Gasoline Station
Health Risk Assessment
Application Form -25T

Santa Barbara County Air Pollution Control District
260 N. San Antonio Road, Suite A
Santa Barbara, CA 93110-1315

GENERAL: This form must be accompanied by a completed District Form -25 and a completed health risk assessment (HRA). Mail the completed form(s) and appropriate filing fees to the Air Pollution Control District (District) at the above address. This form is required for gasoline station permit applications that meet any of the criteria below:

1. The station is new and the requested throughput is 1,000,000 gallons/year or more.

2. The station is existing and the requested throughput increase would result in a total throughput of 1,000,000 gallons/year or more.

3. The station is located within 1000 feet of the outer boundary of a school (k-12) and the permitting action will result in an increase in permitted emissions or if this is a new/rebuilt station.

4. The station has been identified by the District as posing a concern to public health.

The applicant is required to perform the HRA and submit this completed form. The District will review all work done by the applicant and/or their consultant. The fixed cost for this review is $1,500 and is due with submittal of the permit application. Instructions for completing the HRA can be found in Attachments A-C of this document.

Is the facility is open for refueling 24/7?
☐ Yes
☐ No, and the operating hours are indicated in the table below

Day of the Week	Opening Time	Closing Time
Monday		
Tuesday		
Wednesday		
Thursday		
Friday		
Saturday		
Sunday		

Is the Pressure Vent Valve (PV Valve) located on or adjacent to a building?
☐ Yes
☐ No

What is the height of the PV Valve above grade in feet? _____

UTM [1] coordinates of the PV Valve (Easting, Northing): _____

UTM coordinates of center of the dispensers [2] (Easting, Northing): _____

[1] Denote which datum, NAD27 or NAD83, is used. Use the same datum for all UTMs. UTMs must be in meters.
[2] See Attachment A to determine the center of the dispensers.

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Property boundary. Complete the table below with the UTM coordinates of the property boundary. If the facility boundary is not square, use additional points to describe the facility. Attach a separate table if necessary. Label the additional points.

Boundary Location	UTM Easting	UTM Northing
SW Corner		
NW Corner		
NE Corner		
SE Corner		

Receptors. Provide the UTM coordinates in the table below of the nearest worker and residential receptors in all four directions (N/S/E/W) and any applicable sensitive receptors, including daycare facilities, hospitals, elder care facilities, and schools [3]. Attach a separate table if necessary.

Receptor Name or Address	UTM Easting	UTM Northing

[3] See note at bottom of page 3 regarding schools.

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Applicant/Preparer Certification Statement

All applications are required to be signed by a responsible official who works for the owner/operator of the permitted equipment. The person who prepares the application also must sign the permit application. The preparer may be an employee of the owner/operator or an authorized agent (contractor/consultant) working on behalf of the owner/operator.

I certify that all information contained herein and information submitted with this application is true and correct.

_____ _____
signature of owner/operator responsible official date

_____ _____
print name of owner/operator responsible official employer name

I certify that all information contained herein and information submitted with this application is true and correct.

_____ _____
signature of application preparer date

_____ _____
print name of application preparer employer name

Application Checklist (have you submitted all the required information? Please check off the boxes)

☐ Health Risk Assessment Evaluation Fee (Fee = $1,500 for the District to review the applicant-provided Health Risk Assessment).

☐ Completed District Form -25 (and any other forms, attachments, or fees required by District Form -25).

☐ Completed Health Risk Assessment and Report (see Attachment C for more details).

☐ Electronic HARP 2 files (see Attachment C for more details).

☐ Plot Plan. Submit a plot plan drawing (required size: 17" by 11"), with:

- Dimensions and **true North** direction indicated showing the overall site with cross streets
- Buildings
- Property boundary (**with UTM coordinates shown**)
- Pressure vent valve (**with UTM coordinates shown)**
- Island/dispenser locations (**with UTM coordinates shown**)
- Identification of adjacent property owners
- Identify any schools located within one thousand feet of the gasoline station and the location of the nearest business and residential receptors in all four directions (N/S/E/W).

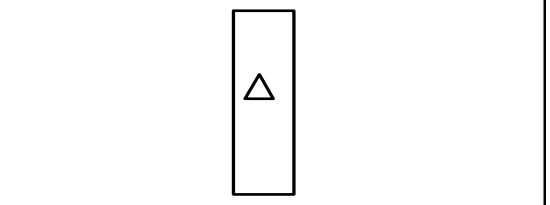
☐ If the gasoline station is located within 1000 feet of a school (k-12), provide the UTM coordinates for the property boundaries of all schools listed in District Form -03.

