From:	Schuett, Rachel (CPC)
To:	BOS Legislation, (BOS)
Cc:	Jain, Devyani (CPC); Gibson, Lisa (CPC); Range, Jessica (CPC); Starr, Aaron (CPC)
Subject:	2675 Geary Boulevard, BOS Record No. 2019-004110APL
Date:	Monday, November 16, 2020 9:59:28 AM
Attachments:	2675 Geary Supplemental Appeal Response.pdf

Ms. Wong,

Attached please find the Planning Department's supplemental appeal response letter for 2675 Geary Boulevard, BOS Record No. 2019-004110APL.

Best,
Rachel

Rachel A. Schuett (she/her/hers)
Senior Environmental Planner
Environmental Planning Division
San Francisco Planning Department

Rachel A. Schuett (she/her/hers)
Senior Environmental Planner
Environmental Planning Division
San Francisco Planning Department

PLEASE NOTE MY NEW ADDRESS AND PHONE NUMBER AS OF AUGUST 17:
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San Francisco Property Information Map

San Francisco Planning

49 South Van Ness Avenue, Suite 1400
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APPEAL OF EXEMPTION DETERMINATION

2675 Geary Boulevard

Date:	November 16, 2020
To:	Angela Calvillo, Clerk of the Board of Supervisors
From:	Lisa Gibson, Environmental Review Officer – (628) 652-7571 Rachel Schuett, rachel.schuett@sfgov.org
RE:	**Board of Supervisors File No 201127, Planning Record No. 2019-004110ENV** **Appeal of Common Sense Exemption for the 2675 Geary Boulevard Project**
Hearing Date:	November 17, 2020
Attachment(s):	A – Health Risk Assessment and Peer Review of Proposed Project at 2675 Geary Boulevard, San Francisco, California, November 13, 2020
Project Sponsor:	Mark Loper, Reuben, Junius & Rose, (415) 567-9000
Appellant(s):	Mark R. Wolfe, M.R. Wolfe & Associates, P.C. (on behalf of San Francisco residents Julie Fisher and Tony Vargas, and United Food & Commercial Workers Union Local 5, and its members who live and/or work in San Francisco)

Introduction

This memorandum and the attached documents are a supplemental response to the letter of appeal to the board of supervisors (the board) regarding the planning department's (the department) issuance of a common sense exemption under the California Environmental Quality Act (CEQA determination) for the proposed 2675 Geary Street project.

Please see the planning department's November 9, 2020 appeal response for a discussion of the project site, description, background, exemption issued, and the department's responses to substantive issues raised in the appellants original CEQA appeal letter dated September 18, 2020 and supplemental appeal letter dated November 6, 2020.

On November 2nd, 2020 the project sponsor submitted a consultant prepared air quality analysis and health risk assessment for the proposed project. The appellants also submitted a consultant prepared air quality analysis to the board on November 6th, 2020. The department has reviewed both the project sponsor's and the appellant's air quality analyses and accurately described the findings of these analyses in the department's November 9th, 2020 appeal response.

The department has directed the preparation of an additional health risk assessment and peer review of both the project sponsor's and appellant's air quality analyses. The assessment and peer review are included as Attachment A to this supplemental response and the findings of this analysis are briefly summarized below.

Planning Department Responses

The air quality concerns raised in the supplemental appeal letter are further addressed in the response below.

Response 1: The planning department's analysis confirms that the proposed project would not result in significant air quality impacts to sensitive receptors.

At the direction of the planning department a qualified air quality consultant conducted a health risk assessment of the proposed project based on methodologies recommended by the Office of Environmental Health Hazard Assessment and the Bay Area Air Quality Management District. The report also contains a peer review of the project sponsor's and appellant's air quality analyses also prepared for the project.

