

# ADAMS BROADWELL JOSEPH & CARDOZO

A PROFESSIONAL CORPORATION

## ATTORNEYS AT LAW

601 GATEWAY BOULEVARD, SUITE 1000  
SOUTH SAN FRANCISCO, CA 94080-7037

TEL: (650) 589-1660  
FAX: (650) 589-5062

[amcguire@adamsbroadwell.com](mailto:amcguire@adamsbroadwell.com)

## SACRAMENTO OFFICE

520 CAPITOL MALL, SUITE 350  
SACRAMENTO, CA 95814-4721

TEL: (916) 444-6201  
FAX: (916) 444-6209

KEVIN T. CARMICHAEL  
CHRISTINA M. CARO  
THOMAS A. ENSLOW  
KELILAH D. FEDERMAN  
RICHARD M. FRANCO  
ANDREW J. GRAF  
TANYA A. GULESSERIAN  
DARION N. JOHNSTON  
RACHAEL E. KOSS  
AIDAN P. MARSHALL  
ALAURO R. MCGUIRE  
ISABEL TAHIR

## *Of Counsel*

DANIEL L. CARDOZO  
MARC D. JOSEPH

August 19, 2025

### **Via Email and Overnight Mail**

City of Antioch Planning Commission  
Kevin Riley, Chair  
Seth Webber, Vice-Chair  
Commissioners Jennifer Perez,  
Robert Martin, Ramesh Suman,  
Cortney L. Jones  
City of Antioch  
200 H Street  
Antioch, CA 94531  
**Email:** [planning@antiochca.gov](mailto:planning@antiochca.gov)

### **Via Email Only**

Kevin Scudero, Acting Director  
Community Development Department  
200 H Street  
Antioch, CA 94531  
**Email:** [planning@antiochca.gov](mailto:planning@antiochca.gov)

Zoe Merideth, Senior Planner

**Email:** [zmerideth@antiochca.gov](mailto:zmerideth@antiochca.gov)

### **Re: Antioch Planning Commission Hearing, Agenda Item 6-1; Wildflower Station Townhomes 2 Multifamily Residential Project (TM-02, AR-23-05)**

Dear Chair Riley, Vice-Chair Webber, Commissioners, Mr. Scudero, and Ms. Merideth:

We are writing on behalf of Contra Costa Residents for Responsible Development ("Contra Costa Residents") to provide comments on Agenda Item 6-1, the Wildflower Station Townhomes 2 Multifamily Residential Project (TM-02, AR-23-05) ("Wildflower Townhomes Project" or "Project") proposed by DeNova Homes, Inc. ("Applicant"). The Project consists of a vesting tentative map to create 19 residential lots for 19 townhome buildings, containing 159 residential units total.<sup>1</sup>

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<sup>1</sup> City of Antioch, Wildflower Townhomes Section 15183 Consistency Memorandum, p. 2.

The Project site is a 10.35 acre undeveloped site located east of Hillcrest Avenue and west of Wildflower Station Place in the City of Antioch (“City”).<sup>2</sup>

The Staff Report claims that the Project is exempt from further CEQA review pursuant to CEQA Guidelines Section 15183 because it was adequately analyzed by the Antioch Housing, Environmental Hazards, and Environmental Justice Elements Project Environmental Impact Report (“Housing Element EIR”).<sup>3</sup> As such, the Staff Report asks the Commission to recommend that the City Council approve the Project’s Vesting Tentative Subdivision Map (“VTSM”), and Design Review (“DR”).<sup>4</sup>

On July 15, 2025, Contra Costa Residents submitted comments, supported by expert evidence, explaining that the Project is likely to result in peculiar impacts that were not identified or analyzed in the Housing Element EIR or the 15183 Consistency Memorandum, thereby requiring preparation of a full EIR. Specifically, Contra Costa Residents’ expert reports included evidence demonstrating that the Project may result in potentially significant and peculiar impacts on air quality, public health, and noise. The City failed to analyze noise impacts specific to the Project, while our noise expert identified significant construction noise and vibration impacts that are unique to the Project site and were not addressed in the Housing Element EIR. Additionally, neither the Consistency Memorandum nor the Housing Element EIR included emissions modeling to assess potential air quality and public health impacts.

The Commission’s Staff Report includes responses to these comments (“Responses”).<sup>5</sup> However, the City’s responses fail to resolve the deficiencies in the Project’s impact analysis. As discussed in detail below, the Project will result in significant, site-specific air quality, public health, and noise impacts that were not previously analyzed in the Housing Element EIR. In addition, the City has failed to provide substantial evidence demonstrating that Housing Element policies and/or standards will substantially mitigate these Project-specific impacts. These comments are supported by additional expert evidence. Contra Costa Residents’ air quality and public health experts Matt Hagemann, P.G., C.Hg, and Paul Rosenfeld, Ph.D. of Soil Water Air Protection Enterprises (“SWAPE”), provide substantial

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<sup>2</sup> *Id.*

<sup>3</sup> City of Antioch, Wildflower Townhomes Staff Report to the Antioch Planning Commission Regular Meeting of August 2025 (“Wildflower Staff Report”), p. 9, available at: <https://www.antiochca.gov/fc/government/agendas/PC/staff-reports/082025-6-1.pdf>.

<sup>4</sup> Wildflower Staff Report, p. 1.

<sup>5</sup> Wildflower Staff Report, Attachment E, p. E29.

evidence demonstrating that the Project will have peculiar air quality and public health impacts from construction-related diesel particulate matter (“DPM”) emissions that the Housing Element EIR did not address.<sup>6</sup> Contra Costa Residents’ noise consultant, Jack Meighan, demonstrates that the City lacks substantial evidence to conclude that the Project’s noise levels will not exceed General Plan policies or result in peculiar noise impacts because it failed to conduct a noise attenuation study.<sup>7</sup>

The City has failed to provide substantial evidence demonstrating that the Project will not result in significant site-specific environmental impacts. Contra Costa Residents’ expert consultants have also provided substantial evidence that the Project will result in significant impacts that neither the Housing Element EIR nor the 15183 Consistency Memorandum addressed. As a result, the Project is not exempt from further CEQA review and the City must prepare an EIR that analyzes all of the Project’s potentially significant environmental impacts before the Commission may consider approving the Project or its entitlements.

## **I. STATEMENT OF INTEREST**

Contra Costa Residents is an unincorporated association of individuals and labor organizations that may be adversely affected by the potential public and worker health and safety hazards, and the environmental and public service impacts of the Project. The coalition includes the International Brotherhood of Electrical Workers Local 302, Plumbers & Steamfitters Local 159, Sheet Metal Workers Local 104, Sprinkler Fitters Local 483, along with their members, their families, and other individuals who live and work in the City of Antioch and Contra Costa County.

Contra Costa Residents’ individual members live, work, recreate, and raise their families in the City of Antioch and surrounding communities. Accordingly, they would be directly affected by the Project’s environmental, health, and safety impacts. Individual members may also work on the Project itself. They will be first in line to be exposed to any health and safety hazards that exist on site.

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<sup>6</sup> See **Exhibit A**, SWAPE, Comments on Wildflower Townhomes 8.20 Planning Commission Hearing Staff Report (August 18, 2025) (“SWAPE Comments”).

<sup>7</sup> See **Exhibit B**, Jack Meighan, Comments on Wildflower Townhomes 8.20 Planning Commission Hearing Staff Report (August 18, 2025) (“Meighan Comments”).

Contra Costa Residents also has an interest in enforcing environmental laws that encourage sustainable development and ensure a safe working environment for its members. Environmentally detrimental projects can jeopardize future jobs by making it more difficult and more expensive for businesses and industries to expand in the region, and by making the area less desirable for new businesses and new residents. Indeed, continued environmental degradation can, and has, caused construction moratoriums and other restrictions on growth that, in turn, reduce future employment opportunities.

## **II. THE PROJECT INVOLVES POTENTIALLY SIGNIFICANT OR PECULIAR IMPACTS THAT PRECLUDE RELIANCE ON CEQA GUIDELINES SECTION 15183 EXEMPTION**

CEQA Guidelines Section 15183 provides an exemption for projects which are consistent with the development density established by existing zoning, community plan or general plan policies for which an EIR was certified, *except as necessary to evaluate whether there are project-specific significant impacts which are peculiar to the project or project site.*<sup>8</sup> In relying on section 15183 to approve a project, a lead agency may not forgo further analysis of potentially significant impacts unless it makes certain findings. An agency is required to perform further analysis as to impacts that (1) are peculiar to the proposed project or parcel, (2) were not analyzed as significant effects in a prior EIR for the zoning, community or general plan with which the project is consistent, (3) are potentially significant off-site or cumulative impacts that were not discussed in the prior EIR, or (4) are previously identified significant impacts which, due to substantial new information not known at the time the EIR was certified, are determined to have a more severe impact than discussed in the prior EIR.<sup>9</sup>

Under section 15183(f), an effect of a project on the environment is not considered peculiar to the project or project site if “uniformly applied development policies or standards have been previously adopted ...with a finding that the development policies or standards will substantially mitigate the environmental effect when applied to future projects, unless substantial new information shows that the policies or standards will not substantially mitigate the environmental effect.”<sup>10</sup>

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<sup>8</sup> 14 CCR § 15183(a).

<sup>9</sup> 14 CCR § 15183(b)(1)-(4).

<sup>10</sup> 14 CCR § 15183(f).

Agency determinations under Guidelines section 15183 are reviewed under the substantial evidence standard.<sup>11</sup> In determining whether an agency's findings concerning the use of a statutory exemption from CEQA may be upheld, courts review the administrative record to see that substantial evidence supports each element of the exemption.<sup>12</sup> This includes the determination that "uniformly applied development policies or standards" will substantially mitigate the project's environmental effects.<sup>13</sup> Agency findings must specifically address the effect of uniform policies and standards on potential environmental impacts.<sup>14</sup>

In addition, CEQA Guidelines Section 15168's two-step inquiry of a program EIR's applicability to later activities holds that "if a later activity would have effects that were not examined in the program EIR, a new initial study would need to be prepared leading to either an EIR or a negative declaration." The City insists that, pursuant to sections 15162 and 15183, the Project is within the scope of the program EIR and no subsequent EIR is required. "Whether a later activity is within the scope of a program EIR is a factual question that the lead agency determines based on substantial evidence in the record."<sup>15</sup>

Contra Costa Resident's previous comments explained that the 15183 Consistency Memo failed to examine several of the Project's significant impacts related to air quality, health risks, transportation, and noise that were not analyzed in the Housing Element EIR and are thus peculiar to the proposed Project. In response to these comments, the City revised its 15183 Consistency Memorandum and now reasserts that the Project would not result in any significant or peculiar environmental impacts that require the preparation of an EIR.

The City's response fails to address the concerns in Contra Costa Residents' comments, and its conclusion that the Project will not result in significant and peculiar impacts is not supported by substantial evidence. As the comments below demonstrate, there is substantial evidence that the Project will result in significant and peculiar impacts to air quality, public health, and noise that the Housing Element EIR and the City's responses and the revised Consistency Memorandum fail to address. This evidence precludes the City from relying on the CEQA

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<sup>11</sup> *Lucas v. City of Pomona* (2023) 92 Cal.App.5th 508, 538, citing *Concerned Dublin Citizens v. City of Dublin* (2103) 214 Cal.App.4th 1301, 1311; see also, *Hilltop Group v. County of San Diego* (2024) 99 Cal.App.5th 890, 909-10.

<sup>12</sup> *Lucas*, 92 Cal.App.5th at 538.

<sup>13</sup> 14 CCR § 15183(f).

<sup>14</sup> *Hilltop Group*, 99 Cal.App.5th at 918.

<sup>15</sup> CEQA Guidelines § 15168.

Guidelines Section 15183 exemption to avoid further CEQA review. In order to comply with CEQA, the City must prepare an EIR that analyzes the Project's potentially significant and peculiar impacts.

**A. The Project's Diesel Particulate Matter Emissions Will Have Significant, Unmitigated Air Quality and Public Health Impacts That are More Severe Than Analyzed in The Housing Element EIR**

Contra Costa Residents' previous comments demonstrated that the City lacks substantial evidence to conclude that the Project would not result in significant air quality or public health impacts peculiar to the Project or Project site. The Housing Element EIR did not evaluate Project-specific emissions, and the City did not conduct any emissions modeling to assess the potential impacts from the Project's construction or operation.

The City's response continues to ignore potentially significant and site-specific air quality and health risks associated with DPM emissions during construction. In particular, the City failed to prepare a health risk analysis ("HRA"). Contra Costa Residents' air quality experts, SWAPE, conducted a screening-level HRA for the Project<sup>16</sup> and found that the Project would emit approximately 31 pounds of DPM during its 565-day construction period and an additional 20 net pounds annually during operation.<sup>17</sup> Based on these emissions, SWAPE calculated lifetime cancer risks (30 years) of 16.3 in one million.<sup>18</sup> This exceeds the Bay Area Air Quality Management District's ("BAAQMD") significance threshold of 10 in one million.<sup>19</sup> This is a significant and peculiar air quality and public health risk that was not addressed in the Housing Element EIR or the City's 15183 Consistency Memo.<sup>20</sup> Because of this, SWAPE explains that a refined HRA should be conducted to adequately and accurately evaluate the Project's potential health risks from DPM emissions.<sup>21</sup>

The City also fails to provide substantial evidence demonstrating that the Project's DPM emissions will be reduced to less-than-significant levels. The City has not identified or committed to any Project-specific mitigation measures to address

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<sup>16</sup> SWAPE Comments, pp. 1-6.

<sup>17</sup> SWAPE Comments, p. 2.

<sup>18</sup> SWAPE Comments, p. 6.

<sup>19</sup> *Id.*

<sup>20</sup> *Id.*

<sup>21</sup> *Id.*

these emissions. Instead, the City asserts that general compliance with existing air quality regulations is sufficient to avoid significant impacts. As SWAPE explains, if the City's refined HRA finds that the Project would result in significant health risk impacts, then mitigation measures should be incorporated to reduce DPM emissions to the greatest extent feasible, as required by CEQA.<sup>22</sup> SWAPE goes on to identify several feasible, cost-effective mitigation measures that the City could implement to substantially reduce DPM emissions.<sup>23</sup>

There is substantial evidence that the Project will result in significant and site-specific air quality and health risk impacts. These impacts were not addressed in the Housing Element EIR or the City's 15183 Consistency Memorandum. The City has also failed to propose any DPM specific mitigation measures or provide any evidence to demonstrate that impacts from DPM emissions will be mitigated to the greatest extent feasible. Accordingly, the City cannot rely on the CEQA Guidelines Section 15183 exemption. The City must prepare an EIR that evaluates the Project-specific, significant air quality and health risk impacts and proposes mitigation measures that will reduce impacts to the greatest extent feasible, as required by CEQA.

**B. The Project Will Have Significant, Unmitigated Noise Impacts That are More Severe Than Analyzed in The Housing Element EIR**

Contra Costa Residents' and its noise expert's previous comments demonstrated that the City lacks substantial evidence to conclude that the Project will not result in significant and peculiar noise impacts to existing sensitive receptors. The City failed to conduct any site-specific noise analysis to evaluate the Project's potential to generate excessive construction noise or vibration. Our noise expert also provided substantial evidence showing that the Project is likely to result in significant construction and vibration impacts that are peculiar to the Project-site.

In response, the City claims that the Project's noise impacts will not be peculiar because construction noise would be mitigated through compliance with the City of Antioch Code of Ordinance and General Plan policies. Specifically, the City asserts that compliance with General Plan Policy 11.8.2 ("Policy") will substantially mitigate impacts. But, the City also claims that the Project does not need to prepare a noise attenuation study—as required under subsection (f) of the

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<sup>22</sup> *Id.*

<sup>23</sup> SWAPE Comments, pp. 7-8.

Policy—because “the City has determined that the Project would not result in a significant increase in noise and because the project is not located in an area exceeding the General Plan noise standards.”<sup>24</sup> This response is inadequate, unsupported, and misrepresents the housing Element EIR’s own findings.

The Housing Element EIR explicitly states that “[i]ndividual housing developments proposed under the Project would result in a potentially significant impact if they cause a new exceedance of the General Plan noise objectives, or an audible (3.0 dBA) increase in noise in areas where the General Plan noise objectives are already exceeded as the result of existing development....”<sup>25</sup> In such cases, “General Plan Policy 11.8.2(f) requires a detailed noise attenuation study to be prepared by a qualified acoustical engineer to determine appropriate mitigation and ways to incorporate such mitigation into project design and implementation.”<sup>26</sup> Yet the City has provided no analysis to determine whether either of these conditions apply to the Project.<sup>27</sup> Instead, it simply asserts, without baseline noise measurements or supporting data, that the Project would not trigger these thresholds.<sup>28</sup>

As Mr. Meighan explains, site-specific baseline noise measurements are essential to determining whether the Project will exceed General Plan noise thresholds or cause a significant increase in ambient noise.<sup>29</sup> Site-specific noise levels vary significantly based on factors such as surrounding land uses, topography, traffic patterns, and building design.<sup>30</sup> Absent this data, the City lacks the substantial evidence necessary to determine whether the Project will comply with General Plan noise standards, and therefore cannot justify its conclusion that a noise attenuation study is not necessary.<sup>31</sup>

Moreover, Mr. Meighan’s previous comments provided substantial evidence that the project may result in significant construction-related noise and vibration impacts. The City has failed to provide any evidence to rebut this analysis. Instead, it relies solely on the assertion that compliance with the City of Antioch Code of Ordinances and General Plan policies will be sufficient to reduce noise impacts to

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<sup>24</sup> Wildflower Staff Report, Attachment E, p. E61.

