These vague commitments fall far short of the robust energy analysis which CEQA requires. Instead, mitigation measures be fully enforceable through permit conditions, agreements, or other legally binding instruments. 14 CCR § 15126.4(a)(2). (*See* also, *Woodward Park Homeowners Assn., Inc. v. City of Fresno* (2007) 150 Cal.App.4th 683,

730 [project proponent's agreement to a mitigation by itself is insufficient; mitigation measure must be an enforceable requirement].) Similarly, a CEQA lead agency may not rely on
38 cont mitigation measures to reduce a project's impacts if the measures are not enforceable. (*Id.*) Because the proposed CAP strategies are not formally adopted by the IS/MND as mitigation measures, there is no guarantee that they "would be implemented, monitored, and enforced" at the Project site.

An EIR is therefore required to evaluate the Project's likely energy impacts, including by
39 providing a more detailed quantitative analysis of the Project's planned use of renewable and/or fossil-fuel-derived energy resources. Legally enforceable mitigation measures must also be properly adopted to reduce the Project's likely energy impacts.

IV. CONCLUSION

For the foregoing reasons, the IS/MND for the proposed Project fails to comply with
40 CEQA. Substantial evidence supports a fair argument that the Project may have significant impacts on biological resources and energy. Moreover, the IS/MND failed to adequately investigate baseline conditions or mitigate the Project's likely impacts. SAFER therefore respectfully requests that you decline to adopt the IS/MND and instead undertake the necessary efforts to prepare an EIR for the proposed Project. Thank you for considering these comments.

Sincerely,

Adam Frankel
LOZEAU | DRURY LLP

EXHIBIT A

LETTER 2 - EXHIBIT A

Shawn Smallwood, PhD
3108 Finch Street
Davis, CA 95616

Jay Paul, Senior Planner
City of Escondido Planning Division
201 North Broadway
Escondido, CA 92025-2798

7 September 2022

RE: ViaWest Group – 2351 Meyers Avenue

Dear Mr. Paul,

A-1

I write to comment on the Initial Study and Mitigated Negative Declaration (IS/MND) prepared for the proposed ViaWest Group – 2351 Meyers Avenue Project, which I understand would add a warehouse with 67,300 sf of floor space on 4.95 acres (4.26 acres according to project description) at 2351 Meyers Avenue between E. Barham Drive and Corporate Drive (City of Escondido 2022). In support of my comments, I reviewed two biological resources reports (Dudek 2018, 2021).

A-2

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.

A-3

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 26 August 2022. She walked the site's eastern edge, stopping to scan for wildlife with use of binoculars. Conditions were cloudy to clear with 2 MPH wind from the west and temperatures ranged 67—75° F. The southern half of the proposed project site was fenced off for construction (Photos 2 and 3). The northern half of the proposed project site was covered by non-native grasses that have been previously mowed (Photos 1 and 2).

A-4

Noriko detected 13 species of vertebrate wildlife at or near the site (Table 1), 1 of which was a special-status species. Noriko saw western fence lizard (Photo 4), snowy egret and American crows (Photos 5 and 6), mourning doves (Photo 7), and burrows of Botta's

A-4 cont

pocket gopher burrows on site (Photo 8). Fewer species than expected were detected, but this was probably due to the construction activity at the Sunrise Project and the use of the southern half (ca. 60%) of the site of the proposed project as a construction staging area for the Sunrise Project. Despite the loss of visual access to more than half the site, Noriko still managed to see enough of the wildlife community to confirm that the site is inherently rich in wildlife.

A-5

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

Noriko Smallwood

A-6

Photos 1, 2, and 3. *Views of the site from the eastern edge looking W (top), looking SW (middle), and looking NW (bottom), 26 August 2022.*

A-7

Table 1. *Species of wildlife Noriko observed during 2.75 hours of survey on 26 August 2022.*

Common name	**Species name**	**Status**[1]	**Notes**
Western fence lizard	*Sceloporus occidentalis*		Foraged on site
Eurasian collared-dove	*Streptopelia decaocto*	Non-native	
Mourning dove	*Zenaida macroura*		Flock foraged on site
Anna's hummingbird	*Calypte anna*		
Snowy egret	*Egretta thula*		Flyover
Red-tailed hawk	*Buteo jamaicensis*	BOP	Just off site
Cassin's kingbird	*Tyrannus vociferans*		
Say's phoebe	*Sayornis saya*		
American crow	*Corvus brachyrhynchos*		Foraged on site
Common raven	*Corvus corax*		Harassed red-tailed hawk just off site
House finch	*Haemorphous mexicanus*		
California towhee	*Pipilo crissalis*		
Botta's pocket gopher	*Thomomys bottae*		Burrows

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

A-8

Photo 4. *Western fence lizard on the project site, 26 August 2022.*

A-8
cont

Photos 5 and 6. *Snowy egret, left, and American crow, right, on the project site, 26 August 2022.*

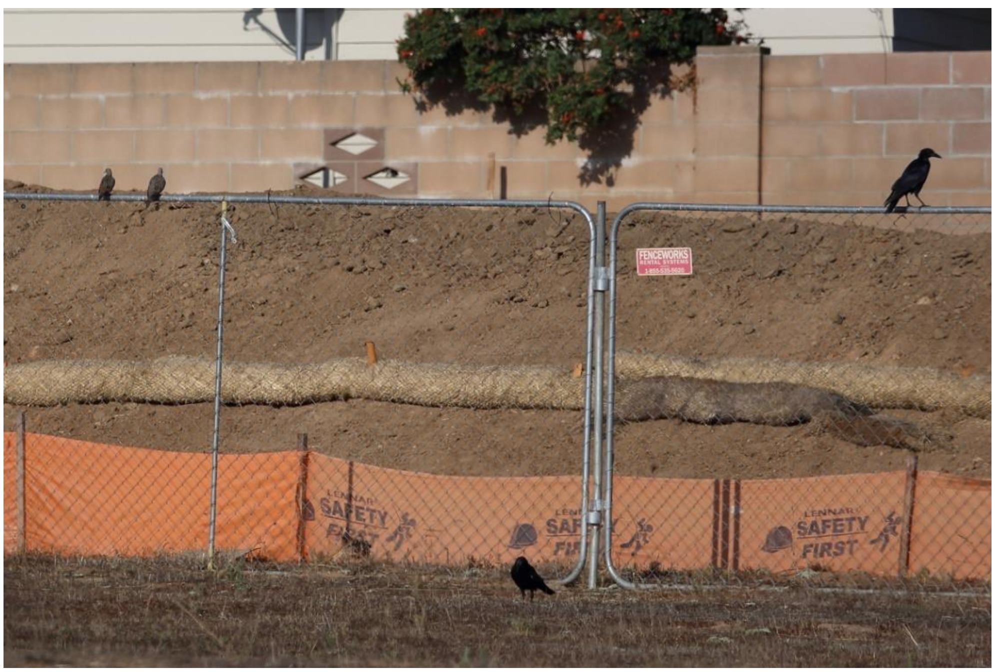


Photo 7. *Mourning doves and American crows perched and foraging on the project site, 26 August 2022.*

A-8 cont

Photo 8. *Burrow mounds of Botta's pocket gopher on the project site, 26 August 2022.*

A-9

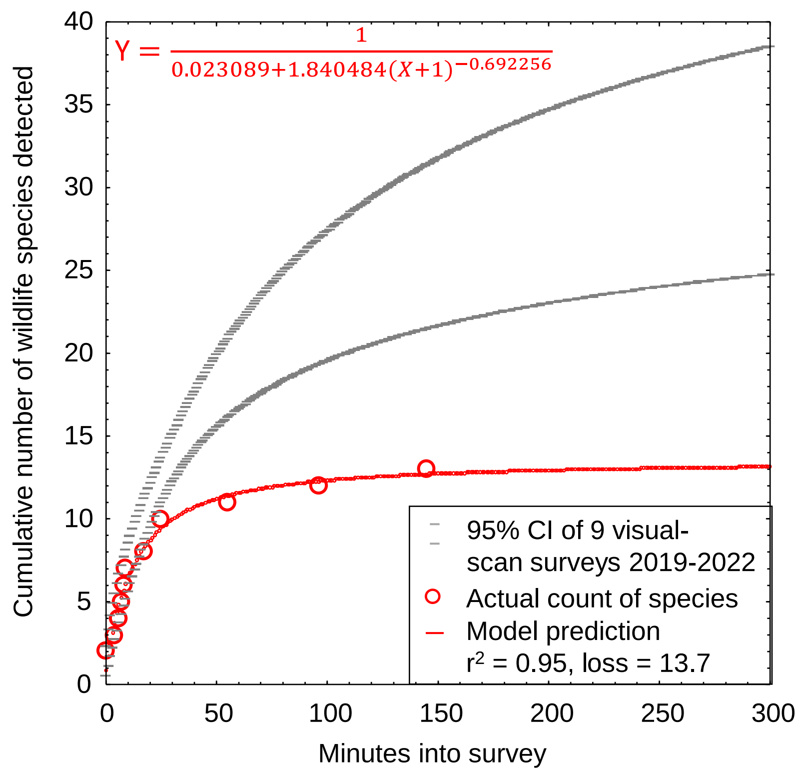
Reconnaissance-level surveys can be useful for confirming presence of species that were detected, but they can also be useful for estimating the number of species that were not detected. One can model the pattern in species detections during a survey as a means to estimate the number of species that 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 26 species of vertebrate wildlife after 5 person-hours and more species yet after more survey time. The pattern in the data indicates that the site's richness of wildlife species remained within the 95% confidence interval estimated from other project sites she and I have surveyed. The site is as rich in wildlife species as other sites we have visited, and it is amply used by wildlife (Figure 1).

A-10

The site supports wildlife, including more species than Noriko could detect during a brief reconnaissance-level survey. 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.

A-11

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 Smallwood's visual-scan survey on 26 August 2022, and compared to the mean and 95% CI of surveys at 9 sites she and I performed at other 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.*



By use of an analytical bridge, a modeling effort applied to a large, robust data set from a research site can predict the number of vertebrate wildlife species that likely make use of the site over the longer term. As part of my research, I completed a much larger survey effort across 167 km² of annual grasslands of the Altamont Pass Wind Resource Area, where from 2015 through 2019 I performed 721 1-hour visual-scan surveys, or 721 hours of surveys, at 46 stations. I used binoculars and otherwise the methods were the same as the methods Noriko and I and other consulting biologists use for surveys at proposed project sites. At each of the 46 survey stations, I tallied new species detected with each sequential survey at that station, and then related the cumulative species detected to the hours (number of surveys, as each survey lasted 1 hour) used to accumulate my counts of species detected. I used combined quadratic and simplex methods of estimation in Statistica to estimate least-squares, best-fit nonlinear models of the number of cumulative species detected regressed on hours of survey (number of surveys) at the station: $\hat{R} = \frac{1}{1/a + b\times(Hours)^c}$, where $\hat{R}$ represented cumulative species richness detected. The coefficients of determination, r^2, of the models ranged 0.88 to 1.00, with a mean of 0.97 (95% CI: 0.96, 0.98); or in other words, the models were excellent fits to the data.

A-12

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

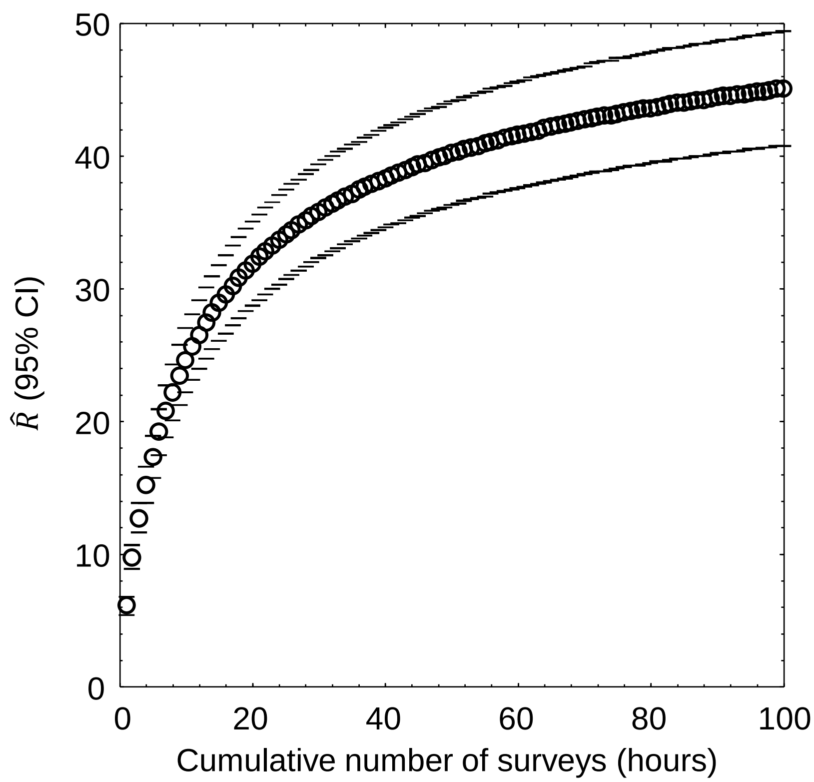
A-12 cont

hours I surveyed at the project site), which composed 21.05% of the predicted total number of species I would detect with a much larger survey effort at the research site. Given the example illustrated in Figure 2, the 13 species Noriko detected after her 2.75 hours of survey at the project site likely represented 21.05% 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, she would likely detect ${}^{13}/_{0.2105} = 62$ 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 62 predicted species, then continued surveys would eventually detect 5 special-status species of wildlife.

A-13

Again, however, my prediction of 62 species of vertebrate wildlife, including 5 special-status species of wildlife, is derived from a daytime visual-scan survey, and would not detect nocturnal mammals. The true number of species composing the wildlife community of the site must be larger. A reconnaissance-level survey should serve only as a starting point toward characterization of a site's wildlife community, but it certainly cannot alone inform of the inventory of species that use the site. 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 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.



EXISTING ENVIRONMENTAL SETTING

A-14

The first step in analysis of potential project impacts to biological resources is to accurately characterize the existing environmental setting, including the biological

A-14 cont

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.

A-15

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?

A-16

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.

A-17

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.

A-18

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.[1]

A-19

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).

A-20

How did the IS/MND address the wildlife species inventory and special-status species occurrence likelihoods at the project site?

Dudek (2021) completed a reconnaissance-level survey for wildlife sometime in July 2017, but does not report the date of the survey, when the survey started, how long it lasted, nor who performed the survey. The essential methodological details needed by the reader to assess the survey's outcome are not reported. Dudek (2021) reports having detected five species of wildlife during this survey, to which two more were added during a 2020 site visit for an unstated purpose on an undisclosed date.

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[1] 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.

A-21 The wildlife species detected by Dudek (2021) numbered half that of Noriko Smallwood's brief survey of the site, even though at the time of Noriko's survey, about 60% of the site had been converted to a construction staging area (Photos 2 and 3). Dudek's 2017 survey was highly inaccurate, and Noriko's survey was impaired by spillover of construction activity onto the project site. Additional evidence of the inaccuracy of Dudek's 2017 reconnaissance survey can be found in Dudek's (2018) detection surveys for California gnatcatcher. In that survey, which committed 15.53 person-hours spread over 6 survey dates (Dudek 2018), 40 species of wildlife were detected, including 11 special-status species (Table 2). The 2018 survey covered a larger area, as it was inclusive of the adjacent Sunrise Project, but except for California gnatcatcher, Dudek (2018) did not inform exactly where the special-status species were detected. Nevertheless, one must assume that any and all of the species detected made use of the currently proposed project site, including the California gnatcatcher that was reportedly found on the Sunrise portion of Dudek's study area. To summarize, the IS/MND makes misleading use of the wildlife surveys completed on the project site.

A-22 The IS/MND misrepresents the reconnaissance survey outcomes regarding wildlife. According to the IS/MND (page 36 and at multiple additional locations, and repeating after Dudek 2021:11), "No special-status wildlife species have moderate or high potential to occur on the project site" and "The project site has no value as habitat for endangered, rare, or threatened wildlife species." The first of these quoted conclusions is factually incorrect, as the IS/MND assigns moderate occurrence likelihood to pallid bat. And both of the conclusions are in contradiction to substantial evidence on the record. Dudek's (2018, 2021) and Noriko Smallwood's surveys together tallied 12 special-status species of wildlife on the project site or on the adjacent Sunrise Project site. Members of species detected on the Sunrise Project site likely also to have used the site of the proposed project, and since grading began at Sunrise, members of those species able to escape the grading would have ended up on the site of the proposed project. Of the 12 special-status species on site, 1 (California gnatcatcher) is a California Threatened Species, 6 are US Fish and Wildlife Service Birds of Conservation Concern, 1 is on the California Taxa to Watch List, 3 are California Birds of Prey, 4 are County of San Diego Sensitive Animals, and 2 are covered by the MHCP. A more accurate set of conclusions is (1) at least a dozen special-status species of wildlife are known to occur on the project site, and (2) the project site provides substantial habitat value to threatened, rare or sensitive species.

Environmental Setting informed by Desktop Review

A-23 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 identity those species yet to be detected at the site but which have been documented to occur nearby or whose available habitat associations

A-23 cont

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).

A-24

The IS/MND is inadequately informed by a literature and data base review. The IS/MND inappropriately uses California Natural Diversity Data Base (CNDDB) to determine which species have potential to occur in the project area. By including only species whose documented occurrences within the nearest CNDDB quadrangles, 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. CNDDB was not designed to support absence determinations or to screen out species from characterization of a site's wildlife community. As noted by CNDDB, "*The CNDDB is a positive sighting database. It does not predict where something may be found. We map occurrences only where we have documentation that the species was found at the site. There are many areas of the state where no surveys have been conducted and therefore there is nothing on the map. That does not mean that there are no special status species present*." The IS/MND misuses CNDDB.

A-25

CNDDB relies entirely on volunteer reporting from biologists who were allowed access to whatever real properties they report from. Many properties have never been surveyed by biologists. Many properties have been surveyed, but the survey outcomes never reported to CNDDB. Many properties have been surveyed multiple times, but not all survey outcomes reported to CNDDB. Furthermore, CNDDB is interested only in the findings of special-status species, which means that species more recently assigned special status will have been reported many fewer times to CNDDB than were species assigned special status since the inception of CNDDB. Because wrentit, California thrasher and multiple other species were not assigned special status until 2021, these species would have lacked records in CNDDB when the reconnaissance surveys were completed. This lack of CNDDB records had nothing to do with true geographic distributions of the species at issue. And because negative findings are not reported to CNDDB, CNDDB cannot provide the basis for estimating occurrence likelihoods, either.

A-26

In my assessment based on database reviews and on reconnaissance surveys, 124 special-status species of wildlife are known to occur near enough to the site to be analyzed for occurrence potential at one time or another (Table 2). Of these, 12 were confirmed on site by reconnaissance surveys, and database occurrences include 26 (21%) within 1.5 miles of the site, 33 (27%) within 1.5 and 4 miles ('Nearby'), and 49 (40%) within 4 to 30 miles ('In region'). More than half (57%) of the potentially-occurring species in Table 2 have been recorded within 4 miles of the site. With so many species known to occur so close to the project site, it is easy to conclude that the site carries a lot of potential for supporting special-status species of wildlife. On any given day, one or more of these species likely make use of the project site, but multiple surveys are needed to document that use (see Figures 1 and 2). Sufficient survey effort should be directed to the site to either confirm these species use the site or to support absence determinations. But surveys completed to date cannot support an absence determination assigned to any of these species, including California gnatcatcher.

Table 2. *Occurrence likelihoods of special-status bird species at or near the proposed project site, according to eBird/iNaturalist records (https://eBird.org, https://www.inaturalist.org) and on-site survey findings. 'Very close' indicates within 1.5 miles of the site, "nearby" indicates within 1.5 and 4 miles, and "in region" indicates within 4 and 30 miles, and 'in range' means the species' geographic range overlaps the site.*

Common name, *Species name*	**Status[1]**	**MHCP cover**	**Occurrence likelihood**	
			IS/MND [2]	**Data base records, Site visits[3]**
Quino checkerspot butterfly, *Euphydryas editha quino*	FE, CSD1			In region
Monarch butterfly, *Danaus plexippus*	FC, CSD2			**Nearby**
Crotch's bumble bee, *Bombus crotchii*	CCE		Low	Nearby
Western spadefoot, *Spea hammondii*	SSC, CSD2	Yes	Low	Nearby
Arroyo toad, *Anaxyrus californicus*	FE, SSC		None	Nearby
Western pond turtle, *Emys marmorata*	SSC	Yes	None	In region
San Diego Banded gecko, *Coleonyx variegatus abbotti*	SSC, CSD1			In region
Coast horned lizard, *Phrynosoma blainvillii*	SSC, CSD2		Low	Very close
Coronado skink, *Plestiodon skiltonianus interparietalis*	WL, CSD2		None	In region
Orange-throated whiptail, *Aspidoscelis hyperythra*	WL, CSD2	Yes	Low	On site
San Diegan tiger whiptail, *Aspidoscelis tigris stejnegeri*	SSC, CSD2		Low	Nearby
San Diegan legless lizard, *Anniella stebbinsi*	SSC		Low	In region
Coastal rosy boa, *Lichanura trivirgata*	FSC [1993] , CSD2			Nearby
California glossy snake, *Arizona elegans occidentalis*	SSC, CSD2		None	In region
San Diego ringneck snake, *Diadophis punctatus similis*	CSD2		None	Nearby
Coast patchnose snake, *Salvadora hexalepis virgultea*	SSC, CSD2			In region
Two-striped gartersnake, *Thamnophis hammondii*	SSC, CSD1			Nearby
South coast garter snake, *Thamnophis sirtalis pop. 1*	SSC, CSD2			In range
Red diamond rattlesnake, *Crotalus ruber*	SSC, CSD2		None	Nearby
Brant, *Branta bernicla*	SSC			In region
Moffitt's Canada goose, *Branta canadensis moffitti*	CSD2			Nearby
Redhead, *Aythya americana*	SSC, CSD2			Nearby
Western grebe, *Aechmophorus occidentalis*	BCC, CSD1			Nearby
Clark's grebe, *Aechmophorus clarkii*	BCC			Nearby

Common name, *Species name*	**Status**[1]	**MHCP cover**	**Occurrence likelihood**	
			IS/MND[2]	**Data base records, Site visits**[3]
Western yellow-billed cuckoo, *Coccyzus americanus occidentalis*	FT, CE, BCC		None	In region
Black swift, *Cypseloides niger*	BCC, CSD2			In region
Vaux's swift, *Chaetura vauxi*	SSC2			Very close
Costa's hummingbird, *Calypte costae*	BCC			Very close
Rufous hummingbird, *Selasphorus rufus*	BCC			On site
Allen's hummingbird, *Selasphorus sasin*	BCC			On site
Snowy plover, *Charadrius nivosus*	BCC	Yes	None	In region
Whimbrel, *Numenius phaeopus*	BCC			In region
Long-billed curlew, *Numenius americanus*	BCC, WL, CSD2			In region
Marbled godwit, *Limosa fedoa*	BCC			In region
Short-billed dowitcher, *Limnodromus griseus*	BCC			In region
Willet, *Tringa semipalmata*	BCC			In region
Laughing gull, *Leucophaeus atricilla*	WL, CSD2			In region
Heermann's gull, *Larus heermanni*	BCC			In region
Western gull, *Larus occidentalis*	BCC			Very close
California gull, *Larus californicus*	WL, CSD2			Very close
California least tern, *Sternula antillarum browni*	FE, CE, FP	Yes	None	In region
Caspian tern, *Hydroprogne caspia*	BCC, CSD1			Nearby
Common loon, *Gavia immer*	SSC CSD2			In region
Double-crested cormorant, *Phalacrocorax auritus*	WL, CSD2			Very close
American white pelican, *Pelacanus erythrorhynchos*	SSC1, CSD2			Very close
Least bittern, *Ixobrychus exilis*	SSC, CSD2		None	Nearby
Green heron, *Butorides striatus*	CSD2			Very close
White-faced ibis, *Plegadis chihi*	WL, CSD1	Yes	None	Very close
Turkey vulture, *Cathartes aura*	BOP, CSD 1			Very close
Osprey, *Pandion haliaetus*	WL, BOP, CSD1	Yes		Very close
White-tailed kite, *Elanus leucurus*	CFP, WL, BOP, CSD1		Low	Very close

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Common name, *Species name*	Status[1]	MHCP cover	Occurrence likelihood	
			IS/MND [2]	Data base records, Site visits[3]
Golden eagle, *Aquila chrysaetos*	BGEPA, BCC, CFP, CSD1		Low	Very close
Northern harrier, *Circus cyaneus*	SSC3, BOP, CSD1		None	Very close
Sharp-shinned hawk, *Accipiter striatus*	BOP, CSD1			Very close
Cooper's hawk, *Accipiter cooperi*	WL, BOP, CSD1	Yes	Low	Very close
Bald eagle, *Haliaeetus leucocephalus*	BGEPA, BCC, CFP, CSD1			Nearby
Red-shouldered hawk, *Buteo lineatus*	BOP, CSD1			On site
Swainson's hawk, Buteo swainsoni	CT, BOP, CSD1		None	Very close
Zone-tailed hawk, *Buteo albonotatus*	BOP			Very close
Red-tailed hawk, *Buteo jamaicensis*	BOP			On site[4]
Ferruginous hawk, *Buteo regalis*	BOP, WL, CSD1			In region
Barn owl, *Tyto alba*	BOP, CSD2			Very close
Western screech-owl, *Megascops kennicotti*	BOP			Nearby
Great-horned owl, *Bubo virginianus*	BOP			Very close
Burrowing owl, *Athene cunicularia*	BCC, SSC2, BOP, CSD1		Low	In region
Long-eared owl, *Asio otus*	SSC3, CSD1			Nearby
Lewis's woodpecker, *Melanerpes lewis*	BCC, CSD1			Nearby
Nuttall's woodpecker, *Picoides nuttallii*	BCC			Very close
American kestrel, *Falco sparverius*	BOP			On site
Merlin, *Falco columbarius*	WL, BOP, CSD2			Very close
Peregrine falcon, *Falco peregrinus*	CFP, BCC, BOP, CSD1	Yes		Very close
Prairie falcon, Falco mexicanus	BCC, WL, BOP, CSD1			In region
Olive-sided flycatcher, *Contopus cooperi*	SSC2, CSD2			Nearby
Willow flycatcher, *Empidonax traillii*	CE, BCC			In region
Vermilion flycatcher, *Pyrocephalus rubinus*	SSC2, CSD1			Nearby
Least Bell's vireo, *Vireo belli pusillus*	FE, CE, CSD1	Yes	None	Nearby
Loggerhead shrike, *Lanius ludovicianus*	BCC, SSC2, CSD1			Nearby
Oak titmouse, *Baeolophus inornatus*	BCC			Very close

