

Response to Comments
December 2019 Draft *Guidance to Address the Friant Ranch Ruling*
for CEQA Projects in the Sac Metro Air District

May 7, 2020

1. **Ascent** – Christopher Lovett (2/13/2020 email) – log-linear question. The Strategic Area Health Effects Tool uses linear interpolation between the CAMx/BenMAP health effects calculations for the 2xTOS (164 lbs./day) and the 8xTOS (656 lbs./day). Most incidence functions are log-linear (in relationship to concentration), does this just represent an approximately linear portion of the curve?
 - [Response](#): The most common relationship in the epidemiological literature is a log-linear relationship – where the natural logarithm of the health response is a linear function of the pollutant concentration (e.g., $y = B \times e^{\beta \times PM}$). These relationships are typically developed by associating changes in health effects to changes in total measured PM_{2.5} concentrations. However, we are dealing with the estimated potential health effects of one project that is a very small fraction of the total PM_{2.5} concentration where the changes in health effects between the 2xTOS and 8xTOS can be accurately estimated as being linear as it is such a small portion of the log-linear relationship curve.

2. **Kleinfelder** – (2/20/2020 email) what is the 2035 population from which the background incidences were calculated and what region does the population encompass
 - [Response](#): The total population in the reduced Sacramento 4-km resolution modeling domain used in the health effects screening modeling is approximately 15.5 million. The background incidence represents the health effects associated with the total PM_{2.5} concentrations across the reduced Sacramento 4-km domain with a 2035 population of approximately 15.5 million. We are updating this calculation so that the percentage is expressed as the percent of the project's health impacts within the 5 air districts of the Sacramento Federal Nonattainment Area (SFNA) that has a population of approximately 3.1 million. Although the population exposed is smaller, the project's health impacts is concentrated in the SFNA so is a larger percentage of the background health incidence.

3. **DWR** – Marcus Yee (3/9/2020 email):
 - a. We recommend SMAQMD explain why the CCOS modeling domain should be used regardless of project location or clarify that a subset of the CCOS modeling domain can be used for project-specific analyses (see also ICF comment j).
 - [Response](#): Either the full Northern California CCOS 4-km resolution or the reduced Sacramento 4-km domain used in the Health Effects screening modeling would be acceptable for projects in Sacramento region.
 - b. We recommend SMAQMD clarify that CAMx and EPA's ISAM source apportionment tool are both accepted models for project-level analyses (see also ICF comment m).
 - [Response](#): The CAMx source apportionment tools (i.e., PSAT and OSAT), as used in the Health Effects screening modeling, would be acceptable. According to the release notes of the latest versions of CMAQ (v5.3 and v5.3.1), the ISAM source apportionment tool has undergone many updates. Assuming that ISAM is working correctly, it would also be acceptable. But ISAM has not been as fully tested and evaluated so at first its results should be carefully reviewed.

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- c. We recommend SMAQMD clarify that the Multiplicative Hybrid Approach can be used, when appropriate for individual project-level analyses (see also ICF comment n).
 - [Response](#): When doing explicit project level modeling analysis that does not follow the air district's guidance, the applicant should prepare a modeling plan for how they will perform the analysis. The air district will review the modeling plan for approval on a case-by-case basis.
 - d. We recommend SMAQMD clarify that the appropriate versions of CMAQ and/or CAMx that should be used for project-specific analyses (which could potentially cast doubt among some individuals on the merits of the Delta Conveyance analysis) (see also ICF comment o).
 - [Response](#): Any of the versions of CAMx or CMAQ released over the last several years (2017 onward, CAMx v6 or v7 and CMAQ v5.2, v5.3, or v5.31) with a fully tested and vetted source apportionment tool would be appropriate. If an applicant wants to use an earlier version of a model then they should document the reason why and the air district will evaluate on a case-by-case basis.
 - e. We recommend SMAQMD clarify that the benchmark approach can be used for project-level analyses (see also ICF comment p).
 - [Response](#): The applicant can report the health effects stratified by total concentration if desired as long as the total health effects across all concentrations are reported, to be consistent with the guidance.
 - f. We recommend SMAQMD clarify that changes in O₃ and PM_{2.5} concentrations should also be included in the project modeling analysis (see also ICF comment r).
 - [Response](#): The health effects should be calculated in response to both changes in ozone and PM_{2.5} due to the project emissions. Both primary and secondary PM_{2.5} effects should be included. The air district will update the guidance to request that project PM_{2.5} and ozone concentrations modeling results also be presented as part of the quality assurance process.
4. **Ascent** – Honey Walters (3/4/2020 meeting) – concern that the guidance does not put the health information into context or do any interpreting. It's not telling the story that is needed for CEQA. Concern that the results don't seem real since the modeling is so complicated. Could be seen as speculative in CEQA.
- [Response](#): The project-level health effects are compared as a percentage against the background incidence health effects across the modeling domain (updated tools will compare percent to the background health incidence within the SFNA) to put the project-level health effects into context. Standard photochemical grid model (PGM) modeling procedures are used that have been used for over 30 years. The modeling procedures follow USEPA's latest air quality modeling guidelines (40 CFR Part 51; Appendix W¹) that recommends photochemical models be used for single-source ozone and secondary PM_{2.5} impacts. USEPA has prepared a memorandum² documenting the suitability for using two PGMs, CAMx and CMAQ, for ozone and secondary PM_{2.5} modeling of single-sources or group of sources (e.g., a project).