<sup>25</sup> Housing Element EIR, p. IV.L-10.

<sup>26</sup> Housing Element EIR, p. IV.L-13.

<sup>27</sup> Meighan Comments, p. 1.

<sup>28</sup> Meighan Comments, p. 1.

<sup>29</sup> Meighan Comments, p. 1.

<sup>30</sup> *Id.*

<sup>31</sup> *Id.* at pp. 1-2.



less-than-significant levels. While the Housing Element EIR generally found that compliance with these standards could mitigate impacts, the City has not demonstrated that it is complying with these policies. Specifically, it has failed to prepare the noise attenuation study required by Policy 11.8.2(f), nor has it provided any site-specific analysis or data to justify its conclusion that the study is unnecessary. Without this, the City lacks substantial evidence to support its determination that the Project's noise impacts will not be significant or peculiar to the site.

Because the City has failed to demonstrate—based on substantial evidence—that the Project will not result in significant and peculiar noise impacts, it cannot rely on the CEQA Guidelines Section 15183 exemption. The City must prepare an EIR that includes an analysis of the Project-specific noise impacts.

### **III. THE CITY LACKS SUBSTANTIAL EVIDENCE TO MAKE THE REQUIRED FINDINGS TO APPROVE THE PROJECTS ENTITLEMENTS**

The Project requires the City to approve a VTSM for condominium purposes that would subdivide the project site for the development of 19 townhome buildings totaling 159 residential units.<sup>32</sup> However, as discussed above, the City has failed to adequately address Contra Costa Residents' previous comments and thus still fails to adequately analyze or mitigate several new Project-specific environmental impacts that were not addressed by the Housing Element EIR. As a result, the City cannot make the requisite findings to approve the Project's VTSM.

California's Subdivision Map Act precludes the approval of a tentative map where the design or improvement of the proposed subdivision is not consistent with the applicable general plan, is likely to cause substantial environmental damage, or is likely to cause serious public health problems.<sup>33</sup>

Additionally, Antioch Municipal Code Section 9-4.323 states that a VTSM may be made conditional or denied if any of the following is determined:

- A failure to do so would place the residents of the subdivision or the immediate community, or both, in a condition dangerous to their health or safety, or both; or

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<sup>32</sup> Wildflower Staff Report, p. 1.

<sup>33</sup> Government Code § 66474(b), (e) and (f).

- The condition or denial is required in order to comply with state or federal laws.

As detailed in our comments and those of our experts, there is substantial evidence that the Project may result in several potentially significant environmental impacts peculiar to the Project, including: (1) construction noise and vibration, and (2) air quality and related health risks. These impacts remain unaddressed and could pose serious risks to public health and safety—both for future subdivision residents and the surrounding community. Therefore, the City cannot make the required findings under the Subdivision Map Act and Antioch's Municipal Code to approve the VTSM until all of the Project's potentially significant impacts are thoroughly analyzed and effectively mitigated.

#### IV. CONCLUSIONS

As discussed herein, the City lacks substantial evidence to rely on a CEQA Guidelines Section 15183 exemption for Project approval. The Project will result in potentially significant impacts which are peculiar to the Project and Project site and will require mitigation. Therefore, the Commission cannot approve the Project until the City complies with CEQA by preparing an EIR.

Sincerely,



Alaura McGuire

Attachments  
ARM:acp

# **EXHIBIT A**



Technical Consultation, Data Analysis and  
Litigation Support for the Environment

2656 29<sup>th</sup> Street, Suite 201  
Santa Monica, CA 90405

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

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

August 19, 2025

Alaura McGuire  
Adams Broadwell Joseph & Cardozo  
601 Gateway Blvd #1000  
South San Francisco, CA 94080

**Subject:           Comments on the Wildflower Townhomes Project**

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Dear Ms. McGuire,

We have reviewed the March 2024 Consistency Memorandum ("Memo") and the Staff Report for the August 20, 2025, Planning Commission meeting for the Wildflower Townhomes Project ("Project") located in the City of Antioch ("City"). The Project proposes to construct 159 dwelling units on a 10.35-acre site.

Our review concludes that the Memo fails to adequately evaluate the Project's health risk impacts. As a result, emissions and health risk impacts associated with construction and operation of the proposed Project may be underestimated and inadequately addressed. A full CEQA analysis should be prepared to adequately assess and mitigate the potential health risk impacts that the project may have on the environment.

## **Air Quality**

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

In order to conduct our screening-level risk assessment we relied upon AERSCREEN, which is a screening level air quality dispersion model.<sup>1</sup> AERSCREEN is included in the California Office of Environmental Health Hazard Assessment ("OEHHA") and the California Air Pollution Control Officers Associated ("CAPCOA") guidance as the appropriate air dispersion model for Level 2 health risk screening

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<sup>1</sup> "Air Quality Dispersion Modeling - Screening Models," U.S. EPA, available at: <https://www.epa.gov/scram/air-quality-dispersion-modeling-screening-models>.

assessments (“HRSAs”).<sup>2, 3</sup> A Level 2 HRSA utilizes a limited amount of site-specific information to generate maximum reasonable downwind concentrations of air contaminants to which nearby sensitive receptors may be exposed. If an unacceptable air quality hazard is determined to be possible using AERSCREEN, a more refined modeling approach should be conducted prior to approval of the Project.

In an effort to quantitatively estimate the Project’s construction-related and operational emissions, we used the California Emissions Estimator Model (“CalEEMod”) Version 2022.1.1.29,<sup>4</sup> as well as Project-specific information provided by the Memo. In our model, we included 159 dwelling units of the “Apartments Mid Rise” land use (Memo, p. 2). Consistent with the Memo, we also assumed Tier 4 mitigation for all construction equipment (p. 11). All other values were left as default.

We then prepared a preliminary health risk analysis (“HRA”) of the Project’s construction and operational health risk impacts to residential sensitive receptors using the annual particulate matter 2.5 (“PM<sub>2.5</sub>”) exhaust estimates from SWAPE’s CalEEMod output files.<sup>5</sup> Consistent with recommendations set forth by OEHHA, we assumed residential exposure begins during the third trimester stage of life.<sup>6</sup> SWAPE’s CalEEMod model indicates that construction activities will generate approximately 31 pounds of diesel particulate matter (“DPM”) over the 565-day construction period.<sup>7</sup> The AERSCREEN model relies on a continuous average emission rate to simulate maximum downward concentrations from point, area, and volume emission sources. To account for the variability in equipment usage and truck trips over Project construction, we calculated an average DPM emission rate by the following equation:

$$\text{Emission Rate} \left( \frac{\text{grams}}{\text{second}} \right) = \frac{31.0 \text{ lbs}}{565 \text{ days}} \times \frac{453.6 \text{ grams}}{\text{lbs}} \times \frac{1 \text{ day}}{24 \text{ hours}} \times \frac{1 \text{ hour}}{3,600 \text{ seconds}} = \mathbf{0.000288g/s}$$

Using this equation, we estimated a construction emission rate of 0.000288 grams per second (“g/s”). Subtracting the 565-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 28.45 years. SWAPE’s operational CalEEMod emissions indicate that operational activities will generate approximately 20 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:

$$\text{Emission Rate} \left( \frac{\text{grams}}{\text{second}} \right) = \frac{20 \text{ lbs}}{365 \text{ days}} \times \frac{453.6 \text{ grams}}{\text{lbs}} \times \frac{1 \text{ day}}{24 \text{ hours}} \times \frac{1 \text{ hour}}{3,600 \text{ seconds}} = \mathbf{0.000288g/s}$$

<sup>2</sup> “Risk Assessment Guidelines: Guidance Manual for Preparation of Health Risk Assessments.” OEHHA, February 2015, available at: <https://oehha.ca.gov/media/downloads/cnr/2015guidancemanual.pdf>.

<sup>3</sup> “Health Risk Assessments for Proposed Land Use Projects.” CAPCOA, July 2009, available at: [http://www.valleyair.org/transportation/CAPCOA\\_HRA\\_LU\\_Guidelines\\_8-6-09.pdf](http://www.valleyair.org/transportation/CAPCOA_HRA_LU_Guidelines_8-6-09.pdf).

<sup>4</sup> “CalEEMod” CAPCOA, available at: <https://caleemod.com/>.

<sup>5</sup> See Attachment A for SWAPE’s CalEEMod output files.

<sup>6</sup> “Risk Assessment Guidelines: Guidance Manual for Preparation of Health Risk Assessments.” OEHHA, February 2015, available at: <https://oehha.ca.gov/media/downloads/cnr/2015guidancemanual.pdf>, p. 8-18.

<sup>7</sup> See Attachment B for health risk calculations.

Using this equation, we estimated an operational emission rate of 0.00028 g/s. Construction and operation were simulated as a 10.35-acre rectangular area source in AERSCREEN, with approximate dimensions of 289- by 145-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 Antioch was obtained from U.S. 2024 Census data.<sup>8</sup>

The AERSCREEN model generates maximum reasonable estimates of single-hour DPM concentrations from the Project Site. The Environmental Protection Agency (“EPA”) suggests that the annualized average concentration of an air pollutant be estimated by multiplying the single-hour concentration by 10% in screening procedures.<sup>9</sup> Review of the Memo indicates that the nearest sensitive receptors are immediately adjacent to the Project site (p. 2). However, review of the AERSCREEN output files demonstrates that the *maximally* exposed individual receptor (“MEIR”) is located approximately 150 meters from the Project site. Thus, the single-hour concentration estimated by AERSCREEN for Project construction is approximately 0.2761  $\mu\text{g}/\text{m}^3$  DPM at approximately 150 meters downwind. Multiplying this single-hour concentration by 10%, we get an annualized average concentration of 0.02761  $\mu\text{g}/\text{m}^3$  for Project construction at the MEIR. For Project operation, the single-hour concentration estimated by AERSCREEN is 0.2761  $\mu\text{g}/\text{m}^3$  DPM at approximately 150 meters downwind. Multiplying this single-hour concentration by 10%, we get an annualized average concentration of 0.02761  $\mu\text{g}/\text{m}^3$  for Project operation at the MEIR.<sup>10</sup>

We calculated the excess cancer risk to the MEIR using applicable HRA methodologies prescribed by OEHHA, as recommended by the Bay Area Air Quality Management District (“BAAQMD”).<sup>11</sup> 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. 95<sup>th</sup> percentile) breathing rates and age sensitivity factors (“ASF”) in order to account for the increased sensitivity to carcinogens during early-in-life exposure and accurately assess risk for susceptible subpopulations such as children. The residential exposure parameters, such as the daily breathing rates (“BR/BW”), exposure duration (“ED”), ASFs, fraction of time at home (“FAH”), and exposure frequency (“EF”) utilized for the various age groups in our screening-level HRA are as follows:

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<sup>8</sup> “Antioch.” U.S. Census Bureau, 2024, *available at*:

<https://datacommons.org/place/geoid/0602252?q=Antioch%2C+CA%2C+USA>.

<sup>9</sup> “Screening Procedures for Estimating the Air Quality Impact of Stationary Sources Revised.” U.S. EPA, October 1992, *available at*: [https://www.epa.gov/sites/default/files/2020-09/documents/epa-454r-92-019\\_ocr.pdf](https://www.epa.gov/sites/default/files/2020-09/documents/epa-454r-92-019_ocr.pdf)

<sup>10</sup> See Attachment C for AERSCREEN output files.

<sup>11</sup> “California Environmental Quality Act Air Quality Guidelines.” BAAQMD, May 2017, *available at*:

[http://www.baaqmd.gov/~media/files/planning-and-research/ceqa/ceqa\\_guidelines\\_may2017-pdf.pdf?la=en](http://www.baaqmd.gov/~media/files/planning-and-research/ceqa/ceqa_guidelines_may2017-pdf.pdf?la=en), p. 56; see also “Recommended Methods for Screening and Modeling Local Risks and Hazards.” BAAQMD, May 2012, *available at*: <https://www.baaqmd.gov/~media/files/planning-and-research/ceqa/risk-modeling-approach-may-2012.pdf>, p. 65, 86.

Exposure Assumptions for Residential Individual Cancer Risk						
Age Group	Breathing Rate (L/kg-day) <sup>12</sup>	Age Sensitivity Factor <sup>13</sup>	Exposure Duration (years)	Fraction of Time at Home <sup>14</sup>	Exposure Frequency (days/year) <sup>15</sup>	Exposure Time (hours/day)
3 <sup>rd</sup> Trimester	361	10	0.25	0.85	350	24
Infant (0 – 2)	1090	10	2	0.85	350	24
Child (2 – 16)	572	3	14	0.72	350	24
Adult (16 – 30)	261	1	14	0.73	350	24

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

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

where:

Dose<sub>AIR</sub> = dose by inhalation (mg/kg/day), per age group

C<sub>air</sub> = concentration of contaminant in air (µg/m<sup>3</sup>)

EF = exposure frequency (number of days/365 days)

BR/BW = daily breathing rate normalized to body weight (L/kg/day)

<sup>12</sup> “Air Toxics NSR Program Health Risk Assessment Guidelines.” BAAQMD, December 2016, available at: [https://www.baaqmd.gov/~media/files/planning-and-research/permit-modeling/hra\\_guidelines\\_12\\_7\\_2016\\_clean-pdf.pdf?la=en#:~:text=To%20assess%20potential%20inhalation%20exposure%20to%20offsite%20workers%2C%20OEHHA%20recommended,for%20an%20eight%2Dhour%20day](https://www.baaqmd.gov/~media/files/planning-and-research/permit-modeling/hra_guidelines_12_7_2016_clean-pdf.pdf?la=en#:~:text=To%20assess%20potential%20inhalation%20exposure%20to%20offsite%20workers%2C%20OEHHA%20recommended,for%20an%20eight%2Dhour%20day), p. 6; see also “Risk Assessment Guidelines Guidance Manual for Preparation of Health Risk Assessments.” OEHHA, February 2015, available at: <https://oehha.ca.gov/media/downloads/cnr/2015guidancemanual.pdf>.

<sup>13</sup> “Risk Assessment Guidelines Guidance Manual for Preparation of Health Risk Assessments.” OEHHA, February 2015, available at: <https://oehha.ca.gov/media/downloads/cnr/2015guidancemanual.pdf>, p. 8-5 Table 8.3.

<sup>14</sup> “Risk Assessment Guidelines Guidance Manual for Preparation of Health Risk Assessments.” OEHHA, February 2015, available at: <https://oehha.ca.gov/media/downloads/cnr/2015guidancemanual.pdf>, p. 5-24; see also: “Air Toxics NSR Program Health Risk Assessment Guidelines.” BAAQMD, December 2016, available at: [https://www.baaqmd.gov/~media/files/planning-and-research/permit-modeling/hra\\_guidelines\\_12\\_7\\_2016\\_clean-pdf.pdf?la=en#:~:text=To%20assess%20potential%20inhalation%20exposure%20to%20offsite%20workers%2C%20OEHHA%20recommended,for%20an%20eight%2Dhour%20day](https://www.baaqmd.gov/~media/files/planning-and-research/permit-modeling/hra_guidelines_12_7_2016_clean-pdf.pdf?la=en#:~:text=To%20assess%20potential%20inhalation%20exposure%20to%20offsite%20workers%2C%20OEHHA%20recommended,for%20an%20eight%2Dhour%20day), p. 4, 5.

<sup>15</sup> “Risk Assessment Guidelines Guidance Manual for Preparation of Health Risk Assessments.” OEHHA, February 2015, available at: <https://oehha.ca.gov/media/downloads/cnr/2015guidancemanual.pdf>, p. 5-24.

A = inhalation absorption factor (default = 1)

CF = conversion factor (1x10<sup>-6</sup>, µg to mg, L to m<sup>3</sup>)

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

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

where:

Dose<sub>AIR</sub> = dose by inhalation (mg/kg/day), per age group

CPF = cancer potency factor, chemical-specific (mg/kg/day)<sup>-1</sup>

ASF = age sensitivity factor, per age group

FAH = fraction of time at home, per age group (for residential receptors only)

ED = exposure duration (years)

AT = averaging time period over which exposure duration is averaged (always 70 years)

Consistent with the 565-day construction schedule, the annualized average concentration for construction was used for the entire third trimester of pregnancy (0.25 years), as well as the first 1.30 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 0.70 years of the infantile stage of life, the entire child (2 – 16 years) stage of life, as well as the entire adult (16 – 30 years) stage of life. The results of our calculations are shown in the table below.

