

**PROPOSED CHANGES
TO REGULATION 2, RULE 5 AND
THE HEALTH RISK SCREENING
ANALYSIS (HRSA) GUIDELINES:
SOCIOECONOMIC IMPACT ANALYSIS
DRAFT**

NOVEMBER 13, 2009

**Prepared for
BAAQMD**

**Prepared by
Applied Development Economics**
100 Pringle Avenue, Suite 560 ♦ Walnut Creek, California 94596 ♦ (925) 934-8712
2150 River Plaza Drive, Suite 168 ♦ Sacramento, CA 95833 ♦ (916) 923-1562
www.adeusa.com

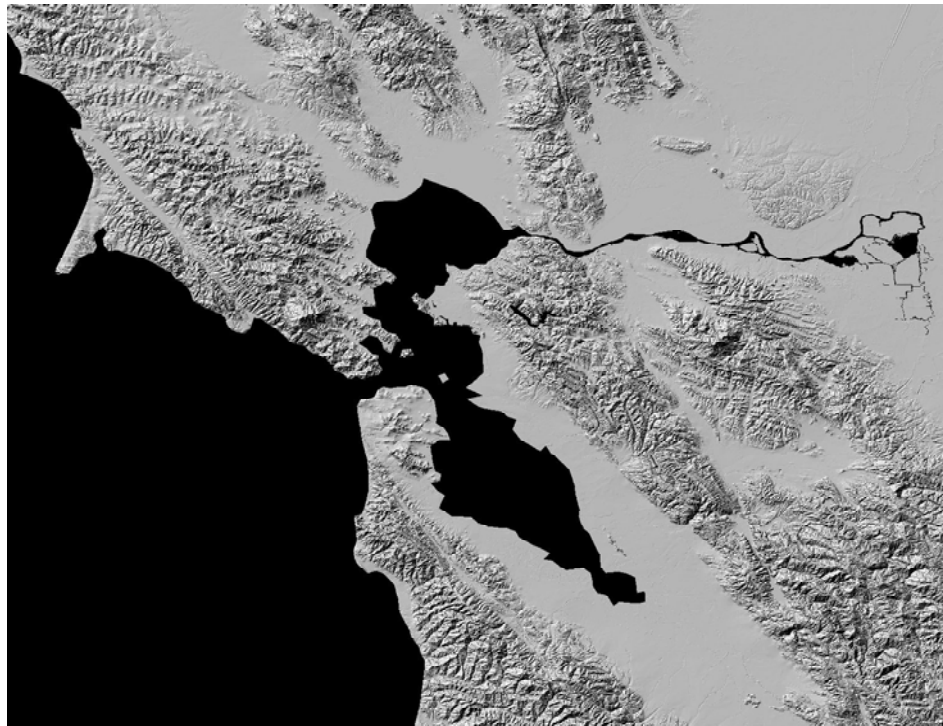
CONTENTS

Section One: Introduction	3
Section Two: Background of BAAQMD’s Rule 2-5 and the HRSA Guidelines	5
Section Three: Methodology	7
Section Four: Regional Demographic and Economic Trends.....	9
Section Five: Socioeconomic Impact Analysis	11
Appendix A: Summary of District Risk Screen Data (BAAQMD)	20

SECTION ONE: INTRODUCTION

This report describes the socioeconomic impacts of a proposal to incorporate age sensitivity factors in Regulation 2, Rule 5 and the Health Risk Screening Analysis Guidelines. Following this introduction, the report summarizes Regulation 2, Rule 5 (“Rule 2-5”) and the Health Risk Screening Analysis (“HRSA”) Guidelines. In Section Three, we describe the methodology for the socioeconomic analysis. Following this, we discuss economic and demographic contexts within which District staff and officials are contemplating changes to Rule 2-5 and the HRSA Guidelines. The fifth section analyzes the socioeconomic impacts of compliance costs on the affected sources and the regional economy.

The report is prepared pursuant to the provisions of AB2051 (Section 40728.5 of the California Health and Safety Code), which requires an assessment of socioeconomic impacts of proposed air quality rules. The findings in this report can assist District staff in understanding the socioeconomic impacts of the proposed requirements, and can assist staff in preparing a refined version of the rule. Figure 1 is a map of the nine-county region that comprises the San Francisco Bay Area Air Basin.



“This section intentionally left blank”

SECTION TWO: BACKGROUND OF REGULATION 2, RULE 5 AND HEALTH RISK SCREENING ANALYSIS

This section of the report summarizes the Bay Area Air Quality Management District's ("District") Toxic NSR program, and how the District seeks to achieve goals and objectives of the Toxic NSR program. This section also discusses vital parts of the Toxic NSR program, namely the District's Health Risk Screening Analysis Guidelines.

As part of its efforts to reduce TAC emissions and associated health risks in the Bay Area, the District developed guidelines for conducting health risk screening analyses. The District requires HRSAs pursuant to Regulation 2 Permits, Rule 1 General Requirements or Rule 5 New Source Review of Toxic Air Contaminants, which are conducted in accordance with these guidelines. HRSA generally conform to the Health Risk Assessment Guidelines adopted by Cal/EPA's Office of Environmental Health Hazard Assessment (OEHHA) for use in the Air Toxics Hot Spots Program. In addition, these guidelines are in accordance with State risk assessment and risk management policies and guidelines in effect as of June 1, 2009.

