



SOCIOECONOMIC IMPACT ANALYSIS FOR SMAQMD RULE 421 AMENDMENT

Final Report

Sacramento Metropolitan
Air Quality Management District
Program Coordination Division
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Sacramento, CA 95814

August 21, 2009



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TABLE OF CONTENTS

Section	Page
EXECUTIVE SUMMARY	1
1.0 INTRODUCTION	3
2.0 OPTIONS AND QUANTITIES AFFECTED	4
3.0 SUPPLIER INDUSTRIES	4
3.1 Industry Characterization	6
3.1.1 Very Small Independents	7
3.1.2 Small Independents—Primary Business	7
3.1.3 Small Independents—Secondary Business	8
3.1.4 Retailers—Wood Bundles	9
3.1.5 Manufactured Logs	10
3.1.6 Pellets	11
3.2 Potential Impacts	12
3.2.1 Small Independents—Primary and Secondary Business	12
3.2.2 Retail Stores	15
3.2.3 Manufactured Log Companies	18
3.2.4 Pellet Manufacturers and Retailers	18
4.0 CONSUMERS	18
4.1 No Cost Increase Scenario	18
4.1.1 Residents	19
4.2 Price Increase Scenario	21
4.2.1 Industries and Businesses	21
4.2.2 Residents	21
5.0 CONCLUSIONS	22
6.0 REFERENCES	24

Tables	Page
ES1 Summary of Impacts on Wood Suppliers	2
1 Options and Fuel Quantities Affected	5
2 Small Independent Wood Dealers—Primary Business	7
3 Small Independent Wood Dealers—Primary Business Revenues and Number of Employees	7
4 Small Independent Wood Dealers—Secondary Business	8

TABLE OF CONTENTS - Continued

5	Small Independent Wood Dealers–Secondary Business Revenues and Number of Employees	9
6	Retail Stores in Sacramento County Potentially Selling Wood Bundles.....	10
7	Value of Wood, Manufactured Logs, and Pellets not Purchased	13
8	Upper Bound Potential Impacts on Independent Wood Dealers	14
9	Potential Impact on Retail Stores.....	17
10	Increased Costs as a Percentage of Median Household Income for Households that Burn Wood.....	22
11	Summary of Impacts on Wood Suppliers	23

Figures

Page

1	Supplier Types for Wood and Other Solid Fuels.....	6
2	Consumers of Wood and Other Solid Fuel: No Cost Increase Scenario	19

EXECUTIVE SUMMARY

Rule 421, Mandatory Episodic Curtailment of Wood and Other Fuel Burning, is being proposed for amendment. SMAQMD is considering four options for modifying the rule:

- Recommended Option: Reduce Stage 1 threshold from 35 to 31 $\mu\text{g}/\text{m}^3$ and reduce Stage 2 threshold from 40 to 35 $\mu\text{g}/\text{m}^3$.
- Option A: Eliminate 2 stages; set no-burn threshold to 30 $\mu\text{g}/\text{m}^3$, and either keep the voluntary threshold at 25 $\mu\text{g}/\text{m}^3$ or reduce it to 20 $\mu\text{g}/\text{m}^3$.
- Option B: Reduce Stage 1 threshold to 25 $\mu\text{g}/\text{m}^3$, reduce Stage 2 threshold to 30 $\mu\text{g}/\text{m}^3$, and reduce voluntary threshold to 20 $\mu\text{g}/\text{m}^3$.
- Contingency Option: Eliminate 2 stages; set no-burn threshold to 20 $\mu\text{g}/\text{m}^3$

ERG—through information supplied by SMAQMD, Yellow Book searches, and Internet searches—identified independent wood dealers, manufactured log producers, pellet manufacturers, and retail stores potentially affected by the rule. ERG searched databases such as Dun & Bradstreet's Million Dollar Directory and manta.com to identify revenues and the number of employees at each company or at their Sacramento County location(s).

ERG evaluated the four options under two different economic scenarios (i.e., price increase or no price increase) and used worst case analyses to avoid the potential to underestimate costs.

For residential consumers of wood and other solid fuels, SMAQMD has mitigated impacts on low income populations by including a hardship exemption. If suppliers raise prices to maintain revenues when sales volumes decline, the estimated price increase is less than one-quarter of one percent (<0.25 percent) of the 2007 median household income for Sacramento County.

For commercial consumers of wood and other solid fuels (e.g. restaurants and lodgings), burning is discretionary. If suppliers raise prices, each business is anticipated to weigh the increased price against the perceived benefit to the business's ambience to determine whether or not to pay the increased prices. No employment losses are anticipated in this sector as a result of the rule amendment.

Impacts to wood and solid fuel suppliers are summarized in Table ES1. If the suppliers are able to raise prices to compensate for lower sales volumes, there are no impacts under any of the options. If suppliers are unable to raise prices, then small impacts might occur.

Impacts on retailers are negligible.

Table ES1. Summary of Impacts on Wood Suppliers

Scenario and Potential Impact	Option	Independent Wood Dealers	Manufactured Log Producers	Retail Stores	Wood Stove and Pellet Retailer
Price Increase					
Potential Loss in Revenues					
	Recommended Option	0%	0%	0%	0%
	Option A	0%	0%	0%	0%
	Option B	0%	0%	0%	0%
	Contingency Option	0%	0%	0%	0%
Potential Loss in Employment					
	Recommended Option	0	0	0	0
	Option A	0	0	0	0
	Option B	0	0	0	0
	Contingency Option	0	0	0	0
No Price Increase					
Potential Loss in Revenues					
	Recommended Option	4.6%	0.5%	0.01%	0.01%
	Option A	8.7%	0.8%	0.03%	0.03%
	Option B	14.0%	1.8%	0.04%	0.04%
	Contingency Option	34.1%	3.8%	0.10%	0.10%
Potential Loss in Employment					
	Recommended Option	2.8	1.2	0	0
	Option A	5.3	2.1	0	0
	Option B	8.5	4.4	0	0
	Contingency Option	20.6	9.4	0	0

The results reported in Table ES1 are based on worst case analyses, which incorporate such assumptions as:

- No independent wood dealers located outside of Sacramento County sell wood within Sacramento County. If such dealers exist, the impacts would be reduced proportionately by the fraction of wood sold in Sacramento County by extra-county dealers.

