



Final Clark County Consumer and Commercial Products Emissions Inventory

*Submitted to Clark County Department of Air Quality
and Environmental Management*



July 29, 2005

Submitted by



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Section 1.0 Introduction

The Clark County Department of Air Quality and Environmental Management (DAQEM) is responsible for developing inventories of volatile organic compounds (VOC) and other pollutants that contribute to the formation of ozone. The United States Environmental Protection Agency (EPA) first promulgated ozone ambient air quality standards in 1971 and adopted a new 8-hour standard to replace the 1-hour standard in 1997. Consumer products have been identified as a probable significant contributor to the VOC emission inventory in Clark County, Nevada. MACTEC was retained by DAQEM to determine and quantify the emissions of VOC from consumer products sold and used in Clark County. The study is also to identify control and mitigation measures for VOC emissions from consumer products sources. MACTEC's scope of work consists of the following:

- Identification of consumer product source categories based on the California Air Resources Board (CARB) regulatory program for consumer products and other source categories sold and used in the County.
- Develop a survey package to collect source category and product sales and usage information in the County.
- Review CARB's regulatory program for consumer products to identify methods used to estimate sales and activity data of consumer products, estimation and calculation methodologies for VOC emissions and control technologies and measures.
- Quantify the VOC emissions for consumer products from County sales and usage projections.
- Estimate the growth in VOC emissions in future years.
- Consider and determine the effects of tourism and visitors on the sales and usage of consumer products.
- Evaluate the changes in emissions and determine the impacts of weekday and weekend variations in tourism, if any.
- Evaluate and recommend control measures for consumer product VOC emissions in Clark County.

MACTEC used the results of the survey conducted in the County and information from California's consumer products program to estimate emissions of VOC from product source categories identified as being sold and used in the County in 2002 and 2003. The methodology and data used to construct the sales and usage activity data was taken from the surveys conducted in Clark County, surveys conducted in California and emission estimation methods developed by CARB.

Consumer products were defined for purposes of this study as chemically formulated products used by household and institutional consumers including detergents, cleaning compounds, polishes, cosmetics, personal care products, home products, lawn and garden products, aerosol products and automotive specialty products. Surveys were conducted to gather sales, usage and product formulation data for these sector categories within Clark County. The sectors surveyed included:

- Grocery and convenience stores

- Hardware stores
- General merchandise and department stores
- Home improvement stores
- Janitorial supply stores
- Pharmacies
- Hotels
- Military bases

Product information collected from the surveys of these sectors and CARB survey and product formulation data were used to calculate base year and future year emissions in Clark County. Sections 2 through 6 of this report discuss the survey and methodologies used to determine product sales and usage, VOC content and product formulation and effects of tourism and military operations on emissions. Spreadsheets showing daily and annual average emissions for each source category are provided in Sections 7 and 8. Section 9 discusses mitigation and control measures for VOC emissions from consumer products.

Section 2.0 Review of EPA/CARB/NYSDEC Consumer Product Methodologies

EPA and several states including California have developed technical and regulatory programs to estimate and control VOCs from the use of consumer and commercial products. California has aggressively pursued identifying and quantifying sources of consumer products with both the manufacturers and retailers of consumer products in the State using surveys and working with the formulators and product development staff of representative companies and product research groups. The approaches that EPA, California, and New York have used for estimating emissions from the use of consumer and commercial products and summaries of the resulting emissions are documented in this section of the report. Many of the same retail and manufacturing groups that sell consumer products in California are located in Clark County and do business there. Also, California is a neighboring State from which many visitors travel to Las Vegas. As a result, the emissions factors developed for consumer products use in California would be expected to be very similar to emissions factors for Clark County.

EPA Consumer Products Methodologies

Section 183(e) of the 1990 Clean Air Act Amendments (CAAA) required EPA to prepare a Report to Congress to assess the impact of VOC emissions from the use of consumer and commercial products. In order to obtain data necessary to prepare the report, EPA conducted a consumer product survey in 1992 requesting 1990 sales data from all companies that produced or marketed any of the identified consumer and commercial products. Those products, as defined in the CAAA, consisted of the following main categories:

- Personal care products (hair care-26 subcategories, deodorants and antiperspirants, fragrance, powders, nail care, facial and body treatments, oral care, health use, and miscellaneous);
- Household products (hard surface cleaners, laundry, fabric and carpet care, dishwashing, waxes and polishes, air fresheners, shoe and leather care, miscellaneous);
- Automotive aftermarket products (detailing and maintenance and repair);
- Adhesives and sealants (consumer adhesives and sealants);
- Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)-regulated products (insecticides, fungicides and nematocides, herbicides, antimicrobial agents, and other FIFRA-related);
- Coatings and related products (aerosol spray paints and coating-related products); and
- Miscellaneous products (arts and crafts, nonpesticidal veterinary and pet products, pressurized food products, and office supplies).

EPA compiled data for 245 individual subcategories of consumer and commercial products. Based on the data received, EPA adjusted the results using the estimated market coverage (25 to 100% but generally 90% or more). EPA determined the percent VOC emitted based on information they obtained on biodegradation or other fates (other than being emitted to the air) of VOCs that enter the wastewater stream. Finally, EPA calculated per capita annual emission rates for each of the 245 categories based on a total population of 284 million. EPA also summarized the data for the individual categories to generate per capita annual emission rates for the major

categories and subcategories shown above. These emission rates are documented in the EPA report *Emission Inventory Improvement Program: Preferred and Alternative Methods for Estimating Air Emissions*, Volume III, Chapter 5, August 1996. The per capita annual emission rates do not reflect the EPA national VOC emission standards for 25 consumer product categories published as a final rule on September 11, 1998. The per capita emission rates reflect the removal of nonreactive compounds, including acetone. A summary of the per capita annual emission rates for the major categories within the personal care product, household product, adhesives and sealants, and FIFRA-related product groups of consumer and commercial products is provided in Table 2.1.

California Consumer Products Methodologies

Consumer products comprise one of the largest use categories of total organic gases and reactive organic gases in California. Consumer products as defined in the Health and Safety Code are chemically formulated products used by household and institutional consumers, including detergents, cleaning products, cosmetics, sanitizers, automotive products, home, lawn and garden products, and personal care products. Furniture and architectural coatings are not defined as consumer products.

California's consumer products inventory development is based on a compilation of several surveys and EPA's 1990 Report to Congress. Four surveys provided the basis for compilation of the latest inventory. The surveys focused on collecting product information from the thousands of manufacturers of consumer products that are sold in California. These surveys include the 2001 California Air Resources Board (CARB) Consumer and Commercial Products Survey, the 1997 Consumer and Commercial Products Survey, the 1994/1995 Mid-term Measures Survey, and the 1990 EPA report. A survey for calendar year 2003 is currently in progress. CARB compiled data for over 200 individual sub-categories. Data obtained from these surveys have been used to create the most comprehensive inventory on consumer products to date. The results from each of these surveys were used to update the CARB's database to account for increased growth in consumer products market coverage, to develop regulations and control strategies and to update the California SIP.

The methodology to estimate emissions of total organic gases used statewide sales of each product from the survey multiplied by the percent of each compound that is in the total organic gas definition in that product. The percentage of total organic and reactive organic compounds in each product was obtained from speciation data collected during the surveys.

The basis and assumptions CARB used to generate emission inventories of consumer products included the following:

- A down-the-drain factor for hand soaps and laundry detergents applied to emissions.
- Statewide emissions apportioned to each county by the ratio of the county population and the statewide population.
- The number of units of products sold equals the number of units used.
- The entire quantity of organic compound contained in the consumer products inventory is ultimately emitted to the atmosphere, with the exception of those products with down-the-drain factors.

A summary of 1997 sales and emissions of consumer and commercial products based on survey results is provided in Table 2.2.

New York Consumer Products Methodologies

In the late 1980s the New York State Department of Environmental Conservation (DEC) contracted with MACTEC to perform an analysis of regulatory alternatives for controlling VOC emissions from consumer and commercial products in the New York City metropolitan area as well as in the entire state. DEC specifically asked MACTEC to evaluate the following nine categories of consumer and commercial products: adhesives, all purpose cleaners, disinfectants, air fresheners, hair sprays, animal insecticides, other insecticides, insect repellants, and spray paints. The emissions inventory included products sold to retail customers for household use along with products marketed by wholesale distributors for use in commercial or institutional settings such as beauty shops, schools, and hospitals. Development of the inventory involved the use of three approaches: on-site shelf survey, manufacturer and distributor survey, and analysis of market research data. Using these approaches, MACTEC obtained data on annual usage and VOC content for each product category and form (aerosol, liquid, or solid). A summary of the results of the inventory for the New York City metropolitan area are summarized in Table 2.3.

Table 2.1
Summary of EPA Per Capita Emission Rates for Selected Major Categories
Of Consumer and Commercial Products
(Pre-Federal Emission Standards)

Category	VOC Content Reported (tons/yr)	Adjusted Product Sales (tons/yr)	Adjusted VOC Content (tons/yr)	VOC Emitted (tons/yr)	Per Capita Emissions (lb/yr/person)
Personal Care Products					
Hair Care	178,685.53	752,801.82	189,794.74	184,564.91	1.49
Deodorants and Antiperspirants	31,061.1	62,736.62	31,075.94	31,075.94	0.251
Fragrances	17,880.98	38,811.03	18,822.08	18,665.72	0.151
Powders	3,374.64	102,703.5	3,552.25	3,552.25	0.0286
Nail Care	4,489.98	12,744.33	4,726.29	4,725.94	0.0381
Facial and Body	7,245.2	146,885.0	7,626.52	7,325.39	0.0591
Oral Care	28,134.66	297,080.94	35,504.5	1,775.22	0.0143
Health Use	5,854.98	56,381.44	6,163.13	6,163.13	0.0497
Miscellaneous	42,458.44	841,356.3	49,223.93	29,467.94	0.238
Household Products					
Hard Surface Cleaners	55,449.94	1,168,799.68	59,534.72	22,451.79	0.181
Laundry	58,204.28	5,159,030.39	74,143.96	7,988.92	0.0644
Fabric and Carpet Care	6,148.55	81,954.64	6,236.63	5,326.49	0.043
Dishwashing	26,690.45	1,034,419.8	34,173.77	1,574.14	0.0127
Waxes and Polishes	12,123.9	220,611.58	12,878.47	12,878.47	0.104
Air Fresheners	34,360.44	141,300.1	38,155.8	33,723.56	0.272
Shoe and Leather Care	230.92	1,086.92	302.95	302.95	0.00244
Miscellaneous	48,869.35	159,742.23	55,798.64	13,800.67	0.111
Adhesives and Sealants					
Consumer Adhesives	55,290.96	458,830.69	61,434.4	61,434.4	0.495
Sealants	8,108.4	199,965.67	9,009.33	9,009.33	0.0727
FIFRA-Regulated Products					
Insecticides	53,592.29	286,284.39	59,216.41	59,216.41	0.478
Fungicides and Nematicides	39,345.83	169,522.4	41,985.84	41,985.84	0.339
Herbicides	63,730.28	440,664.34	63,767.92	63,410.28	0.511
Antimicrobial Agents	33,700.1	457,349.5	34,271.11	17,916.74	0.144
Other FIFRA-Regulated Products	37,810.47	57,811.67	37,890.79	37,890.79	0.306

Table 2.2

1997 Consumer and Commercial Products Survey
Summary of Sales and Emissions (as of 3/21/00)

Cat. Code	Category Name	Sales (tpd)	Adjusted** Sales (tpd)	Adjusted Emissions*								
				VOC (tpd)	PCBT F (tpd)	MeCl (tpd)	TCA (tpd)	VMS (tpd)	Acetone (tpd)	CO2 (tpd)	HFC-152a (tpd)	PERC (tpd)
1101	Arts and Crafts Adhesives	0.10	0.11	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1102	Automotive Adhesives	0.83	0.91	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1103	Carpet and Tile Adhesives	0.67	0.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1104	Construction and Panel Adhesives	3.80	4.19	0.99	0.00	0.00	0.00	0.00	0.18	0.00	0.00	0.00
1105	Contact Adhesive	0.40	0.44	0.26	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.00
1106	General Purpose Adhesive	8.67	9.54	0.17	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.01
1107	Aerosol Adhesive (Including Industrial)	2.27	2.86	1.80	0.00	0.08	0.00	0.00	0.20	0.00	0.00	0.00
1108	Pipe Cements and Primers	1.60	1.76	1.19	0.00	0.00	0.00	0.00	0.18	0.00	0.00	0.00
1109	Woodworking Glues	2.84	3.12	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1201	Caulking Compounds	49.01	53.91	1.92	0.00	0.00	0.00	0.46	0.08	0.00	0.00	0.00
1202	Cold Process Roof Cements	30.00	33.01	5.78	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1203	Wood Fillers	2.34	2.58	0.18	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.00
2101	Bug and Tar Removers	1.21	2.55	0.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2102	Carpet and Upholstery Cleaners	22.45	24.69	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2103	Automotive Hard Paste Waxes	1.28	1.41	0.89	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2104	Automotive Instant Detailers	1.46	1.61	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2105	Automotive Waxes/Polishes/Sealants/	58.60	64.46	1.63	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00
2106	Rubber and Vinyl Protectants	17.25	18.97	1.53	0.00	0.00	0.00	2.42	0.00	0.00	0.00	0.01
2107	Automotive Rubbing or Polishing Comp	4.18	4.60	0.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2108	Tire Cleaners	3.08	3.39	0.34	0.00	0.03	0.00	0.23	0.00	0.00	0.00	0.00
2109	Vinyl and Leather Cleaners	0.34	0.37	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2110	Wheel Cleaners	4.41	4.85	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2201	Battery Cleaners	0.10	0.11	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2202	Automotive Brake Cleaners	11.69	12.86	5.61	0.00	0.29	0.10	0.00	2.20	0.43	0.00	4.14
2203	Carburetor, Choke Cleaners	8.87	9.76	6.48	0.00	0.31	0.00	0.00	1.54	0.15	0.00	0.00
2204	Engine Degreasers	9.88	11.85	2.21	0.00	0.02	0.00	0.00	0.00	0.04	0.00	0.08

Table 2.2

1997 Consumer and Commercial Products Survey
Summary of Sales and Emissions (as of 3/21/00)

Cat. Code	Category Name	Sales (tpd)	Adjusted** Sales (tpd)	Adjusted Emissions*								
				VOC (tpd)	PCBT F (tpd)	MeCl (tpd)	TCA (tpd)	VMS (tpd)	Acetone (tpd)	CO2 (tpd)	HFC-152a (tpd)	PERC (tpd)
5605	Solid/Gel Air Fresheners	16.57	18.23	2.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5701	Charcoal Lighter Materials	7.34	15.30	4.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5702	Aerosol Cooking Sprays	3.17	3.48	0.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6101	Underarm Antiperspirants	20.82	22.91	2.30	0.00	0.00	0.00	6.50	0.01	0.00	0.72	0.00
6102	Underarm Deodorants	4.77	5.25	1.47	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.00
6201	Astringents/Toners	19.44	21.38	2.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6202	Hand and Body Lotions	46.77	51.44	0.30	0.00	0.00	0.00	0.14	0.00	0.00	0.00	0.00
6301	Personal Fragrance Product (<20% Fr)	10.59	11.64	8.57	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00
6302	Personal Fragrance Product (>20% Fr)	0.39	0.43	0.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6401	Hair Spray	40.52	51.87	40.13	0.00	0.00	0.00	0.03	0.00	0.01	0.89	0.00
6402	Hair Mousses	7.63	8.39	0.77	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.00
6403	Hair Shines	0.41	0.45	0.22	0.00	0.00	0.00	0.08	0.00	0.00	0.00	0.00
6404	Hair Styling Gels	21.38	23.51	0.36	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00
6501	Nail Polish	1.03	1.13	0.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6502	Base coats, Undercoats	0.15	0.16	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6503	Nail Polish Removers	2.76	4.06	0.85	0.00	0.00	0.00	0.00	2.25	0.00	0.00	0.00
6601	Rubbing Alcohol	15.47	17.02	10.71	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00
6602	Shaving Creams	8.84	9.73	0.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6603	Shaving Gels	8.18	8.99	0.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6604	Foot Powders	0.42	0.46	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6605	Personal Hygiene Sprays	0.55	0.60	0.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Totals		73508	82152	236.02	0.01	8.53	0.93	10.20	14.17	1.25	1.84	5.42

* Adjustment Factor is the Difference Between Adjusted Sales and Reported Sales

** All Values are Adjusted Assuming 90 Percent Market Coverage Unless Bolded. Adjustments for Bolded Values are Discussed in Cover

Table 2.3
Estimated Annual VOC Emissions from Usage of Consumer and Commercial
Products in New York City

Product Type	User Type	Emissions (tons/year)
Adhesives	Household	Not available
	Commercial	1,270
	Total	1,270
Hairsprays	Household	3,328
	Commercial	3,611
	Total	6,939
All Purpose Cleaners	Household	3,894
	Commercial	655
	Total	4,549
Disinfectants	Household	2,764
	Commercial	647
	Total	3,411
Air Fresheners	Household	866
	Commercial	314
	Total	1,180
Animal Insecticides	Household	5
	Commercial	32
	Total	37
Other Insecticides	Household	413
	Commercial	619
	Total	1,032
Insect Repellants	Household	33
	Commercial	15
	Total	48
Spray Paints	Household	4,481
	Commercial	0
	Total	4,481
Total		22,947

Section 3.0 Development of Clark County Specific Data-Retail

This section of the report describes the purpose for surveying companies that sell consumer products to the public and the methodology used to implement the survey, collect the sales data, and analyze the data received.

