TABLE 4-7. Grid cells assigned to oil fields not in the original MED files.

Oil Field/Facility Identification Code	Grid Cell (I,J)	Comments
Los Angeles County		
Alondra/100101	43, 13	Read from USGS oil and gas map
Canton Creek/100155	37, 28	Facility ID code assigned in this study; read from USGS oil and gas map
Hyperion/100112	43, 14	Rough guess from KVB UTMs
Las Llajas/100115	38, 24	Read from standard map
Lawndale/100116	43, 14	Read from USGS oil and gas map
Lyon Canyon/100146	40, 24	Read from USGS oil and gas map
Newgate/100123	49, 14	Rough guess from KVB UTMs
Newhall-Potrero/100148	40, 25	Field should have been in original MED file; read from USGS oil and gas map
Saugus/100152	40, 26	Read from USGS oil and gas map
Orange County		
Brea-Olinda/100104 (Los Angeles County ID code)	52, 15	Same grid cell as Brea-Olinda No. 100202
Kraemer/100213	53, 14	Facility ID code assigned in this study; read from USGS oil and gas map

5 TASK 3: SPECIES PROFILE DEVELOPMENT

The profiles used to speciate TOG emissions, which identify individual organic compounds and their weight percents, are considered the most uncertain component of the inventory. Accordingly, two methods were used in this study to develop improved organic gas species profiles: (1) sampling and analysis techniques and (2) a review of existing data. This section presents the species profiles developed using these two methods. The development of TOG species profiles is somewhat complicated by the fact that TOG emission estimates and emission factors are not always consistent in terms of the set of compounds that they include. Emission estimates and emission factors may be representative of TOG, total organic compounds (TOC), volatile organic compounds (VOC), HC, or some other set of compounds. In many cases, the kinds of compounds included in an emission estimate may not be clear. During the profile development work performed for this study, an attempt was made to develop profiles that represented all organic gas emissions and that were therefore compatible with TOG emission estimates.

PROFILES DEVELOPED THROUGH ANALYTICAL WORK

At the beginning of this task, two general types of source testing and analysis were considered--one directed at improving emission estimates and one directed at improving speciation. After studying the options, it was concluded that all testing should be directed toward improving speciation. This conclusion was based on several considerations.

The current set of species profiles used in the emission inventory is uncertain. In fact, speciation is considered to be the most uncertain element in the inventory. Profiles were originally developed on the basis of limited testing and analysis. Because the number of profiles currently used in the inventory is limited, their applicability to many of the source categories in the inventory is also questionable.

The current set of emission factors is, in most cases, based on relatively extensive testing programs. Emission factors that have received little attention usually represent unusual source types that do not involve a large amount of emissions (e.g., a specialized chemical process).

A number of profiles can be developed through laboratory testing using limited field sampling. The cost effectiveness of this approach in reducing uncertainties is much better than that of emission rate testing, which generally requires extensive field sampling.

Selection of Source Categories for Speciation Testing

After the decision was made to devote Task 3 efforts to speciation testing and analysis, the source categories to be tested were selected using the following considerations:

The improvement in the certainty of TOG speciation expected to result for a particular source category.

The total amount of ROG emissions that would be affected by the analytical work.

The estimated reactivity of the emissions being reviewed.

The estimated cost of the investigations, tests, and analyses.

On the basis of these considerations, the following source categories and general approaches were selected.

Gasoline--Analyses of both liquid and vapor samples for each product type (e.g., unleaded regular, leaded regular, etc.) and for both winter- and summer-blend gasolines were performed.

Industrial surface coatings--Samples of the most widely used coating types (e.g., lacquer, enamel, etc.) were obtained from both surface coating facilities and coating manufacturers. Composite samples for the different coating types were developed and analyzed.

Asphalts--slow cure and medium cure--Composite samples of two types of asphalt were developed and analyzed. However, after analysis it was found that some of the samples had been purposely altered at a refinery before shipment. As a result, the species profiles developed in this study deserve further attention.

Architectural surface coating--water-based coatings--A composite sample of water-based architectural coatings was developed. The volatile portion of the coating was then distilled off and analyzed.

Architectural surface coating--solvent usage--A sample of solvents used in conjunction with architectural coatings was developed and analyzed.

Internal combustion engines--reciprocating-natural gas--Two different exhaust gas samples from stationary gas-fired IC engines were obtained and analyzed using gas chromatography. One of the samples was also analyzed for aldehydes.

Sampling Methodology

An integral part of the speciation test program was the determination of the composition of the samples to be analyzed and their acquisition. The following paragraphs discuss the makeup of the composite samples, the process used to obtain each sample, and the development of the final composites.

Gasoline

The approach used to develop composite samples was identical for the winter-blend and summer-blend gasoline samples. Composite samples were developed for each product type on the basis of total gasoline sales for the five largest refiners in California. The composition of the samples is presented in Table 5-1 by product type. The sales data were obtained from the 1979-1980 annual report of the California State Board of Equalization. The samples were obtained at service stations in the SOCAB. The winter- and summer-blend samples were taken in December 1983 and May 1984, respectively.

One gallon of gasoline was dispensed prior to pouring a sample. The gasoline was then dispensed into a chilled 40 milliliter (ml) glass container with a teflon seal cap. These samples were shipped in a refrigerated ice chest for next-day delivery to Radian's laboratories. Once received, the samples were stored in a walk-in freezer at -15°C. The composite samples were developed inside the walk-in freezer and the transfers were made using a graduated cylinder. All containers were kept tightly sealed except during the actual transfer process. The composite samples remained in the walk-in freezer until they were analyzed. All composite samples except the heated and agitated vapor samples were developed and analyzed within 14 days of the date they were obtained. Difficulties were encountered during the initial analyses of the heated and agitated vapor samples because of the high concentrations of hydrocarbons. The gas chromatograph (GC) had not been set to analyze such high concentrations. This resulted in the GC being removed from operation until these high concentrations could be purged. Once the GC was back in operation, scheduling constraints resulted in the samples being stored in a freezer for approximately 60 days before the final analyses were performed.

TABLE 5-1. Formulation of gasoline composite samples.