The Maximally Exposed Individual at an Existing Residential Receptor				
Age Group	Emissions Source	Duration (years)	Concentration (ug/m3)	Cancer Risk
3rd Trimester	Construction	0.25	0.0276	3.19E-07
	Construction	1.30	0.0276	5.00E-06
	Operation	0.70	0.0276	2.71E-06
Infant (0 - 2)	Total	2		7.71E-06
Child (2 - 16)	Operation	14	0.0276	7.20E-06
Adult (16 - 30)	Operation	14	0.0276	1.11E-06
<b>Lifetime</b>		<b>30</b>		<b>1.63E-05</b>



As demonstrated in the table above, the excess cancer risks for the 3<sup>rd</sup> trimester of pregnancy, infants, children, and adults at the MEIR located approximately 150 meters away, over the course of Project construction and operation, are approximately 0.319, 7.71, 7.2, and 1.11 in one million, respectively. The excess cancer risk over the course of a residential lifetime (30 years) is approximately 16.3 in one million. The lifetime cancer risk exceeds the BAAQMD threshold of 10 in one million, thus resulting in a potentially significant impact not previously addressed or identified by the Memo.

Our analysis represents a screening-level HRA, which is known to be conservative and tends to err on the side of health protection. The purpose of the screening-level HRA is to demonstrate the potential link between Project-generated emissions and adverse health risk impacts. According to the 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.”

As demonstrated above, screening-level analyses warrant further evaluation in a refined modeling approach. As our screening-level HRA demonstrates that construction and operation of the Project could result in a potentially significant health risk impact, a full CEQA analysis 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. If the refined analysis similarly concludes that the Project would result in a significant health risk impact, then mitigation measures should be incorporated, as described below in the “Feasible Mitigation Measures Available to Reduce Emissions” section.

## Mitigation

### Feasible Mitigation Measures Available to Reduce Emissions

As discussed above in the section titled “Screening-Level Analysis Demonstrates Potentially Significant Health Risk Impact,” the Memo demonstrates that the Project would result in potentially significant cancer risk to nearby sensitive receptors due to Project-related DPM emissions. According to the EPA, sources of DPM include “autos, trucks, and heavy on-road and offroad equipment,” which represent a “significant threat to air quality and human health.”<sup>16</sup>

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<sup>16</sup> “Diesel Particulate Matter (PM) Air Toxics.” EPA, January 2021, *available at*: <https://enviroatlas.epa.gov/enviroatlas/DataFactSheets/pdf/Supplemental/DieselPMairtoxics.pdf>.

To comply with CEQA, the City must propose mitigation measures that will reduce DPM emissions to less than significant levels or to the greatest extent feasible if a refined HRA shows a significant impact. To reduce DPM emissions during Project construction and operations from engine exhaust, the CalEEMod User's Guide recommends the following mitigation measures:

“The emissions mitigation measures for onsite off-road construction diesel equipment include use of alternative fuel, electric equipment, diesel particulate filters (DPF), oxidation catalysts, newer tier engines, and dust suppression.”<sup>17</sup>

Furthermore, we recommend several applicable mitigation measures pulled from Southern California Association of Governments (“SCAG”)’s 2020 RTP/SCS Program Environment Impact Report’s Air Quality Project Level Mitigation Measures (“PMM-AQ-1”) that target Project-related DPM sources:<sup>18</sup>

- Minimize unnecessary vehicular and machinery activities.
- Require contractors to assemble a comprehensive inventory list (i.e., make, model, engine year, horsepower, emission rates) of all heavy-duty off-road (portable and mobile) equipment (50 horsepower and greater) that could be used an aggregate of 40 or more hours for the construction project. Prepare a plan for approval by the applicable air district demonstrating achievement of the applicable percent reduction for a CARB-approved fleet. Daily logging of the operating hours of the equipment should also be required.
- Ensure that all construction equipment is properly tuned and maintained.
- Minimize idling time to 5 minutes or beyond regulatory requirements —saves fuel and reduces emissions.

As demonstrated above, we have provided several mitigation measures that would reduce construction-related and operational DPM emissions. 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.

A full CEQA analysis should be prepared that includes an updated, refined HRA as well as any necessary mitigation measures to reduce emissions to the maximum extent feasible. The full CEQA analysis should also demonstrate a commitment to the implementation of these measures prior to Project approval, to ensure that the Project’s potentially significant emissions are reduced to the maximum extent possible.

## Disclaimer

SWAPE has received limited discovery regarding this project. Additional information may become available in the future; thus, we retain the right to revise or amend this report when additional

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<sup>17</sup> “Calculation Details for CalEEMod.” CAPCOA, May 2021, available at: <http://www.agmd.gov/docs/default-source/caleemod/user-guide-2021/appendix-a2020-4-0.pdf?sfvrsn=6>, Appendix A, p. 60.

<sup>18</sup> “4.0 Mitigation Measures.” Connect SoCal Program Environmental Impact Report Addendum #1, September 2020, available at: [https://scag.ca.gov/sites/main/files/file-attachments/fpeir\\_connectsocial\\_addendum\\_4\\_mitigationmeasures.pdf?1606004420](https://scag.ca.gov/sites/main/files/file-attachments/fpeir_connectsocial_addendum_4_mitigationmeasures.pdf?1606004420), p. 4.0-2 – 4.0-10; 4.0-19 – 4.0-23; See also: “Certified Final Connect SoCal Program Environmental Impact Report.” SCAG, May 2020, available at: <https://scag.ca.gov/fpeir>.

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

Sincerely,

A handwritten signature in blue ink, appearing to read "Matt Hagemann".

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

A handwritten signature in blue ink, appearing to read "Paul Rosenfeld".

Paul E. Rosenfeld, Ph.D.

Attachment A: CalEEMod Output Files  
Attachment B: Health Risk Calculations  
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# Wildflower Townhomes Custom Report

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# 1. Basic Project Information

## 1.1. Basic Project Information

Data Field	Value
Project Name	Wildflower Townhomes
Construction Start Date	1/1/2026
Operational Year	2027
Lead Agency	—
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	3.60
Precipitation (days)	20.6
Location	37.99029248818165, -121.78321479853687
County	Contra Costa
City	Antioch
Air District	Bay Area AQMD
Air Basin	San Francisco Bay Area
TAZ	1359
EDFZ	1
Electric Utility	Pacific Gas & Electric Company
Gas Utility	Pacific Gas & Electric
App Version	2022.1.1.29

## 1.2. Land Use Types

Land Use Subtype	Size	Unit	Lot Acreage	Building Area (sq ft)	Landscape Area (sq ft)	Special Landscape Area (sq ft)	Population	Description
Apartments Mid Rise	159	Dwelling Unit	10.3	152,640	20,000	—	460	—

### 1.3. User-Selected Emission Reduction Measures by Emissions Sector

No measures selected

## 2. Emissions Summary

### 2.1. Construction Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	108	108	9.56	19.1	0.03	0.09	1.07	1.16	0.09	0.25	0.34	—	3,837	3,837	0.14	0.12	4.73	3,882
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.87	0.86	19.5	36.0	0.06	0.20	19.8	19.9	0.19	10.1	10.2	—	6,757	6,757	0.27	0.13	0.12	6,782
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	6.11	6.09	7.90	14.7	0.02	0.08	1.89	1.97	0.08	0.72	0.80	—	2,946	2,946	0.11	0.08	1.15	2,973
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	1.12	1.11	1.44	2.69	< 0.005	0.01	0.35	0.36	0.01	0.13	0.15	—	488	488	0.02	0.01	0.19	492

### 2.2. Construction Emissions by Year, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2026	0.76	0.72	9.56	19.1	0.03	0.09	1.07	1.16	0.09	0.25	0.34	—	3,837	3,837	0.14	0.12	4.73	3,882

2027	108	108	9.53	18.8	0.03	0.09	1.07	1.16	0.09	0.25	0.34	—	3,810	3,810	0.14	0.12	4.26	3,854
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2026	0.87	0.86	19.5	36.0	0.06	0.20	19.8	19.9	0.19	10.1	10.2	—	6,757	6,757	0.27	0.13	0.12	6,782
2027	0.72	0.66	9.61	18.1	0.03	0.09	1.07	1.16	0.09	0.25	0.34	—	3,727	3,727	0.14	0.13	0.11	3,768
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2026	0.52	0.48	7.90	14.7	0.02	0.08	1.89	1.97	0.08	0.72	0.80	—	2,946	2,946	0.11	0.08	1.15	2,973
2027	6.11	6.09	3.14	5.74	0.01	0.03	0.31	0.34	0.03	0.07	0.11	—	1,152	1,152	0.04	0.04	0.54	1,164
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2026	0.09	0.09	1.44	2.69	< 0.005	0.01	0.35	0.36	0.01	0.13	0.15	—	488	488	0.02	0.01	0.19	492
2027	1.12	1.11	0.57	1.05	< 0.005	0.01	0.06	0.06	0.01	0.01	0.02	—	191	191	0.01	0.01	0.09	193

## 2.4. Operations Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	8.28	7.89	4.28	34.9	0.07	0.20	5.61	5.81	0.20	1.42	1.62	74.5	8,991	9,066	7.85	0.28	21.2	9,366
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	7.28	6.91	4.60	24.0	0.07	0.20	5.61	5.80	0.19	1.42	1.62	74.5	8,545	8,619	7.88	0.30	1.61	8,908
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	7.32	7.04	2.82	25.9	0.06	0.07	5.26	5.33	0.07	1.33	1.40	74.5	6,375	6,449	7.81	0.27	9.33	6,736
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	1.34	1.29	0.51	4.73	0.01	0.01	0.96	0.97	0.01	0.24	0.26	12.3	1,055	1,068	1.29	0.05	1.55	1,115

## 2.5. Operations Emissions by Sector, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Sector	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	3.37	3.13	2.27	25.1	0.06	0.04	5.61	5.65	0.04	1.42	1.46	—	6,202	6,202	0.24	0.24	20.1	6,299
Area	4.88	4.74	1.66	9.69	0.01	0.13	—	0.13	0.13	—	0.13	0.00	2,016	2,016	0.04	< 0.005	—	2,018
Energy	0.04	0.02	0.35	0.15	< 0.005	0.03	—	0.03	0.03	—	0.03	—	752	752	0.09	0.01	—	756
Water	—	—	—	—	—	—	—	—	—	—	—	11.1	21.7	32.8	1.14	0.03	—	69.5
Waste	—	—	—	—	—	—	—	—	—	—	—	63.4	0.00	63.4	6.33	0.00	—	222
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.09	1.09
Total	8.28	7.89	4.28	34.9	0.07	0.20	5.61	5.81	0.20	1.42	1.62	74.5	8,991	9,066	7.85	0.28	21.2	9,366
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	3.20	2.94	2.67	23.2	0.06	0.04	5.61	5.65	0.04	1.42	1.46	—	5,779	5,779	0.28	0.26	0.52	5,865
Area	4.04	3.95	1.57	0.67	0.01	0.13	—	0.13	0.13	—	0.13	0.00	1,992	1,992	0.04	< 0.005	—	1,994
Energy	0.04	0.02	0.35	0.15	< 0.005	0.03	—	0.03	0.03	—	0.03	—	752	752	0.09	0.01	—	756
Water	—	—	—	—	—	—	—	—	—	—	—	11.1	21.7	32.8	1.14	0.03	—	69.5
Waste	—	—	—	—	—	—	—	—	—	—	—	63.4	0.00	63.4	6.33	0.00	—	222
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.09	1.09
Total	7.28	6.91	4.60	24.0	0.07	0.20	5.61	5.80	0.19	1.42	1.62	74.5	8,545	8,619	7.88	0.30	1.61	8,908
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	3.01	2.77	2.38	21.3	0.05	0.04	5.26	5.30	0.04	1.33	1.37	—	5,540	5,540	0.25	0.24	8.24	5,626
Area	4.27	4.25	0.08	4.47	< 0.005	0.01	—	0.01	< 0.005	—	< 0.005	0.00	61.0	61.0	< 0.005	< 0.005	—	61.1
Energy	0.04	0.02	0.35	0.15	< 0.005	0.03	—	0.03	0.03	—	0.03	—	752	752	0.09	0.01	—	756
Water	—	—	—	—	—	—	—	—	—	—	—	11.1	21.7	32.8	1.14	0.03	—	69.5
Waste	—	—	—	—	—	—	—	—	—	—	—	63.4	0.00	63.4	6.33	0.00	—	222

Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.09	1.09
Total	7.32	7.04	2.82	25.9	0.06	0.07	5.26	5.33	0.07	1.33	1.40	74.5	6,375	6,449	7.81	0.27	9.33	6,736
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.55	0.51	0.44	3.88	0.01	0.01	0.96	0.97	0.01	0.24	0.25	—	917	917	0.04	0.04	1.36	932
Area	0.78	0.78	0.01	0.82	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	10.1	10.1	< 0.005	< 0.005	—	10.1
Energy	0.01	< 0.005	0.06	0.03	< 0.005	0.01	—	0.01	0.01	—	0.01	—	124	124	0.01	< 0.005	—	125
Water	—	—	—	—	—	—	—	—	—	—	—	1.84	3.60	5.44	0.19	< 0.005	—	11.5
Waste	—	—	—	—	—	—	—	—	—	—	—	10.5	0.00	10.5	1.05	0.00	—	36.7
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.18	0.18
Total	1.34	1.29	0.51	4.73	0.01	0.01	0.96	0.97	0.01	0.24	0.26	12.3	1,055	1,068	1.29	0.05	1.55	1,115

### 3. Construction Emissions Details

#### 3.1. Demolition (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.41	0.41	11.9	18.2	0.03	0.20	—	0.20	0.19	—	0.19	—	3,427	3,427	0.14	0.03	—	3,438
Demolition	—	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	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	0.00

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.02	0.65	1.00	< 0.005	0.01	—	0.01	0.01	—	0.01	—	188	188	0.01	< 0.005	—	188
Demolition	—	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.12	0.18	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	31.1	31.1	< 0.005	< 0.005	—	31.2
Demolition	—	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	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	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.05	0.04	0.04	0.50	0.00	0.00	0.12	0.12	0.00	0.03	0.03	—	119	119	< 0.005	0.01	0.01	120
Vendor	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	0.00
Hauling	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	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.03	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	6.57	6.57	< 0.005	< 0.005	0.01	6.67
Vendor	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	0.00
Hauling	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	0.00

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.09	1.09	< 0.005	< 0.005	< 0.005	1.10
Vendor	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	0.00
Hauling	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	0.00

### 3.3. Site Preparation (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.64	0.64	14.7	28.3	0.05	0.10	—	0.10	0.10	—	0.10	—	5,298	5,298	0.21	0.04	—	5,316
Dust From Material Movement	—	—	—	—	—	—	19.7	19.7	—	10.1	10.1	—	—	—	—	—	—	—
Onsite truck	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	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.02	0.40	0.78	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	145	145	0.01	< 0.005	—	146
Dust From Material Movement	—	—	—	—	—	—	0.54	0.54	—	0.28	0.28	—	—	—	—	—	—	—

Onsite truck	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.07	0.14	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	24.0	24.0	< 0.005	< 0.005	—	24.1
Dust From Material Movement	—	—	—	—	—	—	0.10	0.10	—	0.05	0.05	—	—	—	—	—	—	—
Onsite truck	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	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06	0.05	0.05	0.58	0.00	0.00	0.14	0.14	0.00	0.03	0.03	—	138	138	< 0.005	0.01	0.01	140
Vendor	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	0.00
Hauling	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	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	3.83	3.83	< 0.005	< 0.005	0.01	3.89
Vendor	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	0.00
Hauling	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.63	0.63	< 0.005	< 0.005	< 0.005	0.64
Vendor	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	0.00
Hauling	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	0.00



## 3.5. Grading (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.80	0.80	19.4	35.3	0.06	0.18	—	0.18	0.18	—	0.18	—	6,599	6,599	0.27	0.05	—	6,621
Dust From Material Movement	—	—	—	—	—	—	9.20	9.20	—	3.65	3.65	—	—	—	—	—	—	—
Onsite truck	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	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.07	0.07	1.60	2.91	0.01	0.01	—	0.01	0.01	—	0.01	—	542	542	0.02	< 0.005	—	544
Dust From Material Movement	—	—	—	—	—	—	0.76	0.76	—	0.30	0.30	—	—	—	—	—	—	—
Onsite truck	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.01	0.01	0.29	0.53	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	89.8	89.8	< 0.005	< 0.005	—	90.1
Dust From Material Movement	—	—	—	—	—	—	0.14	0.14	—	0.05	0.05	—	—	—	—	—	—	—
Onsite truck	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	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.06	0.06	0.66	0.00	0.00	0.17	0.17	0.00	0.04	0.04	—	158	158	< 0.005	0.01	0.02	160
Vendor	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	0.00
Hauling	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	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	< 0.005	< 0.005	0.05	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	13.1	13.1	< 0.005	< 0.005	0.02	13.3
Vendor	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	0.00
Hauling	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	2.18	2.18	< 0.005	< 0.005	< 0.005	2.21
Vendor	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	0.00
Hauling	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	0.00