Common name, *Species name*	Status[1]	MHCP cover	Occurrence likelihood	
			IS/MND [2]	Data base records, Site visits[3]
California horned lark, *Eremophila alpestris actia*	WL, CSD2			Nearby
Bank swallow, *Riparia riparia*	CT, CSD1		None	Nearby
Purple martin, *Progne subis*	SSC2, CSD1			In region
Wrentit, *Chamaea fasciata*	BCC			On site
California gnatcatcher, *Polioptila c. californica*	CT, SSC, CSD1	Yes	None	On site
Clark's marsh wren, *Cistothorus palustris clarkae*	SSC2			In range
San Diego cactus wren, *Campylorhynchs brunneicapillus sandiegensis*	BCC, SSC1, CSD1	Yes	None	In region
California thrasher, *Toxostoma redivivum*	BCC			On site
Western bluebird, *Sialia mexicana*	CSD2	Yes		On site
Lawrence's goldfinch, *Spinus lawrencei*	BCC			On site
Grasshopper sparrow, *Ammodramus savannarum*	SSC2, CSD1			Nearby
Black-chinned sparrow, *Spizella atrogularis*	BCC			Nearby
Bell's sage sparrow, *Amphispiza b. belli*	WL, CSD1	Yes	None	In region
Oregon vesper sparrow, *Pooecetes gramineus affinis*	SSC2			Nearby
Belding's savannah sparrow, *Passerculus sandwichensis beldingi*	CE, CSD1	Yes	None	In region
Large-billed savannah sparrow, *Passerculus sandwichensis rostratus*	SSC2	Yes		In region
Southern California rufous-crowned sparrow, *Aimophila ruficeps canescens*	BCC, WL, CSD1	Yes	None	Very close
Yellow-breasted chat, *Icteria virens*	SSC3, CSD1	Yes	None	Nearby
Yellow-headed blackbird, *Xanthocephalus xanthocephalus*	SSC3			Nearby
Bullock's oriole, *Icterus bullockii*	BCC			On site
Tricolored blackbird, *Agelaius tricolor*	CT, BCC, CSD1		None	Very close
Lucy's warbler, *Leiothlypis luciae*	SSC, BCC, CSD1			In region
Virginia's warbler, *Leiothlypis virginiae*	WL, BCC			In region
Yellow warbler, *Setophaga petechia*	SSC2, CSD2		None	**Nearby**
Summer tanager, *Piranga rubra*	SSC1, CSD2			In region
Pallid bat, *Antrozous pallidus*	SSC, WBWG H, CSD2		Moderate	In region

A-27 cont

Common name, *Species name*	**Status**[1]	**MHCP cover**	**Occurrence likelihood**	
			IS/MND[2]	**Data base records, Site visits**[3]
Townsend's western big-eared bat, *Plecotus t. townsendii*	SSC, WBWG H, CSD2		Low	In region
California leaf nosed bat, *Macrotus californicus*	SSC, WBWG: H			In region
Western red bat, *Lasiurus blossevillii*	SSC, WBWG H, CSD2			In region
Hoary bat, *Lasiurus cinereus*	WBWG M			Nearby
Western yellow bat, *Lasiurus xanthinus*	SSC, WBWG H		None	In region
Small-footed myotis, *Myotis cililabrum*	WBWG M, CSD2			In region
Miller's myotis, *Myotis evotis*	WBWG M, CSD2			In region
Fringed myotis, *Myotis thysanodes*	WBWG H, CSD2			In region
Long-legged myotis, *Myotis volans*	WBWG H, CSD2			In region
Yuma myotis, Myotis yumanensis	SSC, WBWG LM, CSD2			In region
Western mastiff bat, *Eumops perotis*	SSC, WBWG H, CSD2		Low	In region
Pocketed free-tailed bat, *Nyctinomops femorosaccus*	SSC, WBWG M, CSD2		None	In region
Big free-tailed bat, *Nyctinomops macrotis*	SSC, WBWG: MH		None	In region
American badger, *Taxidea taxus*	SSC, CSD2		Low	In region
Dulzura pocket mouse, *Chaetodipus californicus femoralis*	SSC, CSD2		Low	In range
Northwestern San Diego pocket mouse, *Chaetodipus fallax fallax*	SSC, CSD2	Yes	Low	In range
Los Angeles pocket mouse, *Perognathus longimembris brevinasus*	SSC, CSD2			In region
Stephens' kangaroo rat, Dipodomys stephensi	FE, CT, CSD1	Yes	Low	In region
San Diego desert woodrat, *Neotoma lepida intermedia*	SSC, CSD2		None	Nearby
San Diego black-tailed jackrabbit, *Lepus californicus bennettii*	SSC, CSD2	Yes	None	In region

[1] Listed as FT or FE = federal threatened or endangered, BCC = U.S. Fish and Wildlife Service Bird of Conservation Concern, CT or CE = California threatened or endangered, SSC = California species of special concern (not threatened with extinction, but rare, very restricted in range, declining throughout range, peripheral portion of species' range, associated with habitat that is declining in extent), CFP = California Fully Protected (CDFG Code 3511), BOP5 = California Fish and Game Code 3503.5 (Birds of prey), and SSC1, SSC2 and SSC3 = California Bird Species of Special Concern priorities 1, 2 and 3, respectively (Shuford and Gardali 2008), and WL = Taxa to Watch List (Shuford and Gardali 2008), WBWG = Western Bat Working Group listing as low, moderate or high

A-27 cont

priority, CSD1 and CSD2 = Group 1 = Group 1 and Group 2 species on County of San Diego Sensitive Animal List (County of San Diego 2010).

[2] Reported in Dudek (2018); I replaced "not expected" with "none"

[3] Noriko saw red-tailed hawk just off site.

[4] Some of the 'On site' entries were reported from a larger study area including the adjacent Sunrise Project, but Dudek (2018) did not report specific locations.

A-28 Of the 45 special-status species the IS/MND addresses and which appear in my Table 2, 1 is given moderate likelihood of occurrence, 16 are given low likelihood of occurrence, and 28 are not expected to occur. Eleven of these 45 species have been documented within 1.5 miles of the site, 12 have been documented within 1.5 and 4 miles of the site, and 19 have been documented within 4 and 30 miles of the site. These distances are not great, putting 23 (>50%) special-status species in close proximity to the site. Most of the IS/MND's occurrence likelihood determinations do not comport with the close distances of occurrence records nor with reconnaissance survey outcomes.

A-29 The IS/MND neglects to analyze the occurrence potentials of 79 (64%) of the special-status species in Table 2. Of these, 10 were confirmed on site, and databases include occurrence records of 17 within 1.5 miles and 21 within 1.5 and 4 miles of the site. The IS/MND made insufficient use of the wildlife occurrence databases, and is not supported by due diligence.

A-30 The project would potentially affect up to 21 special-status species of wildlife in Table 2 that are covered by the MHCP. Of these 21 species, 3 have been confirmed on the project site, and 5 have been documented within 1.5 miles of the site, 3 have been documented within 1.5 and 4 miles of the site, and 9 have been documented within 4 and 30 miles of the site. The project would potentially cause impacts to these 21 species for which the MHCP is attempting to conserve, yet the IS/MND offers no form of compensatory mitigation for any of them.

A-31 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. 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.

A-32

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.

A-33

HABITAT LOSS

The project area is undergoing severe habitat fragmentation, which is a process widely believed to pose the greatest threat to wildlife conservation (Smallwood 2015). The project would contribute further to habitat fragmentation in an environmental setting in which wildlife would be devastated by further habitat fragmentation.

A-33 cont

Habitat fragmentation and habitat loss have been recognized as the most likely leading causes 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 quarter of the total nesting density of the above-referenced study sites, and applying this adjusted density to the 4.95 acres of the project site, one can predict a loss of 42 bird nests.

A-34

The loss of 42 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 122 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 13.880 birds {(nests/year × chicks/nest × number of years) + (2 adults/nest × nests/year) × (number of years ÷ years/generation)}. The project's denial to California of 139 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.

A-35

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 37), "There are no wildlife corridors or habitat linkages on-site; therefore, there are no impacts on these resources." 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.

A-36

CONFLICT WITH PROVISIONS OF ADOPTED HCP

The IS/MND claims, "The project will have no impact on the North County Multiple Habitat Conservation Plan (MHCP)." As noted above, however, 21 special-status species that are covered by the MHCP potentially occur on site, including 3 of them documented

A-36 cont

on site and 11 known to occur within a mere 4 miles of the site. The project provides no compensatory mitigation for any of these species, and the only other type of mitigation it provides is preconstruction surveys to salvage the few nesting birds biologists might be able to locate just prior to construction. The IS/MND claims to have satisfied all mitigation requirements related to the MHCP by buying mitigation credits for the take of coastal sage scrub, but this measure cannot also mitigate the impacts of 12 special-status species documented on site including the 3 covered by the MHCP. It cannot also mitigate for the 11 covered species of wildlife known to occur within 4 miles of the project site and for 10 of which detection surveys have not been implemented in support of absence determinations (meaning that these 10 species should be assumed present). Without mitigating for the impacts to these covered species, the project would conflict with the adopted MHCP. A fair argument can be made for the need to prepare and EIR to address the HCP conflict.

A-37

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 9–12), 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.

A-38

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 next to Vasco Road (Brown et al. 2016). Brown et al.'s (2016) adjustment factors for carcass persistence resembled those of Santos et al. (2011). Also applying searcher detection rates from 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 over 1.25 years and 2.5 miles of road translates to 3,900 wild animals per mile per year. 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 9. *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.*

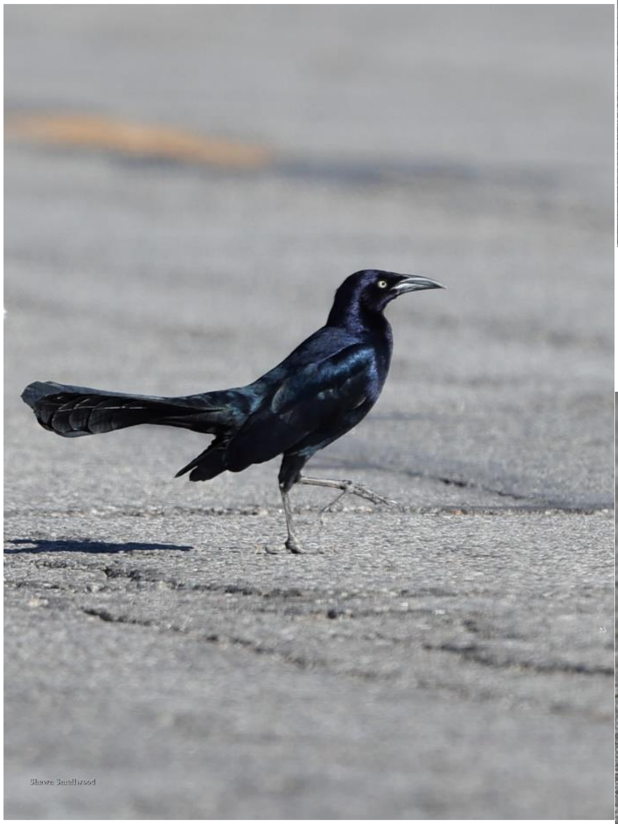

Photo 10. *Great-tailed grackle walks onto a rural road in Imperial County, 4 February 2022.*

Photo 11. *Mourning dove killed by vehicle on a California road. Photo by Noriko Smallwood, 21 June 2020.*

A-39

Photo 12. *Raccoon killed on Road 31 just east of Highway 505 in Solano County. Photo taken on 10 November 2018.*

A-40 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.

A-41 Predicting project-generated traffic impacts to wildlife

The IS/MND predicts 602 daily trips and mean 6.9 miles per trip, which would predict 1,516,137 annual vehicle miles traveled (VMT). During the Mendelsohn et al. (2009) study, 19,500 cars traveled Vasco Road daily, so the vehicle miles that contributed to my estimate of non-volant fatalities was 19,500 cars and trucks × 2.5 miles × 365 days/year × 1.25 years = 22,242,187.5 vehicle miles per 12,187 wildlife fatalities, or 1,825 vehicle miles per fatality. This rate divided into the IS/MND's prediction of 1,516,137 annual VMT due to the project leads to a prediction of 831 vertebrate wildlife fatalities per year. **Operations over 50 years would accumulate 41,550 wildlife fatalities**. Assuming the rates of fatalities found at Vasco Road (Mendelsohn et al. 2009) would apply to the proposed project, the annual number of wildlife fatalities resulting from project operations would include 133 members of special-status species. 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.

A-42 The IS/MND predicts construction would generate an estimated 326,516 VMT. The above rate of 1,825 vehicle miles per fatality would predict 179 wildlife fatalities just from construction traffic. Assuming the rates of fatalities found at Vasco Road (Mendelsohn et al. 2009) would apply to the proposed project, the 179 wildlife fatalities resulting from construction would include 29 members of special-status species.

A-43 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.

CUMULATIVE IMPACTS

A-44 The IS/MND provides a flawed analysis; it provides no analysis of cumulative impacts specific to biological resources. According to the IS/MND, the project would contribute nothing to cumulative impacts because all project impacts were determined less than significant or less than significant with mitigation. 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."

A-45 The cumulative effects analysis also relies on a false standard for determining whether a project's impacts will be cumulatively considerable. The IS/MND implies that a given project impact is cumulatively considerable only when it has not been fully mitigated. Essentially, the IS/MND implies that cumulative impacts are really residual impacts left over by inadequate mitigation at the project. This notion of residual impact being the source of cumulative impact is inconsistent with CEQA's definition of cumulative effects. Individually mitigated projects do not negate the significance of cumulative impacts. If they did, then CEQA would not require a cumulative effects analysis. Even where impacts may be individually limited, their "incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects." (CEQA Guidelines §15064(h)(1)).

A-46 Another fundamental flaw of the cumulative effects analysis is its reliance on an existing plan as some form of umbrella mitigation without explaining how the umbrella of the other plan would cover the project's contribution to cumulative impacts. According to the IS/MND (page 117), "the project is generally consistent with the City's General Plan 2030 Update." according to CEQA Guidelines §15064(h)(3), "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 cited plan would minimize, avoid or offset the project's contributions to cumulative impacts.

A-47 A fair argument can be made for the need to prepare an EIR to provide sufficient analysis of potential project contributions to cumulative impacts and whether and how such impacts can be mitigated.

MITIGATION MEASURES

A-48 The IS/MND (page 36) claims, "...all required biological mitigation has been satisfied. Due to the previous purchase of mitigation credits and the current disturbed nature of the site, the project site has no value as habitat for endangered, rare, or threatened plant species." Based on this false premise, the IS/MND proposes only one mitigation measure for biological resources adversely affected by the project. The IS/MND refers to it as a compliance measure to an adopted Habitat Conservation Plan.

A-49

Compliance Measure 1: Construction Timing and Pre-Construction Surveys for Nesting Birds

I concur with timing construction to avoid the avian breeding season. I must add, however, that no matter when construction takes place, habitat would be permanently destroyed along with the reproductive capacity that habitat supports. The project offers no compensatory mitigation for this impact.

Preconstruction surveys should be performed for nesting birds and bat roosts, but not as a substitute for detection surveys. Preconstruction surveys are not designed or intended to reduce project impacts. Preconstruction surveys are only intended as last-minute, one-time salvage and rescue operations targeting readily detectable nests or individuals before they are crushed under heavy construction machinery. Because most special-status species are rare and cryptic, and because most bird species are expert at hiding their nests lest they get predated, most of their nests will not be detected by preconstruction surveys without prior support of detection surveys. Locating all of the nests on site would require more effort than is committed during preconstruction surveys.

Detection surveys are needed to inform preconstruction take-avoidance surveys by mapping out where biologists performing preconstruction surveys are most likely to find animals or their breeding sites. Detection surveys are needed to assess impacts and to inform the formulation of appropriate mitigation measures, because preconstruction surveys are not intended for these roles either.

Following detection surveys, preconstruction surveys should be performed. However, an EIR should be prepared, and it should detail how the results of preconstruction surveys would be reported. Without reporting the results, preconstruction surveys are vulnerable to serving as an empty gesture rather than a mitigation measure. For these reasons, and because the salvage of readily detectable animals or their nests would not prevent the permanent loss of habitat, the proposed mitigation measure is not sufficient to reduce the project's impacts to nesting birds to less than significant levels.

A-50

RECOMMENDED MEASURES

The IS/MND proposes only preconstruction surveys, but no compensatory mitigation for habitat loss or losses to project-generated traffic. 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.

A-51

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

A-51 cont species' experts. Survey protocols that need to be implemented include CDFW (2012) for burrowing owls. 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 in the area and whether bats forage on site, especially pallid bat, which the IS/MND assigns moderate occurrence likelihood.

A-52

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

A-53

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.

A-54

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.

A-55

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).

A-56

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.

A-57

Thank you for your attention,

Shawn Smallwood

Shawn Smallwood, Ph.D.

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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

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

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

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

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

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

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

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

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

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

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

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

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

Senior Systems Ecologist, 1994-1995, EIP Associates, Sacramento, California. Provided consulting services in environmental planning, and quantitative assessment of land units for their conservation and restoration opportunities basedon 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 founds 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 interspersion of treatments for experimental testing of critical habitat elements. I provided a report to Northern Territories, Inc.

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

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

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

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

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

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

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

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

Peer Reviewed Publications

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

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

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

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

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

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

Smallwood, K. S., and D. A. Bell. 2020. Effects of wind turbine curtailment on bird and bat fatalities. Journal of Wildlife Management 84:684-696. DOI: 10.1002/jwmg.21844

Kitano, M., M. Ino, K. S. Smallwood, and S. Shiraki. 2020. Seasonal difference in carcass persistence rates at wind farms with snow, Hokkaido, Japan. Ornithological Science 19: 63 – 71.

Smallwood, K. S. and M. L. Morrison. 2018. Nest-site selection in a high-density colony of burrowing owls. Journal of Raptor Research 52:454-470.

Smallwood, K. S., D. A. Bell, E. L. Walther, E. Leyvas, S. Standish, J. Mount, B. Karas. 2018. Estimating wind turbine fatalities using integrated detection trials. Journal of Wildlife Management 82:1169-1184.

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

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

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

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

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

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

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

EXHIBIT B

LETTER 2 - EXHIBIT B

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

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September 9, 2022

Adam Frankel
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1939 Harrison Street, Suite 150
Oakland, CA 94618

Subject: Comments on the 2351 Meyers Avenue (SCH No. 2022080408)

Dear Mr. Frankel,

B-1 We have reviewed the August 2022 Initial Study and Mitigated Negative Declaration ("IS/MND") for the 2351 Meyers Avenue ("Project") located in the City of Escondido ("City"). The Project proposes to construct 33,650-square-feet ("SF") of manufacturing space, 21,650-SF of warehouse space, 12,000-SF of office space, and 190 parking spaces on the 4.26-acre site.

B-2 Our review concludes that the IS/MND fails to adequately evaluate the Project's air quality, health risk, and greenhouse gas impacts. As a result, emissions and health risk impacts associated with construction and operation of the proposed Project are underestimated and inadequately addressed. An Environmental Impact Report ("EIR") should be prepared to adequately assess and mitigate the potential air quality, health risk, and greenhouse gas impacts that the Project may have on the environment.

B-3

Air Quality

Unsubstantiated Input Parameters Used to Estimate Project Emissions

The IS/MND's air quality analysis relies on emissions calculated with the California Emissions Estimator Model ("CalEEMod") Version 2020.4.0 (p. 29).[1] CalEEMod provides recommended default values based on site-specific information, such as land use type, meteorological data, total lot acreage, project type and typical equipment associated with project type. If more specific project information is known, the user can change the default values and input project-specific values, but the California Environmental

[1] "CalEEMod Version 2020.4.0." California Air Pollution Control Officers Association (CAPCOA), May 2021, *available at:* https://www.aqmd.gov/caleemod/download-model.

B-3 cont

Quality Act ("CEQA") requires that such changes be justified by substantial evidence. Once all of the values are inputted into the model, the Project's construction and operational emissions are calculated, and "output files" are generated. These output files disclose to the reader what parameters are utilized in calculating the Project's air pollutant emissions and make known which default values are changed as well as provide justification for the values selected.

B-4

When reviewing the Project's CalEEMod output files, provided in the Air Quality, Greenhouse Gas, and Energy Impact Study ("AQ & GHG Study") as Appendix 3 to the IS/MND, we found that several model inputs are not consistent with information disclosed in the IS/MND. As a result, the Project's construction-related emissions are underestimated. An EIR should be prepared to include an updated air quality analysis that adequately evaluates the impacts that Project construction would have on local and regional air quality.

B-5

Failure to Model All Proposed Land Uses

According to the IS/MND:

> "The building includes 6,000 square feet of office on the first floor and 6,000 square feet of office space on the mezzanine. The other 55,300 square feet are divided into 33,650 square feet of manufacturing area and 21,650 square feet of warehousing area" (p. 4).

As such, the model should have included 33,650-SF of manufacturing space. However, review of the CalEEMod output files demonstrates that the "06232010 Meyers Avenue Industrial Project" model includes all 55,300-SF as "Unrefrigerated Warehouse-No Rail" (see excerpt below) (Appendix 3, pp. 81, 106, 132).

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Office Building	17.15	1000sqft	0.15	17,150.00	0
Unrefrigerated Warehouse-No Rail	51.75	1000sqft	1.19	51,750.00	0
Other Non-Asphalt Surfaces	2.06	Acre	2.06	89,733.60	0
Parking Lot	169.00	Space	1.52	67,600.00	0

As demonstrated above, the model fails to distinguish between the proposed warehouse and manufacturing spaces. These inconsistencies present an issue, as CalEEMod includes 63 different land use types that are each assigned a distinctive set of energy usage emission factors.[2] Thus, by failing to include the proposed manufacturing land use, the model may underestimate the Project's operational emissions and should not be relied upon to determine Project significance.

B-6

Underestimated Parking Land Use Size

According to the IS/MND:

[2] "Appendix D – Default Data Tables" California Air Pollution Control Officers Association (CAPCOA), June 2021, *available at:* https://www.aqmd.gov/caleemod/user's-guide, p. D-305.

B-6 cont

> "The following project design considerations are also being proposed. One hundred and fifty-one (151) parking spaces, […] Eighteen future electric vehicle charging spaces, […] Twenty-one (21) clean air/vanpool/electric vehicle spaces" (p. 4).

As such, the model should have included a 190 parking spaces.[3] However, review of the CalEEMod output files demonstrates that the "06232010 Meyers Avenue Industrial Project" model includes only 169 parking spaces (see excerpt below) (Appendix 3, pp. 81, 106, 132).

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Office Building	17.15	1000sqft	0.15	17,150.00	0
Unrefrigerated Warehouse-No Rail	51.75	1000sqft	1.19	51,750.00	0
Other Non-Asphalt Surfaces	2.06	Acre	2.06	89,733.60	0
Parking Lot	169.00	Space	1.52	67,600.00	0

As demonstrated above, the proposed parking area is underestimated by 21 spaces.[4] This underestimation presents an issue, as the square footage of parking land uses is used for certain calculations such as determining the area to be painted and stripped (i.e., VOC emissions from architectural coatings) and area to include lighting (i.e., energy impacts).[5] Thus, by underestimating the proposed number of parking spaces, the model underestimates the Project's construction-related and operational emissions and should not be relied upon to determine Project significance.

Unsubstantiated Reductions to Architectural and Area Coating Emission Factors

B-7

Review of the CalEEMod output files demonstrates that the "06232010 Meyers Avenue Industrial Project" model includes several reductions to the default architectural and area coating emission factors (see excerpt below) (Appendix 3, pp. 82, 107, 133).

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Nonresidential_Exterior	250.00	50.00
tblArchitecturalCoating	EF_Nonresidential_Interior	250.00	50.00
tblArchitecturalCoating	EF_Parking	250.00	100.00
tblArchitecturalCoating	EF_Residential_Exterior	250.00	50.00
tblArchitecturalCoating	EF_Residential_Interior	250.00	50.00
tblAreaCoating	Area_EF_Nonresidential_Exterior	250	50
tblAreaCoating	Area_EF_Nonresidential_Interior	250	50
tblAreaCoating	Area_EF_Parking	250	100
tblAreaCoating	Area_EF_Residential_Exterior	250	50
tblAreaCoating	Area_EF_Residential_Interior	250	50

As demonstrated above, the residential and nonresidential interior and exterior architectural and area coating emission factors are each reduced from their default values of 250- to 50-grams per liter ("g/L"). Furthermore, the parking architectural and area emission factors are both reduced from their default

[3] Calculated: 151 parking spaces + 18 future EV spaces + 21 EV spaces = 190 total parking spaces.
[4] Calculated: 190 proposed parking spaces – 169 modeled parking spaces = 21 underestimated parking spaces.
[5] "CalEEMod User's Guide." California Air Pollution Control Officers Association (CAPCOA), May 2021, *available at:* https://www.aqmd.gov/caleemod/user's-guide, p. 29.

B-7 cont

values of 250- to 100- g/L. As previously mentioned, the CalEEMod User's Guide requires any changes to model defaults be justified. [6] According to the "User Entered Comments & Non-Default Data" table, the justification provided for these changes is:

> "Assumed compliance with SDAPCD Rule 67.0.1" (Appendix 3, pp. 82, 107, 133).

However, we cannot verify the accuracy of the revised architectural and area coating emission factors based on SDAPCD Rule 67.01 alone. The SDAPCD Rule 67.01 VOC Content of Coatings Table provides the required VOC limits (grams of VOC per liter of coating) for 48 different coating categories.[7] The VOC limits for each coating varies from a minimum value of 50 g/L to a maximum value of 730 g/L. As such, SDAPCD Rule 67.01 fails to substantiate the reductions to the default coating values without more information regarding what category of coating will be used. As the IS/MND fails to explicitly require the use of a specific type or types of coating, we are unable to verify the revised emission factors assumed in the model.

These unsubstantiated reductions present an issue, as CalEEMod uses the architectural and area coating emission factors to calculate the Project's reactive organic gas/volatile organic compound ("ROG"/"VOC") emissions.[8] Thus, by including unsubstantiated reductions to the default architectural and area coating emission factors, the model may underestimate the Project's construction-related and operational ROG/VOC emissions and should not be relied upon to determine Project significance.

B-8

Unsubstantiated Changes to Acres of Grading Value

Review of the CalEEMod output files demonstrates that the "06232010 Meyers Avenue Industrial Project" model includes a manual reduction to the default acres of grading value (see excerpt below) (Appendix 3, pp. 82, 107, 133).

Table Name	Column Name	Default Value	New Value
tblGrading	AcresOfGrading	8.00	4.10

As previously mentioned, the CalEEMod User's Guide requires any changes to model defaults be justified.[9] According to the "User Entered Comments & Non-Default Data" table, the justification provided for this change is:

> "~14,000 CY of export anticipated. 4.1 acres of graded area" (Appendix 3, pp. 82, 107, 133).