Top Five Companies by Taxable Sales	Annual 1979-1980 Taxable Sales (1000 gallons)*	Unleaded Regular (% of Sample)	Unleaded Premium (% of Sample)	Leaded Regular (% of Sample)	Leaded Premium (% of Sample)
Chevron USA	2,052,202	28.2	34.4	34.4	--
Shell Oil Co.	1,566,939	21.5	26.2	26.2	--
ARCO	1,358,944	18.6	22.7	22.7	--
Union Oil Co.	1,313,394	18.0	--	--	100.0
Mobil Oil Corp.	995,451	13.7	16.7	16.7	--
Subtotal	7,286,930				
Total Annual Taxable Sales in California	11,916,829				

* Data obtained from the 1979-1980 annual report of the California State Board of Equalization.

Industrial Surface Coatings

An important part of determining the makeup of the composite industrial surface coating samples concerned the nomenclature used for the coatings. There are seven SCCs currently used to categorize surface coatings. The coating descriptors for these SCCs are : 1) solvent-based paint, 2) water-based paint, 3) varnish/shellac, 4) lacquer, 5) enamel, 6) primer, and 7) adhesive. All of these SCCs have been used to some extent to categorize emissions from industrial surface coating in the inventory. The difficulty with this categorization system is that the distinction between some of the coatings is not clear. Thus, a surface coating sample could be categorized as one of several different coating types depending on the individual doing the categorization.

To clarify the categorization of industrial coatings, several coating manufacturers were contacted. These conversations resulted in the following general conclusions.

> Paint is a generic classification and is used for the majority of coatings.
>
> Water-based coatings are used on a limited basis in industrial coating operations.
>
> Varnishes and shellacs are also used on a limited basis in industrial coating operations.

We decided that speciation testing should concentrate on four coating types: lacquer, enamel, primer, and adhesive. Attempts were made to obtain samples of these coating types from both industrial surface coating facilities and industrial surface coating manufacturers.

To develop the composite samples, the completed survey results were first reviewed. Because surveyed facilities had been randomly selected, we concluded that the coatings they used would be representative of coatings used throughout the SOCAB. Therefore, the surveyed facilities were ranked by emissions from each of the coating types. Facilities with the greatest emissions for each of the coating types were then contacted and samples of these coatings were requested.

This process resulted in the acquisition of three to five samples each of enamel, primer, and lacquer. The volatile portions of these samples were distilled off using a method described at the end of this section. These distillates were then combined in proportion to the emissions of the coating type and facility from which they were obtained. For example, if facility X had 200 tons/year of emissions from enamel usage and facility Y had 100 tons/year of emissions from enamel usage, then the distillates from the enamel samples would be combined in a two to one ratio. Table 5-2 presents the makeup of the three composite samples that were developed. Also presented in this table is the volume that was distilled from 5.0 grams of the sample coating.

These composite samples were developed from coating types for cases in which three or more samples had been obtained from industrial surface coating facilities. To obtain additional samples of each coating, surface coating manufacturers in the 1981 ARB industrial surface coating survey were also contacted. Samples from nine coating manufacturers were requested for the following coating types:

varnish/shellac

lacquer

enamel

primer

adhesive

Only six of the nine manufacturers actually supplied coating samples and in most cases, the manufacturer produced only one or two of the coating types. Most manufacturers were concerned that the samples they provided might not be representative of the general coating type. Representative industrial surface coating samples were difficult to obtain because each coating is formulated for a specific application.

Two additional composite samples--an adhesive and an enamel sample--were also developed. Two samples of adhesive were obtained from industrial coating facilities and one sample was obtained from a coating manufacturer. Because no other approach to developing a composite sample appeared justified, the distillates from these three samples were combined in equal amounts.

The second additional composite sample was an enamel sample. During the acquisition of samples from the coating manufacturers, enamel samples were those most frequently provided. For this reason, and because of the large amount of emissions categorized as enamels in the revised inventory, a composite sample of enamels from coating manufacturers was also developed. The formulation of the adhesive and enamel samples is presented in Table 5-3. Also presented in this table is the volume of distillate trapped from each coating sample.

The same general distillation process was used for all coating samples and was taken from the ASTM Method D 2369--Standard Test Method for Volatile Contents of Surface Coatings. A small quantity of the coating was weighed

TABLE 5-2. Formulation of composite coating samples obtained from industrial surface coating facilities.

Coating Type and Facility	Percent of Composite Sample	Volume of Distillate Trapped* (ml)
Enamel		
General Motors	46.0	3.3
Steelcase West	41.3	0.3
Utility Trailer	6.7	0.5
Questor Furniture	4.0	1.2
Western Metal	2.0	0.8
Primer		
General Motors	50.9	3.3
Questor Furniture	34.1	0.7
Douglas Aircraft	15.0	1.8
Lacquer		
Questor Furniture†	32.2	2.8
Questor Furniture§	31.9	3.0
H. W. Hull	21.2	2.0
General Motors	14.8	2.0

* This column represents the amount of distillate that was produced from 5.0 grams of coating.

† This sample was categorized as paint in the original inventory, but was found to be lacquer.

§ This sample was not the same as that designated †; it was correctly categorized as lacquer.

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TABLE 5-3. Formulation of composite coating samples obtained from industrial surface coating facilities and manufacturers.

Coating Type and Facility or Manufacturer	Percent of Composite Sample	Volume of Distillate Trapped* (ml)
Enamel		
DuPont	25.0	0.6
PPG	25.0	0.1
Fuller-O'Brien	25.0	0.4
Mobil Chemical	25.0	0.1
Adhesive		
DuPont	33.3	1.6
Steelcase West	33.3	3.4
Advanced Structures	33.3	4.0

* This column represents the amount of distillate that was produced from 6.0 grams of coating for the enamel samples and from 4.0 grams of coating for the adhesive samples.

in a flask, which was then heated to 110°C for 60 minutes. During this time, the contents of the flask were purged with a continuous stream of organic free nitrogen. The resulting distillate was captured in a cryogenic trap.

The advantage of using the same general approach (110°C for 60 minutes) as the standard method is that the standard method is used for the development of emission factors for coatings. Therefore, the organics that are analyzed for emission factor development and are assumed to evaporate as the coating is applied are the same organics that were analyzed for speciation purposes.

Asphalts--Slow Cure and Medium Cure

An extensive investigation of the composition of different types of asphalt was conducted prior to making the recommendation for asphalt speciation testing. The result of this investigation was the recommendation to analyze one sample of slow-cure and one sample of medium-cure asphalt. It was also determined that only two refineries in the SOCAB currently produce cutback asphalts, and that the most widely used slow-cure asphalt is SC-800 and the most widely used medium-cure asphalt is MC-250. The actual production rates of these grades of asphalt, or of cutback asphalts in general, were not available for these refineries. As a result, composite samples of SC-800 and MC-250 were developed by combining equal amounts of these asphalts from the two refineries.