Survey Background

The objectives of this project among others included:

- Generation of a source category list of consumer products that are sold and used within Clark County
- Development of data collection methods to identify product source categories that are sold and used within Clark County.

The source category list of consumer products sold and/or used in the County was based on California's database of products found in their regulations. Table 3.1 identifies the product source categories considered in this study. This product list was selected based on the relative contribution of emissions from the use of personal care products, cleaners, and general degreasers that likely represent the majority of VOC emissions in Clark County. As shown in Table 2.2, the use of hair care products, cleaners, and general degreasers represent over 75% of the VOC emissions from consumer product use in California. It is expected that the use of these products contributes over 90% of the VOC emissions from consumer product use in Clark County.

The development of a database to document the quantity and usage of products identified in Table 3.1 was accomplished through a survey sent to retailers, department stores, convenience stores, grocery stores, and home improvement and janitorial supply companies that would likely sell products identified in Table 3.1. The survey forms, directions and cover letter sent to representative retailers are provided in Appendix A.

MACTEC prepared the database of companies from several sources including internet searches by product category, telephone books, corporate websites, product research groups, and observation. In addition, California's database of manufacturers of consumer products sold in the State was obtained to supplement and check the Clark County database. Major national corporations with multiple outlets, e.g., grocery stores, pharmacies, and home improvement and department stores, were identified through their corporate headquarters where possible. In most cases corporate or regional headquarters were located out of State. Convenience stores, janitorial supply and some hardware stores were locally based and managed. The survey was sent to a representative sample of these local stores. The majority of retailers reside in the greater Las Vegas valley but retailers in other populated areas of the County, e.g., Laughlin, were also considered. The database of retailers was generated by type of store and/or product. The database consists of company name, address and city, phone number, point of contact and title, if available. The database was updated and improved on a continuing basis through telephone follow-up. The resulting database is contained in Appendix B.

**Table 3.1
Product Source Categories Considered**

Category	Includes	Example Products (Not All-Inclusive)
Hair Care	Color, Styling, Mousse, Spray, Conditioner, Bleach/Lightener, Growth Retardant/Inhibitor, Shine, Tonic/Restorer, Shampoo, Lice Removers, Wig Cleaners, Pet Shampoo	<ul style="list-style-type: none"> • White Rain Pearberry Hair Spray 7 oz. • Sun-In Super Streaks • Sally Hansen Crème Hair Bleach for Face • L’Oreal Hair Color Remover Kit • Revlon Colorstay • Citre Shine Instant Conditioner • St. Ives Hair Repair No Frizz Serum • White Rain Select Effects Leave In Conditioner • L’Oreal Casting Color Spa • Grecian Moustache & Beard Haircolor – Dark Brown • Jergens Naturally Smooth Moisturizer • Vidal Sassoon Polishing Drops • Got2B Glued • L’Oreal Kids Styling Gel • VO5 Mousse • Jheri Redding Straightening Gel • Rusk Being Slick Pomade • Minoxidil • AVO Flea & Tick Shampoo • Thermasilk Heat Activated Shampoo Daily Clarifying • Super Star Fantastic Wig Cleaner • Lice Egg Remover Combing Gel
Nail Care	Coating, Artificial Nail, Wrap, Glue Remover, Polish Thinner, and Drying Enhancer	<ul style="list-style-type: none"> • Sally Hansen Dries Instantly Base Coat • Sally Hansen Artificial Nail Remover • Revlon Nail Builders – Get Smoother Ridge Filler • Naturistics 60 Second Quick Dry Top Coat • L’Oreal Shock Proof Nail Enamel • Orly Smudge Fixer • Revlon Professional Quick Dry Liquid • Almay Massage & Grow Nail and Cuticle Wax • Nail Experts Liquid Silk Wrap
Body Wipes	Baby Wipes, Anti-bacterial Wipes, Refreshing Body Cloths, Medicated Rectal/Vaginal Pads, Hair Removal Towelette, Hand Cleaner Wipes, Pet Shampoo Wipes	<ul style="list-style-type: none"> • Pampers Sensitive Touch Wipes, 72 ea. • WetOnes Antibacterial Wipes, Wild Watermelon & Ballistic Berry, 24 ea. • Shower to Shower Refreshing Body Cloths, Island Fresh 30 ea. • Tucks Hemorrhoidal Pads with Witch Hazel, 40 ea. • Petkins Doggy Wipes, pkg. of 6
Personal Foaming Products	Foaming Body Wash, Foaming Bath, Foaming Hand Cleaner, Foaming Face Wash, Anti-bacterial Foam, Pet Foaming Cleanser, Acne Wash Foaming Cleanser	<ul style="list-style-type: none"> • Dove Essential Nutrients Self-Foaming Cleanser 6.76 oz • Pond’s Clear Solutions Deep Pore Foaming Cleanser • Vagisil Foaming Wash Fresh Clean Scent 1.6 oz • Dial Complete Foaming Hand Wash 7.5 oz

**Table 3.1
Product Source Categories Considered (continued)**

Category	Includes	Example Products (Not All-Inclusive)
Personal Hygiene Products	Feminine Sprays, Antifungal Sprays & Liquids, Foot & Sneaker Sprays, Jock Itch Sprays	<ul style="list-style-type: none"> • Lotrimin AF Jock Itch Spray Powder 100g • FDS Feminine Deodorant Spray Baby Powder 1.5 oz • Tinactin Antifungal Deodorant Powder Spray 100g
Shaving Gel		<ul style="list-style-type: none"> • Skintimate Shave Gel Sensitive Skin 7 oz • Edge Active Care Gel Clean 7 oz • King of Shaves AlphaGel Shaving Gel Antibacterial Formula 5.95 oz
Insect Repellant (NON-Aerosol)	Insect Repellents for humans and pets	<ul style="list-style-type: none"> • 10 Hour The Insect Repellent Pump 2 oz • Deep Woods Off! With Sunscreen • Coppertone-R Bug and Sun • Cutter All Family Insect Repellent Towelettes
Leather Care	Cleaner, Polishes, Conditioners, Saddle Soaps, Ball Glove Oils, Liquid Pine Tar, Dyes, Dressings	<ul style="list-style-type: none"> • Kiwi Leather Dye, Black • Kiwi Sport Shoe Stuff Rain and Stain • Kiwi Suede and Nubuck Cleaner • Kiwi Outdoor Mink Oil
Footwear Care Product	Cleaners, Oils, Shoe Stretch, Conditioners, Polishes, Odor Control, Saddle Soaps	<ul style="list-style-type: none"> • Kiwi Sport Athletic Shoe Deodorant and Sanitizing • Kiwi Leather Scuff Cover, Black
Fabric or Leather Waterproofer		<ul style="list-style-type: none"> • Scotchgard Heavy Duty Water Repellent • Rain X Weather Guard • Kiwi Outdoor Wet Pruf
Fabric Refresher		<ul style="list-style-type: none"> • Febreze • Lysol Disinfectant Spray Plus Fabric Refresher • Arm & Hammer Vacuum Free Foam Carpet Deodorizer
In-dryer Fabric Care	Dryer Activated Cloths	<ul style="list-style-type: none"> • Dryel
Wrinkle-Releasing Spray	Wrinkle releasing sprays	<ul style="list-style-type: none"> • Downy Wrinkle Releaser, 500 mL
Anti-Static Product	Concentrates, Sprays, Floor Finishes	<ul style="list-style-type: none"> • Static Guard 5.5 oz • Endust for Electronics Anti-Static Cleaning and Dusting
Electronic Cleaner		<ul style="list-style-type: none"> • 3M 16-101 General Purpose Contact Cleaner • Endust for Electronics Floppy Drive Head Cleaner • Endust for Electronics Wipes, 70 count
Jewelry Cleaner		<ul style="list-style-type: none"> • Tarn-X Jewelry Cleaner
Toilet or Urinal Cleaner/Deodorizer	Bowl Cleaners, Tank Cleaners, Drop-in Cleaners, Deodorizers	<ul style="list-style-type: none"> • Vanish Hang-Ins • Lime A Way Toilet Bowl Cleaner • Lysol Cling Toilet Bowl Cleaner
Wood Cleaner	Cleaners, Preservatives, Build-up Removers, Polish	<ul style="list-style-type: none"> • Orange Glo Wood Care Kit • Mop & Glo Hard Wood Floor Cleaner

Survey Distribution

Once MACTEC developed the list of survey recipients, the accompanying cover letter, and the survey forms, a package was sent to each company by regular mail. Several of the companies contacted DAQEM or MACTEC to request additional information. A summary of those contacts is provided in Table 3.2. MACTEC also contacted all remaining companies to which the survey was sent to ensure that the package had been received, to offer to answer any questions, and to determine the recipient's intention regarding providing a response. MACTEC left messages in cases that the contact could not be reached. We answered questions and provided additional information by facsimile. In most cases, the recipients indicated that they would need additional time to respond to the survey, often citing the simultaneous survey being conducted by the California Air Resources Board. In some cases, the package was not received and MACTEC sent another package as directed by the company official contacted. MACTEC later conducted another round of phone calls to each company that had not yet responded to the survey. We again offered to answer any questions and attempted to determine if and when a response would be submitted. A summary of the results of the phone calls made by MACTEC is provided in Table 3.3.

Survey Responses

The survey responses actually received from the companies are summarized in Table 3.4. In some cases, the companies indicated that they did not sell any of the products identified in the survey package. In cases that sales data was supplied, the responses varied with respect to the type and completeness. Some responses were provided only in hard copy form and some were provided electronically in various formats. Some of the responses supplied all requested data including VOC and individual compound content of each product. Others only provided the number of units sold and sizes for each product.

Survey Utility

The usefulness of the survey data is dependent on the number of responses received and the completeness of those responses. The survey response rate was very low in that only five companies provided data. Of those five companies, only two provided sufficiently complete data to be of any use. None of the replying companies provided complete VOC/product composition data, which is necessary for making the VOC emission calculations. MACTEC determined that this data was insufficient to use in any fashion for preparing emissions inventories for Clark County. Therefore, a secondary source of data was considered and obtained. The sales and VOC content data contained in the CARB 2001 Consumer and Commercial Products Survey was chosen based on its completeness and representativeness of the data that would have been collected from the surveys for Clark County. The methodology used to complete the 2002 and 2003 emission inventories is discussed in Section 6.0 of this report.

**Table 3.2
Clark County Consumer Products Survey Summary of Inquiries Received**

Company/Location	Name	Phone/Fax No.	Date	Comments
Walgreens/Deerfield IL	Bryan Schneider	847.914.2440/ 847.914.2660	10/12/04 and later	Responded to their questions; will provide Excel spreadsheet and names of manufacturers; will likely need until mid December to supply data
Target Corporation/ Minneapolis MN	Jill Gilchrist	612.761.4589/	10/12/04	Indicated that they have no questions at present and will attempt to respond by mid November
Target Corporation/ Minneapolis MN	Shaun Nicholson	612.761.1009/	11/4/04	Answered some questions regarding survey
Longs Drug Stores/ Walnut Creek CA	Alan Pope	925.210.6889/ 925.210.6202	10/14/04	Faxed table missing from survey package; will need additional time
Safeway/Pleasanton CA	Sharon Plouffe	925.226.5097/ 925.226.5030	10/20/04 and later	Faxed table missing from survey package; said survey requests more than CARB survey and may not be able to respond but if able may need three months
Pier 1 Imports/Fort Worth TX	John Weisert	817.252.7863/ 817.252.7349	10/19/04	Do not sell any of the product categories in our table and will respond with that information; their SIC may be misleading
Sam's Club (Wal Mart)/Bentonville AR	Heather Weeks	479.204.8584/ 479.277.5844	10/21/04	Faxed table missing from survey; indicated that more time would be needed
MGM Grand/Las Vegas	Jack Stone	702.891.3049	11/18/04	Told him to provide data on products sold in gift shop as well as cleaning products used; use Excel or survey forms; and return data to DAQEM
Albertsons/Boise ID	Mark Schwartz	208.395.3910	11/29/04 and later	Answered questions on missing table and on who should receive response to survey
Caesar's Entertainment/Las Vegas	Judy Glasgow	702.866.1263	11/30/04	Indicated that the response to the survey should be sent to Harish Agarwal
Treasure Island/Las Vegas	Kirsten Naylor	702.894.7547	12/3/04	Indicated that we would like data on products sold in gift shop as well as cleaning products used; identified the other MGM hotels that received the survey
May Department Stores	Charles Miller	314.342.6459	12/13/04	Asked some questions including whether there is a legal requirement to provide the data
ACE Hardware	John Van Zeyl	630.990.8910	12/17/04	Answered questions earlier for Shirley; Van Zeyl indicated that he is sending the data by Federal Express for delivery on 12/20
Waxie Sanitary Supply	Stacy Hunt Ross	858.292.8111	3/10/05	Answered questions about product type code, products to be included in response, and MSDS; will provide data next week

