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MEMORANDUM

DATE: February 2, 2017

TO:
Stephen Marshall, AICP
City of Novato, Community Development Department
922 Machin Avenue
Novato, CA 94945

FROM:
Lynette Dias, Principal-in-Charge
Carla Violet, Senior Planner
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cviolet@up-partners.com

RE: Errata to Novato Main Gate and "C" Street Initial Study/Mitigated Negative Declaration

Urban Planning Partners has prepared this Errata to the Initial Study/Mitigated Negative Declaration (IS/MND), published in October 2016, for the Main Gate and "C" Street Project (project) based on new information provided by the City related to the air quality and hazards analyses. The new information does not change any of the findings or conclusions of the IS/MND and does not constitute "significant new information" pursuant to CEQA Guidelines Section 15088.5. Therefore, recirculation of the IS/MND is not required. Changes to the IS/MND, as outlined below, were initiated by staff subsequent to publication of the IS/MND to correct information discovered after the release of the IS/MND.

The North Bay Children's Center (NBCC) project was inadvertently omitted from the cumulative list of projects proposed in the vicinity of the Main Gate project site that are either undergoing development review, approved and yet to be constructed, or initiating construction. The NBCC project includes demolition of its current facilities, and construction of a new childcare center and administrative offices. During demolition and construction, children would possibly be relocated in portable classrooms in an existing parking lot behind and to the east of NBCC's current facility (shown in Figure 1 of the attached Memo). The temporary relocation of facilities would result in a new sensitive receptor location that should have been considered for construction risk air quality impacts from the project. In addition, the NBCC project should have been considered and as part of the Main Gate project's cumulative construction risk assessment for both air quality and hazards.

Air Quality Project Construction Impacts

Illingworth & Rodkin performed the updated air quality analysis which involved modeling community risk impacts from project construction at the NBCC relocation area. The results showed a maximum increased

cancer risk of 10.3 excess cancer cases per million for an infant exposure, which is above the Bay Area Air Quality Management District (BAAQMD) significance threshold of 10 in one million. The excess cancer risk would be lower than the results in the IS/MND (17.9 in one million at the current NBCC location as shown on page 30 of the IS/MND), however, implementation of Mitigation Measures AIR-1 and AIR-2 would still be required to mitigate this impact to a less-than-significant level. With mitigation, the cancer risk would drop to 2.3 excess cancer cases per million for an infant exposure.

A maximum annual $PM_{2.5}$ concentration of 0.1 $\mu g/m^3$ and Hazard Index (HI) of 0.01 would also occur at the NBCC, but would be below the BAAQMD significance thresholds of 0.3 $\mu g/m^3$ and 1.0 HI. With mitigation, the annual $PM_{2.5}$ concentration would decrease to 0.02 $\mu g/m^3$ and the HI would become 0.00 HI.

Air Quality Cumulative Construction Risk Impacts

The updated cumulative construction risk assessment for air quality includes U.S. Highway 101 and the Sonoma-Marin Area Rail Transit (SMART) Station at Hamilton in addition to construction of the NBCC project occurring at the same time as the Main Gate project (along with the other cumulative construction projects previously evaluated[1]), but after the remediation phase planned at the Main Gate site. The analysis resulted in a maximum increased cancer risk of 61.5 in one million for an infant exposure at the temporary NBCC site (with a 48.4 in one million cancer risk due to the NBCC project affecting its own temporary facility) and less than 24.7 in one million at the residential maximally exposed individual (MEI). These risk values are higher than the results in the IS/MND shown on page 34 (19.6 and 12.3 in one million at the NBCC and residential MEI, respectively); however, they are still below the BAAQMD cumulative threshold of 100 in one million.

With implementation of Mitigation Measures AIR-1 and AIR-2, mitigated project construction cancer risk with the cumulative construction projects would be 52.5 in one million at the NBCC. Again, this risk value would be below the BAAQMD cumulative threshold of 100 in one million.

Under cumulative conditions, maximum annual $PM_{2.5}$ concentration would be less than 0.7 $\mu g/m^3$ at both the NBCC and residential MEI. A HI of less than 0.4 and 0.5 would occur at the NBCC and residential MEI, respectively. However, this would be below the BAAQMD cumulative threshold of 0.8 $\mu g/m^3$ and 10.0 HI. With Mitigation Measures AIR-1 and AIR-2, annual $PM_{2.5}$ concentration would be less than 0.6 $\mu g/m^3$ at both the NBCC and residential MEI. With mitigation, a HI of less than 0.3 and 0.4 would occur at the NBCC and residential MEI, respectively.

Hazards Cumulative Construction Risk Impacts

The NBCC project would be added to the five other projects in the vicinity of the project site included in the hazards cumulative analysis. A narrative of the NBCC project is provided below, including location relative to the project site, approval status, and timing of construction.

[1] Cumulative construction projects evaluated in the previous Air Quality analysis included the 801 State Access Senior Apartments and the Hamilton Cottages.

This NBCC project involves the construction of a new childcare center with administrative offices on a 1.34-acre site located at 932 C Street just east of the project site. The City has an open application for Design Review and is in the early stages of considering the proposal's site design. The project requires creation of a Precise Development Plan. The requested entitlements require review by the Design Review Commission, Planning Commission, and City Council. The entitlement phase is expected to take six- to eight-months with demolition and construction possibly starting in late summer 2017 at the earliest or later in the fall.

As discussed in the IS/MND, hazard risks associated with the Main Gate project are related to the excavation and off-hauling of contaminated soil from the project site. Cumulative hazard risks could occur where soil remediation or excavation is performed on another nearby contaminated site(s) at the same time as that proposed for the Main Gate project site.

The NBCC project site was the subject of multiple reviews with respect to site contamination, including a Finding of Suitability to Transfer (FOST) issued by the U.S. Navy and subsequent letters of no further action and concurrence by the California Department of Toxic Substances Control. The noted documents conclude no actual or potential hazardous substances release was indicated which would pose a threat to human health or the environment under any land use. The NBCC site is not subject to any further investigation, require any remediation activities, or limited by any land use covenant due to hazardous materials contamination.

The NBCC project does not present a cumulative risk in conjunction with the Main Gate project since the NBCC site is not contaminated. Notably, the demolition, excavation, and construction activities planned for the NBCC project would occur after the remediation effort at the Main Gate site. Based on these observations, the addition of the NBCC project to the cumulative hazard analysis for the Main Gate project does not change any of the findings or conclusions of the IS/MND with respect to cumulative hazard impacts. Accordingly, implementation of the Main Gate project coupled with other projects in the vicinity would not contribute to any potentially significant cumulative impacts related to hazardous materials.