PLEASE NOTE THAT FAILURE TO COMPLETELY PROVIDE ALL REQUIRED INFORMATION WILL RESULT IN YOUR APPLICATION BEING RETURNED OR DEEMED INCOMPLETE.

ATTACHMENT A

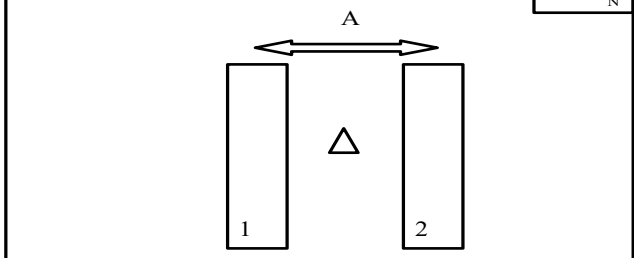
Layouts for the Center of the Dispensers

Figure 1



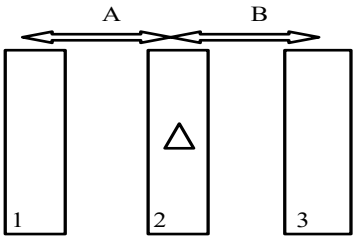
△ = Appropriate center of the island

Figure 2



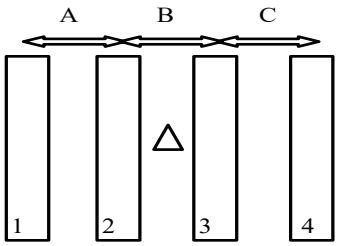
△ = Approximate center of the combination of islands
A = Distance (ft) between Islands 1 & 2

Figure 3



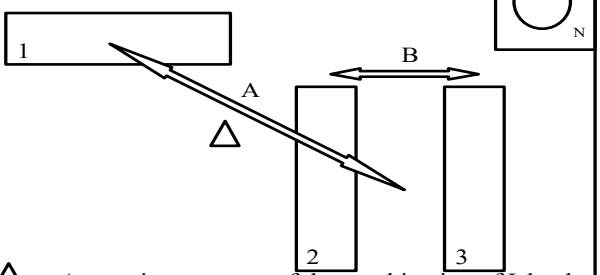
△ = Appropriate center of the combination of Islands
A = Distance (ft) between Island No. 1 & 2
B = Distance (ft) between Island No. 2 & 3

Figure 4



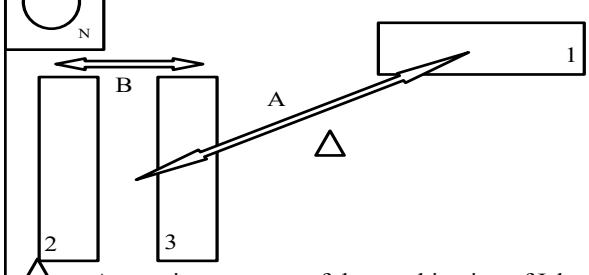
△ = Approximate center of the combination of Islands
A = Distance (ft) between Island No. 1 & 2
B = Distance (ft) between Island No. 2 & 3
C = Distance (ft) between Island No. 3 & 4

Figure 5



△ = Approximate center of the combination of Islands
A = Distance (ft) between the center of Island No. 1 and the center of Island No. 2 & 3
B = Distance (ft) between Island No. 2 and 3