The air quality analysis conducted by the department's consultant finds that the proposed project would result in a maximum excess cancer risk of 2.6 per one million persons exposed. This exposure would occur at the Bright Horizons preschool and daycare. The maximum cancer risk at the nearest residential receptor would be slightly lower than this, at 2.3 per one million persons exposed. These results are well below the department's cancer risk threshold of 7 per one million and similar to the project sponsor's health risk results.[1]

The peer review found that the primary difference between the project sponsor's air quality analysis and the one conducted at the request of the planning department (results of which are described above) was that the project sponsor's analysis subtracted the emissions associated with the previous use, Best Buy. The peer review indicates that even without subtracting the emissions from the prior use, the project sponsor's air quality analysis would result in findings well below the planning department's significance threshold.[2]

The peer review of the appellant's air quality analysis found that the methods used by the consultant do not necessarily mean that the project would result in the maximum cancer risks reported in the appellant's report, but would signal the need for a more detailed analysis, like the one conducted by the planning department and project sponsor. The peer review of the appellant's air quality analysis also found that that it is based on overly conservative emissions factors, which inflate the actual impact. Examples include using emissions factors for refrigerated trucks based on a regulatory limit, rather than unit operations presented in the California Air Resources Board models and using emissions profiles from studies conducted between 1994-1999, reflecting vehicle fleet emissions from 25 year ago, rather than current fleet emissions.

Conclusion

The department's supplemental air quality analysis further substantiates that the project does not have the potential to result in significant air quality impacts. For the reasons described in the common sense exemption,

[1] As described in the planning department's appeal response, the project sponsor's air quality analysis found that the project would result in a cancer risk of 2.4 per one million at the Bright Horizons preschool and daycare and 2.7 per one million persons exposed at the nearest residence.
[2] The cancer risk reported in the project sponsor's air quality analysis would increase slightly by not subtracting the emissions associated with the prior use, Best Buy. The majority of the project's emissions, and consequent health risks, are from refrigerated trucks, which are only associated with the project and not the prior use.

the department's November 9, 2020 appeal response, and this supplemental response, it can be seen with certainty that there is no possibility that the project may have a significant effect on the environment. The project therefore qualifies for a common sense exemption. The department respectfully recommends that the board uphold the CEQA common sense exemption determination and deny the appeal of the CEQA determination.

RAMBOLL

ENVIRONMENT
& HEALTH

MEMO

Date: November 13, 2020

To: Jessica Range
San Francisco Environmental Planning

From: Michael Keinath
Michael Howley

Subject: HEALTH RISK ASSESSMENT AND PEER REVIEW OF PROPOSED PROJECT AT 2675 GEARY BLVD, SAN FRANCISCO, CALIFORNIA

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At the request of the City of San Francisco Planning Department, Ramboll US Consulting, Inc. (Ramboll) conducted a health risk assessment (HRA) for the proposed Whole Foods Market at 2675 Geary Blvd ("the Project"), as well as a peer review of two prior studies for the same Project. These studies were conducted on behalf of the Project Sponsor by ESA+Associates (ESA) and for an appellant to the Project by Environmental Permitting Specialists (EPS).

The Project would consist of a 50,000 square foot supermarket in an existing retail complex. The Project would require no construction or changes to the existing structures, parking area, or roadways. The Project is located in an Air Pollution Exposure Zone (APEZ), as defined by the San Francisco Department of Public Health.

The primary sources of emissions associated with Project operation are mobile sources, including delivery trucks equipped with diesel-powered transport refrigeration units (TRUs). These trucks emit toxic air contaminants (TACs) while running, idling, and when "dwelling" in the loading dock during delivery unloading. The primary TAC of concern is diesel particulate matter (DPM), a known carcinogen emitted from diesel combustion. To be conservative, all DPM will be assumed to be less than 2.5 microns in diameter ($PM_{2.5}$), to evaluate against applicable $PM_{2.5}$ concentration thresholds as well.[1]

HEALTH RISK ASSESSMENT

Toxic Air Contaminant Emissions

The TAC emissions associated with the Project were calculated using databases from the California Air Resources Board (ARB). ARB maintains emissions databases for both on-road vehicles and off-road equipment which calculate projected

[1] State regulatory emission models, discussed in detail below, do not explicitly report "DPM" emissions, but rather exhaust emissions of particulate matter less than 10 microns in diameter (PM_{10}) and $PM_{2.5}$. By definition, $PM_{2.5}$ is a subset of PM_{10}. In this analysis, DPM is defined as all exhaust PM_{10} emissions from diesel vehicles and equipment.

emissions based on user-specified locations (e.g., the County of San Francisco), year, fuel type, and vehicle class. Ramboll queried the most recent version of the on-road database (EMFAC2017) to generate running and idling emission factors for the two heaviest classes of diesel trucks, and the off-road database (OFFROAD2017-Orion) for emission factors associated with TRUs on trucks.