[6] "CalEEMod Version 2020.4.0." California Air Pollution Control Officers Association (CAPCOA), May 2021, *available at:* https://www.aqmd.gov/caleemod/user's-guide, p. 1, 14.
[7] "Rule 67.0.1 Architectural Coatings." SDAPCD, June 2015, *available at:* https://www.sandiegocounty.gov/content/dam/sdc/apcd/PDF/Rules_and_Regulations/Prohibitions/APCD_R67-0-1.pdf, p. 11-12, Table 1. VOC Content of Coatings.
[8] "CalEEMod Version 2020.4.0." California Air Pollution Control Officers Association (CAPCOA), May 2021, *available at:* https://www.aqmd.gov/caleemod/user's-guide, p. 35, 40.
[9] "CalEEMod User's Guide." California Air Pollution Control Officers Association (CAPCOA), May 2021, *available at:* https://www.aqmd.gov/caleemod/user's-guide, p. 1, 14.

B-8 cont

However, this justification is insufficient, as according to the CalEEMod User's Guide:

> "[T]he dimensions (e.g., length and width) of the grading site have no impact on the calculation, only the total area to be graded. In order to properly grade a piece of land multiple passes with equipment may be required. The acres is based on the equipment list and days in grading or site preparation phase according to the anticipated maximum number of acres a given piece of equipment can pass over in an 8-hour workday."[10]

As demonstrated above, the acres of grading value is based on construction equipment and the length of the grading and site preparation phases. Thus, as the dimensions of the Project site have no impact on the acres of grading value, the reduction remains unsupported.

This unsubstantiated reduction presents an issue, as CalEEMod uses the acres of grading value to estimate the dust emissions associated with grading.[11] Thus, by including an unsubstantiated reduction to the default acres of grading value, the model may underestimate the Project's construction-related emissions and should not be relied upon to determine Project significance.

B-9

Updated Analysis Indicates a Potentially Significant Air Quality Impact

In an effort to more accurately estimate the Project's construction-related and operational emissions, SWAPE prepared an updated CalEEMod model, using the Project-specific information provided by the IS/MND. In our updated model, we included all the proposed land use types and sizes, and omitted the unsubstantiated changes to the architectural and area coating emission factors and acres of grading value.[12]

B-10

SWAPE's updated analysis estimates that the Project's construction-related VOC emissions would exceed the applicable San Diego Air Pollution Control District ("SDAPCD") threshold of 75 pounds per day ("lbs/day"), as referenced by the IS/MND (p. 31, Table 10) (see table below).

SWAPE Criteria Air Pollutant Emissions

Construction	**VOC** (lbs/day)
IS/MND	20.42
SWAPE	85.85
% Increase	320%
SDAPCD Threshold	**75**
Exceeds?	***Yes***

[10] "Appendix A – Calculation Details for CalEEMod." California Air Pollution Control Officers Association (CAPCOA), May 2021, *available at:* http://www.aqmd.gov/caleemod/user's-guide, p. 9.
[11] "Appendix A – Calculation Details for CalEEMod." California Air Pollution Control Officers Association (CAPCOA), May 2021, *available at:* https://www.aqmd.gov/caleemod/user's-guide, p. 9.
[12] See Attachment A for updated air modeling.

B-11 As demonstrated in the table above, the Project's construction-related VOC emissions, as estimated by SWAPE, increase by approximately 123% and exceed the applicable SDAPCD significance threshold. Thus, the updated model demonstrates that the Project would result in a potentially significant air quality impact that was not previously identified or addressed in the IS/MND. As a result, an EIR should be prepared to adequately assess and mitigate the potential air quality impacts that the Project may have on the environment.

B-12

Diesel Particulate Matter Emissions Inadequately Evaluated

The IS/MND concludes that the Project would have a less-than-significant health risk impact without conducting a quantified construction or operational health risk analysis ("HRA"). Regarding the health risk impacts associated with the Project construction, the IS/MND states:

> "Given the relatively limited number of heavy-duty construction equipment and construction schedule, the proposed project can qualitatively be determined to not result in a substantial long-term source of toxic air containment emissions and corresponding individual cancer risk. Furthermore, construction-based particulate matter (PM) emissions (including diesel exhaust emissions) do not exceed any local or regional thresholds. Therefore, no significant short-term toxic air contaminant impacts would occur during the proposed project's construction, and the project would have a less than significant impact" (p. 32).

B-13 As demonstrated above, the IS/MND concludes that the Project would result in a less-than-significant construction-related health risk impact because the short-term construction duration and limited amount of heavy-duty equipment and haul trucks would not result in substantial toxic air contaminant ("TAC") emissions. Regarding the health risk impacts associated with the Project operation, the IS/MND states:

> "Finally, the most recent Health Risk Assessment for Proposed Land Use Projects prepared by CAPCOA (July 2009) recommends avoiding siting new sensitive land uses within 1,000 feet of a distribution center (that accommodates more than 100 trucks per day, more than 40 trucks with operating transport refrigeration units (TRUs) per day, or where TRU unit operations exceed 300 hours per week). A summary of the basis for the distance recommendations can be found in the ARB Handbook Air Quality and Land Use Handbook: A Community Health Perspective.
>
> The project is an unrefrigerated warehouse spec building and would not include TRUs. In addition, at only 51,750 square feet of industrial use, the project does not propose any activity with 100 trucks or greater per day. Therefore, a quantitative health risk assessment would not be required for the said project as emissions are far below thresholds. Significant TAC impacts from the project-related operational diesel particulate matter (DPM) sources are not anticipated. No significant long-term operations-related TAC impacts from the proposed project on nearby sensitive receptors would occur" (p. 33 - 34).

B-14 As demonstrated above, the IS/MND concludes that the Project would result in a less-than-significant operational health risk impact because the proposed Project would not generate more than 100 truck

B-14 cont

trips per day. 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 four reasons.

B-15

First, the IS/MND states that the Project is exempt from the preparation of an HRA according to CAPCOA, as the proposed office building would not generate more than 100 truck deliveries per day. This is incorrect, as the above-referenced CAPCOA guidance is in reference to the recommended preparation of an HRA for the development of a new *receptor*, not for a new *source*. Specifically, CAPCOA states:

> "Avoid siting new sensitive land uses within 1,000 feet of a distribution center (that accommodates more than 100 trucks per day, more than 40 trucks with operating transport refrigeration units (TRUs) per day, or where TRU unit operations exceed 300 hours per week)."[13]

B-16

As demonstrated above, the correct use of this guidance would be to avoid locating new residential developments within 1,000-feet of an existing distribution center. As such, the IS/MND's conclusion that the Project is exempt from the preparation of an HRA is based on an incorrect interpretation of CAPCOA guidance and should not be relied upon.

B-17

Second, by failing to prepare a quantified construction and operational 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." [14] This poses a problem, as according to the IS/MND, construction of the Project would produce DPM emissions through the exhaust stacks of construction equipment over a duration of approximately 16 to 20 months (p. 5). As indicated above, operation of the Project is anticipated to generate 602 daily vehicle trips, which would produce additional exhaust emissions and continue to expose nearby, existing sensitive receptors to DPM emissions (p. 29). However, the IS/MND fails to evaluate the TAC emissions associated with Project construction and operation or indicate the concentrations at which such pollutants would trigger adverse health effects. Thus, without making a reasonable effort to connect the Project's 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.

B-18

Third, the Office of Environmental Health Hazard Assessment ("OEHHA"), the organization responsible for providing guidance on conducting HRAs in California, released its most recent *Risk Assessment Guidelines: Guidance Manual for Preparation of Health Risk Assessments* in February 2015. This guidance document describes the types of projects that warrant the preparation of an HRA. Specifically, OEHHA recommends that all short-term projects lasting at least 2 months assess cancer risks.[15] Furthermore, according to OEHHA:

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[13] "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, p. 9, Table 2.

[14] "Sierra Club v. County of Fresno." Supreme Court of California, December 2018, a*vailable at:* https://ceqaportal.org/decisions/1907/Sierra%20Club%20v.%20County%20of%20Fresno.pdf.

[15] "Risk Assessment Guidelines: Guidance Manual for Preparation of Health Risk Assessments." OEHHA, February 2015, *available at:* https://oehha.ca.gov/media/downloads/crnr/2015guidancemanual.pdf, p. 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)."[16]

B-18 cont

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 construction period. Furthermore, OEHHA recommends that an exposure duration of 30 years should be used to estimate the individual cancer risk at the maximally exposed individual resident ("MEIR").[17] While the IS/MND fails to provide the expected lifetime of the proposed Project, we can reasonably assume that the Project would operate for at least 30 years, if not more. Therefore, operation of the Project also exceeds the 2-month and 6-month requirements set forth by OEHHA and should be evaluated for the entire 30-year residential exposure duration, as indicated by OEHHA guidance. 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.

B-19

Fourth, by claiming a less-than-significant impact without conducting a quantified construction or operational HRA for nearby, existing sensitive receptors, the IS/MND fails to compare the Project's excess cancer risk to the SDAPCD's specific numeric threshold of 10 in one million.[18] Thus, in accordance with the most relevant guidance, an assessment of the health risk posed to nearby, existing receptors as a result of Project construction and operation should be conducted.

B-20

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.[19] 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").[20, 21] 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.

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[16] "Risk Assessment Guidelines: Guidance Manual for Preparation of Health Risk Assessments." OEHHA, February 2015, *available at:* https://oehha.ca.gov/media/downloads/crnr/2015guidancemanual.pdf, p. 8-18.

[17] "Risk Assessment Guidelines: Guidance Manual for Preparation of Health Risk Assessments." OEHHA, February 2015, *available at:* https://oehha.ca.gov/media/downloads/crnr/2015guidancemanual.pdf, p. 2-4.

[18] "Supplemental Guidelines for Submission of Air Toxics "Hot Spots" Program Health Risk Assessments (HRAs)." San Diego County Air Pollution Control District (SDAPCD) July 2022, *available at:* https://www.sdapcd.org/content/dam/sdapcd/documents/permits/air-toxics/Hot-Spots-Guidelines.pdf.

[19] "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

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

[21] "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.

B-21

We prepared a preliminary HRA of the Project's construction and operational health risk impact to residential sensitive receptors using the annual PM_{10} exhaust estimates from the IS/MND's CalEEMod output files. Consistent with recommendations set forth by OEHHA, we assumed residential exposure begins during the third trimester stage of life.[22] The IS/MND's CalEEMod model indicates that construction activities will generate approximately 310 pounds of DPM over the 381-day construction period.[23] 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:

$$Emission\ Rate\ \left(\frac{grams}{second}\right) = \frac{309.1\ lbs}{381\ days} \times \frac{453.6\ grams}{lbs} \times \frac{1\ day}{24\ hours} \times \frac{1\ hour}{3{,}600\ seconds} = \mathbf{0.00427\ g/s}$$

Using this equation, we estimated a construction emission rate of 0.00427 grams per second ("g/s"). Subtracting the 381-day construction period from the total residential duration of 30 years, we assumed that after Project construction, the sensitive receptor would be exposed to the Project's operational DPM for an additional 28.96 years. The IS/MND's operational CalEEMod emissions indicate that operational activities will generate approximately 10 net pounds of DPM per year throughout operation. Applying the same equation used to estimate the construction DPM rate, we estimated the following emission rate for Project operation:

$$Emission\ Rate\ \left(\frac{grams}{second}\right) = \frac{9.9\ lbs}{365\ days} \times \frac{453.6\ grams}{lbs} \times \frac{1\ day}{24\ hours} \times \frac{1\ hour}{3{,}600\ seconds} = \mathbf{0.000142\ g/s}$$

Using this equation, we estimated an operational emission rate of 0.000142 g/s. Construction and operation were simulated as a 4.26-acre rectangular area source in AERSCREEN, with approximate dimensions of 186- by 93-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 Escondido was obtained from U.S. 2020 Census data.[24]

The AERSCREEN model generates maximum reasonable estimates of single-hour DPM concentrations from the Project Site. The United States Environmental Protection Agency ("U.S. EPA") suggests that the annualized average concentration of an air pollutant be estimated by multiplying the single-hour concentration by 10% in screening procedures.[25] According to the IS/MND the nearest sensitive receptors are mobile-homes located 50 feet, or 15 meters, to the west of the Project site (p. 33). However, review of the AERSCREEN output files demonstrates that the MEIR is located approximately

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[22] "Risk Assessment Guidelines: Guidance Manual for Preparation of Health Risk Assessments." OEHHA, February 2015, *available at:* https://oehha.ca.gov/media/downloads/crnr/2015guidancemanual.pdf, p. 8-18.
[23] See Attachment B for health risk calculations.
[24] "Escondido." U.S. Census Bureau, 2020, *available at:* https://datacommons.org/place/geoId/0622804.
[25] "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.

B-21 cont

100 meters from the Project site. Thus, the single-hour concentration estimated by AERSCREEN for Project construction is approximately 7.872 µg/m^3 DPM at approximately 100 meters downwind. Multiplying this single-hour concentration by 10%, we get an annualized average concentration of 0.7872 µg/m^3 for Project construction at the MEIR. For Project operation, the single-hour concentration estimated by AERSCREEN is 0.2621 µg/m^3 DPM at approximately 100 meters downwind. Multiplying this single-hour concentration by 10%, we get an annualized average concentration of 0.02621 µg/m^3 for Project operation at the MEIR.

B-22

We calculated the excess cancer risk to the MEIR using applicable HRA methodologies prescribed by OEHHA, as recommended by SDAPCD.[26] Specifically, guidance from OEHHA and the California Air Resources Board ("CARB") recommends the use of a standard point estimate approach, including high-point estimate (i.e. 95th 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. The residential 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") utilized for the various age groups in our screening-level HRA are as follows:

[26] "Supplemental Guidelines for Submission of Rule 1200 Health Risk Assessments (HRAs)." SDAPCD, July 2019, *available at:* https://www.sandiegocounty.gov/content/dam/sdc/apcd/PDF/Toxics_Program/APCD_1200_Supplemental_Guidelines.pdf.

B-22
cont

Exposure Assumptions for Residential Individual Cancer Risk						
Age Group	**Breathing Rate** (L/kg-day)[27]	**Age Sensitivity Factor**[28]	**Exposure Duration** (years)	**Fraction of Time at Home**[29]	**Exposure Frequency** (days/year)[30]	**Exposure Time** (hours/day)
3rd 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 ($mg/kg/day^{-1}$) 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:

$Dose_{AIR}$ = dose by inhalation (mg/kg/day), per age group
C_{air} = concentration of contaminant in air (µg/m3)
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 (1x10-6, µg to mg, L to m3)

To calculate the overall cancer risk, we used the following equation for each appropriate age group:

[27] "Supplemental Guidelines for Submission of Air Toxics "Hot Spots" Program Health Risk Assessments (HRAs)." San Diego County Air Pollution Control District (SDAPCD) July 2022, *available at:* https://www.sdapcd.org/content/dam/sdapcd/documents/permits/air-toxics/Hot-Spots-Guidelines.pdf; see also "Risk Assessment Guidelines Guidance Manual for Preparation of Health Risk Assessments." OEHHA, February 2015, available at: https://oehha.ca.gov/media/downloads/crnr/2015guidancemanual.pdf.
[28] "Risk Assessment Guidelines Guidance Manual for Preparation of Health Risk Assessments." OEHHA, February 2015, available at: https://oehha.ca.gov/media/downloads/crnr/2015guidancemanual.pdf, p. 8-5 Table 8.3.
[29] "Supplemental Guidelines for Submission of Air Toxics "Hot Spots" Program Health Risk Assessments (HRAs)." San Diego County Air Pollution Control District (SDAPCD) July 2022, *available at:* https://www.sdapcd.org/content/dam/sdapcd/documents/permits/air-toxics/Hot-Spots-Guidelines.pdf, pp. 4.
[30] "Risk Assessment Guidelines Guidance Manual for Preparation of Health Risk Assessments." OEHHA, February 2015, available at: https://oehha.ca.gov/media/downloads/crnr/2015guidancemanual.pdf, p. 5-24.

$$Cancer\ Risk_{AIR} = Dose_{AIR} \times CPF \times ASF \times FAH \times \frac{ED}{AT}$$

where:

$Dose_{AIR}$ = dose by inhalation (mg/kg/day), per age group
CPF = cancer potency factor, chemical-specific $(mg/kg/day)^{-1}$
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 381-day construction schedule, the annualized average concentration for construction was used for the entire third trimester of pregnancy (0.25 years), and the first 0.79 years of the infantile stage of life (0 – 2 years). The annualized average concentration for operation was used for the remainder of the 30-year exposure period, which makes up the latter 1.21 years of the infantile stage of life, as well as the entire child (2 – 16) and adult (16 – 30 years) stages of life. The results of our calculations are shown in the table below.

B-22 cont

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	0.7872	1.07E-05
	Construction	*0.79*	*0.7872*	*1.03E-04*
	Operation	*1.21*	*0.02621*	*5.19E-06*
Infant (0 - 2)	Total	2		1.08E-04
Child (2 - 16)	Operation	14	0.02621	9.49E-06
Adult (16 - 30)	Operation	14	0.02621	1.05E-06
Lifetime		**30**		**1.29E-04**

As demonstrated in the table above, the excess cancer risks for the 3rd trimester of pregnancy, infants, children, and adults at the MEIR located approximately 100 meters away, over the course of Project construction and operation, are approximately 10.7, 108, 9.49, and 1.05 in one million, respectively. The excess cancer risk over the course of a residential lifetime (30 years) is approximately 129 in one million.

B-22 cont

The infant, child, and lifetime cancer risks exceed the SDAPCD threshold of 10 in one million, thus resulting in a potentially significant impact not previously addressed or identified by the IS/MND.[31]

B-23

SWAPE's 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."

B-24

As demonstrated above, screening-level analyses warrant further evaluation in a refined modeling approach. Thus, as SWAPE's 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.

B-25

Greenhouse Gas

Failure to Adequately Evaluate Greenhouse Gas Impacts

The IS/MND estimates that the Project would generate net annual GHG emissions of 846 metric tons of carbon dioxide equivalents per year ("MT CO_2e/year") (see excerpt below) (p. 3-42, Table 3.8-1).

Table 3.8-1 Estimated Construction and Operational GHG Emissions

Source Type	Annual GHGs ($MTCO_2e$)
Construction	*2,150*
Amortized Construction	72
Operations	774
Total	846

Notes: $MTCO_2e$ = metric tons of carbon dioxide equivalent

B-26

As such, the IS/MND concludes:

[31] "Supplemental Guidelines for Submission of Air Toxics "Hot Spots" Program Health Risk Assessments (HRAs)." San Diego County Air Pollution Control District (SDAPCD) July 2022, *available at:* https://www.sdapcd.org/content/dam/sdapcd/documents/permits/air-toxics/Hot-Spots-Guidelines.pdf.

B-26 cont

"Therefore, Project-related GHG emissions would not exceed the 900 $MTCO_2e$ per year threshold of significance. This impact would be less-than-significant, and no mitigation would be required" (p. 3-41).

B-27

Furthermore, the IS/MND relies upon the Project's consistency with CARB's 2017 Scoping Plan and the Port of San Diego Climate Action Plan ("CAP") in order to conclude that the Project would result in a less-than-significant GHG impact (p. 3-42 - 3-43). However, the IS/MND's GHG analysis, as well as the subsequent less-than-significant impact conclusion, is incorrect for is incorrect for two reasons.

(1) The IS/MND's quantitative GHG analysis relies upon an incorrect and unsubstantiated air model; and
(2) The IS/MND fails to consider the performance-based standards under CARB's *Scoping Plan*;

B-28

1) Incorrect and Unsubstantiated Quantitative Analysis of Emissions

As previously stated, the IS/MND estimates that the Project would generate net annual GHG emissions of 846 MT CO_2e/year (p. 3-42, Table 3.8-1). However, the IS/MND's quantitative GHG analysis is unsubstantiated. As previously discussed, when we reviewed the Project's CalEEMod output files, provided in the AQ & GHG Study as Appendix 3 to the IS/MND, we found that several of the values inputted into the model are not consistent with information disclosed in the IS/MND. As a result, the model underestimates the Project's emissions, and the IS/MND's quantitative GHG analysis should not be relied upon to determine Project significance. An EIR should be prepared that adequately assesses the potential GHG impacts that construction and operation of the proposed Project may have on the environment.

B-29

2) Failure to Consider Performance-based Standards Under CARB's 2017 Scoping Plan

As previously discussed, the IS/MND concludes that the Project would be consistent with CARB's 2017 Climate Change Scoping Plan (p. 3-42 - 3-43). However, this is incorrect, as the IS/MND fails to consider performance-based measures proposed by CARB.

i. Passenger & Light Duty VMT Per Capita Benchmarks per SB 375

In reaching the State's long-term GHG emission reduction goals, CARB's 2017 *Scoping Plan* explicitly cites SB 375 and the VMT reductions anticipated under the implementation of Sustainable Community Strategies.[32] CARB has identified the population and daily VMT from passenger autos and light-duty vehicles at the state and county level for each year between 2010 to 2050 under a "baseline scenario" that includes "current projections of VMT included in the existing Regional Transportation Plans/Sustainable Communities Strategies (RTP/SCSs) adopted by the State's 18 Metropolitan Planning Organizations (MPOs) pursuant to SB 375 as of 2015."[33] By dividing the projected daily VMT by

[32] "California's 2017 Climate Change Scoping Plan." California Air Resources Board (CARB), November 2017, *available at*: https://ww3.arb.ca.gov/cc/scopingplan/scoping_plan_2017.pdf, p. 25, 98, 101-103.
[33] "Supporting Calculations for 2017 Scoping Plan-Identified VMT Reductions," California Air Resources Board (CARB), January 2019, *available at*: https://ww2.arb.ca.gov/sites/default/files/2019-01/sp_mss_vmt_calculations_jan19_0.xlsx; *see also:* https://ww2.arb.ca.gov/resources/documents/carb-2017-scoping-plan-identified-vmt-reductions-and-relationship-state-climate.

B-29 cont

population, we calculated the daily VMT per capita for each year at the state and county level for 2010 (baseline year), 2023 (Project operational year), and 2030 (target year under SB 32) (see table below).

2017 Scoping Plan Daily VMT Per Capita						
	San Diego County			State		
Year	Population	LDV VMT Baseline	VMT Per Capita	Population	LDV VMT Baseline	VMT Per Capita
2010	3,101,036	74,735,804.86	24.10	37,335,085	836,463,980.46	22.40
2023	3,474,173	84,918,394	24.44	41,659,526	924,184,228.61	21.18
2030	3,631,155	91,328,051.45	25.15	43,939,250	957,178,153.19	21.78

B-30

As the IS/MND fails to evaluate the Project's consistency with the performance-based daily VMT per capita projections from CARB's 2017 *Scoping Plan*, the IS/MND's claim that the proposed Project would be consistent with the *Scoping Plan* is unsupported. An EIR should be prepared for the proposed Project to provide additional information and analysis to conclude less-than-significant GHG impacts.

B-31

Mitigation

Feasible Mitigation Measures Available to Reduce Emissions

The IS/MND's analysis demonstrates that the Project would result in potentially significant air quality 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.[34] 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 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.

[34] "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 – 9.

- 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.

B-31 cont

- 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.

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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.

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An EIR should be prepared to include all feasible mitigation measures, as well as include updated air quality and GHG analyses 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.

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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

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cont

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

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

06232010 Meyers Avenue Industrial Project

San Diego County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Office Building	17.15	1000sqft	0.15	17,150.00	0
Manufacturing	33.65	1000sqft	0.77	33,650.00	0
Unrefrigerated Warehouse-No Rail	18.10	1000sqft	0.42	18,100.00	0
Other Non-Asphalt Surfaces	2.06	Acre	2.06	89,733.60	0
Parking Lot	190.00	Space	1.71	76,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.6	**Precipitation Freq (Days)**	40
Climate Zone	13			**Operational Year**	2023
Utility Company	San Diego Gas & Electric				
CO2 Intensity (lb/MWhr)	539.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Consistent with the IS/MND's model.

Land Use - See SWAPE comment on "Failure to Model All Proposed Land Uses" and "Underestimated Parking Land Use Size"

Construction Phase - Consistent with the IS/MND's model.

Grading - See SWAPE comment on "Unsubstantiated Reduction to Acres of Grading Value."

Architectural Coating - See SWAPE comment on "Unsubstantiated Reductions to Architectural and Area Coating Emission Factors"

Vehicle Trips - Consistent with the IS/MND's model.

Sequestration - Consistent with the IS/MND's model.

Construction Off-road Equipment Mitigation - Consistent with the IS/MND's model.

Mobile Land Use Mitigation - Consistent with the IS/MND's model.

Waste Mitigation - Consistent with the IS/MND's model.