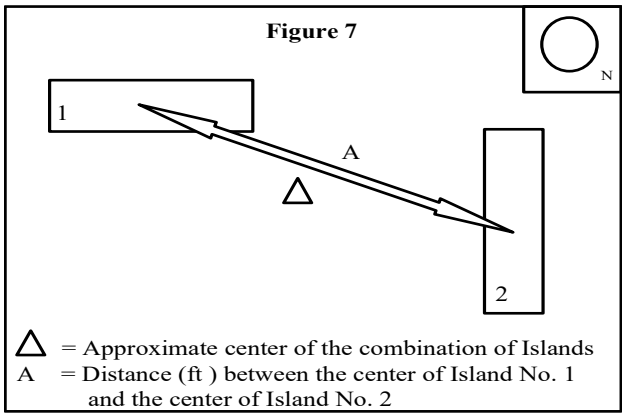
Figure 6

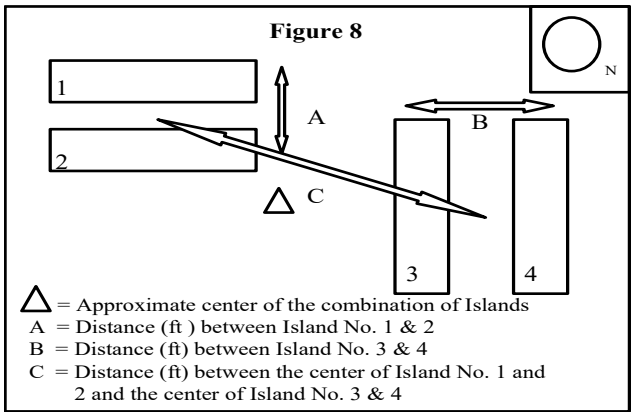


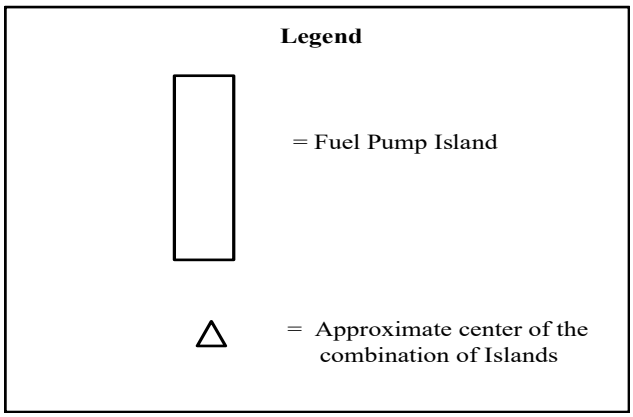
△ = Approximate center of the combination of Islands
A = Distance (ft) between the center of Island No. 1 and the center of Island No. 2 & 3
B = Distance (ft) between Island No. 2 & 3

ATTACHMENT A (Continued)

Layouts for the Center of the Dispensers







ATTACHMENT B

ROC and Benzene Emissions

Emission Sources

ROC and benzene emissions are released in four processes at a gasoline dispensing facility:

1) Loading emissions occur at the P/V Valve during gasoline delivery to the tanks;
2) Breathing emissions occur at the P/V Valve due to changes in temperature and the volume of tank;
3) Refueling emissions occur at the vehicle's tank that is being refueled; and
4) Spillage emissions occur on the ground at the dispenser from the nozzle.

Emission Factors

Santa Barbara County Air Pollution Control District's ROC emission factors used to calculate emissions from these processes are shown below.

GDF ROC Emission Factors for Underground Tanks
w/ Phase I EVR and Phase II (Non-EVR and EVR) and Vent Valves

	SBCAPCD Approved	
	Phase I EVR and Phase II Non-EVR	*Phase I EVR and Phase II EVR*
	lb/1000 gal	lb/1000 gal
Loading	0.15	0.15
Breathing	0.25	0.00 [4]
Refueling	0.42	0.38
Spillage	0.42	0.24
Total	**1.24**	**0.77**

Use the appropriate ROC emission factor above with the vapor weight fraction of benzene in gasoline to calculate benzene emissions from each process. CAPCOA's *Gasoline Service Station Industrywide Risk Assessment Guidelines* (http://www.arb.ca.gov/ab2588/rrap-iwra/gasiwra.pdf) lists the weight percent of benzene in the gasoline vapor as 0.3 percent and the weight percent of benzene in the gasoline liquid as 1.0 percent.

Sample Calculation

A sample calculation is provided below for loading emissions for a throughput of 1,000,000 gal/year. Breathing, refueling, and spillage emissions are calculated using the same methodology. Spillage emissions are calculated using the weight percent of benzene in liquid gasoline.

$$\text{Benzene Emisions}_{\text{Loading}} = (1{,}000{,}000 \text{ gal/yr})\left(\frac{0.15 \text{ lb ROC}}{1000 \text{ gal}}\right)\left(\frac{0.003 \text{ lb benzene}}{\text{lb ROC}}\right) = 0.45 \text{ lb/yr}$$

$$\text{Benzene Emissions}_{\text{Loading}} = (0.45 \text{ lb/yr})\left(\frac{1 \text{ yr}}{8760 \text{ hr}}\right) = 5.14 \times 10^{-5} \text{ lb/hr}$$

[4] Emissions from breathing are included in the refueling emission factor per Table 4-1 of ARB's CP-201 (February 9, 2005)

ATTACHMENT C

Health Risk Assessment and HRA Report

The health risk assessment (HRA) and HRA report should be completed using the most recent version of the District's Modeling Guidelines for Health Risk Assessments, which can be found here: https://www.ourair.org/wp-content/uploads/apcd-15i.pdf. If the HRA and report fail to comply with these guidelines, they will be returned to the applicant for revision. The sections below discuss requirements that are specific to gasoline dispensing facilities.

