The State of New Jersey
Department of Environmental Protection

ESTIMATED VOC EMISSION REDUCTIONS AND ECONOMIC IMPACT ANALYSIS

FOR

PROPOSED PORTABLE FUEL CONTAINERS RULE

July 3, 2003

I. INTRODUCTION

The Department is proposing amendments to its Consumer Products rules as discussed in the rule amendment proposal. This document provides additional details on the estimated volatile organic compound (VOC) emission reductions and the economic impact analysis for the proposed portable fuel container rules.

II. ESTIMATED VOC EMISSION REDUCTIONS

Introduction

These proposed rules for portable fuel containers (PFCs) are based on the portable fuel container model rule developed by the Ozone Transport Commission (OTC). The OTC model rule for PFCs is based on the California Air Resources Board (CARB) rule and background data. The technical basis for the proposed VOC content limits lies within the framework that the CARB developed for its consumer products rules.

Data, Assumptions, Calculations

Population

In support of the effort to develop the potable fuel container model rule, as well as the other model rules, the OTC hired a contractor, E.H. Pechan and Associates, Inc., to quantify emissions associated with the categories to be regulated and to quantify the reductions due to state's implementation of the various rules. The CARB emission estimation methodology for PFCs was used to produce the emission inventory.

The OTC contractor assembled a 1996 inventory of PFC emissions by accounting for emissions from five different components related to PFC use: permeation, diurnal, transport-spillage, refueling-spillage and vapor displacement emissions. The estimated PFC population and usage data for both residential and commercial sectors were developed using survey information collected by the CARB. Emission rates were based on tests conducted by the CARB for various PFC activities.

Emissions

The number of residential containers in New Jersey was estimated using the number of housing units as an indicator. Occupied housing units by county were obtained for the year 1990 from the U.S. Census Bureau. These data were then grown to 1996 using the change in U.S. Census Bureau estimates of county-level population estimates between 1990 and 1996. The 1996 occupied housing units by county were then projected to 2007 using population as an indicator. Growth factors corresponding to the change in population between 1996 and 2007 were obtained from the Economic Growth Analysis System Model. Other data needed in the estimate, such as the expected number of containers per household, the PFC material, amount of fuel stored, and storage condition (open/closed) were based on the CARB survey results.

The number of PFCs used by commercial businesses was estimated using the number of establishments expected to have at least one PFC. The number of establishments for 1996 was taken from the Dun & Bradstreet Marketplace 3.0 Database. Establishment data for all counties in New Jersey were compiled for the following Standard Industrial Classifications (SICs) which are the establishments most likely to own and use PFCs:

- 01 Agricultural Crops
- 02 Agricultural Livestock

- 07 Agricultural Service (except 074 and 075)
- 08 Forestry
- 15, 16, 17 Construction
- 55 Automotive Dealers and Gasoline Service Stations
- 75 Automotive Repair, Services and Parking

Establishment data was then projected from 1996 to 2007 using employment projections from the U.S. Department of Labor's Bureau of Labor Statistics. Employment projections were only available for the years 1998 and 2008. Employment in 2007 was estimated using linear interpolation. Growth factors were developed for all of the above SIC codes, and then weighted based on the number of establishments within each SIC. A weighted growth factor was then applied to the number of total establishments per county in all of the above SIC codes. The expected number of containers per commercial business, the PFC material, amount of fuel stored, and storage condition(open/closed) were obtained from the CARB survey results.

The number of PFCs for both residential and commercial sectors was used as activity data to estimate permeation, diurnal, and transport-spillage emissions. These emissions result during fuel storage and transport. Refueling-spillage emissions result when fuel is spilled during the refueling process, and vapor displacement emissions result when new liquid added to a fuel tank displaces fuel vapors already present in the tank. Spillage and vapor displacement emissions were estimated using data on the population of nonroad equipment assumed to be refueled with PFCs. Data on the characteristics of nonroad engines were used as the activity (e.g., amount fuel consumed per day, fuel tank size.) The calculations only accounted for equipment likely to be refueled with a PFC, instead of at the pump. Daily fuel consumption estimates by county were obtained from the USEPA's Nonroad Model for the years 1996 and 2007. Fuel consumption estimates for 1996 and 2007 were estimated by applying an average annual rate of change each

year from 1996 to 2007.