- All impacts from reduced sale of manufactured logs are absorbed by the one manufactured log producer that is headquartered in California. In reality, the impacts would reflect that company's market share of manufactured log sales in Sacramento County.

1.0 INTRODUCTION

Rule 421, Mandatory Episodic Curtailment of Wood and Other Fuel Burning, is being proposed for amendment. Under the current regulation, a Stage 1 "no-burn day" prohibits burning except in EPA certified wood devices or pellet devices. A Stage 2 no-burn day prohibits all burning. The rule does not apply to fireplaces and devices that burn gaseous fuels (natural gas or propane). The rule exempts burning that is the sole source of heat or in situations when not burning would be a financial hardship to a resident.

Sacramento County exceeds state or federal health standards for fine particle air pollution (PM_{2.5}). The burning of wood or other solid fuel constitutes the single largest source of fine particle emissions for this region during the wintertime. As a result, SMAQMD is considering four options for modifying the rule:

- Recommended Option: Reduce Stage 1 threshold from 35 to 31 $\mu\text{g}/\text{m}^3$ and reduce Stage 2 threshold from 40 to 35 $\mu\text{g}/\text{m}^3$.
- Option A: Eliminate 2 stages; set no-burn threshold to 30 $\mu\text{g}/\text{m}^3$, and either keep the voluntary threshold at 25 $\mu\text{g}/\text{m}^3$ or reduce it to 20 $\mu\text{g}/\text{m}^3$.
- Option B: Reduce Stage 1 threshold to 25 $\mu\text{g}/\text{m}^3$, reduce Stage 2 threshold to 30 $\mu\text{g}/\text{m}^3$, and reduce voluntary threshold to 20 $\mu\text{g}/\text{m}^3$.
- Contingency Option: Eliminate 2 stages; set no-burn threshold to 20 $\mu\text{g}/\text{m}^3$

Section 2.0 of this report describes the quantities of wood, manufactured logs, and pellets that would not be burned pursuant to a no-burn day, examines the change in the number of Stage 1 and Stage 2 no-burn days under each option, and estimates the annual quantities of fuel not burned for each option.

The proposed amendments have the potential to affect both the businesses which supply the fuel as well as the residents that consume the fuel. Section 3.0 describes the suppliers, the steps taken to identify the potentially affected industry sectors and prices, and estimates the potential impact of the options.

Section 4.0 of this report describes the consumers potentially affected by the changes.

Section 5.0 of this report summarizes conclusions regarding the four options evaluated.

This socioeconomic analysis uses two bounding assumptions to study the suppliers and consumers. The first scenario is that suppliers are not able to raise prices. This scenario maximizes the potential impacts on the suppliers but minimizes them for the consumers. The second scenario is that suppliers are able to maintain their income by raising prices. The second scenario minimizes impacts on suppliers but maximizes them for consumers. What is likely to happen lies in the middle of the findings. There are also places where “worst case” assumptions are made in order not to underestimate potential impacts. These are noted throughout the report.

2.0 OPTIONS AND QUANTITIES AFFECTED

Table 1 summarizes the estimated quantities of fuel not burned and not purchased under each of the three options plus the contingency option. The fuel categories are firewood, manufactured logs, and pellets. For each fuel source, SMAQMD has estimated a range in the quantity not burned during a Stage 1 and Stage 2 no-burn day. For each of the options, SMAQMD calculated the change in the number of Stage 1 and Stage 2 burn days. For example, Option A is considered to result in 15 more Stage 2 days and 7 fewer Stage 1 days for a net increase of 8 no-burn days.

Table 1 also provides estimates of the changes by type of wood product. For example, pellets are affected only by the change in the number of Stage 2 no-burn days, while firewood may or may not be purchased; the economic analysis is structured to address this possibility.

3.0 SUPPLIER INDUSTRIES

Section 3.1 describes the characteristics of the fuel suppliers while Section 3.2 examines the potential impacts of the Rule 421 options on these groups.

Table 1. Options and Fuel Quantities Affected

Products	Units	Change in Number of No Burn Days												Products Not Burned						
		Products Not Burned Per Day		Recommended Option				Option A				Option B				Contingency Option	Recommended Option	Option A	Option B	Contingency Option
		Stage 1	Stage 2	Stage 1	Stage 2	Stage 1	Stage 2	Stage 1	Stage 2	Stage 1	Stage 2	Stage 1	Stage 2							
Wood	cord	225	428	-2	7	-7	15	6	15	-7	15	6	15	-7	48	2,546	4,845	7,770	18,969	
Manufactured Fire Logs	log	1,223	1,502	-2	7	-7	15	6	15	-7	15	6	15	-7	48	8,068	13,969	29,868	63,535	
Pellets	ton	0	77	-2	7	-7	15	6	15	-7	15	6	15	-7	48	539	1,155	1,155	3,696	