A distillation process similar to the one described for industrial surface coatings was then used to generate organic samples representative of the emissions during application. However, the temperatures at which these samples were heated were the average application temperatures of the asphalts obtained from CalTrans "Standard Specifications" published in January 1981. The temperatures that were used were approximately 100°C for SC-800 and 85°C for MC-250. The distillate was also cryogenically trapped for analysis.

Architectural Surface Coating--Water-Based Coatings

The first step in developing composite samples of water-based architectural surface coatings was to obtain the 1980 ARB statewide architectural surface coating survey results, as presented in Table 5-4. Using the results for water-based coatings, four product types were identified as comprising the majority of the total emissions: interior flats, exterior flats, interior nonflats, and exterior nonflats. These four product types

TABLE 5-4. ARB 1980 architectural coating survey results.

PRODUCT TYPE	PRODUCT CODE	SOLVENT SALES 1000 GAL	WATER SALES 1000 GAL	SOLVENT EMISSIONS T/D	WATER EMISSIONS T/D	THIN CLEAN (1 PT/GAL) T/D	TOTAL EMISSIONS T/D
Interior Flats	100	44.51	8445.53	.21	4.43	.05	4.69
Exterior Flats	110	78.46	7689.16	.38	4.79	.09	5.26
Interior Nonflats	120	1353.19	3596.69	5.56	2.78	1.48	9.82
Exterior Nonflats	130	1291.43	3507.60	5.21	2.69	1.42	9.32
Clears	140	2315.37	56.49	15.11	.07	2.54	17.72
Primers-General	200	670.78	358.75	2.97	.23	.74	3.93
Sealers	210	383.07	193.50	2.50	.07	.41	2.98
Waterproofers	215	486.23	31.42	3.89	.01	.53	4.44
Undercoaters	220	440.84	374.58	2.11	.13	.48	2.73
Wood Preservatives	300	617.61	.70	4.68	.00	.68	5.36
Opaque Stains	310	536.80	1427.99	2.39	.84	.59	3.81
Semi-Transparent Stains	320	1232.94	174.60	8.40	.16	1.32	9.89
Industrial Metal Primers	400	609.27	20.45	3.29	.01	.67	3.97
Maintenance Finish-Lt. Duty	410	1062.06	60.28	5.57	.05	1.16	6.78
Maintenance Finish-Heavy Duty	420	498.15	8.55	2.38	.01	.55	2.94
Mastic-Texture	500	4.98	115.60	.02	.04	.01	.05
Mill White	520	15.44	.40	.07	.00	.02	.09
Roof Coating	530	2734.58	148.83	8.78	.02	.00	8.80
Swimming Pools	540	59.70	.00	.34	.00	.07	.40
Traffic Paints*							
Tile-Like Glaze	560	22.63	.00	.10	.00	.02	.12
Sigh (Graphic Arts) Coatings	570	34.83	1.10	.11	.00	.04	.15
Multicolor	580	.42	40.00	.00	.15	.00	.15
Metallic	590	59.46	.00	.32	.00	.07	.39
Fire Retardant	600	3.66	3.80	.00	.00	.00	.01
Aerosol	800	573.60	3.29	3.59	.00	.63	4.22
Other	900	.15	.00	.00	.00	.00	.00
TOTAL		15141.40	26471.07	78.03	16.50	13.56	108.09

* Product not surveyed in 1980.

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represented 14.69 tons/day of the total 16.50 tons/day of TOG emissions from water-based architectural coatings in the state in 1980.

To develop a composite sample from the various manufacturers of these architectural coating types, the detailed confidential results from the 1980 ARB survey, which present sales and emission data by product type and company, were used. The individual coatings for the four product types were ranked by emissions, and the seven coatings with the largest amount of emissions were selected for the composite sample. The seven samples represented 5.68 tons/day, or 39 percent of the 14.69 tons/day of emissions from the four product types.

The seven individual coatings were purchased at retail outlets in Sacramento, California and were combined in proportion to their 1980 statewide sales to develop 210 ml composite samples; these composites were considered representative of the mix of water-based architectural coatings. The 210 ml composite samples were then spiked with two surrogate standards, acetonitrile for water soluble compounds and deuterated bromobenzene for non-water-soluble compounds, to determine the efficiency of the distillation process. The amount of each standard added was 0.25 grams, resulting in a concentration of approximately 0.1 percent for each standard. The sample was then distilled at 110°C for 60 minutes, which was also selected to be consistent with ASTM Method D 2369.

Architectural Surface Coating--Solvent Usage

The intention was to develop a composite sample for this source category that was representative of the solvents used in conjunction with architectural surface coatings. Based on discussions with ARB staff, it was decided that solvents should be purchased from the primary retail paint outlets in Sacramento used by painting contractors because contractors represent a large percentage of the total solvent used. The retail outlets that were recommended were Dunn-Edwards, Fuller-O'Brien, and Standard Brands. The managers at each of these outlets were requested to identify their largest selling solvents and the approximate percent of total solvent sales that each solvent represented. The solvents were then made into a composite on the basis of sales within each retail outlet and then combined in equal proportions for the three outlets. The formulation of the composite solvent sample is presented in Table 5-5.

Internal Combustion Engines--Reciprocating-Natural Gas

Exhaust gas samples from two different natural-gas-fired IC engines were obtained and analyzed. The first sample was taken from a White Superior

TABLE 5-5. Formulation of the composite sample of solvents used with architectural coatings.

Retail Outlet and Solvent	Percent of Retail Outlet Sales	Percent of Sample Volume
Dunn-Edwards		
Paint thinner	50	16.7
Lacquer thinner	35	11.7
Benzine	15	5.0
Total	100	33.4
Fuller-O'Brien		
Paint thinner	80	26.7
Lacquer thinner	10	3.3
Brush cleaner	10	3.3
Total	100	33.3
Standard Brands		
Paint thinner	75	25.0
Lacquer thinner	20	6.7
Terpentine	5	1.7
Total	100	33.4

3G-825 500 horsepower (hp) engine and collected in an evacuated metal cylinder for analysis by a flame ionization detector/photo ionization detector gas chromatograph (FID/PID GC). The sample was taken during a SCAQMD compliance test on 13 September 1983 while the engine was operating at approximately 70 percent load. After reviewing the data collected during the source test, the engine was considered to be operating under normal conditions.