Baseline emissions for permeation, diurnal, transport-spillage, and refueling-spillage and vapor displacement emissions were calculated for the years 1996 and 2007. Emission estimates were calculated using the emission rates and equations developed by the CARB. For the vapor displacement emission factor, an average Reid Vapor Pressure of 7.8 pounds per square inch and an average temperature of 88 degrees Fahrenheit were assumed.

The planned implementation of these proposed rules is through attrition, i.e., the longer the estimated useful life of PFCs, the longer it will take to replace conventional with spill-proof containers. The determination of the estimated useful life is an integral part of calculating total revenue from sales of conventional containers. The CARB selected an average useful life of five years as suggested by several manufacturers. The manufacturers based this estimate on a continuing analysis of both annual sales and percent of repeat business. Even though this average useful life value is based on available data, the states in the OTC did not feel comfortable with this number and decided to be conservative, and assumed an average useful life of 10 years. Therefore, full implementation of these proposed rules are not expected until 10 years after the operative date of the performance standards.

Results

Estimates of the emission reductions for the proposed rules were calculated for 2007. A constant rate of turnover was assumed in calculating the reductions (i.e., every year after 2005, 1/10 of the total PFCs would be replaced, until all PFCs were replaced by 2015). The emission

benefits were calculated for July of 2007, 2.5 years respectively, from the operative date of the performance standards. The number of replaced units is then assumed to be 0.25 of the total number of containers in the base year of 1996. The estimated statewide emission reductions are summarized in Table 1. Estimated statewide VOC emission reductions from implementation of these proposed rules are 6.59 tons per day (TPD) in 2007.

Table 1
Statewide Summary of Emissions and Emission Reductions[1]

Year	Uncontrolled VOC Emissions (tons/day)	VOC Reductions (tons/day)	Percent Reduction (percent)
1996	35.03		
2007	36.27	6.59	18

Notes:
1. E.H. Pechan and Associates, Inc., "Control Measure Development Support Analysis of Ozone Transport Commission Model Rules," March 31, 2001.

II. ECONOMIC IMPACT ANALYSIS

Introduction

The analysis and discussion herein is based on a CARB staff report (CARB, Hearing Notice and Staff Report: Initial Statement of Reasons for Proposed Rule Making, Public Hearing to Consider the Adoption of Portable Fuel Container Spillage Control Regulations, August 6, 1999) and a report prepared by E.H. Pechan and Associates, Inc. (Control Measure Development Support Analysis of Ozone Transport Commission Model Rules, March 31, 2001).

The Department's cost estimates may be somewhat inflated, since the Department conservatively assumed that manufacturers will incur the same costs to comply with the proposed New Jersey rules as they incurred to comply with CARB's regulations. In reality, manufacturers of nationally marketed products will incur some costs, such as redesign costs, only once, to comply with the CARB regulations. In addition, manufacturers will have to redesign for the other states in the northeast region adopting the OTC model rule.

Cost-Effectiveness

The cost-effectiveness is generally defined as the ratio of total dollars to be spent to comply with the rules (as an annual cost) to the mass reduction of the pollutant(s) to be achieved by complying with the rules (in annual pounds or tons). First annual costs were calculated. Annual costs include annualized non-recurring costs (e.g., total research and development, product and consumer testing, equipment purchases/modifications, etc.) and annual recurring costs (e.g., raw materials, labeling, packaging, etc.).

The projected annual costs then became the inputs for determining the three main outputs of the economic analysis: estimated cost-effectiveness, the potential business impacts and the potential consumer impacts. The projected annual costs were divided by the number of product units sold to result in a cost per unit.