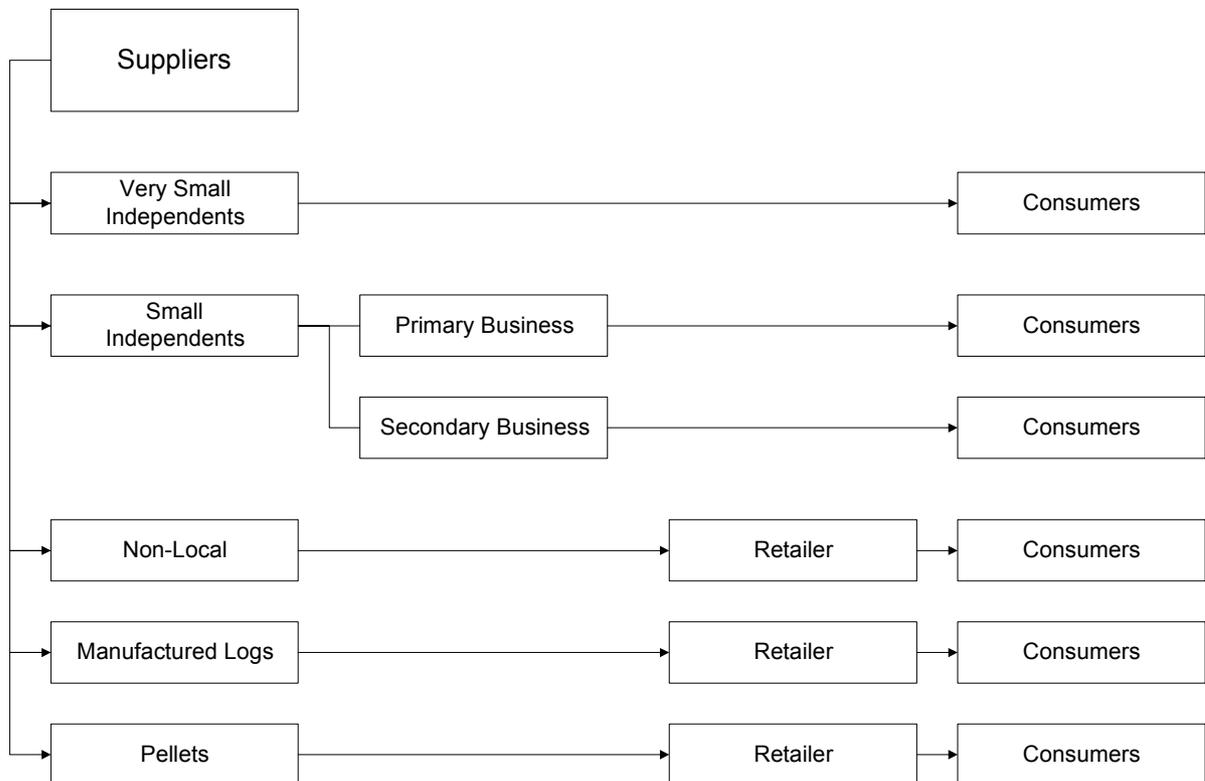
Products	Units	Percent Purchased	Quantity Not Purchased								
			Recommended Option	Option A	Option B	Contingency Option	Option A	Option B	Contingency Option		
Wood	cord	51.4%	1,309	2,490	3,994	9,750					
Manufactured Fire Logs	log	100.0%	8,068	13,969	29,868	63,535					
Pellets	ton	100.0%	539	1,155	1,155	3,696					

Sources: SMAQMD, 2009; Williams, 2009; and Houck, 2003.

3.1 Industry Characterization

ERG identified six types of fuel suppliers that could potentially be affected by the amendments to Rule 421 (See Figure 1). Consumers can purchase wood from local dealers whether they are individuals (“very small independents”) or small independent companies as a primary or secondary line of business. These three types of fuel suppliers conduct their business directly with the consumer and tend to sell in units of cords or fractions of cords. Thus, any price increase by these suppliers is borne directly by the consumer and, conversely, any reduction in fuel demand affects the suppliers’ revenues.

Figure 1. Supplier Types for Wood and Other Solid Fuels



Consumers might purchase wood or other solid fuel from retailers, such as local grocery or hardware stores. The fuel might take the form of wood bundles, manufactured logs, or pellets. For these supply chains, impacts might fall on manufacturers (if located in Sacramento County), retailers, and consumers. Section 3.1 describes the characteristics of the fuel suppliers while Section 3.2 examines the potential impacts of the Rule 421 options on these groups.

3.1.1 Very Small Independents

ERG examined *craigslist* and *Penny Saver* to locate what we term “very small independents.” These appear to be individuals that sell small quantities of firewood as a source of secondary income. Additional information (e.g., sales location, financial information, or even primary income source) for this sector could not be located. Thus, although we found about 25 individuals in this sector, we cannot estimate impacts except to say that, as a group they form a very small part of the supply, so it is likely that, as a group, they would incur a proportionally very small part of the impacts.

3.1.2 Small Independents—Primary Business

Based on information provided by SMAQMD, and through local Yellow Pages and Internet searches, ERG identified eight businesses that sell firewood as a primary business (See Table 2). Of the eight businesses, ERG found information on the annual revenues and number of employees for seven of them. Annual revenues ranged from \$58,000 to \$800,000 while the number of employees ranged from 1 to 12 (See Table 3).

Table 2. Small Independent Wood Dealers—Primary Business

Company Name	
Hillerman Farms	N.P.C. Firewood
Hurd's Firewood	Pak & Save Firewood
M&M Firewood	Tony's Firewood
Muschetto's Firewood LLC	Turner's Firewood Service

Table 3. Small Independent Wood Dealers—Primary Business Revenues and Number of Employees

Parameter	Annual Revenues	Employees
Minimum	\$58,000	1
Maximum	\$800,000	12
Average	\$474,321	4
Imputed total	\$3,794,571	35

ERG computed the average revenues and number of employees (roughly \$474,300 and 4 employees, respectively) and used the average values for the business for which no information could be found. With this imputation, we calculated that the small independent wood dealers in Sacramento County represent 35 jobs and about \$3.8 million in annual revenue. All of the businesses in Table 2 are small businesses.

These businesses are listed with one of two NAICS codes: 423990 or 454319. NAICS 423990 is Other Miscellaneous Durable Goods Merchant Wholesalers. Although firewood merchant wholesalers are part of NAICS 423990, so are merchant dealers for prerecorded DVDs CDs, audio tapes, coin-operated games, musical instruments and accessories, luggage, and other miscellaneous durable goods. Thus, the Census data contained under this NAICS code includes information for a wide variety of other goods. NAICS 454319 encompasses only firewood and coal dealers that sell directly to the public. According to the 2007 *County Business Patterns* (most current available), 5 establishments for NAICS code 454319 and 30 establishments for the wider ranging NAICS 423990 are located in Sacramento County (Census, 2009a).