The second sample was taken from a Waukesha L7042 600 hp engine. In this case, one sample was collected in an evacuated cylinder for GC analysis, and another sample was collected using midget impingers containing 0.009N H_2SO_4 for analysis of total aldehydes. The exhaust gas was passed through the impingers at a rate of approximately 1.0 liter per minute for one hour. This engine was also undergoing a compliance test at the time the samples were obtained. On the basis of data collected during this test, the engine was considered to be operating under normal conditions.

Analytical Methodology

Many of the analytical procedures used during the speciation test program were developed in consultation with ARB chemists.

Gasoline

Eight analyses were performed on each of the winter- and summer-blend gasolines for liquid and static vapor samples from each of the four product types. In addition, a heated and an agitated vapor sample of summer-blend gasoline were analyzed for a total of 18 gasoline analyses. To analyze the liquid gasoline samples, two microliters of each of the four composite gasoline samples were injected into four 2.8 liter stainless steel evacuated canisters. A heated injection port and a flow of zero grade nitrogen was used to insure complete volatilization and transfer into the canisters, which were then pressurized to four atmospheres. Five ml of this dilute gas phase mixture was then analyzed. The five-ml sample was cyrogenically concentrated with liquid oxygen and then thermally desorbed onto a 60-m fused silica capillary column at -50°C. This initial temperature was held for two minutes and then programmed up to 100°C at 6° per minute.

The analysis was performed on a dual detector FID/PID GC. The instrument was a Varian 3700 GC equipped with a FID and a 10.2 eV PID. The column effluent was split into the FID and PID at a ratio of four to one, respectively. The detector responses were plotted and integrated on a dual channel Varian 401 chromatographic data system. A second data system, using an Apple II minicomputer, identified the peaks by comparing the retention times and normalized response ratios with previously established standard values. The FID response was used to quantify each component. Response factors were determined using propane and hexane standards.

The static vapor samples were developed by allowing 30 ml of liquid and 10 ml of vapor to reach equilibrium at room temperature (23°C or 73°F). The heated vapor sample was developed by heating a static vapor sample to 35°C. The agitated vapor sample was produced by shaking a sample (also 30 ml liquid and 10 ml vapor) using a mechanical shaker for one minute and immediately analyzing the vapor. In all cases, a five microliter vapor sample was taken from the 40 ml container using a gas-tight syringe. This sample was then cryogenically trapped and analyzed using an FID/PID GC as described previously.

In addition to these tests, analyses were performed to evaluate the concentrations of ethylene dibromide (EDB) and other halogenated species in gasoline. Due to the relatively low concentrations of halogenated species relative to other organic species in gasoline, the FID/PIC GC analysis was unable to detect the halogenated species. Therefore, a detector that could selectively identify halogenated species was used to analyze two gasoline samples: the liquid summer-blend leaded regular and leaded premium composites. Only two samples were analyzed because this work was not included in the scope of the original analytical approach.

The analyses were performed using a Tracor 560/700A hall electro-conductivity detector (HECD). A Ni-reactor tube was used at 900°C with a hydrogen reactant gas. A methanol electrolyte solution was also used at a flow rate of approximately 5 ml per minute. A certified gas-phase standard was employed to quantify all halogenated species except EDB since a gas-phase EDB standard was not available. Therefore, the response factor of 1,2-dichloroethane was used to quantify EDB. The EDB analyses showed concentrations of 0.0063 milligrams of carbon per ml for the leaded regular sample and 0.014 milligrams of carbon per ml for the leaded premium sample. In both cases, these EDB concentrations represented less than 0.01 percent by weight. Concentrations of all identified halogenated species are shown in Appendix D for the appropriate sample.

Industrial Surface Coatings

The industrial surface coating samples were analyzed using both a GC and a gas chromatograph/mass spectrometer (GC/MS). Initially, the composite distillate from the various surface coating samples was injected directly into the GC. If the concentrations of compounds under these conditions were too high, the sample was diluted in a noninterfering solvent and injected again.

The GC/MS results were used to identify compounds and the GC was used with an FID for quantification. A 60-m fused silica capillary column was used on both instruments. The temperature program started at 35°C and was increased to 310°C at 8°C per minute.

Asphalts--Slow Cure and Medium Cure

The asphalt samples were analyzed using the same procedures and instruments as were used for industrial surface coatings.

Architectural Surface Coating--Water-Based Coatings

A 210 ml composite sample of water-based architectural coatings was distilled as described previously, resulting in approximately 112.2 ml of total distillate. Acetonitrile and bromobenzene-d_5 were used as recovery surrogates to estimate the percent of recovery during distillation. Total recovery was measured at 105 percent for acetonitrile and 130 percent for bromobenzene-d_5. The distillate consisted of three fractions: an organic layer (2.0 ml) with a density less than water, an aqueous layer (110 ml), and an organic layer (approximately 0.2 ml) with a density greater than water. Organic speciation of this sample was developed through an analysis of the first two fractions. The 0.2 ml fraction was not chromatographable and probably consisted of some sort of polymeric substance. The analyses were performed by GC/MS using a 60-m capillary column. The temperature program had an initial temperature of 35°C for one minute and then was increased to 320°C at 10° per minute. Toluene-d_8 and phenol-d_6 were used as internal standards.

Architectural Surface Coating--Solvent Usage

The solvent sample was also analyzed using the same procedures and instruments as were used for industrial surface coatings.

Internal Combustion Engines--Reciprocating-Natural Gas

The first of the two IC engine exhaust gas samples was analyzed using a FID/PID GC; the second sample was analyzed using both a FID/PID GC and the MBTH method. In the first method, the exhaust gas sample was injected directly onto a 60-m fused silica capillary column at -50°C. This initial temperature was held for two minutes and then programmed up to 100°C at 6°C per minute.

The MBTH method (see Appendix C) was used to determine total aldehydes in the exhaust gas. In general, the method consists of trapping the aldehydes in a dilute sulfuric acid solution. The trapped aldehydes are then reacted in the laboratory with MBTH to form an azine. Oxidation of the excess MBTH forms a reactive cation, which adds to the azine to form a blue dye. The intensity of this blue dye is directly proportional to the concentration of the aldehydes. This procedure allows the aldehydes to be measured by a colorimetric method.