Attachment
Illingworth & Rodkin Memo, North Bay Children's Center Temporary Relocation Construction Risk Assessment, dated December 28, 2016

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M E M O

Date: December 28, 2016

To: Carla Violet
Urban Planning Partners, Inc.

From: Joshua Carman

RE: **Main Gate and "C" Street Project, Novato, CA**
SUBJECT: **North Bay Children's Center Temporary Relocation Construction Risk Assessment** Job# 14-051

Illingworth & Rodkin, Inc. prepared the AQ assessment for this project. This study addressed air quality, greenhouse gas, and community risk impacts that would be attributable to implementation of the proposed project. Since then, we understand that planned construction has been identified at the North Bay Children's Center (NBCC), which would require the temporary relocation of facilities as shown in Figure 1, and that this new sensitive receptor location should be considered for construction risk impacts from the project and as part of the cumulative construction risk assessment.

Community risk impacts from project construction were modeled at the NBCC relocation area using the same risk methodology described in the IS/MND. The maximum increased cancer risk of 10.3 excess cancer cases per million would occur at the NBCC relocation area for an infant exposure, which is above the BAAQMD significance threshold of 10.0 in one million. The maximum annual $PM_{2.5}$ concentration of 0.1 $\mu g/m^3$ and Hazard Index (HI) of 0.01 would also occur at the NBCC, but would be below the BAAQMD significance thresholds of 0.3 $\mu g/m^3$ and 1.0 HI. Figure 1 shows the locations of the maximum residential and non-residential infant/child cancer risks. Though excess cancer risk would be lower than computed in the IS/MND (17.9 in one million at the NBCC), implementation of Mitigation Measures AIR-1 and AIR-2 would still be required and would mitigate this impact to a level of less than significant.

Cumulative Construction TAC Exposure

CalEEMod was used to model construction emissions from the NBCC project, which included the following land uses: 16,168 square feet (sf) entered as "Day-Care Center," 3,656 sf entered as "General Office Building" for the administrative wing, and 59 spaces entered as "Parking Lot" on a 1.34-acre site. The model defaults for schedule and equipment were used for a project of this type and size. It was assumed that construction would begin in 2017. Construction occurring later than 2017 would result in lower emissions. Construction emissions were then

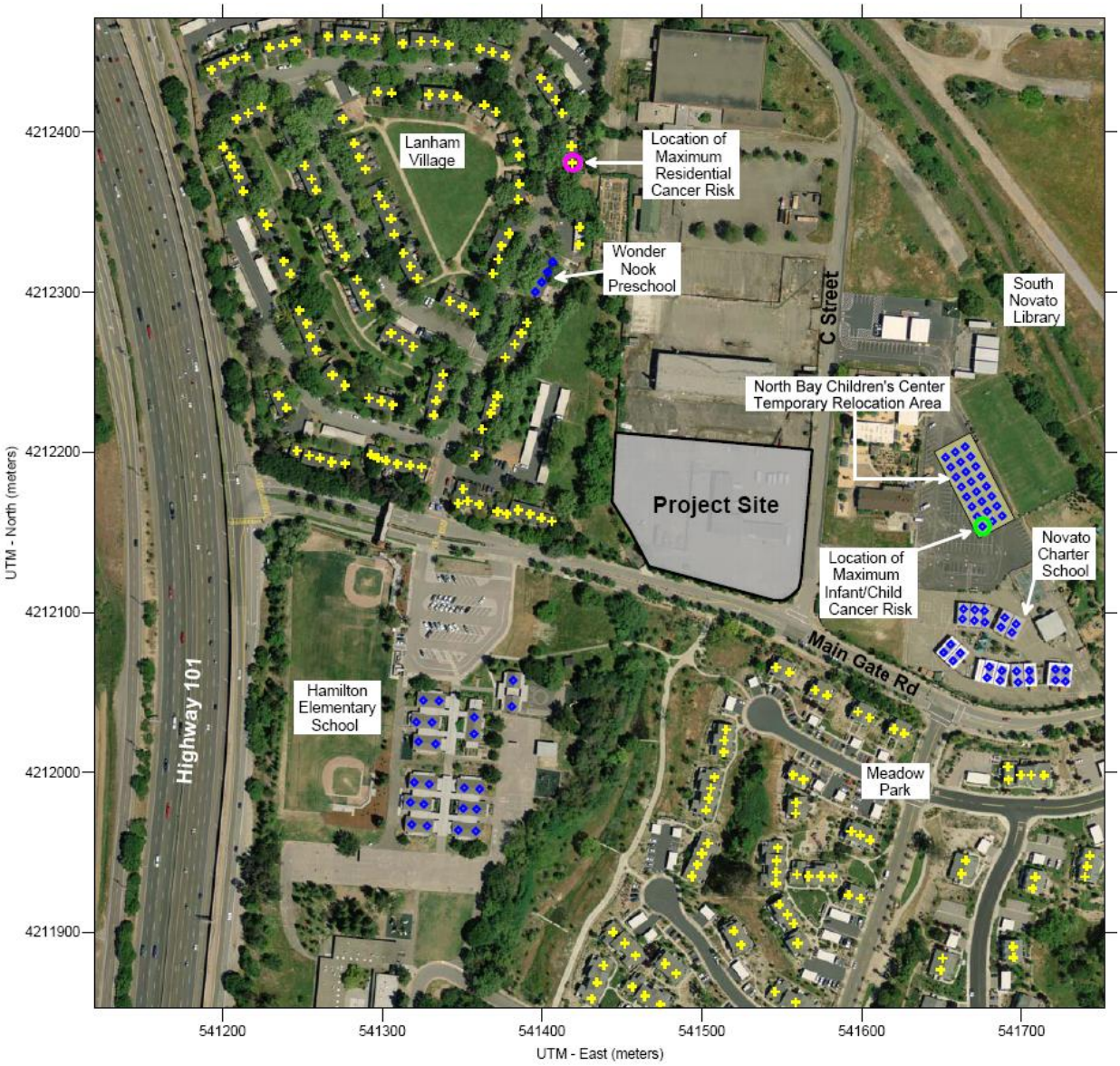
input to the U.S. EPA ISCST3 dispersion model to estimate health risk using the same methodology described in the IS/MND. The cumulative construction scenario included four projects: the proposed project, the 801 State Access project, the Hamilton Cottages project, and the NBCC project. Results of modeling are shown in Table 1, including nearby existing sources, and indicate that the maximum increased cancer risks would be less than 61.5 in one million at the NBCC (with 48.4 in one million cancer risk due to the NBCC project affecting the NBCC temporary relocation area) and less than 24.7 in one million at the residential maximally exposed individual (MEI), respectively. These risk values would be below the BAAQMD cumulative threshold of 100 in one million. Annual $PM_{2.5}$ concentration at the NBCC would be less than 0.7 $\mu g/m^3$, and would be less than 0.7 $\mu g/m^3$ at the residential MEI, which are below the BAAQMD threshold of 0.8 $\mu g/m^3$. HI at the MEIs would be well below the BAAQMD cumulative threshold of 10.0. *Attachment A* includes the NBCC CalEEMod output and risk modeling calculations.