ERG called these wood dealers for prices per cord of wood, and determined that the average price is \$301/cord. Wood dealers reported selling almond, cedar, cherry, eucalyptus, oak, peach, pine, and walnut. The wood dealers also supplied descriptors such as "semi-dry" and "dry" and generic labels such as "hardwood" and "mixed hardwood."

3.1.3 Small Independents—Secondary Business

Based on information provided by SMAQMD, and through local Yellow Pages and Internet searches, eight businesses sell firewood as a secondary business (See Table 4). That is, these businesses do landscaping, tree pruning, and similar activities. Rather than disposing of the wood that is cut during the course of their primary business, these companies sell the firewood as a secondary income. Of the eight businesses, ERG found information on the annual revenues and number of employees for six. Annual revenues ranged from \$48,000 to \$820,000 while the number of employees ranged from 1 to 8 (See Table 5).

Table 4. Small Independent Wood Dealers—Secondary Business

Company Name
A-1 Rock & Materials
Bill's Firewood and Tree Service
Bill's Urban Forest Mgmt.
Foothill's Firewood & Christmas Trees
Jaime Santos Tree Service
Longer Decorative Rock & Ready Mix
Premier Landscaping
Tree Pros Incorporated

Table 5. Small Independent Wood Dealers—Secondary Business Revenues and Number of Employees

Parameter	Annual Revenues	Employees
Minimum	\$48,000	1
Maximum	\$819,000	8
Average	\$486,167	3
Imputed total	\$3,889,333	25

ERG computed the average revenues and number of employees (roughly \$486,000 and three employees respectively) and used the average values for the business for which no information could be found. With this imputation, ERG calculated that the small independent wood dealers in Sacramento County represent 25 jobs and nearly \$3.9 million in revenue. All businesses listed in Table 4 are small businesses.

Consistent with the idea that selling firewood is a secondary business for these companies, most of them are listed with a different set of NAICS codes:

- 236210: Industrial Building Construction
- 444220: Nursery and Garden Centers
- 453998: All Other Miscellaneous Store Retailers
- 454319: Other Fuel Dealers
- 541320: Landscape Architectural Services
- 561730: Landscaping Services

Census data, then, would contain information on a variety of activities other than selling firewood. ERG called these wood dealers for prices per cord of wood. The average price is \$237/cord. The species provided by the dealers are the same as mentioned in Section 3.1.2.

3.1.4 Retailers—Wood Bundles

Through local Yellow Pages and Internet searches, ERG compiled a list of retail stores and verified that each retailer operated a store in Sacramento County. Table 6 is the resultant list of 25 retail stores that might sell wood bundles.

Table 6. Retail Stores in Sacramento County Potentially Selling Wood Bundles

Company	
Ace Hardware	7-Eleven
The Home Depot	Beverages & More
Lowe's	Food Maxx
CVS	Food Source
Costco	Foods Co.
Safeway	Raley's
Kmart	Bel Air
Michaels	Nugget Market
Orchard Supply Hardware	Pitco
Rite Aid	Save Mart Supermarkets
Sam's Club	Smart & Final
Target	Winco Foods
Wal-mart	

ERG called each of the businesses to ask if they sold firewood and, if so, who supplied the firewood. Of the 25 businesses:

- 7 of them did not sell firewood
- 9 knew their firewood supplier
- 9 did not know their firewood supplier

All nine businesses that knew their firewood supplier also knew that the supplier was an outside company and not a local wood dealer. Four brands/companies were specifically mentioned: California Hotwood, CalOak Firewood, Lazzari Fuel and Best of the West. The first three businesses are located in neighboring counties (Stanislaus, San Mateo, and Butte, respectively). Best of the West appears to be a brand sold only by Smart & Final which is headquartered in Los Angeles. Thus, to estimate impacts on Sacramento County, the retailers, but not the companies that supply them, need to be considered.

3.1.5 Manufactured Logs

ERG identified four manufactured log companies whose products are sold in Sacramento County (and elsewhere in California and other states):

- Duraflame, Inc., headquartered in Stockton, CA
- Enviro-Log, headquartered in Fitzgerald, GA
- Landmann USA, headquartered in Cartersville, GA
- Jarden Corporation, headquartered in Daleville, IN

Jarden Corporation manufactures Java Log, Northland, Pine Mountain, and Starter Logg through its Branded Consumables segment.¹ For 2008, the Branded Consumables segment reported \$805 million in net sales while Jarden Corporation reported \$5,383 million (Jarden, 2008).

Duraflame is the only company that has its principal office in California. However, as a company, it reports having approximately 250 employees. This exceeds the state small business size standard of 100 employees.

As shown above, Landmann USA and Enviro-Log are not headquartered in California; therefore, none of the four producers of manufactured logs meet the definition of a California small business.

ERG obtained 24 price estimates for manufactured logs. These ranged from roughly \$2.20/log to \$7.51/log with an average of \$4.91/log. For calculating the estimated costs, ERG rounded this value to \$5.00/log.

3.1.6 Pellets

ERG searched www.woodpelletprice.com and <http://www.pelletheat.org/3/residential/fuelAvailability.cfm#west> to identify North American wood pellet retailers and manufacturers. ERG then looked at each supplier's website to see if they delivered to Sacramento County and compiled a list of manufacturers and retailers. The manufacturers include:

- Bear Mountain Forest Products Inc., headquartered in Portland, OR
- West Oregon Wood Products, headquartered in Columbia City, OR
- Rocky Mountain Pellet Company, Inc., headquartered in Walden, CO, and
- Traeger Pellet Grills, LLC., headquartered in Silverton, OR.

None of these businesses meet the definition of a California small business because none are headquartered in the state.