### 3.7. Building Construction (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.32	0.32	8.74	14.3	0.02	0.09	—	0.09	0.08	—	0.08	—	2,397	2,397	0.10	0.02	—	2,405
Onsite truck	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	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.32	0.32	8.74	14.3	0.02	0.09	—	0.09	0.08	—	0.08	—	2,397	2,397	0.10	0.02	—	2,405
Onsite truck	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	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.17	0.17	4.75	7.78	0.01	0.05	—	0.05	0.05	—	0.05	—	1,304	1,304	0.05	0.01	—	1,309
Onsite truck	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.03	0.03	0.87	1.42	< 0.005	0.01	—	0.01	0.01	—	0.01	—	216	216	0.01	< 0.005	—	217
Onsite truck	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	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.40	0.39	0.25	4.49	0.00	0.00	0.95	0.95	0.00	0.22	0.22	—	990	990	0.02	0.04	3.64	1,005
Vendor	0.04	0.01	0.58	0.28	< 0.005	0.01	0.12	0.13	0.01	0.03	0.04	—	451	451	0.03	0.07	1.09	472
Hauling	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	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.38	0.34	0.32	3.78	0.00	0.00	0.95	0.95	0.00	0.22	0.22	—	905	905	0.03	0.04	0.09	918
Vendor	0.04	0.01	0.61	0.29	< 0.005	0.01	0.12	0.13	0.01	0.03	0.04	—	451	451	0.02	0.07	0.03	471
Hauling	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	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.21	0.18	0.16	2.01	0.00	0.00	0.51	0.51	0.00	0.12	0.12	—	498	498	0.01	0.02	0.85	505
Vendor	0.02	0.01	0.32	0.15	< 0.005	< 0.005	0.06	0.07	< 0.005	0.02	0.02	—	245	245	0.01	0.04	0.25	257
Hauling	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.04	0.03	0.03	0.37	0.00	0.00	0.09	0.09	0.00	0.02	0.02	—	82.4	82.4	< 0.005	< 0.005	0.14	83.7
Vendor	< 0.005	< 0.005	0.06	0.03	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	40.6	40.6	< 0.005	0.01	0.04	42.5
Hauling	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	0.00

### 3.9. Building Construction (2027) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipm	0.32	0.32	8.74	14.3	0.02	0.09	—	0.09	0.08	—	0.08	—	2,397	2,397	0.10	0.02	—	2,405
Onsite truck	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	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipm ent	0.32	0.32	8.74	14.3	0.02	0.09	—	0.09	0.08	—	0.08	—	2,397	2,397	0.10	0.02	—	2,405
Onsite truck	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	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipm ent	0.09	0.09	2.45	4.00	0.01	0.02	—	0.02	0.02	—	0.02	—	671	671	0.03	0.01	—	673
Onsite truck	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipm ent	0.02	0.02	0.45	0.73	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	111	111	< 0.005	< 0.005	—	111
Onsite truck	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	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.39	0.35	0.24	4.21	0.00	0.00	0.95	0.95	0.00	0.22	0.22	—	971	971	0.02	0.04	3.30	986
Vendor	0.04	0.01	0.55	0.27	< 0.005	0.01	0.12	0.13	0.01	0.03	0.04	—	442	442	0.02	0.07	0.96	463
Hauling	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	0.00

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.37	0.33	0.29	3.56	0.00	0.00	0.95	0.95	0.00	0.22	0.22	—	888	888	0.02	0.04	0.09	901
Vendor	0.04	0.01	0.58	0.28	< 0.005	0.01	0.12	0.13	0.01	0.03	0.04	—	442	442	0.02	0.07	0.02	462
Hauling	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	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.10	0.09	0.08	0.97	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	251	251	0.01	0.01	0.40	255
Vendor	0.01	< 0.005	0.16	0.08	< 0.005	< 0.005	0.03	0.03	< 0.005	0.01	0.01	—	124	124	0.01	0.02	0.12	129
Hauling	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.01	0.18	0.00	0.00	0.05	0.05	0.00	0.01	0.01	—	41.6	41.6	< 0.005	< 0.005	0.07	42.2
Vendor	< 0.005	< 0.005	0.03	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	20.5	20.5	< 0.005	< 0.005	0.02	21.4
Hauling	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	0.00

### 3.11. Paving (2027) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.23	0.23	7.21	10.6	0.01	0.09	—	0.09	0.08	—	0.08	—	1,511	1,511	0.06	0.01	—	1,516
Paving	0.00	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	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	0.00

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipm ent	0.01	0.01	0.39	0.58	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	82.8	82.8	< 0.005	< 0.005	—	83.1
Paving	0.00	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipm ent	< 0.005	< 0.005	0.07	0.11	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	13.7	13.7	< 0.005	< 0.005	—	13.8
Paving	0.00	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	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	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.05	0.05	0.03	0.55	0.00	0.00	0.12	0.12	0.00	0.03	0.03	—	127	127	< 0.005	< 0.005	0.43	129
Vendor	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	0.00
Hauling	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	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	6.45	6.45	< 0.005	< 0.005	0.01	6.54
Vendor	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	0.00

Hauling	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.07	1.07	< 0.005	< 0.005	< 0.005	1.08
Vendor	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	0.00
Hauling	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	0.00

### 3.13. Architectural Coating (2027) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.02	1.07	0.96	< 0.005	0.03	—	0.03	0.03	—	0.03	—	134	134	0.01	< 0.005	—	134
Architectural Coatings	107	107	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	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	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.06	0.05	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	7.32	7.32	< 0.005	< 0.005	—	7.34



Architectural Coating	5.89	5.89	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	1.21	1.21	< 0.005	< 0.005	—	1.22
Architectural Coatings	1.07	1.07	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	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	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.08	0.07	0.05	0.84	0.00	0.00	0.19	0.19	0.00	0.04	0.04	—	194	194	< 0.005	0.01	0.66	197
Vendor	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	0.00
Hauling	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	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.04	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	9.84	9.84	< 0.005	< 0.005	0.02	9.98
Vendor	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	0.00
Hauling	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.63	1.63	< 0.005	< 0.005	< 0.005	1.65
Vendor	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	0.00

Hauling	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	0.00
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## 4. Operations Emissions Details

### 4.1. Mobile Emissions by Land Use

#### 4.1.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Mid Rise	3.37	3.13	2.27	25.1	0.06	0.04	5.61	5.65	0.04	1.42	1.46	—	6,202	6,202	0.24	0.24	20.1	6,299
Total	3.37	3.13	2.27	25.1	0.06	0.04	5.61	5.65	0.04	1.42	1.46	—	6,202	6,202	0.24	0.24	20.1	6,299
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Mid Rise	3.20	2.94	2.67	23.2	0.06	0.04	5.61	5.65	0.04	1.42	1.46	—	5,779	5,779	0.28	0.26	0.52	5,865
Total	3.20	2.94	2.67	23.2	0.06	0.04	5.61	5.65	0.04	1.42	1.46	—	5,779	5,779	0.28	0.26	0.52	5,865
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Mid Rise	0.55	0.51	0.44	3.88	0.01	0.01	0.96	0.97	0.01	0.24	0.25	—	917	917	0.04	0.04	1.36	932
Total	0.55	0.51	0.44	3.88	0.01	0.01	0.96	0.97	0.01	0.24	0.25	—	917	917	0.04	0.04	1.36	932

### 4.2. Energy

## 4.2.1. Electricity Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Mid Rise	—	—	—	—	—	—	—	—	—	—	—	—	303	303	0.05	0.01	—	306
Total	—	—	—	—	—	—	—	—	—	—	—	—	303	303	0.05	0.01	—	306
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Mid Rise	—	—	—	—	—	—	—	—	—	—	—	—	303	303	0.05	0.01	—	306
Total	—	—	—	—	—	—	—	—	—	—	—	—	303	303	0.05	0.01	—	306
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Mid Rise	—	—	—	—	—	—	—	—	—	—	—	—	50.2	50.2	0.01	< 0.005	—	50.7
Total	—	—	—	—	—	—	—	—	—	—	—	—	50.2	50.2	0.01	< 0.005	—	50.7

## 4.2.3. Natural Gas Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Mid Rise	0.04	0.02	0.35	0.15	< 0.005	0.03	—	0.03	0.03	—	0.03	—	449	449	0.04	< 0.005	—	450

Total	0.04	0.02	0.35	0.15	< 0.005	0.03	—	0.03	0.03	—	0.03	—	449	449	0.04	< 0.005	—	450
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Mid Rise	0.04	0.02	0.35	0.15	< 0.005	0.03	—	0.03	0.03	—	0.03	—	449	449	0.04	< 0.005	—	450
Total	0.04	0.02	0.35	0.15	< 0.005	0.03	—	0.03	0.03	—	0.03	—	449	449	0.04	< 0.005	—	450
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Mid Rise	0.01	< 0.005	0.06	0.03	< 0.005	0.01	—	0.01	0.01	—	0.01	—	74.3	74.3	0.01	< 0.005	—	74.5
Total	0.01	< 0.005	0.06	0.03	< 0.005	0.01	—	0.01	0.01	—	0.01	—	74.3	74.3	0.01	< 0.005	—	74.5

### 4.3. Area Emissions by Source

#### 4.3.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Source	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	0.18	0.09	1.57	0.67	0.01	0.13	—	0.13	0.13	—	0.13	0.00	1,992	1,992	0.04	< 0.005	—	1,994
Consumer Products	3.27	3.27	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.59	0.59	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.84	0.79	0.09	9.03	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	24.1	24.1	< 0.005	< 0.005	—	24.2

Total	4.88	4.74	1.66	9.69	0.01	0.13	—	0.13	0.13	—	0.13	0.00	2,016	2,016	0.04	< 0.005	—	2,018
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	0.18	0.09	1.57	0.67	0.01	0.13	—	0.13	0.13	—	0.13	0.00	1,992	1,992	0.04	< 0.005	—	1,994
Consumer Products	3.27	3.27	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.59	0.59	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	4.04	3.95	1.57	0.67	0.01	0.13	—	0.13	0.13	—	0.13	0.00	1,992	1,992	0.04	< 0.005	—	1,994
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	8.13	8.13	< 0.005	< 0.005	—	8.14
Consumer Products	0.60	0.60	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.11	0.11	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.08	0.07	0.01	0.81	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	1.97	1.97	< 0.005	< 0.005	—	1.98
Total	0.78	0.78	0.01	0.82	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	10.1	10.1	< 0.005	< 0.005	—	10.1

## 4.4. Water Emissions by Land Use

### 4.4.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Mid Rise	—	—	—	—	—	—	—	—	—	—	—	11.1	21.7	32.8	1.14	0.03	—	69.5
Total	—	—	—	—	—	—	—	—	—	—	—	11.1	21.7	32.8	1.14	0.03	—	69.5
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Mid Rise	—	—	—	—	—	—	—	—	—	—	—	11.1	21.7	32.8	1.14	0.03	—	69.5
Total	—	—	—	—	—	—	—	—	—	—	—	11.1	21.7	32.8	1.14	0.03	—	69.5
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Mid Rise	—	—	—	—	—	—	—	—	—	—	—	1.84	3.60	5.44	0.19	< 0.005	—	11.5
Total	—	—	—	—	—	—	—	—	—	—	—	1.84	3.60	5.44	0.19	< 0.005	—	11.5

## 4.5. Waste Emissions by Land Use

### 4.5.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Mid Rise	—	—	—	—	—	—	—	—	—	—	—	63.4	0.00	63.4	6.33	0.00	—	222

Total	—	—	—	—	—	—	—	—	—	—	—	63.4	0.00	63.4	6.33	0.00	—	222
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Mid Rise	—	—	—	—	—	—	—	—	—	—	—	63.4	0.00	63.4	6.33	0.00	—	222
Total	—	—	—	—	—	—	—	—	—	—	—	63.4	0.00	63.4	6.33	0.00	—	222
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Mid Rise	—	—	—	—	—	—	—	—	—	—	—	10.5	0.00	10.5	1.05	0.00	—	36.7
Total	—	—	—	—	—	—	—	—	—	—	—	10.5	0.00	10.5	1.05	0.00	—	36.7

## 4.6. Refrigerant Emissions by Land Use

### 4.6.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Mid Rise	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.09	1.09
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.09	1.09
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Mid Rise	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.09	1.09
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.09	1.09

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Mid Rise	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.18	0.18
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.18	0.18

## 4.7. Offroad Emissions By Equipment Type

### 4.7.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

## 4.8. Stationary Emissions By Equipment Type

### 4.8.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
----------------	-----	-----	-----	----	-----	-------	-------	-------	--------	--------	--------	------	-------	------	-----	-----	---	------



Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

## 4.9. User Defined Emissions By Equipment Type

### 4.9.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

## 4.10. Soil Carbon Accumulation By Vegetation Type

### 4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

## Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

## 4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

## Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

## 4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

## Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
---------	-----	-----	-----	----	-----	-------	-------	-------	--------	--------	--------	------	-------	------	-----	-----	---	------

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

## 5. Activity Data

### 5.1. Construction Schedule

Phase Name	Phase Type	Start Date	End Date	Days Per Week	Work Days per Phase	Phase Description
Demolition	Demolition	1/1/2026	1/29/2026	5.00	20.0	—
Site Preparation	Site Preparation	1/30/2026	2/13/2026	5.00	10.0	—
Grading	Grading	2/14/2026	3/28/2026	5.00	30.0	—
Building Construction	Building Construction	3/29/2026	5/23/2027	5.00	300	—
Paving	Paving	5/24/2027	6/21/2027	5.00	20.0	—
Architectural Coating	Architectural Coating	6/22/2027	7/20/2027	5.00	20.0	—

### 5.2. Off-Road Equipment

#### 5.2.1. Unmitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Demolition	Rubber Tired Dozers	Diesel	Tier 4 Interim	2.00	8.00	367	0.40
Demolition	Excavators	Diesel	Tier 4 Interim	3.00	8.00	36.0	0.38
Demolition	Concrete/Industrial Saws	Diesel	Tier 4 Interim	1.00	8.00	33.0	0.73
Site Preparation	Rubber Tired Dozers	Diesel	Tier 4 Interim	3.00	8.00	367	0.40
Site Preparation	Tractors/Loaders/Back hoes	Diesel	Tier 4 Interim	4.00	8.00	84.0	0.37
Grading	Graders	Diesel	Tier 4 Interim	1.00	8.00	148	0.41
Grading	Excavators	Diesel	Tier 4 Interim	2.00	8.00	36.0	0.38
Grading	Tractors/Loaders/Back hoes	Diesel	Tier 4 Interim	2.00	8.00	84.0	0.37

Grading	Scrapers	Diesel	Tier 4 Interim	2.00	8.00	423	0.48
Grading	Rubber Tired Dozers	Diesel	Tier 4 Interim	1.00	8.00	367	0.40
Building Construction	Forklifts	Diesel	Tier 4 Interim	3.00	8.00	82.0	0.20
Building Construction	Generator Sets	Diesel	Tier 4 Interim	1.00	8.00	14.0	0.74
Building Construction	Cranes	Diesel	Tier 4 Interim	1.00	7.00	367	0.29
Building Construction	Welders	Diesel	Tier 4 Interim	1.00	8.00	46.0	0.45
Building Construction	Tractors/Loaders/Back hoes	Diesel	Tier 4 Interim	3.00	7.00	84.0	0.37
Paving	Pavers	Diesel	Tier 4 Interim	2.00	8.00	81.0	0.42
Paving	Paving Equipment	Diesel	Tier 4 Interim	2.00	8.00	89.0	0.36
Paving	Rollers	Diesel	Tier 4 Interim	2.00	8.00	36.0	0.38
Architectural Coating	Air Compressors	Diesel	Tier 4 Interim	1.00	6.00	37.0	0.48

## 5.3. Construction Vehicles

### 5.3.1. Unmitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Demolition	—	—	—	—
Demolition	Worker	15.0	11.7	LDA,LDT1,LDT2
Demolition	Vendor	—	8.40	HHDT,MHDT
Demolition	Hauling	0.00	20.0	HHDT
Demolition	Onsite truck	—	—	HHDT
Site Preparation	—	—	—	—
Site Preparation	Worker	17.5	11.7	LDA,LDT1,LDT2
Site Preparation	Vendor	—	8.40	HHDT,MHDT
Site Preparation	Hauling	0.00	20.0	HHDT
Site Preparation	Onsite truck	—	—	HHDT
Grading	—	—	—	—
Grading	Worker	20.0	11.7	LDA,LDT1,LDT2

Grading	Vendor	—	8.40	HHDT,MHDT
Grading	Hauling	0.00	20.0	HHDT
Grading	Onsite truck	—	—	HHDT
Building Construction	—	—	—	—
Building Construction	Worker	114	11.7	LDA,LDT1,LDT2
Building Construction	Vendor	17.0	8.40	HHDT,MHDT
Building Construction	Hauling	0.00	20.0	HHDT
Building Construction	Onsite truck	—	—	HHDT
Paving	—	—	—	—
Paving	Worker	15.0	11.7	LDA,LDT1,LDT2
Paving	Vendor	—	8.40	HHDT,MHDT
Paving	Hauling	0.00	20.0	HHDT
Paving	Onsite truck	—	—	HHDT
Architectural Coating	—	—	—	—
Architectural Coating	Worker	22.9	11.7	LDA,LDT1,LDT2
Architectural Coating	Vendor	—	8.40	HHDT,MHDT
Architectural Coating	Hauling	0.00	20.0	HHDT
Architectural Coating	Onsite truck	—	—	HHDT

## 5.4. Vehicles

### 5.4.1. Construction Vehicle Control Strategies

Non-applicable. No control strategies activated by user.