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblGrading	MaterialExported	0.00	14,000.00
tblLandUse	LotAcreage	0.39	0.15
tblSequestration	NumberOfNewTrees	0.00	52.00
tblVehicleTrips	ST_TR	2.21	20.00
tblVehicleTrips	ST_TR	6.42	5.00
tblVehicleTrips	ST_TR	1.74	5.00
tblVehicleTrips	SU_TR	0.70	20.00
tblVehicleTrips	SU_TR	5.09	5.00
tblVehicleTrips	SU_TR	1.74	5.00
tblVehicleTrips	WD_TR	9.74	20.00
tblVehicleTrips	WD_TR	3.93	5.00
tblVehicleTrips	WD_TR	1.74	5.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	0.0486	0.5711	0.4244	1.3600e-003	0.1004	0.0208	0.1212	0.0422	0.0194	0.0616	0.0000	126.8831	126.8831	0.0183	0.0103	130.4228
2023	1.0650	1.7897	2.1344	4.5500e-003	0.1088	0.0794	0.1882	0.0295	0.0746	0.1041	0.0000	406.2507	406.2507	0.0678	0.0132	411.8805
Maximum	**1.0650**	**1.7897**	**2.1344**	**4.5500e-003**	**0.1088**	**0.0794**	**0.1882**	**0.0422**	**0.0746**	**0.1041**	**0.0000**	**406.2507**	**406.2507**	**0.0678**	**0.0132**	**411.8805**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	0.0486	0.5711	0.4244	1.3600e-003	0.1004	0.0208	0.1212	0.0422	0.0194	0.0616	0.0000	126.8830	126.8830	0.0183	0.0103	130.4227
2023	1.0650	1.7897	2.1344	4.5500e-003	0.1088	0.0794	0.1882	0.0295	0.0746	0.1041	0.0000	406.2504	406.2504	0.0677	0.0132	411.8802
Maximum	**1.0650**	**1.7897**	**2.1344**	**4.5500e-003**	**0.1088**	**0.0794**	**0.1882**	**0.0422**	**0.0746**	**0.1041**	**0.0000**	**406.2504**	**406.2504**	**0.0677**	**0.0132**	**411.8802**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.01**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**11-1-2022**	**1-31-2023**	0.8172	0.8172
2	**2-1-2023**	**4-30-2023**	0.5764	0.5764
3	**5-1-2023**	**7-31-2023**	0.5935	0.5935
4	**8-1-2023**	**9-30-2023**	0.3935	0.3935
		Highest	0.8172	0.8172

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.3656	2.0000e-005	2.4000e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	4.6600e-003	4.6600e-003	1.0000e-005	0.0000	4.9700e-003
Energy	4.1000e-003	0.0373	0.0313	2.2000e-004		2.8400e-003	2.8400e-003		2.8400e-003	2.8400e-003	0.0000	184.6387	184.6387	9.5800e-003	1.8100e-003	185.4181
Mobile	0.3027	0.3412	2.7852	5.7200e-003	0.5892	4.5300e-003	0.5938	0.1573	4.2300e-003	0.1615	0.0000	533.5127	533.5127	0.0390	0.0247	541.8348
Waste						0.0000	0.0000		0.0000	0.0000	15.1614	0.0000	15.1614	0.8960	0.0000	37.5617
Water						0.0000	0.0000		0.0000	0.0000	4.7637	52.9713	57.7349	0.4925	0.0120	73.6074
Total	**0.6724**	**0.3785**	**2.8189**	**5.9400e-003**	**0.5892**	**7.3800e-003**	**0.5966**	**0.1573**	**7.0800e-003**	**0.1643**	**19.9251**	**771.1274**	**791.0524**	**1.4371**	**0.0384**	**838.4270**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.3656	2.0000e-005	2.4000e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	4.6600e-003	4.6600e-003	1.0000e-005	0.0000	4.9700e-003
Energy	4.1000e-003	0.0373	0.0313	2.2000e-004		2.8400e-003	2.8400e-003		2.8400e-003	2.8400e-003	0.0000	184.6387	184.6387	9.5800e-003	1.8100e-003	185.4181
Mobile	0.2438	0.2338	1.9183	3.5100e-003	0.3555	2.9100e-003	0.3584	0.0949	2.7100e-003	0.0976	0.0000	327.5876	327.5876	0.0286	0.0173	333.4459
Waste						0.0000	0.0000		0.0000	0.0000	15.1614	0.0000	15.1614	0.8960	0.0000	37.5617
Water						0.0000	0.0000		0.0000	0.0000	4.7637	52.9713	57.7349	0.4925	0.0120	73.6074
Total	**0.6135**	**0.2711**	**1.9520**	**3.7300e-003**	**0.3555**	**5.7600e-003**	**0.3612**	**0.0949**	**5.5600e-003**	**0.1004**	**19.9251**	**565.2022**	**585.1273**	**1.4268**	**0.0310**	**630.0380**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**8.77**	**28.38**	**30.75**	**37.21**	**39.67**	**21.95**	**39.45**	**39.67**	**21.47**	**38.89**	**0.00**	**26.70**	**26.03**	**0.72**	**19.26**	**24.85**

2.3 Vegetation

Vegetation

	CO2e
Category	MT
New Trees	36.8160
Total	**36.8160**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Grading	Grading	11/1/2022	11/28/2022	5	20	
2	Building Construction	Building Construction	11/29/2022	10/16/2023	5	230	
3	Paving	Paving	10/17/2023	11/13/2023	5	20	
4	Architectural Coating	Architectural Coating	11/14/2023	12/11/2023	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 20

Acres of Paving: 3.77

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 103,350; Non-Residential Outdoor: 34,450; Striped Parking Area: 9,944 (Architectural Coating – sqft)

OffRoad Equipment

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Grading	Excavators	1	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Grading	6	15.00	0.00	1,750.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	97.00	38.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	19.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Grading - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0718	0.0000	0.0718	0.0344	0.0000	0.0344	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0195	0.2086	0.1527	3.0000e-004		9.4100e-003	9.4100e-003		8.6600e-003	8.6600e-003	0.0000	26.0548	26.0548	8.4300e-003	0.0000	26.2654
Total	**0.0195**	**0.2086**	**0.1527**	**3.0000e-004**	**0.0718**	**9.4100e-003**	**0.0812**	**0.0344**	**8.6600e-003**	**0.0431**	**0.0000**	**26.0548**	**26.0548**	**8.4300e-003**	**0.0000**	**26.2654**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	3.8800e-003	0.1473	0.0348	5.5000e-004	0.0150	1.3700e-003	0.0164	4.1200e-003	1.3100e-003	5.4300e-003	0.0000	54.8461	54.8461	2.6300e-003	8.7100e-003	57.5084
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.3000e-004	3.1000e-004	3.6900e-003	1.0000e-005	1.2000e-003	1.0000e-005	1.2100e-003	3.2000e-004	1.0000e-005	3.3000e-004	0.0000	0.9893	0.9893	3.0000e-005	3.0000e-005	0.9985
Total	**4.3100e-003**	**0.1477**	**0.0384**	**5.6000e-004**	**0.0162**	**1.3800e-003**	**0.0176**	**4.4400e-003**	**1.3200e-003**	**5.7600e-003**	**0.0000**	**55.8353**	**55.8353**	**2.6600e-003**	**8.7400e-003**	**58.5069**

3.2 Grading - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0718	0.0000	0.0718	0.0344	0.0000	0.0344	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0195	0.2086	0.1527	3.0000e-004		9.4100e-003	9.4100e-003		8.6600e-003	8.6600e-003	0.0000	26.0547	26.0547	8.4300e-003	0.0000	26.2654
Total	**0.0195**	**0.2086**	**0.1527**	**3.0000e-004**	**0.0718**	**9.4100e-003**	**0.0812**	**0.0344**	**8.6600e-003**	**0.0431**	**0.0000**	**26.0547**	**26.0547**	**8.4300e-003**	**0.0000**	**26.2654**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	3.8800e-003	0.1473	0.0348	5.5000e-004	0.0150	1.3700e-003	0.0164	4.1200e-003	1.3100e-003	5.4300e-003	0.0000	54.8461	54.8461	2.6300e-003	8.7100e-003	57.5084
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.3000e-004	3.1000e-004	3.6900e-003	1.0000e-005	1.2000e-003	1.0000e-005	1.2100e-003	3.2000e-004	1.0000e-005	3.3000e-004	0.0000	0.9893	0.9893	3.0000e-005	3.0000e-005	0.9985
Total	**4.3100e-003**	**0.1477**	**0.0384**	**5.6000e-004**	**0.0162**	**1.3800e-003**	**0.0176**	**4.4400e-003**	**1.3200e-003**	**5.7600e-003**	**0.0000**	**55.8353**	**55.8353**	**2.6600e-003**	**8.7400e-003**	**58.5069**

3.3 Building Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0205	0.1874	0.1964	3.2000e-004		9.7100e-003	9.7100e-003		9.1300e-003	9.1300e-003	0.0000	27.8070	27.8070	6.6600e-003	0.0000	27.9736
Total	**0.0205**	**0.1874**	**0.1964**	**3.2000e-004**		**9.7100e-003**	**9.7100e-003**		**9.1300e-003**	**9.1300e-003**	**0.0000**	**27.8070**	**27.8070**	**6.6600e-003**	**0.0000**	**27.9736**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.0100e-003	0.0251	8.2200e-003	1.0000e-004	3.0300e-003	2.6000e-004	3.2900e-003	8.7000e-004	2.5000e-004	1.1300e-003	0.0000	9.5094	9.5094	2.9000e-004	1.3800e-003	9.9283
Worker	3.3600e-003	2.4400e-003	0.0286	8.0000e-005	9.3300e-003	5.0000e-005	9.3900e-003	2.4800e-003	5.0000e-005	2.5300e-003	0.0000	7.6766	7.6766	2.4000e-004	2.2000e-004	7.7486
Total	**4.3700e-003**	**0.0275**	**0.0368**	**1.8000e-004**	**0.0124**	**3.1000e-004**	**0.0127**	**3.3500e-003**	**3.0000e-004**	**3.6600e-003**	**0.0000**	**17.1860**	**17.1860**	**5.3000e-004**	**1.6000e-003**	**17.6769**

3.3 Building Construction - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0205	0.1874	0.1964	3.2000e-004		9.7100e-003	9.7100e-003		9.1300e-003	9.1300e-003	0.0000	27.8070	27.8070	6.6600e-003	0.0000	27.9735
Total	**0.0205**	**0.1874**	**0.1964**	**3.2000e-004**		**9.7100e-003**	**9.7100e-003**		**9.1300e-003**	**9.1300e-003**	**0.0000**	**27.8070**	**27.8070**	**6.6600e-003**	**0.0000**	**27.9735**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.0100e-003	0.0251	8.2200e-003	1.0000e-004	3.0300e-003	2.6000e-004	3.2900e-003	8.7000e-004	2.5000e-004	1.1300e-003	0.0000	9.5094	9.5094	2.9000e-004	1.3800e-003	9.9283
Worker	3.3600e-003	2.4400e-003	0.0286	8.0000e-005	9.3300e-003	5.0000e-005	9.3900e-003	2.4800e-003	5.0000e-005	2.5300e-003	0.0000	7.6766	7.6766	2.4000e-004	2.2000e-004	7.7486
Total	**4.3700e-003**	**0.0275**	**0.0368**	**1.8000e-004**	**0.0124**	**3.1000e-004**	**0.0127**	**3.3500e-003**	**3.0000e-004**	**3.6600e-003**	**0.0000**	**17.1860**	**17.1860**	**5.3000e-004**	**1.6000e-003**	**17.6769**

3.3 Building Construction - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1620	1.4816	1.6731	2.7800e-003		0.0721	0.0721		0.0678	0.0678	0.0000	238.7589	238.7589	0.0568	0.0000	240.1788
Total	**0.1620**	**1.4816**	**1.6731**	**2.7800e-003**		**0.0721**	**0.0721**		**0.0678**	**0.0678**	**0.0000**	**238.7589**	**238.7589**	**0.0568**	**0.0000**	**240.1788**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.5900e-003	0.1738	0.0613	8.0000e-004	0.0260	1.0200e-003	0.0270	7.5000e-003	9.8000e-004	8.4800e-003	0.0000	78.5346	78.5346	2.3700e-003	0.0114	81.9850
Worker	0.0270	0.0187	0.2283	6.9000e-004	0.0801	4.4000e-004	0.0806	0.0213	4.1000e-004	0.0217	0.0000	64.1927	64.1927	1.8800e-003	1.7700e-003	64.7668
Total	**0.0316**	**0.1925**	**0.2896**	**1.4900e-003**	**0.1061**	**1.4600e-003**	**0.1076**	**0.0288**	**1.3900e-003**	**0.0302**	**0.0000**	**142.7272**	**142.7272**	**4.2500e-003**	**0.0132**	**146.7518**

3.3 Building Construction - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1620	1.4816	1.6731	2.7800e-003		0.0721	0.0721		0.0678	0.0678	0.0000	238.7586	238.7586	0.0568	0.0000	240.1785
Total	**0.1620**	**1.4816**	**1.6731**	**2.7800e-003**		**0.0721**	**0.0721**		**0.0678**	**0.0678**	**0.0000**	**238.7586**	**238.7586**	**0.0568**	**0.0000**	**240.1785**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.5900e-003	0.1738	0.0613	8.0000e-004	0.0260	1.0200e-003	0.0270	7.5000e-003	9.8000e-004	8.4800e-003	0.0000	78.5346	78.5346	2.3700e-003	0.0114	81.9850
Worker	0.0270	0.0187	0.2283	6.9000e-004	0.0801	4.4000e-004	0.0806	0.0213	4.1000e-004	0.0217	0.0000	64.1927	64.1927	1.8800e-003	1.7700e-003	64.7668
Total	**0.0316**	**0.1925**	**0.2896**	**1.4900e-003**	**0.1061**	**1.4600e-003**	**0.1076**	**0.0288**	**1.3900e-003**	**0.0302**	**0.0000**	**142.7272**	**142.7272**	**4.2500e-003**	**0.0132**	**146.7518**

3.4 Paving - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0103	0.1019	0.1458	2.3000e-004		5.1000e-003	5.1000e-003		4.6900e-003	4.6900e-003	0.0000	20.0269	20.0269	6.4800e-003	0.0000	20.1888
Paving	2.2400e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0126**	**0.1019**	**0.1458**	**2.3000e-004**		**5.1000e-003**	**5.1000e-003**		**4.6900e-003**	**4.6900e-003**	**0.0000**	**20.0269**	**20.0269**	**6.4800e-003**	**0.0000**	**20.1888**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.1000e-004	2.8000e-004	3.4300e-003	1.0000e-005	1.2000e-003	1.0000e-005	1.2100e-003	3.2000e-004	1.0000e-005	3.3000e-004	0.0000	0.9638	0.9638	3.0000e-005	3.0000e-005	0.9724
Total	**4.1000e-004**	**2.8000e-004**	**3.4300e-003**	**1.0000e-005**	**1.2000e-003**	**1.0000e-005**	**1.2100e-003**	**3.2000e-004**	**1.0000e-005**	**3.3000e-004**	**0.0000**	**0.9638**	**0.9638**	**3.0000e-005**	**3.0000e-005**	**0.9724**

3.4 Paving - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0103	0.1019	0.1458	2.3000e-004		5.1000e-003	5.1000e-003		4.6900e-003	4.6900e-003	0.0000	20.0268	20.0268	6.4800e-003	0.0000	20.1888
Paving	2.2400e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0126**	**0.1019**	**0.1458**	**2.3000e-004**		**5.1000e-003**	**5.1000e-003**		**4.6900e-003**	**4.6900e-003**	**0.0000**	**20.0268**	**20.0268**	**6.4800e-003**	**0.0000**	**20.1888**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.1000e-004	2.8000e-004	3.4300e-003	1.0000e-005	1.2000e-003	1.0000e-005	1.2100e-003	3.2000e-004	1.0000e-005	3.3000e-004	0.0000	0.9638	0.9638	3.0000e-005	3.0000e-005	0.9724
Total	**4.1000e-004**	**2.8000e-004**	**3.4300e-003**	**1.0000e-005**	**1.2000e-003**	**1.0000e-005**	**1.2100e-003**	**3.2000e-004**	**1.0000e-005**	**3.3000e-004**	**0.0000**	**0.9638**	**0.9638**	**3.0000e-005**	**3.0000e-005**	**0.9724**

3.5 Architectural Coating - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.8560					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.9200e-003	0.0130	0.0181	3.0000e-005		7.1000e-004	7.1000e-004		7.1000e-004	7.1000e-004	0.0000	2.5533	2.5533	1.5000e-004	0.0000	2.5571
Total	**0.8579**	**0.0130**	**0.0181**	**3.0000e-005**		**7.1000e-004**	**7.1000e-004**		**7.1000e-004**	**7.1000e-004**	**0.0000**	**2.5533**	**2.5533**	**1.5000e-004**	**0.0000**	**2.5571**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.1000e-004	3.6000e-004	4.3400e-003	1.0000e-005	1.5200e-003	1.0000e-005	1.5300e-003	4.0000e-004	1.0000e-005	4.1000e-004	0.0000	1.2208	1.2208	4.0000e-005	3.0000e-005	1.2317
Total	**5.1000e-004**	**3.6000e-004**	**4.3400e-003**	**1.0000e-005**	**1.5200e-003**	**1.0000e-005**	**1.5300e-003**	**4.0000e-004**	**1.0000e-005**	**4.1000e-004**	**0.0000**	**1.2208**	**1.2208**	**4.0000e-005**	**3.0000e-005**	**1.2317**

3.5 Architectural Coating - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.8560					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.9200e-003	0.0130	0.0181	3.0000e-005		7.1000e-004	7.1000e-004		7.1000e-004	7.1000e-004	0.0000	2.5533	2.5533	1.5000e-004	0.0000	2.5571
Total	**0.8579**	**0.0130**	**0.0181**	**3.0000e-005**		**7.1000e-004**	**7.1000e-004**		**7.1000e-004**	**7.1000e-004**	**0.0000**	**2.5533**	**2.5533**	**1.5000e-004**	**0.0000**	**2.5571**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.1000e-004	3.6000e-004	4.3400e-003	1.0000e-005	1.5200e-003	1.0000e-005	1.5300e-003	4.0000e-004	1.0000e-005	4.1000e-004	0.0000	1.2208	1.2208	4.0000e-005	3.0000e-005	1.2317
Total	**5.1000e-004**	**3.6000e-004**	**4.3400e-003**	**1.0000e-005**	**1.5200e-003**	**1.0000e-005**	**1.5300e-003**	**4.0000e-004**	**1.0000e-005**	**4.1000e-004**	**0.0000**	**1.2208**	**1.2208**	**4.0000e-005**	**3.0000e-005**	**1.2317**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Improve Destination Accessibility

Increase Transit Accessibility

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.2438	0.2338	1.9183	3.5100e-003	0.3555	2.9100e-003	0.3584	0.0949	2.7100e-003	0.0976	0.0000	327.5876	327.5876	0.0286	0.0173	333.4459
Unmitigated	0.3027	0.3412	2.7852	5.7200e-003	0.5892	4.5300e-003	0.5938	0.1573	4.2300e-003	0.1615	0.0000	533.5127	533.5127	0.0390	0.0247	541.8348

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Office Building	343.00	343.00	343.00	819,685	494,506
Manufacturing	168.25	168.25	168.25	491,208	296,340
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Parking Lot	0.00	0.00	0.00		
Unrefrigerated Warehouse-No Rail	90.50	90.50	90.50	264,216	159,398
Total	601.75	601.75	601.75	1,575,109	950,244

4.3 Trip Type Information

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Office Building	9.50	7.30	7.30	33.00	48.00	19.00	77	19	4
Manufacturing	9.50	7.30	7.30	59.00	28.00	13.00	92	5	3
Other Non-Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Unrefrigerated Warehouse-No Rail	9.50	7.30	7.30	59.00	0.00	41.00	92	5	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Office Building	0.553514	0.062792	0.181046	0.120736	0.024419	0.006214	0.008493	0.006184	0.000715	0.000556	0.029185	0.000982	0.005164
Manufacturing	0.553514	0.062792	0.181046	0.120736	0.024419	0.006214	0.008493	0.006184	0.000715	0.000556	0.029185	0.000982	0.005164
Other Non-Asphalt Surfaces	0.553514	0.062792	0.181046	0.120736	0.024419	0.006214	0.008493	0.006184	0.000715	0.000556	0.029185	0.000982	0.005164
Parking Lot	0.553514	0.062792	0.181046	0.120736	0.024419	0.006214	0.008493	0.006184	0.000715	0.000556	0.029185	0.000982	0.005164
Unrefrigerated Warehouse-No Rail	0.553514	0.062792	0.181046	0.120736	0.024419	0.006214	0.008493	0.006184	0.000715	0.000556	0.029185	0.000982	0.005164

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	144.0274	144.0274	8.8000e-003	1.0700e-003	144.5654
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	144.0274	144.0274	8.8000e-003	1.0700e-003	144.5654
NaturalGas Mitigated	4.1000e-003	0.0373	0.0313	2.2000e-004		2.8400e-003	2.8400e-003		2.8400e-003	2.8400e-003	0.0000	40.6113	40.6113	7.8000e-004	7.4000e-004	40.8527
NaturalGas Unmitigated	4.1000e-003	0.0373	0.0313	2.2000e-004		2.8400e-003	2.8400e-003		2.8400e-003	2.8400e-003	0.0000	40.6113	40.6113	7.8000e-004	7.4000e-004	40.8527

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Office Building	343515	1.8500e-003	0.0168	0.0141	1.0000e-004		1.2800e-003	1.2800e-003		1.2800e-003	1.2800e-003	0.0000	18.3312	18.3312	3.5000e-004	3.4000e-004	18.4402
Manufacturing	387648	2.0900e-003	0.0190	0.0160	1.1000e-004		1.4400e-003	1.4400e-003		1.4400e-003	1.4400e-003	0.0000	20.6864	20.6864	4.0000e-004	3.8000e-004	20.8093
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	29865	1.6000e-004	1.4600e-003	1.2300e-003	1.0000e-005		1.1000e-004	1.1000e-004		1.1000e-004	1.1000e-004	0.0000	1.5937	1.5937	3.0000e-005	3.0000e-005	1.6032
Total		**4.1000e-003**	**0.0373**	**0.0313**	**2.2000e-004**		**2.8300e-003**	**2.8300e-003**		**2.8300e-003**	**2.8300e-003**	**0.0000**	**40.6113**	**40.6113**	**7.8000e-004**	**7.5000e-004**	**40.8527**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Office Building	343515	1.8500e-003	0.0168	0.0141	1.0000e-004		1.2800e-003	1.2800e-003		1.2800e-003	1.2800e-003	0.0000	18.3312	18.3312	3.5000e-004	3.4000e-004	18.4402
Manufacturing	387648	2.0900e-003	0.0190	0.0160	1.1000e-004		1.4400e-003	1.4400e-003		1.4400e-003	1.4400e-003	0.0000	20.6864	20.6864	4.0000e-004	3.8000e-004	20.8093
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	29865	1.6000e-004	1.4600e-003	1.2300e-003	1.0000e-005		1.1000e-004	1.1000e-004		1.1000e-004	1.1000e-004	0.0000	1.5937	1.5937	3.0000e-005	3.0000e-005	1.6032
Total		**4.1000e-003**	**0.0373**	**0.0313**	**2.2000e-004**		**2.8300e-003**	**2.8300e-003**		**2.8300e-003**	**2.8300e-003**	**0.0000**	**40.6113**	**40.6113**	**7.8000e-004**	**7.5000e-004**	**40.8527**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Office Building	221921	54.3553	3.3200e-003	4.0000e-004	54.5583
Manufacturing	275257	67.4189	4.1200e-003	5.0000e-004	67.6708
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Parking Lot	26600	6.5152	4.0000e-004	5.0000e-005	6.5395
Unrefrigerated Warehouse-No Rail	64255	15.7380	9.6000e-004	1.2000e-004	15.7968
Total		**144.0274**	**8.8000e-003**	**1.0700e-003**	**144.5654**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Office Building	221921	54.3553	3.3200e-003	4.0000e-004	54.5583
Manufacturing	275257	67.4189	4.1200e-003	5.0000e-004	67.6708
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Parking Lot	26600	6.5152	4.0000e-004	5.0000e-005	6.5395
Unrefrigerated Warehouse-No Rail	64255	15.7380	9.6000e-004	1.2000e-004	15.7968
Total		**144.0274**	**8.8000e-003**	**1.0700e-003**	**144.5654**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.3656	2.0000e-005	2.4000e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	4.6600e-003	4.6600e-003	1.0000e-005	0.0000	4.9700e-003
Unmitigated	0.3656	2.0000e-005	2.4000e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	4.6600e-003	4.6600e-003	1.0000e-005	0.0000	4.9700e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0856					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.2798					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	2.2000e-004	2.0000e-005	2.4000e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	4.6600e-003	4.6600e-003	1.0000e-005	0.0000	4.9700e-003
Total	**0.3656**	**2.0000e-005**	**2.4000e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**	**0.0000**	**4.6600e-003**	**4.6600e-003**	**1.0000e-005**	**0.0000**	**4.9700e-003**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0856					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.2798					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	2.2000e-004	2.0000e-005	2.4000e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	4.6600e-003	4.6600e-003	1.0000e-005	0.0000	4.9700e-003
Total	**0.3656**	**2.0000e-005**	**2.4000e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**	**0.0000**	**4.6600e-003**	**4.6600e-003**	**1.0000e-005**	**0.0000**	**4.9700e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	57.7349	0.4925	0.0120	73.6074
Unmitigated	57.7349	0.4925	0.0120	73.6074

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Office Building	3.04813 / 1.86821	15.7720	0.1002	2.4500e-003	19.0093
Manufacturing	7.78156 / 0	27.2860	0.2551	6.1700e-003	35.5020
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	4.18562 / 0	14.6769	0.1372	3.3200e-003	19.0962
Total		**57.7349**	**0.4925**	**0.0119**	**73.6074**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Office Building	3.04813 / 1.86821	15.7720	0.1002	2.4500e-003	19.0093
Manufacturing	7.78156 / 0	27.2860	0.2551	6.1700e-003	35.5020
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	4.18562 / 0	14.6769	0.1372	3.3200e-003	19.0962
Total		**57.7349**	**0.4925**	**0.0119**	**73.6074**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	15.1614	0.8960	0.0000	37.5617
Unmitigated	15.1614	0.8960	0.0000	37.5617

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Office Building	15.95	3.2377	0.1913	0.0000	8.0213
Manufacturing	41.73	8.4708	0.5006	0.0000	20.9861
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	17.01	3.4529	0.2041	0.0000	8.5544
Total		**15.1614**	**0.8960**	**0.0000**	**37.5617**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Office Building	15.95	3.2377	0.1913	0.0000	8.0213
Manufacturing	41.73	8.4708	0.5006	0.0000	20.9861
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	17.01	3.4529	0.2041	0.0000	8.5544
Total		**15.1614**	**0.8960**	**0.0000**	**37.5617**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

	Total CO2	CH4	N2O	CO2e
Category	MT			
Unmitigated	36.8160	0.0000	0.0000	36.8160

11.2 Net New Trees

Species Class

	Number of Trees	Total CO2	CH4	N2O	CO2e
		MT			
Miscellaneous	52	36.8160	0.0000	0.0000	36.8160
Total		**36.8160**	**0.0000**	**0.0000**	**36.8160**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

06232010 Meyers Avenue Industrial Project

San Diego County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Office Building	17.15	1000sqft	0.15	17,150.00	0
Manufacturing	33.65	1000sqft	0.77	33,650.00	0
Unrefrigerated Warehouse-No Rail	18.10	1000sqft	0.42	18,100.00	0
Other Non-Asphalt Surfaces	2.06	Acre	2.06	89,733.60	0
Parking Lot	190.00	Space	1.71	76,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.6	**Precipitation Freq (Days)**	40
Climate Zone	13			**Operational Year**	2023
Utility Company	San Diego Gas & Electric				
CO2 Intensity (lb/MWhr)	539.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Consistent with the IS/MND's model.

Land Use - See SWAPE comment on "Failure to Model All Proposed Land Uses" and "Underestimated Parking Land Use Size"

Construction Phase - Consistent with the IS/MND's model.

Grading - See SWAPE comment on "Unsubstantiated Reduction to Acres of Grading Value."

Architectural Coating - See SWAPE comment on "Unsubstantiated Reductions to Architectural and Area Coating Emission Factors"

Vehicle Trips - Consistent with the IS/MND's model.

Sequestration - Consistent with the IS/MND's model.

Construction Off-road Equipment Mitigation - Consistent with the IS/MND's model.

Mobile Land Use Mitigation - Consistent with the IS/MND's model.