¹ American Fire Log is co-located with the Pine Mountain Corporation address; thus it is likely to be another brand name manufactured by Jarden Corporation even though it is not specifically mentioned in Jarden Corporation's 10-K form for 2008. (Jarden, 2008.)

ERG identified a wood stove retailer—a California small business—that also sold pellets. ERG located the private company in manta.com which reported annual company revenues were in the range of \$2.5 million to \$5 million. In addition, major retailers such as Home Depot and Lowe’s also sell pellets. ERG found pellet prices of about \$7.49 per 40-lb bag for local non-chain retailers and \$6.27 per 40-lb bag for local chain stores (e.g., Lowe’s). ERG used a mid-point value of \$6.88 per bag to calculate a cost of \$344/ton.

3.2 Potential Impacts

Table 7 lists the quantity of fuel not purchased (from Table 1) with the average prices by fuel type as of summer 2009. ERG could not identify the relative market share for very small independents, small independents for which selling wood is a primary business, or small independents for which selling wood is a secondary business. As a result, Table 7 calculates the value of wood not sold based on a price of \$269/cord—the mid-point between the prices for primary and secondary wood dealers. The cost of the recommended Option is approximately \$0.6 million, and the estimated costs for Option A, Option B, and the Contingency Option are \$1.1 million, \$1.6 million, and \$4.2 million, respectively. The potential impacts of these lost sales are examined by industry sector.

3.2.1 Small Independents—Primary and Secondary Business

ERG examined impacts on small independent wood dealers under two scenarios. The first scenario assumed that wood dealers are not able to raise prices to maintain their income while selling a smaller quantity of wood. The second scenario examined the price increase that would offset the smaller quantity of wood sold.

No Price Increase

For the purpose of examining the upper bound of impacts (worst case) on these small businesses, ERG assumed that the **total** loss in the value of wood sales was borne entirely by independent wood dealers in Sacramento County. In addition, the dealers are assumed to be unable to recoup any income by raising prices. (In this scenario, no impacts are borne by consumers because there are no price increases.)

Table 7. Value of Wood, Manufactured Logs, and Pellets Not Purchased

Products	Units	Quantity Not Purchased				Cost Per Unit	Value Not Purchased			
		Recommended Option	Option A	Option B	Contingency Option		Recommended Option	Option A	Option B	Contingency Option
Wood	cord	1,309	2,490	3,994	9,750	\$269	\$669,899	\$1,074,327	\$2,622,768	
Manufactured Fire Logs	log	8,068	13,969	29,868	63,535	\$5	\$69,845	\$149,340	\$317,675	
Pellets	ton	539	1,155	1,155	3,696	\$344	\$397,320	\$397,320	\$1,271,424	
Aggregate Cost							\$1,137,064	\$1,620,987	\$4,211,867	

Table 8 shows the impacts on wood dealers under a no-price increase scenario. The value of wood not purchased is estimated at \$0.35 million (Recommended Option), \$0.67 million (Option A), \$1.07 million (Option B), and \$2.62 million (Contingency Option). The total revenue for independent wood dealers in Sacramento County is approximately \$7.68 million (see Tables 3 and 5). Thus, the lost value is about:

- 4.6 percent of revenues for the Recommended Option
- 8.7 percent of revenues for Option A
- 14.0 percent of revenues for Option B
- 34.1 percent of revenues for the Contingency Option.

Table 8. Upper Bound Potential Impacts on Independent Wood Dealers

Parameter	Value Not Purchased			
	Recommended Option	Option A	Option B	Contingency Option
Value Not Purchased	\$352,025	\$669,899	\$1,074,327	\$2,622,768
Group Revenues	\$7,683,905	\$7,683,905	\$7,683,905	\$7,683,905
Percent of Group Revenues	4.6%	8.7%	14.0%	34.1%
Group Employment	60	60	60	60
Upper Bound Estimate of Employment Loss	2.8	5.3	8.5	20.6
Sacramento County (May 2009)				
Labor Force	687,758	687,758	687,758	687,758
Employment	610,444	610,444	610,444	610,444
Unemployment rate	11.2%	11.2%	11.2%	11.2%
Unemployment rate after option	11.2%	11.2%	11.2%	11.2%
Change due to option	0.0%	0.0%	0.0%	0.0%

Source: Tables 3, 5, and 7; BLS, 2009.

ERG assumed that a small business might react by laying off workers in response to lower revenues and that this reaction would be proportional to the loss in income incurred as a result of an increase in no-burn days. As a group, independent wood dealers employ approximately 60 people in Sacramento County (See Tables 3 and 5). Thus, the potential loss in jobs might be about 3 for the Recommended Option, 5 for Option A, 8 to 9 for Option B, and nearly 21 for the Contingency Option.

ERG examined local area unemployment statistics for Sacramento County as of May 2009 (BLS, 2009). The local unemployment rate would not change significantly under any of the options considered.

As mentioned above, these impacts are calculated with the assumption that **all** impacts fall **only** on independent wood dealers in Sacramento County. If there are wood dealers in neighboring counties that sell wood in Sacramento County, then the potential loss in the value of wood not sold would be spread across a larger group of companies with a proportional decrease in the impact.

Price Increase

The wood dealers could potentially raise prices to recoup the lost value of wood not sold due to increased no-burn days. Table 8 indicates that price increases of approximately 5 percent would mitigate any revenue losses from reduced wood sales under the Recommended Option. For Options A and B, price increases between 9 and 14 percent would offset a lower volume of sales. Under the Contingency Option, a price increase of 34 percent would mitigate impacts on the wood dealers. In this scenario, impacts are borne by the consumers and not the wood dealers.

3.2.2 Retail Stores

Retail stores might sell firewood, manufactured logs, and/or pellets. For the analysis of this sector, ERG made the worst case assumption that the **entire cost of the option for all fuel sources** is borne by retail stores. (If this were accurate, there would be no impacts on independent fuel dealers, or manufacturers of pellets and logs.)