**Table 3.3
Summary of Phone Call Results**

Company	POC	Location	Date Called: December 2004	Date Called: February 25, 2005	Date Called: March 4, 2005
Sam's Club	Pam Spies	Bentonville, AR	Heather Weeks called-needs more time; faxed table	forwarded package to someone else - unknown	Heather is too busy with the mandatory CA VOC study
7-Eleven	Marlo Michalek	Dallas, TX	Left detailed voice mail message	Left detailed voice mail message	Left detailed voice mail message
Target	Kristen Knowles	Minneapolis, MN	Shaun Nicholson called-had questions	do not participate in surveys	
Kmart	Paul Guyardo	Troy, MI	Left detailed message with Gail	Left detailed voice mail message	Left detailed voice mail message
Vons	Jerry Scorsatto	Arcadia, CA	Forwarded to Sharon Plouffe at corporate	Left detailed voice mail message	Sharon Plouffe doesn't have time
Smith's	Dirk Burningham	Salt Lake City, UT	Left detailed voice mail message-Dick & Carma Howard	Left detailed voice mail message	Left detailed voice mail message
Safeway	Brian C. Cornell	Pleasanton, CA	Sharon Plouffe called-may not respond; needs more time	Left detailed voice mail message	Sharon Plouffe doesn't have time
Kroger	Evan Anthony	Cincinnati, OH	Do business in Clark County only as Smith's Food & Drug	Left detailed voice mail message	
Food 4 Less	Eddie Vasquez	Compton, CA	Will supply data by end of December		
Raley's	Kathy Herbold	W. Sacramento, CA	Have no stores in County-sold to Smith's 3 years ago		

**Table 3.3
Summary of Phone Call Results (continued)**

Company	POC	Location	Date Called: December 2004	Date Called: February 25, 2005	Date Called: March 4, 2005
Ross Stores	Janet Kanios	Newark, CA	Moved but package forwarded-provided correct address, etc.		
Ross Stores	Katie Loughnot	Pleasanton, CA	Correct name and address for Ross Stores		
Pier 1 Imports	Mike Foulkes	Ft. Worth, TX	John Weisert called-do not sell any products on list		
Mervyn's	Ms. Lee Walker	Hayward, CA	Left detailed voice mail message	Left detailed voice mail message	Left detailed voice mail message
CVS	Chris Bodine	Woonsocket, RI	Tina Egan of legal dept.said they would consider	NO PHONE #	Tina says it got passed on, says will call back
JC Penney	Nick Bomersbach	Plano, TX	Bomersbach asked questions, said they would get back to us	NO PHONE #	Left detailed voice mail message
Big A Drug Store	Dave Wright	South Gate, CA	No stores in County-suggested Amerisource Bergen contact	Left detailed voice mail message	
Walgreens	Doug Egan	Deerfield, IL	Bryan Schneider called-had questions; needs more time	Left detailed voice mail message	Unable to get through to line
Rite Aid	John Learish	Camp Hill, PA	Michael Yount in legal said they would consider responding	Left detailed voice mail message	Left detailed voice mail message

**Table 3.3
Summary of Phone Call Results (continued)**

Company	POC	Location	Date Called: December 2004	Date Called: February 25, 2005	Date Called: March 4, 2005
Longs Drugs	Todd Vasos	Walnut Creek, CA	Alan Pope called-needs more time; faxed table	NO PHONE #	Alan had assigned it to someone and thought it had been sent out - he's looking into it
Dillard's	Ken Eaton	Little Rock, AR	Ken Eaton said they would consider	NO PHONE #	Ken's secretary says we have the wrong contact - says to send it to Jim Benson in Phoenix
Home Depot	John Costello	Atlanta, GA	Doug Zacker of com. Relations sent to Dir. Env. Compliance	NO PHONE #	Left detailed voice mail message
Lowe's	Dale Pond	Mooresville, NC	Left detailed voice mail message for Chris Ahern (her)	NO PHONE #	Doesn't remember getting it
Albertson's	Paul T. Gannon	Boise, ID	Mark Schwartz called-had questions but intend to respond		
Quick Stop	DJ Longa	Fremont, CA	Left detailed voice mail message		
Federated Dept.	Janet E. Grove	Cincinnati, OH	Christine Brandt working on survey and will return	No phone #	Left detailed voice mail message, Christine is on vacation until next week
May Department Stores	Mary Morgan	N. Hollywood, CA	Requested that survey package be resent		
Wal-Mart	Robert F. Connolly	Bentonville, AR	Heather Weeks is handling Wal-Mart survey and Sam's Club	NO PHONE #	Heather is too busy with the mandatory CA VOC study

**Table 3.3
Summary of Phone Call Results (continued)**

Company	POC	Location	Date Called: December 2004	Date Called: February 25, 2005	Date Called: March 4, 2005
ACE Hardware	Lori Bossman	Oakbrook, IL	John Van Zeyl called-sent data by Fed Ex to arrive 12/20		
MGM Grand & NY NY Hotels	Jack Stone	Las Vegas, NV	Jack Stone called-had questions; part of MGM		
Bellagio	Larryl Lamb	Las Vegas, NV	Part of MGM		
Boardwalk Hotel	Joe Benson	Las Vegas, NV	Part of MGM		
Primm Valley Casino Resorts	Frank Scharadin	Jean, NV	Part of MGM		
The Mirage	Lisanne Bogle	Las Vegas, NV	Part of MGM		
TI	Kirstin Naylor	Las Vegas, NV	Part of MGM-Mark Stolarczyk of MGM Mirage to handle all	Left detailed voice mail message	
Caesars Entertainment	Steven N. Rosen	Las Vegas, NV	Was given different person and asked to resend survey		
Caesars Entertainment	Steven J. Lyons	Las Vegas, NV	New name and address for Caesar's Entertainment	Left detailed voice mail message	Says went to Tom Irvin, spoke with him, doesn't know, says will call back
Boyd Gaming	Marianne Boyd Johnson	Las Vegas, NV	Secretary trying to find survey package		
Saks Fifth Avenue	Vicky Forinos	Birmingham, AL	Was given different person and asked to resend survey		

**Table 3.3
Summary of Phone Call Results (continued)**

Company	POC	Location	Date Called: December 2004	Date Called: February 25, 2005	Date Called: March 4, 2005
Saks Fifth Avenue	Terron Schaefer	New York, NY	New name and address for Sak's Fifth Avenue		
Speedee Mart	NA	Las Vegas, NV	Requested that survey package be resent	Left detailed voice mail message for Mike	Left detailed voice mail message for Mike
Short Line Express	Liz Lutz	Las Vegas, NV	Requested that survey package be resent	SEE WHAT SHE CAN DO	Left detailed voice mail message for Mike
Amerisource Bergen Corp	Fred Stern	Chesterbrook, PA	New name and address for Good Neighbor Pharm.		
MGM Mirage	Mark Stolarczyk	Las Vegas, NV	To respond for all of MGM	Left detailed voice mail message	Remembers survey, thinks someone has it, will call back
Mandalay Resort Group	Darlene Ghirardi	Las Vegas, NV	Did not send survey until 1/4/2005		
Harrah's Corp.	Ginny Shanks	Las Vegas, NV	Did not send survey until 1/4/2005	Left detailed voice mail message	Ginny Shanks secretary says I'm speaking to the wrong person
Woodworker's Emporium	John Henderson	Las Vegas, NV	Do not sell any products on list		
TruServ Corporation	Carol Wentworth	Chicago, IL	Left detailed voice mail message	Left detailed voice mail message	
Advance Janitorial Supplies	NA	Las Vegas, NV	Did not send survey until 2/9/2005		Left detailed message
Shuman & Assoc. Janitorial Supplies	NA	Las Vegas, NV	Did not send survey until 2/9/2005		Phone number no longer in service
Waxie Sanitary Supply	NA	Las Vegas, NV	Did not send survey until 2/9/2005		Do not remember seeing survey; otherwise do not plan on submitting any info

**Table 3.4
Survey Responses Received**

Company Name & Location	Complete (Y/N)	Data Format	Data Provided	Product/ MSDS Information
Food 4 Less Compton, CA	N	hard copy	Category of product (e.g., hair care); item description; unit size; units sold	None
Albertson's Boise, ID	N	electronic	Category of product; sub-category of product; brand; description of product; unit size of product; sales quantity	None
Amerisource Bergen Corp (Good Neighbor Pharmacy) Chesterbrook, PA	N	hard copy	Category of product; brand name; unit size; unit sales volume	From MSDS: Specific gravity for all products
ACE Hardware Oakbrook, IL	N	electronic	Brand name; item description; size in oz.; units shipped; total sales volume (lb/yr); dispensing form (e.g., liquid); vendor information	CD provided with approximately 200 MSDS's. Reviewed 10 MSDS's at random, and most provide the specific gravity of the product, but no VOC information.
Waxie Sanitary Supply	N	electronic; hard copy	Brand Name; dispensing form; annual sales volume (lb/yr)	CD provides MSDS's of all products on spreadsheet. Only some MSDS's provide VOC information.

Section 4.0 Development of Clark County Specific Data-Tourism/Military

This section of the report describes the purpose for surveying hotels, janitorial services, and military bases that use and perhaps sell consumer products and the methodology used to implement the survey, collect the sales data, and analyze the data received.

Survey Background

The objectives of this project among others included:

- Generation of a source category list of consumer products that are sold and used within Clark County
- Development of data collection methods to identify product source categories that are sold and used within Clark County.

The source category list of consumer products sold and/or used in the County was based on California's database of products found in their regulations. Table 3.1 identifies the product source categories considered in this study. This product list was selected based on the relative contribution of emissions from the use of personal care products, cleaners, and general degreasers that likely represent the majority of VOC emissions in Clark County. As shown in Table 2.2, the use of hair and personal care products, cleaners, and general degreasers represent over 75% of the VOC emissions from consumer product use in California. It is expected that the use of these products contributes over 90% of the total VOC emissions from consumer products in Clark County and probably close to 100% of the emissions from consumer products use by visitors.

The development of a database to estimate the quantity and usage of products identified in Table 3.1 was accomplished through a survey sent to major hotels and hotel management groups shown in Table 3.1. The form and content of the survey and cover letter were changed from the survey of retailers to focus on product usage rates and to a lesser degree product sales in gift shops and hotel retail outlets. The survey forms, directions and cover letter sent to representative hotels and hotel management groups are provided in Appendix C.

MACTEC prepared the database of hotels from several sources including internet searches, telephone books, corporate websites, Las Vegas Convention and Visitors Authority data and observation. The hotel and tourism database focused primarily on the Las Vegas Valley including the towns of Jean and Laughlin. MACTEC's database was constructed in a spreadsheet and included the name, address, phone number, and point of contact. The database was updated, improved and verified through telephone follow-up. The resulting database is contained in Appendix B.

Survey Distribution

Once MACTEC developed the list of survey recipients, the accompanying cover letter, and the survey forms, a package was sent to each hotel or company by regular mail. Several of the hotels contacted MACTEC to request additional information. A summary of those contacts is provided in Table 3.2. MACTEC also contacted all remaining hotels/companies to which the survey was sent to ensure that the package had been received, to offer to answer any questions, and to determine the recipient's intention regarding providing a response. MACTEC left messages in cases that the contact could not be reached. We answered questions and provided additional

information by facsimile. In several cases, the recipients did not understand what information they were being asked to provide so MACTEC made some revisions to the original package sent to the hotels and resent the revised materials to the hotels and janitorial companies. In some cases, the package was not received and MACTEC sent another package as directed by the company official contacted. MACTEC later conducted another round of phone calls to each hotel/company that had not yet responded to the survey. We again offered to answer any questions and attempted to determine if and when a response would be submitted. A summary of the results of the phone calls made by MACTEC is provided in Table 3.3.

Survey Responses

Only one hotel responded to the survey. That response provided data for only toiler bowl cleaner used by the hotel company. In addition, the response seemed to assign all usage to only one of a number of hotels operated by the company and that usage amount seemed sufficient for all their hotels.

Survey Utility

The usefulness of the survey data is dependent on the number of responses received and the completeness of those responses. Because only one questionable response was provided, MACTEC determined that there was insufficient data to use in any fashion for preparing emissions inventories for Clark County. Therefore, a secondary source of data was considered and obtained. The sales and VOC content data contained in the CARB 2001 Consumer and Commercial Products Survey was chosen based on its completeness and representativeness of the data that would have been collected from the surveys for Clark County. The methodology used to complete the 2002 and 2003 emission inventories is discussed in Section 6.0 of this report.

5.0 Analysis of Weekday/Weekend Effects

As discussed in the previous section of this report, the tourist population in Clark County is significant and is expected to add substantially to the usage of and emissions from various consumer products. The 35 million visitors per year in the County contribute additional VOC emissions primarily from the use of personal care products such as hairspray and other hair care products. MACTEC obtained statistical information on visitor and tourism characteristics including length of stay, occupancy rates for weekday and weekend and annual occupancy rates from the Las Vegas Convention and Visitors Authority. We analyzed the data to determine if significant differences occurred in occupancy rates and length of stay from the weekdays defined as Monday through Thursday to the weekend defined as Friday through Sunday. Significant differences in visitor counts between the two time periods could result in significant emission variations from weekdays to weekends.

The results for calendar year 2003 as follows:

- Weekend occupancy rate - 92.8%
- Midweek occupancy rate - 81.6%
- Average nights stayed - 3.6

On the basis of occupancy rate, there is a clear increase in the number of visitors during the weekend. This increase appears to be at least 13.7%, although it could be greater if the number of persons per room also increases. It is reasonable to assume that the weekend increase in emissions is 13.7% compared to a typical midweek day. This weekend factor is important for constructing daily or hourly emission values for an episodic period.

Section 6.0 Emission Inventory Methodology

This section of the report describes the consumer products that were inventoried for Clark County, the correlation of these categories with CARB's categories, the methodology used to complete the 2002 and 2003 emission inventories for Clark County, and adjustments made for VOC content.

Products Inventoried/Correlation of Categories

As discussed in Section 3.0, the source category list of consumer products that MACTEC inventoried was based on California's database of products found in their regulations. Table 3.1 identifies the product source categories that were considered in this study. This product list was selected based on the relative contribution of emissions from the use of personal care products, cleaners, and general degreasers that likely represent the majority of VOC emissions in Clark County. As shown in Table 2.2, the use of automotive products, aerosol coatings, hair care products, cleaners, and general degreasers represent over 75% of the VOC emissions from consumer product use in California. It is expected that the use of these products contributes over 90% of the VOC emissions from consumer product use in Clark County.

Methodology

Due to the small number of surveys returned with usable data (2 total), MACTEC was not able to use the survey data to develop VOC emissions data for Clark County. Therefore, a secondary methodology of calculating representative emissions had to be formulated. Using the data contained in the CARB 2001 Consumer and Commercial Products Survey and the population of California in 2001, MACTEC calculated an emission factor in pounds per day per person for each category to be inventoried for Clark County. These emission factors were then used to calculate the VOC emissions for the permanent residents, military population, and visitors of Clark County for each consumer products category.

The 2002 and 2003 Clark County emission inventories were compiled based on the results of these calculations, including a visitor "bump-up" factor for certain consumer products categories. MACTEC assumed that visitors would have a higher usage rate of certain product categories than permanent residents while in Las Vegas. The "bump-up" factor was applied to the following categories to estimate VOC emissions from product use by visitors:

- Hair styling product: spray
- Shaving gel
- Personal hygiene products
- Shampoo
- Hair styling product: mousse
- Nail polish
- Conditioner
- Hair shine
- Hair styling product: liquid
- Hair styling product: semisolid
- Personal foaming products
- Hair styling product: solid
- Other hair care products

The “bump-up” factor for hair spray was determined based on results from two separate surveys of visitors to the Las Vegas area. MACTEC conducted the surveys at several locations in the area including malls, hotels and other public places such as the marriage bureau office in downtown Las Vegas. The first survey conducted at a local mall and hotel obtained responses from 45 visitors that used hairspray in Las Vegas. For the second survey at the marriage bureau office, MACTEC interviewed 114 additional users of hairspray. For both surveys, MACTEC asked a series of questions to respondents. Only visitors to the County and/or Las Vegas were included in the survey tabulation and analysis. For the surveys, respondents were asked whether they use hairspray and if “yes” whether or not they use hairspray while in Las Vegas, and if “yes” how many times per day they use hairspray.