TABLE 1 CUMULATIVE HEALTH RISK IMPACTS FROM CONSTRUCTION

Sensitive Receptor Type	Cancer Risk (per million)	Maximum Annual $PM_{2.5}$ ($\mu g/m^3$)	Hazard Index
Residential – Infant			
Cumulative Construction	17.9	<0.4	<0.4
U.S. Highway 101 at 800 feet or greater	5.8	<0.2	<0.1
SMART at over 30 feet	<1.0	<0.1	--
Total	<24.7	<0.7	<0.5
BAAQMD Thresholds	*>100.0*	*>0.8*	*>10.0*
Exceed Threshold?	No	No	No
North Bay Children's Center - Infant			
Cumulative Construction	60.5	<0.6	<0.4
U.S. Highway 101[1]	--	--	--
SMART at over 30 feet	<1.0	<0.1	--
Total	<61.5	<0.7	<0.4
BAAQMD Thresholds	*>100.0*	*>0.8*	*>10.0*
Exceed Threshold?	No	No	No

Note: [1]U.S. Highway 101 is over 1,000 feet from this receptor

FIGURE 1 PROJECT SITE, CONSTRUCTION AREA, AND OFF-SITE SENSITIVE RECEPTORS



Attachment A

NBCC - Construction TAC

Marin County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Day-Care Center	16.17	1000sqft	1.34	16,168.00	0
General Office Building	3.66	1000sqft	0.00	3,656.00	0
Parking Lot	59.00	Space	0.00	23,600.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	69
Climate Zone	5			**Operational Year**	2014
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Land Use - from plan drawings

Trips and VMT - 0.5mi trip lengths for risk assessment

Table Name	Column Name	Default Value	New Value
tblLandUse	LotAcreage	0.37	1.34
tblLandUse	LotAcreage	0.08	0.00
tblLandUse	LotAcreage	0.53	0.00
tblTripsAndVMT	HaulingTripLength	20.00	0.50
tblTripsAndVMT	HaulingTripLength	20.00	0.50
tblTripsAndVMT	HaulingTripLength	20.00	0.50

tblTripsAndVMT	HaulingTripLength	20.00	0.50
tblTripsAndVMT	HaulingTripLength	20.00	0.50
tblTripsAndVMT	HaulingTripLength	20.00	0.50
tblTripsAndVMT	VendorTripLength	7.30	0.50
tblTripsAndVMT	VendorTripLength	7.30	0.50
tblTripsAndVMT	VendorTripLength	7.30	0.50
tblTripsAndVMT	VendorTripLength	7.30	0.50
tblTripsAndVMT	VendorTripLength	7.30	0.50
tblTripsAndVMT	VendorTripLength	7.30	0.50
tblTripsAndVMT	WorkerTripLength	12.40	0.50
tblTripsAndVMT	WorkerTripLength	12.40	0.50
tblTripsAndVMT	WorkerTripLength	12.40	0.50
tblTripsAndVMT	WorkerTripLength	12.40	0.50
tblTripsAndVMT	WorkerTripLength	12.40	0.50
tblTripsAndVMT	WorkerTripLength	12.40	0.50

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2017	0.4548	2.3304	1.8445	2.6000e-003	0.0167	0.1467	0.1634	8.3000e-003	0.1408	0.1491	0.0000	221.4904	221.4904	0.0478	0.0000	222.4933
Total	**0.4548**	**2.3304**	**1.8445**	**2.6000e-003**	**0.0167**	**0.1467**	**0.1634**	**8.3000e-003**	**0.1408**	**0.1491**	**0.0000**	**221.4904**	**221.4904**	**0.0478**	**0.0000**	**222.4933**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2017	1/27/2017	5	20	
2	Site Preparation	Site Preparation	1/28/2017	1/31/2017	5	2	
3	Grading	Grading	2/1/2017	2/6/2017	5	4	
4	Building Construction	Building Construction	2/7/2017	11/13/2017	5	200	
5	Paving	Paving	11/14/2017	11/27/2017	5	10	
6	Architectural Coating	Architectural Coating	11/28/2017	12/11/2017	5	10	

Acres of Grading (Site Preparation Phase): 1

Acres of Grading (Grading Phase): 1.5

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 30,798; Non-Residential Outdoor: 10,266 (Architectural Coating –

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Rubber Tired Dozers	1	8.00	255	0.40
Demolition	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Site Preparation	Graders	1	8.00	174	0.41
Site Preparation	Rubber Tired Dozers	1	7.00	255	0.40
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Grading	Graders	1	6.00	174	0.41
Grading	Rubber Tired Dozers	1	6.00	255	0.40
Grading	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Building Construction	Cranes	1	6.00	226	0.29
Building Construction	Forklifts	1	6.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74

Building Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Building Construction	Welders	3	8.00	46	0.45
Paving	Cement and Mortar Mixers	1	6.00	9	0.56
Paving	Pavers	1	6.00	125	0.42
Paving	Paving Equipment	1	8.00	130	0.36
Paving	Rollers	1	7.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	5	13.00	0.00	0.00	0.50	0.50	0.50	LD_Mix	HDT_Mix	HHDT
Site Preparation	3	8.00	0.00	0.00	0.50	0.50	0.50	LD_Mix	HDT_Mix	HHDT
Grading	3	8.00	0.00	0.00	0.50	0.50	0.50	LD_Mix	HDT_Mix	HHDT
Building Construction	7	18.00	7.00	0.00	0.50	0.50	0.50	LD_Mix	HDT_Mix	HHDT
Paving	5	13.00	0.00	0.00	0.50	0.50	0.50	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	4.00	0.00	0.00	0.50	0.50	0.50	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0272	0.2659	0.2087	2.4000e-004		0.0161	0.0161		0.0150	0.0150	0.0000	22.2938	22.2938	5.6600e-003	0.0000	22.4126

