

Rule 1200 Health Risk Assessment

Facility Name: Costco Gasoline (Loc No 124)
Facility ID: APCD2023-SITE-04383
Application: APCD2023-APP-007920
Project Engineer: Karen Yimnei Chan
Modeler: Bill Reeve
Toxics Risk Analyst: Maria Galvez
Date Submitted to Toxics: 10/10/2023
Date Completed by Toxics: 10/18/2023
HRA Tools Used: Lakes-AERMOD (Version 21112)/HARP (v22118)

The following estimated risks are valid only for the input data provided by the Project Engineer.

Only the higher of either worker or residential risk is presented in the following results.

Estimated Risk Levels:

Maximum Individual Cancer Risk (Residential)	= 17.96 in one million
Chronic Noncancer Health Hazard Index (Worker)	= 0.14
8-Hour Noncancer Health Hazard Index (Worker)	= No Health Data
Acute Health Hazard Index (Worker)	= 0.57

Input Data Provided by Project Engineer:

Type of Source: Gas Station
 Controls Description: OPW Phase I, Healy Phase II and Arid Permeator
 T-BACT: Yes.

Worst-Case TAC Emissions Increase:

Loading

Toxic Air Contaminant	Hourly Emission Rate (lb/hr)	Annual Emission Rate (lb/yr)
BENZENE	5.4E-02	3.8E+01
ETHYL BENZENE	1.8E-02	1.3E+01
HEXANE-N	2.5E-01	1.8E+02
TOLUENE	2.0E-01	1.4E+02
XYLENES	7.2E-02	5.0E+01

Breathing

Toxic Air Contaminant	Hourly Emission Rate (lb/hr)	Annual Emission Rate (lb/yr)
BENZENE	6.9E-04	6.0E+00
ETHYL BENZENE	2.3E-04	2.0E+00
HEXANE-N	3.2E-03	2.8E+01
TOLUENE	2.5E-03	2.2E+01
XYLENES	9.2E-04	8.1E+00

Refueling

Toxic Air Contaminant	Hourly Emission Rate (lb/hr)	Annual Emission Rate (lb/yr)
BENZENE	3.8E-03	2.2E+01
ETHYL BENZENE	1.3E-03	7.5E+00
HEXANE-N	1.8E-02	1.0E+02
TOLUENE	1.4E-02	8.2E+01
XYLENES	5.1E-03	3.0E+01

Hose Permeation

Toxic Air Contaminant	Hourly Emission Rate (lb/hr)	Annual Emission Rate (lb/yr)
BENZENE	3.9E-04	2.3E+00
ETHYL BENZENE	1.3E-04	7.6E-01
HEXANE-N	1.8E-03	1.1E+01
TOLUENE	1.4E-03	8.3E+00
XYLENES	5.2E-04	3.0E+00

Spillage

Toxic Air Contaminant	Hourly Emission Rate (lb/hr)	Annual Emission Rate (lb/yr)
BENZENE	3.5E-02	2.0E+02
ETHYL BENZENE	5.5E-02	3.2E+02
HEXANE-N	6.2E-02	3.6E+02
TOLUENE	2.8E-01	1.6E+03
XYLENES	8.3E-02	4.8E+02

Release Parameters:

Loading

Stack Height (ft)	12
Stack Diameter (ft)	0.16
Temperature (deg F)	64.1
Exhaust Flow Rate (acfm)	0.004

Breathing

Stack Height (ft)	12
Stack Diameter (ft)	0.16
Temperature (deg F)	60.5
Exhaust Flow Rate (acfm)	0.004

Volume Sources

Fueling release height (ft)	4.9
Hose permeation release height (ft)	4.9
Spillage release height (ft)	3.3
Initial horizontal dimension (ft)	9.9
Initial vertical dimension (ft)	6.1

Discussion

The HRA was conducted in accordance with EPA and OEHHA guidance and District standard procedures. Modeling was conducted in accordance with the 2022 CARB/CAPCOA Gasoline Service Station Industrywide Risk Assessment Technical Guidance document. Two point sources and three volume sources were modeled with refined air dispersion modeling using EPA's AERMOD model, AERMET (Version 22112) processed McClellan Palomar 2019/2021 ustars updated meteorology data, AERMAP terrain processing, and urban dispersion coefficients. Building downwash effects were calculated using the EPA BPIP-Prime model. The receptor grid was sufficiently dense to identify maximum impacts.

These risk results are based on the risk scenario calculations and health data at the time of the review, and should not be scaled with revised emissions rates without consulting with the Toxics Section.

*HARP - HRACalc v22118 10/17/2023 11:27:51 AM - Cancer Risk

REC	GRP	NETID	X	Y	CONC	POLID	POLABBRE	RISK_SUM	SCENARIO
8110	ALL		474069.5	3672001	0.238906	71432	Benzene	1.62E-05	90% 30YrCancerRMP_InhSoilDermMMilk_FAH16to70
8110	ALL		474069.5	3672001	0.305806	100414	Ethyl Benz	1.80E-06	10% 30YrCancerRMP_InhSoilDermMMilk_FAH16to70
8110	ALL		474069.5	3672001	0.603038	110543	Hexane	0.00E+00	0% 30YrCancerRMP_InhSoilDermMMilk_FAH16to70
8110	ALL		474069.5	3672001	1.64973	108883	Toluene	0.00E+00	0% 30YrCancerRMP_InhSoilDermMMilk_FAH16to70
8110	ALL		474069.5	3672001	0.509001	1330207	Xylenes	0.00E+00	0% 30YrCancerRMP_InhSoilDermMMilk_FAH16to70
								1.80E-05	

*HARP - HRACalc v22118 10/18/2023 10:25:18 AM - Cancer Risk by Receptor and Source

SRC	REC	GRP	NETID	X	Y	RISK_SUM	SCENARIO
VOL1		8110	ALL	474069.5	3672001	1.37E-06	8% 30YrCancerRMP_InhSoilDermMMilk_FAH16to70
VOL2		8110	ALL	474069.5	3672001	1.38E-05	77% 30YrCancerRMP_InhSoilDermMMilk_FAH16to70
VOL3		8110	ALL	474069.5	3672001	1.39E-07	1% 30YrCancerRMP_InhSoilDermMMilk_FAH16to70
STCK1		8110	ALL	474069.5	3672001	2.32E-06	13% 30YrCancerRMP_InhSoilDermMMilk_FAH16to70
STCK2		8110	ALL	474069.5	3672001	3.71E-07	2% 30YrCancerRMP_InhSoilDermMMilk_FAH16to70
						1.80E-05	