MACTEC tabulated the results for both survey data sets and calculated bump factors for each data set. For the 45 respondents from the first survey, the “bump-up” factor was determined to be 1.5. For the 114 responses collected at the marriage bureau, the bump factor was calculated to be 1.1. MACTEC combined the results from the two surveys and calculated a weighted average “bump-up” factor of 1.25 additional uses per day per visitor. The “bump-up” factor for all other categories listed above was assumed to be one (1) additional use per day per visitor. All categories of users (permanent residents, military population, visitors, and visitors with the “bump-up factor”) were totaled per source category for the 2002 and 2003 base years and future year inventories. The raw data obtained from the two surveys are presented in Appendix D.

Adjustments for VOC Content

MACTEC did not make adjustments for VOC content for the 2002 or 2003 Clark County emissions inventories. Because of the close proximity of Clark County to California and the high number of visitors to Clark County from California, we concluded that the VOC content of products sold in California is representative of the VOC content of products used and sold in Clark County.

Section 7.0 Base Year 2002 and 2003 VOC Emission Inventories

This section of the report describes the methodology used to complete the 2002 and 2003 emission inventories for Clark County. As discussed in the previous section, MACTEC calculated emissions for permanent residents, the military population, visitors, and visitors with a “bump-up” category. For these calculations, we applied per capita emission factors derived from the results of the 2001 consumer products survey conducted by CARB. These results are shown in Table 7.1 for year 2002 and in Table 7.2 for year 2003.

The additional assumptions used to develop the 2002 and 2003 VOC emission inventories, e.g., average length of stay per visitor, military population, etc., are included at the end of Tables 7.1 and 7.2.

**Table 7.1
Base Year 2002 VOC Emission Inventory**

Category	California Emission Factor (lb/day/person)	Total VOC Emissions from Permanent Residents of Clark County (lb/day)	Total VOC Emissions from Military Population (lb/day)	Total VOC Emissions from Visitors to Clark County (lb/day)	Total VOC Emissions from Additional Visitor Bump-up (lb/day)	Total VOC Emissions for Clark County (lb/day)
Automotive products	1.26E-03	1,989.7	18.5			2,008.2
Aerosol coatings	1.02E-03	1,616.6	15.1			1,631.7
Hair styling product: spray	8.73E-04	1,377.2	12.8	285.1	356.3	2,031.5
Personal fragrance	4.95E-04	780.9	7.3	161.6		949.8
Packaged solvent	4.23E-04	667.5	6.2			673.7
Gen'l purpose degreaser	2.46E-04	389.0	3.6			392.6
Toilet/Urinal Deodorizer	1.30E-04	204.6	1.9	42.3		248.8
Adhesive remover	7.62E-05	120.2	1.1			121.3
Shaving gel	6.78E-05	107.0	1.0	22.1	22.1	152.3
Fabric refresher	6.59E-05	103.9	1.0			104.9
Multi-purpose remover	5.45E-05	86.0	0.8			86.8
Personal hygiene product	5.14E-05	81.2	0.8	16.8	16.8	115.5
Insect Repellent: Non-aerosol	4.93E-05	77.8	0.7			78.5
Shampoo	3.99E-05	63.0	0.6	13.0	13.0	89.7
Hair styling product: mousse	3.07E-05	48.5	0.5	10.0	10.0	69.0
Nail polish	2.53E-05	40.0	0.4	8.3	8.3	56.9
Conditioner	2.37E-05	37.3	0.3	7.7	7.7	53.2
Hair color product: permanent	2.07E-05	32.7	0.3	6.8		39.7
Electronic cleaner	2.05E-05	32.4	0.3			32.7
Wood cleaner	1.87E-05	29.5	0.3			29.8
Solvent parts cleaner: non-aerosol	1.74E-05	27.4	0.3			27.7
Footwear care product	1.43E-05	22.5	0.2	4.7		27.4
Toilet/Urinal Cleaner & Deodorizer	1.40E-05	22.1	0.2	4.6		26.9
Anti-static product	1.31E-05	20.7	0.2	4.3		25.2
Fabric or leather waterproofer	1.18E-05	18.6	0.2			18.8
Hair shine	1.04E-05	16.4	0.2	3.4	3.4	23.3
Graffiti remover	9.81E-06	15.5	0.1			15.6
Body wipes	9.66E-06	15.2	0.1	3.2		18.5
Leather care product	8.60E-06	13.6	0.1			13.7
Contact adhesive	8.25E-06	13.0	0.1			13.1
Hair styling product: liquid	6.68E-06	10.6	0.1	2.2	2.2	15.0
Hair color product: temporary	5.06E-06	8.0	0.1	1.7		9.7
Hair styling product: semisolid	4.99E-06	7.9	0.1	1.6	1.6	11.2
Personal foaming product	3.30E-06	5.2	0.05	1.1	1.1	7.4
Toilet or urinal cleaner	2.93E-06	4.6	0.04	1.0		5.6
Nail treatment product	2.92E-06	4.6	0.04	1.0		5.6
Bleach/lightener	2.75E-06	4.3	0.04	0.9		5.3
Nail product: drying enhancer	2.21E-06	3.5	0.03	0.7		4.2
Top coat	1.80E-06	2.8	0.03	0.6		3.5
Base coat/undercoat	1.74E-06	2.7	0.03	0.6		3.3
Hair color product: semipermanent	9.57E-07	1.5	0.01	0.3		1.8
Hair color product: demipermanent	8.73E-07	1.4	0.01	0.3		1.7
Hair tonic/ Hair restorer	6.62E-07	1.0	0.01	0.2		1.3
Nail polish thinner	3.73E-07	0.6	0.01	0.1		0.7
Hair styling product: solid	9.83E-08	0.2	0.001	0.03	0.03	0.2
Artificial nail, wrap, or nail glue remover	6.94E-08	0.1	0.001	0.02		0.1
Jewelry cleaner	5.49E-08	0.1	0.001	0.02		0.1
Other hair care products	1.73E-08	0.03	0.0003	0.01	0.01	0.04
Miscellaneous *	2.89E-03	4,567.2	42.6			4,609.7
Emissions Grand Total		12,696.3	118.3	606.1	442.7	13,863.5

Table 7.1
Base Year 2002 VOC Emission Inventory (continued)

Assumptions

Clark County population (2002)	1,578,332
Visitors to Clark County (2002)	35,071,504 /year
Military Population (Permanent)	8,000
Military Population (Training)	350,000 /year
TOTAL Population	37,007,836

Average length of stay/visitor (nights) 3.4
[At 3.4 nights/person; 365 nights/year; 35,071,504 visitors per year = 326,693 visitors/night]

Visitor hairspray bump-up factor 1.25 additional uses per day
 Visitor bump-up factor (other categories) 1 additional use per day

Military population/day (approximate) 14,712
[At 7 days/person training; 365 days/yr; plus 8,000 permanent population]

* “Miscellaneous” includes, but is not limited to, insecticides, insect spray, glass cleaner, floor waxes, paint remover, multipurpose solvents, sealants, caulking

**Table 7.2
Base Year 2003 VOC Emission Inventory**

Category	<i>California Emission Factor (lb/day/person)</i>	Total VOC Emissions from Permanent Residents of Clark County (lb/day)	Total VOC Emissions from Military Population (lb/day)	Total VOC Emissions from Visitors to Clark County (lb/day)	Total VOC Emissions from Additional Visitor Bump-up (lb/day)	Total VOC Emissions for Clark County (lb/day)
Automotive products	1.32E-03	2,171.0	19.5			2,190.4
Aerosol coatings	1.07E-03	1,763.9	15.8			1,779.7
Hair styling product: spray	8.73E-04	1,432.4	12.8	288.9	361.1	2,095.2
Personal fragrance	5.19E-04	852.1	7.6	171.8		1,031.5
Packaged solvent	4.23E-04	694.2	6.2			700.4
Gen'l purpose degreaser	2.46E-04	404.6	3.6			408.2
Toilet/Urinal Deodorizer	1.30E-04	212.8	1.9	42.9		257.6
Adhesive remover	7.62E-05	125.0	1.1			126.2
Shaving gel	6.78E-05	111.3	1.0	22.4	22.4	157.2
Fabric refresher	6.59E-05	108.1	1.0			109.1
Multi-purpose remover	5.45E-05	89.4	0.8			90.2
Personal hygiene product	5.14E-05	84.4	0.8	17.0	17.0	119.2
Insect Repellent: Non-aerosol	4.93E-05	80.9	0.7			81.6
Shampoo	3.99E-05	65.5	0.6	13.2	13.2	92.6
Hair styling product: mousse	3.07E-05	50.4	0.5	10.2	10.2	71.2
Nail polish	2.53E-05	41.6	0.4	8.4	8.4	58.7
Conditioner	2.37E-05	38.8	0.3	7.8	7.8	54.9
Hair color product: permanent	2.07E-05	34.0	0.3	6.9		41.1
Electronic cleaner	2.05E-05	33.7	0.3			34.0
Wood cleaner	1.87E-05	30.7	0.3			31.0
Solvent parts cleaner: non-aerosol	1.74E-05	28.5	0.3			28.8
Footwear care product	1.43E-05	23.4	0.2	4.7		28.3
Toilet/Urinal Cleaner & Deodorizer	1.40E-05	23.0	0.2	4.6		27.8
Anti-static product	1.31E-05	21.5	0.2	4.3		26.1
Fabric or leather waterproofer	1.18E-05	19.4	0.2			19.5
Hair shine	1.04E-05	17.0	0.2	3.4	3.4	24.0
Graffiti remover	9.81E-06	16.1	0.1			16.2
Body wipes	9.66E-06	15.9	0.1	3.2		19.2
Leather care product	8.60E-06	14.1	0.1			14.2
Contact adhesive	8.25E-06	13.5	0.1			13.7
Hair styling product: liquid	6.68E-06	11.0	0.1	2.2	2.2	15.5
Hair color product: temporary	5.06E-06	8.3	0.1	1.7		10.1
Hair styling product: semisolid	4.99E-06	8.2	0.1	1.7	1.7	11.6
Personal foaming product	3.30E-06	5.4	0.05	1.1	1.1	7.7
Toilet or urinal cleaner	2.93E-06	4.8	0.04	1.0		5.8
Nail treatment product	2.92E-06	4.8	0.04	1.0		5.8
Bleach/lightener	2.75E-06	4.5	0.04	0.9		5.5
Nail product: drying enhancer	2.21E-06	3.6	0.03	0.7		4.4
Top coat	1.80E-06	3.0	0.03	0.6		3.6
Base coat/undercoat	1.74E-06	2.9	0.03	0.6		3.5
Hair color product: semipermanent	9.57E-07	1.6	0.01	0.3		1.9
Hair color product: demipermanent	8.73E-07	1.4	0.01	0.3		1.7
Hair tonic/ Hair restorer	6.62E-07	1.1	0.01	0.2		1.3
Nail polish thinner	3.73E-07	0.6	0.01	0.1		0.7
Hair styling product: solid	9.83E-08	0.2	0.001	0.03	0.03	0.2
Artificial nail, wrap, or nail glue remover	6.94E-08	0.1	0.001	0.02		0.1
Jewelry cleaner	5.49E-08	0.1	0.001	0.02		0.1
Other hair care products	1.73E-08	0.03	0.0003	0.01	0.01	0.04
Miscellaneous *	3.04E-03	4,983.3	44.7			5,028.0
Emissions Grand Total		13,662.1	122.4	622.3	448.6	14,855.4

Table 7.2
Base Year 2003 VOC Emission Inventory (continued)

Assumptions

Clark County population (2003)	1,641,529
Visitors to Clark County (2003)	35,540,126 /year
Military Population (Permanent)	8,000
Military Population (Training)	350,000 /year
TOTAL Population	37,539,655

Average length of stay/visitor (nights) 3.4
[At 3.4 nights/person; 365 nights/year; 35,540,126 visitors per year = 331,059 visitors/night]

Visitor hairspray bump-up factor 1.25 additional uses per day
 Visitor bump-up factor (other categories) 1 additional use per day

Military population/day (approximate) 14,712
[At 7 days/person training; 365 days/yr; plus 8,000 permanent population]

* “Miscellaneous” includes, but is not limited to, insecticides, insect spray, glass cleaner, floor waxes, paint remover, multipurpose solvents, sealants, caulking

Section 8.0 2010, 2020, 2030 VOC Emission Inventories

This section of the report discusses the formulation of and methodologies used for calendar year 2010, 2020, and 2030 projected emission inventories. The methodology used to perform the basic calculations within this section is the same as presented in Sections 6.0 and 7.0 of this report, adjusted for the projected populations for each year. The projected population figures are provided for 2010, 2020, and 2030 at the end of Tables 8.1, 8.2, and 8.3, respectively.

The projected populations for Clark County were obtained from the Advanced Planning Division (Comprehensive Planning) of Clark County. The projected number of visitors was based on a historical review of visitor volume from the 4th Quarter 2003 Las Vegas Marketing Bulletin - Vol. 31, No. 128. No increases in the permanent or training military population were assumed for the projection years.

