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Mr. Nick Pappani
Raney Planning and Management
1501 Sports Drive
Sacramento, CA. 95834

Subject: Screening Health Risk Assessment for a Gasoline Fueling Facility at the Bohemian Retail Project, Placer County, California

Dear Mr. Pappani:

Introduction

This letter report provides a conservative screening health risk analysis for a gasoline fueling facility proposed to be constructed within the Bohemian commercial development east of the intersection of Highway 49 and Hulbert Drive. A fueling station is proposed near the southwest corner of the site. The proposed location is shown in the attached site plan.

Gasoline fueling facilities are a source of gasoline vapors that would include Toxic Air Contaminants (TACs), primarily benzene. Gasoline vapors are released during the filling of both the stationary underground storage tanks and the transfer from those underground tanks to individual vehicles.

Small amounts of gasoline vapor (a reactive organic gas) escape to the atmosphere at filling stations due to loading losses, breathing losses, refueling losses and spillage. The rate of emission, for stations with CARB Phase I and Phase II emission controls and vent valves (as required by Placer County APCD permit requirements) is 1.269 pounds per thousand gallons.[1]

[1] California Air Pollution Control Officers Association (CAPCOA), *Gasoline Service Station Industry-wide Risk Assessment Guidelines*, December 1997.

The Placer County Air Pollution Control District has stringent requirements for the control of gasoline vapor emissions from gasoline dispensing facilities that require all new facilities to install and maintain CARB Certified Vapor Recovery Systems. Primary applicable Placer County APCD regulations are Rule 213, "Gasoline Transfert into Stationary Storage Containers", Rule 214: "Transfer of Gasoline into Vehicle Fuel Tanks", and Rule 502, "New Source Review". As a source of TACs, a gasoline filling station is subject to the Placer County APCD's toxic risk screening and risk management procedures.

Methodology

A screening risk assessment has been conducted utilizing the procedures and emission factors defined in California Air Pollution Control Officers' *Air Toxics "Hot Spots" Program Gasoline Service Station Industry-wide Risk Assessment Guidelines*.[2] Using the project site plan and aerial photographs of the project environs, the distance between the center of the proposed gasoline facility and the nearest sensitive receptors were estimated.

The CAPCOA procedures provide a very conservative estimate of cancer risk per million gallons of gasoline pumped based on distance from the facility using results of the ISCST-3 dispersion model and hypothetical worst-case meteorological conditions as defined by the SCREEN-3 dispersion model. The only inputs required for the CAPCOA risk calculation is the distance from the gasoline facility to the receptor, identification of the type of emission control equipment that will be utilized, and a determination as to whether the surrounding neighborhood would be considered urban or rural. With these inputs, a conservative estimate of benzene concentration and the resulting risk can be obtained from tables and graphs. The risk is expressed as excess cancer risk per million gallons throughput. Since concentration is directly proportional to throughput, risks for any throughput can be estimated by multiplying the risk per million gallons by the desired throughput.

The estimated risk from the CAPCOA risk calculation is based on a continuous 24-hour a day exposure over a 70-year lifetime, typically termed the exposure of the Maximum

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[2] California Air Pollution Control Officers Association (CAPCOA), *Gasoline Service Station Industry-wide Risk Assessment Guidelines*, December 1997.

Exposed Individual (MEI). The CAPCOA document recommends that adjustments to this risk calculation be made for other types of exposure.

The project site is bounded on the east and north by residential uses. The closest residence to the center of the proposed fueling station is located north of the site on the south side of Dyer Court. The distance to between the center of the fueling station and the closest residence is 800 feet or 243.8 meters.

The closest non-residential off-site structure would be a building in the PG&E corporation yard directly to the east of the fueling station. The distance between the center of the fueling station and this building would be 275 feet or 83.8 meters. Exposures at this building have been estimated for employees. The correction factor for employees is based on an exposure of 8 hours per day, five days per week for 46 years (8/24 x 5/7 x 46/70 = 0.156).

Estimated Cancer and Non-Cancer Risk

The distance to receptors was determined using the site plan and aerial photographs. Cancer risks were found by interpolating within the attached table of cancer risks for gas stations assuming rural dispersion coefficients.

Table 1 shows the calculation of cancer risk at the maximally exposed residential and non-residential receptors for an annual throughput of 1 million gallons of gasoline. At this emission rate, the fueling station would result in a maximum incremental individual cancer risk of 0.519 in one million (per million gallons) for non-residential uses. The project would result in a maximum incremental individual cancer risk of 1.04 in one million (per million gallons) at the point of maximum residential exposure.

The applicant has indicated a desired maximum annual throughput of 9 million gallons. At this level of throughput, the fueling station would result in a maximum incremental individual cancer risk of 4.67 in one million for non-residential uses. The project would result in a maximum incremental individual cancer risk of 9.36 in one million at the point of maximum residential exposure. This is to be compared to the Placer County APCD's Significant Risk Threshold of 10 in one million.

The potential for non-cancer health effects is evaluated by comparing the long-term exposure level to a Reference Exposure Level (REL). A REL is a concentration level at or below which no adverse health effects are anticipated. RELs are designed to protect sensitive individuals with the population. Comparisons to RELs are made by determining the Hazard Index, which the ratio of the estimated exposure to the REL.

Table 1: Calculated Excess Carcinogenic Risk for 1 Million Gallon Annual Throughput

Receptor	**Maximum Annual Concentration (ug/m^3)**	**Distance (Meters)**	**Risk for MEI**	**Adjustment Factor**	**Adjusted Risk**
Non-Residential Exposure	1.43	83.8	$3.32x\ 10^{-6}$	0.156	$0.52x10^{-6}$
Residential Exposure	0.45	243.8	$1.04x10^{-6}$	1.0	$1.04x10^{-6}$

Based on the anticipated 9 million gallons throughput, the maximum off-site concentration would be 12.87 ug/m^3 (9 x 1.43 ug/m^3). The resulting Hazard Index is 0.18. This is to be compared to the Placer County APCD's Significant Risk Threshold of 1.0.

Conclusions

A screening risk assessment was conducted utilizing the procedures and emission factors defined in California Air Pollution Control Officers' *Air Toxics "Hot Spots" Program Gasoline Service Station Industry-wide Risk Assessment Guidelines.* The CAPCOA procedures provide a very conservative estimate of cancer risk per million gallons of gasoline pumped based on distance from the facility using results of the ISCST-3 dispersion model and hypothetical worst-case meteorological conditions as defined by the SCREEN-3 dispersion model.

Based on the results in Table 1, the proposed fueling station would not exceed the Placer County Significant Risk Thresholds at the anticipated throughput of 9 millions gallons per year.

The Placer County APCD may place limitations on the throughput of the proposed fueling facility in order to keep risks below the Significant Risk Thresholds. Base on the above analysis the risk thresholds would not be exceeded unless throughput was to exceed 9.61 million gallons per year.

Please call if you have any questions regarding this analysis.

Sincerely,

Donald Ballanti
Certified Consulting Meteorologist

Attachments

Cancer Risks

Basis: Rural Dispersion Coefficients
1,000,000 gallons of throughput per year