*HARP - HRACalc v22118 10/17/2023 11:27:51 AM - Chronic Risk

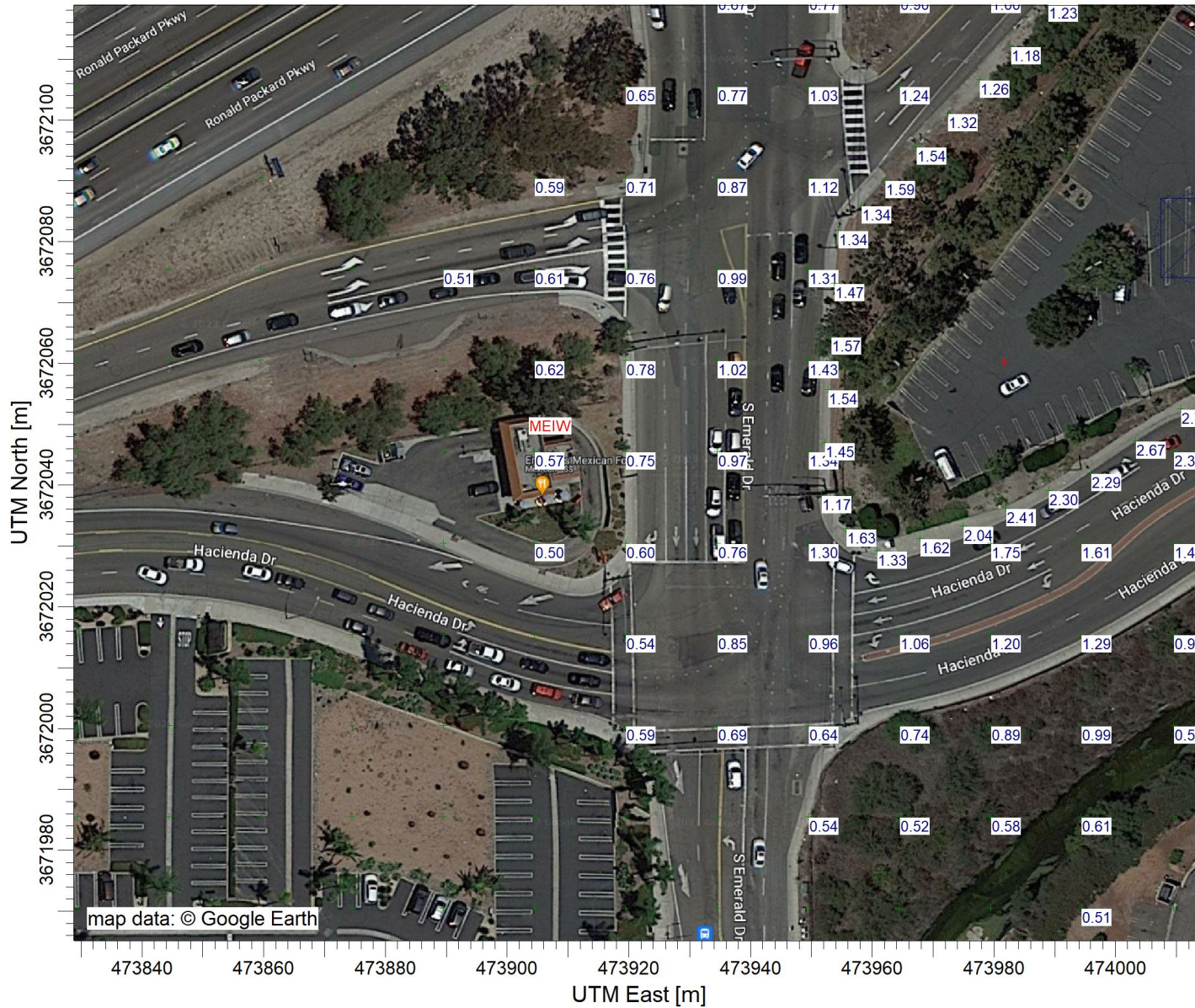
REC	GRP	NETID	X	Y	CONC	POLID	POLABBRE	BLOOD	SCENARIO
8500	ALL		473904.5	3672046	0.418698	71432	Benzene	1.40E-01	NonCancerChronicDerived_InhSoilDermMMilk
8500	ALL		473904.5	3672046	0.499597	100414	Ethyl Benz	0.00E+00	NonCancerChronicDerived_InhSoilDermMMilk
8500	ALL		473904.5	3672046	1.139119	110543	Hexane	0.00E+00	NonCancerChronicDerived_InhSoilDermMMilk
8500	ALL		473904.5	3672046	2.76691	108883	Toluene	0.00E+00	NonCancerChronicDerived_InhSoilDermMMilk
8500	ALL		473904.5	3672046	0.861448	1330207	Xylenes	0.00E+00	NonCancerChronicDerived_InhSoilDermMMilk
								0.13957	

*HARP - HRACalc v22118 10/17/2023 11:27:51 AM - Acute Risk

REC	GRP	NETID	X	Y	CONC	POLID	POLABBRE	IMMUN	SCENARIO
8500	ALL		473904.5	3672046	15.29985	71432	Benzene	5.67E-01	NonCancerAcute
8500	ALL		473904.5	3672046	11.23247	100414	Ethyl Benz	0.00E+00	NonCancerAcute
8500	ALL		473904.5	3672046	57.52043	110543	Hexane	0.00E+00	NonCancerAcute
8500	ALL		473904.5	3672046	77.07912	108883	Toluene	0.00E+00	NonCancerAcute
8500	ALL		473904.5	3672046	25.56402	1330207	Xylenes	0.00E+00	NonCancerAcute
								0.56666	

PROJECT TITLE:
7920 Acute
MEIW 8500

COMMENTS:



SOURCES:

5

RECEPTORS:

17824

OUTPUT TYPE:

Concentration

MAX:

3.29 ug/m³

COMPANY NAME:

MODELER:

DATE:

10/17/2023

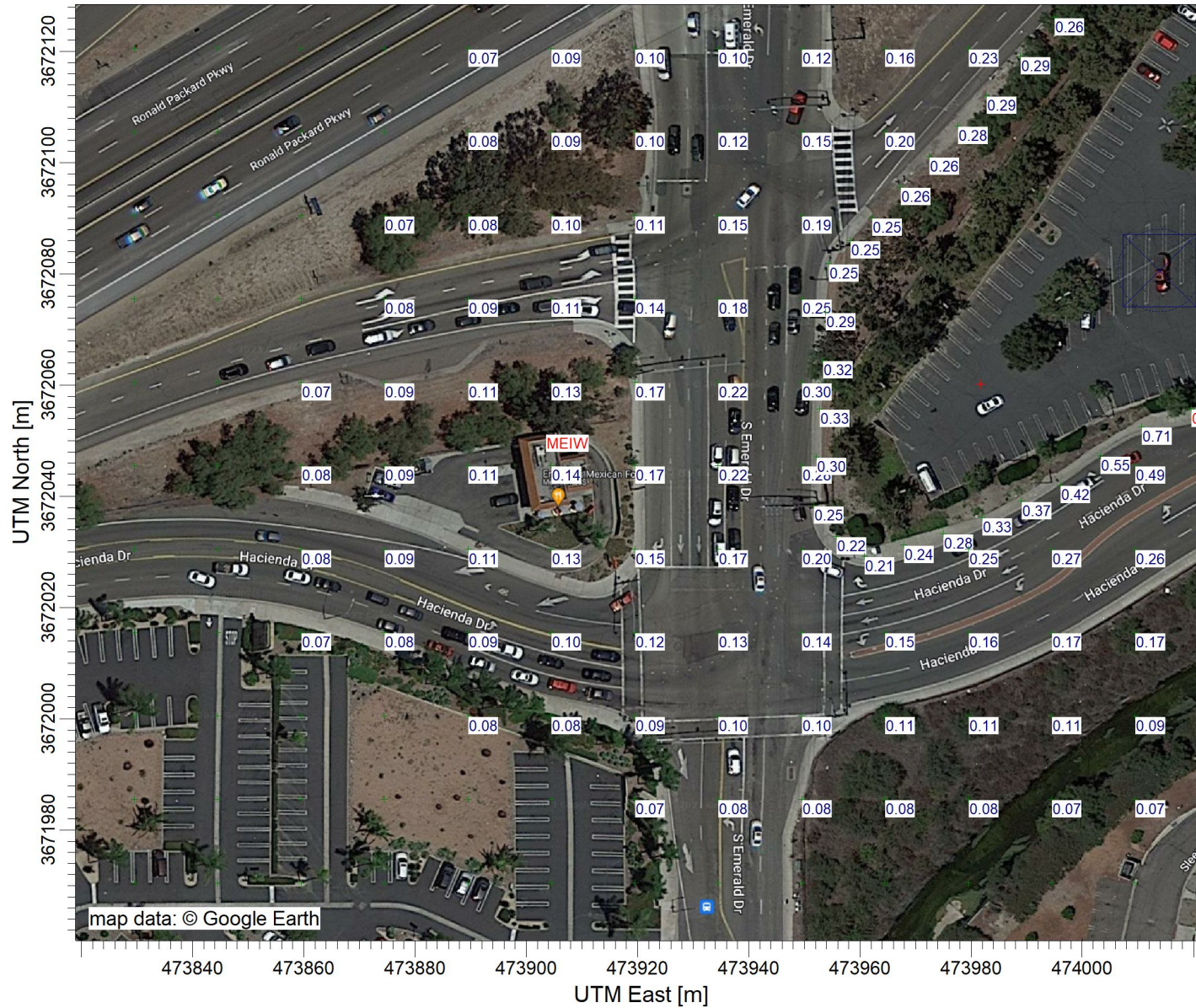
SCALE:

1:1,047

PROJECT NO.:

PROJECT TITLE:
7920 Chronic
MEIW 8500

COMMENTS:



SOURCES:

5

RECEPTORS:

17824

OUTPUT TYPE:

Concentration

MAX:

0.781 ug/m³

COMPANY NAME:

MODELER:

DATE:

10/17/2023

SCALE:

1:1,146

0  0.03 km

PROJECT NO.:

PROJECT TITLE:
7920 Cancer
MEIR 8110

COMMENTS:



SOURCES:

5

RECEPTORS:

17824

OUTPUT TYPE:

Concentration

MAX:

177 ug/m³

COMPANY NAME:

MODELER:

DATE:

10/17/2023

SCALE:

1:768

0  0.02 km

PROJECT NO.:

Maximum Operating hours for processes

Refueling, Hose Permeation, Spillage

Hours of Operation	
Hours/Day	16
Days/Week	7
Days/Year	365

Breathing

Hours of Operation	
Hours/Day	24
Days/Week	7
Days/Year	365

Outputs			
12612.04	lb/year	*Loading	Vapor
2016	lb/year	Breathing	Vapor
7476	lb/year	Refueling	Vapor
756	lb/year	Hose Permeat	Vapor
20160	lb/year	Spillage	Liquid

Emissions per San Diego EIS speciation outlined on website

Gasoline Speciation	Weight % Vapor	Weight % Liquid
Benzene	0.30%	1%
Ethyl Benzene	0.10%	1.60%
Hexane	1.40%	1.80%
Toluene	1.10%	8%
Xylene	0.40%	2.40%
2,2,4-Trimethylpentane	0.70%	0.80%

TAC Emissions from different gasoline loading and dispensing processes

Gas Speciation	Loading		Breathing		Refueling		Hose Permeation		Spillage (liquid)		Total	
	lbs/hr	lbs/year	lbs/hr	lbs/year	lbs/hr	lbs/year	lbs/hr	lbs/year	lbs/hr	lbs/year	lbs/hr	lbs/year
Benzene	5.40E-02	37.83612229	6.90E-04	6.048	3.84E-03	22.428	3.88E-04	2.268	3.45E-02	201.6	0.09343973	270.18
Ethyl Benzene	1.80E-02	12.61204076	2.30E-04	2.016	1.28E-03	7.476	1.29E-04	0.756	5.52E-02	322.56	0.07487260	345.42
Hexane	2.52E-01	176.5685707	3.22E-03	28.224	1.79E-02	104.664	1.81E-03	10.584	6.21E-02	362.88	0.33709315	682.92
Toluene	1.98E-01	138.7324484	2.53E-03	22.176	1.41E-02	82.236	1.42E-03	8.316	2.76E-01	1612.8	0.49220137	1864.26
Xylene	7.20E-02	50.44816306	9.21E-04	8.064	5.12E-03	29.904	5.18E-04	3.024	8.28E-02	483.84	0.16140822	575.28
2,2,4-Trimethylpentane	1.26E-01	88.28428535	1.61E-03	14.112	8.96E-03	52.332	9.06E-04	5.292	2.76E-02	161.28	0.16509452	321.30

Note: The values in these cell are updated. Loading was calculated as loading event when filling tank to max capacity.

* loading loss caused by the displacement of the gasoline with additive is included in the total loading loss

**San Diego Air Pollution Control District
Supplemental Application Information
Rule 1200 Toxics Evaluation**

(ALL REQUESTED INFORMATION IS IMPORTANT - PLEASE FILL BLUE CELLS)

Facility Name: Costco (#124)
Equipment Location: 1765 Hacienda Drive, Vista, CA 92081

Project Description: Retail gas station
Control Equipment: OPW Phase I, Healy Phase II and Arid Permeator

Operating Schedule for refueling, hose	Hours per day	16	Weeks per Year:	52
	Days per Week:	7	Days per Year:	365
Max. Operating Schedule:	Hours per day	24	Weeks per Year:	52
	Days per Week:	7	Days per Year:	365

How are the emissions from this project released into the outdoor air? (Check all that apply)

Point Source	Non-Point Source
Exhaust Stack: Vent pipes for breathing	Loading, refueling, hose permeation, spillage

Point Source

Parameter	Point Source #1
Height of release above ground (ft)	12.0
Stack Diameter (or length x width) (ft)	0.17
Exhaust Gas Temperature (°F) ¹	Ambient
Exhaust Gas Flow (ACFM)	NA
Direction of Flow ²	vertical
Flow Obstruction ³	Yes
Distance to Nearest Property Line (+/- 10ft)	86.00

¹ Use "70 °F" or "Ambient" if unknown

² if "other" describe: There is an obstruction to vertical flow with the pressure/ vacuum cap installed at the end of 2: dia. Vent riser pipes

³ if "other" describe: _____

AERIAL MAP AND FACILITY PLOT PLAN must be attached and labeled with **Release Point(s) and Building(s)**
(includes facility and neighboring buildings within 5x the release height of a point source(s)).

Parameter	Building A		
Point Source(s)	NONE		
Point Source Location			
Building Length (ft) (optional)			
Building Width (ft) (optional)			
Building Height above ground (ft)			

San Diego APCD Use Only

Additional Rule 1200 Submittal Information

Submittal Date:	10/18/2023	Site ID:	APCD2023-SITE-04299
Project Engineer:	Karen Chan	Appl. Number(s):	APCD2023-APP-007760
Fees Collected:		PTO No. (if existing):	NA

HARP2 - HRACalc (dated 22118) 10/17/2023 11:27:51 AM - Output Log

GLCs loaded successfully
Pollutants loaded successfully
Pathway receptors loaded successfully

RISK SCENARIO SETTINGS

Receptor Type: Resident
Scenario: All
Calculation Method: Derived

EXPOSURE DURATION PARAMETERS FOR CANCER

Start Age: -0.25
Total Exposure Duration: 30

Exposure Duration Bin Distribution

3rd Trimester Bin: 0.25
0<2 Years Bin: 2
2<9 Years Bin: 0
2<16 Years Bin: 14
16<30 Years Bin: 14
16 to 70 Years Bin: 0

PATHWAYS ENABLED

NOTE: Inhalation is always enabled and used for all assessments. The remaining pathways are only used for cancer and noncancer chronic assessments.