**Table 8.1
2010 Clark County Projected Emissions Inventory**

Category	<i>California Emission Factor (lb/day/person)</i>	Emissions from Permanent Residents of Clark County	Total VOC Emissions from Military Population (lb/day)	Total VOC Emissions from Visitors to Clark County (lb/day)	Emissions from Additional Visitor Bump-up (lb/day)	Total VOC Emissions for Clark County (lb/day)
Automotive products	1.32E-03	2,762.9	19.5			2,782.3
Aerosol coatings	1.07E-03	2,244.8	15.8			2,260.7
Hair styling product: spray	8.73E-04	1,822.9	12.8	380.1	475.2	2,691.1
Personal fragrance	5.19E-04	1,084.4	7.6	226.1		1,318.2
Packaged solvent	4.23E-04	883.5	6.2			889.7
Gen'l purpose degreaser	2.46E-04	514.9	3.6			518.5
Toilet/Urinal Deodorizer	1.30E-04	270.8	1.9	56.5		329.1
Adhesive remover	7.62E-05	159.1	1.1			160.3
Shaving gel	6.78E-05	141.6	1.0	29.5	29.5	201.7
Fabric refresher	6.59E-05	137.6	1.0			138.6
Multi-purpose remover	5.45E-05	113.8	0.8			114.6
Personal hygiene product	5.14E-05	107.5	0.8	22.4	22.4	153.0
Insect Repellent: Non-aerosol	4.93E-05	103.0	0.7			103.7
Shampoo	3.99E-05	83.4	0.6	17.4	17.4	118.8
Hair styling product: mousse	3.07E-05	64.2	0.5	13.4	13.4	91.4
Nail polish	2.53E-05	52.9	0.4	11.0	11.0	75.3
Conditioner	2.37E-05	49.4	0.3	10.3	10.3	70.4
Hair color product: permanent	2.07E-05	43.2	0.3	9.0		52.6
Electronic cleaner	2.05E-05	42.9	0.3			43.2
Wood cleaner	1.87E-05	39.1	0.3			39.3
Solvent parts cleaner: non-aerosol	1.74E-05	36.3	0.3			36.5
Footwear care product	1.43E-05	29.8	0.2	6.2		36.2
Toilet/Urinal Cleaner & Deodorizer	1.40E-05	29.2	0.2	6.1		35.5
Anti-static product	1.31E-05	27.4	0.2	5.7		33.3
Fabric or leather waterproofer	1.18E-05	24.6	0.2			24.8
Hair shine	1.04E-05	21.7	0.2	4.5	4.5	30.8
Graffiti remover	9.81E-06	20.5	0.1			20.6
Body wipes	9.66E-06	20.2	0.1	4.2		24.5
Leather care product	8.60E-06	18.0	0.1			18.1
Contact adhesive	8.25E-06	17.2	0.1			17.4
Hair styling product: liquid	6.68E-06	14.0	0.1	2.9	2.9	19.9
Hair color product: temporary	5.06E-06	10.6	0.1	2.2		12.8
Hair styling product: semisolid	4.99E-06	10.4	0.1	2.2	2.2	14.8
Personal foaming product	3.30E-06	6.9	0.05	1.4	1.4	9.8
Toilet or urinal cleaner	2.93E-06	6.1	0.04	1.3		7.4
Nail treatment product	2.92E-06	6.1	0.04	1.3		7.4
Bleach/lightener	2.75E-06	5.8	0.04	1.2		7.0
Nail product: drying enhancer	2.21E-06	4.6	0.03	1.0		5.6
Top coat	1.80E-06	3.8	0.03	0.8		4.6
Base coat/undercoat	1.74E-06	3.6	0.03	0.8		4.4
Hair color product: semipermanent	9.57E-07	2.0	0.01	0.4		2.4
Hair color product: demipermanent	8.73E-07	1.8	0.01	0.4		2.2
Hair tonic/ Hair restorer	6.62E-07	1.4	0.01	0.3		1.7
Nail polish thinner	3.73E-07	0.8	0.01	0.2		0.9
Hair styling product: solid	9.83E-08	0.2	0.001	0.04	0.04	0.3
Artificial nail, wrap, or nail glue remover	6.94E-08	0.1	0.001	0.03		0.2
Jewelry cleaner	5.49E-08	0.1	0.001	0.02		0.1
Other hair care products	1.73E-08	0.04	0.0003	0.01	0.01	0.05
Miscellaneous *	3.04E-03	6,342.1	44.7			6,386.8
Emissions Grand Total		17,387.2	122.4	818.9	590.3	18,918.8

Table 8.1
2010 Clark County Projected Emissions Inventory (continued)

Assumptions

Clark County projected population (2010)	2,089,102
Projected Visitors to Clark County (2010)	46,768,381 / year
Military Population (Permanent)	8,000
Military Population (Training)	350,000 / year
TOTAL Population	49,215,483

Average length of stay/visitor (nights) 3.4
[At 3.4 nights/person; 365 nights/year; 46,768,381 visitors per year = 435,651 visitors/night]

Visitor hairspray bump-up factor 1.25 additional uses per day
 Visitor bump-up factor (other categories) 1 additional use per day

Military population/day (approximate) 14,712
[At 7 days/person training; 365 days/yr; plus 8,000 permanent population]

Notes:

Projected population for Clark County obtained from Advanced Planning Division (Comprehensive Planning) of Clark County

Projected visitors based on historical review of visitor volume from 4th Quarter 2003 Las Vegas Marketing Bulletin - Vol. 31, No. 128.

* "Miscellaneous" includes, but is not limited to, insecticides, insect spray, glass cleaner, floor waxes, paint remover, multipurpose solvents, sealants, caulking

Table 8.2
2020 Clark County Projected Emissions Inventory

Category	<i>California Emission Factor (lb/day/person)</i>	Emissions from Permanent Residents of Clark County	Total VOC Emissions from Military Population (lb/day)	Total VOC Emissions from Visitors to Clark County (lb/day)	Emissions from Additional Visitor Bump-up (lb/day)	Total VOC Emissions for Clark County (lb/day)
Automotive products	1.32E-03	3,409.8	19.5			3,429.2
Aerosol coatings	1.07E-03	2,770.4	15.8			2,786.2
Hair styling product: spray	8.73E-04	2,249.7	12.8	562.7	703.4	3,528.6
Personal fragrance	5.19E-04	1,338.3	7.6	334.7		1,680.6
Packaged solvent	4.23E-04	1,090.3	6.2			1,096.6
Gen'l purpose degreaser	2.46E-04	635.5	3.6			639.1
Toilet/Urinal Deodorizer	1.30E-04	334.2	1.9	83.6		419.7
Adhesive remover	7.62E-05	196.4	1.1			197.5
Shaving gel	6.78E-05	174.8	1.0	43.7	43.7	263.2
Fabric refresher	6.59E-05	169.8	1.0			170.8
Multi-purpose remover	5.45E-05	140.5	0.8			141.3
Personal hygiene product	5.14E-05	132.6	0.8	33.2	33.2	199.7
Insect Repellent: Non-aerosol	4.93E-05	127.1	0.7			127.8
Shampoo	3.99E-05	102.9	0.6	25.7	25.7	155.0
Hair styling product: mousse	3.07E-05	79.2	0.5	19.8	19.8	119.3
Nail polish	2.53E-05	65.3	0.4	16.3	16.3	98.3
Conditioner	2.37E-05	61.0	0.3	15.3	15.3	91.9
Hair color product: permanent	2.07E-05	53.4	0.3	13.3		67.0
Electronic cleaner	2.05E-05	53.0	0.3			53.3
Wood cleaner	1.87E-05	48.2	0.3			48.5
Solvent parts cleaner: non-aerosol	1.74E-05	44.8	0.3			45.0
Footwear care product	1.43E-05	36.7	0.2	9.2		46.1
Toilet/Urinal Cleaner & Deodorizer	1.40E-05	36.1	0.2	9.0		45.3
Anti-static product	1.31E-05	33.8	0.2	8.5		42.4
Fabric or leather waterproofer	1.18E-05	30.4	0.2			30.6
Hair shine	1.04E-05	26.7	0.2	6.7	6.7	40.3
Graffiti remover	9.81E-06	25.3	0.1			25.4
Body wipes	9.66E-06	24.9	0.1	6.2		31.3
Leather care product	8.60E-06	22.2	0.1			22.3
Contact adhesive	8.25E-06	21.3	0.1			21.4
Hair styling product: liquid	6.68E-06	17.2	0.1	4.3	4.3	26.0
Hair color product: temporary	5.06E-06	13.0	0.1	3.3		16.4
Hair styling product: semisolid	4.99E-06	12.9	0.1	3.2	3.2	19.4
Personal foaming product	3.30E-06	8.5	0.05	2.1	2.1	12.8
Toilet or urinal cleaner	2.93E-06	7.6	0.04	1.9		9.5
Nail treatment product	2.92E-06	7.5	0.04	1.9		9.5
Bleach/lightener	2.75E-06	7.1	0.04	1.8		8.9
Nail product: drying enhancer	2.21E-06	5.7	0.03	1.4		7.2
Top coat	1.80E-06	4.6	0.03	1.2		5.8
Base coat/undercoat	1.74E-06	4.5	0.03	1.1		5.6
Hair color product: semipermanent	9.57E-07	2.5	0.01	0.6		3.1
Hair color product: demipermanent	8.73E-07	2.3	0.01	0.6		2.8
Hair tonic/ Hair restorer	6.62E-07	1.7	0.01	0.4		2.1
Nail polish thinner	3.73E-07	1.0	0.01	0.2		1.2
Hair styling product: solid	9.83E-08	0.3	0.001	0.06	0.06	0.4
Artificial nail, wrap, or nail glue remover	6.94E-08	0.2	0.001	0.04		0.2
Jewelry cleaner	5.49E-08	0.1	0.001	0.04		0.2
Other hair care products	1.73E-08	0.04	0.0003	0.01	0.01	0.1
Miscellaneous *	3.04E-03	7,827.0	44.7			7,871.6
Emissions Grand Total		21,458.0	122.4	1,212.1	873.8	23,666.4

Table 8.2
2020 Clark County Projected Emissions Inventory (continued)

Assumptions

Clark County projected population (2020)	2,578,221
Projected Visitors to Clark County (2020)	69,228,629 / year
Military Population (Permanent)	8,000
Military Population (Training)	350,000 / year
TOTAL Population	72,164,850

Average length of stay/visitor (nights) 3.4
[At 3.4 nights/person; 365 nights/year; 69,228,629 visitors per year = 644,869 visitors/night]

Visitor hairspray bump-up factor 1.25 additional uses per day
 Visitor bump-up factor (other categories) 1 additional use per day

Military population/day (approximate) 14,712
[At 7 days/person training; 365 days/yr; plus 8,000 permanent population]

Notes:

Projected population for Clark County obtained from Advanced Planning Division (Comprehensive Planning) of Clark County

Projected visitors based on historical review of visitor volume from 4th Quarter 2003 Las Vegas Marketing Bulletin - Vol. 31, No. 128.

* “Miscellaneous” includes, but is not limited to, insecticides, insect spray, glass cleaner, floor waxes, paint remover, multipurpose solvents, sealants, caulking

**Table 8.3
2030 Clark County Projected Emissions Inventory**

Category	<i>California Emission Factor (lb/day/person)</i>	Emissions from Permanent Residents of Clark County	Total VOC Emissions from Military Population (lb/day)	Total VOC Emissions from Visitors to Clark County (lb/day)	Emissions from Additional Visitor Bump-up (lb/day)	Total VOC Emissions for Clark County (lb/day)
Automotive products	1.32E-03	3,890.1	19.5			3,909.5
Aerosol coatings	1.07E-03	3,160.7	15.8			3,176.5
Hair styling product: spray	8.73E-04	2,566.6	12.8	832.9	1,041.2	4,453.5
Personal fragrance	5.19E-04	1,526.8	7.6	495.5		2,029.9
Packaged solvent	4.23E-04	1,243.9	6.2			1,250.2
Gen'l purpose degreaser	2.46E-04	725.0	3.6			728.6
Toilet/Urinal Deodorizer	1.30E-04	381.2	1.9	123.7		506.9
Adhesive remover	7.62E-05	224.1	1.1			225.2
Shaving gel	6.78E-05	199.4	1.0	64.7	64.7	329.8
Fabric refresher	6.59E-05	193.7	1.0			194.7
Multi-purpose remover	5.45E-05	160.2	0.8			161.0
Personal hygiene product	5.14E-05	151.3	0.8	49.1	49.1	250.2
Insect Repellent: Non-aerosol	4.93E-05	145.0	0.7			145.7
Shampoo	3.99E-05	117.4	0.6	38.1	38.1	194.2
Hair styling product: mousse	3.07E-05	90.3	0.5	29.3	29.3	149.4
Nail polish	2.53E-05	74.5	0.4	24.2	24.2	123.2
Conditioner	2.37E-05	69.6	0.3	22.6	22.6	115.1
Hair color product: permanent	2.07E-05	60.9	0.3	19.8		80.9
Electronic cleaner	2.05E-05	60.4	0.3			60.7
Wood cleaner	1.87E-05	55.0	0.3			55.3
Solvent parts cleaner: non-aerosol	1.74E-05	51.1	0.3			51.3
Footwear care product	1.43E-05	41.9	0.2	13.6		55.7
Toilet/Urinal Cleaner & Deodorizer	1.40E-05	41.2	0.2	13.4		54.7
Anti-static product	1.31E-05	38.6	0.2	12.5		51.3
Fabric or leather waterproofer	1.18E-05	34.7	0.2			34.8
Hair shine	1.04E-05	30.5	0.2	9.9	9.9	50.4
Graffiti remover	9.81E-06	28.8	0.1			29.0
Body wipes	9.66E-06	28.4	0.1	9.2		37.8
Leather care product	8.60E-06	25.3	0.1			25.4
Contact adhesive	8.25E-06	24.3	0.1			24.4
Hair styling product: liquid	6.68E-06	19.7	0.1	6.4	6.4	32.5
Hair color product: temporary	5.06E-06	14.9	0.1	4.8		19.8
Hair styling product: semisolid	4.99E-06	14.7	0.1	4.8	4.8	24.3
Personal foaming product	3.30E-06	9.7	0.05	3.2	3.2	16.1
Toilet or urinal cleaner	2.93E-06	8.6	0.04	2.8		11.5
Nail treatment product	2.92E-06	8.6	0.04	2.8		11.4
Bleach/lightener	2.75E-06	8.1	0.04	2.6		10.8
Nail product: drying enhancer	2.21E-06	6.5	0.03	2.1		8.7
Top coat	1.80E-06	5.3	0.03	1.7		7.0
Base coat/undercoat	1.74E-06	5.1	0.03	1.7		6.8
Hair color product: semipermanent	9.57E-07	2.8	0.01	0.9		3.7
Hair color product: demipermanent	8.73E-07	2.6	0.01	0.8		3.4
Hair tonic/ Hair restorer	6.62E-07	1.9	0.01	0.6		2.6
Nail polish thinner	3.73E-07	1.1	0.01	0.4		1.5
Hair styling product: solid	9.83E-08	0.3	0.001	0.09	0.09	0.5
Artificial nail, wrap, or nail glue remover	6.94E-08	0.2	0.001	0.07		0.3
Jewelry cleaner	5.49E-08	0.2	0.001	0.05		0.2
Other hair care products	1.73E-08	0.1	0.0003	0.02	0.02	0.1
Miscellaneous *	3.04E-03	8,929.5	44.7			8,974.2
Emissions Grand Total		24,480.7	122.4	1,794.3	1,293.5	27,690.8

Table 8.3
2030 Clark County Projected Emissions Inventory (continued)

Assumptions

Clark County projected population (2030)	2,941,398
Projected Visitors to Clark County (2030)	102,475,283 / year
Military Population (Permanent)	8,000
Military Population (Training)	350,000 / year
TOTAL Population	105,774,681

Average length of stay/visitor (nights) 3.4
[At 3.4 nights/person; 365 nights/year; 102,475,283 visitors per year = 954,564 visitors/night]

Visitor hairspray bump-up factor 1.25 additional uses per day
 Visitor bump-up factor (other categories) 1 additional use per day

Military population/day (approximate) 14,712
[At 7 days/person training; 365 days/yr; plus 8,000 permanent population]

Notes:

Projected population for Clark County obtained from Advanced Planning Division (Comprehensive Planning) of Clark County

Projected visitors based on historical review of visitor volume from 4th Quarter 2003 Las Vegas Marketing Bulletin - Vol. 31, No. 128.

* “Miscellaneous” includes, but is not limited to, insecticides, insect spray, glass cleaner, floor waxes, paint remover, multipurpose solvents, sealants, caulking

Section 9.0 Control and Mitigation of Consumer Product VOC Emissions

This section discusses mitigation and control measures for VOC emissions from consumer products. MACTEC reviewed literature and regulations for reducing VOC emissions from regulated and unregulated product categories using the control measures of product reformulation, change in application method, product substitution, and product banning.

One method of reducing VOC emissions from consumer products is by product reformulation. Both California and New York have formulated VOC content limits by source category, with some categories broken down into more detailed product categories (e.g., insecticides can be further broken down by foggers, lawn and garden, flying bugs, etc.). Each of these limits has a date by which manufacturers and retailers must comply and/or apply for a variance with the more stringent VOC limits.

Currently, California has five consumer product regulations:

1. antiperspirants and deodorants,
2. general consumer products,
3. aerosols and coatings,
4. emissions trading for VOC from consumer products, and
5. hairspray credit program

These regulations focus on setting VOC content limits for each product category. Tables 9.1 and 9.2 provide the VOC standards and effective dates for various consumer product categories subject to regulation in California. Table 9.3 provides Federal VOC standards, effective September 11, 1998, for various consumer product categories that are used in other states, including those used in Clark County. The formulator and/or manufacturer must determine how to meet these standards. CARB continues to look at new innovative approaches to achieve further VOC reductions from consumer products including, but not limited to, alternative packaging technologies and zero or near zero emission technologies.