Source Modeling Parameters

The modeling parameters for each process should be determined based on CAPCOA's *Gasoline Service Station Industrywide Risk Assessment Guidelines* (CAPCOA's Guidelines, accessible at http://www.arb.ca.gov/ab2588/rrap-iwra/gasiwra.pdf):

- Use the stack diameter and stack exhaust temperatures from CAPCOA's Guidelines.
- The stack gas exit velocity must be calculated according to CAPCOA's Guidelines. An example calculation is shown below.
- The default stack height, and initial vertical and lateral dimensions from CAPCOA's Guidelines may be used. Alternatively, the applicant may provide the PV Valve stack height and the dimensions to calculate the initial vertical and lateral dimensions (σ_{Zint}, σ_{Yint}). If the PV Valve stack height is above 12 feet, the District may require a permit condition to enforce the height.

Default CAPCOA Source Parameters

The default stack parameter inputs to the dispersion model are as follows:

Process	Release Height (ft)	Stack Temp (°F)	Stack Vel (fpm)	Stack Dia (ft)	σ_{Zint} (ft)	σ_{Yint} (ft)
Loading	12	65	No default	0.167		
Breathing	12	60	No default	0.167		
Refueling	3.28				6.10	9.16
Spillage	0				6.10	9.16

Stack Gas Exit Velocity

The stack gas exit velocity is calculated by the following:

$$\text{Velocity} = \frac{(\text{Mass Emission Rate})}{(\text{Cross Sectoinal Area of Stack})(\text{Density of Gasoline Vapor})}$$

Where:

$$\text{Area} = \frac{\pi D^2}{4} = \frac{\pi(0.167\,\text{ft})^2}{4} = 0.0218\,\text{ft}^2$$

$$\text{Density of Gasoline Vapors} = 0.105\,\frac{\text{lb}}{\text{ft}^2}\text{, from Appendix D of CAPCOA's Guidelines}$$

Sample Velocity Calculation

A sample calculation is provided below for the velocity of loading emissions leaving the PV Valve for a throughput of 1,000,000 gal/year.

$$\text{Velocity}_{\text{Loading}} = (1{,}000{,}000\ \text{gal/yr})\left(\frac{0.15\ \text{lb ROC}}{1000\ \text{gal}}\right)\left(\frac{1\ \text{yr}}{8760\ \text{hr}}\right)\left(\frac{1\ \text{hr}}{3600\ \text{sec}}\right)\left(\frac{1}{(0.105\ \text{lb/ft}^3)(0.0218\ \text{ft}^2)}\right)(60\ \text{sec/min}) = 0.125\ \text{fpm}$$

Initial Vertical and Lateral Dimensions

The defaults for initial vertical and lateral dimensions from CAPCOA's Guidelines are calculated by the following (assumed volume source is 4 m high x 13 m long x 13 m wide):

$$\text{Initial Lateral Dimensions}(\sigma_{Y\,\text{int}}) = \frac{\sqrt{[(\text{Length of Pump Island or Canopy})\,\text{ft} \times (\text{Width of Pump Island or Canopy})\,\text{ft}]}}{4.3}$$

$$\sigma_{Y\,\text{int}} = \frac{\sqrt{\left[\left(13\,\text{m} \times 3.28\frac{\text{ft}}{\text{m}}\right) \times \left(13\,\text{m} \times 3.28\frac{\text{ft}}{\text{m}}\right)\right]}}{4.3} = 9.16\,\text{ft}$$

$$\text{Initial Vertical Dimensions}(\sigma_{Z\,\text{int}}) = \frac{(\text{Height of Canopy})\,\text{ft}}{2.15}$$

$$\sigma_{Z\,\text{int}} = \frac{\left(4\,\text{m} \times 3.28\frac{\text{ft}}{\text{m}}\right)}{2.15} = 6.10\ \text{ft}$$

Building Downwash

Building downwash is not required to be included in the model due to its minimal effects. The analysis in Section IX., *Miscellaneous Modeling Parameters,* of CAPCOA's *Gasoline Service Station Industrywide Risk Assessment Guidelines* (CAPCOA's Guidelines, accessible at http://www.arb.ca.gov/ab2588/rrap-iwra/gasiwra.pdf) shows that the effects from building downwash are minimal when determining the dispersion from the vent pipes.

Multipathway Analysis

A multipathway analysis is not needed for gasoline dispensing facilities because the only pollutant emitted, benzene, is not a multipathway pollutant. Therefore, inhalation is the only pathway that must be selected for the risk analysis.

Risk Driver

The risk driver tables described in Section 4 of Form-15i are not required for gasoline dispensing facilities.