Through the rule development process, the District will periodically update Regulation 2, Rule 5 and the HRSA guidelines to clarify procedures, amend health effects data, or incorporate other revisions to regulatory guidelines. Right now, the District is contemplating a proposal to incorporate age sensitivity factors (ASF) in the health risk assessment procedures and to update health effects values for numerous toxic air contaminants. Incorporating age sensitivity factors would result in a 70 percent increase in cancer risk estimates for residential receptors. The health effects value changes mainly concern non-cancer health impacts, and the results of these changes will generally be small in comparison the cancer risk impacts expected due to the use of ASFs. As part of its due diligence efforts, the District reviewed recent risk assessment data for the three most common source categories to determine how this proposed cancer risk calculation procedure change may impact future projects. These source categories are diesel-fired emergency generator engines, gasoline dispensing facilities (GDFs), and crematories. See Appendix A for a District-issued memo on the proposed risk calculation procedure change and the three source categories.

SECTION THREE: METHODOLOGY

Applied Development Economics (ADE) began the analysis by preparing a statistical description of the industry groups of which the affected sources are a part, analyzing data on the number of establishments, jobs, and payroll. We also estimated sales generated by impacted industries, as well as net profits for each affected industry.

This report relies heavily on the most current data available from a variety of sources, such as the 2002 Economic Census, US Bureau of Labor Statistics, the State of California's Employment Development Department (EDD) Labor Market Information Division, and US Securities and Exchange Commission. For purposes of estimating profits, ADE reviewed industry-specific financial ratios issued by the US Internal Revenue Services. For purposes of estimating revenues generated by gasoline dispensing facilities (GDFs), ADE relied on California Board of Equalization for data on gas stations in the nine-county region.

With the above information, ADE was able to estimate net after tax profit ratios for sources affected by the proposed control measures. ADE calculated ratios of profit per dollar of revenue for affected industries. The result of the socioeconomic analysis shows what proportion of profits the compliance costs represent. Based on assumed thresholds of significance, ADE discusses in the report whether the affected sources are likely to reduce jobs as a means of recouping the cost of rule compliance or as a result of reducing business operations. To the extent that such job losses appear likely, the indirect multiplier effects of the jobs losses are estimated using a regional IMPLAN input-output model. In some instances, particularly where consumers are the ultimately end-users of goods and services subject to proposed control measures, we also analyzed to see if costs could be passed to households in the region.

When analyzing the socioeconomic impacts of proposed new rules and amendments, ADE attempts to work closely within the parameters of accepted methodologies discussed in a 1995 California Air Resources Board report called "Development of a Methodology to Assess the Economic Impact Required by SB513/AB969" (by Peter Berck, PhD, UC Berkeley Department of Agricultural and Resources Economics, Contract No. 93-314, August, 1995). The author of this report reviewed a methodology to assess the impact that California Environmental Protection Agency proposed regulations would have on the ability of California businesses to compete. The California Air Resources Board (ARB) has incorporated the methodologies described in this report in its own assessment of socioeconomic impacts of rules generated by ARB. One methodology relates to determining a level above or below which a rule and its associated costs is deemed to have significant impacts. When analyzing the degree to which its rules are significant or insignificant, ARB employs a threshold of significance that ADE follows. Berck reviewed the threshold in his analysis and wrote, "The Air Resources Board's (ARB) use of a 10 percent change in [Return on Equity] ROE (i.e. a change in ROE from 10 percent to a ROE of 9 percent) as a

threshold for a finding of no significant, adverse impact on either competitiveness or jobs seems reasonable or even conservative.”

SECTION FOUR: REGIONAL DEMOGRAPHIC AND ECONOMIC TRENDS

This section of the report tracks economic and demographic contexts within which District staff and officials are contemplating changes to Rule 2-5 and the HRSA guidelines. Table 1 tracks population growth in the nine-county San Francisco Bay Area between 2000 and 2008, including data for the year 2004. Between 2000 and 2004, the region grew by less than one percent a year, at 0.73 percent. Between 2004 and 2008, the region grew annually by slightly over one percent, at 1.05 percent a year. In both periods, the region did not grow as fast as the rest of California. Overall, there are 7,375,678 people in the region. At 1,857,621, Santa Clara County has the most people, while Napa has the least, at 137,571.