The estimated cost per unit calculated by CARB for PFCs to comply with the proposed rules are shown in Table 2.

Table 2
Estimated Sales Price for Portable Fuel Containers [1]

Size of Container (gallons)	Percent of Total Containers (percent)	Average Unit Cost of Container (1998 $)	Estimated Unit Cost of Container which Meets Rule Specifications (1998 $)	Incremental Cost to Meet Rule Requirements
1 - 1.5	39	$2.62	$9.00	$6.38
2 - 2.5	36	$3.79	$12.00	$8.21
5 - 6	25	$7.44	$18.00	$10.56

Notes:
1. CARB, Hearing Notice and Staff Report: Initial Statement of Reasons for Proposed Rule Making, Public Hearing to Consider the Adoption of Portable Fuel Container Spillage Control Regulations, August 6, 1999

The annual PFC population turnover and the estimated sales prices for each container were used to calculate the incremental cost of the proposed rules on an annual basis. The total VOC reductions for year 2007 and annual incremental cost were used to calculate the cost-effectiveness in dollars per ton. Table 3 presents the cost-effectiveness in 1998 dollars. These figures are based on plastic fuel containers which are estimated to comprise 75 percent of the statewide population.

Table 3
Cost-effectiveness of Portable Fuel Container Rule in 2007
Based on Proposed Rules In
N.J.A.C. 7:27- 24 [1]

Estimate of Containers Sold in New Jersey Annually (for 1996)	Incremental Cost ($/year) [1998 dollars]	VOC Reductions [in 2007] (tons/year)	VOC Reductions (tons/day)	Cost-effectiveness ($/ton of VOC Reduced)
295,071	$2,385,680	2,406	6.59	991

Notes:
1. E.H. Pechan and Associates, Inc., "Control Measure Development Support Analysis of Ozone Transport Commission Model Rules," March 31, 2001, Page 13.

Potential Business Impact

The proposed PFC rules would primarily impact manufacturers of PFCs and spouts who may have to redesign their products. Businesses that market, distribute, supply, sell, or use these PFCs may also be affected by the proposed rules. Also, potentially affected are businesses that supply parts to these manufacturers. Manufacturers of PFCs must comply with the proposed performance standards by January 1, 2005. PFCs manufactured prior to this date, which do not comply with the performance standards, may be sold for one year after the operative date of January 1, 2005.

PFCs and spout manufacturers fall into the industry classified by Standard Industrial Classification (SIC) 3089 or by the North American Industry Classification System (NAICS) 326199. The PFC and spout industry consists of 21 manufacturers nationwide, of which 13 are small manufacturers (fewer than 100 employees). None of these manufacturers is located in New Jersey. PFCs and spouts generally account for only a small portion of these manufacturers' product portfolio. Table 4 provides a list of the large and small (fewer than 100 employees) PFC and spout manufacturers.

Table 4 Large and Small Portable Fuel Container and Spout Manufacturers	
Large Manufacturers	Small Manufacturers[1]
Blitz U.S.A.	Bomatics
Briggs & Stratton Corp.	CCI Products, Inc.
Chilton Products	Environ Can, Inc.
Eagle Manufacturing Co.	Gas-O-Haul
Hopkins Manufacturing	Instep, Inc.
Just Rite Manufacturing	Jazz Products
Protectoseal Co.	Midwest Can Co.
Wedco Molded Products	Mooses Offroad
	No-Spill Research, Inc.
	S&K Products
	Scribner Plastics
	Tracy International
	Vemco, Inc.
Notes: 1. Fewer than 100 employees	

During their fact gathering, CARB determined that several manufacturers already produce PFCs that meet the majority of the performance standards in these proposed rules. The cost analysis shows that the proposed rules will increase average annual costs by about $2.4 million. CARB assumed that the market will allow manufacturers to pass on the entire cost increase to consumers because of the low relative price and long lifetime of PFCs, and because there will be few legal substitutes available to consumers. As a result, the proposed rules are not expected to have a noticeable adverse impact on the affected manufacturers.