VOC emissions from most consumer product use are a result of the propellant or delivery/packaging system and the product formulation chemical composition. Product formulation and reformulation information is generally company sensitive and confidential so specific information is proprietary, although the common practice is to add more water to the product and/or to modify the formulae using components with a lower VOC content. This control strategy also relies on controlling the emissions during the delivery, which is accomplished through changing the pressure and or composition of the propellant to a non-VOC composition, modifying the delivery system, and changing the delivery phase and application method.

Table 9.1
CARB Standards for Antiperspirants and Deodorants

Table of Standards

For products manufactured beginning January 1, 2001
 (percent volatile organic compounds by weight)

Effective Dates

1/1/01	
HVOC ^a	MVOC ^b

Aerosol Products		
Antiperspirants	40	10
Deodorants	0	10
Non-Aerosol Products	0	0

^a High volatility organic compounds, i.e., any organic compound that exerts a vapor pressure greater than 80 mm Hg when measured at 20 C.

^b Medium volatility organic compounds, i.e., any organic compound that exerts a vapor pressure greater than 2 mm Hg and less than or equal to 80 mm Hg when measured at 20 C.

**Table 9.2
CARB Standards for Consumer Products**

**Table of Standards
Percent Volatile Organic Compound by Weight**

Product Category	Effective Date ¹	VOC Standard ²
<u>Adhesive Removers*:</u>		
<u>Floor or Wall Covering Adhesive Remover</u>	<u>12/31/2006</u>	<u>5</u>
<u>Gasket or Thread Locking Adhesive Remover</u>	<u>12/31/2006</u>	<u>50</u>
<u>General Purpose Adhesive Remover</u>	<u>12/31/2006</u>	<u>20</u>
<u>Specialty Adhesive Remover</u>	<u>12/31/2006</u>	<u>70</u>
[*See section 94509(n) for additional requirements that apply to adhesive removers.]		
<u>Adhesives *:</u>		
Aerosol	1/1/95	75
mist spray adhesives	1/1/2002	65
web spray adhesives	1/1/2002	55
special purpose spray adhesives mounting, automotive engine compartment, and flexible vinyl adhesives	1/1/2002	70
polystyrene foam and automobile headliner adhesives	1/1/2002	65
polyolefin and laminate repair/edgebanding adhesives	1/1/2002	60
[See 94509(i)(i), 94512(d), and 94513(d) for additional requirements that apply to aerosol adhesives.]		
construction, panel, and floor covering**	1/1/95 12/31/2002	40 15

**Table 9.2
CARB Standards for Consumer Products (continued)**

contact	1/1/95	80
<u>contact adhesive – general purpose</u>	<u>12/31/2006</u>	<u>55</u>
<u>contact adhesive – special purpose</u>	<u>12/31/2006</u>	<u>80</u>
<u>[See section 94509(n)(m) for additional requirements that apply to contact adhesives.]</u>		
general purpose	1/1/95	10
=====		
* See section 94510(i) for an exemption that applies to adhesives sold in containers of one fluid ounce or less.		
** See section 94509(k)(4)(k) for the effective date of the VOC limit for certain types of “construction, panel, and floor covering adhesives.”		
Aerosol Cooking Sprays	1/1/95	18
Air Fresheners*:		
Double phase aerosols	1/1/93	30
	12/31/2004	25
single phase aerosols	1/1/93	70
	1/1/96	30
dual purpose air fresheners/disinfectant aerosols	1/1/94	60
liquid/pump sprays	1/1/93	18
solids/gels/semisolid	1/1/93	3
=====		
[*See sections 94510(f) and 94510(g) and 94510(g)(2) for exemptions that apply to certain air fresheners, and 94509(o) for additional requirements that apply to air fresheners.]		
Anti-static Product:		
Aerosol	<u>12/31/2008</u>	<u>80</u>
non-aerosol	<u>12/31/2006</u>	<u>11</u>
Automotive Brake Cleaners	1/1/97	50
	12/31/2002	45
Automotive Rubbing or Polishing Compounds	1/1/2005	17

**Table 9.2
CARB Standards for Consumer Products (continued)**

Automotive Wax/Polish/Sealant/Glaze: all other forms	1/1/2005	15
-----	-----	-----
hard paste waxes	1/1/2005	45
-----	-----	-----
instant detailers	1/1/2001	3
Automotive Windshield Washer Fluids: Type "A" areas*	1/1/93	35
-----	-----	-----
All other areas (all forms)	1/1/93	10
Dilutable and Pre-Mixed ^{1/}	12/31/2002	1
^{1/} See section 94508(a)(18)(19)(20), section 94508(a)(19)(20)(21), and section 94509(l)(m)(l) for provisions that apply to Automotive Windshield Washer Fluids.	=====	=====
=====	=====	=====
* Type "A" areas include only the following: Del Norte, Shasta and Trinity Counties; the Great Basin Valley, Lake Tahoe, Mountain Counties, and Northeast Plateau Air Basins, as defined in Title 17, California Code of Regulations, Sections 60105, 60108, 60111, and 60113.		
Bathroom and Tile Cleaners: aerosols	1/1/94	7
-----	-----	-----
all other forms	1/1/94	5
Bug and Tar Remover	1/1/2002	40
Carburetor or Fuel-injection Air Intake Cleaners **	1/1/95 12/31/2002	75 45
=====	=====	=====
** See section 94509(k)(l)(k) for the effective date of the VOC limit for fuel-injection air intake cleaners.		
Carpet and Upholstery Cleaner: Aerosols	1/1/2001	7
-----	-----	-----
non-aerosols (dilutables)	1/1/2001	.1
-----	-----	-----
non-aerosols (ready-to-use)	1/1/2001	3
Charcoal Lighter Material	See 94509(h)(i)(h)	
Dusting Aids: Aerosol	1/1/95 1/1/97	35 25
-----	-----	-----
all other forms	1/1/95	7

**Table 9.2
CARB Standards for Consumer Products (continued)**

Electrical Cleaner*	<u>12/31/2006</u>	<u>45</u>
[*See section 94509(n) for additional requirements that apply to electrical cleaners.]		
Electronic Cleaner*	<u>12/31/2006</u>	<u>75</u>
[*See section 94509(m) for additional requirements that apply to electronic cleaners.]		
Engine Degreasers (all forms):	1/1/93	75
	1/1/96	50
-----	-----	-----
aerosols	<u>12/31/2004</u>	<u>35</u>
-----	-----	-----
non-aerosols	<u>12/31/2004</u>	<u>5</u>
Fabric Refresher:		
<u>Aerosol</u>	<u>12/31/2006</u>	<u>15</u>
-----	-----	-----
<u>non-aerosol</u>	<u>12/31/2006</u>	<u>6</u>
Fabric Protectants	1/1/95	75
	1/1/97	60
Floor Polishes/Waxes:		
products for flexible flooring materials	1/1/94	7
-----	-----	-----
products for nonresilient flooring	1/1/94	10
-----	-----	-----
wood floor wax	1/1/94	90
Floor Wax Stripper:	See Section	
non-aerosols	94509(j)(k)(l)	
Footwear or Leather Care Product*:		
<u>Aerosol</u>	<u>12/31/2006</u>	<u>75</u>
-----	-----	-----
<u>solid</u>	<u>12/31/2006</u>	<u>55</u>
-----	-----	-----
<u>all other forms</u>	<u>12/31/2006</u>	<u>15</u>
[*See section 94509(m) for additional requirements that apply to footwear or leather care products.]		
Furniture Maintenance Products:		
Aerosols	1/1/94	25
	12/31/2004	17
-----	-----	-----
all other forms (except solid/paste forms)	1/1/94	7

**Table 9.2
CARB Standards for Consumer Products (continued)**

General Purpose Cleaners aerosols and non-aerosols:	1/1/94	10
----- non-aerosols	12/31/2004	4
General Purpose Degreasers*: Aerosols	1/1/2002	50
----- non-aerosols	12/31/2004	4
[*See section 94509(n)(m) for additional requirements that apply to general purpose degreasers.]		
Glass Cleaners: Aerosols	1/1/93	12
----- non-aerosols	1/1/93 1/1/96 12/31/2004	8 6 4
Graffiti Remover*: Aerosols	12/31/2006	50
----- non-aerosols	12/31/2006	30
[*See section 94509(n) for additional requirements that apply to graffiti removers.]		
Hair Mousses	1/1/94 12/31/2002	16 6
Hair Shine	1/1/2005	55
Hairsprays Hair Spray	1/1/93 6/1/99	80 55
Hair Styling Gels	1/1/94	6
Hair Styling Product aerosols and pump sprays	12/31/2006	6
----- all other forms	12/31/2006	2
Heavy-duty Hand Cleaners or Soap	1/1/2005	8
Insect Repellents: Aerosols	1/1/94	65
Insecticides*: crawling bug (all forms):	1/1/95 1/1/98	40 20
----- aerosol crawling bug insecticides	12/31/2004	15
----- flea and tick	1/1/95	25

**Table 9.2
CARB Standards for Consumer Products (continued)**

----- flying bug (all forms): -----	1/1/95	35
aerosols	12/31/2003	25
----- foggers	1/1/95	45
----- lawn and garden (all forms)	1/1/95	20
non-aerosol lawn and garden insecticides	12/31/2003	3
----- wasp and hornet	<u>1/1/2005</u>	<u>40</u>
=====	=====	=====
* See sections 94510(g)(1) and 94510(k) for exemptions that apply to certain insecticides.		
----- Laundry Prewash: aerosols/solids	1/1/94	22
----- all other forms	1/1/94	5
----- Laundry Starch Products	1/1/95	5
----- Metal Polish/Cleanser	1/1/2005	30
----- Multi-purpose Lubricant: (excluding solid or semisolid products)	1/1/2003	50
----- Nail Polish Removers	1/1/94 1/1/96 12/31/2004	85 75 0
----- Non-selective Terrestrial Herbicide: non-aerosols	1/1/2002	3
----- Oven Cleaners: aerosols/pump sprays	1/1/93	8
----- liquids	1/1/93	5
----- Paint Remover or Stripper	1/1/2005	50
----- Penetrant	1/1/2003	50
----- Personal Fragrance Products*: products with 20% or less fragrance	1/1/95 1/1/99	80 75
----- products with more than 20% fragrance	1/1/95 1/1/99	70 65
=====	=====	=====
* See sections 94510(h), 94510(j), and 94510(l) for exemptions that apply to personal fragrance products.		

**Table 9.2
CARB Standards for Consumer Products (continued)**

Rubber and Vinyl Protectant: Aerosols	1/1/2005	10
----- non-aerosols	1/1/2003	3
Sealants and Caulking Compounds	12/31/2002	4
Shaving Creams	1/1/94	5
<u>Shaving Gel</u>	<u>12/31/2006</u>	<u>7</u>
	<u>12/31/2009</u>	<u>4</u>
Silicone-based Multi-purpose Lubricant: (excluding solid or semisolid products)	1/1/2005	60
Spot Remover: Aerosols	1/1/2001	25
----- non-aerosols	1/1/2001	8
Tire Sealants and Inflators	12/31/2002	20
<u>Toilet/Urinal Care Product:*</u> <u>Aerosol</u>	<u>12/31/2006</u>	<u>10</u>
----- <u>non-aerosol</u>	<u>12/31/2006</u>	<u>3</u>
<u>[See section 94509(o) for additional requirements that apply to Toilet/Urinal Care Products]</u>		
Undercoating: Aerosols	1/1/2002	40
Wasp and Hornet Insecticide	1/1/2005	40
<u>Wood Cleaner:</u> <u>Aerosol</u>	<u>12/31/2006</u>	<u>17</u>
----- <u>non-aerosol</u>	<u>12/31/2006</u>	<u>4</u>

- ¹ See section 94509(d), ~~(e)~~, (d) for the effective date of the VOC standards for products registered under FIFRA, and section 94509(c) and (d) for the "Sell-through" allowed for products manufactured prior to the effective date of standards.
- ² See section 94510(c) for an exemption that applies to fragrances in consumer products, and section 94510(d) for an exemption that applies to LVP-VOCs.

**Table 9.3
Federal VOC Standards for Consumer Products**

Product Category	Federal VOC content limit (wt %)
Bathroom & tile cleaners: Aerosols	7
Bathroom & tile cleaners: All other forms	5
Fabric protectants	75
Furniture maintenance products – aerosol	25
General purpose cleaners	10
Hairsprays	80
Hair mousses	16
Hair styling gels	6
Household adhesives: Contact adhesive	80
Insecticides: Lawn and garden	20
Nail polish removers	85
Shaving creams	5
Underarm antiperspirants: Aerosol	60
Underarm deodorants: Aerosol	20

The VOC standards established by CARB for various products have often resulted in a manufacturer(s) applying for a variance and requesting time to allow development of a VOC-conforming product. CARB allows the product formulator or manufacturer to consider mitigation options for reducing excess emissions generated during the variance period. Examples of these options are listed below:

- An applicant could temporarily or permanently generate emission reductions by reducing VOC content of one or more regulated or unregulated consumer products they sell in California and
- An applicant could acquire or purchase emission reductions from another company that sells regulated or unregulated consumer products in California.

Should Clark County decide to develop regulations for consumer product categories that are significant sources of VOC emissions, then MACTEC suggests adopting the relevant standards established and implemented in California along with a market-based regulation comparable to California’s regulation 4, Alternative Control Plan (ACP), which is an alternative way to comply with the VOC limits.

Appendix A
Survey Forms



Information/Directions for Clark County Consumer Products Survey

If your company is a **Distributor Only**, complete Part A only and provide the name and address of the manufacturer of all products that you distribute.

If your company is a **Manufacturer Only**, complete Parts A & B.

If your company is **Both a Manufacturer and Distributor**, complete Parts A & B.

If your company is **Neither a Manufacturer nor Distributor** of any product whose type is listed, please complete identification and return form.

Please photocopy forms if sufficient space is not provided.

Example Form – Completed.

Part A. Product Distribution Data				
1. Product Number	2. Brand Name (on label)	3. Product Type	4. Dispensing Form	5. Annual Sales Volume (lb/yr)
1	Lysol Toilet Cleaner	D	L	500,000

Part B. Product Composition					
6. Product Number	7. Chemical Name	8. CAS #	9. Wt. %	10. Active/Nonactive	11. Propellant
1	Ammonia	8030-30-6	10.2	A	
	Chlorine	63-25-2	3.0	A	
	Others	106-97-8	77.8	N	

Description of Information Required

- Product Number:** Number each product consecutively 1, 2, 3, etc., e.g., the Product Number for the first product listed should be “1,” “2” for the second product, “3” for the third, and so on. Air fresheners with the same brand name, but with different scents, i.e., the only significant difference is the fragrance used, should be listed as a single product.
- Brand Name:** List the brand name of each product exactly as it appears on the label.
- Product Type:** Use the following letter codes to describe the product type:
 - A – Adhesives (not including industrial adhesives) – Any product specifically formulated to cause a firm attachment (adherence) by cohesion or bonding, either temporary or permanent between two surfaces.
 - C – All Purpose Cleaners – Any general cleaning product that is formulated to be used on a variety of washable surfaces to perform a variety of cleaning tasks.
 - D – Disinfectants – Any product which makes a disinfectant claim, i.e., use of the product is intended to destroy or irreversibly inactivate infectious or other undesirable bacteria, pathogenic fungi, or viruses on surfaces or inanimate objects, and is regulated pursuant to the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). These do not include personal hygiene products.