Species Profile Development from Analytical Results

The unreduced results of the analyses previously described are presented in Appendix D. These results were used to develop species profiles for each of the source categories under consideration. Table 5-6 lists the 68 profiles developed from both test results and existing information.

Gasoline

Species profiles for gasoline were developed directly from the analytical results. The units of the analytical results for liquid samples were milligrams of carbon per milliliter (mg-C/ml). The units of the analytical results for vapor samples were parts of carbon per thousand by volume (ppthv-C).

For vapor samples, to convert a concentration expressed as carbon to a concentration expressed as a specific compound, the following calculation was made:

$$C_{carb}(16/MW_{carb}) = C_{comp}$$

where

C_{carb} = Concentration expressed as carbon

C_{comp} = Concentration expressed as the compound

MW_{carb} = Molecular weight of the carbon atoms in the compound

For liquid samples, to convert a concentration expressed as carbon to a concentration expressed as a specific compound, the following calculation was made:

$$C_{carb}\ (MW_{comp}/MW_{carb}) = C_{comp}$$

TABLE 5-6. New profiles developed in this study.

Profile Code	Profile Description
701	LIQUID GASOLINE - UNLEADED REGULAR - SUMMER BLEND
702	LIQUID GASOLINE - LEADED REGULAR - SUMMER BLEND
703	LIQUID GASOLINE - UNLEADED PREMIUM - SUMMER BLEND
704	LIQUID GASOLINE - LEADED PREMIUM - SUMMER BLEND
705	GASOLINE VAPORS - UNLEADED REGULAR - SUMMER BLEND
706	GASOLINE VAPORS - LEADED REGULAR - SUMMER BLEND
707	GASOLINE VAPORS - UNLEADED PREMIUM - SUMMER BLEND
708	GASOLINE VAPORS - LEADED PREMIUM - SUMMER BLEND
709	LIQUID GASOLINE - COMPOSITE OF PRODUCT - SUMMER BLEND
710	GASOLINE VAPORS - COMPOSITE OF PRODUCT - SUMMER BLEND
711	INDUSTRIAL SURFACE COATING - COMPOSITE LACQUER
712	INDUSTRIAL SURFACE COATING - COMPOSITE ENAMEL
713	INDUSTRIAL SURFACE COATING - COMPOSITE PRIMER
714	INDUSTRIAL SURFACE COATING - COMPOSITE ADHESIVE
715	SLOW CURE ASPHALT
716	MEDIUM CURE ASPHALT
717	ARCHITECTURAL SURFACE COATING - WATER BASED PAINT
718	ARCHITECTURAL SURFACE COATING - COMPOSITE SOLVENT
719	INTERNAL COMBUSTION ENGINE - RECIPROCATING-NATURAL GAS FIRED
721	LIQUID GASOLINE - UNLEADED REGULAR - WINTER BLEND
722	LIQUID GASOLINE - LEADED REGULAR - WINTER BLEND
723	LIQUID GASOLINE - UNLEADED PREMIUM - WINTER BLEND
724	LIQUID GASOLINE - LEADED PREMIUM - WINTER BLEND
725	GASOLINE VAPORS - UNLEADED REGULAR - WINTER BLEND
726	GASOLINE VAPORS - LEADED REGULAR - WINTER BLEND
727	GASOLINE VAPORS - UNLEADED PREMIUM - WINTER BLEND
728	GASOLINE VAPORS - LEADED PREMIUM - WINTER BLEND
729	LIQUID GASOLINE - COMPOSITE OF PRODUCT - WINTER BLEND
730	GASOLINE VAPORS - COMPOSITE OF PRODUCT - WINTER BLEND
731	HEATED GASOLINE VAPORS - UNLEADED REGULAR - SUMMER BLEND
732	AGITATED GASOLINE VAPORS - UNLEADED REGULAR - SUMMER BLEND
751	ACRYLONITRILE-BUTADIENE-STYRENE (ABS) RESIN MFG.
752	POLYSTYRENE RESIN MFG.
753	STYRENE
754	CHLOROSOLVE
755	TRICHLOROTRIFLOUROETHANE
756	OIL AND GAS PRODUCTION FUGITIVES-LIQUID SERVICE
757	OIL AND GAS PRODUCTION FUGITIVES-GAS SERVICE
758	OIL AND GAS PRODUCTION FUGITIVES-VALVES-UNSPECIFIED SERVICE
759	OIL AND GAS PRODUCTION FUGITIVES-FITTINGS-UNSPECIFIED SERVICE
760	EVAPORATIVE EMISSIONS-DISTILLATE FUEL
761	EVAPORATIVE EMISSIONS-NAPHTHA
762	BTX (BENZENE/TOLUENE/XYLENE)
763	PHTHALIC ANHYDRIDE MFG - XYLENE OXIDATION
764	FLUOROCARBON - 12/11 MANUFACTURING
765	FLUOROCARBON - 23/22 MANUFACTURING
766	FLUOROCARBON - 113/114 MANUFACTURING
767	FLUOROCARBON - 11

TABLE 5-6 (concluded)

Profile Code	Profile Description
768	FLUOROCARBON - 113
769	FLUOROCARBON - 114
770	CHLOROFLUOROCARBONS
771	CARBON TETRACHLORIDE
772	ORTHO-XYLENE
773	FLUOROCARBON MFG - VALVES, PUMPS, ETC
774	ISOBUTYL ACETATE
775	ISOBUTYL ALCOHOL
776	ISOBUTYL ISOBUTYRATE
777	METHYL AMYL KETONE
778	METHYL ISOBUTYL KETONE
779	N-BUTYL ACETATE
780	N-PROPYL ACETATE
781	N-PROPYL ALCOHOL
782	HEXYLENE GLYCOL
783	INDUSTRIAL SURFACE COATING - SOLVENT BASED PAINT
784	SYNTHETIC RUBBER MFG - STYRENE-BUTADIENE RUBBER
785	ETHYLENE OXIDE
786	METHYL ALCOHOL
787	CARBON BLACK MANUFACTURING

where

MW_{comp} = Molecular weight of the compound

Values for MW_{carb} and MW_{comp} are presented next for some example compounds.