¹https://www3.epa.gov/ttn/scram/guidance/guide/appw_17.pdf

²https://www3.epa.gov/ttn/scram/guidance/clarification/20170804-Photochemical_Grid_Model_Clarification_Memo.pdf

Additionally, the air district will update the guidance to include information on disclosing health effects in a CEQA document providing additional context.

5. ICF -- COMMENTS ON SMAQMD DRAFT *Guidance to Address the Friant Ranch Ruling for CEQA Projects in the Sac Metro Air District*

- a. Page A-10 indicates that annual pollutant concentrations were generated over 365 days per year. Accordingly, the health effects estimates are based on a full year of emissions and exposure. Use of the screening tools may therefore overestimate health effects resulting from projects with fewer than 365 operational days. Is it appropriate for these projects to scale the health effects from the screening tools by the ratio of project activity days to 365 days per year?
 - [Response](#): The Screening Tool was designed to provide a conservative estimate of the potential health effects of a project by assuming the project was operating 365 days a year at a specific emissions rate. The entire year of meteorological data is used in the analysis; simply scaling results is not appropriate since it may result in an underestimate of effects. Instead, we recommend a qualitative discussion of this issue.
- b. Most SFNA air district CEQA thresholds are based on maximum daily emissions. The photochemical modeling is based on average daily emissions over 365 days per year. If a project has a maximum daily emissions rate of 90 pounds per day for 5 days per year, but their average daily rate is 50 pounds per day over the entire year, there would be a CEQA impact (in El Dorado County AQMD) for the five days in which emissions exceed 82 pounds per day. Does this conclusion preclude use of the Minor Project Screening Tool? If so, what emissions should be inserted into the Strategic Area Growth Tool (assuming it can be used) – average daily or maximum daily? We recommend SMAQMD clarify whether average daily or maximum daily emissions should be used for the Friant Ranch analysis.
 - [Response](#): The Screening Tools are designed to screen out projects that are expected to have small impacts so makes conservative assumptions on number of days of operation and using maximum 24-hour emissions. The minor project screening tool could not be used if the maximum emissions exceed 82 pounds per day. If the project is located in a strategic growth area, the strategic growth tool could be used entering the maximum pounds per day, providing a conservative estimate of health effects. If the project is not a typical land development project, explicit PGM and health effects modeling may be warranted.
- c. Page 6 indicates that 2035 future year emissions were used as the baseline emissions for the CAMx modeling. These emissions are from CARB's CEPAM. These projections are based on anticipated regional growth. If a project is consistent with the growth assumptions of local general plans and the SIP, shouldn't operational emissions from that project therefore be reflected in the baseline condition? Please further explain what is included in the baseline conditions and how this relates to land use development projects consistent with the SIP.
 - [Response](#): The health effects are based on the incremental ozone and PM_{2.5} concentrations due to emissions from the project. Although the background emissions help define the reactivity of the atmosphere that ultimately affect the incremental project concentrations, the background is reasonably approximated with or without the project emissions included in it. Therefore, this does not affect

the project's incremental health effect estimates. Consistency with SIP assumptions was not considered for this modeling effort because the goal of the effort was to present a conservative health effects analysis of a single project's emissions to answer the Court's question.