On-road idling emission factors from EMFAC were reported in units of tons/vehicle/day. Ramboll converted these emission factors into units of grams/trip using the EMFAC-reported vehicle population and trips/day rate. This method is slightly conservative as the idling emissions reported by EMFAC include all idling activity during vehicle operation and not just at trip endpoints. Similarly, TRU emissions for each equipment class from OFFROAD were reported in total tons, alongside total operating hours. Ramboll used these data to calculate emission factors in grams/hour.

The Project Sponsor provided estimated daily truck activity by truck type associated with the Project based on the maximum truck activity for an existing Whole Foods Market in San Francisco. This data, along with the derived emission factors and calculated emission rates, are presented in Table 1. For all emissions, Ramboll used PM_{10} exhaust emission factors and conservatively assumed that all PM_{10} exhaust emissions were DPM and $PM_{2.5}$.

Although passenger vehicles associated with customer trips also emit TACs, these vehicles are overwhelmingly gasoline-powered (or electric) and have far less impact on nearby receptors than diesel vehicles. Ramboll has reviewed the traffic study associated with the Project and notes that the average daily number of customer trips is expected to be 3,366 trips per day, well below the adjusted BAAQMD screening threshold of 5,000 vehicles per day. Thus passenger vehicles are not expected to contribute to any significant impacts and were not included in this assessment.

Screening Health Risk Assessment

Ramboll analyzed Project risks by estimating ambient air concentrations of DPM and $PM_{2.5}$. To estimate air concentrations of DPM and $PM_{2.5}$, Ramboll used AERSCREEN, a single source Gaussian plume model developed by USEPA which provides worst-case maximum ground-level concentrations. The model automatically generates concentrations at regular distances from the input source, but Ramboll also specified distances based on the nearest receptors to the Project. These were a daycare facility on the roof level of the building, 36 meters West of the truck loading dock, and residences to the south of the Project, with the nearest being 80 meters away.

The AERSCREEN methodology incorporates conservative assumptions and worst-case meteorological conditions, which result in overly conservative health risk estimates. Ramboll modeled the loading dock as a single volume source, consistent with USEPA methodology for haul trucks. Ramboll used the following source parameters:

- Release Height: 2.55 meters, based on USEPA Haul Road Guidance[2] of 1.7 x vehicle height/2 and an assumed vehicle height of 3 meters
- Initial Vertical Dimension: 2.37 meters, based on USEPA Haul Road Guidance of Release Height x 2/2.15 (also consistent with AERMOD and AERSCREEN guidance[3] for a single volume source adjacent to a building)

[2] USEPA. 2012. Haul Road Workgroup Final Report Submission. Available at: https://www3.epa.gov/scram001/reports/Haul_Road_Workgroup-Final_Report_Package-20120302.pdf

[3] USEPA. 2019. AERMOD User's Guide. Available at: https://www3.epa.gov/ttn/scram/models/aermod/aermod_userguide.pdf

- Initial Lateral Dimension: 1.96 meters, based on the AERMOD guidance for a single volume source of source width / 4.3, with the width of the loading dock measured to be 8.4 meters

The complete AERSCREEN inputs and outputs are included in Appendix A.

In February 2015, OEHHA released the updated Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments (OEHHA 2015), which combines information from previously-released and adopted technical support documents to delineate OEHHA's revised risk assessment methodologies based on current science. The BAAQMD has issued HRA Guidelines formally adopting the OEHHA 2015 Guidance Manual.[4] This analysis followed the recommended methodology from the 2015 OEHHA Hot Spots Guidance. Ramboll conservatively evaluated Project impacts using default exposure assumptions for a resident child and daycare child from OEHHA (2015) unless otherwise noted.[5] The resident child scenario assumes a much higher daily breathing rate and age-sensitivity factor (ASF)[6] than other sensitive receptor populations and therefore is the most conservative scenario to evaluate for this analysis. The exposure parameters used to estimate excess lifetime cancer risks for a resident child are presented in Table 2.