## 5.5. Architectural Coatings

Phase Name	Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
Architectural Coating	309,096	103,032	0.00	0.00	—

## 5.6. Dust Mitigation

### 5.6.1. Construction Earthmoving Activities

Phase Name	Material Imported (cy)	Material Exported (cy)	Acres Graded (acres)	Material Demolished (sq. ft.)	Acres Paved (acres)
Demolition	0.00	0.00	0.00	—	—
Site Preparation	—	—	15.0	0.00	—
Grading	—	—	90.0	0.00	—
Paving	0.00	0.00	0.00	0.00	—

### 5.6.2. Construction Earthmoving Control Strategies

Non-applicable. No control strategies activated by user.

## 5.7. Construction Paving

Land Use	Area Paved (acres)	% Asphalt
Apartments Mid Rise	—	0%

## 5.8. Construction Electricity Consumption and Emissions Factors

### kWh per Year and Emission Factor (lb/MWh)

Year	kWh per Year	CO2	CH4	N2O
2026	0.00	204	0.03	< 0.005
2027	0.00	204	0.03	< 0.005

## 5.9. Operational Mobile Sources

### 5.9.1. Unmitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VMt/Weekday	VMt/Saturday	VMt/Sunday	VMt/Year
Apartments Mid Rise	865	781	650	300,124	7,943	7,169	5,972	2,756,074

## 5.10. Operational Area Sources

### 5.10.1. Hearths

#### 5.10.1.1. Unmitigated

Hearth Type	Unmitigated (number)
Apartments Mid Rise	—
Wood Fireplaces	0
Gas Fireplaces	81
Propane Fireplaces	0
Electric Fireplaces	0
No Fireplaces	78
Conventional Wood Stoves	0
Catalytic Wood Stoves	0
Non-Catalytic Wood Stoves	0
Pellet Wood Stoves	0

### 5.10.2. Architectural Coatings

Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
309096	103,032	0.00	0.00	—

### 5.10.3. Landscape Equipment

Season	Unit	Value
Snow Days	day/yr	0.00
Summer Days	day/yr	180



## 5.11. Operational Energy Consumption

### 5.11.1. Unmitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBtu/yr)

Land Use	Electricity (kWh/yr)	CO2	CH4	N2O	Natural Gas (kBtu/yr)
Apartments Mid Rise	542,421	204	0.0330	0.0040	1,399,847

## 5.12. Operational Water and Wastewater Consumption

### 5.12.1. Unmitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
Apartments Mid Rise	5,786,380	291,748

## 5.13. Operational Waste Generation

### 5.13.1. Unmitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
Apartments Mid Rise	118	—

## 5.14. Operational Refrigeration and Air Conditioning Equipment

### 5.14.1. Unmitigated

Land Use Type	Equipment Type	Refrigerant	GWP	Quantity (kg)	Operations Leak Rate	Service Leak Rate	Times Serviced
Apartments Mid Rise	Average room A/C & Other residential A/C and heat pumps	R-410A	2,088	< 0.005	2.50	2.50	10.0
Apartments Mid Rise	Household refrigerators and/or freezers	R-134a	1,430	0.12	0.60	0.00	1.00

## 5.15. Operational Off-Road Equipment

### 5.15.1. Unmitigated

Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
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## 5.16. Stationary Sources

### 5.16.1. Emergency Generators and Fire Pumps

Equipment Type	Fuel Type	Number per Day	Hours per Day	Hours per Year	Horsepower	Load Factor
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### 5.16.2. Process Boilers

Equipment Type	Fuel Type	Number	Boiler Rating (MMBtu/hr)	Daily Heat Input (MMBtu/day)	Annual Heat Input (MMBtu/yr)
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## 5.17. User Defined

Equipment Type	Fuel Type
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## 5.18. Vegetation

### 5.18.1. Land Use Change

#### 5.18.1.1. Unmitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres
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### 5.18.1. Biomass Cover Type

#### 5.18.1.1. Unmitigated

Biomass Cover Type	Initial Acres	Final Acres
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5.18.2. Sequestration

5.18.2.1. Unmitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)
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8. User Changes to Default Data

Screen	Justification
Land Use	Consistent with the Staff Report.
Construction: Off-Road Equipment	Consistent with the Staff Report.

Construction			
2026		Total	
Annual Emissions (tons/year)	0.01	Total DPM (lbs)	30.96890411
Daily Emissions (lbs/day)	0.054794521	Total DPM (g)	14042.9589
Construction Duration (days)	365	Emission Rate (g/s)	0.000287671
Total DPM (lbs)	20	Release Height (meters)	3
Total DPM (g)	9072	Total Acreage	10.35
Start Date	1/1/2026	Max Horizontal (meters)	289.43
End Date	1/1/2027	Min Horizontal (meters)	144.72
Construction Days	365	Initial Vertical Dimension (meters)	1.5
2027		Setting	Urban
Annual Emissions (tons/year)	0.01	Population	118,453
Daily Emissions (lbs/day)	0.054794521	Start Date	1/1/2026
Construction Duration (days)	200	End Date	7/20/2027
Total DPM (lbs)	10.95890411	Total Construction Days	565
Total DPM (g)	4970.958904	Total Years of Construction	1.55
Start Date	1/1/2027	Total Years of Operation	28.45
End Date	7/20/2027		
Construction Days	200		

Operation	
Emission Rate	
Annual Emissions (tons/year)	0.01
Daily Emissions (lbs/day)	0.054794521
Total DPM (lbs)	20
Emission Rate (g/s)	0.000287671
Release Height (meters)	3
Total Acreage	10.35
Max Horizontal (meters)	289.43
Min Horizontal (meters)	144.72
Initial Vertical Dimension (meters)	1.5
Setting	Urban
Population	118,453

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	0.0276	3.19E-07
	Construction	1.30	0.0276	5.00E-06
	Operation	0.70	0.0276	2.71E-06
	Total	2		7.71E-06
Child (2 - 16)	Operation	14	0.0276	7.20E-06
Adult (16 - 30)	Operation	14	0.0276	1.11E-06
Lifetime		30		1.63E-05

AERSCREEN 21112 / AERMOD 21112

08/11/25

14:15:18

TITLE: Wildflower, Construction

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 \*\*\*\*\* AREA PARAMETERS \*\*\*\*\*  
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SOURCE EMISSION RATE:	0.288E-03 g/s	0.228E-02 lb/hr
AREA EMISSION RATE:	0.687E-08 g/(s-m2)	0.545E-07 lb/(hr-m2)
AREA HEIGHT:	3.00 meters	9.84 feet
AREA SOURCE LONG SIDE:	289.43 meters	949.57 feet
AREA SOURCE SHORT SIDE:	144.72 meters	474.80 feet
INITIAL VERTICAL DIMENSION:	1.50 meters	4.92 feet
RURAL OR URBAN:	URBAN	
POPULATION:	118453	
INITIAL PROBE DISTANCE =	5000. meters	16404. feet

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 \*\*\*\*\* BUILDING DOWNWASH PARAMETERS \*\*\*\*\*  
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BUILDING DOWNWASH NOT USED FOR NON-POINT SOURCES

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 \*\*\*\*\* FLOW SECTOR ANALYSIS \*\*\*\*\*  
 25 meter receptor spacing: 1. meters - 5000. meters  
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## MAXIMUM IMPACT RECEPTOR

Zo SECTOR	SURFACE ROUGHNESS	1-HR CONC (ug/m3)	RADIAL (deg)	DIST (m)	TEMPORAL PERIOD
1*	1.000	0.2761	15	150.0	WIN

\* = worst case diagonal

\*\*\*\*\* MAKEMET METEOROLOGY PARAMETERS \*\*\*\*\*

MIN/MAX TEMPERATURE: 250.0 / 310.0 (K)

MINIMUM WIND SPEED: 0.5 m/s

ANEMOMETER HEIGHT: 10.000 meters

SURFACE CHARACTERISTICS INPUT: AERMET SEASONAL TABLES

DOMINANT SURFACE PROFILE: Urban

DOMINANT CLIMATE TYPE: Average Moisture

DOMINANT SEASON: Winter

ALBEDO: 0.35

BOWEN RATIO: 1.50

ROUGHNESS LENGTH: 1.000 (meters)

SURFACE FRICTION VELOCITY (U\*) NOT ADJUSTED

METEOROLOGY CONDITIONS USED TO PREDICT OVERALL MAXIMUM IMPACT

YR MO DY JDY HR

10 01 10 10 01

H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O	LEN	Z0	BOWEN	ALBEDO	REF	WS
-1.30	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.50	0.35	0.50		

HT	REF	TA	HT
10.0	310.0	2.0	

\*\*\*\*\* AERSCREEN AUTOMATED DISTANCES \*\*\*\*\*

OVERALL MAXIMUM CONCENTRATIONS BY DISTANCE

DIST (m)	MAXIMUM 1-HR CONC (ug/m3)	DIST (m)	MAXIMUM 1-HR CONC (ug/m3)
1.00	0.2109	2525.00	0.6025E-02

25.00	0.2252	2550.00	0.5945E-02
50.00	0.2381	2575.00	0.5867E-02
75.00	0.2495	2600.00	0.5790E-02
100.00	0.2595	2625.00	0.5716E-02
125.00	0.2687	2650.00	0.5642E-02
150.00	0.2761	2675.00	0.5571E-02
175.00	0.2158	2700.00	0.5560E-02
200.00	0.1670	2725.00	0.5490E-02
225.00	0.1406	2750.00	0.5422E-02
250.00	0.1237	2775.00	0.5355E-02
275.00	0.1103	2800.00	0.5290E-02
300.00	0.9920E-01	2825.00	0.5226E-02
325.00	0.8989E-01	2850.00	0.5163E-02
350.00	0.8198E-01	2875.00	0.5102E-02
375.00	0.7519E-01	2900.00	0.5042E-02
400.00	0.6929E-01	2925.00	0.4983E-02
425.00	0.6417E-01	2950.00	0.4925E-02
450.00	0.5965E-01	2975.00	0.4868E-02
475.00	0.5567E-01	3000.00	0.4813E-02
500.00	0.5208E-01	3025.00	0.4759E-02
525.00	0.4891E-01	3050.00	0.4705E-02
550.00	0.4606E-01	3075.00	0.4653E-02
575.00	0.4347E-01	3100.00	0.4602E-02
600.00	0.4112E-01	3125.00	0.4551E-02
625.00	0.3900E-01	3150.00	0.4502E-02
650.00	0.3703E-01	3175.00	0.4454E-02
675.00	0.3524E-01	3200.00	0.4406E-02
700.00	0.3361E-01	3225.00	0.4359E-02
725.00	0.3211E-01	3250.00	0.4314E-02
750.00	0.3070E-01	3275.00	0.4269E-02
775.00	0.2939E-01	3300.00	0.4224E-02
800.00	0.2818E-01	3325.00	0.4181E-02
825.00	0.2705E-01	3350.00	0.4138E-02
850.00	0.2601E-01	3375.00	0.4096E-02
875.00	0.2504E-01	3400.00	0.4055E-02
900.00	0.2413E-01	3425.00	0.4015E-02
925.00	0.2326E-01	3450.00	0.3975E-02
950.00	0.2245E-01	3475.00	0.3936E-02
975.00	0.2169E-01	3500.00	0.3898E-02
1000.00	0.2096E-01	3525.00	0.3860E-02
1025.00	0.2028E-01	3550.00	0.3823E-02
1050.00	0.1964E-01	3575.00	0.3786E-02
1075.00	0.1903E-01	3600.00	0.3750E-02
1100.00	0.1846E-01	3625.00	0.3715E-02
1125.00	0.1792E-01	3650.00	0.3680E-02
1150.00	0.1740E-01	3675.00	0.3646E-02
1175.00	0.1690E-01	3700.00	0.3612E-02
1200.00	0.1643E-01	3725.00	0.3579E-02
1225.00	0.1598E-01	3750.00	0.3546E-02
1250.00	0.1556E-01	3775.00	0.3514E-02



1275.00	0.1515E-01	3800.00	0.3483E-02
1300.00	0.1476E-01	3825.00	0.3452E-02
1325.00	0.1439E-01	3849.99	0.3421E-02
1350.00	0.1404E-01	3875.00	0.3391E-02
1375.00	0.1370E-01	3900.00	0.3361E-02
1400.00	0.1337E-01	3925.00	0.3332E-02
1425.00	0.1305E-01	3950.00	0.3303E-02
1450.00	0.1275E-01	3975.00	0.3275E-02
1475.00	0.1246E-01	4000.00	0.3247E-02
1500.00	0.1218E-01	4025.00	0.3219E-02
1525.00	0.1192E-01	4050.00	0.3192E-02
1550.00	0.1166E-01	4075.00	0.3165E-02
1575.00	0.1141E-01	4100.00	0.3139E-02
1600.00	0.1117E-01	4125.00	0.3113E-02
1625.00	0.1094E-01	4149.99	0.3087E-02
1650.00	0.1071E-01	4175.00	0.3062E-02
1675.00	0.1050E-01	4200.00	0.3037E-02
1700.00	0.1029E-01	4225.00	0.3013E-02
1725.00	0.1009E-01	4250.00	0.2988E-02
1750.00	0.9894E-02	4275.00	0.2964E-02
1775.00	0.9706E-02	4300.00	0.2941E-02
1800.00	0.9524E-02	4325.00	0.2918E-02
1825.00	0.9347E-02	4350.00	0.2895E-02
1850.00	0.9177E-02	4375.00	0.2872E-02
1875.00	0.9012E-02	4400.00	0.2850E-02
1900.00	0.8853E-02	4425.00	0.2828E-02
1925.00	0.8698E-02	4450.00	0.2806E-02
1950.00	0.8548E-02	4475.00	0.2785E-02
1975.00	0.8402E-02	4500.00	0.2764E-02
2000.00	0.8261E-02	4525.00	0.2743E-02
2025.00	0.8124E-02	4550.00	0.2722E-02
2050.00	0.7991E-02	4575.00	0.2702E-02
2075.00	0.7862E-02	4600.00	0.2682E-02
2100.00	0.7736E-02	4625.00	0.2662E-02
2125.00	0.7613E-02	4650.00	0.2642E-02
2150.00	0.7494E-02	4675.00	0.2623E-02
2175.00	0.7378E-02	4700.00	0.2604E-02
2200.00	0.7264E-02	4725.00	0.2585E-02
2225.00	0.7154E-02	4750.00	0.2567E-02
2250.00	0.7047E-02	4775.00	0.2548E-02
2275.00	0.6943E-02	4800.00	0.2530E-02
2300.00	0.6840E-02	4825.00	0.2512E-02
2325.00	0.6740E-02	4850.00	0.2494E-02
2350.00	0.6643E-02	4875.00	0.2477E-02
2375.00	0.6548E-02	4900.00	0.2460E-02
2400.00	0.6455E-02	4924.99	0.2443E-02
2425.00	0.6365E-02	4950.00	0.2426E-02
2450.00	0.6277E-02	4975.00	0.2409E-02
2475.00	0.6191E-02	5000.00	0.2393E-02
2500.00	0.6107E-02		

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 \*\*\*\*\* AERSCREEN MAXIMUM IMPACT SUMMARY \*\*\*\*\*  
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3-hour, 8-hour, and 24-hour scaled  
 concentrations are equal to the 1-hour concentration as referenced in  
 SCREENING PROCEDURES FOR ESTIMATING THE AIR QUALITY  
 IMPACT OF STATIONARY SOURCES, REVISED (Section 4.5.4)  
 Report number EPA-454/R-92-019  
[http://www.epa.gov/scram001/guidance\\_permit.htm](http://www.epa.gov/scram001/guidance_permit.htm)  
 under Screening Guidance

CALCULATION PROCEDURE	MAXIMUM 1-HOUR CONC (ug/m3)	SCALED 3-HOUR CONC (ug/m3)	SCALED 8-HOUR CONC (ug/m3)	SCALED 24-HOUR CONC (ug/m3)	SCALED ANNUAL CONC (ug/m3)
FLAT TERRAIN	0.2761	0.2761	0.2761	0.2761	N/A
DISTANCE FROM SOURCE	150.00 meters				
IMPACT AT THE AMBIENT BOUNDARY	0.2109	0.2109	0.2109	0.2109	N/A
DISTANCE FROM SOURCE	1.00 meters				

TITLE: Wildflower, operation

## \*\*\*\*\* AREA PARAMETERS \*\*\*\*\*

SOURCE EMISSION RATE:	0.288E-03 g/s	0.228E-02 lb/hr
AREA EMISSION RATE:	0.687E-08 g/(s-m2)	0.545E-07 lb/(hr-m2)
AREA HEIGHT:	3.00 meters	9.84 feet
AREA SOURCE LONG SIDE:	289.43 meters	949.57 feet
AREA SOURCE SHORT SIDE:	144.72 meters	474.80 feet
INITIAL VERTICAL DIMENSION:	1.50 meters	4.92 feet
RURAL OR URBAN:	URBAN	
POPULATION:	118453	
INITIAL PROBE DISTANCE =	5000. meters	16404. feet

## \*\*\*\*\* BUILDING DOWNWASH PARAMETERS \*\*\*\*\*

BUILDING DOWNWASH NOT USED FOR NON-POINT SOURCES

## \*\*\*\*\* FLOW SECTOR ANALYSIS \*\*\*\*\*

25 meter receptor spacing: 1. meters - 5000. meters

## MAXIMUM IMPACT RECEPTOR

Zo SECTOR	SURFACE ROUGHNESS	1-HR CONC (ug/m3)	RADIAL (deg)	DIST (m)	TEMPORAL PERIOD
1*	1.000	0.2761	15	150.0	WIN

\* = worst case diagonal

\*\*\*\*\* MAKEMET METEOROLOGY PARAMETERS \*\*\*\*\*

MIN/MAX TEMPERATURE: 250.0 / 310.0 (K)

