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Subject: Criteria Pollutant Health Risk Analysis Based on SMAQMD's Draft Friant Ranch Guidance

Mr. Phillips:

Introduction

Raney Planning & Management, Inc. (Raney) has prepared an analysis of potential health risks related to the operational emission of criteria pollutants resulting from implementation of the Newbridge project. The following analysis is based on the draft methodologies and screening tools published by SMAQMD on January 31, 2020. It should be noted that SMAQMD has not yet formally adopted the draft guidance, nor has SMAQMD made public any of the comments received on the draft guidance.

Methodology

In order to estimate the potential health risks that could result from the operational emissions of ROG, NO_X, and $PM_{2.5}$, Raney implemented the procedures within SMAQMD's Draft Instructions for health effects screening. To date, SMAQMD has published three options for analyzing projects: small projects may use the *Minor Project Health Screening Tool*, while larger projects may use the *Strategic Area Project Health Screening Tool*, and practitioners may also conduct project-specific modeling. Both the *Minor Project Health Screening Tool* and *Strategic Area Project Health Screening Tool* are based on the maximum thresholds of significance adopted within the five air district region contemplated within SMAQMD's Draft Instructions. The air district thresholds considered in SMAQMD's Draft Instructions included thresholds from SMAQMD as well as the El Dorado County Air Quality Management District, the Feather River Air Quality Management District, the Placer County Air Pollution Control District, and the Yolo Solano Air Quality Management District. The highest allowable emission rates of NO_X, ROG, PM_{10}, and $PM_{2.5}$ from the five air districts is 82 pounds per day (lbs/day) for all four pollutants. Thus, the *Minor Project Health Screening Tool* is intended for use by projects that would result in emissions at or below 82 lbs/day, while the *Strategic Area Project Health Screening Tool* is intended for use by projects that would result in emissions between two and eight times greater than 82 lbs/day. The *Strategic Area Project Health Screening Tool* is based on location specific modeling, in five specific growth area locations. The Newbridge project is proximate to the Rancho Cordova location in the *Strategic Area Project Health Screening Tool*. Raney considered the applicability of both tools in light of the previous quantification of emissions from the Newbridge project.

The operational emissions from the Newbridge project have been analyzed in an Air Quality Mitigation Plan (AQMP) prepared for the project. The AQMP includes various measures that reduce emissions of criteria pollutants, including ozone precursors such as ROG and NO_X, and $PM_{2.5}$. SMAQMD recommends that an AQMP be prepared for projects that exceed their adopted lbs/day thresholds of significance for ozone precursors and PM emissions, with reduction targets calculated as a percentage of tons/year emissions for ozone precursors. However, SMAQMD's

draft health risks tools rely on emissions estimates in pounds per day of pollutants. Thus, the quantified emissions analyzed in this memorandum will rely on unmitigated and mitigated estimates of emissions from CalEEMod in pounds per day, rather than the tons per year estimates presented in the AQMP.

The operational emissions anticipated for the Newbridge Project are presented in Table 1 below in lbs/day.

Table 1
Newbridge Operational Emissions (lbs/day)

Scenario	ROG	NO_X	$PM_{2.5}$
Unmitigated	281.57	338.12	115.42
Mitigated	263.24	251.68	72.16

Source: Newbridge Specific Plan Operational Air Quality Mitigation Plan. April 2020.

Based on the emissions presented in Table 1, the SMAQMD's Draft *Strategic Area Project Health Screening Tool* would be the applicable tool for mitigated and unmitigated emissions of ROG, NO_X, and unmitigated $PM_{2.5}$ emissions. However, mitigated emissions of $PM_{2.5}$ are estimated to be below the SMAQMD's operational thresholds, and, thus, the more applicable tool for estimating health risks from the mitigated project related to $PM_{2.5}$ would be the *Minor Project Health Screening Tool*. Although the *Minor Project Health Screening Tool* would be more applicable for mitigated $PM_{2.5}$ emissions, SMAQMD's draft guidance does not provide information regarding the use of both tools for different pollutants. Consequently, Raney has determined that modeling health risks using the Draft *Strategic Area Project Health Screening Tool* alone provides the most conservative approach to analysis. It should be noted that given the location of the Newbridge Project, the Rancho Cordova location within SMAQMD's *Strategic Area Project Health Screening Tool* has been used.