The dose estimated for each exposure pathway is a function of the concentration of a chemical and the intake of that chemical. The intake factor for inhalation, IF_{inh}, can be calculated as follows:

$$IF_{inh} = \frac{DBR * FAH * EF * ED * ASF * CF}{AT}$$

Where:

IF_{inh}	=	Intake Factor for Inhalation (m^3/kg-day)
DBR	=	Daily Breathing Rate (L/kg-day)
FAH	=	Fraction of Time at Home (unitless)
EF	=	Exposure Frequency (days/year)
ED	=	Exposure Duration (years)
AT	=	Averaging Time (days)
ASF	=	Age Sensitivity Factor (unitless)
CF	=	Conversion Factor, 0.001 (m^3/L)

The chemical intake or dose is estimated by multiplying the inhalation intake factor, IF_{inh}, by the chemical concentration in air, C_i. When coupled with the chemical concentration, this calculation is mathematically equivalent to the dose algorithm given in the OEHHA Hot Spots guidance (Cal/EPA 2003).

The toxicity assessment characterizes the relationship between the magnitude of exposure and the nature and magnitude of adverse health effects that may result from such exposure. This HRA evaluated theoretical exposures to TACs for two categories of potential adverse health effects, cancer and non-cancer endpoints. Toxicity values used to estimate the likelihood of adverse effects occurring in humans at different exposure levels are identified as part of the toxicity assessment component of a

[4] BAAQMD. 2016. Proposed Health Risk Assessment Guidelines. Air Toxics NSR program. January. Available at: http://www.baaqmd.gov/~/media/files/planning-and-research/rules-and-regs/workshops/2016/reg-2-5/hra-guidelines_clean_jan_2016-pdf.pdf?la=en

[5] BAAQMD. 2010. BAAQMD Air Toxics NSR Program Health Risk Screening Analysis (HRSA) Guidelines. January.

[6] Ibid.

risk assessment. Since the only chemical of concern in this HRA is DPM, and the chronic non-cancer Reference Exposure Level for DPM (5.0 ug/m^3) is less than the significance threshold for $PM_{2.5}$ concentration (0.2 ug/m^3) in an air pollution exposure zone (APEZ), non-cancer effects were not explicitly evaluated.

Cancer risk was calculated from ambient annual concentrations using intake factors, cancer potency factors, and chronic reference exposure levels calculated consistent with the 2015 OEHHA Hot Spots Guidance[7] and 2010 BAAQMD guidance.[8]

As shown in Table 3, the maximum cancer risk from Project operations is calculated to be 2.6 in 1 million, compared to a threshold of 7 in 1 million, based on a maximum $PM_{2.5}$ concentration of 0.008 µg/m^3 (threshold of 0.2 µg/m^3). These results are all well below the APEZ thresholds of significance; thus, health risk impacts associated with construction of the Project are less than significant.

PEER REVIEW OF PRIOR ASSESSMENTS

ESA Air Quality Technical Memo

ESA conducted an air quality analysis and health risk assessment for the Project using much of the same data and methods described above, and in fact produced similar overall results. ESA relied on the same truck activity data, emission factor sources, and HRA methodology as Ramboll.

ESA did not include truck running emissions, but these are negligible compared to idling and TRU emissions. There appear to be some minor differences, such as the use of an area source for truck idling and a volume source for TRU operation, but the model parameters used by ESA are reasonable for this analysis. The area source for truck idling may be overly conservative when using a worst-case screening dispersion model such as AERSCREEN, according to USEPA Haul Road Guidance.

The primary difference between ESA's report and Ramboll's analysis is that ESA established a Baseline condition for the Project based on the previous tenant of the space, a Best Buy store. ESA used vehicle count data from another Best Buy in San Francisco to estimate Baseline activity and presented Project impacts as the net change from that Baseline. This serves to reduce the overall impacts of the Project compared to analyzing the Project by itself.

However, even without subtracting the Baseline condition none of ESA's conclusions would change. All mass emissions of Criteria Air Pollutants evaluated by ESA would still be below the applicable significance thresholds. In the HRA, the vast majority of impacts calculated by ESA are from TRU emissions, which only exist in the Project case, and thus if Baseline activity were removed from ESA's HRA the results would be similar to those reported and still less than significant. This is also consistent with Ramboll's HRA analysis.