Inhalation: True
Soil: True
Dermal: True
Mother's milk: True
Water: False
Fish: False
Homegrown crops: False
Beef: False
Dairy: False
Pig: False
Chicken: False
Egg: False

INHALATION

Daily breathing rate: RMP

****Worker Adjustment Factors****
Worker adjustment factors enabled: NO

****Fraction at time at home****
3rd Trimester to 16 years: OFF
16 years to 70 years: ON

SOIL & DERMAL PATHWAY SETTINGS

Deposition rate (m/s): 0.05
Soil mixing depth (m): 0.01
Dermal climate: Warm

TIER 2 SETTINGS
Tier2 not used.

Calculating cancer risk
Cancer risk breakdown by pollutant and receptor saved to: C:\Users\E088126\OneDrive - County of San Diego\Desktop\7920_Costco # 124\7920_HARP\hra\resident_CancerRisk.csv
Cancer risk total by receptor saved to: C:\Users\E088126\OneDrive - County of San Diego\Desktop\7920_Costco # 124\7920_HARP\hra\resident_CancerRiskSumByRec.csv
Calculating chronic risk
Chronic risk breakdown by pollutant and receptor saved to:
C:\Users\E088126\OneDrive - County of San Diego\Desktop\7920_Costco # 124\7920_HARP\hra\resident_NCChronicRisk.csv
Chronic risk total by receptor saved to: C:\Users\E088126\OneDrive - County of San Diego\Desktop\7920_Costco # 124\7920_HARP\hra\resident_NCChronicRiskSumByRec.csv
Calculating acute risk
Acute risk breakdown by pollutant and receptor saved to: C:\Users\E088126\OneDrive - County of San Diego\Desktop\7920_Costco # 124\7920_HARP\hra\resident_NCAcuteRisk.csv
Acute risk total by receptor saved to: C:\Users\E088126\OneDrive - County of San Diego\Desktop\7920_Costco # 124\7920_HARP\hra\resident_NCAcuteRiskSumByRec.csv
HRA ran successfully

** Model Options Selected:

- * Model Uses Regulatory DEFAULT Options
- * Model Is Setup For Calculation of Average CONCentration Values.
- * NO GAS DEPOSITION Data Provided.
- * NO PARTICLE DEPOSITION Data Provided.
- * Model Uses NO DRY DEPLETION. DDPLETE = F
- * Model Uses NO WET DEPLETION. WETDPLT = F
- * Stack-tip Downwash.
- * Model Accounts for ELEVated Terrain Effects.
- * Use Calms Processing Routine.
- * Use Missing Data Processing Routine.
- * No Exponential Decay.
- * Model Uses URBAN Dispersion Algorithm for the SBL for 5 Source(s),
for Total of 1 Urban Area(s):

Urban Population = 384125.0 ; Urban Roughness Length = 1.000 m

- * Urban Roughness Length of 1.0 Meter Used.
- * ADJ_U* - Use ADJ_U* option for SBL in AERMET
- * CCVR_Sub - Meteorological data includes CCVR substitutions
- * TEMP_Sub - Meteorological data includes TEMP substitutions
- * Model Assumes No FLAGPOLE Receptor Heights.
- * The User Specified a Pollutant Type of: OTHER

**Model Calculates 1 Short Term Average(s) of: 1-HR
and Calculates PERIOD Averages

**This Run Includes: 5 Source(s); 6 Source Group(s); and 17824 Receptor(s)

with: 2 POINT(s), including
0 POINTCAP(s) and 0 POINTHOR(s)
and: 3 VOLUME source(s)
and: 0 AREA type source(s)
and: 0 LINE source(s)
and: 0 RLINE/RLINEXT source(s)
and: 0 OPENPIT source(s)
and: 0 BUOYANT LINE source(s) with a total of 0 line(s)
and: 0 SWPOINT source(s)

19	01	01	1	10	77.6	0.226	0.818	0.005	254.	258.	-13.4	0.03	0.93	0.22	2.67	7.	7.9	284.8	2.0
19	01	01	1	11	110.3	0.226	1.328	0.005	763.	257.	-9.4	0.03	0.93	0.20	2.57	17.	7.9	286.4	2.0
19	01	01	1	12	125.8	0.231	1.462	0.005	892.	267.	-8.8	0.03	0.93	0.19	2.62	2.	7.9	287.0	2.0
19	01	01	1	13	123.8	0.281	1.512	0.005	1004.	358.	-16.1	0.03	0.93	0.19	3.35	353.	7.9	287.5	2.0
19	01	01	1	14	104.6	0.245	1.470	0.005	1090.	292.	-12.7	0.03	0.93	0.20	2.88	7.	7.9	288.8	2.0
19	01	01	1	15	68.4	0.246	1.295	0.005	1142.	293.	-19.6	0.03	0.93	0.23	3.07	64.	7.9	288.8	2.0
19	01	01	1	16	18.1	0.311	0.835	0.005	1153.	416.	-149.4	0.03	0.93	0.32	4.29	87.	7.9	287.0	2.0
19	01	01	1	17	-24.0	0.270	-9.000	-9.000	-999.	337.	79.9	0.03	0.93	0.60	3.93	114.	7.9	285.3	2.0
19	01	01	1	18	-6.3	0.099	-9.000	-9.000	-999.	106.	13.6	0.03	0.93	1.00	1.53	116.	7.9	283.8	2.0
19	01	01	1	19	-6.7	0.101	-9.000	-9.000	-999.	78.	14.0	0.03	0.93	1.00	1.57	98.	7.9	282.0	2.0
19	01	01	1	20	-3.4	0.072	-9.000	-9.000	-999.	47.	10.0	0.03	0.93	1.00	1.11	98.	7.9	279.8	2.0
19	01	01	1	21	-5.6	0.092	-9.000	-9.000	-999.	67.	12.5	0.03	0.93	1.00	1.43	25.	7.9	279.8	2.0
19	01	01	1	22	-7.2	0.105	-9.000	-9.000	-999.	81.	14.3	0.03	0.93	1.00	1.64	39.	7.9	279.2	2.0
19	01	01	1	23	-16.3	0.161	-9.000	-9.000	-999.	155.	28.5	0.03	0.93	1.00	2.44	49.	7.9	279.2	2.0
19	01	01	1	24	-25.8	0.257	-9.000	-9.000	-999.	312.	72.5	0.03	0.93	1.00	3.83	69.	7.9	280.3	2.0

First hour of profile data

YR	MO	DY	HR	HEIGHT	F	WDIR	WSPD	AMB_TMP	sigmaA	sigmaW	sigmaV
19	01	01	01	7.9	1	25.	1.57	280.4	99.0	-99.00	-99.00

F indicates top of profile (=1) or below (=0)

*** AERMOD - VERSION 22112 *** C:\Modeling Projects\7920_Costco\7920_Costco.isc
 *** AERMET - VERSION 22112 ***

*** 10/16/23
 *** 15:58:48
 *** PAGE 4

*** MODELOPTs: RegDEFAULT CONC ELEV URBAN ADJ_U*

*** THE SUMMARY OF MAXIMUM PERIOD (26304 HRS) RESULTS ***

** CONC OF OTHER IN MICROGRAMS/M**3 **

GROUP ID	AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
STCK1	1ST HIGHEST VALUE IS 654.92480	AT (474010.67, 3672052.54,	71.50, 78.83, 0.00)	DC
	2ND HIGHEST VALUE IS 604.26380	AT (474003.34, 3672047.27,	71.81, 78.83, 0.00)	DC
	3RD HIGHEST VALUE IS 530.44625	AT (473996.02, 3672042.01,	72.51, 78.71, 0.00)	DC