MINIMUM WIND SPEED: 0.5 m/s

ANEMOMETER HEIGHT: 10.000 meters

SURFACE CHARACTERISTICS INPUT: AERMET SEASONAL TABLES

DOMINANT SURFACE PROFILE: Urban

DOMINANT CLIMATE TYPE: Average Moisture

DOMINANT SEASON: Winter

ALBEDO: 0.35

BOWEN RATIO: 1.50

ROUGHNESS LENGTH: 1.000 (meters)

SURFACE FRICTION VELOCITY (U\*) NOT ADJUSTED

METEOROLOGY CONDITIONS USED TO PREDICT OVERALL MAXIMUM IMPACT

YR MO DY JDY HR

10 01 10 10 01

H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O	LEN	Z0	BOWEN	ALBEDO	REF WS
-1.30	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.50	0.35	0.50	

HT	REF TA	HT
10.0	310.0	2.0

\*\*\*\*\* AERSCREEN AUTOMATED DISTANCES \*\*\*\*\*

OVERALL MAXIMUM CONCENTRATIONS BY DISTANCE

DIST (m)	MAXIMUM 1-HR CONC (ug/m3)	DIST (m)	MAXIMUM 1-HR CONC (ug/m3)
1.00	0.2109	2525.00	0.6025E-02

25.00	0.2252	2550.00	0.5945E-02
50.00	0.2381	2575.00	0.5867E-02
75.00	0.2495	2600.00	0.5790E-02
100.00	0.2595	2625.00	0.5716E-02
125.00	0.2687	2650.00	0.5642E-02
150.00	0.2761	2675.00	0.5571E-02
175.00	0.2158	2700.00	0.5560E-02
200.00	0.1670	2725.00	0.5490E-02
225.00	0.1406	2750.00	0.5422E-02
250.00	0.1237	2775.00	0.5355E-02
275.00	0.1103	2800.00	0.5290E-02
300.00	0.9920E-01	2825.00	0.5226E-02
325.00	0.8989E-01	2850.00	0.5163E-02
350.00	0.8198E-01	2875.00	0.5102E-02
375.00	0.7519E-01	2900.00	0.5042E-02
400.00	0.6929E-01	2925.00	0.4983E-02
425.00	0.6417E-01	2950.00	0.4925E-02
450.00	0.5965E-01	2975.00	0.4868E-02
475.00	0.5567E-01	3000.00	0.4813E-02
500.00	0.5208E-01	3025.00	0.4759E-02
525.00	0.4891E-01	3050.00	0.4705E-02
550.00	0.4606E-01	3075.00	0.4653E-02
575.00	0.4347E-01	3100.00	0.4602E-02
600.00	0.4112E-01	3125.00	0.4551E-02
625.00	0.3900E-01	3150.00	0.4502E-02
650.00	0.3703E-01	3175.00	0.4454E-02
675.00	0.3524E-01	3200.00	0.4406E-02
700.00	0.3361E-01	3225.00	0.4359E-02
725.00	0.3211E-01	3250.00	0.4314E-02
750.00	0.3070E-01	3275.00	0.4269E-02
775.00	0.2939E-01	3300.00	0.4224E-02
800.00	0.2818E-01	3325.00	0.4181E-02
825.00	0.2705E-01	3350.00	0.4138E-02
850.00	0.2601E-01	3375.00	0.4096E-02
875.00	0.2504E-01	3400.00	0.4055E-02
900.00	0.2413E-01	3425.00	0.4015E-02
925.00	0.2326E-01	3450.00	0.3975E-02
950.00	0.2245E-01	3475.00	0.3936E-02
975.00	0.2169E-01	3500.00	0.3898E-02
1000.00	0.2096E-01	3525.00	0.3860E-02
1025.00	0.2028E-01	3550.00	0.3823E-02
1050.00	0.1964E-01	3575.00	0.3786E-02
1075.00	0.1903E-01	3600.00	0.3750E-02
1100.00	0.1846E-01	3625.00	0.3715E-02
1125.00	0.1792E-01	3650.00	0.3680E-02
1150.00	0.1740E-01	3675.00	0.3646E-02
1175.00	0.1690E-01	3700.00	0.3612E-02
1200.00	0.1643E-01	3725.00	0.3579E-02
1225.00	0.1598E-01	3750.00	0.3546E-02
1250.00	0.1556E-01	3775.00	0.3514E-02

1275.00	0.1515E-01	3800.00	0.3483E-02
1300.00	0.1476E-01	3825.00	0.3452E-02
1325.00	0.1439E-01	3849.99	0.3421E-02
1350.00	0.1404E-01	3875.00	0.3391E-02
1375.00	0.1370E-01	3900.00	0.3361E-02
1400.00	0.1337E-01	3925.00	0.3332E-02
1425.00	0.1305E-01	3950.00	0.3303E-02
1450.00	0.1275E-01	3975.00	0.3275E-02
1475.00	0.1246E-01	4000.00	0.3247E-02
1500.00	0.1218E-01	4025.00	0.3219E-02
1525.00	0.1192E-01	4050.00	0.3192E-02
1550.00	0.1166E-01	4075.00	0.3165E-02
1575.00	0.1141E-01	4100.00	0.3139E-02
1600.00	0.1117E-01	4125.00	0.3113E-02
1625.00	0.1094E-01	4149.99	0.3087E-02
1650.00	0.1071E-01	4175.00	0.3062E-02
1675.00	0.1050E-01	4200.00	0.3037E-02
1700.00	0.1029E-01	4225.00	0.3013E-02
1725.00	0.1009E-01	4250.00	0.2988E-02
1750.00	0.9894E-02	4275.00	0.2964E-02
1775.00	0.9706E-02	4300.00	0.2941E-02
1800.00	0.9524E-02	4325.00	0.2918E-02
1825.00	0.9347E-02	4350.00	0.2895E-02
1850.00	0.9177E-02	4375.00	0.2872E-02
1875.00	0.9012E-02	4400.00	0.2850E-02
1900.00	0.8853E-02	4425.00	0.2828E-02
1925.00	0.8698E-02	4450.00	0.2806E-02
1950.00	0.8548E-02	4475.00	0.2785E-02
1975.00	0.8402E-02	4500.00	0.2764E-02
2000.00	0.8261E-02	4525.00	0.2743E-02
2025.00	0.8124E-02	4550.00	0.2722E-02
2050.00	0.7991E-02	4575.00	0.2702E-02
2075.00	0.7862E-02	4600.00	0.2682E-02
2100.00	0.7736E-02	4625.00	0.2662E-02
2125.00	0.7613E-02	4650.00	0.2642E-02
2150.00	0.7494E-02	4675.00	0.2623E-02
2175.00	0.7378E-02	4700.00	0.2604E-02
2200.00	0.7264E-02	4725.00	0.2585E-02
2225.00	0.7154E-02	4750.00	0.2567E-02
2250.00	0.7047E-02	4775.00	0.2548E-02
2275.00	0.6943E-02	4800.00	0.2530E-02
2300.00	0.6840E-02	4825.00	0.2512E-02
2325.00	0.6740E-02	4850.00	0.2494E-02
2350.00	0.6643E-02	4875.00	0.2477E-02
2375.00	0.6548E-02	4900.00	0.2460E-02
2400.00	0.6455E-02	4924.99	0.2443E-02
2425.00	0.6365E-02	4950.00	0.2426E-02
2450.00	0.6277E-02	4975.00	0.2409E-02
2475.00	0.6191E-02	5000.00	0.2393E-02
2500.00	0.6107E-02		

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 \*\*\*\*\* AERSCREEN MAXIMUM IMPACT SUMMARY \*\*\*\*\*  
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3-hour, 8-hour, and 24-hour scaled  
 concentrations are equal to the 1-hour concentration as referenced in  
 SCREENING PROCEDURES FOR ESTIMATING THE AIR QUALITY  
 IMPACT OF STATIONARY SOURCES, REVISED (Section 4.5.4)  
 Report number EPA-454/R-92-019  
[http://www.epa.gov/scram001/guidance\\_permit.htm](http://www.epa.gov/scram001/guidance_permit.htm)  
 under Screening Guidance

CALCULATION PROCEDURE	MAXIMUM 1-HOUR CONC (ug/m3)	SCALED 3-HOUR CONC (ug/m3)	SCALED 8-HOUR CONC (ug/m3)	SCALED 24-HOUR CONC (ug/m3)	SCALED ANNUAL CONC (ug/m3)
FLAT TERRAIN	0.2761	0.2761	0.2761	0.2761	N/A
DISTANCE FROM SOURCE	150.00 meters				
IMPACT AT THE AMBIENT BOUNDARY	0.2109	0.2109	0.2109	0.2109	N/A
DISTANCE FROM SOURCE	1.00 meters				



Technical Consultation, Data Analysis and  
Litigation Support for the Environment

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

(949) 887-9013  
mhagemann@swape.com

### **Matthew F. Hagemann, P.G., C.Hg.**

- **Geologic and Hydrogeologic Characterization, Investigation and Remediation Strategies**
- **Industrial Stormwater Compliance**
- **CEQA Review**
- **Expert Testimony**

#### **Professional Certifications:**

California Professional Geologist, P.G.  
California Certified Hydrogeologist, C.Hg.

#### **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 Experience:**

30 years of experience in environmental policy, contaminant assessment and remediation, stormwater compliance, and CEQA review. Spent nine years with the U.S. EPA in the Resource Conservation Recovery Act (RCRA) and Superfund programs and served as EPA's Senior Science Policy Advisor in the Western Regional Office where I identified emerging threats to groundwater. While with EPA, I served as a Senior Hydrogeologist in the oversight of the assessment of seven major military facilities undergoing base closure. 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, I developed extensive client relationships and has managed complex projects that include consultations as an expert witness and a regulatory specialist, and managing projects ranging from industrial stormwater compliance to CEQA review of impacts from hazardous waste, air quality and greenhouse gas emissions.

Positions held include:

#### **Government:**

Senior Science Policy Advisor and Hydrogeologist, U.S. Environmental Protection Agency (1989–1998);  
Hydrogeologist, National Park Service, Water Resources Division (1998 – 2000);



Geologist, U.S. Forest Service (1986 – 1998).

Educational:

Geology Instructor, Golden West College, 2010 – 2104, 2017;

Adjunct Faculty Member, San Francisco State University, Department of Geosciences (1993 – 1998);

Instructor, College of Marin, Department of Science (1990 – 1995).

Private Sector:

Founding Partner, Soil/Water/Air Protection Enterprise (SWAPE) (2003 – present);

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

Executive Director, Orange Coast Watch (2001 – 2004);

Geologist, Dames & Moore (1984 – 1986).

**Senior Regulatory and Litigation Support Analyst:**

With SWAPE, responsibilities have included:

- Lead analyst and testifying expert, for both plaintiffs and defendants, 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.
- Recommending 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 exposure to hazards from toxins.
- Stormwater analysis, sampling and best management practice evaluation, for both government agencies and corporate clients, at more than 150 industrial facilities.
- Serving as expert witness for both plaintiffs and defendants in cases including contamination of groundwater, CERCLA compliance in assessment and remediation, and industrial stormwater contamination.
- Technical assistance and litigation support for vapor intrusion concerns, for both government agencies and corporate clients.
- 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., 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.
- Lead author for a multi-volume remedial investigation report for an operating school in Los Angeles that met strict State of California regulatory requirements.
- Development of strategic approaches for cleanup of contaminated sites in consultation with clients and regulators.

### **Hydrogeology:**

As a Senior Hydrogeologist with the U.S. Environmental Protection Agency, 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 included:

- Leading efforts to model groundwater flow and contaminant transport, ensured adequacy of monitoring networks, and assessed cleanup alternatives for contaminated sediment, soil, and groundwater.
- Initiating a regional program for evaluation of groundwater sampling practices and laboratory analysis at military bases.
- Identifying 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, developed a methodology to determine the vulnerability of groundwater to contamination on the islands of Maui and Oahu. 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, 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 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. Prepared geologic reports, conducted 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.

Served as a hydrogeologist with the RCRA Hazardous Waste program. Duties included:

- 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, directed service-wide investigations of contaminant sources to prevent degradation of water quality, including the following:

- 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 as senior management as the Senior Science Policy Advisor with the U.S. Environmental Protection Agency, Region 9. Activities included the following:

- Advising 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.
- Shaping 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.
- Improving the technical training of EPA's scientific and engineering staff.
- Earning 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.
- Establishing national protocol for the peer review of scientific documents.

**Geology:**

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

- Mapping geology in the field, and used aerial photographic interpretation and mathematical models to determine slope stability.
- Coordinating research with community stakeholders who were concerned with natural resource protection.
- Characterizing 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, led geologic investigations of two contaminated sites (later listed on the Superfund NPL) in the Portland, Oregon, area and a large RCRA hazardous waste site in eastern Oregon.

Duties included the following:

- Supervising year-long effort for soil and groundwater sampling.
- Conducting aquifer tests.
- Investigating active faults beneath sites proposed for hazardous waste disposal.

**Teaching:**

From 1990 to 1998, 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.
- Part time geology instructor at Golden West College in Huntington Beach, California from 2010 to 2014 and in 2017.

**Summary of Testimony Experience Over Past Four Years**

*In Re New Jersey Department of Environmental Protection et al. vs. E.I. DuPont de Nemours and Company, in the United States District Court, District of New Jersey, Civil Action No. 1:19-cv-14766-RMB-JBC. Deposition in 2025. Representing Plaintiffs in matters regarding contamination of groundwater, wastewater, soil, and air with per- and poly-fluoroalkyl substances.*

*In Re Edmond Asher, et al., vs. RTX Corporation (f/k/a Raytheon Technologies Corporation, et al.) in the County of Huntington Superior Court, Indiana, Cause number 35D01-2006-CT-000338. Deposition in 2024. Representing Plaintiffs in matters regarding contamination of groundwater and soil vapor with trichlorethylene.*

*In Re Wright vs Consolidated Rail Corporation In the Circuit Court of Cook County, Illinois, Case No: 21L3966. Deposition in 2023, Representing Plaintiff in matters involving groundwater and drinking water contamination of perchloroethylene, trichlorethylene, 1,2-dichloroethane, and carbon tetrachloride.*

*In Re Behr Dayton Thermal Products LLC In the United States District Court for the Southern District of Ohio Western Division at Dayton, Case No: 08-cv-326. Deposition in 2022. Representing Plaintiff in matters regarding contamination of groundwater and indoor air with perchloroethylene and trichloethelene.*

*Orange County Water District vs. Sabic Innovative Plastics US, LLC, et al. In the Court of Appeal, Fourth District, Division 1, California, Case No: D070553. Deposition in 2020. Representing Plaintiff in matters involving compliance with The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).*

*Los Angeles Waterkeeper vs. AAA Plating and Inspection, Inc. In the United States District Court for the Central District of California, Case No: No. CV 18-5916 PA (GJSx). Deposition in 2019. Expert witness representing Plaintiff in matters involving contaminated stormwater runoff at an industrial facility in Compton, California.*

*Californians for Alternatives to Toxics vs. Schneider Dock and Intermodal Facility. In the United States District Court for the Northern District of California, Case No: 3:17-cv-05287-JST. Deposition in 2019. Expert witness representing Plaintiff in matters involving contaminated stormwater runoff at an industrial facility in Eureka, California.*

*Bells et al. vs. The 3M Company et al. In the United States District Court for the District of Colorado, Case No: 1:16-CV-02531-RBJ. Deposition in 2018. Expert witness representing Plaintiff on matters regarding the general hydrogeological conditions present in an area impacted by per- and poly-fluoroalkyl substances.*

*Ungar vs. Foundation for Affordable Housing. In the Superior Court, State of California, Los Angeles County, Case No. BC628890 Deposition in 2017. Expert witness representing defendant on matters involving alleged drinking water contamination.*

**Invited Testimony, Reports, Papers and Presentations:**

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

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

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

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

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

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

**Hagemann, M.F.**, 2004. Perchlorate Contamination of the Colorado River and Impacts to Drinking Water in

Arizona and the Southwestern U.S. Presentation to a meeting of the American Groundwater Trust, Phoenix, AZ (served on conference organizing committee).

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

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

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

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

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

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

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

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

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

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

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

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

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

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

**Hagemann, M.F.**, and VanMouwerik, M., 1999. Potential Water Concerns Related to Snowmobile Usage.

Water Resources Division, National Park Service, Technical Report.