Waste Mitigation - Consistent with the IS/MND's model.

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblGrading	MaterialExported	0.00	14,000.00
tblLandUse	LotAcreage	0.39	0.15
tblSequestration	NumberOfNewTrees	0.00	52.00
tblVehicleTrips	ST_TR	2.21	20.00
tblVehicleTrips	ST_TR	6.42	5.00
tblVehicleTrips	ST_TR	1.74	5.00
tblVehicleTrips	SU_TR	0.70	20.00
tblVehicleTrips	SU_TR	5.09	5.00
tblVehicleTrips	SU_TR	1.74	5.00
tblVehicleTrips	WD_TR	9.74	20.00
tblVehicleTrips	WD_TR	3.93	5.00
tblVehicleTrips	WD_TR	1.74	5.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2022	2.3846	35.0946	19.5546	0.0857	8.8345	1.0784	9.9130	3.8918	0.9972	4.8890	0.0000	9,031.108 2	9,031.108 2	1.2229	0.9632	9,348.703 0
2023	85.8428	16.1786	19.1652	0.0418	1.0542	0.7139	1.7681	0.2855	0.6719	0.9573	0.0000	4,115.756 3	4,115.756 3	0.7170	0.1394	4,173.601 2
Maximum	**85.8428**	**35.0946**	**19.5546**	**0.0857**	**8.8345**	**1.0784**	**9.9130**	**3.8918**	**0.9972**	**4.8890**	**0.0000**	**9,031.108 2**	**9,031.108 2**	**1.2229**	**0.9632**	**9,348.703 0**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2022	2.3846	35.0946	19.5546	0.0857	8.8345	1.0784	9.9130	3.8918	0.9972	4.8890	0.0000	9,031.108 2	9,031.108 2	1.2229	0.9632	9,348.703 0
2023	85.8428	16.1786	19.1652	0.0418	1.0542	0.7139	1.7681	0.2855	0.6719	0.9573	0.0000	4,115.756 3	4,115.756 3	0.7170	0.1394	4,173.601 1
Maximum	**85.8428**	**35.0946**	**19.5546**	**0.0857**	**8.8345**	**1.0784**	**9.9130**	**3.8918**	**0.9972**	**4.8890**	**0.0000**	**9,031.108 2**	**9,031.108 2**	**1.2229**	**0.9632**	**9,348.703 0**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	2.0047	2.4000e-004	0.0266	0.0000		9.0000e-005	9.0000e-005		9.0000e-005	9.0000e-005		0.0571	0.0571	1.5000e-004		0.0609
Energy	0.0225	0.2044	0.1717	1.2300e-003		0.0155	0.0155		0.0155	0.0155		245.2949	245.2949	4.7000e-003	4.5000e-003	246.7526
Mobile	1.7360	1.7482	15.2135	0.0327	3.3158	0.0249	3.3407	0.8833	0.0233	0.9065		3,359.5042	3,359.5042	0.2269	0.1430	3,407.7977
Total	**3.7631**	**1.9528**	**15.4119**	**0.0339**	**3.3158**	**0.0406**	**3.3564**	**0.8833**	**0.0389**	**0.9222**		**3,604.8562**	**3,604.8562**	**0.2317**	**0.1475**	**3,654.6112**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	2.0047	2.4000e-004	0.0266	0.0000		9.0000e-005	9.0000e-005		9.0000e-005	9.0000e-005		0.0571	0.0571	1.5000e-004		0.0609
Energy	0.0225	0.2044	0.1717	1.2300e-003		0.0155	0.0155		0.0155	0.0155		245.2949	245.2949	4.7000e-003	4.5000e-003	246.7526
Mobile	1.4177	1.1977	10.2748	0.0200	2.0004	0.0160	2.0164	0.5329	0.0149	0.5478		2,061.0297	2,061.0297	0.1643	0.0999	2,094.8981
Total	**3.4449**	**1.4023**	**10.4732**	**0.0213**	**2.0004**	**0.0316**	**2.0320**	**0.5329**	**0.0306**	**0.5634**		**2,306.3818**	**2,306.3818**	**0.1691**	**0.1044**	**2,341.7115**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	8.46	28.19	32.04	37.25	39.67	22.02	39.46	39.67	21.42	38.90	0.00	36.02	36.02	27.03	29.25	35.92

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Grading	Grading	11/1/2022	11/28/2022	5	20	
2	Building Construction	Building Construction	11/29/2022	10/16/2023	5	230	
3	Paving	Paving	10/17/2023	11/13/2023	5	20	
4	Architectural Coating	Architectural Coating	11/14/2023	12/11/2023	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 20

Acres of Paving: 3.77

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 103,350; Non-Residential Outdoor: 34,450; Striped Parking Area: 9,944 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Grading	Excavators	1	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

<u>Trips and VMT</u>

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Grading	6	15.00	0.00	1,750.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	97.00	38.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	19.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Grading - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					7.1810	0.0000	7.1810	3.4396	0.0000	3.4396			0.0000			0.0000
Off-Road	1.9486	20.8551	15.2727	0.0297		0.9409	0.9409		0.8656	0.8656		2,872.046 4	2,872.046 4	0.9289		2,895.268 4
Total	**1.9486**	**20.8551**	**15.2727**	**0.0297**	**7.1810**	**0.9409**	**8.1218**	**3.4396**	**0.8656**	**4.3052**		**2,872.046 4**	**2,872.046 4**	**0.9289**		**2,895.268 4**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.3921	14.2110	3.4544	0.0549	1.5304	0.1369	1.6673	0.4195	0.1310	0.5504		6,044.671 1	6,044.671 1	0.2907	0.9602	6,338.083 1
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0438	0.0285	0.3889	1.1200e-003	0.1232	7.0000e-004	0.1239	0.0327	6.4000e-004	0.0333		114.3907	114.3907	3.2800e-003	2.9500e-003	115.3516
Total	**0.4359**	**14.2395**	**3.8433**	**0.0560**	**1.6536**	**0.1376**	**1.7912**	**0.4522**	**0.1316**	**0.5838**		**6,159.061 8**	**6,159.061 8**	**0.2940**	**0.9632**	**6,453.434 7**

3.2 Grading - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					7.1810	0.0000	7.1810	3.4396	0.0000	3.4396			0.0000			0.0000
Off-Road	1.9486	20.8551	15.2727	0.0297		0.9409	0.9409		0.8656	0.8656	0.0000	2,872.0464	2,872.0464	0.9289		2,895.2684
Total	**1.9486**	**20.8551**	**15.2727**	**0.0297**	**7.1810**	**0.9409**	**8.1218**	**3.4396**	**0.8656**	**4.3052**	**0.0000**	**2,872.0464**	**2,872.0464**	**0.9289**		**2,895.2684**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.3921	14.2110	3.4544	0.0549	1.5304	0.1369	1.6673	0.4195	0.1310	0.5504		6,044.6711	6,044.6711	0.2907	0.9602	6,338.0831
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0438	0.0285	0.3889	1.1200e-003	0.1232	7.0000e-004	0.1239	0.0327	6.4000e-004	0.0333		114.3907	114.3907	3.2800e-003	2.9500e-003	115.3516
Total	**0.4359**	**14.2395**	**3.8433**	**0.0560**	**1.6536**	**0.1376**	**1.7912**	**0.4522**	**0.1316**	**0.5838**		**6,159.0618**	**6,159.0618**	**0.2940**	**0.9632**	**6,453.4347**

3.3 Building Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.7062	15.6156	16.3634	0.0269		0.8090	0.8090		0.7612	0.7612		2,554.3336	2,554.3336	0.6120		2,569.6322
Total	**1.7062**	**15.6156**	**16.3634**	**0.0269**		**0.8090**	**0.8090**		**0.7612**	**0.7612**		**2,554.3336**	**2,554.3336**	**0.6120**		**2,569.6322**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0847	2.0209	0.6760	8.1100e-003	0.2574	0.0220	0.2793	0.0741	0.0210	0.0951		873.3374	873.3374	0.0266	0.1268	911.7774
Worker	0.2832	0.1844	2.5151	7.2700e-003	0.7968	4.5100e-003	0.8013	0.2114	4.1500e-003	0.2155		739.7264	739.7264	0.0212	0.0191	745.9404
Total	**0.3679**	**2.2052**	**3.1912**	**0.0154**	**1.0542**	**0.0265**	**1.0807**	**0.2855**	**0.0252**	**0.3106**		**1,613.0638**	**1,613.0638**	**0.0478**	**0.1458**	**1,657.7178**

3.3 Building Construction - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.7062	15.6156	16.3634	0.0269		0.8090	0.8090		0.7612	0.7612	0.0000	2,554.3336	2,554.3336	0.6120		2,569.6322
Total	**1.7062**	**15.6156**	**16.3634**	**0.0269**		**0.8090**	**0.8090**		**0.7612**	**0.7612**	**0.0000**	**2,554.3336**	**2,554.3336**	**0.6120**		**2,569.6322**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0847	2.0209	0.6760	8.1100e-003	0.2574	0.0220	0.2793	0.0741	0.0210	0.0951		873.3374	873.3374	0.0266	0.1268	911.7774
Worker	0.2832	0.1844	2.5151	7.2700e-003	0.7968	4.5100e-003	0.8013	0.2114	4.1500e-003	0.2155		739.7264	739.7264	0.0212	0.0191	745.9404
Total	**0.3679**	**2.2052**	**3.1912**	**0.0154**	**1.0542**	**0.0265**	**1.0807**	**0.2855**	**0.0252**	**0.3106**		**1,613.0638**	**1,613.0638**	**0.0478**	**0.1458**	**1,657.7178**

3.3 Building Construction - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5728	14.3849	16.2440	0.0269		0.6997	0.6997		0.6584	0.6584		2,555.209 9	2,555.209 9	0.6079		2,570.406 1
Total	**1.5728**	**14.3849**	**16.2440**	**0.0269**		**0.6997**	**0.6997**		**0.6584**	**0.6584**		**2,555.209 9**	**2,555.209 9**	**0.6079**		**2,570.406 1**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0454	1.6290	0.5870	7.7800e-003	0.2574	9.9300e-003	0.2673	0.0741	9.4900e-003	0.0836		839.9784	839.9784	0.0255	0.1216	876.8584
Worker	0.2653	0.1647	2.3342	7.0400e-003	0.7968	4.2900e-003	0.8011	0.2114	3.9500e-003	0.2153		720.5679	720.5679	0.0193	0.0177	726.3367
Total	**0.3106**	**1.7937**	**2.9212**	**0.0148**	**1.0542**	**0.0142**	**1.0684**	**0.2855**	**0.0134**	**0.2989**		**1,560.546 4**	**1,560.546 4**	**0.0448**	**0.1394**	**1,603.195 1**

3.3 Building Construction - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5728	14.3849	16.2440	0.0269		0.6997	0.6997		0.6584	0.6584	0.0000	2,555.2099	2,555.2099	0.6079		2,570.4061
Total	**1.5728**	**14.3849**	**16.2440**	**0.0269**		**0.6997**	**0.6997**		**0.6584**	**0.6584**	**0.0000**	**2,555.2099**	**2,555.2099**	**0.6079**		**2,570.4061**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0454	1.6290	0.5870	7.7800e-003	0.2574	9.9300e-003	0.2673	0.0741	9.4900e-003	0.0836		839.9784	839.9784	0.0255	0.1216	876.8584
Worker	0.2653	0.1647	2.3342	7.0400e-003	0.7968	4.2900e-003	0.8011	0.2114	3.9500e-003	0.2153		720.5679	720.5679	0.0193	0.0177	726.3367
Total	**0.3106**	**1.7937**	**2.9212**	**0.0148**	**1.0542**	**0.0142**	**1.0684**	**0.2855**	**0.0134**	**0.2989**		**1,560.5464**	**1,560.5464**	**0.0448**	**0.1394**	**1,603.1951**

3.4 Paving - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0327	10.1917	14.5842	0.0228		0.5102	0.5102		0.4694	0.4694		2,207.5841	2,207.5841	0.7140		2,225.4336
Paving	0.2240					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.2568**	**10.1917**	**14.5842**	**0.0228**		**0.5102**	**0.5102**		**0.4694**	**0.4694**		**2,207.5841**	**2,207.5841**	**0.7140**		**2,225.4336**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0410	0.0255	0.3610	1.0900e-003	0.1232	6.6000e-004	0.1239	0.0327	6.1000e-004	0.0333		111.4280	111.4280	2.9800e-003	2.7400e-003	112.3201
Total	**0.0410**	**0.0255**	**0.3610**	**1.0900e-003**	**0.1232**	**6.6000e-004**	**0.1239**	**0.0327**	**6.1000e-004**	**0.0333**		**111.4280**	**111.4280**	**2.9800e-003**	**2.7400e-003**	**112.3201**

3.4 Paving - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0327	10.1917	14.5842	0.0228		0.5102	0.5102		0.4694	0.4694	0.0000	2,207.5841	2,207.5841	0.7140		2,225.4336
Paving	0.2240					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.2568**	**10.1917**	**14.5842**	**0.0228**		**0.5102**	**0.5102**		**0.4694**	**0.4694**	**0.0000**	**2,207.5841**	**2,207.5841**	**0.7140**		**2,225.4336**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0410	0.0255	0.3610	1.0900e-003	0.1232	6.6000e-004	0.1239	0.0327	6.1000e-004	0.0333		111.4280	111.4280	2.9800e-003	2.7400e-003	112.3201
Total	**0.0410**	**0.0255**	**0.3610**	**1.0900e-003**	**0.1232**	**6.6000e-004**	**0.1239**	**0.0327**	**6.1000e-004**	**0.0333**		**111.4280**	**111.4280**	**2.9800e-003**	**2.7400e-003**	**112.3201**

3.5 Architectural Coating - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	85.5992					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1917	1.3030	1.8111	2.9700e-003		0.0708	0.0708		0.0708	0.0708		281.4481	281.4481	0.0168		281.8690
Total	**85.7908**	**1.3030**	**1.8111**	**2.9700e-003**		**0.0708**	**0.0708**		**0.0708**	**0.0708**		**281.4481**	**281.4481**	**0.0168**		**281.8690**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0520	0.0323	0.4572	1.3800e-003	0.1561	8.4000e-004	0.1569	0.0414	7.7000e-004	0.0422		141.1422	141.1422	3.7800e-003	3.4700e-003	142.2721
Total	**0.0520**	**0.0323**	**0.4572**	**1.3800e-003**	**0.1561**	**8.4000e-004**	**0.1569**	**0.0414**	**7.7000e-004**	**0.0422**		**141.1422**	**141.1422**	**3.7800e-003**	**3.4700e-003**	**142.2721**

3.5 Architectural Coating - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	85.5992					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1917	1.3030	1.8111	2.9700e-003		0.0708	0.0708		0.0708	0.0708	0.0000	281.4481	281.4481	0.0168		281.8690
Total	**85.7908**	**1.3030**	**1.8111**	**2.9700e-003**		**0.0708**	**0.0708**		**0.0708**	**0.0708**	**0.0000**	**281.4481**	**281.4481**	**0.0168**		**281.8690**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0520	0.0323	0.4572	1.3800e-003	0.1561	8.4000e-004	0.1569	0.0414	7.7000e-004	0.0422		141.1422	141.1422	3.7800e-003	3.4700e-003	142.2721
Total	**0.0520**	**0.0323**	**0.4572**	**1.3800e-003**	**0.1561**	**8.4000e-004**	**0.1569**	**0.0414**	**7.7000e-004**	**0.0422**		**141.1422**	**141.1422**	**3.7800e-003**	**3.4700e-003**	**142.2721**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Improve Destination Accessibility

Increase Transit Accessibility

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	1.4177	1.1977	10.2748	0.0200	2.0004	0.0160	2.0164	0.5329	0.0149	0.5478		2,061.0297	2,061.0297	0.1643	0.0999	2,094.8981
Unmitigated	1.7360	1.7482	15.2135	0.0327	3.3158	0.0249	3.3407	0.8833	0.0233	0.9065		3,359.5042	3,359.5042	0.2269	0.1430	3,407.7977

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Office Building	343.00	343.00	343.00	819,685	494,506
Manufacturing	168.25	168.25	168.25	491,208	296,340
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Parking Lot	0.00	0.00	0.00		
Unrefrigerated Warehouse-No Rail	90.50	90.50	90.50	264,216	159,398
Total	601.75	601.75	601.75	1,575,109	950,244

4.3 Trip Type Information

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Office Building	9.50	7.30	7.30	33.00	48.00	19.00	77	19	4
Manufacturing	9.50	7.30	7.30	59.00	28.00	13.00	92	5	3
Other Non-Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Unrefrigerated Warehouse-No Rail	9.50	7.30	7.30	59.00	0.00	41.00	92	5	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Office Building	0.553514	0.062792	0.181046	0.120736	0.024419	0.006214	0.008493	0.006184	0.000715	0.000556	0.029185	0.000982	0.005164
Manufacturing	0.553514	0.062792	0.181046	0.120736	0.024419	0.006214	0.008493	0.006184	0.000715	0.000556	0.029185	0.000982	0.005164
Other Non-Asphalt Surfaces	0.553514	0.062792	0.181046	0.120736	0.024419	0.006214	0.008493	0.006184	0.000715	0.000556	0.029185	0.000982	0.005164
Parking Lot	0.553514	0.062792	0.181046	0.120736	0.024419	0.006214	0.008493	0.006184	0.000715	0.000556	0.029185	0.000982	0.005164
Unrefrigerated Warehouse-No Rail	0.553514	0.062792	0.181046	0.120736	0.024419	0.006214	0.008493	0.006184	0.000715	0.000556	0.029185	0.000982	0.005164

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0225	0.2044	0.1717	1.2300e-003		0.0155	0.0155		0.0155	0.0155		245.2949	245.2949	4.7000e-003	4.5000e-003	246.7526
NaturalGas Unmitigated	0.0225	0.2044	0.1717	1.2300e-003		0.0155	0.0155		0.0155	0.0155		245.2949	245.2949	4.7000e-003	4.5000e-003	246.7526

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
General Office Building	941.136	0.0102	0.0923	0.0775	5.5000e-004		7.0100e-003	7.0100e-003		7.0100e-003	7.0100e-003		110.7218	110.7218	2.1200e-003	2.0300e-003	111.3798
Manufacturing	1062.05	0.0115	0.1041	0.0875	6.2000e-004		7.9100e-003	7.9100e-003		7.9100e-003	7.9100e-003		124.9470	124.9470	2.3900e-003	2.2900e-003	125.6895
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	81.8219	8.8000e-004	8.0200e-003	6.7400e-003	5.0000e-005		6.1000e-004	6.1000e-004		6.1000e-004	6.1000e-004		9.6261	9.6261	1.8000e-004	1.8000e-004	9.6833
Total		**0.0225**	**0.2044**	**0.1717**	**1.2200e-003**		**0.0155**	**0.0155**		**0.0155**	**0.0155**		**245.2949**	**245.2949**	**4.6900e-003**	**4.5000e-003**	**246.7526**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
General Office Building	0.941136	0.0102	0.0923	0.0775	5.5000e-004		7.0100e-003	7.0100e-003		7.0100e-003	7.0100e-003		110.7218	110.7218	2.1200e-003	2.0300e-003	111.3798
Manufacturing	1.06205	0.0115	0.1041	0.0875	6.2000e-004		7.9100e-003	7.9100e-003		7.9100e-003	7.9100e-003		124.9470	124.9470	2.3900e-003	2.2900e-003	125.6895
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	0.0818219	8.8000e-004	8.0200e-003	6.7400e-003	5.0000e-005		6.1000e-004	6.1000e-004		6.1000e-004	6.1000e-004		9.6261	9.6261	1.8000e-004	1.8000e-004	9.6833
Total		**0.0225**	**0.2044**	**0.1717**	**1.2200e-003**		**0.0155**	**0.0155**		**0.0155**	**0.0155**		**245.2949**	**245.2949**	**4.6900e-003**	**4.5000e-003**	**246.7526**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	2.0047	2.4000e-004	0.0266	0.0000		9.0000e-005	9.0000e-005		9.0000e-005	9.0000e-005		0.0571	0.0571	1.5000e-004		0.0609
Unmitigated	2.0047	2.4000e-004	0.0266	0.0000		9.0000e-005	9.0000e-005		9.0000e-005	9.0000e-005		0.0571	0.0571	1.5000e-004		0.0609

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.4690					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	1.5332					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	2.4700e-003	2.4000e-004	0.0266	0.0000		9.0000e-005	9.0000e-005		9.0000e-005	9.0000e-005		0.0571	0.0571	1.5000e-004		0.0609
Total	**2.0047**	**2.4000e-004**	**0.0266**	**0.0000**		**9.0000e-005**	**9.0000e-005**		**9.0000e-005**	**9.0000e-005**		**0.0571**	**0.0571**	**1.5000e-004**		**0.0609**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.4690					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	1.5332					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	2.4700e-003	2.4000e-004	0.0266	0.0000		9.0000e-005	9.0000e-005		9.0000e-005	9.0000e-005		0.0571	0.0571	1.5000e-004		0.0609
Total	**2.0047**	**2.4000e-004**	**0.0266**	**0.0000**		**9.0000e-005**	**9.0000e-005**		**9.0000e-005**	**9.0000e-005**		**0.0571**	**0.0571**	**1.5000e-004**		**0.0609**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

06232010 Meyers Avenue Industrial Project

San Diego County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Office Building	17.15	1000sqft	0.15	17,150.00	0
Manufacturing	33.65	1000sqft	0.77	33,650.00	0
Unrefrigerated Warehouse-No Rail	18.10	1000sqft	0.42	18,100.00	0
Other Non-Asphalt Surfaces	2.06	Acre	2.06	89,733.60	0
Parking Lot	190.00	Space	1.71	76,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.6	**Precipitation Freq (Days)**	40
Climate Zone	13			**Operational Year**	2023
Utility Company	San Diego Gas & Electric				
CO2 Intensity (lb/MWhr)	539.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Consistent with the IS/MND's model.

Land Use - See SWAPE comment on "Failure to Model All Proposed Land Uses" and "Underestimated Parking Land Use Size"

Construction Phase - Consistent with the IS/MND's model.

Grading - See SWAPE comment on "Unsubstantiated Reduction to Acres of Grading Value."

Architectural Coating - See SWAPE comment on "Unsubstantiated Reductions to Architectural and Area Coating Emission Factors"

Vehicle Trips - Consistent with the IS/MND's model.

Sequestration - Consistent with the IS/MND's model.

Construction Off-road Equipment Mitigation - Consistent with the IS/MND's model.

Mobile Land Use Mitigation - Consistent with the IS/MND's model.

Waste Mitigation - Consistent with the IS/MND's model.

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblGrading	MaterialExported	0.00	14,000.00
tblLandUse	LotAcreage	0.39	0.15
tblSequestration	NumberOfNewTrees	0.00	52.00
tblVehicleTrips	ST_TR	2.21	20.00
tblVehicleTrips	ST_TR	6.42	5.00
tblVehicleTrips	ST_TR	1.74	5.00
tblVehicleTrips	SU_TR	0.70	20.00
tblVehicleTrips	SU_TR	5.09	5.00
tblVehicleTrips	SU_TR	1.74	5.00
tblVehicleTrips	WD_TR	9.74	20.00
tblVehicleTrips	WD_TR	3.93	5.00
tblVehicleTrips	WD_TR	1.74	5.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2022	2.3781	35.6317	19.4449	0.0856	8.8345	1.0787	9.9132	3.8918	0.9974	4.8892	0.0000	9,027.3629	9,027.3629	1.2225	0.9639	9,345.1546
2023	85.8472	16.2677	19.0668	0.0414	1.0542	0.7140	1.7682	0.2855	0.6719	0.9574	0.0000	4,077.3422	4,077.3422	0.7172	0.1411	4,135.7312
Maximum	**85.8472**	**35.6317**	**19.4449**	**0.0856**	**8.8345**	**1.0787**	**9.9132**	**3.8918**	**0.9974**	**4.8892**	**0.0000**	**9,027.3629**	**9,027.3629**	**1.2225**	**0.9639**	**9,345.1546**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2022	2.3781	35.6317	19.4449	0.0856	8.8345	1.0787	9.9132	3.8918	0.9974	4.8892	0.0000	9,027.3629	9,027.3629	1.2225	0.9639	9,345.1546
2023	85.8472	16.2677	19.0668	0.0414	1.0542	0.7140	1.7682	0.2855	0.6719	0.9574	0.0000	4,077.3422	4,077.3422	0.7172	0.1411	4,135.7312
Maximum	**85.8472**	**35.6317**	**19.4449**	**0.0856**	**8.8345**	**1.0787**	**9.9132**	**3.8918**	**0.9974**	**4.8892**	**0.0000**	**9,027.3629**	**9,027.3629**	**1.2225**	**0.9639**	**9,345.1546**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	2.0047	2.4000e-004	0.0266	0.0000		9.0000e-005	9.0000e-005		9.0000e-005	9.0000e-005		0.0571	0.0571	1.5000e-004		0.0609
Energy	0.0225	0.2044	0.1717	1.2300e-003		0.0155	0.0155		0.0155	0.0155		245.2949	245.2949	4.7000e-003	4.5000e-003	246.7526
Mobile	1.6963	1.8965	15.6191	0.0312	3.3158	0.0249	3.3408	0.8833	0.0233	0.9066		3,213.2546	3,213.2546	0.2409	0.1509	3,264.2551
Total	**3.7235**	**2.1012**	**15.8174**	**0.0325**	**3.3158**	**0.0406**	**3.3564**	**0.8833**	**0.0389**	**0.9222**		**3,458.6066**	**3,458.6066**	**0.2458**	**0.1554**	**3,511.0685**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	2.0047	2.4000e-004	0.0266	0.0000		9.0000e-005	9.0000e-005		9.0000e-005	9.0000e-005		0.0571	0.0571	1.5000e-004		0.0609
Energy	0.0225	0.2044	0.1717	1.2300e-003		0.0155	0.0155		0.0155	0.0155		245.2949	245.2949	4.7000e-003	4.5000e-003	246.7526
Mobile	1.3689	1.3028	10.8235	0.0192	2.0004	0.0160	2.0164	0.5329	0.0149	0.5478		1,973.4560	1,973.4560	0.1779	0.1059	2,009.4528
Total	**3.3960**	**1.5074**	**11.0219**	**0.0204**	**2.0004**	**0.0317**	**2.0320**	**0.5329**	**0.0306**	**0.5634**		**2,218.8080**	**2,218.8080**	**0.1827**	**0.1104**	**2,256.2662**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	8.79	28.26	30.32	37.10	39.67	21.99	39.46	39.67	21.44	38.90	0.00	35.85	35.85	25.65	28.99	35.74