Total	**0.0272**	**0.2659**	**0.2087**	**2.4000e-004**		**0.0161**	**0.0161**		**0.0150**	**0.0150**	**0.0000**	**22.2938**	**22.2938**	**5.6600e-003**	**0.0000**	**22.4126**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.2000e-004	9.0000e-005	1.1700e-003	0.0000	5.0000e-005	0.0000	5.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0671	0.0671	1.0000e-005	0.0000	0.0672
Total	**3.2000e-004**	**9.0000e-005**	**1.1700e-003**	**0.0000**	**5.0000e-005**	**0.0000**	**5.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0671**	**0.0671**	**1.0000e-005**	**0.0000**	**0.0672**

3.3 Site Preparation - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					5.8000e-003	0.0000	5.8000e-003	2.9500e-003	0.0000	2.9500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.3100e-003	0.0242	0.0159	2.0000e-005		1.3100e-003	1.3100e-003		1.2000e-003	1.2000e-003	0.0000	1.5895	1.5895	4.9000e-004	0.0000	1.5997
Total	**2.3100e-003**	**0.0242**	**0.0159**	**2.0000e-005**	**5.8000e-003**	**1.3100e-003**	**7.1100e-003**	**2.9500e-003**	**1.2000e-003**	**4.1500e-003**	**0.0000**	**1.5895**	**1.5895**	**4.9000e-004**	**0.0000**	**1.5997**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.0000e-005	1.0000e-005	7.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	4.1300e-003	4.1300e-003	0.0000	0.0000	4.1400e-003
Total	**2.0000e-005**	**1.0000e-005**	**7.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**4.1300e-003**	**4.1300e-003**	**0.0000**	**0.0000**	**4.1400e-003**

3.4 Grading - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					9.8300e-003	0.0000	9.8300e-003	5.0500e-003	0.0000	5.0500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.7700e-003	0.0396	0.0264	3.0000e-005		2.1300e-003	2.1300e-003		1.9600e-003	1.9600e-003	0.0000	2.6112	2.6112	8.0000e-004	0.0000	2.6280
Total	**3.7700e-003**	**0.0396**	**0.0264**	**3.0000e-005**	**9.8300e-003**	**2.1300e-003**	**0.0120**	**5.0500e-003**	**1.9600e-003**	**7.0100e-003**	**0.0000**	**2.6112**	**2.6112**	**8.0000e-004**	**0.0000**	**2.6280**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.0000e-005	1.0000e-005	1.4000e-004	0.0000	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	8.2600e-003	8.2600e-003	0.0000	0.0000	8.2700e-003
Total	**4.0000e-005**	**1.0000e-005**	**1.4000e-004**	**0.0000**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**8.2600e-003**	**8.2600e-003**	**0.0000**	**0.0000**	**8.2700e-003**

3.5 Building Construction - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2955	1.9109	1.4311	2.2000e-003		0.1226	0.1226		0.1182	0.1182	0.0000	184.5473	184.5473	0.0387	0.0000	185.3605
Total	**0.2955**	**1.9109**	**1.4311**	**2.2000e-003**		**0.1226**	**0.1226**		**0.1182**	**0.1182**	**0.0000**	**184.5473**	**184.5473**	**0.0387**	**0.0000**	**185.3605**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	6.3500e-003	0.0171	0.0895	2.0000e-005	3.2000e-004	1.0000e-004	4.2000e-004	9.0000e-005	9.0000e-005	1.8000e-004	0.0000	2.0070	2.0070	3.0000e-005	0.0000	2.0076

Worker	4.4700e-003	1.1900e-003	0.0162	1.0000e-005	6.7000e-004	2.0000e-005	6.9000e-004	1.8000e-004	2.0000e-005	2.0000e-004	0.0000	0.9287	0.9287	8.0000e-005	0.0000	0.9304
Total	**0.0108**	**0.0183**	**0.1057**	**3.0000e-005**	**9.9000e-004**	**1.2000e-004**	**1.1100e-003**	**2.7000e-004**	**1.1000e-004**	**3.8000e-004**	**0.0000**	**2.9357**	**2.9357**	**1.1000e-004**	**0.0000**	**2.9381**

3.6 Paving - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	5.9300e-003	0.0605	0.0452	7.0000e-005		3.6700e-003	3.6700e-003		3.3800e-003	3.3800e-003	0.0000	6.1129	6.1129	1.8400e-003	0.0000	6.1515
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**5.9300e-003**	**0.0605**	**0.0452**	**7.0000e-005**		**3.6700e-003**	**3.6700e-003**		**3.3800e-003**	**3.3800e-003**	**0.0000**	**6.1129**	**6.1129**	**1.8400e-003**	**0.0000**	**6.1515**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.6000e-004	4.0000e-005	5.9000e-004	0.0000	2.0000e-005	0.0000	3.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0335	0.0335	0.0000	0.0000	0.0336
Total	**1.6000e-004**	**4.0000e-005**	**5.9000e-004**	**0.0000**	**2.0000e-005**	**0.0000**	**3.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0335**	**0.0335**	**0.0000**	**0.0000**	**0.0336**

3.7 Architectural Coating - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.1071					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.6600e-003	0.0109	9.3400e-003	1.0000e-005		8.7000e-004	8.7000e-004		8.7000e-004	8.7000e-004	0.0000	1.2766	1.2766	1.3000e-004	0.0000	1.2795
Total	**0.1087**	**0.0109**	**9.3400e-003**	**1.0000e-005**		**8.7000e-004**	**8.7000e-004**		**8.7000e-004**	**8.7000e-004**	**0.0000**	**1.2766**	**1.2766**	**1.3000e-004**	**0.0000**	**1.2795**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.0000e-005	1.0000e-005	1.8000e-004	0.0000	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0103	0.0103	0.0000	0.0000	0.0103
Total	**5.0000e-005**	**1.0000e-005**	**1.8000e-004**	**0.0000**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0103**	**0.0103**	**0.0000**	**0.0000**	**0.0103**

Construction Health Risk Modeling Emissions and Risk Calculations

Maximum Impacts at North Bay Children's Center - Infant Exposures

Construction Year	UNMITIGATED				
	Maximum Concentrations		Infant Cancer Risk (per million)	Hazard Index (-)	Maximum Annual PM2.5 Concentration ($\mu g/m^3$)
	Exhaust PM2.5/DPM ($\mu g/m^3$)	Fugitive PM2.5 ($\mu g/m^3$)			
2016-2017	0.0629	0.0412	**10.3**	**0.01**	**0.10**

Construction Year	MITIGATED				
	Maximum Concentrations		Infant Cancer Risk (per million)	Hazard Index (-)	Maximum Annual PM2.5 Concentration ($\mu g/m^3$)
	Exhaust PM2.5/DPM ($\mu g/m^3$)	Fugitive PM2.5 ($\mu g/m^3$)			
2016-2017	0.0141	0.0094	**2.3**	**0.00**	**0.02**