	4TH HIGHEST VALUE IS	529.91500	AT (	474019.46,	3672055.75,	71.00,	79.05,	0.00)	DC
	5TH HIGHEST VALUE IS	510.01780	AT (	473989.00,	3672039.11,	72.73,	78.71,	0.00)	DC
	6TH HIGHEST VALUE IS	505.93837	AT (	474009.50,	3672045.50,	71.87,	78.71,	0.00)	DC
	7TH HIGHEST VALUE IS	471.10977	AT (	473952.70,	3672055.75,	77.39,	77.39,	0.00)	DC
	8TH HIGHEST VALUE IS	468.08131	AT (	473981.97,	3672036.21,	72.80,	78.55,	0.00)	DC
	9TH HIGHEST VALUE IS	465.96205	AT (	473952.15,	3672047.05,	76.99,	76.99,	0.00)	DC
	10TH HIGHEST VALUE IS	425.92710	AT (	473949.50,	3672045.50,	76.90,	76.90,	0.00)	DC
STCK2	1ST HIGHEST VALUE IS	655.20783	AT (	474010.67,	3672052.54,	71.50,	78.83,	0.00)	DC
	2ND HIGHEST VALUE IS	604.50927	AT (	474003.34,	3672047.27,	71.81,	78.83,	0.00)	DC
	3RD HIGHEST VALUE IS	530.60400	AT (	473996.02,	3672042.01,	72.51,	78.71,	0.00)	DC
	4TH HIGHEST VALUE IS	530.08951	AT (	474019.46,	3672055.75,	71.00,	79.05,	0.00)	DC
	5TH HIGHEST VALUE IS	510.16958	AT (	473989.00,	3672039.11,	72.73,	78.71,	0.00)	DC
	6TH HIGHEST VALUE IS	506.08966	AT (	474009.50,	3672045.50,	71.87,	78.71,	0.00)	DC
	7TH HIGHEST VALUE IS	471.14058	AT (	473952.70,	3672055.75,	77.39,	77.39,	0.00)	DC
	8TH HIGHEST VALUE IS	468.20558	AT (	473981.97,	3672036.21,	72.80,	78.55,	0.00)	DC
	9TH HIGHEST VALUE IS	465.98590	AT (	473952.15,	3672047.05,	76.99,	76.99,	0.00)	DC
	10TH HIGHEST VALUE IS	425.94620	AT (	473949.50,	3672045.50,	76.90,	76.90,	0.00)	DC
VOL1	1ST HIGHEST VALUE IS	616.20136	AT (	474028.25,	3672058.95,	70.64,	78.83,	0.00)	DC
	2ND HIGHEST VALUE IS	598.84108	AT (	474019.46,	3672055.75,	71.00,	79.05,	0.00)	DC
	3RD HIGHEST VALUE IS	585.60973	AT (	474037.05,	3672062.16,	70.37,	78.71,	0.00)	DC
	4TH HIGHEST VALUE IS	523.97271	AT (	474045.84,	3672065.36,	70.07,	78.55,	0.00)	DC
	5TH HIGHEST VALUE IS	515.20430	AT (	474010.67,	3672052.54,	71.50,	78.83,	0.00)	DC
	6TH HIGHEST VALUE IS	502.50615	AT (	474039.50,	3672060.50,	70.30,	78.71,	0.00)	DC
	7TH HIGHEST VALUE IS	449.39193	AT (	474054.63,	3672068.57,	69.93,	69.93,	0.00)	DC
	8TH HIGHEST VALUE IS	380.07641	AT (	474003.34,	3672047.27,	71.81,	78.83,	0.00)	DC
	9TH HIGHEST VALUE IS	366.01821	AT (	474063.02,	3672070.40,	69.83,	69.83,	0.00)	DC
	10TH HIGHEST VALUE IS	351.13110	AT (	474009.50,	3672045.50,	71.87,	78.71,	0.00)	DC
VOL2	1ST HIGHEST VALUE IS	641.88176	AT (	474028.25,	3672058.95,	70.64,	78.83,	0.00)	DC
	2ND HIGHEST VALUE IS	619.71436	AT (	474019.46,	3672055.75,	71.00,	79.05,	0.00)	DC
	3RD HIGHEST VALUE IS	606.27814	AT (	474037.05,	3672062.16,	70.37,	78.71,	0.00)	DC
	4TH HIGHEST VALUE IS	540.24590	AT (	474045.84,	3672065.36,	70.07,	78.55,	0.00)	DC
	5TH HIGHEST VALUE IS	528.77426	AT (	474010.67,	3672052.54,	71.50,	78.83,	0.00)	DC
	6TH HIGHEST VALUE IS	517.52127	AT (	474039.50,	3672060.50,	70.30,	78.71,	0.00)	DC
	7TH HIGHEST VALUE IS	461.89358	AT (	474054.63,	3672068.57,	69.93,	69.93,	0.00)	DC
	8TH HIGHEST VALUE IS	387.00390	AT (	474003.34,	3672047.27,	71.81,	78.83,	0.00)	DC
	9TH HIGHEST VALUE IS	375.11610	AT (474063.02,	3672070.40,	69.83,	69.83,	0.00)	DC

10TH HIGHEST VALUE IS 357.49376 AT (474009.50, 3672045.50, 71.87, 78.71, 0.00) DC
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 *** AERMET - VERSION 22112 *** ***

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*** MODELOPTs: RegDEFAULT CONC ELEV URBAN ADJ_U*

*** THE SUMMARY OF MAXIMUM PERIOD (26304 HRS) RESULTS ***

** CONC OF OTHER IN MICROGRAMS/M**3 **

GROUP ID	AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
VOL3	1ST HIGHEST VALUE IS 616.20136 AT (474028.25, 3672058.95, 70.64, 78.83, 0.00)	DC		
	2ND HIGHEST VALUE IS 598.84108 AT (474019.46, 3672055.75, 71.00, 79.05, 0.00)	DC		
	3RD HIGHEST VALUE IS 585.60973 AT (474037.05, 3672062.16, 70.37, 78.71, 0.00)	DC		
	4TH HIGHEST VALUE IS 523.97271 AT (474045.84, 3672065.36, 70.07, 78.55, 0.00)	DC		
	5TH HIGHEST VALUE IS 515.20430 AT (474010.67, 3672052.54, 71.50, 78.83, 0.00)	DC		
	6TH HIGHEST VALUE IS 502.50615 AT (474039.50, 3672060.50, 70.30, 78.71, 0.00)	DC		
	7TH HIGHEST VALUE IS 449.39193 AT (474054.63, 3672068.57, 69.93, 69.93, 0.00)	DC		
	8TH HIGHEST VALUE IS 380.07641 AT (474003.34, 3672047.27, 71.81, 78.83, 0.00)	DC		
	9TH HIGHEST VALUE IS 366.01821 AT (474063.02, 3672070.40, 69.83, 69.83, 0.00)	DC		
	10TH HIGHEST VALUE IS 351.13110 AT (474009.50, 3672045.50, 71.87, 78.71, 0.00)	DC		
ALL	1ST HIGHEST VALUE IS 2877.40103 AT (474019.46, 3672055.75, 71.00, 79.05, 0.00)	DC		
	2ND HIGHEST VALUE IS 2869.31550 AT (474010.67, 3672052.54, 71.50, 78.83, 0.00)	DC		
	3RD HIGHEST VALUE IS 2706.64430 AT (474028.25, 3672058.95, 70.64, 78.83, 0.00)	DC		
	4TH HIGHEST VALUE IS 2431.82802 AT (474037.05, 3672062.16, 70.37, 78.71, 0.00)	DC		
	5TH HIGHEST VALUE IS 2355.92979 AT (474003.34, 3672047.27, 71.81, 78.83, 0.00)	DC		
	6TH HIGHEST VALUE IS 2124.64731 AT (474039.50, 3672060.50, 70.30, 78.71, 0.00)	DC		
	7TH HIGHEST VALUE IS 2107.27260 AT (474045.84, 3672065.36, 70.07, 78.55, 0.00)	DC		
	8TH HIGHEST VALUE IS 2071.78399 AT (474009.50, 3672045.50, 71.87, 78.71, 0.00)	DC		
	9TH HIGHEST VALUE IS 1917.46120 AT (473996.02, 3672042.01, 72.51, 78.71, 0.00)	DC		
	10TH HIGHEST VALUE IS 1782.17676 AT (474054.63, 3672068.57, 69.93, 69.93, 0.00)	DC		