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

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

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

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

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

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

**Hagemann, M.F.**, 1994. Groundwater Characterization and 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.

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**SOIL WATER AIR PROTECTION ENTERPRISE**

2656 29th Street, Suite 201  
Santa Monica, California 90405  
Attn: Paul Rosenfeld, Ph.D.  
Mobil: (310) 795-2335  
Office: (310) 452-5555  
Fax: (310) 452-5550

Email: [prosenfeld@swape.com](mailto:prosenfeld@swape.com)

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## ***Paul Rosenfeld, Ph.D.***

*Principal Environmental Chemist*

**Chemical Fate and Transport & Air Dispersion Modeling**

**Risk Assessment & Remediation Specialist**

### **Education**

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

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

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

### **Professional Experience**

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

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



## **Professional History:**

Soil Water Air Protection Enterprise (SWAPE); 2003 to present; Principal and Founding Partner  
UCLA School of Public Health; 2007 to 2011; Lecturer (Assistant Researcher)  
UCLA School of Public Health; 2003 to 2006; Adjunct Professor  
UCLA Environmental Science and Engineering Program; 2002-2004; Doctoral Intern Coordinator  
UCLA Institute of the Environment, 2001-2002; Research Associate  
Komex H<sub>2</sub>O Science, 2001 to 2003; Senior Remediation Scientist  
National Groundwater Association, 2002-2004; Lecturer  
San Diego State University, 1999-2001; Adjunct Professor  
Anteon Corp., San Diego, 2000-2001; Remediation Project Manager  
Ogden (now Amec), San Diego, 2000-2000; Remediation Project Manager  
Bechtel, San Diego, California, 1999 – 2000; Risk Assessor  
King County, Seattle, 1996 – 1999; Scientist  
James River Corp., Washington, 1995-96; Scientist  
Big Creek Lumber, Davenport, California, 1995; Scientist  
Plumas Corp., California and USFS, Tahoe 1993-1995; Scientist  
Peace Corps and World Wildlife Fund, St. Kitts, West Indies, 1991-1993; Scientist

## **Publications:**

**Rosenfeld, P.E.**, Spaeth, K.R., McCarthy, S.J. *et al.* Camp Lejeune Marine Cancer Risk Assessment for Exposure to Contaminated Drinking Water From 1955 to 1987. *Water Air Soil Pollut* **235**, 124 (2024).  
<https://doi.org/10.1007/s11270-023-06863-y>.

**Rosenfeld P.E.**, Spaeth K.R., Remy L.L., Byers V., Muerth S.A., Hallman R.C., Summers-Evans J., Barker S. (2023) Perfluoroalkyl substances exposure in firefighters: Sources and implications, *Environmental Research*, Volume 220, <https://doi.org/10.1016/j.envres.2022.115164>.

**Rosenfeld P.E.** and Spaeth K.R., (2023) Authors' Response to Letter to the Editor from Bullock and Ramacciotti, *Water Air Soil Pollution* Volume 234, <https://doi.org/10.1007/s11270-023-06165-3>

**Rosenfeld P. E.**, Spaeth K., Hallman R., Bressler R., Smith, G., (2022) Cancer Risk and Diesel Exhaust Exposure Among Railroad Workers. *Water Air Soil Pollution*. **233**, 171.

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 Aermol and Empirical Data. *American Journal of Environmental Science*, 8(6), 622-632.

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

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

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

Feng, L., Wu, C., Tam, L., Sutherland, A.J., Clark, J.J., **Rosenfeld, P.E.** (2010). Dioxin and Furan Blood Lipid and Attic Dust Concentrations in Populations Living Near Four Wood Treatment Facilities in the United States. *Journal of Environmental Health*. 73(6), 34-46.

Cheremisinoff, N.P., & **Rosenfeld, P.E.** (2010). *Handbook of Pollution Prevention and Cleaner Production: Best Practices in the Wood and Paper Industries*. Amsterdam: Elsevier Publishing.

Cheremisinoff, N.P., & **Rosenfeld, P.E.**, (2009). *Handbook of Pollution Prevention and Cleaner Production: Best Practices in the Petroleum Industry*. Amsterdam: Elsevier Publishing.

Wu, C., Tam, L., Clark, J., **Rosenfeld, P.** (2009). Dioxin and furan blood lipid concentrations in populations living near four wood treatment facilities in the United States. *WIT Transactions on Ecology and the Environment, Air Pollution*, 123 (17), 319-327.

Cheremisinoff, N.P., **Rosenfeld, P.E.** Davletshin, A.R. (2008). *Responsible Care*. Gulf Publishing. Texas.

Tam L. K., Wu C. D., Clark J. J. and **Rosenfeld, P.E.** (2008). A Statistical Analysis Of Attic Dust And Blood Lipid Concentrations Of Tetrachloro-p-Dibenzodioxin (TCDD) Toxicity Equivalency Quotients (TEQ) In Two Populations Near Wood Treatment Facilities. *Organohalogen Compounds*, 70, 002252-002255.

Tam L. K., Wu C. D., Clark J. J. and **Rosenfeld, P.E.** (2008). Methods For Collect Samples For Assessing Dioxins And Other Environmental Contaminants In Attic Dust: A Review. *Organohalogen Compounds*, 70, 000527-000530.

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

**Rosenfeld, P.E.**, J. J. J. Clark, A. R. Hensley, M. Suffet. (2007). The Use of an Odor Wheel Classification for Evaluation of Human Health Risk Criteria for Compost Facilities. *Water Science & Technology* 55(5), 345-357.

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

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

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

**Rosenfeld P. E.**, J.J. Clark, I.H. (Mel) Suffet (2004). The Value of An Odor-Quality-Wheel Classification Scheme for The Urban Environment. *Water Environment Federation's Technical Exhibition and Conference (WEFTEC) 2004*. New Orleans, October 2-6, 2004.

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

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

**Rosenfeld, P. E.**, Grey, M. A., Sellew, P. (2004). Measurement of Biosolids Odor and Odorant Emissions from Windrows, Static Pile and Biofilter. *Water Environment Research*. 76(4), 310-315.

**Rosenfeld, P.E.**, Grey, M and Suffet, M. (2002). Compost Demonstration Project, Sacramento California Using High-Carbon Wood Ash to Control Odor at a Green Materials Composting Facility. *Integrated Waste Management Board Public Affairs Office*, Publications Clearinghouse (MS-6), Sacramento, CA Publication #442-02-008.

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

**Rosenfeld, P.E.**, and Henry C. L., (2000). Wood ash control of odor emissions from biosolids application. *Journal of Environmental Quality*. 29, 1662-1668.

**Rosenfeld, P.E.**, C.L. Henry and D. Bennett. (2001). Wastewater dewatering polymer affects on biosolids odor emissions and microbial activity. *Water Environment Research*. 73(4), 363-367.

**Rosenfeld, P.E.**, and C.L. Henry. (2001). Activated Carbon and Wood Ash Sorption of Wastewater, Compost, and Biosolids Odorants. *Water Environment Research*, 73, 388-393.

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

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

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

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

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

**Rosenfeld, P. E.** (1994). Potential Utilization of Small Diameter Trees on Sierra County Public Land. Master's 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. Bachelor's Thesis. University of California.

## **Presentations:**

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

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

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

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

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

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

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

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

**Rosenfeld, P. E.** (October 15-18, 2007). The Repeated Trespass of Tritium-Contaminated Water Into A Surrounding Community Form Repeated Waste Spills From A Nuclear Power Plant. *The 23<sup>rd</sup> Annual International Conferences on Soils Sediment and Water*. Platform lecture conducted from University of Massachusetts, Amherst MA.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

## **Teaching Experience:**

UCLA Department of Environmental Health (Summer 2003 through 20010) Taught Environmental Health Science 100 to students, including undergrad, medical doctors, public health professionals and nurses. The 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 the 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 the 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 the 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 District Court of Harris County Texas  
Mt Davis Interest, Inc v Sesco Cement Corp  
Cause No 2023-26512  
Trial 6-6-25

In the United States Southern District of New York  
Gallo vs Avon Products Inc., et al  
Civil Action No.: 1:23-cv-2023  
Deposition 4-24-2025

In Vanderburgh Superior Court 5, County of Vanderburgh, Indiana  
Markello v CSX  
Civil Action No 82D05-2011-CT-004962  
Deposition 3-26-25

In the Circuit Court of Cook County Illinois  
Jarosiewicz v Northeast Regional Railroad  
Case No 2023 L 002290  
Deposition 2-27-25

In the District Court 191st Judicial District Dallas County  
Acklin v Poly America International  
Cause No DC-22-08610  
Deposition 1-8-2025

United States District Court, Norther District of California  
Asustin Vs Monsanto  
Case No 2:23-cv-272  
Deposition 12-20-25

In Jefferson Circuit Court Division One, Louisville, Kentucky  
Stafford vs, CSX  
Case No. 18-CI-001790

Deposition: 8-27-24

In the Twenty-Second Judicial Circuit of St. Louis. State of Missouri  
Patricia Godfrey vs. Amtrak  
Case No. 2122-CC-00525  
Deposition: 7-17-24

In the Circuit Court of Jefferson County Alabama  
Linda Early Vs. CSX  
Case number CV-2021-00241  
Deposition 6-24-24

In the Court of Common Pleas Lucas County, Ohio  
Brenda Conkright vs. CSX  
Case No. G-4801-CI-0202102664-000  
Deposition: 6-4-24

In the Commonwealth of Kentucky, Greenup Circuit Court  
Patsy Sue Napier vs. CSX  
Case No. 19-CI-0012  
Deposition: 5-8-2-24

In United States District Court of Hawaii  
Patrick Feindt, Jr. et al. vs. The United States of America  
Case No. 1:22-cv-LEK-KJM  
Trial 3-29-24 and 4-5-24

In the District Court of Hood County State of Texas  
Artie Gray vs. Exxon Mobil  
Case No. C-2018047  
Rosenfeld Deposition:4-22-2024

In the Elkhart Superior Court State of Indiana  
Estate of Clark Stacy vs. Penn Central Corporation  
Cause No 2D01-2001-CT-00007  
Rosenfeld Deposition 1-25-2024 and 3-7-2024

In the Circuit Court of Trempealeau County, State of Wisconsin  
Michael J. Sylla et al. vs. High-Crush Whitehall LLC  
Case No. 2019-CV-63, 2019-CV-64, 2019-CV-65, 2019-CV-66  
Rosenfeld Deposition: 3-5-2024

In the Circuit Court of Trempealeau County, State of Wisconsin  
Leland Drangstveit vs. High-Crush Blair LLC  
Case No. 19-CV-66  
Rosenfeld Deposition 3-5-2024

In the Circuit Court of Jefferson County Alabama  
Donald Lee Ashworth vs. CSX Transportation Inc.  
Case No CV-2021-901261  
Rosenfeld Deposition 1-23-2024

In the United States District Court for the Eastern District of Wisconsin  
Gary L Siepe vs. Soo Line Railroad  
Case No. 2:21-cv-00919  
Rosenfeld Deposition 1-19-2024



In the United States District Court for the Western District of Louisiana  
Ricky Bush v. Clean Harbors Colfax LLC  
Case No. 1:22-cv-02026-DDD-JPM  
Rosenfeld Deposition 12-18-2023 and 1-15-2024

In United States District Court of Hawaii  
Patrick Feindt, Jr. et al. vs. The United States of America  
Case No. 1:22-cv-LEK-KJM  
Rosenfeld Deposition 11-29-2023

In the Circuit Court for the Twentieth Judicial Circuit St. Clair County, Illinois  
Timothy Gray vs. Rural King et al.  
Case No 2022-LA-355  
Rosenfeld Deposition 9-26-2023

In United States District Court Eastern District of Wisconsin  
Gary L. Siepe vs. Soo Line Railroad Company  
Case No. 2:21-cv-00919  
Rosenfeld Deposition 9-15-2023

In the Circuit Court of Cook County Illinois  
Donald Fox vs. BNSF  
Case No. 2021 L12  
Rosenfeld Deposition 9-12-2023

In the Court of Common Pleas Cuyahoga County, Ohio  
Thomas Schleich vs. Penn Central Corporation  
Lead Case No. CV-20-939184  
Rosenfeld Deposition 8-27-2023

In the Circuit Court of Jackson County Missouri at Kansas City  
Timothy Dalsing vs. BNSF  
Case No. No. 2216-cv06539  
Rosenfeld Deposition 7-28-2023

In the United States District Court for the Southern District of Texas Houston Division  
International Terminals Company LLC Deer Park Fire Litigation  
Lead Case No. 4:19-cv-01460  
Rosenfeld Deposition 7-25-2023

In the Circuit Court of Livingston County Missouri  
Shirley Ralls vs. Canadian Pacific Railway and Soo Lind Railroad  
Case No. 28LV-CV0020  
Rosenfeld Daubert Hearing 7-18-2023 Trial Testimony 7-19-2023

In the Circuit Court of Cook County Illinois  
Brenda Wright vs. Penn Central and Conrail  
Case No. No. 2032L003966  
Rosenfeld Deposition 6-13-2023

In the Circuit Court Common Pleas Philadelphia of Jefferson County Alabama  
Frank Belle vs. Birmingham Southern Railroad Company et al.  
Case No. 01-cv-2021-900901.00  
Rosenfeld Deposition 4-6-2023

In the Circuit Court of Jefferson County Alabama  
Linda De Gregorio vs. Penn Central  
Case No. 002278  
Rosenfeld Deposition 3-27-20203

In the United States District Court Eastern District of New York  
Rosalie Romano et al. vs. Northrup Grumman Corporation  
Case No. 16-cv-5760  
Rosenfeld Deposition 3-16-2023

In the Superior Court of Washington, Spokane County  
Judy Cundy vs. BNSF  
Case No. 21-2-03718-32  
Rosenfeld Deposition 3-9-2023

In The Court of Common Pleas of Philadelphia County, PA Civil Trial Division  
Feaster v Conrail  
Case No. 001075  
Rosenfeld Deposition 2-1-2023

In United States District Court for the Central District of Illinois  
Sherman vs. BNSF  
Case No. 3:17-cv-01192  
Rosenfeld Deposition 1-18-2023

In United States District Court District of Colorado  
Gonzales vs. BNSF  
Case No. 1:21-cv-01690  
Rosenfeld Deposition 1-17-2023

In United States District Court District of Colorado  
Abeyta vs. BNSF  
Case No. 1:21-cv-01689-KMT  
Rosenfeld Deposition 1-3-2023

In United States District Court For The Easter District of Louisiana  
Nathaniel Smith vs. Illinois Central Railroad  
Case No. 2:21-cv-01235  
Rosenfeld Deposition 11-30-2022

In the Superior Court of the State of California, County of San Bernardino  
Billy Wildrick, Plaintiff vs. BNSF Railway Company  
Case No. CIVDS1711810  
Rosenfeld Deposition 10-17-2022

In the State Court of Bibb County, State of Georgia  
Richard Hutcherson, Plaintiff vs Norfolk Southern Railway Company  
Case No. 10-SCCV-092007  
Rosenfeld Deposition 10-6-2022

In the Civil District Court of the Parish of Orleans, State of Louisiana  
Millard Clark, Plaintiff vs. Dixie Carriers, Inc. et al.  
Case No. 2020-03891  
Rosenfeld Deposition 9-15-2022

In The Circuit Court of Livingston County, State of Missouri, Circuit Civil Division

Shirley Ralls, Plaintiff vs. Canadian Pacific Railway and Soo Line Railroad  
Case No. 18-LV-CC0020  
Rosenfeld Deposition 9-7-2022

In The Circuit Court of the 13th Judicial Circuit Court, Hillsborough County, Florida Civil Division  
Jonny C. Daniels, Plaintiff vs. CSX Transportation Inc.  
Case No. 20-CA-5502  
Rosenfeld Deposition 9-1-2022

In The Circuit Court of St. Louis County, State of Missouri  
Kieth Luke et. al. Plaintiff vs. Monsanto Company et. al.  
Case No. 19SL-CC03191  
Rosenfeld Deposition 8-25-2022

In The Circuit Court of the 13th Judicial Circuit Court, Hillsborough County, Florida Civil Division  
Jeffery S. Lamotte, Plaintiff vs. CSX Transportation Inc.  
Case No. NO. 20-CA-0049  
Rosenfeld Deposition 8-22-2022

In State of Minnesota District Court, County of St. Louis Sixth Judicial District  
Greg Bean, Plaintiff vs. Soo Line Railroad Company  
Case No. 69-DU-CV-21-760  
Rosenfeld Deposition 8-17-2022

In United States District Court Western District of Washington at Tacoma, Washington  
John D. Fitzgerald Plaintiff vs. BNSF  
Case No. 3:21-cv-05288-RJB  
Rosenfeld Deposition 8-11-2022

In Circuit Court of the Sixth Judicial Circuit, Macon Illinois  
Rocky Bennyhoff Plaintiff vs. Norfolk Southern  
Case No. 20-L-56  
Rosenfeld Deposition 8-3-2022, Trial 1-10-2023

In Court of Common Pleas, Hamilton County Ohio  
Joe Briggins Plaintiff vs. CSX  
Case No. A2004464  
Rosenfeld Deposition 6-17-2022

In the Superior Court of the State of California, County of Kern  
George LaFazia vs. BNSF Railway Company.  
Case No. BCV-19-103087  
Rosenfeld Deposition 5-17-2022

In the Circuit Court of Cook County Illinois  
Bobby Earles vs. Penn Central et. al.  
Case No. 2020-L-000550  
Rosenfeld Deposition 4-16-2022

In United States District Court Easter District of Florida  
Albert Hartman Plaintiff vs. Illinois Central  
Case No. 2:20-cv-1633  
Rosenfeld Deposition 4-4-2022

In the Circuit Court of the 4<sup>th</sup> Judicial Circuit, in and For Duval County, Florida  
Barbara Steele vs. CSX Transportation