**TABLE 1
REGIONAL DEMOGRAPHIC TRENDS: 2000-2008
POPULATION GROWTH: SAN FRANCISCO BAY AREA**

	Population			Percent Change		
	2000	2004	2008	00-04	04-08	00-08
California	34,430,970	36,676,931	38,292,687	1.6%	1.1%	1.3%
Bay Area	6,871,151	7,073,168	7,375,678	0.7%	1.1%	0.9%
Alameda County	1,465,144	1,498,967	1,556,657	0.6%	1.0%	0.8%
Contra Costa County	966,095	1,016,407	1,060,435	1.3%	1.1%	1.2%
Marin County	248,879	251,586	258,618	0.3%	0.7%	0.5%
Napa County	125,975	132,280	137,571	1.2%	1.0%	1.1%
San Francisco County	785,534	806,433	845,559	0.7%	1.2%	0.9%
San Mateo County	712,289	720,042	745,858	0.3%	0.9%	0.6%
Santa Clara County	1,701,385	1,753,041	1,857,621	0.8%	1.5%	1.1%
Solano County	401,367	418,876	426,729	1.1%	0.5%	0.8%
Sonoma County	464,483	475,536	486,630	0.6%	0.6%	0.6%

Source: Applied Development Economics, based on total population estimates from The California Department of Finance (E-5 Report)

Data in Table 2 describe the larger economic context within which officials are contemplating the proposed updates to the Rule 2-5 and HRSA guidelines. Businesses in the region employ over three million workers, or 3,148,847. The number of jobs in the region grew annually by 1.2 percent between 2004 and 2008, after having declined dramatically between 2000 and 2004 by 2.7 percent a year. Of the 3,148,847 positions, almost 13.4 percent are in the public sector. In the state, almost 15 percent of all jobs are in the public sector. Relative to the state as a whole, manufacturing, professional/business services, and education/health service sectors comprise a greater proportion of the employment base. In the region, these sectors comprise 0.2 percent, 18 percent, and 11.4 percent respectively of total employment. In the state, these sectors comprise 9.1 percent, 14.4 percent, and 10.8 percent of statewide job base. In other words, as a percent of total workforce, the region employs more people in sectors and industries that are presumptively more advanced,

higher-paying.

**TABLE 2
REGIONAL EMPLOYMENT TRENDS: 2000-2008**

	2000	2004	2008	Distribution 2008		Annual Percentage Change	
				SFBA	State	00-04	04-08
Private and Public: All	3,353,821	3,003,430	3,148,847			-2.70%	1.20%
Total, all industries (private ownership):	2,939,710	2,588,823	2,727,987			-3.10%	1.30%
Goods-Producing	650,274	515,647	503,436			-5.60%	-0.60%
Natural Resources and Mining	22,267	17,599	16,120	0.50%	2.70%	-5.70%	-2.20%
Construction	173,663	169,409	165,536	5.30%	5.00%	-0.60%	-0.60%
Manufacturing	454,346	328,642	321,780	10.20%	9.10%	-7.80%	-0.50%
Service-Providing	2,289,437	2,073,174	2,224,553			-2.50%	1.80%
Trade, Transportation, and Utilities	582,710	521,223	526,559	16.70%	18.30%	-2.70%	0.30%
Information	147,606	110,639	112,028	3.60%	3.00%	-7.00%	0.30%
Financial Activities	190,053	197,996	186,333	5.90%	5.50%	1.00%	-1.50%
Professional and Business Services	661,810	502,453	567,658	18.00%	14.40%	-6.70%	3.10%
Education and Health Services	304,028	323,039	358,359	11.40%	10.80%	1.50%	2.60%
Leisure and Hospitality	282,104	284,461	314,110	10.00%	10.10%	0.20%	2.50%
Other Services	120,900	133,027	148,383	4.70%	4.80%	2.40%	2.80%
Unclassified	0	338	11,123	0.40%	0.50%		
Government Ownership:							
Federal Government	62,225	52,493	49,969	1.60%	1.60%	-4.20%	-1.20%
State Government	74,725	81,082	82,135	2.60%	3.00%	2.10%	0.30%
Local Government	277,161	281,032	288,756	9.20%	11.30%	0.30%	0.70%

Source: ADE, Inc. based on EDD LMID

SECTION FIVE: SOCIOECONOMIC IMPACT ANALYSIS

This section of the report analyzes socioeconomic impacts stemming from changes to the Rule 2-5 and HRSA guidelines to clarify procedures, amend health effects factors, or incorporate other revisions to regulatory guidelines. In particular, the District is contemplating a proposal to incorporate age sensitivity factors in the health risk assessment procedures. As indicated earlier, changes that the BAAQMD is considering would result in a 70 percent increase in cancer risk estimates for residential receptors. This section analyzes impacts on the three most common source categories in the six priority communities: diesel-fired emergency generator engines, gasoline dispensing facilities (GDFs), and crematories.

In identifying the common source categories identified below, the District analyzed its databases and identified a number of specific sources that will be subject to the rule changes. Below is a summary of how sources were identified for purposes of the socioeconomic impact analysis.

Diesel Fired Emergency Generator Engines

The District estimates that 12 percent of diesel engines in operation in the region need to comply with current rules. Thus, of the 312 engines subject to the rule as currently written, 37 projects are expected to require cleaner engines or diesel PM filters. When age sensitivity factors are included (the current Rule 2-5 proposal), the total number of projects requiring cleaner engines or diesel PM filters will be 69, or 312 times 22 percent. Therefore, this rule change is expected to require an additional 32 diesel engine projects per year ($69-37$) to have cleaner engines or diesel PM controls. About 40 percent of the engine projects affected by the rule change were for engines <750 bhp ($32*0.4 = 13$ engine projects). About 60 percent of the engine projects affected by the rule change were for larger engines: $32*0.6 = 19$ projects for engines >750 bhp. The average size of the larger engine projects affected by the rule change was 1714 bhp.