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Grading	Grading	11/1/2022	11/28/2022	5	20	
2	Building Construction	Building Construction	11/29/2022	10/16/2023	5	230	
3	Paving	Paving	10/17/2023	11/13/2023	5	20	
4	Architectural Coating	Architectural Coating	11/14/2023	12/11/2023	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 20

Acres of Paving: 3.77

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 103,350; Non-Residential Outdoor: 34,450; Striped Parking Area: 9,944 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Grading	Excavators	1	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74

Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Grading	6	15.00	0.00	1,750.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	97.00	38.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	19.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Grading - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					7.1810	0.0000	7.1810	3.4396	0.0000	3.4396			0.0000			0.0000
Off-Road	1.9486	20.8551	15.2727	0.0297		0.9409	0.9409		0.8656	0.8656		2,872.0464	2,872.0464	0.9289		2,895.2684
Total	**1.9486**	**20.8551**	**15.2727**	**0.0297**	**7.1810**	**0.9409**	**8.1218**	**3.4396**	**0.8656**	**4.3052**		**2,872.0464**	**2,872.0464**	**0.9289**		**2,895.2684**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.3821	14.7445	3.5070	0.0549	1.5304	0.1371	1.6675	0.4195	0.1312	0.5507		6,047.2307	6,047.2307	0.2901	0.9607	6,340.7626
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0474	0.0321	0.3688	1.0600e-003	0.1232	7.0000e-004	0.1239	0.0327	6.4000e-004	0.0333		108.0858	108.0858	3.4900e-003	3.1900e-003	109.1237
Total	**0.4295**	**14.7766**	**3.8757**	**0.0560**	**1.6536**	**0.1378**	**1.7914**	**0.4522**	**0.1318**	**0.5840**		**6,155.3165**	**6,155.3165**	**0.2936**	**0.9639**	**6,449.8862**

3.2 Grading - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					7.1810	0.0000	7.1810	3.4396	0.0000	3.4396			0.0000			0.0000
Off-Road	1.9486	20.8551	15.2727	0.0297		0.9409	0.9409		0.8656	0.8656	0.0000	2,872.0464	2,872.0464	0.9289		2,895.2684
Total	**1.9486**	**20.8551**	**15.2727**	**0.0297**	**7.1810**	**0.9409**	**8.1218**	**3.4396**	**0.8656**	**4.3052**	**0.0000**	**2,872.0464**	**2,872.0464**	**0.9289**		**2,895.2684**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.3821	14.7445	3.5070	0.0549	1.5304	0.1371	1.6675	0.4195	0.1312	0.5507		6,047.2307	6,047.2307	0.2901	0.9607	6,340.7626
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0474	0.0321	0.3688	1.0600e-003	0.1232	7.0000e-004	0.1239	0.0327	6.4000e-004	0.0333		108.0858	108.0858	3.4900e-003	3.1900e-003	109.1237
Total	**0.4295**	**14.7766**	**3.8757**	**0.0560**	**1.6536**	**0.1378**	**1.7914**	**0.4522**	**0.1318**	**0.5840**		**6,155.3165**	**6,155.3165**	**0.2936**	**0.9639**	**6,449.8862**

3.3 Building Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.7062	15.6156	16.3634	0.0269		0.8090	0.8090		0.7612	0.7612		2,554.3336	2,554.3336	0.6120		2,569.6322
Total	**1.7062**	**15.6156**	**16.3634**	**0.0269**		**0.8090**	**0.8090**		**0.7612**	**0.7612**		**2,554.3336**	**2,554.3336**	**0.6120**		**2,569.6322**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0839	2.0971	0.6969	8.1100e-003	0.2574	0.0220	0.2794	0.0741	0.0211	0.0952		873.7857	873.7857	0.0264	0.1269	912.2763
Worker	0.3063	0.2073	2.3846	6.8700e-003	0.7968	4.5100e-003	0.8013	0.2114	4.1500e-003	0.2155		698.9545	698.9545	0.0226	0.0206	705.6665
Total	**0.3902**	**2.3045**	**3.0815**	**0.0150**	**1.0542**	**0.0266**	**1.0807**	**0.2855**	**0.0252**	**0.3107**		**1,572.7402**	**1,572.7402**	**0.0490**	**0.1476**	**1,617.9428**

3.3 Building Construction - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.7062	15.6156	16.3634	0.0269		0.8090	0.8090		0.7612	0.7612	0.0000	2,554.3336	2,554.3336	0.6120		2,569.6322
Total	**1.7062**	**15.6156**	**16.3634**	**0.0269**		**0.8090**	**0.8090**		**0.7612**	**0.7612**	**0.0000**	**2,554.3336**	**2,554.3336**	**0.6120**		**2,569.6322**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0839	2.0971	0.6969	8.1100e-003	0.2574	0.0220	0.2794	0.0741	0.0211	0.0952		873.7857	873.7857	0.0264	0.1269	912.2763
Worker	0.3063	0.2073	2.3846	6.8700e-003	0.7968	4.5100e-003	0.8013	0.2114	4.1500e-003	0.2155		698.9545	698.9545	0.0226	0.0206	705.6665
Total	**0.3902**	**2.3045**	**3.0815**	**0.0150**	**1.0542**	**0.0266**	**1.0807**	**0.2855**	**0.0252**	**0.3107**		**1,572.7402**	**1,572.7402**	**0.0490**	**0.1476**	**1,617.9428**

3.3 Building Construction - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5728	14.3849	16.2440	0.0269		0.6997	0.6997		0.6584	0.6584		2,555.2099	2,555.2099	0.6079		2,570.4061
Total	**1.5728**	**14.3849**	**16.2440**	**0.0269**		**0.6997**	**0.6997**		**0.6584**	**0.6584**		**2,555.2099**	**2,555.2099**	**0.6079**		**2,570.4061**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0441	1.6975	0.6048	7.7900e-003	0.2574	9.9700e-003	0.2673	0.0741	9.5400e-003	0.0836		841.1726	841.1726	0.0253	0.1219	878.1343
Worker	0.2876	0.1853	2.2180	6.6500e-003	0.7968	4.2900e-003	0.8011	0.2114	3.9500e-003	0.2153		680.9597	680.9597	0.0206	0.0192	687.1909
Total	**0.3318**	**1.8828**	**2.8228**	**0.0144**	**1.0542**	**0.0143**	**1.0685**	**0.2855**	**0.0135**	**0.2989**		**1,522.1323**	**1,522.1323**	**0.0459**	**0.1411**	**1,565.3252**

3.3 Building Construction - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5728	14.3849	16.2440	0.0269		0.6997	0.6997		0.6584	0.6584	0.0000	2,555.2099	2,555.2099	0.6079		2,570.4061
Total	**1.5728**	**14.3849**	**16.2440**	**0.0269**		**0.6997**	**0.6997**		**0.6584**	**0.6584**	**0.0000**	**2,555.2099**	**2,555.2099**	**0.6079**		**2,570.4061**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0441	1.6975	0.6048	7.7900e-003	0.2574	9.9700e-003	0.2673	0.0741	9.5400e-003	0.0836		841.1726	841.1726	0.0253	0.1219	878.1343
Worker	0.2876	0.1853	2.2180	6.6500e-003	0.7968	4.2900e-003	0.8011	0.2114	3.9500e-003	0.2153		680.9597	680.9597	0.0206	0.0192	687.1909
Total	**0.3318**	**1.8828**	**2.8228**	**0.0144**	**1.0542**	**0.0143**	**1.0685**	**0.2855**	**0.0135**	**0.2989**		**1,522.1323**	**1,522.1323**	**0.0459**	**0.1411**	**1,565.3252**

3.4 Paving - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0327	10.1917	14.5842	0.0228		0.5102	0.5102		0.4694	0.4694		2,207.5841	2,207.5841	0.7140		2,225.4336
Paving	0.2240					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.2568**	**10.1917**	**14.5842**	**0.0228**		**0.5102**	**0.5102**		**0.4694**	**0.4694**		**2,207.5841**	**2,207.5841**	**0.7140**		**2,225.4336**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0445	0.0287	0.3430	1.0300e-003	0.1232	6.6000e-004	0.1239	0.0327	6.1000e-004	0.0333		105.3031	105.3031	3.1800e-003	2.9700e-003	106.2666
Total	**0.0445**	**0.0287**	**0.3430**	**1.0300e-003**	**0.1232**	**6.6000e-004**	**0.1239**	**0.0327**	**6.1000e-004**	**0.0333**		**105.3031**	**105.3031**	**3.1800e-003**	**2.9700e-003**	**106.2666**

3.4 Paving - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0327	10.1917	14.5842	0.0228		0.5102	0.5102		0.4694	0.4694	0.0000	2,207.5841	2,207.5841	0.7140		2,225.4336
Paving	0.2240					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.2568**	**10.1917**	**14.5842**	**0.0228**		**0.5102**	**0.5102**		**0.4694**	**0.4694**	**0.0000**	**2,207.5841**	**2,207.5841**	**0.7140**		**2,225.4336**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0445	0.0287	0.3430	1.0300e-003	0.1232	6.6000e-004	0.1239	0.0327	6.1000e-004	0.0333		105.3031	105.3031	3.1800e-003	2.9700e-003	106.2666
Total	**0.0445**	**0.0287**	**0.3430**	**1.0300e-003**	**0.1232**	**6.6000e-004**	**0.1239**	**0.0327**	**6.1000e-004**	**0.0333**		**105.3031**	**105.3031**	**3.1800e-003**	**2.9700e-003**	**106.2666**

3.5 Architectural Coating - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	85.5992					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1917	1.3030	1.8111	2.9700e-003		0.0708	0.0708		0.0708	0.0708		281.4481	281.4481	0.0168		281.8690
Total	**85.7908**	**1.3030**	**1.8111**	**2.9700e-003**		**0.0708**	**0.0708**		**0.0708**	**0.0708**		**281.4481**	**281.4481**	**0.0168**		**281.8690**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0563	0.0363	0.4345	1.3000e-003	0.1561	8.4000e-004	0.1569	0.0414	7.7000e-004	0.0422		133.3839	133.3839	4.0200e-003	3.7600e-003	134.6044
Total	**0.0563**	**0.0363**	**0.4345**	**1.3000e-003**	**0.1561**	**8.4000e-004**	**0.1569**	**0.0414**	**7.7000e-004**	**0.0422**		**133.3839**	**133.3839**	**4.0200e-003**	**3.7600e-003**	**134.6044**

3.5 Architectural Coating - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	85.5992					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1917	1.3030	1.8111	2.9700e-003		0.0708	0.0708		0.0708	0.0708	0.0000	281.4481	281.4481	0.0168		281.8690
Total	**85.7908**	**1.3030**	**1.8111**	**2.9700e-003**		**0.0708**	**0.0708**		**0.0708**	**0.0708**	**0.0000**	**281.4481**	**281.4481**	**0.0168**		**281.8690**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0563	0.0363	0.4345	1.3000e-003	0.1561	8.4000e-004	0.1569	0.0414	7.7000e-004	0.0422		133.3839	133.3839	4.0200e-003	3.7600e-003	134.6044
Total	**0.0563**	**0.0363**	**0.4345**	**1.3000e-003**	**0.1561**	**8.4000e-004**	**0.1569**	**0.0414**	**7.7000e-004**	**0.0422**		**133.3839**	**133.3839**	**4.0200e-003**	**3.7600e-003**	**134.6044**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Improve Destination Accessibility

Increase Transit Accessibility

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	1.3689	1.3028	10.8235	0.0192	2.0004	0.0160	2.0164	0.5329	0.0149	0.5478		1,973.4560	1,973.4560	0.1779	0.1059	2,009.4528
Unmitigated	1.6963	1.8965	15.6191	0.0312	3.3158	0.0249	3.3408	0.8833	0.0233	0.9066		3,213.2546	3,213.2546	0.2409	0.1509	3,264.2551

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Office Building	343.00	343.00	343.00	819,685	494,506
Manufacturing	168.25	168.25	168.25	491,208	296,340
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Parking Lot	0.00	0.00	0.00		
Unrefrigerated Warehouse-No Rail	90.50	90.50	90.50	264,216	159,398
Total	601.75	601.75	601.75	1,575,109	950,244

4.3 Trip Type Information

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Office Building	9.50	7.30	7.30	33.00	48.00	19.00	77	19	4
Manufacturing	9.50	7.30	7.30	59.00	28.00	13.00	92	5	3
Other Non-Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Unrefrigerated Warehouse-No	9.50	7.30	7.30	59.00	0.00	41.00	92	5	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Office Building	0.553514	0.062792	0.181046	0.120736	0.024419	0.006214	0.008493	0.006184	0.000715	0.000556	0.029185	0.000982	0.005164
Manufacturing	0.553514	0.062792	0.181046	0.120736	0.024419	0.006214	0.008493	0.006184	0.000715	0.000556	0.029185	0.000982	0.005164
Other Non-Asphalt Surfaces	0.553514	0.062792	0.181046	0.120736	0.024419	0.006214	0.008493	0.006184	0.000715	0.000556	0.029185	0.000982	0.005164
Parking Lot	0.553514	0.062792	0.181046	0.120736	0.024419	0.006214	0.008493	0.006184	0.000715	0.000556	0.029185	0.000982	0.005164
Unrefrigerated Warehouse-No Rail	0.553514	0.062792	0.181046	0.120736	0.024419	0.006214	0.008493	0.006184	0.000715	0.000556	0.029185	0.000982	0.005164

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0225	0.2044	0.1717	1.2300e-003		0.0155	0.0155		0.0155	0.0155		245.2949	245.2949	4.7000e-003	4.5000e-003	246.7526
NaturalGas Unmitigated	0.0225	0.2044	0.1717	1.2300e-003		0.0155	0.0155		0.0155	0.0155		245.2949	245.2949	4.7000e-003	4.5000e-003	246.7526

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
General Office Building	941.136	0.0102	0.0923	0.0775	5.5000e-004		7.0100e-003	7.0100e-003		7.0100e-003	7.0100e-003		110.7218	110.7218	2.1200e-003	2.0300e-003	111.3798
Manufacturing	1062.05	0.0115	0.1041	0.0875	6.2000e-004		7.9100e-003	7.9100e-003		7.9100e-003	7.9100e-003		124.9470	124.9470	2.3900e-003	2.2900e-003	125.6895
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	81.8219	8.8000e-004	8.0200e-003	6.7400e-003	5.0000e-005		6.1000e-004	6.1000e-004		6.1000e-004	6.1000e-004		9.6261	9.6261	1.8000e-004	1.8000e-004	9.6833
Total		**0.0225**	**0.2044**	**0.1717**	**1.2200e-003**		**0.0155**	**0.0155**		**0.0155**	**0.0155**		**245.2949**	**245.2949**	**4.6900e-003**	**4.5000e-003**	**246.7526**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
General Office Building	0.941136	0.0102	0.0923	0.0775	5.5000e-004		7.0100e-003	7.0100e-003		7.0100e-003	7.0100e-003		110.7218	110.7218	2.1200e-003	2.0300e-003	111.3798
Manufacturing	1.06205	0.0115	0.1041	0.0875	6.2000e-004		7.9100e-003	7.9100e-003		7.9100e-003	7.9100e-003		124.9470	124.9470	2.3900e-003	2.2900e-003	125.6895
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	0.0818219	8.8000e-004	8.0200e-003	6.7400e-003	5.0000e-005		6.1000e-004	6.1000e-004		6.1000e-004	6.1000e-004		9.6261	9.6261	1.8000e-004	1.8000e-004	9.6833
Total		**0.0225**	**0.2044**	**0.1717**	**1.2200e-003**		**0.0155**	**0.0155**		**0.0155**	**0.0155**		**245.2949**	**245.2949**	**4.6900e-003**	**4.5000e-003**	**246.7526**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	2.0047	2.4000e-004	0.0266	0.0000		9.0000e-005	9.0000e-005		9.0000e-005	9.0000e-005		0.0571	0.0571	1.5000e-004		0.0609
Unmitigated	2.0047	2.4000e-004	0.0266	0.0000		9.0000e-005	9.0000e-005		9.0000e-005	9.0000e-005		0.0571	0.0571	1.5000e-004		0.0609

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.4690					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	1.5332					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	2.4700e-003	2.4000e-004	0.0266	0.0000		9.0000e-005	9.0000e-005		9.0000e-005	9.0000e-005		0.0571	0.0571	1.5000e-004		0.0609
Total	**2.0047**	**2.4000e-004**	**0.0266**	**0.0000**		**9.0000e-005**	**9.0000e-005**		**9.0000e-005**	**9.0000e-005**		**0.0571**	**0.0571**	**1.5000e-004**		**0.0609**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.4690					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	1.5332					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	2.4700e-003	2.4000e-004	0.0266	0.0000		9.0000e-005	9.0000e-005		9.0000e-005	9.0000e-005		0.0571	0.0571	1.5000e-004		0.0609
Total	**2.0047**	**2.4000e-004**	**0.0266**	**0.0000**		**9.0000e-005**	**9.0000e-005**		**9.0000e-005**	**9.0000e-005**		**0.0571**	**0.0571**	**1.5000e-004**		**0.0609**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Construction	
2022	
Annual Emissions (tons/year)	0.0202
Daily Emissions (lbs/day)	0.110684932
Construction Duration (days)	61
Total DPM (lbs)	6.751780822
Total DPM (g)	3062.607781
Start Date	11/1/2022
End Date	1/1/2023
Construction Days	61
2023	
Annual Emissions (tons/year)	0.1728
Daily Emissions (lbs/day)	0.946849315
Construction Duration (days)	320
Total DPM (lbs)	302.9917808
Total DPM (g)	137437.0718
Start Date	1/1/2023
End Date	11/17/2023
Construction Days	320
Total	
Total DPM (lbs)	309.7435616
Total DPM (g)	140499.6796
Emission Rate (g/s)	0.00426812
Release Height (meters)	3
Total Acreage	4.26
Max Horizontal (meters)	185.69
Min Horizontal (meters)	92.84
Initial Vertical Dimension (meters)	1.5
Setting	Urban
Population	150,665
Start Date	11/1/2022
End Date	11/17/2023
Total Construction Days	381
Total Years of Construction	1.04
Total Years of Operation	28.96

Operation	
Emission Rate	
Annual Emissions (tons/year)	0.00494
Daily Emissions (lbs/day)	0.027068493
Total DPM (lbs)	9.88
Emission Rate (g/s)	0.00014211
Release Height (meters)	3
Total Acreage	4.26
Max Horizontal (meters)	185.69
Min Horizontal (meters)	92.84
Initial Vertical Dimension (meters)	1.5
Setting	Urban
Population	150,665

```
Start date and time  09/08/22 13:42:11
                                AERSCREEN 21112

Meyers Avenue - Construction

            Meyers Avenue - Construction

         -----------------  DATA ENTRY VALIDATION  -----------------
                         METRIC              ENGLISH
 ** AREADATA **  ---------------     ----------------

 Emission Rate:    0.427E-02 g/s         0.339E-01 lb/hr
 Area Height:           3.00 meters           9.84 feet
 Area Source Length:  185.69 meters         609.22 feet
 Area Source Width:    92.84 meters         304.59 feet
 Vertical Dimension:    1.50 meters           4.92 feet
 Model Mode:           URBAN
 Population:          150665
 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:

2022.09.08_MeyersAve_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 09/08/22 13:44:16
 ********************************************


  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 09/08/22 13:44:26


REFINE       started 09/08/22 13:44:26


 AERMOD Finishes Successfully for REFINE stage 3 Winter sector   0


    ********   WARNING MESSAGES   ********
```

*** NONE ***

REFINE ended 09/08/22 13:44:28

****

AERSCREEN Finished Successfully

With no errors or warnings

Check log file for details

****

Ending date and time 09/08/22 13:44:29

```
  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
   0.60599E+01         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
   0.66889E+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
   0.72077E+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
   0.76371E+01        75.00      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
*  0.78846E+01        99.00      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
   0.78719E+01       100.00      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
   0.52091E+01       125.00      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
   0.39387E+01       150.00      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
   0.32144E+01       175.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.26929E+01       200.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.23030E+01       225.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.20001E+01       250.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.17608E+01       275.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.15671E+01       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
   0.14075E+01       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
   0.12742E+01       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
   0.11616E+01       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
   0.10649E+01       400.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.98107E+00       425.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.90858E+00       450.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.84534E+00       475.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.78856E+00       500.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.73802E+00       525.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.69302E+00       550.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.65274E+00       575.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.61648E+00       600.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.58325E+00       625.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.55308E+00       650.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.52559E+00       675.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.50044E+00       700.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.47717E+00       725.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.45576E+00       750.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.43600E+00       775.00      0.00   0.0        Winter       0-360   10011001
```

```
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.41771E+00       800.00      0.00   0.0         Winter      0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.40056E+00       825.00      0.00   0.0         Winter      0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.38459E+00       850.00      0.00   0.0         Winter      0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.36971E+00       875.00      0.00   0.0         Winter      0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.35582E+00       900.00      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
   0.34282E+00       925.00      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
   0.33061E+00       950.00      0.00   0.0         Winter      0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.31916E+00       975.00      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
   0.30839E+00      1000.00      0.00   0.0         Winter      0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.29824E+00      1025.00      0.00   0.0         Winter      0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.28867E+00      1050.00      0.00   0.0         Winter      0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.27963E+00      1075.00      0.00   0.0         Winter      0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.27103E+00      1100.00      0.00   0.0         Winter      0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.26288E+00      1125.00      0.00   0.0         Winter      0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.25515E+00      1150.00      0.00   0.0         Winter      0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.24781E+00      1175.00      0.00   0.0         Winter      0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
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   0.24081E+00      1200.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.23412E+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
   0.22775E+00      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
   0.22168E+00      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
   0.21589E+00      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
   0.21035E+00      1325.00      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
   0.20507E+00      1350.00      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
   0.20001E+00      1375.00      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
   0.19516E+00      1400.00      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
   0.19051E+00      1425.00      0.00   5.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.18606E+00      1450.00      0.00   5.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.18178E+00      1475.00      0.00   5.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.17767E+00      1500.00      0.00   5.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.17372E+00      1525.00      0.00   5.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.16992E+00      1550.00      0.00   5.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.16626E+00      1575.00      0.00   5.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.16274E+00      1600.00      0.00   5.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
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 310.0    2.0
   0.15935E+00      1625.00      0.00   5.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.15608E+00      1650.00      0.00   5.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.15292E+00      1675.00      0.00   5.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.14987E+00      1700.00      0.00   5.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.14802E+00      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
   0.14513E+00      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
   0.14233E+00      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
   0.13963E+00      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
   0.13701E+00      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
   0.13448E+00      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
   0.13203E+00      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
   0.12966E+00      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
   0.12736E+00      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
   0.12513E+00      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
   0.12296E+00      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
   0.12086E+00      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
   0.11882E+00      2025.00      0.00   5.0        Winter       0-360   10011001
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-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.11684E+00      2050.00      0.00   0.0         Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.11491E+00      2075.00      0.00   0.0         Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.11304E+00      2100.00      0.00   0.0         Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.11123E+00      2125.00      0.00   0.0         Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.10946E+00      2150.00      0.00   0.0         Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.10774E+00      2175.00      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
   0.10607E+00      2200.00      0.00   0.0         Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.10444E+00      2225.00      0.00   0.0         Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.10285E+00      2250.00      0.00   0.0         Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.10131E+00      2275.00      0.00   0.0         Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.99801E-01      2300.00      0.00   0.0         Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.98334E-01      2325.00      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
   0.96905E-01      2350.00      0.00   0.0         Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.95510E-01      2375.00      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
   0.94150E-01      2400.00      0.00   0.0         Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.92824E-01      2425.00      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
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   0.91529E-01      2450.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.90266E-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
   0.89032E-01      2500.00      0.00  15.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.87827E-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
   0.86650E-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
   0.85501E-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
   0.84377E-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
   0.83279E-01      2625.00      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
   0.82205E-01      2650.00      0.00  15.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.81155E-01      2675.00      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
   0.80128E-01      2700.00      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
   0.79123E-01      2725.00      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
   0.78140E-01      2750.00      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
   0.77178E-01      2775.00      0.00  15.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.76236E-01      2800.00      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
   0.75314E-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
   0.74411E-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
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 310.0    2.0
   0.73527E-01      2875.00      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
   0.72661E-01      2900.00      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
   0.71812E-01      2925.00      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
   0.70980E-01      2950.00      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
   0.70165E-01      2975.00      0.00  10.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.69366E-01      3000.00      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
   0.68582E-01      3025.00      0.00  10.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.67814E-01      3050.00      0.00   5.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.67061E-01      3074.99      0.00  20.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.66321E-01      3100.00      0.00   5.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.65596E-01      3125.00      0.00  10.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.64885E-01      3150.00      0.00   5.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.64187E-01      3174.99      0.00  10.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.63501E-01      3199.99      0.00  10.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.62829E-01      3225.00      0.00  10.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.62168E-01      3250.00      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
   0.61519E-01      3275.00      0.00  20.0        Winter       0-360   10011001
```

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-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.60883E-01      3300.00      0.00   5.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.60257E-01      3325.00      0.00  15.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.59642E-01      3350.00      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
   0.59039E-01      3375.00      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
   0.58445E-01      3400.00      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
   0.57862E-01      3425.00      0.00  25.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.57289E-01      3450.00      0.00  15.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.56726E-01      3475.00      0.00  15.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.56172E-01      3500.00      0.00  20.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.55628E-01      3525.00      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
   0.55092E-01      3550.00      0.00  25.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.54566E-01      3575.00      0.00  15.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.54048E-01      3600.00      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
   0.53539E-01      3625.00      0.00  15.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.53037E-01      3650.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.52545E-01      3675.00      0.00  20.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
```

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   0.52059E-01      3700.00      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
   0.51582E-01      3724.99      0.00  20.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.51112E-01      3750.00      0.00  15.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.50649E-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
   0.50194E-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
   0.49746E-01      3825.00      0.00   5.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.49304E-01      3849.99      0.00  15.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.48870E-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
   0.48441E-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
   0.48020E-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
   0.47604E-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
   0.47195E-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
   0.46792E-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
   0.46395E-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
   0.46004E-01      4050.00      0.00  30.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.45618E-01      4075.00      0.00   5.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.45238E-01      4100.00      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
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 310.0    2.0
   0.44863E-01      4125.00      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
   0.44494E-01      4150.00      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
   0.44130E-01      4175.00      0.00   5.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.43771E-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
   0.43417E-01      4225.00      0.00   5.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.43068E-01      4250.00      0.00  10.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.42724E-01      4275.00      0.00   5.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.42384E-01      4300.00      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
   0.42049E-01      4325.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.41719E-01      4350.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.41393E-01      4375.00      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
   0.41072E-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
   0.40755E-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
   0.40442E-01      4450.00      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
   0.40133E-01      4475.00      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
   0.39829E-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
   0.39528E-01      4525.00      0.00   0.0        Winter       0-360   10011001
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-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.39231E-01      4550.00      0.00   0.0         Winter      0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.38938E-01      4575.00      0.00  20.0         Winter      0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.38649E-01      4600.00      0.00   0.0         Winter      0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.38363E-01      4625.00      0.00  25.0         Winter      0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.38082E-01      4650.00      0.00   0.0         Winter      0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.37803E-01      4675.00      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
   0.37528E-01      4700.00      0.00   0.0         Winter      0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.37257E-01      4725.00      0.00   0.0         Winter      0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.36989E-01      4750.00      0.00   5.0         Winter      0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.36725E-01      4775.00      0.00   0.0         Winter      0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.36463E-01      4800.00      0.00   0.0         Winter      0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.36205E-01      4825.00      0.00   0.0         Winter      0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.35950E-01      4850.00      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
   0.35698E-01      4875.00      0.00   0.0         Winter      0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.35449E-01      4900.00      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
   0.35203E-01      4925.00      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
```

```
   0.34960E-01      4950.00      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
   0.34720E-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
   0.34483E-01      5000.00      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
```