Novato - Main Gate, Novato, CA - Construction Impacts
Maximum DPM Cancer Risk Calculations From Construction
North Bay Children's Center - Infant Exposure

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 1.0E6

Where: CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$
ASF = Age sensitivity factor for specified age group
ED = Exposure duration (years)
AT = Averaging time for lifetime cancer risk (years)
FAH = Fraction of time spent at home (unitless)

Inhalation Dose = C_{air} x DBR x A x (EF/365) x 10^{-6}

Where: C_{air} = concentration in air ($\mu g/m^3$)
DBR = daily breathing rate (L/kg body weight-day)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
10^{-6} = Conversion factor

Values

	Infant/Child			Adult
Age -->	**3rd Trimester**	**0 - 2**	**2 - 16**	**16 - 30**
Parameter				
ASF =	10	10	3	1
CPF =	1.10E+00	1.10E+00	1.10E+00	1.10E+00
DBR* =	361	1090	572	261
A =	1	1	1	1
EF =	350	350	350	350
AT =	70	70	70	70
FAH =	1.00	1.00	1.00	0.73

* 95th percentile breathing rates for infants and 80th percentile for children and adults

Construction Cancer Risk by Year - Maximum Impact Receptor Location

		Infant - Exposure Information					
Exposure Year	**Exposure Duration (years)**	**DPM Conc (ug/m3) Year**	**Annual**	**Age* Sensitivity Factor**	**Infant Cancer Risk (per million)**	**Fugitive PM2.5**	**Total PM2.5**
2016-2017	1	2016-2017	0.0629	10	**10.3**	0.0412	0.10

* Assumes infant exposure

Novato - Main Gate, Novato, CA - Construction Impacts
Maximum DPM Cancer Risk Calculations From Construction
North Bay Children's Center - Child Exposures

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 1.0E6

Where: CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$
ASF = Age sensitivity factor for specified age group
ED = Exposure duration (years)
AT = Averaging time for lifetime cancer risk (years)
FAH = Fraction of time spent at home (unitless)

Inhalation Dose = C_{air} x DBR x A x (EF/365) x 10^{-6}

Where: C_{air} = concentration in air $(\mu g/m^3)$
DBR = daily breathing rate (L/kg body weight-day)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
10^{-6} = Conversion factor

Values

	Infant/Child			Adult
Age -->	**3rd Trimester**	**0 - 2**	**2 - 16**	**16 - 30**
Parameter				
ASF =	10	10	3	1
CPF =	1.10E+00	1.10E+00	1.10E+00	1.10E+00
DBR* =	361	1090	572	261
A =	1	1	1	1
EF =	350	350	350	350
AT =	70	70	70	70
FAH =	1.00	1.00	1.00	0.73

* 95th percentile breathing rates for infants and 80th percentile for children and adults

Construction Cancer Risk by Year - Maximum Impact Receptor Location

		Student - Exposure Information			Student		
		DPM Conc (ug/m3)		Age*	Cancer		
Exposure Year	**Exposure Duration (years)**	**Year**	**Annual**	**Sensitivity Factor**	**Risk (per million)**	**Fugitive PM2.5**	**Total PM2.5**
2016-2017	1	2016-2017	0.0629	3	**1.6**	0.0412	0.10

* Children assumed to be2 years of age or older

Novato - Main Gate, Novato, CA - Construction Impacts - Mitigated Emissions
Maximum DPM Cancer Risk Calculations From Construction
North Bay Children's Center - Infant Exposure

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 1.0E6

Where: CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$
ASF = Age sensitivity factor for specified age group
ED = Exposure duration (years)
AT = Averaging time for lifetime cancer risk (years)
FAH = Fraction of time spent at home (unitless)

Inhalation Dose = C_{air} x DBR x A x (EF/365) x 10^{-6}

Where: C_{air} = concentration in air ($\mu g/m^3$)
DBR = daily breathing rate (L/kg body weight-day)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
10^{-6} = Conversion factor

Values

	Infant/Child			Adult
Age -->	**3rd Trimester**	**0 - 2**	**2 - 16**	**16 - 30**
Parameter				
ASF =	10	10	3	1
CPF =	1.10E+00	1.10E+00	1.10E+00	1.10E+00
DBR* =	361	1090	572	261
A =	1	1	1	1
EF =	350	350	350	350
AT =	70	70	70	70
FAH =	1.00	1.00	1.00	0.73

* 95th percentile breathing rates for infants and 80th percentile for children and adults

Construction Cancer Risk by Year - Maximum Impact Receptor Location

		Infant - Exposure Information			Infant		
Exposure Year	**Exposure Duration (years)**	**DPM Conc (ug/m3) Year**	**Annual**	**Age* Sensitivity Factor**	**Cancer Risk (per million)**	**Fugitive PM2.5**	**Total PM2.5**
2016-2017	1	2016-2017	0.0141	10	**2.3**	0.0094	0.02

* Assumes infant exposure

Novato - Main Gate, Novato, CA - Construction Impacts - Mitigated Emissions
Maximum DPM Cancer Risk Calculations From Construction
North Bay Children's Center - Child Exposures

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 1.0E6

Where: CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$
ASF = Age sensitivity factor for specified age group
ED = Exposure duration (years)
AT = Averaging time for lifetime cancer risk (years)
FAH = Fraction of time spent at home (unitless)

Inhalation Dose = C_{air} x DBR x A x (EF/365) x 10^{-6}

Where: C_{air} = concentration in air ($\mu g/m^3$)
DBR = daily breathing rate (L/kg body weight-day)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
10^{-6} = Conversion factor

Values

	Infant/Child			Adult
Age -->	**3rd Trimester**	**0 - 2**	**2 - 16**	**16 - 30**
Parameter				
ASF =	10	10	3	1
CPF =	1.10E+00	1.10E+00	1.10E+00	1.10E+00
DBR* =	361	1090	572	261
A =	1	1	1	1
EF =	350	350	350	350
AT =	70	70	70	70
FAH =	1.00	1.00	1.00	0.73

* 95th percentile breathing rates for infants and 80th percentile for children and adults

Construction Cancer Risk by Year - Maximum Impact Receptor Location

		Student - Exposure Information			Student		
		DPM Conc (ug/m3)		Age*	Cancer		
Exposure Year	**Exposure Duration (years)**	**Year**	**Annual**	**Sensitivity Factor**	**Risk (per million)**	**Fugitive PM2.5**	**Total PM2.5**
2016-2017	1	2016-2017	0.0141	3	**0.4**	0.0094	0.02