Assuming the diesel PM filter costs are roughly proportional to engine size, the average diesel PM filter cost for the 13 smaller engine projects would be about \$20,000 per engine and the average diesel PM filter cost for the 19 larger engine projects would be about \$65,000 per engine. When annualized, the \$20,000 and \$65,000 costs translate into \$2,460 and \$7,995 per year.

Crematories

The District reviewed 19 health risk assessments for crematories in the Bay Area spanning a 5 year period for an average of 4 crematory HRSA's per year. The cancer risks for these projects ranged from 0.6 in a million to 10.0 in a million for most sites. One site had a cancer risk of 90 in a million. After incorporating the age dependent adjustment factors for

residential cancer risk, 8 of the 19 sites evaluated (42 percent) would have cancer risks exceeding 10 in a million risk.

About half of the crematories could likely comply with the 10 in a million risk limit by limiting their operation or increasing stack heights. The other facilities would likely require some type of add-on emissions control to achieve compliance. One site would have a cancer risk greater than 100 in a million and would become subject to mandatory risk reduction measures under AB-2588.

The District is considering adopting risk reduction measures for crematories that would result in lower metal emissions. A 40 percent reduction in risk weighted emissions would allow all but one facility to meet a 10 in a million cancer risk. The anticipated control measures, which include carbon injection and dry filtration, are expected to achieve greater than 40 percent reduction in cancer risk weighted emissions. The District is investigating the cost of these potential control measures.

Costs stemming from the add-on emission control could run up to \$1.2 million for three crematory retorts with two abatement systems, based on discussions between District staff and one potentially affected crematory. On average, the \$1.2 million for three crematory retorts amounts to \$400,000 per crematory retort, which, when annualized, translates to a \$49,900 annual cost.

Gasoline-Dispensing Facilities (GDFs)

As with the diesel engines, the percentages of affected projects need to be applied to the expected number of risk screens. In this case, the District expects about four percent of the anticipated 400 risk screens/year to involve GDFs: ($400 \times 0.04 = 16$ GDF risk screen projects per year). After incorporation of enhanced vapor recovery (EVR) and age-sensitivity factor adjustments, about 75 percent of the GDFs would not be allowed to have any additional emission increases. However, the District staff indicates that it might only get applications for new GDFs or for throughput increases from the remaining 25 percent of the GDF sites that could accommodate a throughput increase. Since EVR is the best control available and all retail GDFs should have EVR in place by now, there are no additional control options. For the 16 GDF risk screens/year, the District anticipates that the majority will involve new facilities with a few modifications at existing GDFs. For new facilities, the throughput rate that would be allowed for a new GDF equipped with EVR is higher than the throughput rate that would have been allowed under the current procedures for a GDF without EVR. Thus, CARB's EVR requirement will offset the impacts of the proposed risk screen procedure change. For existing facilities, the District would either approve the permit request for a throughput increase (though the throughput amount allowed may not be as high as the site wants), or the District would deny the requested increase for an existing GDF, if the site already has a throughput limit that is higher than the District could now allow.

SOCIOECONOMIC IMPACT ANALYSIS AND SMALL BUSINESS DISPROPORTIONATE ANALYSIS

Table 4 includes the number of sources in the nine-county region operating diesel engines that will be subject to the proposed changes to HRSA guidelines. As the table below shows, there are 51 establishments in the region that will be impacted by the proposed changes. The diesel engines are placed in commercial offices, retail centers (Target, Costco, etc) cell phone tower locations (many for Verizon), and in institutional settings such as hospitals and educational facilities. In essence, any kind of business that needs back-up power typically operates diesel engines and would be subject to changes to the HRSA guidelines when the site proposes to install, replace, or modify a diesel engine.

Of the 51 affected establishments, 23 are in office/business park settings. Typically, businesses here are high-tech businesses, including bio-engineering, software engineering, computer electronics manufacturers, and computer-peripheral equipment designers and manufacturers. Among the 23 affected sources is Apple, Inc., which alone generates \$19.3 billion of the \$22.4 billion in annual revenues generated by affected sources. As the table below shows, costs stemming from the rule change are less than significant across the board.