Calculated Health Risks

Based on the emissions presented in Table 1, the unmitigated and mitigated health risks resulting from implementation of the Newbridge Project have been quantified and are presented in Table 2 and Table 3 below.

To understand the health risks presented in Table 2 and Table 3, a few pieces of background information are necessary. First, the modeling prepared for SMAQMD, and the health risks presented in Table 2 and Table 3 relate to the specific modeling "domain" used in SMAQMD's tools. The domain used by SMAQMD includes Sacramento and nearby counties, which generally includes SACOG's Metropolitan Transportation Planning area, but also includes portions of Solano County under the jurisdiction of the Yolo-Solano Air Quality Management District.[1] The specified domain is used for two purposes: 1) the domain provides the area within which SMAQMD completed air quality modeling to determine health risks from a project due to criteria pollutants, and 2) the domain provides the area within which background health risks were calculated. Consequently, the results of SMAQMD's draft tools present the potential health risks to residents within the domain due to the project's estimated emissions, and contrasts those health risks to the background rate of health risks that affects residents within the domain in the absence of the project.

[1] Ramboll. *Guidance to Address the Friant Ranch Ruling For CEQA Projects in the Sac Metro Air District*. December 2019.

In addition to understanding the domain within which health effects are discussed, the units that health effects are presented is also important to understand. Using the Draft *Strategic Area Project Health Screening Tool*, health effects are presented in the average (or mean) incidences of health effects that could occur within the community per year due to project-related emissions. The average annual health effects are then presented as a percent of the health risks that would occur within the domain irrespective of the project. The health risks that would occur within the domain in the absence of the project are referenced as the Background Health Incidence.

Finally, the types of health risks resulting from the pollutant are referred to as "health endpoints". Health endpoints represent specific health effects caused by each pollutant, for example the average number of increased emergency room visits due to asthma per year, or an average increase in hospital admissions related to asthma exacerbated or caused by criteria pollutants.

As shown in the tables below, implementation of the mitigation included in the AQMP would result in a reduction in potential health risks from the unmitigated health risks presented in Table 2 to the mitigated levels presented in Table 3.

Conclusion

Neither SMAQMD nor the County of Sacramento have adopted thresholds of significance for the assessment of health risks related to the emission of criteria pollutants. Furthermore, an industry standard level of significance has not been adopted or proposed. Due to the lack of adopted thresholds of significance the health risks presented in Table 2 and Table 3 are presented for informational purposes and do not represent an attempt to arrive at any level-of-significance conclusions.

In addition to the lack of adopted thresholds, the health risks were calculated using recommended draft guidance and tools that have not yet been finalized. The draft guidance has been released to obtain public feedback on the methods employed. Based on feedback received to date, SMAQMD anticipates that information regarding the background rate of health effects may change, but the project-specific health effect values should remain unchanged.[2] Consequently, the results presented in Table 2 and Table 3 should be used for informational purposes only.

If you have any questions regarding the contents of this document, please do not hesitate to contact me at (916) 372-6100, or via email at rods@raneymanagement.com.

Sincerely,

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[2] Joanne Chan and Karen Huss, Sacramento Metropolitan Air District. Personal Communication with Rod Stinson, Division Manager/Air Quality Specialist, Raney Planning and Management, Inc. April 21, 2020.