For retail stores, we examined the percentage loss in revenue as a measure of impacts because we did not know the profit made on each unit.² The San Joaquin Valley Unified Air Pollution Control District (SJVUAPCD, 2008) used net profit rates in its analysis. But because we would need to assume that the profit rates are comparable across all items sold, the percentage of revenues and the percentage of profits lost would be the same.

² SJVUAPCD (2008), Appendix C, Table 7 compares the value of lost sales to the estimated net profits by type of retailer. This is akin to saying that firewood sales are all profit (i.e., there are no wholesale costs or operating costs).

Table 9 summarizes the analysis. First, ERG started with the taxable transactions at retail stores in California for fiscal year 2007-2008 (California, 2009 [Table 19]) for general merchandise stores, drug stores, food stores, and building material retail stores. These types of retail stores accounted for \$112 billion in sales. In order to analyze the potential effects of the options on the wood stove retailers that also sold wood pellets (see Section 3.1.6), ERG added a column for the retailer type, entered the mid-point value for the revenues, and scaled the reported revenues for the other types of retailers to keep the same value of total sales.³

Second, ERG multiplied the taxable transactions by the percentage of retail sales in Sacramento County (California, 2009 [Table 20]) for retail types other than wood stove and pellet retailers. Because the revenues represent sales to Sacramento retailers, 100 percent of the revenues are from wood stove and pellet retailers.

The distribution of firewood and solid fuel sales among types of retail stores is taken from SJVUAPCD (2008). ERG summed the entries for lumber/building materials and hardware stores because California (2009) did not provide a separate line entry for hardware stores. ERG calculated the percentage of Sacramento sales represented by wood stove and pellet retailers, and scaled the SJVUAPCD distribution of firewood and solid fuel sales to accommodate the additional type of retailer.

The block of entries labeled “Value of Lost Sales” in Table 9 is the prorated cost of an option for that type of retail store. Note that the entries listed in the Total column correspond to the estimated option costs in Table 7. The block of entries labeled “Percentage of Lost Sales” is the percentage that these costs comprise of store revenues. Under the Recommended Option, the estimated fraction of lost sales does not exceed 0.03 percent for any type of retail store. Under Options A and B, estimated fraction of lost sales does not exceed 0.08 percent. Even under the Contingency Option, the costs comprise less than 0.25 percent of total revenues for any type of retail store. It is unlikely that such small percentages in lost revenue would lead to any job losses.

³ ERG multiplied the revenues for each retailer type by $(1 - (\$3.75 \text{ million}/\$112 \text{ billion}))$ or 0.999967, the fraction of California revenues from these retailer types represented by the wood stove and pellet dealer.

Table 9. Potential Impact on Retail Stores

Parameter	General Merchandise Stores	Drug Stores	Food Stores	Lumber/ Building Materials*	Stove And Pellet Retailers in Sacramento County	Total
State Sales	\$52,709,151,410	\$6,560,470,618	\$22,883,207,787	\$29,988,589,184	\$3,750,000	\$112,145,169,000
Sacramento Fraction of State Sales	3.63%	3.63%	3.63%	3.63%	100.00%	
Estimated Sacramento Sales	\$1,913,342,196	\$238,145,083	\$830,660,443	\$1,088,585,787	\$3,750,000	\$4,070,733,510
Firewood Sales by Retail Store Type	29.2%	9.6%	41.0%	20.2%	0.1%	100.00%
Value of Lost Sales						
Recommended	\$168,557	\$55,416	\$236,672	\$116,604	\$532	\$577,781
Option A	\$331,717	\$109,058	\$465,767	\$229,475	\$1,047	\$1,137,064
Option B	\$472,892	\$155,471	\$663,992	\$327,138	\$1,493	\$1,620,987
Contingency Option	\$1,228,732	\$403,967	\$1,725,275	\$850,013	\$3,880	\$4,211,867
Percentage of Lost Sales						
Recommended	0.01%	0.02%	0.03%	0.01%	0.01%	0.01%
Option A	0.02%	0.05%	0.06%	0.02%	0.03%	0.03%
Option B	0.02%	0.07%	0.08%	0.03%	0.04%	0.04%
Contingency Option	0.06%	0.17%	0.21%	0.08%	0.10%	0.10%

Source: California, 2009, SJVUAPCD (2008), and manta.com.

ERG further examined the potential impact on wood stove and pellet dealers in Sacramento. The estimated losses in pellet sales (rather than all revenues) are less than one-half of one percent (<0.05 percent) for the Recommended Option, less than 1.25 percent for Options A and B, and approximately 3.2 percent for the Contingency Option. Job losses are not anticipated with these small changes in revenue.

3.2.3 Manufactured Log Companies

There are no manufactured log companies within Sacramento County but Duraflame is headquartered in nearby Stockton, CA. Annual revenues for Duraflame are available through Dun & Bradstreet's *Million Dollar Directory*. ERG examined the impacts under the **worst-case** assumption that Duraflame bore the **entire loss of value** from manufactured logs (i.e., no impacts to Enviro-Log, Landmann USA, and Jarden Corporation). The estimated losses represent:

- 0.5 percent of total revenues or less for the Recommended Option
- 0.8 percent of total revenues or less for Option A,
- 1.8 percent of total revenues or less for Option B, and
- 3.8 percent of total revenues or less for the Contingency Option.

The associated potential loss in employment would be 1.2, 2.1, 4.4, or 9.4 jobs under the Recommended Option, Option A, Option B, and the Contingency Option, respectively. The actual loss in revenues or employment would be much less than shown above, and would be prorated by the proportion of Duraflame's revenues represented by sales in Sacramento County, compared to the other manufacturers.

3.2.4 Pellet Manufacturers and Retailers

ERG did not identify any pellet manufacturers within Sacramento County. (See Section 3.2.2 for impacts of lost sales to wood stove and pellet retailers in Sacramento County.)