**TABLE 4
SOCIOECONOMIC ANALYSIS: PROPOSED CHANGES TO RULE 2-5 AND HRSA GUIDELINES: IMPACTS ON SOURCE
CATEGORIES WITH DIESEL ENGINES**

	Estab.	Revenues	Net Profits	Annual Costs	Costs to Net Profits	Summary
Total	51	\$29,489,515,514	\$3,154,924,086	\$186,290	0.006%	less than significant
Office	23	\$22,360,245,062	\$1,269,123,120	\$100,820	0.008%	less than significant
Industrial	3	\$367,028,700	\$367,028,700	\$12,910	0.004%	less than significant
Refinery	1	\$5,474,627,540	\$310,675,487	\$7,990	0.003%	less than significant
Institutional: civic	2	\$72,100,000	\$72,100,000	\$4,920	0.007%	less than significant
Institutional: education	2	\$61,914,497	\$61,914,497	\$4,920	0.008%	less than significant
Institutional: cultural	1	\$6,800,000	\$6,800,000	\$2,460	0.036%	less than significant
Institutional: Hospital	2	\$1,022,752,004	\$1,022,752,004	\$4,920	0.000%	less than significant
Institutional: residential	1	\$12,100,000	\$378,172	\$2,460	0.650%	less than significant
Institutional: Hotel/Motel	1	\$4,500,000	\$285,896	\$2,460	0.860%	less than significant
Institutional: Other	1	\$13,569,789	\$13,569,789	\$7,990	0.059%	less than significant
Cell phone tower	8	\$9,653,499	\$530,482	\$19,680	3.710%	less than significant
Retail center	2	\$29,441,980	\$27,515,581	\$4,920	0.018%	less than significant
Unknown	4	\$54,782,443	\$2,250,359	\$9,840	0.437%	less than significant

Source: ADE, Inc., based on BAAQMD, GoogleEarth, US Economic Census 2002, US Bureau of Labor Statistics, and various corporate annual reports

There are approximately 64 crematories operating in the nine-county Bay Area. Of these facilities, the District expects eight will be impacted by changes to the HRSA guidelines. The analysis assumes that impacted sources represent larger facilities relative to the rest of the crematories in the Bay Area, in terms of number of workers and operating capacity. The analysis applies revenue-per-worker ratios derived from the US Economic Census 2002 in a way that accounts for the size of the eight sources affected by the proposed rule changes.

As Table 5 below shows, the eight establishments generate an estimated \$59.9 million in annual revenues, out of which is generated \$5.4 million in net profits. Annual costs stemming from the project amount to \$399,200, for a cost-to-net profit impact of 7.4 percent, which is below the 10 percent threshold used for determining whether impacts stemming from a rule are significant.

TABLE 5
SOCIOECONOMIC IMPACT ANALYSIS: PROPOSED
CHANGES TO RULE 2-5 AND HRSA GUIDELINES:
CREMATORIES SOURCE CATEGORY

NAICS Code	812220
Description	Cemeteries and crematories
Affected Sources	8
Employment	606
Est. Annual Revenues	\$59,905,684
Est. Annual Profits	\$5,391,512
Est. Annual Cost	\$399,200
Cost-to-Net Profits	7.4%
Summary	< significant

Source: ADE, Inc., based on BAAQMD, US Economic Census 2002, and US BLS

Proposed changes to Rule 2-5 and HRSA guidelines affect GDFs unlike the way crematories or sources with diesel engines are impacted. Rather than requiring a new emission-control equipment, GDF sources impacted by the proposed rule are either prevented from expanding capacity, or are allowed to expand capacity by a certain amount specified by the District per existing Rule 2-5 and HRSA guidelines.

There are a total of 2,588 GDFs in the District. About 1,640 of these GDFs are retail facilities (i.e. gasoline service stations) and the remainder are non-retail facilities serving fleets, company vehicles, etc. Although the District processed over 1,000 permit applications for equipment changes at GDFs in 2008, most of these changes involved EVR upgrades that resulted in emission reductions and did not trigger new risk screens. In 2008, only 14 risk screens (out of 399 total risk screens for all source types) involved new or modified GDFs that were subject to Regulation 2, Rule 5. The non-retail GDFs generally have much lower throughputs than the retail GDFs and are typically not located close to residents. Therefore, non-retail GDFs will not be impacted by the rule change, according to the District.

As required by CARB, all retail GDF sites should now be equipped with EVR. For sites with EVR, no additional emission control measures are possible. The only way the District can reduce risk at these sites is to limit the gasoline throughput. If a GDF site has a current throughput limit that would result in a risk > 10 in a million under the new Rule 2-5 proposal, the site would not be forced to accept a lower throughput limit, but the District would deny any increase in their current throughput limit. The only practical method that retail GDFs have of complying with a throughput limit is to raise their prices when their actual throughput rate is approaching their limit (if they can't get a throughput limit increase from the District due to 2-5 limitations). In such cases, customers will generally shift their business to another station, which may be farther away, resulting in additional costs and driving emissions.

Data in Table 5 analyzes impacts on 100 GDFs. The District provided the consultant with baseline data on the 100 GDFs, such as name of the facility, location by address, throughput

capacity, and additional capacity that sources can grow by (if at all), among other things. The consultant combined the District's data with sales 2004-2007 data from the California Board of Equalization for the nine-county Bay Area region, to estimate amount of sales generated by each of the 100 GDFs in the dataset provided by the District. While the socioeconomic analysis is conducted on 100 GDFs, in a typical year, the District typically conducts HRSAs for less than 20 GDF projects per year.