Table 2
Draft SMAQMD Health Effects Tool: Unmitigated Emissions

Health Endpoint	Age Range[1]	Incidences (per year)[2] (Mean)	Percent of Background Health Incidence[3] (%)
$PM_{2.5}$			
Emergency Room Visits, Asthma	0 - 99	1.9600	0.2473%
Mortality, All Cause	30 - 99	4.9587	0.2692%
Hospital Admissions, Asthma	0 - 64	0.1251	0.1414%
Hospital Admissions, All Cardiovascular (less Myocardial Infarctions)	65 - 99	0.4173	0.0397%
Hospital Admissions, All Respiratory	65 - 99	0.7598	0.0841%
Acute Myocardial Infarction, Nonfatal	18 - 24	0.0002	0.0930%
Acute Myocardial Infarction, Nonfatal	25 - 44	0.0141	0.1261%
Acute Myocardial Infarction, Nonfatal	45 - 54	0.0363	0.1265%
Acute Myocardial Infarction, Nonfatal	55 - 64	0.0588	0.1218%
Acute Myocardial Infarction, Nonfatal	65 - 99	0.2634	0.1295%
Ozone			
Hospital Admissions, All Respiratory	65 - 99	0.3097	0.0343%
Mortality, Non-Accidental	0 - 99	0.1957	0.0159%
Emergency Room Visits, Asthma	0 - 17	1.1989	0.4991%
Emergency Room Visits, Asthma	18 - 99	2.0572	0.3724%

Notes:

1 Affected age ranges are shown. Other age ranges are available, but the endpoints and age ranges shown here are the ones used by the USEPA in their health assessments. The age ranges are consistent with the epidemiological study that is the basis of the health function.

2 Health effects are shown in terms of incidences of each health endpoint and how it compares to the base (2035 base year health effect incidences, or "background health incidence") values. Health effects and background health incidences are across the Northern California model domain.

3 The percent of background health incidence uses the mean incidence. The background health incidence is an estimate of the average number of people that are affected by the health endpoint in a given population over a given period of time. In this case, these background incidence rates cover the modeled domain. Health incidence rates and other health data are typically collected by the government as well as the World Health Organization. The background incidence rates used here are obtained from BenMAP.

Source: SMAQMD, Draft Strategic Area Project Health Effects Tool. 2020.

Table 3
Draft SMAQMD Health Effects Tool: Mitigated Emissions

Health Endpoint	Age Range[1]	Incidences (per year)[2] (Mean)	Percent of Background Health Incidence[3] (%)
$PM_{2.5}$			
Emergency Room Visits, Asthma	0 - 99	1.9080	0.2407%
Mortality, All Cause	30 - 99	4.8364	0.2625%
Hospital Admissions, Asthma	0 - 64	0.1218	0.1377%
Hospital Admissions, All Cardiovascular (less Myocardial Infarctions)	65 - 99	0.4075	0.0388%
Hospital Admissions, All Respiratory	65 - 99	0.7404	0.0819%
Acute Myocardial Infarction, Nonfatal	18 - 24	0.0002	0.0905%
Acute Myocardial Infarction, Nonfatal	25 - 44	0.0138	0.1229%
Acute Myocardial Infarction, Nonfatal	45 - 54	0.0354	0.1234%
Acute Myocardial Infarction, Nonfatal	55 - 64	0.0573	0.1188%
Acute Myocardial Infarction, Nonfatal	65 - 99	0.2573	0.1265%
Ozone			
Hospital Admissions, All Respiratory	65 - 99	0.2375	0.0263%
Mortality, Non-Accidental	0 - 99	0.1501	0.0122%
Emergency Room Visits, Asthma	0 - 17	0.9230	0.3842%
Emergency Room Visits, Asthma	18 - 99	1.5827	0.2865%

Notes:

1 Affected age ranges are shown. Other age ranges are available, but the endpoints and age ranges shown here are the ones used by the USEPA in their health assessments. The age ranges are consistent with the epidemiological study that is the basis of the health function.

2 Health effects are shown in terms of incidences of each health endpoint and how it compares to the base (2035 base year health effect incidences, or "background health incidence") values. Health effects and background health incidences are across the Northern California model domain.

3 The percent of background health incidence uses the mean incidence. The background health incidence is an estimate of the average number of people that are affected by the health endpoint in a given population over a given period of time. In this case, these background incidence rates cover the modeled domain. Health incidence rates and other health data are typically collected by the government as well as the World Health Organization. The background incidence rates used here are obtained from BenMAP.

Source: SMAQMD, Draft Strategic Area Project Health Effects Tool. 2020.