Start date and time 09/08/22 13:51:04

AERSCREEN 21112

Meyers Avenue - Operations

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

	METRIC	ENGLISH
** AREADATA **	---------------	----------------
Emission Rate:	0.142E-03 g/s	0.113E-02 lb/hr
Area Height:	3.00 meters	9.84 feet
Area Source Length:	185.69 meters	609.22 feet
Area Source Width:	92.84 meters	304.59 feet
Vertical Dimension:	1.50 meters	4.92 feet
Model Mode:	URBAN	
Population:	150665	
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:

2022.09.08_MeyersAve_AERSCREEN_Operations.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 09/08/22 13:52:06

****

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
```

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 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 09/08/22 13:52:16

REFINE       started 09/08/22 13:52:16

 AERMOD Finishes Successfully for REFINE stage 3 Winter sector   0

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

REFINE   ended 09/08/22 13:52:17

****

AERSCREEN Finished Successfully

With no errors or warnings

Check log file for details

****

Ending date and time 09/08/22 13:52:19

```
 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
   0.20174E+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
   0.22268E+00        25.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.23996E+00        50.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.25425E+00        75.00      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
*  0.26249E+00        99.00      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
   0.26207E+00       100.00      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
   0.17342E+00       125.00      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
   0.13113E+00       150.00      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
   0.10701E+00       175.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.89652E-01       200.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.76670E-01       225.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.66588E-01       250.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.58619E-01       275.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.52170E-01       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
   0.46858E-01       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
   0.42419E-01       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
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 310.0    2.0
   0.38670E-01       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
   0.35453E-01       400.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.32662E-01       425.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.30248E-01       450.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.28143E-01       475.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.26252E-01       500.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.24570E-01       525.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.23072E-01       550.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.21731E-01       575.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.20524E-01       600.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.19417E-01       625.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.18413E-01       650.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.17498E-01       675.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.16660E-01       700.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.15886E-01       725.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.15173E-01       750.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.14515E-01       775.00      0.00   0.0        Winter       0-360   10011001
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-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.13906E-01       800.00      0.00   0.0        Winter      0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.13335E-01       825.00      0.00   0.0        Winter      0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.12804E-01       850.00      0.00   0.0        Winter      0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.12308E-01       875.00      0.00   0.0        Winter      0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.11846E-01       900.00      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
   0.11413E-01       925.00      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
   0.11006E-01       950.00      0.00   0.0        Winter      0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.10625E-01       975.00      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
   0.10267E-01      1000.00      0.00   0.0        Winter      0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.99290E-02      1025.00      0.00   0.0        Winter      0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.96104E-02      1050.00      0.00   0.0        Winter      0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.93094E-02      1075.00      0.00   0.0        Winter      0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.90232E-02      1100.00      0.00   0.0        Winter      0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.87518E-02      1125.00      0.00   0.0        Winter      0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.84945E-02      1150.00      0.00   0.0        Winter      0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.82501E-02      1175.00      0.00   0.0        Winter      0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
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   0.80169E-02      1200.00      0.00   0.0         Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.77943E-02      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
   0.75823E-02      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
   0.73801E-02      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
   0.71872E-02      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
   0.70030E-02      1325.00      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
   0.68273E-02      1350.00      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
   0.66587E-02      1375.00      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
   0.64973E-02      1400.00      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
   0.63425E-02      1425.00      0.00   5.0         Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.61942E-02      1450.00      0.00   5.0         Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.60517E-02      1475.00      0.00   5.0         Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.59149E-02      1500.00      0.00   5.0         Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.57834E-02      1525.00      0.00   5.0         Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.56570E-02      1550.00      0.00   5.0         Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.55352E-02      1575.00      0.00   5.0         Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.54180E-02      1600.00      0.00   5.0         Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
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 310.0    2.0
   0.53051E-02      1625.00      0.00   5.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.51962E-02      1650.00      0.00   5.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.50911E-02      1675.00      0.00   5.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.49895E-02      1700.00      0.00   5.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.49277E-02      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
   0.48315E-02      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
   0.47385E-02      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
   0.46485E-02      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
   0.45614E-02      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
   0.44772E-02      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
   0.43956E-02      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
   0.43165E-02      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
   0.42399E-02      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
   0.41656E-02      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
   0.40935E-02      1975.00      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
   0.40236E-02      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
   0.39557E-02      2025.00      0.00   5.0        Winter       0-360   10011001
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-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.38897E-02      2050.00      0.00   0.0         Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.38257E-02      2075.00      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
   0.37634E-02      2100.00      0.00   0.0         Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.37029E-02      2125.00      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
   0.36441E-02      2150.00      0.00   0.0         Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.35868E-02      2175.00      0.00   0.0         Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.35311E-02      2200.00      0.00   0.0         Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.34769E-02      2225.00      0.00   0.0         Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.34241E-02      2250.00      0.00   0.0         Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.33726E-02      2275.00      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
   0.33225E-02      2300.00      0.00   0.0         Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.32737E-02      2325.00      0.00   0.0         Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.32261E-02      2350.00      0.00   0.0         Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.31797E-02      2375.00      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
   0.31344E-02      2400.00      0.00   0.0         Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.30903E-02      2425.00      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
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   0.30472E-02      2450.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.30051E-02      2475.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.29640E-02      2500.00      0.00  15.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.29239E-02      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
   0.28847E-02      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
   0.28465E-02      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
   0.28090E-02      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
   0.27725E-02      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
   0.27367E-02      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
   0.27018E-02      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
   0.26676E-02      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
   0.26341E-02      2725.00      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
   0.26014E-02      2750.00      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
   0.25694E-02      2775.00      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
   0.25380E-02      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
   0.25073E-02      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
   0.24773E-02      2850.00      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
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 310.0    2.0
   0.24478E-02      2875.00      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
   0.24190E-02      2900.00      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
   0.23907E-02      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
   0.23630E-02      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
   0.23359E-02      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
   0.23093E-02      3000.00      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
   0.22832E-02      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
   0.22576E-02      3050.00      0.00   5.0        Winter      0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.22325E-02      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
   0.22079E-02      3100.00      0.00   5.0        Winter      0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.21838E-02      3125.00      0.00  10.0        Winter      0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.21601E-02      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
   0.21369E-02      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
   0.21141E-02      3200.00      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
   0.20917E-02      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
   0.20697E-02      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
   0.20481E-02      3275.00      0.00   0.0        Winter      0-360   10011001
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-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.20269E-02      3300.00      0.00   5.0        Winter      0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.20060E-02      3325.00      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
   0.19856E-02      3350.00      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
   0.19655E-02      3375.00      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
   0.19457E-02      3400.00      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
   0.19263E-02      3425.00      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
   0.19073E-02      3450.00      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
   0.18885E-02      3475.00      0.00   0.0        Winter      0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.18701E-02      3500.00      0.00  20.0        Winter      0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.18519E-02      3525.00      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
   0.18341E-02      3550.00      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
   0.18166E-02      3575.00      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
   0.17994E-02      3600.00      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
   0.17824E-02      3625.00      0.00   0.0        Winter      0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.17657E-02      3650.00      0.00   0.0        Winter      0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.17493E-02      3675.00      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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   0.17331E-02      3700.00      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
   0.17172E-02      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
   0.17016E-02      3750.00      0.00  15.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.16862E-02      3775.00      0.00  25.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.16710E-02      3800.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.16561E-02      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
   0.16414E-02      3849.99      0.00  15.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.16269E-02      3875.00      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
   0.16127E-02      3900.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.15987E-02      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
   0.15848E-02      3950.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.15712E-02      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
   0.15578E-02      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
   0.15446E-02      4025.00      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
   0.15315E-02      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
   0.15187E-02      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
   0.15060E-02      4100.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
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 310.0    2.0
   0.14936E-02      4125.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.14813E-02      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
   0.14691E-02      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
   0.14572E-02      4200.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.14454E-02      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
   0.14338E-02      4250.00      0.00  15.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.14223E-02      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
   0.14110E-02      4300.00      0.00  10.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.13999E-02      4325.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.13889E-02      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
   0.13780E-02      4375.00      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
   0.13673E-02      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
   0.13568E-02      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
   0.13464E-02      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
   0.13361E-02      4475.00      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
   0.13260E-02      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
   0.13159E-02      4525.00      0.00   0.0        Winter       0-360   10011001
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-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.13061E-02      4550.00      0.00   0.0         Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.12963E-02      4575.00      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
   0.12867E-02      4600.00      0.00   0.0         Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.12772E-02      4625.00      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
   0.12678E-02      4650.00      0.00   0.0         Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.12585E-02      4675.00      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
   0.12494E-02      4700.00      0.00   0.0         Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.12403E-02      4725.00      0.00   0.0         Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.12314E-02      4750.00      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
   0.12226E-02      4775.00      0.00   0.0         Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.12139E-02      4800.00      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
   0.12053E-02      4825.00      0.00   0.0         Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.11968E-02      4850.00      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
   0.11884E-02      4875.00      0.00   0.0         Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.11802E-02      4900.00      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
   0.11720E-02      4925.00      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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   0.11639E-02      4950.00      0.00   0.0        Winter      0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.      6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.11559E-02      4975.00      0.00   0.0        Winter      0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.      6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.11480E-02      5000.00      0.00   0.0        Winter      0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.      6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
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SWAPE Technical Consultation, Data Analysis and Litigation Support for the Environment

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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 – 2104, 2017;
- Senior Environmental Analyst, Komex H2O Science, Inc. (2000 -- 2003);

- Executive Director, Orange Coast Watch (2001 – 2004);
- Senior Science Policy Advisor and Hydrogeologist, U.S. Environmental Protection Agency (1989–1998);
- Hydrogeologist, National Park Service, Water Resources Division (1998 – 2000);
- Adjunct Faculty Member, San Francisco State University, Department of Geosciences (1993 – 1998);
- Instructor, College of Marin, Department of Science (1990 – 1995);
- Geologist, U.S. Forest Service (1986 – 1998); and
- Geologist, Dames & Moore (1984 – 1986).

Senior Regulatory and Litigation Support Analyst:

With SWAPE, Matt's responsibilities have included:

- Lead analyst and testifying expert in the review of over 300 environmental impact reports and negative declarations since 2003 under CEQA that identify significant issues with regard to hazardous waste, water resources, water quality, air quality, greenhouse gas emissions, and geologic hazards. Make recommendations for additional mitigation measures to lead agencies at the local and county level to include additional characterization of health risks and implementation of protective measures to reduce worker exposure to hazards from toxins and Valley Fever.
- Stormwater analysis, sampling and best management practice evaluation at more than 100 industrial facilities.
- Expert witness on numerous cases including, for example, perfluorooctanoic acid (PFOA) contamination of groundwater, MTBE litigation, air toxins at hazards at a school, CERCLA compliance in assessment and remediation, and industrial stormwater contamination.
- Technical assistance and litigation support for vapor intrusion concerns.
- Lead analyst and testifying expert in the review of environmental issues in license applications for large solar power plants before the California Energy Commission.
- Manager of a project to evaluate numerous formerly used military sites in the western U.S.
- Manager of a comprehensive evaluation of potential sources of perchlorate contamination in Southern California drinking water wells.
- Manager and designated expert for litigation support under provisions of Proposition 65 in the review of releases of gasoline to sources drinking water at major refineries and hundreds of gas stations throughout California.

With Komex H2O Science Inc., Matt's duties included the following:

- Senior author of a report on the extent of perchlorate contamination that was used in testimony by the former U.S. EPA Administrator and General Counsel.
- Senior researcher in the development of a comprehensive, electronically interactive chronology of MTBE use, research, and regulation.
- Senior researcher in the development of a comprehensive, electronically interactive chronology of perchlorate use, research, and regulation.
- Senior researcher in a study that estimates nationwide costs for MTBE remediation and drinking water treatment, results of which were published in newspapers nationwide and in testimony against provisions of an energy bill that would limit liability for oil companies.
- Research to support litigation to restore drinking water supplies that have been contaminated by MTBE in California and New York.

- Expert witness testimony in a case of oil production-related contamination in Mississippi.
- Lead author for a multi-volume remedial investigation report for an operating school in Los Angeles that met strict regulatory requirements and rigorous deadlines.
- Development of strategic approaches for cleanup of contaminated sites in consultation with clients and regulators.

Executive Director:

As Executive Director with Orange Coast Watch, Matt led efforts to restore water quality at Orange County beaches from multiple sources of contamination including urban runoff and the discharge of wastewater. In reporting to a Board of Directors that included representatives from leading Orange County universities and businesses, Matt prepared issue papers in the areas of treatment and disinfection of wastewater and control of the discharge of grease to sewer systems. Matt actively participated in the development of countywide water quality permits for the control of urban runoff and permits for the discharge of wastewater. Matt worked with other nonprofits to protect and restore water quality, including Surfrider, Natural Resources Defense Council and Orange County CoastKeeper as well as with business institutions including the Orange County Business Council.

Hydrogeology:

As a Senior Hydrogeologist with the U.S. Environmental Protection Agency, Matt led investigations to characterize and cleanup closing military bases, including Mare Island Naval Shipyard, Hunters Point Naval Shipyard, Treasure Island Naval Station, Alameda Naval Station, Moffett Field, Mather Army Airfield, and Sacramento Army Depot. Specific activities were as follows:

- Led efforts to model groundwater flow and contaminant transport, ensured adequacy of monitoring networks, and assessed cleanup alternatives for contaminated sediment, soil, and groundwater.
- Initiated a regional program for evaluation of groundwater sampling practices and laboratory analysis at military bases.
- Identified emerging issues, wrote technical guidance, and assisted in policy and regulation development through work on four national U.S. EPA workgroups, including the Superfund Groundwater Technical Forum and the Federal Facilities Forum.

At the request of the State of Hawaii, Matt developed a methodology to determine the vulnerability of groundwater to contamination on the islands of Maui and Oahu. He used analytical models and a GIS to show zones of vulnerability, and the results were adopted and published by the State of Hawaii and County of Maui.

As a hydrogeologist with the EPA Groundwater Protection Section, Matt worked with provisions of the Safe Drinking Water Act and NEPA to prevent drinking water contamination. Specific activities included the following:

- Received an EPA Bronze Medal for his contribution to the development of national guidance for the protection of drinking water.
- Managed the Sole Source Aquifer Program and protected the drinking water of two communities through designation under the Safe Drinking Water Act. He prepared geologic reports, conducted

public hearings, and responded to public comments from residents who were very concerned about the impact of designation.

- Reviewed a number of Environmental Impact Statements for planned major developments, including large hazardous and solid waste disposal facilities, mine reclamation, and water transfer.

Matt served as a hydrogeologist with the RCRA Hazardous Waste program. Duties were as follows:

- Supervised the hydrogeologic investigation of hazardous waste sites to determine compliance with Subtitle C requirements.
- Reviewed and wrote "part B" permits for the disposal of hazardous waste.
- Conducted RCRA Corrective Action investigations of waste sites and led inspections that formed the basis for significant enforcement actions that were developed in close coordination with U.S. EPA legal counsel.
- Wrote contract specifications and supervised contractor's investigations of waste sites.

With the National Park Service, Matt directed service-wide investigations of contaminant sources to prevent degradation of water quality, including the following tasks:

- Applied pertinent laws and regulations including CERCLA, RCRA, NEPA, NRDA, and the Clean Water Act to control military, mining, and landfill contaminants.
- Conducted watershed-scale investigations of contaminants at parks, including Yellowstone and Olympic National Park.
- Identified high-levels of perchlorate in soil adjacent to a national park in New Mexico and advised park superintendent on appropriate response actions under CERCLA.
- Served as a Park Service representative on the Interagency Perchlorate Steering Committee, a national workgroup.
- Developed a program to conduct environmental compliance audits of all National Parks while serving on a national workgroup.
- Co-authored two papers on the potential for water contamination from the operation of personal watercraft and snowmobiles, these papers serving as the basis for the development of nation-wide policy on the use of these vehicles in National Parks.
- Contributed to the Federal Multi-Agency Source Water Agreement under the Clean Water Action Plan.

Policy:

Served senior management as the Senior Science Policy Advisor with the U.S. Environmental Protection Agency, Region 9.

Activities included the following:

- Advised the Regional Administrator and senior management on emerging issues such as the potential for the gasoline additive MTBE and ammonium perchlorate to contaminate drinking water supplies.
- Shaped EPA's national response to these threats by serving on workgroups and by contributing to guidance, including the Office of Research and Development publication, Oxygenates in Water: Critical Information and Research Needs.
- Improved the technical training of EPA's scientific and engineering staff.
- Earned an EPA Bronze Medal for representing the region's 300 scientists and engineers in negotiations with the Administrator and senior management to better integrate scientific

principles into the policy-making process.
- Established national protocol for the peer review of scientific documents.

Geology:

With the U.S. Forest Service, Matt led investigations to determine hillslope stability of areas proposed for timber harvest in the central Oregon Coast Range. Specific activities were as follows:

- Mapped geology in the field, and used aerial photographic interpretation and mathematical models to determine slope stability.
- Coordinated his research with community members who were concerned with natural resource protection.
- Characterized the geology of an aquifer that serves as the sole source of drinking water for the city of Medford, Oregon.

As a consultant with Dames and Moore, Matt led geologic investigations of two contaminated sites (later listed on the Superfund NPL) in the Portland, Oregon, area and a large hazardous waste site in eastern Oregon. Duties included the following:

- Supervised year-long effort for soil and groundwater sampling.
- Conducted aquifer tests.
- Investigated active faults beneath sites proposed for hazardous waste disposal.

Teaching:

From 1990 to 1998, Matt taught at least one course per semester at the community college and university levels:

- At San Francisco State University, held an adjunct faculty position and taught courses in environmental geology, oceanography (lab and lecture), hydrogeology, and groundwater contamination.
- Served as a committee member for graduate and undergraduate students.
- Taught courses in environmental geology and oceanography at the College of Marin.

Matt is currently a part time geology instructor at Golden West College in Huntington Beach, California where he taught from 2010 to 2014 and in 2017.

Invited Testimony, Reports, Papers and Presentations:

Hagemann, M.F., 2008. Disclosure of Hazardous Waste Issues under CEQA. Presentation to the Public Environmental Law Conference, Eugene, Oregon.

Hagemann, M.F., 2008. Disclosure of Hazardous Waste Issues under CEQA. Invited presentation to U.S. EPA Region 9, San Francisco, California.

Hagemann, M.F., 2005. Use of Electronic Databases in Environmental Regulation, Policy Making and Public Participation. Brownfields 2005, Denver, Coloradao.

Hagemann, M.F., 2004. Perchlorate Contamination of the Colorado River and Impacts to Drinking Water in Nevada and the Southwestern U.S. Presentation to a meeting of the American Groundwater Trust, Las Vegas, NV (served on conference organizing committee).

Hagemann, M.F., 2004. Invited testimony to a California Senate committee hearing on air toxins at schools in Southern California, Los Angeles.

Brown, A., Farrow, J., Gray, A. and **Hagemann, M.**, 2004. An Estimate of Costs to Address MTBE Releases from Underground Storage Tanks and the Resulting Impact to Drinking Water Wells. Presentation to the Ground Water and Environmental Law Conference, National Groundwater Association.

Hagemann, M.F., 2004. Perchlorate Contamination of the Colorado River and Impacts to Drinking Water in Arizona and the Southwestern U.S. Presentation to a meeting of the American Groundwater Trust, Phoenix, AZ (served on conference organizing committee).

Hagemann, M.F., 2003. Perchlorate Contamination of the Colorado River and Impacts to Drinking Water in the Southwestern U.S. Invited presentation to a special committee meeting of the National Academy of Sciences, Irvine, CA.

Hagemann, M.F., 2003. Perchlorate Contamination of the Colorado River. Invited presentation to a tribal EPA meeting, Pechanga, CA.

Hagemann, M.F., 2003. Perchlorate Contamination of the Colorado River. Invited presentation to a meeting of tribal repesentatives, Parker, AZ.

Hagemann, M.F., 2003. Impact of Perchlorate on the Colorado River and Associated Drinking Water Supplies. Invited presentation to the Inter-Tribal Meeting, Torres Martinez Tribe.

Hagemann, M.F., 2003. The Emergence of Perchlorate as a Widespread Drinking Water Contaminant. Invited presentation to the U.S. EPA Region 9.

Hagemann, M.F., 2003. A Deductive Approach to the Assessment of Perchlorate Contamination. Invited presentation to the California Assembly Natural Resources Committee.

Hagemann, M.F., 2003. Perchlorate: A Cold War Legacy in Drinking Water. Presentation to a meeting of the National Groundwater Association.

Hagemann, M.F., 2002. From Tank to Tap: A Chronology of MTBE in Groundwater. Presentation to a meeting of the National Groundwater Association.

Hagemann, M.F., 2002. A Chronology of MTBE in Groundwater and an Estimate of Costs to Address Impacts to Groundwater. Presentation to the annual meeting of the Society of Environmental Journalists.

Hagemann, M.F., 2002. An Estimate of the Cost to Address MTBE Contamination in Groundwater (and Who Will Pay). Presentation to a meeting of the National Groundwater Association.

Hagemann, M.F., 2002. An Estimate of Costs to Address MTBE Releases from Underground Storage Tanks and the Resulting Impact to Drinking Water Wells. Presentation to a meeting of the U.S. EPA and State Underground Storage Tank Program managers.

Hagemann, M.F., 2001. From Tank to Tap: A Chronology of MTBE in Groundwater. Unpublished report.

Hagemann, M.F., 2001. Estimated Cleanup Cost for MTBE in Groundwater Used as Drinking Water. Unpublished report.

Hagemann, M.F., 2001. Estimated Costs to Address MTBE Releases from Leaking Underground Storage Tanks. Unpublished report.

Hagemann, M.F., and VanMouwerik, M., 1999. Potential Water Quality Concerns Related to Snowmobile Usage. Water Resources Division, National Park Service, Technical Report.

VanMouwerik, M. and **Hagemann, M.F**. 1999, Water Quality Concerns Related to Personal Watercraft Usage. Water Resources Division, National Park Service, Technical Report.

Hagemann, M.F., 1999, Is Dilution the Solution to Pollution in National Parks? The George Wright Society Biannual Meeting, Asheville, North Carolina.

Hagemann, M.F., 1997, The Potential for MTBE to Contaminate Groundwater. U.S. EPA Superfund Groundwater Technical Forum Annual Meeting, Las Vegas, Nevada.

Hagemann, M.F., and Gill, M., 1996, Impediments to Intrinsic Remediation, Moffett Field Naval Air Station, Conference on Intrinsic Remediation of Chlorinated Hydrocarbons, Salt Lake City.

Hagemann, M.F., Fukunaga, G.L., 1996, The Vulnerability of Groundwater to Anthropogenic Contaminants on the Island of Maui, Hawaii. Hawaii Water Works Association Annual Meeting, Maui, October 1996.

Hagemann, M. F., Fukanaga, G. L., 1996, Ranking Groundwater Vulnerability in Central Oahu, Hawaii. Proceedings, Geographic Information Systems in Environmental Resources Management, Air and Waste Management Association Publication VIP-61.

Hagemann, M.F., 1994. Groundwater Characterization and Cleanup at Closing Military Bases in California. Proceedings, California Groundwater Resources Association Meeting.

Hagemann, M.F. and Sabol, M.A., 1993. Role of the U.S. EPA in the High Plains States Groundwater Recharge Demonstration Program. Proceedings, Sixth Biennial Symposium on the Artificial Recharge of Groundwater.

Hagemann, M.F., 1993. U.S. EPA Policy on the Technical Impracticability of the Cleanup of DNAPL-contaminated Groundwater. California Groundwater Resources Association Meeting.

Hagemann, M.F., 1992. Dense Nonaqueous Phase Liquid Contamination of Groundwater: An Ounce of Prevention... Proceedings, Association of Engineering Geologists Annual Meeting, v. 35.

Other Experience:

Selected as subject matter expert for the California Professional Geologist licensing examinations, 2009-2011.

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

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Paul Rosenfeld, Ph.D.

Chemical Fate and Transport & Air Dispersion Modeling

Principal Environmental Chemist

Risk Assessment & Remediation Specialist

Education

Ph.D. Soil Chemistry, University of Washington, 1999. Dissertation on volatile organic compound filtration.

M.S. Environmental Science, U.C. Berkeley, 1995. Thesis on organic waste economics.

B.A. Environmental Studies, U.C. Santa Barbara, 1991. Thesis on wastewater treatment.

Professional Experience

Dr. Rosenfeld has over 25 years' experience conducting environmental investigations and risk assessments for evaluating impacts to human health, property, and ecological receptors. His expertise focuses on the fate and transport of environmental contaminants, human health risk, exposure assessment, and ecological restoration. Dr. Rosenfeld has evaluated and modeled emissions from oil spills, landfills, boilers and incinerators, process stacks, storage tanks, confined animal feeding operations, industrial, military and agricultural sources, unconventional oil drilling operations, and locomotive and construction engines. His project experience ranges from monitoring and modeling of pollution sources to evaluating impacts of pollution on workers at industrial facilities and residents in surrounding communities. Dr. Rosenfeld has also successfully modeled exposure to contaminants distributed by water systems and via vapor intrusion.

Dr. Rosenfeld has investigated and designed remediation programs and risk assessments for contaminated sites containing lead, heavy metals, mold, bacteria, particulate matter, petroleum hydrocarbons, chlorinated solvents, pesticides, radioactive waste, dioxins and furans, semi- and volatile organic compounds, PCBs, PAHs, creosote, perchlorate, asbestos, per- and poly-fluoroalkyl substances (PFOA/PFOS), unusual polymers, fuel oxygenates (MTBE), among other pollutants. Dr. Rosenfeld also has experience evaluating greenhouse gas emissions from various projects and is an expert on the assessment of odors from industrial and agricultural sites, as well as the evaluation of odor nuisance impacts and technologies for abatement of odorous emissions. As a principal scientist at SWAPE, Dr. Rosenfeld directs air dispersion modeling and exposure assessments. He has served as an expert witness and testified about pollution sources causing nuisance and/or personal injury at sites and has testified as an expert witness on numerous cases involving exposure to soil, water and air contaminants from industrial, railroad, agricultural, and military sources.