In analyzing its own databases, the District anticipates that it will not allow 74 to 75 percent of the GDFs to increase capacity and allow the remaining 25 to 26 percent to increase capacity, in the event the proposed rule change is adopted. Data in the table below shows that, of the 74 sample GDFs sample *not allowed* to increase throughput, 15 are generating average revenues above the regional average, or 20 percent of those not allowed to increase throughput. Similarly, of the 74 sample GDFs *not allowed* to increase throughput, 59 generate average revenues below the regional average, or 80 percent of those not allowed to increase throughput

TABLE 6
SOCIOECONOMIC IMPACT ANALYSIS: PROPOSED CHANGES TO RULE 2-5 & HRSA GUIDELINES: GASOLINE-DISPENSING FACILITIES SOURCE CATEGORY

	Sample: 100 GDFs	Aggregate Revenues	Average Revenues	Aggregate Net Profits	Avg. Net Profits	Est. Annual Aggregate Volume of Gas Sold (gallons)	Est. Annual Average Volume of Gas Sold Per Station (gallons)
Total Number of GDFs in 100 Sample	100	\$426,566,662	\$4,265,667	\$4,333,313	\$43,333	104,042,527	1,040,425
Sample GDFs Allowed to Increase	26	\$196,623,448	\$7,562,440	\$1,997,416	\$76,824	47,957,804	1,844,531
Sample GDFs Not Allowed to Increase	74	\$229,943,214	\$3,107,341	\$2,335,897	\$31,566	56,084,723	757,902
Sample GDFs Allowed to Increase	26	\$196,623,448	\$7,562,440	\$1,997,416	\$76,824	47,957,804	1,844,531
Number GDFs generating > Avg Revenues	17	\$176,187,507	\$10,363,971	\$1,789,816	\$105,283	42,973,338	2,527,843
Number GDFs generating < Avg Revenues	9	\$20,435,942	\$2,270,660	\$207,600	\$23,067	4,984,466	553,830
Sample GDFs Not Allowed to Increase	74	\$229,943,214	\$3,107,341	\$2,335,897	\$31,566	56,084,723	757,902
Number GDFs generating > Avg Revenues	15	\$97,908,082	\$6,527,205	\$994,607	\$66,307	23,880,451	1,592,030
Number GDFs generating < Avg Revenues	59	\$132,035,132	\$2,237,884	\$1,341,290	\$22,734	32,204,272	545,835

Source: ADE, Inc. based on BAAQMD, California Board of Equalization, US Department of Energy

The District indicates that it believes that GDFs interested in increasing throughput more than likely will come from 26 sample GDFs that are allowed to increase throughput, or 25 percent to -26 percent of total sample GDFs. Of the 26 sample GDFs allowed to expand throughput, 17 (65 percent of sample GDFs allowed to expand) generate average revenues well-above the regional average, i.e. \$10.4 million versus \$4.3 million (rounded). Of the 26 sample GDFs allowed to expand throughput, nine (35 percent of sample GDFs allowed to expand) generate average revenues below the regional average, i.e. \$2.3 million versus \$4.3 million (rounded).

Based on the numbers and percentages generated via the table above, it is possible that the 16 GDFs that receive risk screens a year will break down accordingly:

- If all 16 GDFs are within the group that's allowed to increase, then 10 (or 65 percent) will generate revenues and net profits above the regional average - assuming percentages derived from above hold
- If all 16 GDFs are within the group that's allowed to increase, then 6 (or 35 percent) will operate on razor thin profit margins, on average \$23,100, which is almost 5 times below amount generated by the other 10 GDFs allowed to increase.

It is also possible that the 16 GDFs allowed to expand break down according to the sample as a whole:

- If all 16 GDFs are distributed in accordance with way 100 sample GDFs are distributed, then 12 of the 16 could *not be allowed* to increase throughput ($12 = .74_{\text{no expand ratio}} * 16$), leaving only four remaining that would be allowed to increase ($4 = 16 - 12$).
- In the scenario where all 16 GDFs are distributed in accordance with the way 100 sample GDFs are distributed, four are allowed to increase their respective throughput, and, if the percentages hold, of the four, three will generate better than average revenues ($3 = 4 \times [17/26]$) and one will be low-performing ($1 = 4 \times [9/26]$)

Socioeconomic impact of the proposed rule change on GDFs is such that retail GDFs that are *not allowed* to increase throughput and, at the same time, are *low-performing* relative to the regional average revenue benchmark will continue to be low-performing: the rule precludes these businesses from expanding via additional throughput, thus leaving these businesses to compete on price. But in this regard, the businesses cannot (for the most part) increase prices to off-set static volume due to competition. Will these businesses shutter because the program precludes them from expanding? Judging from a review of each of the 59 GDFs *not allowed* to increase capacity that are also low-performing, it appears that the gap between each businesses' respective revenues and the regional revenue average is such that they would need to expand throughput capacity in a significant manner that, in all likelihood, would not realistically occur given space limitations at the affected sites. Of the 59 GDFs that are *not allowed* to increase capacity and are *low-performing*, approximately three are within striking range of the regional revenue average through throughput expansion. Most likely, these are the only gas stations that could expand. The remaining 56 *low-performing* entities *not allowed* to

expand will continue to be low-performing; it is not a forgone conclusion that these stations will shutter, as a number of these stores may have developed a niche. In the event the stations shutter, it would not be because of the proposed changes to Rule 2-5 and the HRSA guidelines, as many were low-performing to begin with, with limited physical expansion potential.