* Children assumed to be2 years of age or older

Cumulative Construction Health Risk Modeling Emissions and Risk Calculations

DPM Construction Emissions and Modeling Emission Rates - North Bay Children's Center

Construction Year	Activity	DPM (ton/year)	Area Source	DPM Emissions (lb/yr)	DPM Emissions (lb/hr)	DPM Emissions (g/s)	Modeled Area (m^2)	DPM Emission Rate ($g/s/m^2$)
2017	Construction	0.1408	CON_DPM	281.6	0.08572	1.08E-02	5,530	1.95E-06

Construction Hours

hr/day =	9	(7am - 4pm)
days/yr =	365	
hours/year =	3285	

PM2.5 Fugitive Dust Construction Emissions for Modeling - North Bay Children's Center

Construction Year	Activity	Area Source	PM2.5 Emissions (ton/year)	PM2.5 Emissions (lb/yr)	PM2.5 Emissions (lb/hr)	PM2.5 Emissions (g/s)	Modeled Area (m^2)	PM2.5 Emission Rate $g/s/m^2$
2017	Construction	CON_FUG	0.0083	16.6	0.00505	6.37E-04	5,530	1.15E-07

Construction Hours

hr/day =	9	(7am - 4pm)
days/yr =	365	
hours/year =	3285	

Novato - Main Gate, Novato, CA
Cumulative Construction Source Health Impact Summary

Construction Source	Maximum Health Impacts at Project MEI Locations: Exposure Type	Cancer Risk (per million)	Annual PM2.5 Concentration ($\mu g/m^3$)	Hazard Index (-)
Project	Residential	**7.8**	**<0.1**	**<0.1**
801 State Access Road	Residential	**1.2**	**<0.1**	**<0.1**
Hamilton Cottages	Residential	**3.3**	**<0.1**	**<0.1**
North Bay Children's Center	Residential	**5.6**	**<0.1**	**<0.1**
Total		**17.9**	**<0.4**	**<0.4**
Project	Infant/Child	**10.3**	**<0.1**	**<0.1**
801 State Access Road	Infant/Child	**0.7**	**<0.1**	**<0.1**
Hamilton Cottages	Infant/Child	**1.1**	**<0.1**	**<0.1**
North Bay Children's Center	Infant/Child	**48.4**	**0.3**	**<0.1**
Total		**60.5**	**<0.6**	**<0.4**

801 State Access, Novato, CA - Construction Impacts
Maximum DPM Cancer Risk Calculations From Construction
Off-Site Maximum Child Receptor - 1.25 meters

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 1.0E6

Where: CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$
ASF = Age sensitivity factor for specified age group
ED = Exposure duration (years)
AT = Averaging time for lifetime cancer risk (years)
FAH = Fraction of time spent at home (unitless)

Inhalation Dose = C_{air} x DBR x A x (EF/365) x 10^{-6}

Where: C_{air} = concentration in air ($\mu g/m^3$)
DBR = daily breathing rate (L/kg body weight-day)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
10^{-6} = Conversion factor

Values

	Infant/Child			Adult
Age --> / **Parameter**	**3rd Trimester**	**0 - 2**	**2 - 16**	**16 - 30**
ASF =	10	10	3	1
CPF =	1.10E+00	1.10E+00	1.10E+00	1.10E+00
DBR* =	361	1090	572	261
A =	1	1	1	1
EF =	350	350	350	350
AT =	70	70	70	70
FAH =	1.00	1.00	1.00	0.73

* 95th percentile breathing rates for infants and 80th percentile for children and adults

Construction Cancer Risk by Year - Maximum Impact Receptor Location

			Infant/Child - Exposure Information				Adult - Exposure Information					
			DPM Conc (ug/m3)				Modeled DPM Conc (ug/m3)					
Exposure Year	**Exposure Duration (years)**	**Age**	**Year**	**Annual**	**Age Sensitivity Factor**	**Infant/Child Cancer Risk (per million)**	**Year**	**Annual**	**Age Sensitivity Factor**	**Adult Cancer Risk (per million)**	**Fugitive PM2.5**	**Total PM2.5**
0	0.25	-0.25 - 0*	-	-	10	-	-	-	-	-	-	-
1	1	0 - 1	2016	0.0017	10	0.28	2016	0.0017	1	0.00	0.0034	0.005
2	1	1 - 2	2017	0.0027	10	0.44	2017	0.0027	1	0.01	0.0000	0.003
3	1	2 - 3	2018	0.0007	3	0.02	2018	0.0007	1	0.00	0.0000	0.001
4	1	3 - 4		0.0000	3	0.00		0.0000	1	0.00		
5	1	4 - 5		0.0000	3	0.00		0.0000	1	0.00		
6	1	5 - 6		0.0000	3	0.00		0.0000	1	0.00		
7	1	6 - 7		0.0000	3	0.00		0.0000	1	0.00		
8	1	7 - 8		0.0000	3	0.00		0.0000	1	0.00		
9	1	8 - 9		0.0000	3	0.00		0.0000	1	0.00		
10	1	9 - 10		0.0000	3	0.00		0.0000	1	0.00		
11	1	10 - 11		0.0000	3	0.00		0.0000	1	0.00		
12	1	11 - 12		0.0000	3	0.00		0.0000	1	0.00		
13	1	12 - 13		0.0000	3	0.00		0.0000	1	0.00		
14	1	13 - 14		0.0000	3	0.00		0.0000	1	0.00		
15	1	14 - 15		0.0000	3	0.00		0.0000	1	0.00		
16	1	15 - 16		0.0000	3	0.00		0.0000	1	0.00		
17	1	16-17		0.0000	1	0.00		0.0000	1	0.00		
18	1	17-18		0.0000	1	0.00		0.0000	1	0.00		
19	1	18-19		0.0000	1	0.00		0.0000	1	0.00		
20	1	19-20		0.0000	1	0.00		0.0000	1	0.00		
21	1	20-21		0.0000	1	0.00		0.0000	1	0.00		
22	1	21-22		0.0000	1	0.00		0.0000	1	0.00		
23	1	22-23		0.0000	1	0.00		0.0000	1	0.00		
24	1	23-24		0.0000	1	0.00		0.0000	1	0.00		
25	1	24-25		0.0000	1	0.00		0.0000	1	0.00		
26	1	25-26		0.0000	1	0.00		0.0000	1	0.00		
27	1	26-27		0.0000	1	0.00		0.0000	1	0.00		
28	1	27-28		0.0000	1	0.00		0.0000	1	0.00		
29	1	28-29		0.0000	1	0.00		0.0000	1	0.00		
30	1	29-30		0.0000	1	0.00		0.0000	1	0.00		
Total Increased Cancer Risk						**0.7**				**0.01**		