Compound	MW_{carb}	MW_{comp}
Ethane	24	30
Butane	48	58
Butene	48	56

To convert liquid sample concentrations expressed as carbon to percent by weight, it was assumed that the difference between a weight percent expressed as carbon and a weight percent expressed as the specific compound was insignificant. This assumption is justified for two reasons:

The ratio of the molecular weight of a compound to the molecular weight of carbon in the compound (MW_{comp}/MW_{carb}) does not vary much for the organics found in gasoline.

The imprecision introduced by this assumption is small relative to the overall imprecision of the analytical results.

Once this assumption was made, the calculation of weight and volume percents was straightforward. For liquid samples, the concentration of a compound in mg-C/ml was divided by the total nonmethane hydrocarbon concentration of the sample and multiplied by 100. This resulted in the weight percent of that compound. For vapor samples, this same calculation as applied to a concentration in ppthv resulted in the volume percent of the compound.

A total of eighteen composite gasoline samples were analyzed. Sixteen of these samples consisted of liquid and vapor samples for each of the four product types for both winter- and summer-blend gasolines. The additional two samples were a heated and an agitated vapor sample for summer-blend unleaded regular. The eighteen species profiles that were developed from these analytical results are presented in Appendix E-1.

Gasoline evaporative emissions in the current 1979 SOCAB inventory are not differentiated by product type. Therefore, it was necessary to develop composite summer- and winter-blend gasoline profiles representative of the 1979 product mix. Using 1979 data from the California Energy Commission production and consumption report (CEC, 1981) as presented in Table 5-7,

TABLE 5-7. Sales of gasoline products in California in 1979.

Product Type	1979 California Sales (1000 barrels)	Percent of Total Sales
Unleaded regular	100,178	39.8
Leaded regular	95,206	37.8
Unleaded premium	0	0.0
Leaded premium	56,587	22.4
Total	251,971	100.0

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four liquid and vapor composite profiles were developed for the winter- and summer-blend gasolines. These profiles are also presented in Appendix E-1.

Several comparisons were made to evaluate the new gasoline species profiles. The new profiles were first compared to the profile in the VOC species data manual (EPA, 1980) for evaporative gasoline emissions. This profile, No. 98, is quite similar to the new liquid gasoline profiles we developed. Assuming that profile No. 98 was based on an analysis of liquid gasoline, the profile often used for gasoline evaporative emissions to date is inappropriate for emissions of gasoline vapors. Furthermore, gasoline vapors, in contrast to the complete evaporation of liquid gasoline, make up the great majority of gasoline evaporative emissions.

To further evaluate the new gasoline profiles, a comparison was made of the weight percents of the primary compound groups in each sample (Table 5-8). This comparison shows that there is a good agreement in the trends among all samples analyzed except the heated vapor sample. The low paraffin content in the heated vapor sample may be the result of the loss of some of the lowest molecular weight compounds during heating or storage. Trends for the liquid and static vapor samples are as follows:

The paraffin content in static vapor samples is much higher than in liquid samples. This trend occurs because the lower molecular weight and more volatile paraffins tend to move into the vapor phase more readily than do the aromatics.

The unleaded liquid samples tend to have a higher aromatic content than do the leaded liquid samples.

The comprehensive analyses performed for gasoline samples represent more extensive results than originally called for by the scope of the project. Profiles of liquid gasoline are now available for evaporative losses resulting from such occurrences as gasoline spillage. Similarly, related gasoline profiles for static vapor emissions are available for such conditions as storage tank losses.

Industrial Surface Coatings

Five composite industrial surface coating samples of the following coating types were analyzed:

Lacquer

Primer

TABLE 5-8. Comparison of gasoline species profiles developed in this study.

Sample	Percent by Weight		
	Paraffins	Olefins	Aromatics
Summer Blend			
Liquid			
Unleaded regular	51.2	8.0	39.7
Leaded regular	62.4	8.5	28.9
Unleaded premium	48.5	7.6	43.9
Leaded premium	56.3	3.5	40.2
Vapor			
Unleaded regular	85.2	13.4	1.3
Leaded regular	84.2	14.9	0.9
Unleaded premium	83.4	13.3	3.2
Leaded premium	92.9	5.2	1.9
Heated Vapor			
Unleaded regular	37.9	10.0	52.0
Agitated Vapor			
Unleaded regular	54.8	13.0	32.2
Winter Blend			
Liquid			
Unleaded regular	51.0	7.2	41.8
Leaded regular	57.6	10.0	32.4
Unleaded premium	48.3	7.3	44.3
Leaded premium	61.8	4.2	34.0
Vapor			
Unleaded regular	85.4	10.7	3.9
Leaded regular	80.7	15.2	4.2
Unleaded premium	83.2	12.6	4.3
Leaded premium	92.8	4.7	2.6

Adhesive

Enamel obtained from surface coating facilities

Enamel obtained from surface coating manufacturers

Species profiles were developed for each of these samples. A sixth industrial surface coating profile, representative of general enamel samples, was also developed by taking an arithmetic average of the two enamel profiles. The new industrial surface coating profiles that were assigned profile numbers are presented in Appendix E-2.

The following conclusions can be drawn from a comparison of the new species profiles with the existing profiles for these coating types.

The profiles of the two enamel samples analyzed in this study contain significant differences. This demonstrates that composite samples of industrial coatings composed of three to five individual coating samples are probably not representative of general coating types. A greater number of individual coating samples appears necessary to achieve a representative coating type.

The new industrial coating profiles have a high aromatic content, especially of toluene and xylene. This is in contrast to the currently used profiles, which consist primarily of "mineral spirits." Mineral spirits refer to a mixture of primarily C_6 to C_{10} straight-chain paraffins.

Asphalts--Slow Cure and Medium Cure

Species profiles were developed for composite slow cure and medium cure cutback asphalt samples. However, after the samples were analyzed and profiles were developed, it was discovered that one of the individual samples used in each composite sample had been purposely altered by the supplier. Unknown to us before our analyses, these samples had been distilled and then washed with caustic in an attempt to remove the lighter, more volatile compounds. Because the profile currently used for cutback asphalts is the result of a grab sample of emissions taken from a hot-mix asphalt pile, we feel the new profiles, though still deserving future investigation, better represent emissions from cutback asphalts. The new profiles are shown in Appendix E-3.

Architectural Surface Coating--Water-Based Coatings

The new species profile for water-based architectural surface coating is presented in Appendix E-4. These results indicate that three compounds make up over 65 percent of the organics in the sample. These three compounds are listed next along with their approximate weight percents in the sample.