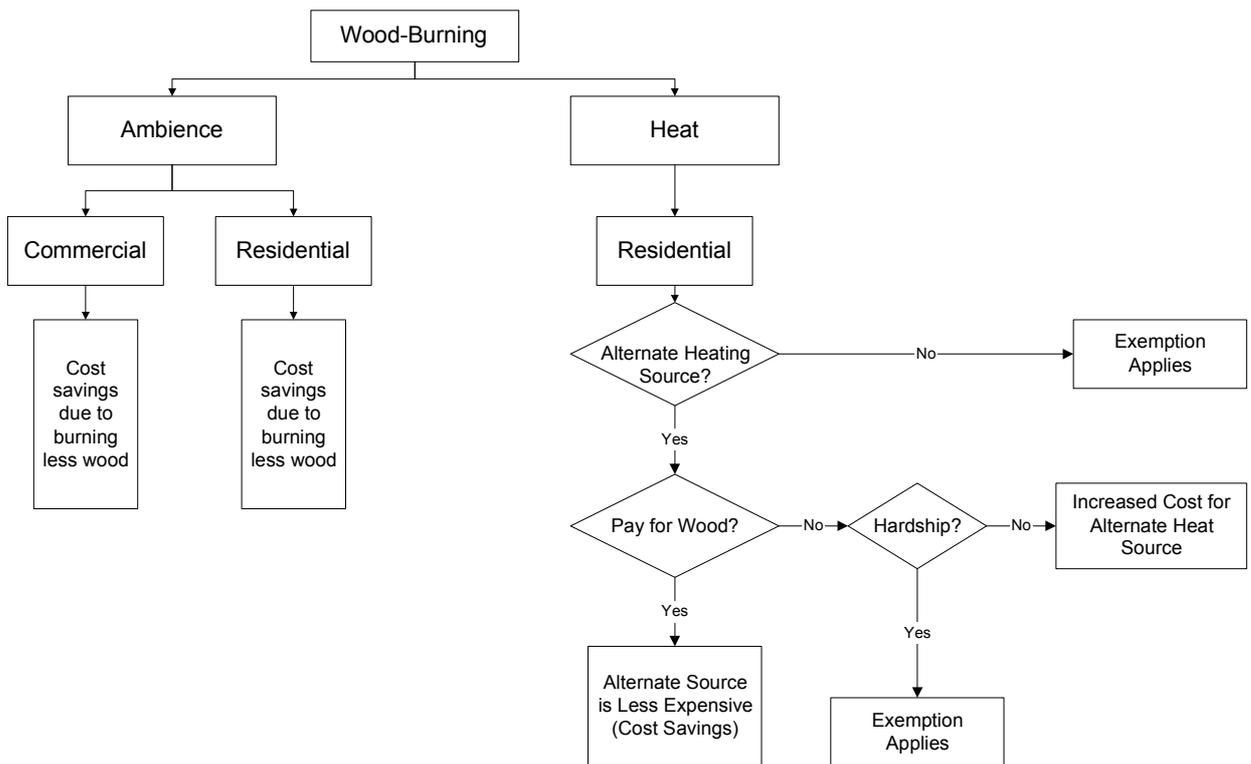
4.0 CONSUMERS

4.1 No Cost Increase Scenario

The economic impact analysis for the consumers is illustrated in the logic flowchart in Figure 2. In this scenario, the suppliers are assumed to be unable to raise prices. Wood and other

solid fuels might be burned for two reasons: ambience (which is discretionary), and heat (which is not discretionary).

Figure 2. Consumers of Wood and Other Solid Fuel: No Cost Increase Scenario



4.1.1 Residents

If residents burn wood or other solid fuels only for ambience, then they would realize a cost savings due to reduced wood use.

If residents burn wood or other fuels for heat, SMAQMD has structured the regulation to mitigate economic impacts, particularly the impacts on low-income residents. For these residents, impacts differ based on whether or not they have an alternate source of heat.⁴ Residents with no alternate source of heat are exempt from Rule 421. Low-income residents may qualify for an exemption based on economic hardship.

⁴ A telephone survey conducted in April 2009 for SMAQMD found no respondents that indicated wood burning as their sole source of heat (SMAQMD, 2009). Although uncommon, there may be rare cases where burning wood or other solid fuel would be the only heat source.

For consumers with alternate heat sources, the potential impacts differ according to the following scenarios:

- Pay for wood, wood used for central heating
- Pay for wood, wood used for zonal heating
- Do not pay for wood

SMAQMD (2009) examined the relative costs of heating by fireplace, certified wood stove, electricity, and natural gas and found that heating with wood was the most expensive. For consumers that pay for wood and use it to heat the entire living space (“central heating”), these consumers will realize cost savings due to switching to a lower cost source of heat.

Wood can be used to heat a room while leaving other rooms unheated (“zonal heating”). Consumers that fall into this scenario might see an increase in costs due to the change from heating one room with wood to heating all rooms by central heating. ERG could not locate data to quantify these relative costs and thus could not quantify the potential impacts for this scenario. In this scenario, if the consumer incurs a financial hardship, the exemption would apply.

If, however, the consumers did not pay for wood, they would incur the costs of the alternative heat source for the additional no-burn days. The average cost of heating a home for 30 days is \$153 for electricity and \$88 for natural gas. The average per-day costs to heat a home are \$5.10 and \$2.93 for electricity and natural gas respectively (SMAQMD, 2009). The incremental numbers of no-burn days for which the consumers would have to pay for heat by Option are:

- Recommended Option: 5 additional no-burn days for a cost between \$15 to \$25
- Option A: 8 additional no-burn days for a cost between \$23 to \$41
- Option B: 21 additional no-burn days for a cost between \$62 to \$107
- Contingency Option: 41 additional no-burn days for a cost between \$120 to \$209

In 2007, the median household income for Sacramento County was \$56,283 (Census, 2009b). The increased costs do not exceed 0.05 percent of household income for the Recommended Option, 0.07 percent for Option A, 0.19 percent for Option B, or 0.37 percent for the Contingency Option regardless of whether the household heats with electricity or natural gas.