* Third trimester of pregnancy

Hamilton Cottages, Novato, CA - Construction Impacts
Maximum DPM Cancer Risk Calculations From Construction
Off-Site Maximum Child Receptor - 1.25 meters

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 1.0E6

Where: CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$
ASF = Age sensitivity factor for specified age group
ED = Exposure duration (years)
AT = Averaging time for lifetime cancer risk (years)
FAH = Fraction of time spent at home (unitless)

Inhalation Dose = C_{air} x DBR x A x (EF/365) x 10^{-6}

Where: C_{air} = concentration in air ($\mu g/m^3$)
DBR = daily breathing rate (L/kg body weight-day)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
10^{-6} = Conversion factor

Values

	Infant/Child			Adult
Age -->	**3rd Trimester**	**0 - 2**	**2 - 16**	**16 - 30**
Parameter				
ASF =	10	10	3	1
CPF =	1.10E+00	1.10E+00	1.10E+00	1.10E+00
DBR* =	361	1090	572	261
A =	1	1	1	1
EF =	350	350	350	350
AT =	70	70	70	70
FAH =	1.00	1.00	1.00	0.73

* 95th percentile breathing rates for infants and 80th percentile for children and adults

Construction Cancer Risk by Year - Maximum Impact Receptor Location

			Infant/Child - Exposure Information				Adult - Exposure Information					
			DPM Conc (ug/m3)		Age	Infant/Child	Modeled DPM Conc (ug/m3)		Age	Adult		
Exposure Year	**Exposure Duration (years)**	**Age**	**Year**	**Annual**	**Sensitivity Factor**	**Cancer Risk (per million)**	**Year**	**Annual**	**Sensitivity Factor**	**Cancer Risk (per million)**	**Fugitive PM2.5**	**Total PM2.5**
0	0.25	-0.25 - 0*	-	-	10	-	-	-	-	-	-	-
1	1	0 - 1	2017	0.0070	10	1.14	2017	0.0070	1	0.02	0.0005	0.01
2	1	1 - 2		0.0000	10	0.00		0.0000	1	0.00		
3	1	2 - 3		0.0000	3	0.00		0.0000	1	0.00		
4	1	3 - 4		0.0000	3	0.00		0.0000	1	0.00		
5	1	4 - 5		0.0000	3	0.00		0.0000	1	0.00		
6	1	5 - 6		0.0000	3	0.00		0.0000	1	0.00		
7	1	6 - 7		0.0000	3	0.00		0.0000	1	0.00		
8	1	7 - 8		0.0000	3	0.00		0.0000	1	0.00		
9	1	8 - 9		0.0000	3	0.00		0.0000	1	0.00		
10	1	9 - 10		0.0000	3	0.00		0.0000	1	0.00		
11	1	10 - 11		0.0000	3	0.00		0.0000	1	0.00		
12	1	11 - 12		0.0000	3	0.00		0.0000	1	0.00		
13	1	12 - 13		0.0000	3	0.00		0.0000	1	0.00		
14	1	13 - 14		0.0000	3	0.00		0.0000	1	0.00		
15	1	14 - 15		0.0000	3	0.00		0.0000	1	0.00		
16	1	15 - 16		0.0000	3	0.00		0.0000	1	0.00		
17	1	16-17		0.0000	1	0.00		0.0000	1	0.00		
18	1	17-18		0.0000	1	0.00		0.0000	1	0.00		
19	1	18-19		0.0000	1	0.00		0.0000	1	0.00		
20	1	19-20		0.0000	1	0.00		0.0000	1	0.00		
21	1	20-21		0.0000	1	0.00		0.0000	1	0.00		
22	1	21-22		0.0000	1	0.00		0.0000	1	0.00		
23	1	22-23		0.0000	1	0.00		0.0000	1	0.00		
24	1	23-24		0.0000	1	0.00		0.0000	1	0.00		
25	1	24-25		0.0000	1	0.00		0.0000	1	0.00		
26	1	25-26		0.0000	1	0.00		0.0000	1	0.00		
27	1	26-27		0.0000	1	0.00		0.0000	1	0.00		
28	1	27-28		0.0000	1	0.00		0.0000	1	0.00		
29	1	28-29		0.0000	1	0.00		0.0000	1	0.00		
30	1	29-30		0.0000	1	0.00		0.0000	1	0.00		
Total Increased Cancer Risk						**1.1**				**0.02**		

* Third trimester of pregnancy

North Bay Children's Center, Novato, CA - Construction Impacts
Maximum DPM Cancer Risk Calculations From Construction
Off-Site Maximum Residential Receptor - 1.5 meters

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 1.0E6

Where: CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$
ASF = Age sensitivity factor for specified age group
ED = Exposure duration (years)
AT = Averaging time for lifetime cancer risk (years)
FAH = Fraction of time spent at home (unitless)

Inhalation Dose = C_{air} x DBR x A x (EF/365) x 10^{-6}

Where: C_{air} = concentration in air ($\mu g/m^3$)
DBR = daily breathing rate (L/kg body weight-day)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
10^{-6} = Conversion factor

Values

	Infant/Child			Adult
Age -->	**3rd Trimester**	**0 - 2**	**2 - 16**	**16 - 30**
Parameter				
ASF =	10	10	3	1
CPF =	1.10E+00	1.10E+00	1.10E+00	1.10E+00
DBR* =	361	1090	572	261
A =	1	1	1	1
EF =	350	350	350	350
AT =	70	70	70	70
FAH =	1.00	1.00	1.00	0.73

* 95th percentile breathing rates for infants and 80th percentile for children and adults