2-Methylpropanoic acid, 2,2-dimethyl-1-(2-hydroxy-1-methylethyl) propyl ester: 23.2 percent by weight

2-Methylpropanoic acid, 3-hydroxy-2,4,4-trimethylpentyl ester: 23.8 percent by weight

1-Butanol: 19.5 percent by weight

It is important to note that the identification and quantification of these compounds were not confirmed by the use of standards. Therefore, particularly for the more complex species, the results should be considered an indication of the type of species present in the sample, but not a positive identification of the particular species.

Architectural Surface Coating--Solvent Usage

Using the analytical results of the composite solvent sample, the species profile presented in Appendix E-5 was developed. This profile consists of a wide variety of different compounds, with few halogenated hydrocarbons.

Internal Combustion Engines--Reciprocating-Natural Gas

Two gas-fired IC engine exhaust samples were analyzed using gas chromatography, and one of these samples was also analyzed for aldehyde content. The measured aldehyde content was assumed to be applicable to both exhaust samples, and was used to develop two profiles. These two profiles were then arithmetically averaged to develop the composite species profile shown in Appendix E-6. As can be seen from the composite profile, the primary constituent of the organic gases is methane, but other low molecular weight paraffins and olefins are present in measurable quantities.

PROFILES DEVELOPED FROM LITERATURE, SURVEY RESULTS, AND OTHER EXISTING DATA

In addition to developing species profiles through analytical work, efforts were made to develop profiles from existing data. Moreover, the speciation of TOG emissions in the inventory was improved significantly through changes to SCCs used to identify emission sources and to assign speciation profiles. An example of this improvement is a source that originally was identified with SCC 3-01-999-99, chemical manufacturing-unspecified. After reviewing the survey results and emission fee data for the appropriate facility, this SCC was changed to a more specific SCC such as 3-01-018-01, chemical manufacturing-plastics production-polyvinyl chloride. Use of this revised SCC resulted in the assignment of a more specific and reliable speciation profile which, in turn, led to an improved inventory.

To develop new organic gas species profiles from existing data, several steps were taken.

- Computerized literature search
- Manual search of Radian's library
- Contacts with individuals at Radian and other companies and agencies
- Review of data obtained in the Task 2 survey

Computerized Literature Search

Several computerized data bases were searched using combinations of various key words:

- DOE Energy
- National Technical Information Service
- Chemical Abstracts Search
- Compendex
- Pollution Abstracts

Various combinations of keywords were used to emphasize organic gas speciation. However, no documents were identified that specifically addressed the development of a species profile. Those documents that did treat organic gas speciation did so in a limited manner (e.g., documents might have emphasized the speciation of polynuclear aromatic compounds or the speciation of C_2 through C_6 hydrocarbons, but not full organic gas speciation). Therefore, no profiles were added to the inventory through this effort.

Other Existing Data

During additional data collection efforts, a number of documents were identified that contained speciation information. However, in most cases these data were too limited to allow the development of species profiles. The documents we reviewed are briefly described:

Control Technique Guideline Documents. These documents, in particular those related to surface coating (e.g., EPA, 1977), normally identify the specific organic compounds emitted from the source category of interest. However, no quantification of the relative amounts of these compounds is provided.

Vapor Control Methods for Gasoline Marketing. This report (Radian, 1975) contains useful information on gasoline vapor speciation as well as on the hydrocarbon concentration gradient that exists between the liquid surface and the outlet in underground gasoline storage tanks.

Analysis of Polynuclear Aromatic Hydrocarbon (PNA) in Liquid Fuels. This document (Radian, 1979) contains a detailed analysis of PNAs in jet fuels and diesel fuels. However, full speciation of these fuels was not obtained in this study.

Assessment of Emissions from Petroleum Refining. In this study (Radian, 1980), more than 20 analyses of refinery products and intermediates were made. Because the emphasis was on quantifying aromatics, full speciation was not available.

1974 Composition of Los Angeles Gasolines. In this analysis (ARB, 1975), full hydrocarbon speciation was developed for several gasoline samples.

Vehicular Evaporative Emissions. Hydrocarbon speciation was obtained in this study (Mayrsohn and Crabtree, 1975) for numerous gasoline samples.

Source Reconciliation of Hydrocarbons in the SOCAB. This document (ARB, 1976) presents limited speciation data for a variety of fuels and solvents. Compounds greater than C_6 are not differentiated beyond the number of carbon atoms present.

In addition to these documents, two ongoing studies were identified that may later provide valuable speciation data. Mr. John Wood at the South Coast Air Quality Management District is investigating the speciation of emissions from surface coating activities before and after incineration devices. In addition, Dr. Charles Spicer at Battelle Laboratories in Columbus, Ohio is performing a major study of the composition of jet engine exhaust.

Species Profile Development

The documents just described provided a useful perspective, but were not directly used to develop profiles. Nevertheless, a total of 37 new species profiles labeled as profile codes Nos. 751 through 787 were developed from existing data. More than half of these profiles consisted of one specific compound, and thus no documentation of their development is necessary. A brief documentation of the development of the remaining profiles is provided next. Each of these profiles is presented in Appendix E-7.

Profile 751--Acrylonitrile-Butadiene-Styrene (ABS) Resin Manufacturing. On the basis of a conversation with one of the environmental coordinators at an ABS resin plant, emissions from ABS manufacturing were assumed to be evaporative emissions from a liquid mixture at standard conditions. This liquid mixture was further assumed to be 20 percent acrylonitrile and 80 percent styrene. Profile 751 was developed on the basis of the vapor pressures of these materials at standard conditions.

Profile 752--Polystyrene Resin Manufacturing. From the survey responses and literature review, we found that (1) styrene and ethylbenzene are present in emissions from polystyrene manufacturing, and (2) styrene is the major constituent of these emissions. Profile 752 was developed on the basis of this information.

Profiles 756 through 759--Oil and Gas Production Fugitives. The first step in developing these profiles was to determine the ratio of liquid service and gas service components for valves and fittings in the SOCAB. This was done using information from two sources. The number of wells in the SOCAB in each of four gas-to-oil ratio (GOR) categories was determined using the "67th Report of the State Oil and Gas Supervisor, 1981." Data for 1981 were felt to be appropriate because the profiles that were developed would be used for both 1979 and future inventories. These well counts were then used in conjunction with information on the number of liquid and gas service components for each GOR category. This information was developed by KVB and was contained in a ARB technical note entitled, "Estimation of Fugitive PROC Emissions from Oil and Gas Operations and Gas Processing Plants." The calculation of the ratio of liquid and gas service valves and fittings in the SOCAB is shown next.