- d. The screening tools calculate increased premature mortality resulting from project-generated criteria pollutant emissions and ozone precursors. Projects often conduct a separate health risk assessment to quantify increased cancer and non-cancer risks from receptor exposure to air toxics, like diesel particulate matter. These risks are compared to thresholds of 10 per million and 1.0 HI, which are based on OEHHA and USEPA guidance. Please confirm the health outputs from the screening tool(s) should not be added to any of the results from the air toxics HRA and or compared to air district risk thresholds.
 - **Response:** The incremental health effects calculated for a project by either of the health effects screening tools based on ozone precursor and particulate emissions should not be added to the toxic pollutants health effects as it is unclear whether they are additive or not. Both health effects should be reported and qualitatively discussed.
- e. While the Friant Ranch decision was not explicitly about the adequacy of thresholds, we recommend SMAQMD clarify the nexus between air districts' mass emission thresholds and health risks. Should air district mass emission thresholds be used as the basis for the CEQA impact determination for health risks from *criteria pollutants* (CEQA Guidelines Appendix G, Checklist question "c")? In other words, emissions below air district mass emission thresholds would expose receptors to less than significant criteria pollutant concentrations (even though there would still be some increased health risk), whereas emissions above thresholds would be potentially significant.
 - **Response:** The guidance does not change the significance thresholds for mass emissions contained in air district CEQA guidance documents and does not establish thresholds of significance for health risk. This guidance is simply to fulfil the requirements of the Court's decision by disclosing the potential health effects that may result from a project's additional criteria pollutant emissions. The Sac Metro Air District's mass emissions thresholds were developed and designed to obtain a certain amount of emission reductions from the land use sector to contribute to the overall effort to attain the ambient air quality standards, which are designed to protect health.
- f. The Minor Project Health Screening Tool outputs the estimated health effects at the 82 pounds per day emissions rate. Is it possible to revise this tool to enable users to input the actual project emissions rate (like the Strategic Area Projects Health Effects Screening Tool)?
 - **Response:** The Minor Project Health Screening Tool is designed to be used for proposed projects with emissions at the 82 lbs./day thresholds of significance levels and provides a conservative estimate of potential health effects for projects with emissions below the thresholds.
- g. The description of "strategic growth areas" is confusing. Please clarify. Please provide a map and KMZ of the Strategic Growth Areas so that analysts can determine whether their project is located within one of the strategic growth areas. If there is no intent to map strategic growth areas, is there a recommended distance from the 5 strategic growth area latitude/longitude points a project should not exceed in order to be "within" the growth area and use the Strategic Area Project Health Screening Tool?

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- [Response](#): If a proposed project is located in the same or an **adjacent** 4-km grid cell to one of the hypothetical Strategic Growth Area sources, and has a similar or lower population density, then the Strategic Growth Area Health Effects Tool can be used for the project. If the project does not meet these criteria, the applicant should contact the air district to discuss options.
- h. The Minor Project Health Screening Tool gives the percent of background health risk as a decimal, where the Strategic Area Projects Health Effects Screening Tool is formatted as a percentage. For example, “emergency room visits, asthma” has a background value of 0.00155% according to the Minor Project Health Screening Tool. “Emergency room visits, asthma” has a background value of 0.2772% according to the Strategic Area Projects Health Effects Screening Tool for a project in Sacramento at 164 pounds per day. It appears the values in Column D of the Minor Project Health Screening Tool are off by a factor of 100. Please confirm.
- [Response](#): The tools have been fixed so both display percentage.
- i. Both tools provide health risks out to several decimal points. We recommend rounding to the nearest whole number to avoid the perception of precision in the result. We also recommend the guidance include a discussion on limitations associated with the analysis.
- [Response](#): Some caveats and discussion of limitations are provided in the appendix. Because the health effects can span several magnitudes depending on location and emissions, the number of digits to the right of the decimal point has been defined for all possibilities, but will be limited to 2 significant digits to avoid the appearance of greater accuracy.
- j. It’s unclear as to whether the CCOS modeling domain (Figure A-1) or the subset Sacramento Air District domain (Figure B-2) should be used in the PGM modeling. We recommend including a discussion on which to use or what would trigger the need to model with the CCOS domain.
- [Response](#): Either the CCOS domain or Sacramento reduced 4-km domain would be acceptable for proposed projects in the Sacramento region.
- k. Emission projections are available for California through 2035 but a portion of both domains encompass parts of Nevada. How should projections for the Nevada emissions be made? Should those be excluded from the domain?
- [Response](#): Nevada emissions are included in the modeling for the screening tools and can be left at base case levels. Nevada emissions need to be included in order to obtain the correct background reactivity in border areas of California. If an applicant plans to conduct explicit PGM and health effects modeling for a project, modeling files are available with this data.
- l. In addition to the air pollutants identified in Section A.3.1, we recommend that the project analysis include emissions of ammonia, if any, as ammonia nitrate formation is an important pathway for secondary PM formation during the fall and winter months.
- [Response](#): If the project has quantified ammonia emissions, they should be included in the explicit PGM analysis. The modeling considers the formation of ammonium nitrate and ammonium sulfate from the project’s NO_x and SO₂ emissions interacting with emissions of ammonia from other sources (e.g., from agriculture and livestock). However, the PM_{2.5} concentration attributed to the project’s emissions is just the nitrate and sulfate portions of the molecule, the

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ammonium portion is not included in the PM2.5 attributed to the project's emissions.