EPS Technical Memorandum

EPS conducted their own evaluation of the Project and determined that the Project would result in significant health impacts. To make this determination, EPS calculated Project-related emissions from truck idling, TRU operations, truck travel across the parking lot, and gasoline vehicle travel, then input all of the calculated emissions to a Prioritization Score Calculator published by the San Juaquin Valley Air Pollution Control District (SJVAPCD).

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[7] Cal/EPA. 2003. The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments. Office of Environmental Health Hazard Assessment. August.

[8] BAAQMD. 2010. Air Toxics NSR Program Health Risk Screening Analysis (HRSA) Guidelines. January

EPS interprets the output of this Prioritization Score Calculator to reflect Project cancer risks in excess of BAAQMD thresholds. However, there is no indication in the Calculator or associated documentation from SJVAPCD to support this assertion. The California Air Pollution Control Officers Association (CAPCOA) Facility Prioritization Guidelines state, "Because the threshold for high priority is based on a conservative modeling scenario, it is possible that facilities with higher scores than the threshold may not significantly impact receptors."[9] The Prioritization Score calculated by EPS does not necessarily equate to the actual maximum Project cancer risk, but would signal the need for a more detailed analysis like the ones conducted by ESA and Ramboll. EPS did not include any such analysis in their report.

EPS calculated emissions associated with the same truck operations as Ramboll. EPS uses a conservatively low number of truck trips, and uses similar data and methods to calculate truck running and idling emissions as Ramboll. EPS also uses a similar methodology to calculate TRU emissions, relying on reported average TRU size in horsepower and an emission factor in units of grams per horsepower-hour (g/hp-hr). However, EPS appears to calculate substantially higher TRU emissions, based on an emission factor from a regulatory limit rather than actual unit operations presented in ARB models. Ramboll was unable to verify the exact emission factor used by EPS as it does not appear in the cited document. The nearest emission factor in that document, 0.22 g/hp-hr (compared to EPS value of 0.25), is 2.5 to 9 times greater than equivalent emission factors from the ARB OFFROAD database used by Ramboll and ESA. BAAQMD guidance specifically recommends the ARB OFFROAD and EMFAC models for projects that do not require an air permit such as large retail centers.[10] The EPS analysis artificially inflates potential impacts in contraction to appropriate regulatory guidance.

EPS also includes TAC emissions from gasoline passenger vehicles in their Prioritization Score calculations. This is a conservative approach, as discussed above, but EPS appears to use overly conservative emission factors without justification. Rather than calculate passenger vehicle emissions in a manner consistent with truck emissions using ARB developed models and then apply a TAC speciation profile to the results, EPS calculated individual TAC emissions directly. The emission factors used by EPS appear to be selected as the maximum emission factors for each TAC from a subset of emission factors reported in the source document cited by EPS. This subset is a series of studies conducted in the Caldecott Tunnel from 1994-1999. The emission factors themselves were derived from factors in units of TAC emission per fuel consumption based on assumed fuel consumption rates, also specific to the 1994-1999. Vehicle standards and performance change significantly over time; these emission factors likely do not represent operating conditions relevant to the Project. Again, EPS artificially inflates potential impacts by citing a document which reports emissions reflective of an automobile fleet from 25-years ago, rather than using the most up-to-date models published by ARB to estimate the emissions from the current automobile fleet.

CLOSING

Based on the assumptions and methodology described above, Ramboll has determined that the proposed Project would not result in any health impacts in excess of the relevant thresholds of

[9] CAPCOA. Facility Prioritization Guidelines. 2016. Available at: http://www.valleyair.org/busind/pto/tox_resources/CAPCOA-Prioritization-Guidelines-August-2016-FINAL.pdf

[10] BAAQMD. 2017. California Environmental Quality Act (CEQA) Air Quality Guidelines. Available at: https://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa_guidelines_may2017-pdf.pdf?la=en

significance for a project located in an APEZ. This is consistent with the analysis conducted by ESA. The findings of significant health impacts reported by EPS appear to be based on an incomplete analysis and rely on outdated methods to overly inflate potential impacts.