*** RECEPTOR TYPES: GC = GRIDCART

GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR

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*** AERMET - VERSION 22112 ***

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*** MODELOPTs: RegDFAULT CONC ELEV URBAN ADJ_U*

*** THE SUMMARY OF HIGHEST 1-HR RESULTS ***

** CONC OF OTHER IN MICROGRAMS/M**3 **

GROUP ID	AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
STCK1 HIGH 1ST HIGH VALUE IS	7160.36251	ON 19120716: AT (	473981.97, 3672036.21, 72.80, 78.55, 0.00)	DC	
STCK2 HIGH 1ST HIGH VALUE IS	7277.04573	ON 19120716: AT (	473981.97, 3672036.21, 72.80, 78.55, 0.00)	DC	
VOL1 HIGH 1ST HIGH VALUE IS	11588.89884	ON 19120716: AT (	474019.46, 3672055.75, 71.00, 79.05, 0.00)	DC	
VOL2 HIGH 1ST HIGH VALUE IS	12571.64956	ON 19120716: AT (	474019.46, 3672055.75, 71.00, 79.05, 0.00)	DC	
VOL3 HIGH 1ST HIGH VALUE IS	11588.89884	ON 19120716: AT (	474019.46, 3672055.75, 71.00, 79.05, 0.00)	DC	
ALL HIGH 1ST HIGH VALUE IS	35863.37443	ON 19120716: AT (474019.46, 3672055.75, 71.00, 79.05, 0.00)	DC	

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR

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*** AERMET - VERSION 22112 ***

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*** MODELOPTs: RegDFAULT CONC ELEV URBAN ADJ_U*

*** Message Summary : AERMOD Model Execution ***

----- Summary of Total Messages -----

A Total of 0 Fatal Error Message(s)
A Total of 2 Warning Message(s)
A Total of 1272 Informational Message(s)

A Total of 26304 Hours Were Processed

A Total of 701 Calm Hours Identified

A Total of 571 Missing Hours Identified (2.17 Percent)

***** FATAL ERROR MESSAGES *****
*** NONE ***

***** WARNING MESSAGES *****
ME W186 81 MEOPEN: THRESH_1MIN 1-min ASOS wind speed threshold used 0.50
ME W187 81 MEOPEN: ADJ_U* Option for Stable Low Winds used in AERMET

HRA Request and Receptor Maps

Facility: Costco Gasoline (Loc. No. 124)

App: APCD2023-APP-007920

Site: APCD2023-SITE-04383

Equipment Address: 1765 Hacienda Drive, Vista, CA 92081

Operation Schedule:

Operating Schedule for refueling, hose permeation and spillage:	Hours per day	16	Weeks per Year:	52
	Days per Week:	7	Days per Year:	365
Max. Operating Schedule:	Hours per day	24	Weeks per Year:	52
	Days per Week:	7	Days per Year:	365

Costco Gas Station · Hours

1755 Hacienda Dr, Vista, CA 92081

Open · Closes 9:30 PM

Tuesday	5:30 AM - 9:30 PM
Wednesday	5:30 AM - 9:30 PM
Thursday	5:30 AM - 9:30 PM
Friday	5:30 AM - 9:30 PM
Saturday	6 AM - 8 PM
Sunday	6 AM - 7:30 PM
Monday	5:30 AM - 9:30 PM

[See hours on official site](#)

Proposed throughput: 84,000,000 gallon gasoline per year

Proposed throughput: 7,000,000 gallon gasoline per month

Gas Station CARB Emission Factors:

Emission Factor	Units	Process	Phase	EF Source	Hour Scalar Notes
0.15	lb/1K gallon	Phase I Bulk Transfer Loss	Vapor	CARB 2013 Updated Emission Factors Table I-I	24
0.024	lb/1K gallon	Pressure Driven Loss (Breathing Loss)	Vapor	CARB 2013 Updated Emission Factors Table I-I	24
0.089	lb/1K gallon	Non-ORVR Vehicles with Phase II fueling	Vapor	CARB 2013 Updated Emission Factors Table I-I	16
0.009	lb/1K gallon	Hose Permeation, low perm hose (2017)	Vapor	CARB 2013 Updated Emission Factors Table I-I	16
0.24	lb/1K gallon	Spillage	Liquid	CARB 2013 Updated Emission Factors Table I-I	16
0.512	Total				

Emissions calculations from the loading losses of Lubrizol (gasoline additive)

LL includes Max error and Ph I control Eff.	Loading loss Emissions based on estimated additive throughput
(lb/1000 gallons)	(lbs/year)
0.21	12.04

Assumptions:

Emissions from the standing loss/breathing loss and transfer of gasoline additive is assumed negligible due to low vapor pressure and low mixing ratio of 0.00068 gallons of additive per gallons of gasoline. Loading loss is included in the emissions of phase I transfer.

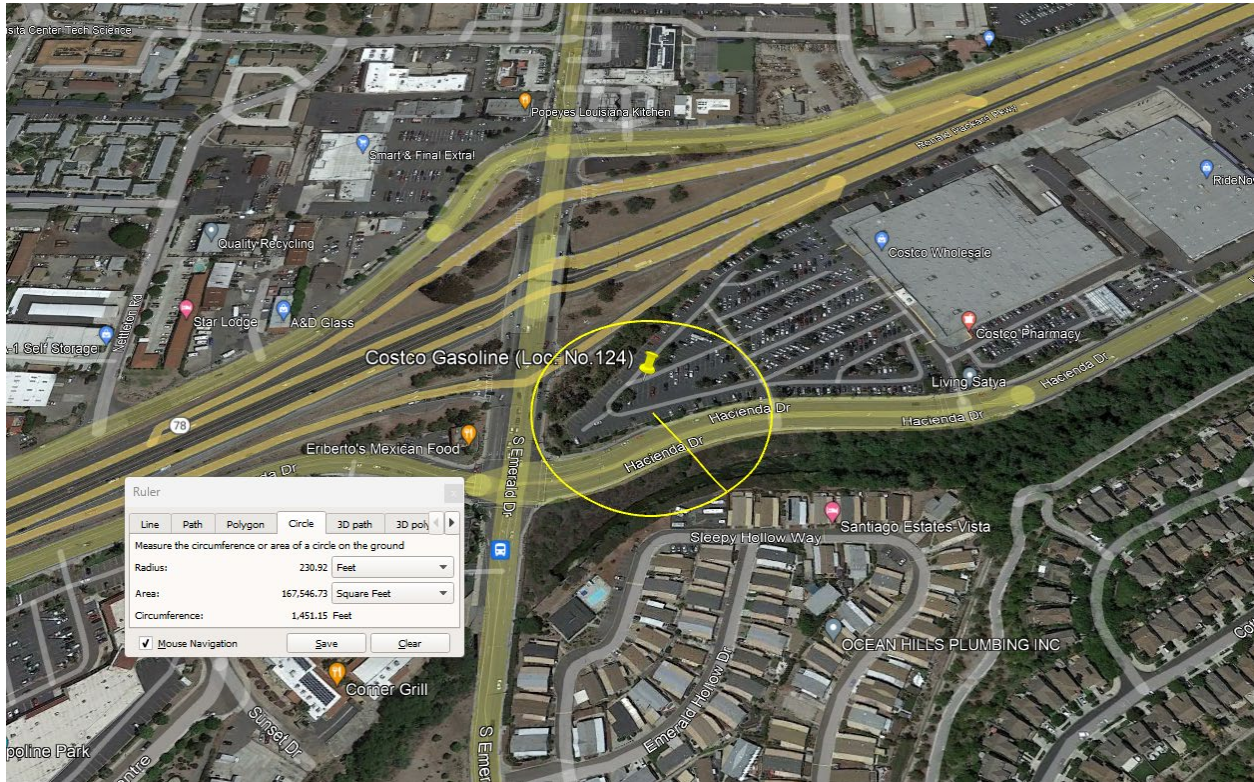
Property boundary:



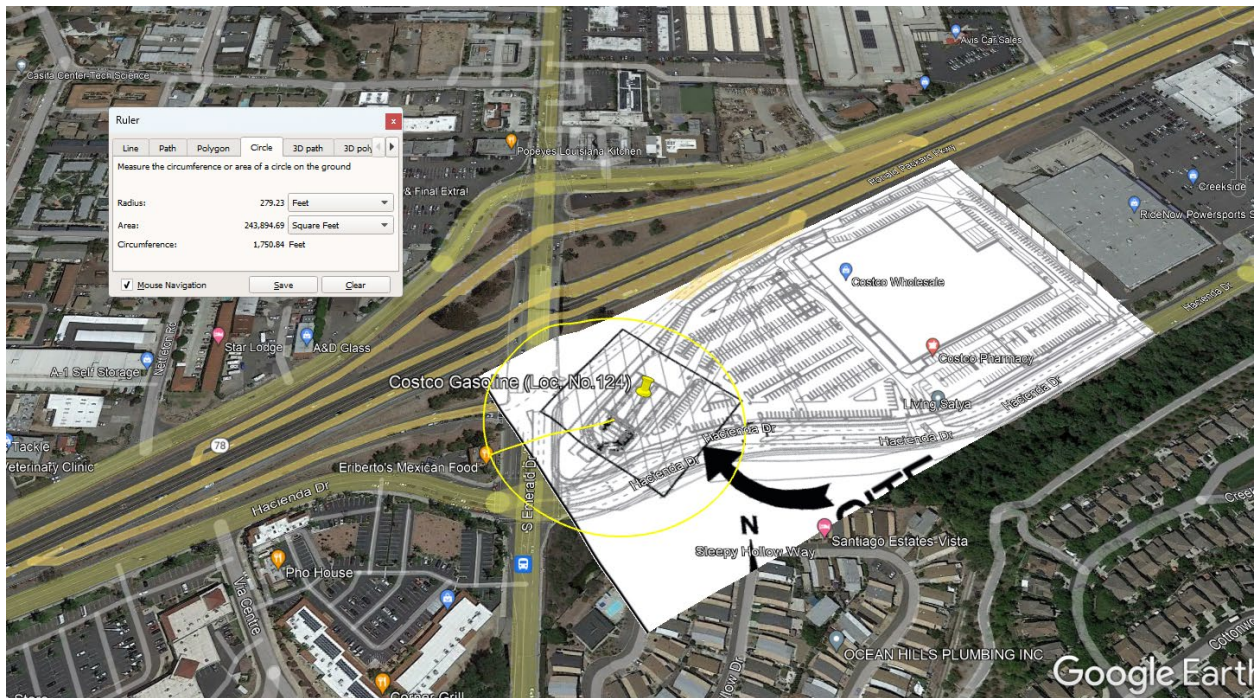
Closest School is 680.84 ft away from the dispensing equipment.



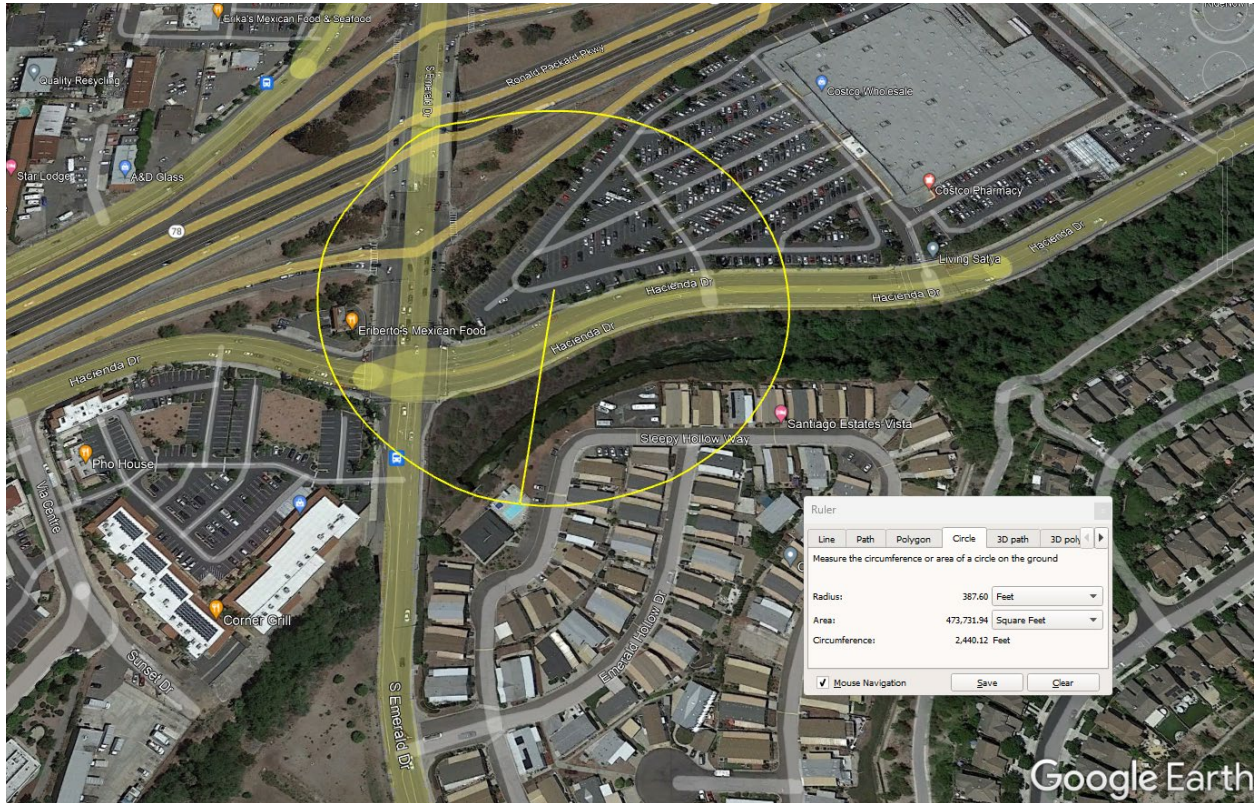
Residential receptors are 230.92 ft away from the dispensing equipment.