- m. The current recommendation for use of source apportionment technique limits the modeling choice to use of CAMx only. While the District has not evaluated EPA's ISAM source apportionment tool, we recommend that its use be accepted based on the work done by EPA and others (e.g., Kwok, Napelenok, and Baker, *Atm Env Vol 80*, Dec 2013, pp 398-407).<https://doi.org/10.1016/j.atmosenv.2013.08.017>
- [Response](#): The paper referenced in the comment is for an old version of CMAQ ISAM and not relevant for the current version. The latest version of CMAQ (v5.3.1) has an updated version of the ISAM source apportionment tool that we have not tested or seen tests and evaluation so we cannot comment on its veracity. In theory, CMAQ using ISAM should be acceptable, but its first applications should be analyzed with care to make sure the results are reasonable.
- n. There is general concern with use of a relatively coarse 4x4 km grid-cell (4,000 acres) for overstating the initial emission and associated air quality impacts allocated over the entire grid. Even large CEQA projects where these assessments would be applied are much smaller than 4,000 acres. We recommend SMAQMD consider the reasonableness of the Multiplicative Hybrid Approach, which uses concentrations from CMAQ and AERMOD within a grid cell to provide sub grid cell fidelity.
- [Response](#): If an applicant is going to do explicit PGM and health effects modeling for a project, they can propose the Multiplicative Hybrid Approach and the air district will review the modeling plan for approval on a case-by-case basis.
- o. What version of CMAQ and/or CAMx should be used in this work? The latest versions available with the SAPRAC07 and AERO6 speciation/chemical mechanism?
- [Response](#): Any of the versions of CAMx or CMAQ released over the last several years (2017 onward, CAMx v6 or v7 and CMAQ v5.2, v5.3, or v5.3.1) with a fully tested and vetted source apportionment tool would be appropriate. If an applicant wants to use an earlier version of a model, then they should document the reason why and the air district will evaluate on a case-by-case basis.
- p. We recommend that to illustrate the relative confidence in the threshold for the PM2.5 and O3 concentration, that a benchmark approach (also referred to as the Lowest Measured Level [LML] analysis) be used. This approach has been used in several EPA regulatory impact analyses (EPA 2019, 2018) and EPA's Policy Assessment for Particulate Matter (EPA 2011) by reporting the estimated PM2.5-related premature deaths according to alternative concentration cutpoints. LML analysis allows a reader to determine the portion of population exposed to annual mean PM2.5 levels at or above different concentrations, which provides insight into the level of uncertainty in the estimated PM2.5 mortality benefits. These concentration benchmarks should not be viewed as concentration thresholds below which not to quantify health impacts, but rather, the impact reflecting the full range of air quality concentrations associated with the emissions changes being evaluated. For example, in the case of mortality, all cause, (Krewski et al., 2009) an LML of 5.8 µg/m³ would be used.
- [Response](#): The applicant can report the health effects stratified by total concentration if desired as long as the total health effects across all concentrations are reported, to be consistent with the guidance.
- q. Projections of population changes should be made particularly for large-scale residential projects where current or near future population is zero or very small.

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- [Response:](#) If additional information is available to justify updating the 2035 population data used in BenMAP, the applicant should propose and justify that in their modeling plan and the air district will evaluate it on a case-by-case basis.
- r. We recommend that the modeling results also present changes in O3 and PM2.5 concentrations to emphasize that some areas may experience increases and some areas decreases in concentrations and hence health outcomes.
- [Response:](#) At a minimum, the applicant should disclose the spatial extent of the annual and maximum 24-hour PM_{2.5} impacts and highest Maximum Daily Average 8-Hour (MDA8) ozone concentrations due to emissions from the proposed project. The applicant is encouraged to examine other aspects of the project and PGM PM_{2.5} and ozone concentrations as part of the quality assurance process of the analysis.