Attachments:

Tables

Appendix A: AERSCREEN Output Files

TABLES

Table 1
Emissions Calculations
2675 Geary Whole Foods Market
San Francisco, California

Truck type[1]	EMFAC Vehicle Category	TRU Category	Average Daily Trips[1]	Dwelling Time[1] (hours/trip)	Onsite Travel Distance (mi)	TRU PM_{10} EF[2] (g/hour)	Idling PM_{10} EF[3] (g/trip)	Running PM_{10} EF (g/mi)	Annual Emission Rate[4,5] (g/s)
65 Foot Trailer	HHDT	TRU - Instate Trailer TRU	4	1	0.05	0.96	0.011	0.115	4.6E-05
30-48 Foot Trailer	HHDT	TRU - Instate Truck TRU	4	0.5	0.05	1.35	0.011	0.159	3.3E-05
Other	MHDT	TRU - Instate Van TRU	15	0.5	0.05	0.86	0.003	0.115	7.7E-05
							Total:		1.6E-04

Notes:

1. Truck descriptions, trip counts, and dwelling times provided by Project Sponsor.
2. TRU emission factors derived from ARB OFFROAD2017-Orion model for San Francisco in 2021, assuming all diesel fuel.
3. Idling emission factors derived from ARB EMFAC2017 for San Francisco in 2021, assuming all diesel fuel.
4. Annual emission rate calculated assuming idling activity takes place both at arrival and departure of each truck.
5. Emissions annualized over a continuous year.

Abbreviations:

EF - Emission Factor
g - grams
HHDT - Heavy Heavy Duty Truck
MHDT - Medium Heavy Duty Truck
mi - mile
PM10 - Particulate Matter less than 10 microns in diameter
s - second
TRU - Transport Refrigeration Unit

References:

California Air Resource Board. 2017. OFFROAD2017-Orion Web Database (v1.0.1). Available at: https://www.arb.ca.gov/orion/?_ga=2.128781003.634143458.1605135827-1292042476.1557263948

California Air Resource Board. 2017. EMFAC017 Web Database (v1.0.2). Available at: https://arb.ca.gov/emfac/2017/?_ga=2.135013046.634143458.1605135827-1292042476.1557263948

Table 2
Exposure Paramaters
2675 Geary Whole Foods Market
San Francisco, California

Population	Receptor Age Group	Exposure Parameters						
		Daily Breathing Rate (DBR)[1]	Exposure Duration (ED)	Fraction of Time at Home (FAH)[2]	Exposure Frequency (EF)[3]	Averaging Time (AT)	Age Sensitivity Factor	Intake Factor, Inhalation (IF_{inh})
		[L/kg-day]	[years]	[unitless]	[days/year]	[days]	[unitless]	$[m^3/kg\text{-}day]^{-1}$
Resident Child	3rd Trimester	361	0.25	1.0	350	25,550	10	0.0124
	Age 0-<2 Years	1,090	2.0	1.0	350	25,550	10	0.299
	Age 2-<16 Years	572	14	1.0	350	25,550	3	0.33
	Age 16-30 Years	261	14	0.73	350	25,550	1	0.037
Daycare Child	Age Six Weeks-<2 Years	1,200	1.9	1.0	250	25,550	10	0.221
	Age 2-<9 Years	520	4.0	1.0	250	25,550	3	0.061

Notes:

1. Daily breathing rates reflect default breathing rates from OEHHA 2015 and BAAQMD 2016 as follows: 95th percentile 24-hour daily breathing rate for 3rd trimester and age 0-<2 years; 80th percentile for ages 2 years and older (per BAAQMD 2016 guidance).

2. Fraction of time spent at home is conservatively assumed to be 1 (i.e., 24 hours/day) for age groups from the third trimester to less than 16 years old based on the recommendation from BAAQMD (BAAQMD 2016) and OEHHA (OEHHA 2015). The fraction of time at home for adults age 16-30 reflects default OEHHA guidance (OEHHA 2015) as recommended by BAAQMD (2016). The fraction of time at home for the daycare children was conservatively set to be 1, consistent with OEHHA 2015 guidance for resident children.