It is important to note that some of the 16 GDFs that the District *allows* to expand will also be *low-performing* -- if the percentages indicated in the District's GDF dataset hold. Based on a close examination of its database, the District determined that of the GDFs in its sample of 100, 25 to 26 percent could expand capacity. We examined the data further and estimate that, of the 26 that could expand, nine are low-performing in terms of revenues, or 35 percent of the GDFs allowed to expand (i.e. 26). The nine low-performing GDFs allowed to expand also represent nine-percent of the total number of GDFs that are either allowed to expand and are prevented from expanding. Thus, the rule does not preclude relatively low-performing businesses from growing.

SMALL BUSINESS DISPROPORTIONATE IMPACT ANALYSIS

As discussed above, businesses impacted subject to proposed changes to Rule 2-5 and the HRSA guidelines are not impacted significantly across the board. For these reasons, we conclude that small businesses are not disproportionately impacted.

APPENDIX A: SUMMARY OF DISTRICT RISK SCREEN DATA (BAAQMD)

In 2008, the District conducted 399 health risk screening analyses (HRSAs) on new or modified sources. The projects evaluated included new or modified diesel engines (78 percent), gasoline dispensing facilities (4 percent), and a variety of other commercial and industrial sources, such as gas fired combustion devices, crematories, petroleum refinery projects, cement plants, and landfills.

The District’s proposal to incorporate age sensitivity factors in the health risk assessment procedures will result in a 70 percent increase in the cancer risk estimates for residential receptors. The District has reviewed recent risk assessment data for the three most common source categories to determine how this proposed risk calculation procedure change may impact future projects.

Diesel-Fired Emergency Generator Engines

The District reviewed 50 risk screens that were conducted in 2009 for new diesel-fired emergency standby engines. For these risk screens, 46 projects (92 percent) included a single IC engine and 4 projects (8 percent) included multiple engines at a site. The diesel engine sizes ranged from 48 bhp to 3251 bhp, and the average engine size was 739 bhp. Project cancer risks for these projects ranged from 0.1 in a million to 9.9 in a million, and the average cancer risk for these 50 projects was 4.4 in a million. The ranges of engine sizes evaluated and the average cancer risk for each size range are presented in Table 1.

**TABLE 1
DIESEL ENGINE SIZES EVALUATED IN 2009**

Emergency Standby Engine Capacities	Percentage of Engines for 2009 Data Set	Average Project Cancer Risk in a Million
< 250 bhp	41%	3.2
250 bhp < 750 bhp	29%	5.2
750 bhp and larger	29%	5.6

Source: ADE, Inc.

The data recorded for these projects did not specify whether the maximum risk for the project occurred at a residential or a worker receptor. The proposed change to include age sensitivity factors in the health risk calculation procedures will only impact the cancer risk determination for residential receptors. For the purposes of this analysis, the District assumed that the proposed 70 percent increase in residential cancer risk estimates applies to all the projects in the 2009 data set.

After including the age-dependent factors in the risk screen procedure, 40 percent of the projects would have cancer risk greater than the project risk limit of 10 in a million risk.

If a diesel-fired engine project exceeds a project risk standard, the District will present various compliance options to the applicant. For emergency generators, the most commonly used compliance option is to reduce the maximum allowable annual operating time for reliability related activities. The CARB ATCM allows 50 hours/year of operation for reliability related testing, but many standby engine operators do not require this many hours and can accept a lower operating time limit. This compliance option adds no cost to the project.

Other compliance options include using a different engine with a lower certified emission diesel PM emission rate (grams/bhp-hour) or adding a diesel particulate filter to the proposed engine that reduces the certified diesel PM emission rate from the proposed engine. While there is presumably an added cost for using a cleaner engine and will certainly be an additional cost for using a diesel PM filter, these options have the added benefit of reducing emissions from the engine while it is operating during an emergency. Diesel particulate filter costs range from \$12,000 for small mobile sources to \$118,000 per filter for a facility with sixteen large standby engines (3353 bhp each).

Most of the projects that would have an age sensitivity factor adjusted cancer risk of more than 10 in a million should be able to achieve compliance with the Regulation 2, Rule 5 project risk limit of 10 in a million cancer risk by limiting the annual operating time for reliability related activities. Assuming that all engine operators could accept an operating time as low as 30 hours/year, only 6 additional projects (12 percent of the total projects reviewed) would need to use a cleaner engine or diesel particulate filter to achieve compliance.