Professional History:

Soil Water Air Protection Enterprise (SWAPE); 2003 to present; Principal and Founding Partner
UCLA School of Public Health; 2007 to 2011; Lecturer (Assistant Researcher)
UCLA School of Public Health; 2003 to 2006; Adjunct Professor
UCLA Environmental Science and Engineering Program; 2002-2004; Doctoral Intern Coordinator
UCLA Institute of the Environment, 2001-2002; Research Associate
Komex H_2O Science, 2001 to 2003; Senior Remediation Scientist
National Groundwater Association, 2002-2004; Lecturer
San Diego State University, 1999-2001; Adjunct Professor
Anteon Corp., San Diego, 2000-2001; Remediation Project Manager
Ogden (now Amec), San Diego, 2000-2000; Remediation Project Manager
Bechtel, San Diego, California, 1999 – 2000; Risk Assessor
King County, Seattle, 1996 – 1999; Scientist
James River Corp., Washington, 1995-96; Scientist
Big Creek Lumber, Davenport, California, 1995; Scientist
Plumas Corp., California and USFS, Tahoe 1993-1995; Scientist
Peace Corps and World Wildlife Fund, St. Kitts, West Indies, 1991-1993; Scientist

Publications:

Remy, L.L., Clay T., Byers, V., **Rosenfeld P. E.** (2019) Hospital, Health, and Community Burden After Oil Refinery Fires, Richmond, California 2007 and 2012. *Environmental Health.* 18:48

Simons, R.A., Seo, Y. **Rosenfeld, P**., (2015) Modeling the Effect of Refinery Emission On Residential Property Value. Journal of Real Estate Research. 27(3):321-342

Chen, J. A, Zapata A. R., Sutherland A. J., Molmen, D.R., Chow, B. S., Wu, L. E., **Rosenfeld, P. E.,** Hesse, R. C., (2012) Sulfur Dioxide and Volatile Organic Compound Exposure To A Community In Texas City Texas Evaluated Using Aermod and Empirical Data. *American Journal of Environmental Science*, 8(6), 622-632.

Rosenfeld, P.E. & Feng, L. (2011). *The Risks of Hazardous Waste.* Amsterdam: Elsevier Publishing.

Cheremisinoff, N.P., & **Rosenfeld, P.E.** (2011). *Handbook of Pollution Prevention and Cleaner Production: Best Practices in the Agrochemical Industry*, Amsterdam: Elsevier Publishing.

Gonzalez, J., Feng, L., Sutherland, A., Waller, C., Sok, H., Hesse, R., **Rosenfeld, P.** (2010). PCBs and Dioxins/Furans in Attic Dust Collected Near Former PCB Production and Secondary Copper Facilities in Sauget, IL. *Procedia Environmental Sciences*. 113–125.

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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.

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Hensley, A.R. A. Scott, J. J. J. Clark, **Rosenfeld, P.E.** (2007). Attic Dust and Human Blood Samples Collected near a Former Wood Treatment Facility. *Environmental Research*. 105, 194-197.

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Rosenfeld, P. E., M. Suffet. (2007). The Anatomy Of Odour Wheels For Odours Of Drinking Water, Wastewater, Compost And The Urban Environment. *Water Science & Technology* 55(5), 335-344.

Sullivan, P. J. Clark, J.J.J., Agardy, F. J., **Rosenfeld, P.E.** (2007). *Toxic Legacy, Synthetic Toxins in the Food, Water, and Air in American Cities.* Boston Massachusetts: Elsevier Publishing

Rosenfeld, P.E., and Suffet I.H. (2004). Control of Compost Odor Using High Carbon Wood Ash. *Water Science and Technology*. 49(9),171-178.

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Rosenfeld, P.E., and Suffet, I.H. (2004). Understanding Odorants Associated With Compost, Biomass Facilities, and the Land Application of Biosolids. *Water Science and Technology*. 49(9), 193-199.

Rosenfeld, P.E., and Suffet I.H. (2004). Control of Compost Odor Using High Carbon Wood Ash, *Water Science and Technology*, 49(9), 171-178.

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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.

Rosenfeld, P.E., and C.L. Henry. (2001). Characterization of odor emissions from three different biosolids. *Water Soil and Air Pollution*. 127(1-4), 173-191.

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Rosenfeld, P.E., and Henry C. L., (2001). High carbon wood ash effect on biosolids microbial activity and odor. *Water Environment Research*. 131(1-4), 247-262.

Chollack, T. and **P. Rosenfeld. (**1998). Compost Amendment Handbook For Landscaping. Prepared for and distributed by the City of Redmond, Washington State.

Rosenfeld, P. E. (1992). The Mount Liamuiga Crater Trail. *Heritage Magazine of St. Kitts*, 3(2).

Rosenfeld, P. E. (1993). High School Biogas Project to Prevent Deforestation On St. Kitts. *Biomass Users Network*, 7(1).

Rosenfeld, P. E. (1998). Characterization, Quantification, and Control of Odor Emissions From Biosolids Application To Forest Soil. Doctoral Thesis. University of Washington College of Forest Resources.

Rosenfeld, P. E. (1994). Potential Utilization of Small Diameter Trees on Sierra County Public Land. Masters thesis reprinted by the Sierra County Economic Council. Sierra County, California.

Rosenfeld, P. E. (1991). How to Build a Small Rural Anaerobic Digester & Uses Of Biogas In The First And Third World. Bachelors Thesis. University of California.

Presentations:

Rosenfeld, P.E., "The science for Perfluorinated Chemicals (PFAS): What makes remediation so hard?" Law Seminars International, (May 9-10, 2018) 800 Fifth Avenue, Suite 101 Seattle, WA.

Rosenfeld, P.E., Sutherland, A; Hesse, R.; Zapata, A. (October 3-6, 2013). Air dispersion modeling of volatile organic emissions from multiple natural gas wells in Decatur, TX. *44th Western Regional Meeting, American Chemical Society.* Lecture conducted from Santa Clara, CA.

Sok, H.L.; Waller, C.C.; Feng, L.; Gonzalez, J.; Sutherland, A.J.; Wisdom-Stack, T.; Sahai, R.K.; Hesse, R.C.; **Rosenfeld, P.E.** (June 20-23, 2010). Atrazine: A Persistent Pesticide in Urban Drinking Water. *Urban Environmental Pollution*. Lecture conducted from Boston, MA.

Feng, L.; Gonzalez, J.; Sok, H.L.; Sutherland, A.J.; Waller, C.C.; Wisdom-Stack, T.; Sahai, R.K.; La, M.; Hesse, R.C.; **Rosenfeld, P.E.** (June 20-23, 2010). Bringing Environmental Justice to East St. Louis, Illinois. *Urban Environmental Pollution.* Lecture conducted from Boston, MA.

Rosenfeld, P.E. (April 19-23, 2009). Perfluoroctanoic Acid (PFOA) and Perfluoroactane Sulfonate (PFOS) Contamination in Drinking Water From the Use of Aqueous Film Forming Foams (AFFF) at Airports in the United States. *2009 Ground Water Summit and 2009 Ground Water Protection Council Spring Meeting*, Lecture conducted from Tuscon, AZ.

Rosenfeld, P.E. (April 19-23, 2009). Cost to Filter Atrazine Contamination from Drinking Water in the United States" Contamination in Drinking Water From the Use of Aqueous Film Forming Foams (AFFF) at Airports in the United States. *2009 Ground Water Summit and 2009 Ground Water Protection Council Spring Meeting*. Lecture conducted from Tuscon, AZ.

Wu, C., Tam, L., Clark, J., **Rosenfeld, P**. (20-22 July, 2009). Dioxin and furan blood lipid concentrations in populations living near four wood treatment facilities in the United States. Brebbia, C.A. and Popov, V., eds., *Air Pollution XVII: Proceedings of the Seventeenth International Conference on Modeling, Monitoring and Management of Air Pollution*. Lecture conducted from Tallinn, Estonia.

Rosenfeld, P. E. (October 15-18, 2007). Moss Point Community Exposure To Contaminants From A Releasing Facility. *The 23rd Annual International Conferences on Soils Sediment and Water.* Platform lecture conducted from University of Massachusetts, Amherst MA.

Rosenfeld, P. E. (October 15-18, 2007). The Repeated Trespass of Tritium-Contaminated Water Into A Surrounding Community Form Repeated Waste Spills From A Nuclear Power Plant. *The 23rd Annual International*

Conferences on Soils Sediment and Water. Platform lecture conducted from University of Massachusetts, Amherst MA.

Rosenfeld, P. E. (October 15-18, 2007). Somerville Community Exposure To Contaminants From Wood Treatment Facility Emissions. The *23rd Annual International Conferences on Soils Sediment and Water*. Lecture conducted from University of Massachusetts, Amherst MA.

Rosenfeld P. E. (March 2007). Production, Chemical Properties, Toxicology, & Treatment Case Studies of 1,2,3-Trichloropropane (TCP). *The Association for Environmental Health and Sciences (AEHS) Annual Meeting*. Lecture conducted from San Diego, CA.

Rosenfeld P. E. (March 2007). Blood and Attic Sampling for Dioxin/Furan, PAH, and Metal Exposure in Florala, Alabama. *The AEHS Annual Meeting.* Lecture conducted from San Diego, CA.

Hensley A.R., Scott, A., **Rosenfeld P.E.,** Clark, J.J.J. (August 21 – 25, 2006). Dioxin Containing Attic Dust And Human Blood Samples Collected Near A Former Wood Treatment Facility. *The 26th International Symposium on Halogenated Persistent Organic Pollutants – DIOXIN2006*. Lecture conducted from Radisson SAS Scandinavia Hotel in Oslo Norway.

Hensley A.R., Scott, A., **Rosenfeld P.E.,** Clark, J.J.J. (November 4-8, 2006). Dioxin Containing Attic Dust And Human Blood Samples Collected Near A Former Wood Treatment Facility. *APHA 134 Annual Meeting & Exposition.* Lecture conducted from Boston Massachusetts.

Paul Rosenfeld Ph.D. (October 24-25, 2005). Fate, Transport and Persistence of PFOA and Related Chemicals. Mealey's C8/PFOA. *Science, Risk & Litigation Conference.* Lecture conducted from The Rittenhouse Hotel, Philadelphia, PA.

Paul Rosenfeld Ph.D. (September 19, 2005). Brominated Flame Retardants in Groundwater: Pathways to Human Ingestion, *Toxicology and Remediation PEMA Emerging Contaminant Conference*. Lecture conducted from Hilton Hotel, Irvine California.

Paul Rosenfeld Ph.D. (September 19, 2005). Fate, Transport, Toxicity, And Persistence of 1,2,3-TCP. *PEMA Emerging Contaminant Conference.* Lecture conducted from Hilton Hotel in Irvine, California.

Paul Rosenfeld Ph.D. (September 26-27, 2005). Fate, Transport and Persistence of PDBEs. *Mealey's Groundwater Conference.* Lecture conducted from Ritz Carlton Hotel, Marina Del Ray, California.

Paul Rosenfeld Ph.D. (June 7-8, 2005). Fate, Transport and Persistence of PFOA and Related Chemicals. *International Society of Environmental Forensics: Focus On Emerging Contaminants*. Lecture conducted from Sheraton Oceanfront Hotel, Virginia Beach, Virginia.

Paul Rosenfeld Ph.D. (July 21-22, 2005). Fate Transport, Persistence and Toxicology of PFOA and Related Perfluorochemicals. *2005 National Groundwater Association Ground Water And Environmental Law Conference*. Lecture conducted from Wyndham Baltimore Inner Harbor, Baltimore Maryland.

Paul Rosenfeld Ph.D. (July 21-22, 2005). Brominated Flame Retardants in Groundwater: Pathways to Human Ingestion, Toxicology and Remediation. *2005 National Groundwater Association Ground Water and Environmental Law Conference.* Lecture conducted from Wyndham Baltimore Inner Harbor, Baltimore Maryland.

Paul Rosenfeld, Ph.D. and James Clark Ph.D. and Rob Hesse R.G. (May 5-6, 2004). Tert-butyl Alcohol Liability and Toxicology, A National Problem and Unquantified Liability. *National Groundwater Association. Environmental Law Conference*. Lecture conducted from Congress Plaza Hotel, Chicago Illinois.

Paul Rosenfeld, Ph.D. (March 2004). Perchlorate Toxicology. *Meeting of the American Groundwater Trust*. Lecture conducted from Phoenix Arizona.

Hagemann, M.F., **Paul Rosenfeld, Ph.D.** and Rob Hesse (2004). Perchlorate Contamination of the Colorado River. *Meeting of tribal representatives*. Lecture conducted from Parker, AZ.

Paul Rosenfeld, Ph.D. (April 7, 2004). A National Damage Assessment Model For PCE and Dry Cleaners. *Drycleaner Symposium. California Ground Water Association*. Lecture conducted from Radison Hotel, Sacramento, California.

Rosenfeld, P. E., Grey, M., (June 2003) Two stage biofilter for biosolids composting odor control. *Seventh International In Situ And On Site Bioremediation Symposium Battelle Conference* Orlando, FL.

Paul Rosenfeld, Ph.D. and James Clark Ph.D. (February 20-21, 2003) Understanding Historical Use, Chemical Properties, Toxicity and Regulatory Guidance of 1,4 Dioxane. *National Groundwater Association. Southwest Focus Conference. Water Supply and Emerging Contaminants*.. Lecture conducted from Hyatt Regency Phoenix Arizona.

Paul Rosenfeld, Ph.D. (February 6-7, 2003). Underground Storage Tank Litigation and Remediation. *California CUPA Forum*. Lecture conducted from Marriott Hotel, Anaheim California.

Paul Rosenfeld, Ph.D. (October 23, 2002) Underground Storage Tank Litigation and Remediation. *EPA Underground Storage Tank Roundtable*. Lecture conducted from Sacramento California.

Rosenfeld, P.E. and Suffet, M. (October 7- 10, 2002). Understanding Odor from Compost, *Wastewater and Industrial Processes. Sixth Annual Symposium On Off Flavors in the Aquatic Environment. International Water Association*. Lecture conducted from Barcelona Spain.

Rosenfeld, P.E. and Suffet, M. (October 7- 10, 2002). Using High Carbon Wood Ash to Control Compost Odor. *Sixth Annual Symposium On Off Flavors in the Aquatic Environment. International Water Association*. Lecture conducted from Barcelona Spain.

Rosenfeld, P.E. and Grey, M. A. (September 22-24, 2002). Biocycle Composting For Coastal Sage Restoration. *Northwest Biosolids Management Association*. Lecture conducted from Vancouver Washington..

Rosenfeld, P.E. and Grey, M. A. (November 11-14, 2002). Using High-Carbon Wood Ash to Control Odor at a Green Materials Composting Facility. *Soil Science Society Annual Conferenc*e. Lecture conducted from Indianapolis, Maryland.

Rosenfeld. P.E. (September 16, 2000). Two stage biofilter for biosolids composting odor control. *Water Environment Federation.* Lecture conducted from Anaheim California.

Rosenfeld. P.E. (October 16, 2000). Wood ash and biofilter control of compost odor. *Biofest.* Lecture conducted from Ocean Shores, California.

Rosenfeld, P.E. (2000). Bioremediation Using Organic Soil Amendments. *California Resource Recovery Association*. Lecture conducted from Sacramento California.

Rosenfeld, P.E., C.L. Henry, R. Harrison. (1998). Oat and Grass Seed Germination and Nitrogen and Sulfur Emissions Following Biosolids Incorporation With High-Carbon Wood-Ash. *Water Environment Federation 12th Annual Residuals and Biosolids Management Conference Proceedings*. Lecture conducted from Bellevue Washington.

Rosenfeld, P.E., and C.L. Henry. (1999). An evaluation of ash incorporation with biosolids for odor reduction. *Soil Science Society of America*. Lecture conducted from Salt Lake City Utah.

Rosenfeld, P.E., C.L. Henry, R. Harrison. (1998). Comparison of Microbial Activity and Odor Emissions from Three Different Biosolids Applied to Forest Soil. *Brown and Caldwell.* Lecture conducted from Seattle Washington.

Rosenfeld, P.E., C.L. Henry. (1998). Characterization, Quantification, and Control of Odor Emissions from Biosolids Application To Forest Soil. *Biofest.* Lecture conducted from Lake Chelan, Washington.

Rosenfeld, P.E, C.L. Henry, R. Harrison. (1998). Oat and Grass Seed Germination and Nitrogen and Sulfur Emissions Following Biosolids Incorporation With High-Carbon Wood-Ash. Water Environment Federation 12th Annual Residuals and Biosolids Management Conference Proceedings. Lecture conducted from Bellevue Washington.

Rosenfeld, P.E., C.L. Henry, R. B. Harrison, and R. Dills. (1997). Comparison of Odor Emissions From Three Different Biosolids Applied to Forest Soil. *Soil Science Society of America*. Lecture conducted from Anaheim California.

Teaching Experience:

UCLA Department of Environmental Health (Summer 2003 through 20010) Taught Environmental Health Science 100 to students, including undergrad, medical doctors, public health professionals and nurses. Course focused on the health effects of environmental contaminants.

National Ground Water Association, Successful Remediation Technologies. Custom Course in Sante Fe, New Mexico. May 21, 2002. Focused on fate and transport of fuel contaminants associated with underground storage tanks.

National Ground Water Association; Successful Remediation Technologies Course in Chicago Illinois. April 1, 2002. Focused on fate and transport of contaminants associated with Superfund and RCRA sites.

California Integrated Waste Management Board, April and May, 2001. Alternative Landfill Caps Seminar in San Diego, Ventura, and San Francisco. Focused on both prescriptive and innovative landfill cover design.

UCLA Department of Environmental Engineering, February 5, 2002. Seminar on Successful Remediation Technologies focusing on Groundwater Remediation.

University Of Washington, Soil Science Program, Teaching Assistant for several courses including: Soil Chemistry, Organic Soil Amendments, and Soil Stability.

U.C. Berkeley, Environmental Science Program Teaching Assistant for Environmental Science 10.

Academic Grants Awarded:

California Integrated Waste Management Board. $41,000 grant awarded to UCLA Institute of the Environment. Goal: To investigate effect of high carbon wood ash on volatile organic emissions from compost. 2001.

Synagro Technologies, Corona California: $10,000 grant awarded to San Diego State University.
Goal: investigate effect of biosolids for restoration and remediation of degraded coastal sage soils. 2000.

King County, Department of Research and Technology, Washington State. $100,000 grant awarded to University of Washington: Goal: To investigate odor emissions from biosolids application and the effect of polymers and ash on VOC emissions. 1998.

Northwest Biosolids Management Association, Washington State. $20,000 grant awarded to investigate effect of polymers and ash on VOC emissions from biosolids. 1997.

James River Corporation, Oregon: $10,000 grant was awarded to investigate the success of genetically engineered Poplar trees with resistance to round-up. 1996.

United State Forest Service, Tahoe National Forest: $15,000 grant was awarded to investigating fire ecology of the Tahoe National Forest. 1995.

Kellogg Foundation, Washington D.C. $500 grant was awarded to construct a large anaerobic digester on St. Kitts in West Indies. 1993

Deposition and/or Trial Testimony:

In the Circuit Court Of The Twentieth Judicial Circuit, St Clair County, Illinois
Martha Custer et al., Plaintiff vs. Cerro Flow Products, Inc., Defendants
Case No.: No. 0i9-L-2295
Rosenfeld Deposition, 5-14-2021
Trial, October 8-4-2021

In the Circuit Court of Cook County Illinois
Joseph Rafferty, Plaintiff vs. Consolidated Rail Corporation and National Railroad Passenger Corporation d/b/a AMTRAK,
Case No.: No. 18-L-6845
Rosenfeld Deposition, 6-28-2021

In the United States District Court For the Northern District of Illinois
Theresa Romcoe, Plaintiff vs. Northeast Illinois Regional Commuter Railroad Corporation d/b/a METRA Rail, Defendants
Case No.: No. 17-cv-8517
Rosenfeld Deposition, 5-25-2021

In the Superior Court of the State of Arizona In and For the Cunty of Maricopa
Mary Tryon et al., Plaintiff vs. The City of Pheonix v. Cox Cactus Farm, L.L.C., Utah Shelter Systems, Inc.
Case Number CV20127-094749
Rosenfeld Deposition: 5-7-2021

In the United States District Court for the Eastern District of Texas Beaumont Division
Robinson, Jeremy et al *Plaintiffs*, vs. CNA Insurance Company et al.
Case Number 1:17-cv-000508
Rosenfeld Deposition: 3-25-2021

In the Superior Court of the State of California, County of San Bernardino
Gary Garner, Personal Representative for the Estate of Melvin Garner vs. BNSF Railway Company.
Case No. 1720288
Rosenfeld Deposition 2-23-2021

In the Superior Court of the State of California, County of Los Angeles, Spring Street Courthouse
Benny M Rodriguez vs. Union Pacific Railroad, A Corporation, et al.
Case No. 18STCV01162
Rosenfeld Deposition 12-23-2020

In the Circuit Court of Jackson County, Missouri
Karen Cornwell, *Plaintiff,* vs. Marathon Petroleum, LP, *Defendant.*
Case No.: 1716-CV10006
Rosenfeld Deposition. 8-30-2019

In the United States District Court For The District of New Jersey
Duarte et al, *Plaintiffs,* vs. United States Metals Refining Company et. al. *Defendant.*
Case No.: 2:17-cv-01624-ES-SCM
Rosenfeld Deposition. 6-7-2019

In the United States District Court of Southern District of Texas Galveston Division
M/T Carla Maersk, *Plaintiffs,* vs. Conti 168., Schiffahrts-GMBH & Co. Bulker KG MS "Conti Perdido" *Defendant.*
Case No.: 3:15-CV-00106 consolidated with 3:15-CV-00237
Rosenfeld Deposition. 5-9-2019

In The Superior Court of the State of California In And For The County Of Los Angeles – Santa Monica
Carole-Taddeo-Bates et al., vs. Ifran Khan et al., Defendants
Case No.: No. BC615636
Rosenfeld Deposition, 1-26-2019

In The Superior Court of the State of California In And For The County Of Los Angeles – Santa Monica
The San Gabriel Valley Council of Governments et al. vs El Adobe Apts. Inc. et al., Defendants
Case No.: No. BC646857
Rosenfeld Deposition, 10-6-2018; Trial 3-7-19

In United States District Court For The District of Colorado
Bells et al. Plaintiff vs. The 3M Company et al., Defendants
Case No.: 1:16-cv-02531-RBJ
Rosenfeld Deposition, 3-15-2018 and 4-3-2018

In The District Court Of Regan County, Texas, 112th Judicial District
Phillip Bales et al., Plaintiff vs. Dow Agrosciences, LLC, et al., Defendants
Cause No.: 1923
Rosenfeld Deposition, 11-17-2017

In The Superior Court of the State of California In And For The County Of Contra Costa
Simons et al., Plaintiffs vs. Chevron Corporation, et al., Defendants
Cause No C12-01481
Rosenfeld Deposition, 11-20-2017

In The Circuit Court Of The Twentieth Judicial Circuit, St Clair County, Illinois
Martha Custer et al., Plaintiff vs. Cerro Flow Products, Inc., Defendants
Case No.: No. 0i9-L-2295
Rosenfeld Deposition, 8-23-2017

In United States District Court For The Southern District of Mississippi
Guy Manuel vs. The BP Exploration et al., Defendants
Case: No 1:19-cv-00315-RHW
Rosenfeld Deposition, 4-22-2020

In The Superior Court of the State of California, For The County of Los Angeles
Warrn Gilbert and Penny Gilber, Plaintiff vs. BMW of North America LLC
Case No.: LC102019 (c/w BC582154)
Rosenfeld Deposition, 8-16-2017, Trail 8-28-2018

In the Northern District Court of Mississippi, Greenville Division
Brenda J. Cooper, et al., *Plaintiffs,* vs. Meritor Inc., et al., *Defendants*
Case Number: 4:16-cv-52-DMB-JVM
Rosenfeld Deposition: July 2017

In The Superior Court of the State of Washington, County of Snohomish
Michael Davis and Julie Davis et al., Plaintiff vs. Cedar Grove Composting Inc., Defendants
Case No.: No. 13-2-03987-5
Rosenfeld Deposition, February 2017
Trial, March 2017

In The Superior Court of the State of California, County of Alameda
Charles Spain., Plaintiff vs. Thermo Fisher Scientific, et al., Defendants
Case No.: RG14711115
Rosenfeld Deposition, September 2015

In The Iowa District Court In And For Poweshiek County
Russell D. Winburn, et al., Plaintiffs vs. Doug Hoksbergen, et al., Defendants
Case No.: LALA002187
Rosenfeld Deposition, August 2015

In The Circuit Court of Ohio County, West Virginia
Robert Andrews, et al. v. Antero, et al.
Civil Action N0. 14-C-30000
Rosenfeld Deposition, June 2015

In The Iowa District Court For Muscatine County
Laurie Freeman et. al. Plaintiffs vs. Grain Processing Corporation, Defendant
Case No 4980
Rosenfeld Deposition: May 2015

In the Circuit Court of the 17th Judicial Circuit, in and For Broward County, Florida
Walter Hinton, et. al. Plaintiff, vs. City of Fort Lauderdale, Florida, a Municipality, Defendant.
Case Number CACE07030358 (26)
Rosenfeld Deposition: December 2014

In the County Court of Dallas County Texas
Lisa Parr et al, *Plaintiff*, vs. Aruba et al, *Defendant.*
Case Number cc-11-01650-E
Rosenfeld Deposition: March and September 2013
Rosenfeld Trial: April 2014

In the Court of Common Pleas of Tuscarawas County Ohio
John Michael Abicht, et al., *Plaintiffs,* vs. Republic Services, Inc., et al., *Defendants*
Case Number: 2008 CT 10 0741 (Cons. w/ 2009 CV 10 0987)
Rosenfeld Deposition: October 2012

In the United States District Court for the Middle District of Alabama, Northern Division
James K. Benefield, et al., *Plaintiffs*, vs. International Paper Company, *Defendant*.
Civil Action Number 2:09-cv-232-WHA-TFM
Rosenfeld Deposition: July 2010, June 2011

In the Circuit Court of Jefferson County Alabama
Jaeanette Moss Anthony, et al., *Plaintiffs*, vs. Drummond Company Inc., et al., *Defendants*
Civil Action No. CV 2008-2076
Rosenfeld Deposition: September 2010

In the United States District Court, Western District Lafayette Division
Ackle et al., *Plaintiffs*, vs. Citgo Petroleum Corporation, et al., *Defendants*.
Case Number 2:07CV1052
Rosenfeld Deposition: July 2009