F – Air Fresheners – Any product which is marketed for the purpose of masking or deodorizing indoor air odors. These do not include personal hygiene products.

H – Hair Sprays, Spritzes, etc. (not including foam mousses) – Any hair control, setting, or styling product dispensed from a propellant aerosol can, a mechanical pump spray container, or any other type of spray container. These do not include styling mousse products.

An insecticide is a substance or mixture of substances marketed for the purpose of preventing, destroying, or mitigating and insects, and which is regulated pursuant to FIFRA. These do not include personal hygiene products. The following are specific subcategories of insecticides:

IR – Insect Repellants

4. **Dispensing Form:** Use the following letter codes to describe the dispensing form:
 - S – Solid
 - L – Liquid
 - A – Aerosol
 - P – Pump
 - O – Other (describe)
5. **Clark County Annual Sales Volume for 2003:** Based on DAQM Survey
6. **Product Number:** Use product number assigned in Part A.
7. **Chemical Name:** List the name of all ingredients contained in the product. Use proper chemical names as defined by IUPAC (International Union of Pure and Applied Chemists) or CAS (Chemical Abstracts Service) rules of nomenclature. Please note that: *All nonactive ingredients whose weight percent in aggregate is less than 2 percent need not be identified.*
8. **CAS #:** Chemical Abstract Service Registry Number for each ingredient.
9. **Weight %:** List the amount of each ingredient contained in the product as a percentage of the total product weight.
10. **Active/Nonactive:** Indicate for each chemical compound whether it is an active or nonactive ingredient using the following letter codes:
 - A – Active Ingredient
 - N – Nonactive (Inert) Ingredient
11. **Propellant:** If an ingredient is used as the aerosol propellant, please be sure columns 6 through 9 are completed for this compound and also place a ‘Y’ in this column.



Clark County Consumer Products Survey

Part B. Product Composition						
6. Product Number	7. Chemical Name	8. CAS #	9. Wt %	10. Active/Nonactive	11. Propellant	

(Photocopy and attach additional pages if necessary)

Page ___ of ___



Information/Directions for Clark County Consumer Products Survey

If your hotels are consumer products **Users Only**, complete Part A and if possible complete Part B, but if you cannot complete Part B, provide the name and address of the manufacturer of all products that you use.

If your hotels are **Users and Sellers**, complete Parts A & B but if you cannot complete Part B, provide the name and address of the manufacturer of all products that you sell.

If your hotels are **Neither Users nor Sellers** of any product whose type is listed, please complete identification and return form.

Please photocopy forms as needed.

Example Form – Completed.

Part A. Product Distribution Data				
1. Product Number	2. Brand Name (on label)	3. Product Type	4. Dispensing Form	5. Annual Sales Volume (lb/yr)
1	Lysol Toilet Cleaner	Leave Blank	L	500,000

Part B. Product Composition					
6. Product Number	7. Chemical Name	8. CAS #	9. Wt. %	10. Active/ Nonactive	11. Propellant
1	Ammonia	8030-30-6	10.2	A	
	Chlorine	63-25-2	3.0	A	
	Others	106-97-8	77.8	N	

Description of Information Required

1. **Product Number:** Number each product consecutively 1, 2, 3, etc., e.g., the Product Number for the first product listed should be “1,” “2” for the second product, “3” for the third, and so on. Air fresheners with the same brand name, but with different scents, i.e., the only significant difference is the fragrance used, should be listed as a single product.
2. **Brand Name:** List the brand name of each product exactly as it appears on the label.
3. **Product Type:** Use the following letter codes to describe the product type:
 - A – Adhesives (not including industrial adhesives) – Any product specifically formulated to cause a firm attachment (adherence) by cohesion or bonding, either temporary or permanent between two surfaces.
 - C – All Purpose Cleaners – Any general cleaning product that is formulated to be used on a variety of washable surfaces to perform a variety of cleaning tasks.
 - D – Disinfectants – Any product which makes a disinfectant claim, i.e., use of the product is intended to destroy or irreversibly inactivate infectious or other undesirable bacteria, pathogenic fungi, or viruses on surfaces or inanimate objects, and is regulated pursuant to the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). These do not include personal hygiene products.



F – Air Fresheners – Any product which is marketed for the purpose of masking or deodorizing indoor air odors. These do not include personal hygiene products.

H – Hair Sprays, Spritzes, etc. (not including foam mousses) – Any hair control, setting, or styling product dispensed from a propellant aerosol can, a mechanical pump spray container, or any other type of spray container. These do not include styling mousse products.

An insecticide is a substance or mixture of substances marketed for the purpose of preventing, destroying, or mitigating and insects, and which is regulated pursuant to FIFRA. These do not include personal hygiene products. The following are specific subcategories of insecticides:

IR – Insect Repellants

4. **Dispensing Form:** Use the following letter codes to describe the dispensing form:
 - S – Solid
 - L – Liquid
 - A – Aerosol
 - P – Pump
 - O – Other (describe)
5. **Clark County Annual Sales Volume for 2003:** Based on DAQEM Survey
6. **Product Number:** Use product number assigned in Part A.
7. **Chemical Name:** List the name of all ingredients contained in the product. Use proper chemical names as defined by IUPAC (International Union of Pure and Applied Chemists) or CAS (Chemical Abstracts Service) rules of nomenclature. Please note that: *All nonactive ingredients whose weight percent in aggregate is less than 2 percent need not be identified.*
8. **CAS #:** Chemical Abstract Service Registry Number for each ingredient.
9. **Weight %:** List the amount of each ingredient contained in the product as a percentage of the total product weight.
10. **Active/Nonactive:** Indicate for each chemical compound whether it is an active or nonactive ingredient using the following letter codes:
 - A – Active Ingredient
 - N – Nonactive (Inert) Ingredient
11. **Propellant:** If an ingredient is used as the aerosol propellant, please be sure columns 6 through 9 are completed for this compound and also place a ‘Y’ in this column.



Clark County Consumer Products Survey

Hotel Name(s): _____ Contact Person: _____

Address: _____ Telephone: _____

Please indicate which of the following best describes operations at your hotels:

- Use of Products by Hotel Employees Only
- Sale of Products in Gift Shop Only
- Both Use and Sale of Products
- No Use or Sale of any product whose type is listed – please check and return form

Part A. Product Use or Sales Data				
1. Product Number	2. Brand Name (on label)	3. Product Type	4. Dispensing Form	5. Annual Use or Sales Volume (lb/yr)

(Photocopy and attach additional pages as needed)





Clark County Consumer Products Survey

Part B. Product Composition						
6. Product Number	7. Chemical Name	8. CAS #	9. Wt %	10. Active/Nonactive	11. Propellant	

(Photocopy and attach additional pages as needed)

Page ___ of ___

Appendix B
Survey Letters

Clark County, Nevada
Department of Air Quality and Environmental Management
Letterhead

Date

Name

Title

Company

Street

City, State Zip

Re: Request for Product Information/Usage in Clark County

Dear *Name*:

In April 2004, the U.S. Environmental Protection Agency (EPA) designated Clark County Nevada (includes the Las Vegas metropolitan area), along with hundreds of other counties around the United States, as an ozone nonattainment areas. This means that ozone levels in Clark County are higher than the EPA standard. Ozone is a substance that forms in the atmosphere photochemically from precursor emissions. These precursors include solvents or volatile organic compounds (VOCs) released into the air mainly due to evaporation. The use of paints and printing inks is one of the largest industrial sources of VOCs. However, in metropolitan areas that have little manufacturing activity, major VOC sources include the use of consumer products like hair sprays, nail polish removers, cleaning agents, deodorants, etc. Although each individual container of these products contains only a few ounces of VOCs, millions of uses each day contribute significantly to the formation of ozone.

Clark County Department of Air Quality and Environmental Management (DAQEM) requests information to quantify the VOC emissions from the use of consumer products. Once emissions from all sources like mobile sources, consumer products, industrial sources, printing companies, etc. are obtained, Clark County will develop a strategy to reduce the emissions from different source categories. DAQEM seeks data on the amount of consumer products used within Clark County, Nevada. In this regard, we request that **you provide information on the actual volume of certain products sold** in your stores in Clark County. We do not need sales dollars or unit costs for this study.

We understand that point of sale data for each store is available by product category and Universal Product Code (UPC) number for the entire year. We have selected calendar year 2003 for this evaluation. We have requested similar data from other companies to ensure that we obtain a comprehensive survey of the amount of products sold. We will compile the sales data in such a fashion that neither individual

Letter to *Company*

Date

Page 2

vendors nor their stores can be identified. Furthermore, we will maintain a secure data base such that neither you nor your competitors will be able to gain access to any sales volume information.

The types of products for which we need information are shown on the attached table by category. Please provide an electronic spreadsheet, preferably Microsoft Excel, showing the category, product, size, weight, and units sold for each product. If the category description does not match your product description, please correct the description and provide the requested sales data. For example, the category we refer to as “personal hygiene products” may be called or include products called “antifungal deodorant spray” in your stores. We will use the sales information, which includes the weight of the contents of the container, along with data on the VOC content of the product that we will obtain from you or the manufacturer to make our computations. Environmental regulations require manufacturers of certain products that contain hazardous substances to supply users with Material Safety Data Sheets (MSDS). Please provide a copy of the MSDS for all products sold in the categories listed in the attached table.

Please respond with this information within 30 days and send your response to MACTEC Federal Programs, Inc., 560 Herndon Parkway Suite 200, Herndon, VA 20170, Attn: Vanessa Olsen. Should you have any questions regarding the information requested, please call Mr. Douglas Toothman of MACTEC at 703.471.8383. We greatly appreciate your cooperation in improving the quality of the air in Clark County.

Sincerely,

CLARK COUNTY DEPARTMENT OF
AIR QUALITY AND ENVIRONMENTAL
MANAGEMENT

Harish S. Agarwal, P.E.
Senior Planner

Enclosures

UNIT SALES DATA REQUESTED FOR EACH PRODUCT

Category	Includes	Example Products (Not All-Inclusive)
Hair Care	Color, Styling, Mousse, Spray, Conditioner, Bleach/Lightener, Growth Retardant/Inhibitor, Shine, Tonic/Restorer, Shampoo, Lice Removers, Wig Cleaners, Pet Shampoo	<ul style="list-style-type: none"> • White Rain Pearberry Hair Spray 7 oz. • Sun-In Super Streaks • Sally Hansen Crème Hair Bleach for Face • L’Oreal Hair Color Remover Kit • Revlon Colorstay • Citre Shine Instant Conditioner • St. Ives Hair Repair No Frizz Serum • White Rain Select Effects Leave In Conditioner • L’Oreal Casting Color Spa • Grecian Moustache & Beard Haircolor – Dark Brown • Jergens Naturally Smooth Moisturizer • Vidal Sassoon Polishing Drops • Got2B Glued • L’Oreal Kids Styling Gel • VO5 Mousse • Jheri Redding Straightening Gel • Rusk Being Slick Pomade • Minoxidil • AVO Flea & Tick Shampoo • Thermasilk Heat Activated Shampoo Daily Clarifying • Super Star Fantastic Wig Cleaner • Lice Egg Remover Combing Gel
Nail Care	Coating, Artificial Nail, Wrap, Glue Remover, Polish Thinner, and Drying Enhancer	<ul style="list-style-type: none"> • Sally Hansen Dries Instantly Base Coat • Sally Hansen Artificial Nail Remover • Revlon Nail Builders – Get Smoother Ridge Filler • Naturistics 60 Second Quick Dry Top Coat • L’Oreal Shock Proof Nail Enamel • Orly Smudge Fixer • Revlon Professional Quick Dry Liquid • Almay Massage & Grow Nail and Cuticle Wax • Nail Experts Liquid Silk Wrap

UNIT SALES DATA REQUESTED FOR EACH PRODUCT

Category	Includes	Example Products (Not All-Inclusive)
Body Wipes	Baby Wipes, Anti-bacterial Wipes, Refreshing Body Cloths, Medicated Rectal/Vaginal Pads, Hair Removal Towelette, Hand Cleaner Wipes, Pet Shampoo Wipes	<ul style="list-style-type: none"> • Pampers Sensitive Touch Wipes, 72 ea. • WetOnes Antibacterial Wipes, Wild Watermelon & Ballistic Berry, 24 ea. • Shower to Shower Refreshing Body Cloths, Island Fresh 30 ea. • Tucks Hemorrhoidal Pads with Witch Hazel, 40 ea. • Petkins Doggy Wipes, pkg. of 6
Personal Foaming Products	Foaming Body Wash, Foaming Bath, Foaming Hand Cleaner, Foaming Face Wash, Anti-bacterial Foam, Pet Foaming Cleanser, Acne Wash Foaming Cleanser	<ul style="list-style-type: none"> • Dove Essential Nutrients Self-Foaming Cleanser 6.76 oz • Pond's Clear Solutions Deep Pore Foaming Cleanser • Vagisil Foaming Wash Fresh Clean Scent 1.6 oz • Dial Complete Foaming Hand Wash 7.5 oz
Personal Hygiene Products	Feminine Sprays, Antifungal Sprays & Liquids, Foot & Sneaker Sprays, Jock Itch Sprays	<ul style="list-style-type: none"> • Lotrimin AF Jock Itch Spray Powder 100g • FDS Feminine Deodorant Spray Baby Powder 1.5 oz • Tinactin Antifungal Deodorant Powder Spray 100g
Shaving Gel		<ul style="list-style-type: none"> • Skintimate Shave Gel Sensitive Skin 7 oz • Edge Active Care Gel Clean 7 oz • King of Shaves AlphaGel Shaving Gel Antibacterial Formula 5.95 oz
Insect Repellent (NON-Aerosol)	Insect Repellents (humans and pets)	<ul style="list-style-type: none"> • 10 Hour The Insect Repellent Pump 2 oz • Deep Woods Off! With Sunscreen • Coppertone-R Bug and Sun • Cutter All Family Insect Repellent Towelettes
Leather Care	Cleaner, Polishes, Conditioners, Saddle Soaps, Ball Glove Oils, Liquid Pine Tar, Dyes, Dressings	<ul style="list-style-type: none"> • Kiwi Leather Dye, Black • Kiwi Sport Shoe Stuff Rain and Stain • Kiwi Suede and Nubuck Cleaner • Kiwi Outdoor Mink Oil
Footwear Care Product	Cleaners, Oils, Shoe Stretch, Conditioners, Polishes, Odor Control, Saddle Soaps	<ul style="list-style-type: none"> • Kiwi Sport Athletic Shoe Deodorant and Sanitizing • Kiwi Leather Scuff Cover, Black

UNIT SALES DATA REQUESTED FOR EACH PRODUCT

Category	Includes	Example Products (Not All-Inclusive)
Fabric or Leather Waterproofer		<ul style="list-style-type: none"> • Scotchgard Heavy Duty Water Repellent • Rain X Weather Guard • Kiwi Outdoor Wet Pruf
Fabric Refresher		<ul style="list-style-type: none"> • Febreze • Lysol Disinfectant Spray Plus Fabric Refresher • Arm & Hammer Vacuum Free Foam Carpet Deodorizer
In-dryer Fabric Care	Dryer Activated Cloths	<ul style="list-style-type: none"> • Dryel
Wrinkle-Releasing Spray	Wrinkle Releasing Sprays	<ul style="list-style-type: none"> • Downy Wrinkle Releaser, 500 mL
Anti-Static Product	Concentrates, Sprays, Floor Finishes	<ul style="list-style-type: none"> • Static Guard 5.5 oz • Endust for Electronics Anti-Static Cleaning and Dusting
Electronic Cleaner		<ul style="list-style-type: none"> • 3M 16-101 General Purpose Contact Cleaner • Endust for Electronics Floppy Drive Head Cleaner • Endust for Electronics Wipes, 70 count
Jewelry Cleaner		<ul style="list-style-type: none"> • Tarn-X Jewelry Cleaner
Toilet or Urinal Cleaner/Deodorizer	Bowl Cleaners, Tank Cleaners, Drop-in Cleaners, Deodorizers	<ul style="list-style-type: none"> • Vanish Hang-Ins • Lime A Way Toilet Bowl Cleaner • Lysol Cling Toilet Bowl Cleaner
Wood Cleaner	Cleaners, Preservatives, Build-up Removers, Polish	<ul style="list-style-type: none"> • Orange Glo Wood Care Kit • Mop & Glo Hard Wood Floor Cleaner

Clark County, Nevada
Department of Air Quality and Environmental Management
Letterhead

Date

Name

Title

Hotel

Street

City, State Zip

Re: Request for Consumer Products Usage and Sales Data in Clark County

Dear *Name*:

In April 2004, the U.S. Environmental Protection Agency (EPA) designated Clark County Nevada (includes the Las Vegas metropolitan area), along with hundreds of other counties around the United States, as ozone nonattainment areas. This means that ozone levels in Clark County are higher than the EPA standard. Ozone is a substance that forms in the atmosphere photochemically from precursor emissions. These precursors include solvents or volatile organic compounds (VOCs) released into the air mainly due to evaporation. The use of paints and printing inks is one of the largest industrial sources of VOCs. However, in metropolitan areas that have little manufacturing activity, major VOC sources include the use of consumer products like hair sprays, nail polish removers, cleaning agents, deodorants, etc. Although each individual container of these products has only a few ounces of VOCs, millions of uses each day contribute significantly to the formation of ozone.