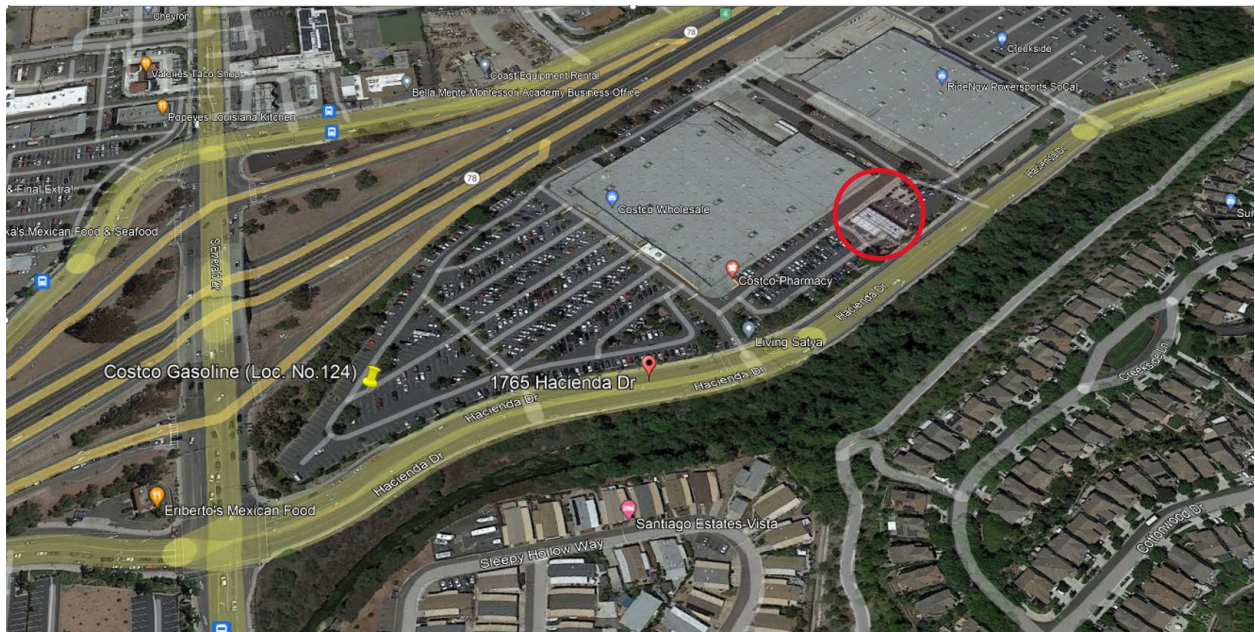
The occupational receptors are 279.23 ft away from the dispensing equipment.



The acute receptor is 387.60 ft away from the dispensing equipment

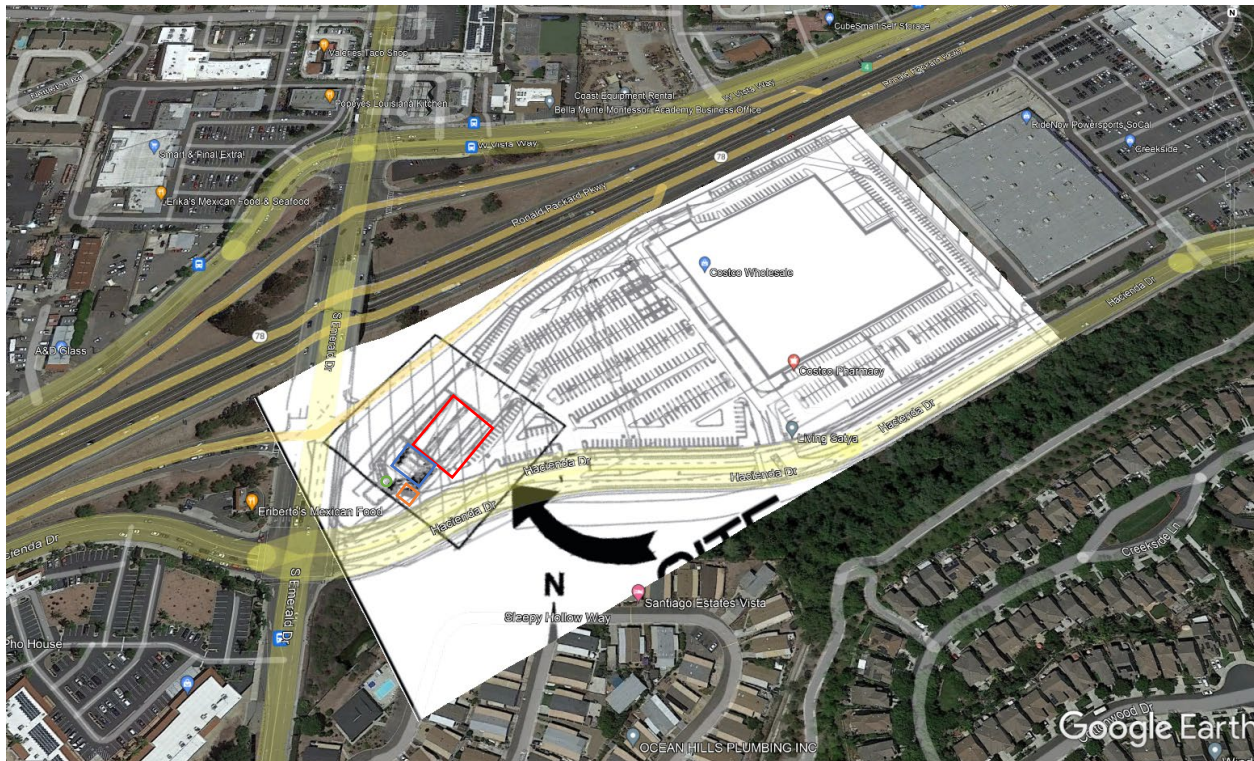


Existing gas station



The Site has an existing permitted gas dispensing operation with sixteen (16) nozzles under active APCD2006-PTO-971289. Existing gas dispensing equipment and underground storage tanks will be demolished after the new GDF is in operation.

Emission sources: Please refer to the Underground Tank and Piping Site Plan for details.



Red box is the dispensing area, where refueling, hose permeation and spillage occur (non-point source #2).

Blue box is the underground storage tanks

Green circle is the vent pipes for breathing and loading losses (point source #1)

Orange is the remote filling area

Galvez, Maria

From: Chan, Karen Yimnei
Sent: Tuesday, October 10, 2023 11:33 AM
To: Reeve, Bill; Nguyen, Tony
Cc: Canter, Adam; DiFulvio, Jaime; Swaney, Jim; Weller, Allison
Subject: Expedited: 7920 Costco Gasoline (Loc. No. 124)
Attachments: APCD2023-APP-007920_VR Emission Calcs.xlsx; APP-007920-receptor maps.docx; APP-007920-Rule1200_generictoxics_050818 (updated point sources).xlsx; Underground Tank and Piping Site Plan.pdf

Hello Bill,

Here is a HRA request for a new gasoline dispensing facility permit application (APCD2023-APP-007920). I have attached the emission calculations, Rule 1200 calculations and the site and receptor maps for your review.

Could you please have the modeler post the results in [7920 Costco Gasoline \(Loc. No. 124\)](#)? Please let me know if you have any questions or need additional information. Thank you!

Best regards,

Karen Yimnei Chan
Assistant APCD Engineer
10124 Old Grove Rd,
San Diego, CA 92131
Email: Karen.Chan@sdapcd.org
Phone: (858) 414-9917