CARB and EPA have adopted tier standard changes that will reduce PM emissions from new diesel engines in the near future. To compare the impacts of these tier standard changes, the District used the 2009 risk screen set discussed above to develop a baseline group of engines. The 2009 baseline group includes the engine sizes evaluated for the risk screen set, the 2009 maximum allowable engine diesel PM emission rate for the engine (this limit is the current TBACT and ATCM standard of 0.15 g/bhp-hour), and either the ATCM maximum allowable operating time of 50 hours/year. For this 2009 baseline set of engines, 22 percent of the projects exceeded the project risk limit of 10 in a million and required some type of diesel PM emission limitation. About half of these projects could achieve compliance by adjusting the annual operating time limitation, but 12 percent of the total projects reviewed would require a cleaner engine or a diesel PM filter.

For engines subject to the 2009 and 2010 emission standards, including the age dependent factors in the calculation procedures will increase the number of projects that are required to implement controls to 44 percent compared to the baseline rate of 22 percent. As with the baseline case, about half of these projects are expected to be able to comply with the 10 in a million project risk standard by using the no-cost compliance option of reducing their operating time limit for reliability related activities. However, 22 percent of the total projects (compared to 6 percent for the baseline case) would require a cleaner engine or diesel PM filter.

As of 2011, all diesel engines larger than 175 bhp will be subject to interim Tier 4 diesel PM standards that are lower than the current TBACT/ATCM limit of 0.15 g/bhp-hr. These changes will reduce the number of diesel engine projects that will require emission controls in order to comply with the Regulation 2, Rule 5 project risk limit. By 2011, only 8 percent of the projects, based on inclusion of the age-adjustment factors in the calculation procedures, will require emission controls, and only 4 percent of the projects will require cleaner engines or diesel PM filters to achieve compliance. These percentages are lower than the percentages of projects requiring emission limits and diesel PM filters for the 2009 baseline set. By 2013, all projects are expected to comply with the project risk limits without any additional diesel PM reductions.

Gasoline Dispensing Facilities

The District evaluated 100 risk screens for gasoline dispensing facilities (GDFs) that were conducted during 2004-2009. At the time these risk screens were conducted, many of the GDFs were not equipped with enhanced vapor recovery (EVR) on the gasoline dispensing operations, which is now required for all retail GDFs. Without Phase II EVR, 19 percent of the GDFs were found to have actual cancer risks greater than 10 in a million based on actual throughput data for the site. After adjusting the emission rates downward for sites that should now have Phase II EVR implemented, only 2 percent of the sites would have cancer risks exceeding 10 in a million. If the 70 percent increase in residential cancer risk, which is caused by the incorporation of the age sensitivity factors in the District's risk calculation procedure, is applied to the post-EVR actual risk data, then 22 percent of the GDFs are expected to exceed a cancer risk of 10 in a million. These facilities (22 percent of the retail GDFs) would not be allowed to have any additional throughput increases and would be subject to the AB-2588 public notification requirements.

After adjusting for post Phase II EVR emission reductions, 76 percent of the GDFs have condition limits that result in cancer risks of less than 10 in a million, and 65 percent of the GDFs could be allowed a throughput increase of 10 percent or more above the current limit for that site. However, when the age sensitivity factors are incorporated into the risk calculations, the percentage of GDFs with condition limits equating to less than 10 in a million cancer risk is reduced to 25 percent. Only 9 percent of the GDF sites would be allowed to have a throughput increase of 10 percent or more.

After including the age sensitivity adjustment factors in the risk calculation procedure, the gasoline throughput limit for a new facility could be no higher than 113,860 gallons/year based on the best case site conditions and meteorological data reviewed in the study. However, the throughput limit for a new facility could be as low as 760 gallons/year for a site located close to residents that has no applicable real meteorological data. The actual throughput rates for the GDFs evaluated in this study ranged from 9 gallons/year to 12,380 gallons/year with an average of 2,195 gallons/year. While all sites could comply with the best case throughput limit for a new GDF, only 6 percent of the stations could meet the worst case throughput limit.

If the age sensitivity factors are incorporated into the risk calculation procedures, the receptor types and locations near a site and the available meteorological data for a site will have a large impact on a new GDF's ability to comply with the Regulation 2, Rule 5 project risk limit. The District may need to conduct many more refined risk assessments and reevaluate the use of SCREEN3 meteorological data for GDFs.

Crematories

The District reviewed 19 health risk assessments for crematories in the Bay Area, spanning a 5 year period for an average of 4 crematory HRSAs per year. The cancer risks for these projects ranged from 0.6 in a million to 10.0 in a million for most sites. One site had a cancer risk of 90 in a million.

After incorporating the age dependent adjustment factors for residential cancer risk, 8 of the 19 sites evaluated (42 percent) would have cancer risks exceeding 10 in a million risk.

About half of the crematories could likely comply with the 10 in a million risk limit by limiting their operation or increasing stack heights. The other facilities would likely require some type of add-on emissions control to achieve compliance. One site would have a cancer risk greater than 100 in a million and would become subject to mandatory risk reduction measures under AB-2588.

The District is considering adopting risk reduction measures for crematories that would result in lower metal emissions. A 40 percent reduction in risk weighted emissions would allow all but one facility to meet a 10 in a million cancer risk. The anticipated control measures, which include carbon injection and dry filtration, are expected to achieve greater than 40 percent reduction in cancer risk weighted emissions. The District is investigating the cost of these potential control measures.