Case No.16-219-Ca-008796  
Rosenfeld Deposition 3-15-2022

In United States District Court Easter District of New York  
Romano et al. vs. Northrup Grumman Corporation  
Case No. 16-cv-5760  
Rosenfeld Deposition 3-10-2022

In the Circuit Court of Cook County Illinois  
Linda Benjamin vs. Illinois Central  
Case No. No. 2019 L 007599  
Rosenfeld Deposition 1-26-2022

In the Circuit Court of Cook County Illinois  
Donald Smith vs. Illinois Central  
Case No. No. 2019 L 003426  
Rosenfeld Deposition 1-24-2022

In the Circuit Court of Cook County Illinois  
Jan Holeman vs. BNSF  
Case No. 2019 L 000675  
Rosenfeld Deposition 1-18-2022

In the State Court of Bibb County State of Georgia  
Dwayne B. Garrett vs. Norfolk Southern  
Case No. 20-SCCV-091232  
Rosenfeld Deposition 11-10-2021

In the Circuit Court of Cook County Illinois  
Joseph Ruepke vs. BNSF  
Case No. 2019 L 007730  
Rosenfeld Deposition 11-5-2021

In the United States District Court For the District of Nebraska  
Steven Gillett vs. BNSF  
Case No. 4:20-cv-03120  
Rosenfeld Deposition 10-28-2021

In the Montana Thirteenth District Court of Yellowstone County  
James Eadus vs. Soo Line Railroad and BNSF  
Case No. DV 19-1056  
Rosenfeld Deposition 10-21-2021

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

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

In the United States District Court For the Northern District of Illinois

Theresa Romcoe vs. Northeast Illinois Regional Commuter Railroad Corporation d/b/a METRA Rail  
Case No. 17-cv-8517  
Rosenfeld Deposition 5-25-2021

In the Superior Court of the State of Arizona In and For the County of Maricopa  
Mary Tryon et al. vs. The City of Phoenix v. Cox Cactus Farm, L.L.C., Utah Shelter Systems, Inc.  
Case No. 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 vs. CNA Insurance Company et al.  
Case No. 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 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. 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. BC646857  
Rosenfeld Deposition 10-6-2018; Trial 3-7-19

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

In The District Court Of Regan County, Texas, 112<sup>th</sup> Judicial District  
Phillip Bales et al., Plaintiff vs. Dow Agrosiences, 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 No. 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. 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. vs. Antero, et al.  
Civil Action No. 14-C-30000  
Rosenfeld Deposition June 2015

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

In the Circuit Court of the 17<sup>th</sup> Judicial Circuit, in and For Broward County, Florida  
Walter Hinton, et. al. Plaintiff, vs. City of Fort Lauderdale, Florida, a Municipality, Defendant.

Case No. CACE07030358 (26)  
Rosenfeld Deposition December 2014

In the United States District Court Western District of Oklahoma  
Tommy McCarty, et al., Plaintiffs, vs. Oklahoma City Landfill, LLC d/b/a Southeast Oklahoma City  
Landfill, et al. Defendants.  
Case No. 5:12-cv-01152-C  
Rosenfeld Deposition: July 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 County of Kern, Unlimited Jurisdiction  
Rose Propagation Services vs. Heppe Enterprises  
Case No. S-1500-CV-278190, LHB  
Rosenfeld Deposition: May 2014

In the Circuit Court of Baltimore County Maryland  
Philip E. Cvach, II et al., *Plaintiffs* vs. Two Farms, Inc. d/b/a Royal Farms, Defendants  
Case Number: 03-C-12-012487 OT  
Rosenfeld Deposition: September 2013

In the Court of Galveston County, Texas 56<sup>th</sup> Judicial District  
MDL Litigation Regarding Texas City Refinery Ultracracker Emission Event Litigation  
Cause No. 10-UC-0001  
Rosenfeld Deposition: March 2013  
Rosenfeld Trial: September 2013

In the United States District Court of Southern District of Texas Galveston Division  
Kyle Cannon, Eugene Donovan, Genaro Ramirez, Carol Sassler, and Harvey Walton, each Individually and  
on behalf of those similarly situated, *Plaintiffs*, vs. BP Products North America, Inc., *Defendant*.  
Case 3:10-cv-00622  
Rosenfeld Deposition: February 2012  
Rosenfeld Trial: April 2013

In the United States District court of Southern District of California  
United States of America, Plaintiff vs. 2,560 Acres of Land, more or less, located in Imperial County, State  
of California; and Donald L. Crawford, et. al.  
Civil No. 3:11-cv-02258-IEG-RBB  
Rosenfeld Deposition: December 2012, January 2013

In the Court of Common Pleas of Tuscarawas County Ohio  
John Michael Abicht, et al., Plaintiffs, vs. Republic Services, Inc., et al., Defendants  
Case No. 2008 CT 10 0741 (Cons. w/ 2009 CV 10 0987)  
Rosenfeld Deposition October 2012

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 No. 2:09-cv-232-WHA-TFM  
Rosenfeld Deposition July 2010, June 2011



## **EXHIBIT B**



WI #25-001

August 18, 2025

Alaura R. McGuire  
Adams Broadwell Joseph & Cardozo  
601 Gateway Boulevard, Suite 1000  
South San Francisco, CA 94080

**SUBJECT: Wildflower 2 Section 15183 Consistency Memorandum  
Antioch, CA  
Response to Staff Report Comments**

Dear Ms. McGuire,

As requested, we have reviewed Staff Report agenda item 6-1 for the August 20, 2025 Planning Commission meeting in Antioch, California. The Staff Report includes a response to our letter dated July 12<sup>th</sup>, 2024, regarding our belief that the noise impact analysis for the Wildflower 2 Townhomes Project in Antioch, CA has the potential to create significant impacts from construction and operational noise as well as construction vibration on the surrounding community that are peculiar to the Project.

The City's response to comment 1-8 states that a "noise attenuation study is not required, as the City has determined that the project would not result in a significant increase in noise and because the project is not located in an area exceeding the General Plan noise standards." The Housing Element EIR claims that compliance with General Plan Policy 11.8.2 would ensure impacts remain less than significant. However, Policy 11.8.2 states that for developments in areas exceeding the noise levels identified in the General Plan noise objectives, or where the development of proposed uses could result in a significant increase in noise, General Plan Policy 11.8.2(f) requires a detailed noise attenuation study to be prepared by a qualified acoustical engineer to determine appropriate mitigation and ways to incorporate such mitigation into project design and implementation. (Housing Element pg. IV.L-13). The City has not provided any evidence to demonstrate that the Project will not exceed General Plan noise objectives or require a noise attenuation study.

Specifically, no baseline noise measurements were taken. Baseline noise measurements are the preferred way to determine background noise sources. Noise measurements are required to determine if General Plan noise objectives are exceeded because they provide objective, site-specific data on existing and potential sound levels in the community. General Plan noise objectives are established to protect public health, safety, and quality of life, but these objectives cannot be meaningfully evaluated without quantifiable information. Noise impacts vary depending on surrounding land uses, traffic volumes, building design, and other environmental factors, making actual measurements necessary to assess compliance with established thresholds. Without reliable

measurements, the City risks relying on assumptions that may underestimate or overstate impacts, leading to flawed planning decisions and inadequate mitigation, in addition to no proof that the project does not result in a significant increase in noise.

The City also failed to address the Project's peculiar construction and vibration impacts. Our previous letter demonstrated how construction noise could reach as high as 85 dBA, and that construction vibration is within the buffer zone required by the Housing Element DEIR. Construction activities have the potential to create significant impacts compared to reasonable criteria for daytime construction noise and damage to buildings due to construction.

For construction noise, General Plan Policy 11.8.2 "requires development adjacent to occupied noise sensitive land uses to implement a construction-related noise mitigation plan and requires that all construction equipment utilize noise reduction features" Additionally, the construction-related noise mitigation plan should "depict the location of construction equipment and how the noise from this equipment will be mitigated during construction through the use of noise reduction methods" that are listed in General Plan Policy 11.8.2 (m) (DEIR page IV.L-12).

The City's response to comment 1-9 details several design guidelines that reduce noise. None of these are guaranteed to reduce noise and depend on the unique characteristics of each site. 'Noise reduction features are already included in construction noise source models of the cited FTA database, which takes its source values from measurements of modern equipment already equipped with mufflers. Nighttime construction restrictions do not mitigate daytime noise levels. Strategic staging will reduce the length of unnecessary noise impacts, but will not mitigate the worst-case construction noise scenarios when necessary activities occur adjacent to sensitive uses.

The Staff Report states that any "proposed development adjacent to occupied noise sensitive land uses shall implement a construction-related noise mitigation plan that depicts the location of construction equipment storage and maintenance areas, and documents methods to be employed to minimize noise impacts on adjacent noise sensitive land uses." A construction-related noise mitigation plan alone is not sufficient to reduce impacts under CEQA guidelines because CEQA requires that all feasible mitigation measures be identified, analyzed, and implemented to the extent possible—not just as broadly planned. A plan submitted after project approval does not ensure that noise impacts will actually be reduced to less-than-significant levels, since effectiveness depends on site-specific conditions, timing, equipment, and enforcement. CEQA requires substantial evidence demonstrating that proposed measures will meaningfully reduce noise exposure; simply adopting a mitigation plan without quantifying reductions or evaluating feasibility leaves uncertainty about whether impacts are adequately addressed. In other words, compliance with CEQA is based on demonstrated effectiveness, not on the existence of a plan alone.

Finally, the City's response to comment 1-12 states that the "requirement for a screening level vibration analysis is based specifically on the use of impact pile drivers during construction." The Staff Report states that pile driving is not typically used on residential projects. If this is the case, this should be included somewhere within the terms of approval for the project. Without this assurance that pile drivers will not be used during Project construction, the proposed project may not follow the mitigation required by the Housing Element DEIR and could generate significant impacts.

Therefore, the City fails to adequately address my previous comments related to the 15183 Consistency Memo's inadequate noise impact analysis. The City fails to establish baseline noise measurements or conduct a noise attenuation study to properly identify potentially significant noise impacts peculiar to the Project or Project site. The City also fails to adequately address the Project's significant and peculiar construction noise and vibration impacts, which must be analyzed in an EIR prior to Project approval.

Very truly yours,  
WILSON IHRIG

A handwritten signature in blue ink, appearing to read "Jack Meighan", written over a horizontal line.

Jack Meighan  
Associate

meighan -wildflower response to staff report comments.docx



## **JACK MEIGHAN**

*Associate*

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Jack joined Wilson Ihrig in 2021 and is an experienced acoustics engineer with expertise in projects involving rail transit systems, highways, CEQA analysis, environmental noise reduction, mechanical drawing reviews, and construction noise and vibration mitigation. He has hands-on experience with project management, including client coordination and presentations, as well as in designing, developing, and testing MATLAB code used in acoustics applications. Additionally, his expertise includes taking field measurements, developing test plans and specifying, purchasing, setting up and repairing acoustic measurement equipment. He has experience in using Traffic Noise Model (TNM), CadnaA, EASE, Visual Basic, LabView, and CAD software.

### **Education**

- B.S. in Mechanical Engineering, University of Southern California, Los Angeles, CA
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### **Project Experience**

#### ***Metro Regional Connector, Los Angeles CA***

Planned, took, and processed measurements as part of a team to determine the effectiveness of floating slab trackwork for a new subway in downtown Los Angeles that travels below the Walt Disney Concert Hall and the Colburn School of Music.

#### ***Rodeo Credit Enterprise CEQA Analysis for New Construction, Palmdale, CA***

Wrote an accepted proposal and executed it for a noise study project to determine noise mitigation requirements on a new housing development. Led all aspects of the project and managed the budget during all phases of project completion. Completed 5 separate projects of this type for this developer.

#### ***Blackhall Studios, Santa Clarita, CA***

Led the vibration measurement effort for a new soundstage directly adjacent to an existing freight and commuter rail line. Tested equipment, processed data, and analyzed results to determine the vibration propagation through the soil to the proposed soundstage locations, and was part of the team that developed mitigation techniques for the office spaces directly next to the rail line.

#### ***Octavia Residential Condos CEQA Study, San Francisco, CA***

Calculated the STC ratings for the proposed windows to meet Title 24 requirements, modeled the acoustic performance of floor and ceiling structures, researched noise codes, helped with a mechanical design review, and wrote a report summarizing the results for a new Condominium project being developed in San Francisco.

#### ***San Diego International Airport Terminal I Replacement, CA***

Conducted interior noise and vibration measurements, analyzed measurement data to help determine project criteria, modeled the existing and future terminals in CadnaA, and was part of a team that did a complete HVAC analysis of the entire terminal, as part of a CEQA analysis where a new terminal for the airport is being designed.

***Five Points Apartments Noise Study, Whittier, CA***

Took measurements, researched sound data and solutions, and recommended mitigation for a new apartment complex that was located next to an existing car wash, as part of a CEQA review.

***USC Ellison Vibration Survey, Los Angeles, CA***

Conducted vibration measurements as part of a survey to determine the effectiveness of vibration isolation platforms that are used to insulate cell growth in a cancer research facility. Determined the effectiveness and presented this information to the client. Researched and recommended a permanent monitoring system so the client could view data in real time.

***TEN50 Condos 'Popping' Noise Investigation, Los Angeles, CA***

Was part of a team that investigated the noise source of an unwanted popping noise in luxury condos in Downtown Los Angeles. Helped isolate the noise source location with accelerometers to determine where vibrations were occurring first and used an acoustic camera to determine where in the condo the noise was coming from.

***2000 University Project, Berkely, CA***

Wrote a construction noise monitoring plan based on environmental noise calculations, wrote a report summarizing the results, and attending a meeting with the client to discuss options.

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***Bay Area Rapid Transit (BART) On-Track, CA, San Francisco Bay Area, CA\****

Day to day project manager, responsible for meetings, presentations, and coordination with the client for an ongoing noise study on the BART system. Developed MATLAB code to process measurements and determine areas where high corrugation was present, contributing to excessively high in-car noise levels. Performed noise measurements inside both the right of way and the vehicle cabin, in addition to rail corrugation measurements.

***California I-605/SR-60 Interchange Improvement, Los Angeles, CA\****

Developed a noise model of the area that predicted sound levels for abatement design, in addition to conducting noise measurements and analysis. Led the Team in use of the FHWA Traffic Noise Model Software for the project, involving three major highways and two busy interchanges extending over 17 miles in southern California.

***Sound Transit On-Track, Seattle, WA\****

Took measurements, fixed equipment, and developed software in MATLAB to process Corrugation Analysis Trolley measurements as part of an ongoing noise study on the Sound Transit Link system. Tested vibration data to determine the best measurement and processing techniques to store the data in an online database for in-car measurements.

***LA Metro CRRC Railcar Testing, Los Angeles, CA\****

Led the effort to plan the measurements, determine measurement locations and finalize the test plan. Formulated a method to capture speed data directly from legacy train vehicles. Executed noise and vibration specification measurements for new rail cars delivered by CRRC.

***City of Los Angeles, Pershing Square Station Rehabilitation Noise Monitoring, CA\****

Built noise models, wrote a construction noise plan, and assisted in on-site construction noise issues as they arose for a renovation of the Pershing Square metro station in downtown Los Angeles.

Angeles. Trained construction personnel in techniques for noise reduction and how to conduct noise monitoring measurements to meet project specifications.

***City of Orange Metrolink Parking Garage Construction Monitoring, CA\****

Wrote an adaptive management vibration monitoring plan, set up equipment to monitor live vibration levels, and generated weekly reports as part of an effort to build a new parking garage. Designed, planned, and completed measurements to predict and mitigate pile driving construction impacts at three historic building locations adjacent to the construction site. Coordinated with the client whenever an on-site problem arose.

***LA Metro Westside Subway Construction, Los Angeles, CA\****

Planned, organized, and processed noise measurements for the Purple Line extension construction. Implemented both long term microphones to measure noise levels and accelerometers to measure vibration levels in existing subway tunnels. Oversaw noise monitoring at sensitive construction sites for the project and worked with the contractor to find ways to reduce construction noise levels by approximately 10dB.

***Montreal Réseau Express Métropolitain, Canada\****

Conducted vibration propagation measurements used to create models to predict operational vibration levels for an under-construction transit line. Managed equipment, solved problems in the field, and wrote parts of the report summarizing the findings of the acoustic study.

***NHCRP Barrier\****

Took on-highway measurements and wrote, designed, developed, and tested MATLAB code to identify specific spectrograms to use for analyses for a project evaluating barrier reflected highway traffic noise differences in the presence of a single absorptive or reflective noise barrier.

***Siemens Railcar Testing for Sound Transit, Seattle, WA\****

Measured in-car noise and vibration for new rail cars delivered by Siemens. Developed new internal techniques for measurements based on the written specifications. Contributed to the team that helped identify issues that new cars had in meeting the Sound Transit specifications for noise and vibration. Participated in developing the test plan and specified then acquired new equipment for the measurement.

***Toronto/Ontario Eglinton Crosstown Light Rail, Final Design, Canada\****

Assisted in vibration propagation measurements, analysis, and recommendations for mitigation for a 12-mile light-rail line both on and under Eglinton Avenue. Set up and ran equipment for at-grade measurements with an impact hammer for underground measurements with an impact load cell that was used during pre-construction borehole drilling.

*\* Work done prior to working for Wilson Ihrig*