Construction Cancer Risk by Year - Maximum Impact Receptor Location

			Infant/Child - Exposure Information				Adult - Exposure Information					
			DPM Conc (ug/m3)				Modeled DPM Conc (ug/m3)					
Exposure Year	**Exposure Duration (years)**	**Age**	**Year**	**Annual**	**Age Sensitivity Factor**	**Infant/Child Cancer Risk (per million)**	**Year**	**Annual**	**Age Sensitivity Factor**	**Adult Cancer Risk (per million)**	**Fugitive PM2.5**	**Total PM2.5**
0	0.25	-0.25 - 0*	-	-	10	-	-	-	-	-	-	-
1	1	0 - 1	2017	0.0344	10	5.65	2017	0.0344	1	0.10	0.0023	0.04
2	1	1 - 2		0.0000	10	0.00		0.0000	1	0.00		
3	1	2 - 3		0.0000	3	0.00		0.0000	1	0.00		
4	1	3 - 4		0.0000	3	0.00		0.0000	1	0.00		
5	1	4 - 5		0.0000	3	0.00		0.0000	1	0.00		
6	1	5 - 6		0.0000	3	0.00		0.0000	1	0.00		
7	1	6 - 7		0.0000	3	0.00		0.0000	1	0.00		
8	1	7 - 8		0.0000	3	0.00		0.0000	1	0.00		
9	1	8 - 9		0.0000	3	0.00		0.0000	1	0.00		
10	1	9 - 10		0.0000	3	0.00		0.0000	1	0.00		
11	1	10 - 11		0.0000	3	0.00		0.0000	1	0.00		
12	1	11 - 12		0.0000	3	0.00		0.0000	1	0.00		
13	1	12 - 13		0.0000	3	0.00		0.0000	1	0.00		
14	1	13 - 14		0.0000	3	0.00		0.0000	1	0.00		
15	1	14 - 15		0.0000	3	0.00		0.0000	1	0.00		
16	1	15 - 16		0.0000	3	0.00		0.0000	1	0.00		
17	1	16-17		0.0000	1	0.00		0.0000	1	0.00		
18	1	17-18		0.0000	1	0.00		0.0000	1	0.00		
19	1	18-19		0.0000	1	0.00		0.0000	1	0.00		
20	1	19-20		0.0000	1	0.00		0.0000	1	0.00		
21	1	20-21		0.0000	1	0.00		0.0000	1	0.00		
22	1	21-22		0.0000	1	0.00		0.0000	1	0.00		
23	1	22-23		0.0000	1	0.00		0.0000	1	0.00		
24	1	23-24		0.0000	1	0.00		0.0000	1	0.00		
25	1	24-25		0.0000	1	0.00		0.0000	1	0.00		
26	1	25-26		0.0000	1	0.00		0.0000	1	0.00		
27	1	26-27		0.0000	1	0.00		0.0000	1	0.00		
28	1	27-28		0.0000	1	0.00		0.0000	1	0.00		
29	1	28-29		0.0000	1	0.00		0.0000	1	0.00		
30	1	29-30		0.0000	1	0.00		0.0000	1	0.00		
Total Increased Cancer Risk						**5.6**				**0.10**		

* Third trimester of pregnancy

North Bay Children's Center, Novato, CA - Construction Impacts
Maximum DPM Cancer Risk Calculations From Construction
Off-Site Maximum Child Receptor - 1.25 meters

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 1.0E6

Where: CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$
ASF = Age sensitivity factor for specified age group
ED = Exposure duration (years)
AT = Averaging time for lifetime cancer risk (years)
FAH = Fraction of time spent at home (unitless)

Inhalation Dose = C_{air} x DBR x A x (EF/365) x 10^{-6}

Where: C_{air} = concentration in air ($\mu g/m^3$)
DBR = daily breathing rate (L/kg body weight-day)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
10^{-6} = Conversion factor

Values

	Infant/Child			Adult
Age --> / **Parameter**	**3rd Trimester**	**0 - 2**	**2 - 16**	**16 - 30**
ASF =	10	10	3	1
CPF =	1.10E+00	1.10E+00	1.10E+00	1.10E+00
DBR* =	361	1090	572	261
A =	1	1	1	1
EF =	350	350	350	350
AT =	70	70	70	70
FAH =	1.00	1.00	1.00	0.73

* 95th percentile breathing rates for infants and 80th percentile for children and adults

Construction Cancer Risk by Year - Maximum Impact Receptor Location

			Infant/Child - Exposure Information				Adult - Exposure Information					
			DPM Conc (ug/m3)				Modeled DPM Conc (ug/m3)					
Exposure Year	**Exposure Duration (years)**	**Age**	**Year**	**Annual**	**Age Sensitivity Factor**	**Infant/Child Cancer Risk (per million)**	**Year**	**Annual**	**Age Sensitivity Factor**	**Adult Cancer Risk (per million)**	**Fugitive PM2.5**	**Total PM2.5**
0	0.25	-0.25 - 0*	-	-	10	-	-	-	-	-	-	-
1	1	0 - 1	2017	0.2944	10	48.35	2017	0.2944	1	0.85	0.0398	0.33
2	1	1 - 2		0.0000	10	0.00		0.0000	1	0.00		
3	1	2 - 3		0.0000	3	0.00		0.0000	1	0.00		
4	1	3 - 4		0.0000	3	0.00		0.0000	1	0.00		
5	1	4 - 5		0.0000	3	0.00		0.0000	1	0.00		
6	1	5 - 6		0.0000	3	0.00		0.0000	1	0.00		
7	1	6 - 7		0.0000	3	0.00		0.0000	1	0.00		
8	1	7 - 8		0.0000	3	0.00		0.0000	1	0.00		
9	1	8 - 9		0.0000	3	0.00		0.0000	1	0.00		
10	1	9 - 10		0.0000	3	0.00		0.0000	1	0.00		
11	1	10 - 11		0.0000	3	0.00		0.0000	1	0.00		
12	1	11 - 12		0.0000	3	0.00		0.0000	1	0.00		
13	1	12 - 13		0.0000	3	0.00		0.0000	1	0.00		
14	1	13 - 14		0.0000	3	0.00		0.0000	1	0.00		
15	1	14 - 15		0.0000	3	0.00		0.0000	1	0.00		
16	1	15 - 16		0.0000	3	0.00		0.0000	1	0.00		
17	1	16-17		0.0000	1	0.00		0.0000	1	0.00		
18	1	17-18		0.0000	1	0.00		0.0000	1	0.00		
19	1	18-19		0.0000	1	0.00		0.0000	1	0.00		
20	1	19-20		0.0000	1	0.00		0.0000	1	0.00		
21	1	20-21		0.0000	1	0.00		0.0000	1	0.00		
22	1	21-22		0.0000	1	0.00		0.0000	1	0.00		
23	1	22-23		0.0000	1	0.00		0.0000	1	0.00		
24	1	23-24		0.0000	1	0.00		0.0000	1	0.00		
25	1	24-25		0.0000	1	0.00		0.0000	1	0.00		
26	1	25-26		0.0000	1	0.00		0.0000	1	0.00		
27	1	26-27		0.0000	1	0.00		0.0000	1	0.00		
28	1	27-28		0.0000	1	0.00		0.0000	1	0.00		
29	1	28-29		0.0000	1	0.00		0.0000	1	0.00		
30	1	29-30		0.0000	1	0.00		0.0000	1	0.00		
Total Increased Cancer Risk						**48.4**				**0.85**		

* Third trimester of pregnancy