Table 5 lists the estimated number of PFCs in New Jersey based on the CARB survey results. The data indicate that 86 percent of PFCs are used in residential households, and commercial use is about 14 percent.

Table 5
1996 Portable Fuel Container Populations: Number of Units in New Jersey [1]

Sector	Container Population
Residential	2,895,118
Commercial	55,592
Total	2,950,710

Notes:
1. E.H. Pechan and Associates, Inc., "Control Measure Development Support Analysis of Ozone Transport Commission Model Rules," March 31, 2001, Page 13.

The proposed rules will primarily impact manufacturers; however, other industries could also be impacted to a lesser amount, more difficult to quantify. These industries include distributors, retailers, upstream suppliers, and businesses that use PFCs.

Distributors and retailers may be impacted if the potential increase in costs of products dampen demand for the products. The potential consumer impact analysis assumes that manufacturers, distributors and retailers pass on any additional compliance costs to the consumers. Based on the potential consumer impact analysis, discussed below, the Department does not anticipate any significant adverse economic impacts for distributors and retailers.

Impacts to businesses that use PFCs would be similar to the potential additional costs a consumer would experience as discussed below in "Potential Consumer Impact." Based on the

consumer impact analysis, the Department does not anticipate any significant adverse economic impacts for businesses who use PFCs.

CARB's economic analysis concluded that most manufacturers will be able to absorb the cost of the proposed rules with no significant adverse economic impact. However, some individual businesses may be adversely affected by this regulatory action. The proposed rules may impose extraordinary economic hardship on some businesses with small or no margin of profit. These businesses may be able to use the variance provision of the proposed rules to extend the deadline by which they must comply, and thereby minimize the cost impacts. They may also be able to use the innovative product exemption. New Jersey accepts variances and innovative product exemptions only if they have been approved by CARB or another state which has a rule based on the OTC model rule.

Potential Consumer Impact

The potential impact of the proposed rules on retail prices of PFCs and spouts depends on the ability of manufacturers to pass on the cost increase to consumers. CARB assumed that manufacturers would pass the entire cost of compliance on to consumers. This assumption seems to be valid given the higher price of compliant PFCs sold in California since January 1, 2001. Assuming that manufacturers are able and continue to pass on the entire costs of compliance to consumers, CARB estimated that the average price of a container would increase by approximately $6.00 to $11.00 in order to comply with the proposed rules. This amounts to an annual increase of about $0.60 to $1.10 in the price of a container over an assumed ten year life. PFCs had a 1998 retail price of $4.25 on average. The potential cost increase to the

consumer is not expected to impose a noticeable adverse impact, because of the low relative price and long lifetime of PFCs.

Results Summary

The estimated cost-effectiveness of the proposed rules for PFCs of $991 per ton of VOC is the lowest cost-effectiveness among the sources regulated in the five OTC VOC model rules. The cost-effectiveness of the other OTC rules ranges from approximately $2,300 per ton VOC for the proposed chemically formulated consumer product rules and amendments to approximately $5,580 per ton of VOC for the proposed architectural coating rules and amendments. Therefore, based on the economic impact analysis, the Department believes the proposed rules and amendments are cost-effective. CARB estimated that the average price of a container would increase by approximately $6.00 to $11.00 in order to comply with the proposed rules. This amounts to an annual increase of about $0.60 to $1.10 in the price of a container over an assumed ten year life. The Department does not anticipate significant adverse economic impact on PFC and spout manufacturers, distributors, retailers, businesses that use PFCs, or consumers. The Department assumes manufacturers will pass on the cost of compliance to consumers. The potential cost increase to the consumer is not expected to impose a noticeable adverse impact, because of the low relative price and long lifetime of PFCs.