The typical household would not be disproportionately impacted by the cost for using an alternative source of heat. If this is not the case, however, the resident can apply for an exemption based on economic hardship.

4.2 Price Increase Scenario

In this scenario, fuel suppliers are able to raise prices to maintain their income while selling less wood and other solid fuels, and consumers would bear the increased costs. Table 8 indicates that lost value to wood dealers is about:

- 4.6 percent of revenues for the Recommended Option
- 8.7 percent of revenues for Option A
- 14.0 percent of revenues for Option B
- 34.1 percent of revenues for the Contingency Option

Assuming that wood sales comprise the sole source of income, as is likely for independent primary wood dealers, the companies could maintain their income with price increases of 4.6 percent for the Recommended Option, 8.7 percent under Option, 14 percent under Option B, and 34 percent under the Contingency Option. Given the findings in Sections 3.2.2, retailer prices for manufactured logs and pellets are unlikely to increase by more than a negligible amount.

4.2.1 Industries and Businesses

As shown in Figure 2, industries and businesses such as restaurants and hotel lobbies might burn wood and other solid fuels for ambience. Thus, burning is discretionary for these commercial entities. If no cost increase occurs, industries and businesses might see a cost savings due to reduced fuel use. If a cost increase occurs, we anticipate that each location would evaluate the price increase with respect to the (typically non-monetized) benefit of “ambience” or increased prices to consumers, and would decide whether to pay the higher prices or reduce the amount burned. ERG anticipates no employment losses as a result of increased prices for a discretionary business practice.

4.2.2 Residents

Houck (2003) surveyed wood burning pattern for households in the Sacramento area. He found that households with fireplaces burned an average of 0.92 cords per season while those with stoves burned an average of 1.5 cords per season. ERG calculated the amount a household

spent on wood, recalculated the amount spent after small independent wood dealers increased their prices to maintain income levels under the new regulation, and then calculated the increased cost to the consumer.

The calculations are shown in Table 10. The price increases range from \$11/season to \$138/season depending on the option and whether the household used a fireplace or stove. ERG compared the cost increases to Sacramento County 2007 median household income (\$56,283; Census, 2009b). The cost increases do not exceed one-quarter of one percent of median household income.

Table 10. Increased Costs as a Percentage of Median Household Income for Households that Burn Wood

Parameter	Households that Burn Wood	
	Fireplace	Stove
Amount burned per season (cords)	0.92	1.5
Price (\$/cord)	\$269	\$269
Cost per Season	\$247	\$404
Estimated Price Increase		
Recommended Option	4.6%	4.6%
Option A	8.7%	8.7%
Option B	14.0%	14.0%
Contingency Option	34.1%	34.1%
New Cost Per Season		
Recommended Option	\$259	\$422
Option A	\$269	\$439
Option B	\$282	\$460
Contingency Option	\$332	\$541
Incremental Cost		
Recommended Option	\$11	\$18
Option A	\$22	\$35
Option B	\$35	\$56
Contingency Option	\$84	\$138
Percent of 2007 Median Income		
Recommended Option	0.02%	0.03%
Option A	0.04%	0.06%
Option B	0.06%	0.10%
Contingency Option	0.15%	0.24%

5.0 CONCLUSIONS

ERG evaluated four options under two different economic scenarios (price increase or no price increase) and used worst case analyses to avoid the potential to underestimate costs.

For residential consumers of wood and other solid fuels, SMAQMD has mitigated impacts on low income populations through a hardship exemption. If suppliers raise prices to maintain revenues when sales volumes decline, the estimated price increases are less than one-quarter of one percent (<0.25 percent) of the 2007 median household income for Sacramento County.

For commercial consumers of wood and other solid fuels (e.g. restaurants and lodgings), burning is discretionary. If suppliers raise prices, each business is anticipated to weigh the increased price against the perceived benefit to the business's ambience to determine whether or not to pay the increased prices. No employment losses are anticipated in this sector as a result of the rule.

Impacts to wood and solid fuel suppliers are summarized in Table 11. If the suppliers are able to raise prices to compensate for lower sales volumes, there are no impacts under any of the options. If suppliers are unable to raise prices, then small impacts might occur.

Table 11. Summary of Impacts on Wood Suppliers

Scenario and Potential Impact	Option	Independent Wood Dealers	Manufactured Log Producers	Retail Stores	Wood Stove and Pellet Retailer
Price Increase					
Potential Loss in Revenues					
	Recommended Option	0%	0%	0%	0%
	Option A	0%	0%	0%	0%
	Option B	0%	0%	0%	0%
	Contingency Option	0%	0%	0%	0%
Potential Loss in Employment					
	Recommended Option	0	0	0	0
	Option A	0	0	0	0
	Option B	0	0	0	0
	Contingency Option	0	0	0	0
No Price Increase					
Potential Loss in Revenues					
	Recommended Option	4.6%	0.5%	0.01%	0.01%
	Option A	8.7%	0.8%	0.03%	0.03%
	Option B	14.0%	1.8%	0.04%	0.04%
	Contingency Option	34.1%	3.8%	0.10%	0.10%
Potential Loss in Employment					
	Recommended Option	2.8	1.2	0	0
	Option A	5.3	2.1	0	0
	Option B	8.5	4.4	0	0
	Contingency Option	20.6	9.4	0	0

Impacts on retailers are negligible.

The results reported in Table 11 are based on worst case analyses which incorporate such assumptions as:

- No independent wood dealers located outside of Sacramento County sell wood within Sacramento County. If such dealers exist, the impacts would be reduced proportionately by the fraction of wood sold in Sacramento County by extra-county dealers.
- All impacts from reduced sale of manufactured logs are absorbed by the one manufactured log producer that is headquartered in California. In reality, the impacts would reflect that company's market share of manufactured log sales in Sacramento County.

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