3. Exposure frequency reflects default residential exposure frequency from OEHHA 2015.

4. Daycare children are modeled using parameters consistent with OEHHA 2015 guidance, but conservatively assumed to be exposed to all emissions 5 days/week by maintaing FAH of 1.

Calculation:

IF_{inh} = DBR * FAH * EF * ED * ASF * CF / AT

CF = 0.001 (m^3/L)

Abbreviations:

AT - averaging time
BAAQMD - Bay Area Air Quality Management District
DBR - daily breathing rate
ED - exposure duration
EF - exposure frequency
FAH - fraction of time at home
IF_{inh} - intake factor
kg - kilogram
L - liter
m^3 - cubic meter
OEHHA - Office of Environmental Health Hazard Assessment

References:

BAAQMD. 2016. Air Toxics NSR ProgramHealth Risk Assessment (HRA) Guidelines. January.
OEHHA. 2015. Air Toxics Hot Spots Program Risk Assessment Guidelines. Guidance Manual for Preparation of Health Risk Assessments. February.

Table 3
Health Risk Assessment
2675 Geary Whole Foods Market
San Francisco, California

Receptor Type	Hourly Dispersion Factor[1]	Annual Dispersion Factor[2]	PM_{10} Emission Rate	Annual PM_{10} Concentration (C)	Inhalation Factor (IF_{inh})	Cancer Potency Factor (CPF)	Lifetime Cancer Risk
	[$ug/m^3/g/s$]	[$ug/m^3/g/s$]	[g/s]	[ug/m^3]	[$m^3/kg\text{-}day]^{-1}$	[mg/kg-day]	[in a million]
Daycare Child	544	54.4	1.55E-04	8.46E-03	0.28	1.1	2.6
Resident Child	194.9	19.49	1.55E-04	3.03E-03	0.68	1.1	2.3

Notes:

1. Maximum hourly dispersion factor as reported by AERSCREEN at the nearest distance of each receptor type from the edge of the loading dock area. See Appendix A for model parameters.

2. Annual dispersion factors calcualted as 0.1* Maximum Hourly Dispersion Factor, consistent with the AERSCREEN User Guide.

Calculation:

Cancer Risk = IF_{Inh} * C * CPF / CF

CF = 1000 ug/mg

Abbreviations:

g - gram
kg - kilogram
m3 - meters cubed
mg - miligram
PM10 - Particulate Matter less than 10 microns in diameter
s - second
ug - microgram

References:

United States Environmental Protection Agency. AERSCREEN User Guide (v16216). Available at: https://www.epa.gov/scram/air-quality-dispersion-modeling-screening-models

APPENDIX A
AERSCREEN OUTPUT FILES

AERSCREEN 16216 / AERMOD 19191 11/12/20
16:48:00

TITLE: Geary_WF_daycare_vol

********** VOLUME PARAMETERS **********

SOURCE EMISSION RATE: 1.0000 g/s 7.937 lb/hr
VOLUME HEIGHT: 2.55 meters 8.37 feet
INITIAL LATERAL DIMENSION: 1.96 meters 6.43 feet
INITIAL VERTICAL DIMENSION: 2.37 meters 7.78 feet
RURAL OR URBAN: URBAN
POPULATION: 4335391

FLAGPOLE RECEPTOR HEIGHT: 10.90 meters 35.76 feet

INITIAL PROBE DISTANCE = 300. meters 984. feet

********** BUILDING DOWNWASH PARAMETERS **********

BUILDING DOWNWASH NOT USED FOR NON-POINT SOURCES

********** PROBE ANALYSIS **********
25 meter receptor spacing: 5. meters - 300. meters

	Zo SECTOR	ROUGHNESS LENGTH	1-HR CONC (ug/m3)	DIST (m)	TEMPORAL PERIOD
1*	1.000	2074.	5.2	SUM

* = worst case flow sector

********** 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: Summer

ALBEDO: 0.16
BOWEN RATIO: 2.00
ROUGHNESS LENGTH: 1.000 (meters)