Clark County Department of Air Quality and Environmental Management (DAQEM) requests information to quantify VOC emissions from the use of consumer/commercial products. Once emissions from all sources, i.e., mobile sources, consumer products, industrial sources, printing companies, etc., are obtained, Clark County will develop a strategy to reduce the emissions from different source categories. DAQEM seeks data on the amount of these products used within Clark County Nevada. In this regard, we request that **you provide information on the actual volume of certain products purchased by your hotels and used by your employees or sold to guests** in your hotels in Clark County.

We understand that such data for your hotels is available by product category and Universal Product Code (UPC) number for the entire year. We have selected calendar year 2003 for this evaluation. We have and will request similar data from other hotels and retailers to ensure that we obtain a comprehensive survey of the amount of products

Letter to *Hotel*

Date

Page 2

sold/used. We will compile the usage and sales data in such a fashion that neither individual companies nor hotels can be identified. Furthermore, we will maintain a secure data base such that neither you nor your competitors will be able to gain access to any usage or sales volume information.

The types of products for which we need information are shown on the attached table by category. Please provide an electronic spreadsheet, preferably Microsoft Excel, showing the category, product, size, weight, and units used or sold for each product. If the category description does not match your product description, please correct the description and provide the requested usage or sales data. We will use the usage and sales information, which includes the weight of the contents of the container, along with data on the VOC content of the product from you or from the manufacturer to make our computations. Environmental regulations require manufacturers of certain products that contain hazardous substances to supply users with Material Safety Data Sheets (MSDS). Please provide a copy of the MSDS for all products sold in the categories listed in the attached table.

Please respond with this information within 30 days and send your response to MACTEC Federal Programs, Inc., 560 Herndon Parkway Suite 200, Herndon, VA 20170, Attn: Vanessa Olsen. Should you have any questions regarding the information requested, please call Mr. Douglas Toothman at MACTEC, on this matter at 703.471.8383. We greatly appreciate your cooperation in improving the quality of the air in Clark County.

Sincerely,

CLARK COUNTY DEPARTMENT OF
AIR QUALITY AND ENVIRONMENTAL
MANAGEMENT

Harish S. Agarwal, P.E.
Senior Planner

Enclosures

UNIT SALES DATA REQUESTED FOR EACH PRODUCT

Category	Includes	Example Products (Not All-Inclusive)
Hair Care	Color, Styling, Mousse, Spray, Conditioner, Bleach/Lightener, Growth Retardant/Inhibitor, Shine, Tonic/Restorer, Shampoo, Lice Removers, Wig Cleaners, Pet Shampoo	<ul style="list-style-type: none"> • White Rain Pearberry Hair Spray 7 oz. • Sun-In Super Streaks • Sally Hansen Crème Hair Bleach for Face • L’Oreal Hair Color Remover Kit • Revlon Colorstay • Citre Shine Instant Conditioner • St. Ives Hair Repair No Frizz Serum • White Rain Select Effects Leave In Conditioner • L’Oreal Casting Color Spa • Grecian Moustache & Beard Haircolor – Dark Brown • Jergens Naturally Smooth Moisturizer • Vidal Sassoon Polishing Drops • Got2B Glued • L’Oreal Kids Styling Gel • VO5 Mousse • Jheri Redding Straightening Gel • Rusk Being Slick Pomade • Minoxidil • AVO Flea & Tick Shampoo • Thermasilk Heat Activated Shampoo Daily Clarifying • Super Star Fantastic Wig Cleaner • Lice Egg Remover Combing Gel
Nail Care	Coating, Artificial Nail, Wrap, Glue Remover, Polish Thinner, and Drying Enhancer	<ul style="list-style-type: none"> • Sally Hansen Dries Instantly Base Coat • Sally Hansen Artificial Nail Remover • Revlon Nail Builders – Get Smoother Ridge Filler • Naturistics 60 Second Quick Dry Top Coat • L’Oreal Shock Proof Nail Enamel • Orly Smudge Fixer • Revlon Professional Quick Dry Liquid • Almay Massage & Grow Nail and Cuticle Wax • Nail Experts Liquid Silk Wrap

UNIT SALES DATA REQUESTED FOR EACH PRODUCT

Category	Includes	Example Products (Not All-Inclusive)
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Personal Foaming Products	Foaming Body Wash, Foaming Bath, Foaming Hand Cleaner, Foaming Face Wash, Anti-bacterial Foam, Pet Foaming Cleanser, Acne Wash Foaming Cleanser	<ul style="list-style-type: none"> • Dove Essential Nutrients Self-Foaming Cleanser 6.76 oz • Pond's Clear Solutions Deep Pore Foaming Cleanser • Vagisil Foaming Wash Fresh Clean Scent 1.6 oz • Dial Complete Foaming Hand Wash 7.5 oz
Personal Hygiene Products	Feminine Sprays, Antifungal Sprays & Liquids, Foot & Sneaker Sprays, Jock Itch Sprays	<ul style="list-style-type: none"> • Lotrimin AF Jock Itch Spray Powder 100g • FDS Feminine Deodorant Spray Baby Powder 1.5 oz • Tinactin Antifungal Deodorant Powder Spray 100g
Shaving Gel		<ul style="list-style-type: none"> • Skintimate Shave Gel Sensitive Skin 7 oz • Edge Active Care Gel Clean 7 oz • King of Shaves AlphaGel Shaving Gel Antibacterial Formula 5.95 oz
Insect Repellent (NON-Aerosol)	Insect Repellents (humans and pets)	<ul style="list-style-type: none"> • 10 Hour The Insect Repellent Pump 2 oz • Deep Woods Off! With Sunscreen • Coppertone-R Bug and Sun • Cutter All Family Insect Repellent Towelettes
Leather Care	Cleaner, Polishes, Conditioners, Saddle Soaps, Ball Glove Oils, Liquid Pine Tar, Dyes, Dressings	<ul style="list-style-type: none"> • Kiwi Leather Dye, Black • Kiwi Sport Shoe Stuff Rain and Stain • Kiwi Suede and Nubuck Cleaner • Kiwi Outdoor Mink Oil
Footwear Care Product	Cleaners, Oils, Shoe Stretch, Conditioners, Polishes, Odor Control, Saddle Soaps	<ul style="list-style-type: none"> • Kiwi Sport Athletic Shoe Deodorant and Sanitizing • Kiwi Leather Scuff Cover, Black

UNIT SALES DATA REQUESTED FOR EACH PRODUCT

Category	Includes	Example Products (Not All-Inclusive)
Fabric or Leather Waterproofer		<ul style="list-style-type: none"> • Scotchgard Heavy Duty Water Repellent • Rain X Weather Guard • Kiwi Outdoor Wet Pruf
Fabric Refresher		<ul style="list-style-type: none"> • Febreze • Lysol Disinfectant Spray Plus Fabric Refresher • Arm & Hammer Vacuum Free Foam Carpet Deodorizer
In-dryer Fabric Care	Dryer Activated Cloths	<ul style="list-style-type: none"> • Dryel
Wrinkle-Releasing Spray	Wrinkle Releasing Sprays	<ul style="list-style-type: none"> • Downy Wrinkle Releaser, 500 mL
Anti-Static Product	Concentrates, Sprays, Floor Finishes	<ul style="list-style-type: none"> • Static Guard 5.5 oz • Endust for Electronics Anti-Static Cleaning and Dusting
Electronic Cleaner		<ul style="list-style-type: none"> • 3M 16-101 General Purpose Contact Cleaner • Endust for Electronics Floppy Drive Head Cleaner • Endust for Electronics Wipes, 70 count
Jewelry Cleaner		<ul style="list-style-type: none"> • Tarn-X Jewelry Cleaner
Toilet or Urinal Cleaner/Deodorizer	Bowl Cleaners, Tank Cleaners, Drop-in Cleaners, Deodorizers	<ul style="list-style-type: none"> • Vanish Hang-Ins • Lime A Way Toilet Bowl Cleaner • Lysol Cling Toilet Bowl Cleaner
Wood Cleaner	Cleaners, Preservatives, Build-up Removers, Polish	<ul style="list-style-type: none"> • Orange Glo Wood Care Kit • Mop & Glo Hard Wood Floor Cleaner

Appendix C
Survey Response

Company Name & Location	Complete (Y/N)	Data Format	Data Provided	Product/ MSDS Information
Food 4 Less Compton, CA	N	hard copy	Category of product (e.g., hair care); item description; unit size; units sold	None
Albertson's Boise, ID	N	electronic	Category of product; sub-category of product; brand; description of product; unit size of product; sales quantity	None
Amerisource Bergen Corp (Good Neighbor Pharmacy) Chesterbrook, PA	N	hard copy	Category of product; brand name; unit size; unit sales volume	From MSDS: Specific gravity for all products
ACE Hardware Oakbrook, IL	N	electronic	Brand name; item description; size in oz.; units shipped; total sales volume (lb/yr); dispensing form (e.g., liquid); vendor information	CD provided with approximately 200 MSDS's. Reviewed 10 MSDS's at random, and most provide the specific gravity of the product, but no VOC information.
Waxie Sanitary Supply	N	electronic; hard copy	Brand Name; dispensing form; annual sales volume (lb/yr)	CD provides MSDS's of all products on spreadsheet. Only some MSDS's provide VOC information.

Appendix D
Hairspray Survey Data



MACTEC

	Are you a visitor to Las Vegas?		Do you use hairspray?		Use per day @ home	Use per day in Las Vegas
	Yes	No	Yes	No		
1	X	NO	X		1/WK	1/WK
2	X		X		1/DAY	1/DAY
3	X			X		
4	X			X		
5	X		X		1/DAY	1/DAY
6	X			X		
7	X		X		1/WK	1/WK.
8	X			X		
9	X		X		1/DAY	1/DAY
10	X			X		
11	X			X		
12	X			X		
13	X		X		1/WK	0
14	X			X		
15	X		X		2X/DAY	1X/DAY
16	X		X		2X/WK	2X/WK
17	X		X		1X/DAY	1X/DAY
18	X		X		1/DAY	1/DAY
19	X		X		1/DAY	LESS
20	X		X		1/DAY	1/DAY
21	X		X		1/DAY	SAME
22	X		X		1/DAY	LESS
23	X		X		1/DAY	1/DAY
24	X		X		1/DAY	1/DAY
25	X		X		1/DAY	SAME
26	X		X		1/DAY	1/DAY
27	X		X		1/WK	1/WK
28	X		X		1/DAY	LESS
29	X			X		
30	X		X		1/DAY	LESS
31	X			X		
32	X		X		1/DAY	SAME
33	X			X		
34	X		X		1/DAY	2/DAY
35	X			X		
36	X		X		1/DAY	SAME LESS
37	X		X		1/DAY	LESS
38	X			X		
39	X		X		1/DAY	SAME
40	X		X		1/DAY	LESS



MACTEC

	Are you a visitor to Vegas?		Do you use hairspray?		Use per day @ home	Use per day in Vegas
	Yes	No	Yes	No		
41	X			X		
42	X			X		
43	X		X		1/DAY	2/3 → DAY
44	X		X		1/4 DAY	1/ DAY
45	X		X		2/DAY	2/DAY
46	X		X		1/WK	LESS.
47	X		X		2/DAY	MORE
48	X			X		
49	X			X		
50	X			X		
51	X		X		1/DAY	DON'T KNOW YET
52	X		X		3/DAY	1/DAY
53	X		X		1/4 DAY	1/ DAY
54	X			X		
55	X		X		2X/WK	1/DAY
56	X		X		1/DAY	2/DAY
57	X		X		1/4 DAY	LESS
58	X		X		1/DAY	1/DAY
59		X				
60	X		X		2/WK	1/DAY
61	X		X		1/4 DAY	1/ DAY
62	X			X		
63	X			X		
64	X			X		
65	X			X		
66	X		X		1/DAY	1/4 DAY
67	X		X		1/DAY	1/DAY
68	X			X		
69	X			X		
70		X				
71	X		X		1/DAY	LESS
72	X		X		1/DAY	1/DAY
73	X		X		2/DAY	1/DAY
74	X			X		
75	X		X		2/DAY	MORE
76		X				
77	X		X		2/YR	NO
78	X			X	2/DAY	MORE
79	X		X		2/DAY	MORE
80	X		X		2/DAY	2/DAY



MACTEC

	Are you a visitor to Vegas?		Do you use hairspray?		Use per day @ home	Use per day in Vegas
	Yes	No	Yes	No		
81	X			X		
82	X		X		1/DAY	1/DAY
83	X		X		1/DAY	1/DAY
84	X			X		
85	X		X		1/DAY	1/DAY
86	X		X		1/WK	0
87	X			X		
88	X		X		1/DAY	1/DAY
89	X		X		1/WK	1/DAY
90	X		X		1/DAY	1/DAY
91	X			X		
92	X			X		
93	X			X		
94		X				
95	X		X		1/DAY	1/DAY
96	X			X		
97	X			X		
98		X				
99	X		X		1/DAY	1/DAY
100	X		X		2/DAY	2/DAY
101	X			X		
102	X			X		
103	X			X		
104		X				
105	X			X		
106	X		X		1/2 WKS	0
107	X			X		
108	X			X		
109	X			X		
110	X			X		
111	X			X		
112	X			X		
113	X		X		1/DAY	1/DAY
114	X		X		1/DAY	1/DAY
115	X			X		
116	X		X		1/DAY	1/DAY
117	X			X		
118	X			X		
119	X		X		1/DAY	1/DAY
120	X		X		1/DAY	DONT KNOW YET