SURFACE FRICTION VELOCITY (U*) ADJUSTED

METEOROLOGY CONDITIONS USED TO PREDICT OVERALL MAXIMUM IMPACT

YR MO DY JDY HR
-- -- -- --- --
10 01 18 18 12

H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS
155.88	0.179	1.200	0.020	340.	174.	-2.8	1.000	2.00	0.16	0.50

HT	REF TA	HT
10.0	250.0	2.0

METEOROLOGY CONDITIONS USED TO PREDICT AMBIENT BOUNDARY IMPACT

YR MO DY JDY HR
-- -- -- --- --
10 01 18 18 12

H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS
155.88	0.179	1.200	0.020	340.	174.	-2.8	1.000	2.00	0.16	0.50

HT	REF TA	HT
10.0	250.0	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)
5.21	2074.	150.00	100.1
25.00	806.8	175.00	78.57
36.00	544.9	200.00	63.55
50.00	416.2	225.00	52.53
75.00	268.8	250.00	44.20
80.00	247.0	275.00	37.77
100.00	181.6	300.00	32.70
125.00	131.7		

********** AERSCREEN MAXIMUM IMPACT SUMMARY **********

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	2074.	2074.	1866.	1244.	207.4

DISTANCE FROM SOURCE 5.21 meters

IMPACT AT THE AMBIENT BOUNDARY	2074.	2074.	1866.	1244.	207.4

DISTANCE FROM SOURCE 5.21 meters

AERSCREEN 16216 / AERMOD 19191 11/12/20
17:10:59

TITLE: Geary_WF_resident_vol

********** VOLUME PARAMETERS **********

SOURCE EMISSION RATE: 1.0000 g/s 7.937 lb/hr
VOLUME HEIGHT: 2.55 meters 8.37 feet
INITIAL LATERAL DIMENSION: 1.96 meters 6.43 feet
INITIAL VERTICAL DIMENSION: 2.37 meters 7.78 feet
RURAL OR URBAN: URBAN
POPULATION: 4335391

FLAGPOLE RECEPTOR HEIGHT: 1.80 meters 5.91 feet

INITIAL PROBE DISTANCE = 300. meters 984. feet

********** BUILDING DOWNWASH PARAMETERS **********

BUILDING DOWNWASH NOT USED FOR NON-POINT SOURCES

********** PROBE ANALYSIS **********
25 meter receptor spacing: 5. meters - 300. meters

	Zo SECTOR	ROUGHNESS LENGTH	1-HR CONC (ug/m3)	DIST (m)	TEMPORAL PERIOD
1*	1.000	0.1858E+05	5.2	AUT

* = worst case flow sector

********** 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: Autumn

ALBEDO: 0.18
BOWEN RATIO: 2.00
ROUGHNESS LENGTH: 1.000 (meters)

SURFACE FRICTION VELOCITY (U*) ADJUSTED

METEOROLOGY CONDITIONS USED TO PREDICT OVERALL MAXIMUM IMPACT

YR MO DY JDY HR
-- -- -- --- --
10 01 13 13 12

H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS
3.41	0.110	0.600	0.020	2182.	84.	-33.8	1.000	2.00	0.18	0.50

HT	REF TA	HT
10.0	280.0	2.0

METEOROLOGY CONDITIONS USED TO PREDICT AMBIENT BOUNDARY IMPACT

YR MO DY JDY HR
-- -- -- --- --
10 01 13 13 12

H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS
3.41	0.110	0.600	0.020	2182.	84.	-33.8	1.000	2.00	0.18	0.50

HT	REF TA	HT
10.0	280.0	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)
5.21	0.1858E+05	150.00	66.23
25.00	1554.	175.00	50.93
36.00	782.5	200.00	43.53
50.00	440.8	225.00	37.84
75.00	217.9	250.00	33.12
80.00	194.9	275.00	29.21
100.00	132.6	300.00	25.95
125.00	90.44		

********** AERSCREEN MAXIMUM IMPACT SUMMARY **********

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	0.1858E+05	0.1858E+05	0.1672E+05	0.1115E+05	1858.

DISTANCE FROM SOURCE 5.21 meters

IMPACT AT THE
AMBIENT BOUNDARY 0.1858E+05 0.1858E+05 0.1672E+05 0.1115E+05 1858.

DISTANCE FROM SOURCE 5.21 meters