Well Populations by GOR in the SOCAB

Gas-to-Oil Ratio	<100	100-400	400-900	>900
Number of Wells	2,203	3,271	3,054	1,204

These data were then used in conjunction with information on the number of liquid and gas service components for each GOR category, as shown next.

Valve and Fitting Populations per Well by GOR

Gas-to-Oil Ratio	<100	100-400	400-900	>900
Liquid Service Valves/Well	31.2	23.1	24.7	10.9
Gas Service Valves/Well	0.7	16.4	18.1	10.5
Liquid Service Fittings/Well	24.2	197.4	145.8	63.4
Gas Service Fittings/Well	5.2	98.4	108.0	72.8

Using these data, component populations for gas and liquid service valves and fittings in the SOCAB were developed:

Valve and Fitting Populations in the SOCAB

Gas-to-Oil Ratio	<100	100-400	400-900	>900
Liquid Service Valves	68,734	75,560	75,434	13,124
Gas Service Valves	1,542	53,644	55,277	12,642
Liquid Service Fittings	53,313	645,695	445,273	76,334
Gas Service Fittings	11,456	321,866	329,832	87,651

Therefore, the total ratio of liquid service to gas service valves is 232,852 to 123,105 or 0.654 to 0.346. The total ratio of liquid service to gas service fittings is 1,220,615 to 750,805 or 0.619 to 0.381.

The second step in developing profiles for oil and gas production was to develop composite profiles based on the liquid service and gas service species data developed for API by Rockwell. These species data, from page E-4 of the API/Rockwell report, are presented next.

Weight Fraction of Species

	C_1	C_2	C_3	C_4	C_5	C_6^+
Liquid Service	0.375	0.064	0.101	0.078	0.056	0.326
Gas Service	0.614	0.079	0.070	0.045	0.021	0.171

Using these species data and the ratio of gas and liquid service components, the following species data were developed:

Weight Fraction of Species

	C_1	C_2	C_3	C_4	C_5	C_6^+
Valves	0.458	0.069	0.090	0.067	0.044	0.272
Fittings	0.466	0.070	0.089	0.065	0.043	0.267

To obtain detailed profiles, this information was used in conjunction with Table 4-03-001C from the VOC species data manual (EPA, 1980). We assume that the resulting profiles contain a fair amount of uncertainty. The following steps were taken in developing these profiles:

(1) The C_4 component was divided into n-butane and isobutane in proportion to the weight percentages of these compounds in Table 4-03-001C of the VOC species data manual.

(2) The C_6^+ component was divided into isomers of hexane, heptane, and octane; C-7 and C-8 cycloparaffins; and benzene in proportion to the weight percentages of these compounds in Table 4-03-001C of the VOC species data manual.

<u>Profiles 760 and 761--Evaporative Emissions-Distillate Fuel and Naphtha.</u> These profiles were obtained from the species data manual. Profile 760 consists of Table 3-06-008F and profile 761 consists of Table 3-06-008G. The series of profiles 3-06-008A through 3-06-008G were developed for fugitive leaks from valves and flanges carrying various petroleum products and intermediates. Because data for emissions from storage tanks containing a variety of petroleum products do not exist, these data were felt to be the best available for storage tank evaporative emissions.

The current profile for distillate fuel is based on a test of weed oil and consists of most naphthalenes. Profile 760, which consists primarily of paraffins with no aromatics, is considered to be more representative of distillate fuel because aromatics are normally not added to distillate fuel in order to lower the self-ignition point of the fuel.

Profile 761, which contains both paraffins and aromatics, is believed to be representative of evaporative emissions from middle distillate petroleum intermediates such as naphtha.

Profile 762--BTX (Benzene/Toluene/Xylene). BTX is a common term for a mixture of aromatic compounds including benzene, toluene, and xylene. Although it is known that the composition of BTX is variable, no data were available on the average composition of BTX. As a result, it was assumed for this profile that BTX emissions contain the three main constituents in equal proportions.

Profile 763--Phthalic Anhydride Manufacturing-Xylene Oxidation. The composition of emissions from phthalic anhydride manufacturing, as well as the primary and secondary chemical reactions involved, is discussed in several documents. This information was reviewed and a rough estimate of the composition of these emissions was made. The compounds that are emitted are similar in chemical structure. Therefore, inaccuracies in the weight percent of each compound are less significant than they would otherwise be. The documents reviewed include

"Report on the Emissions from a Gas-Fired Afterburner Serving a Phthalic Anhydride Plant," SCAQMD, 1976.

EPA Publication No. AP-42 (including supplements 1 through 14), EPA, 1983.

Industrial Chemistry, 7th Edition, Kent, 1974.

Industrial Chemicals, Lowenheim and Moran, 1975.

"Potential Pollutants from Petrochemical Processes," Monsanto Research Corp., 1973.

Profiles 764 through 766--Fluorocarbon Manufacturing. These profiles were developed using two sources of information: "Organic Chemical Manufacturing" prepared by IT-Enviroscience for EPA and the 1979 SCAQMD emission fee data for a fluorocarbon manufacturing facility. These two information sources presented different estimates for the composition of emissions from each of the types of fluorocarbon manufacturing. The individual estimates were therefore averaged to develop profiles 764 through 766. The derivation of these profiles is shown in Table 5-9.

TABLE 5-9. Derivation of Profiles 764 through 766.

Product Constituents	Percent by Weight: Organic Chemical Manufacturing Estimate	SCAQMD Estimate	Average
Fluorocarbon 12/11			
Fluorocarbon 11	--	5.8	2.9
Fluorocarbon 12	99.0	47.2	73.1
Fluorocarbon 13	1.0	47.1	24.0
Fluorocarbon 23/22			
Fluorocarbon 22	33.3	1.6	17.4
Fluorocarbon 23	66.7	98.4	82.6
Fluorocarbon 113/114			
Fluorocarbon 113	39.6	NA*	39.6
Fluorocarbon 114	58.0	NA	58.0
Fluorocarbon 115	2.4	NA	2.4

* NA indicates that data were not available.

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Profile 773--Fluorocarbon Manufacturing-Miscellaneous Emissions. This profile was developed to represent a composite of all TOG emissions related to fluorocarbon manufacturing. To develop this profile, a facility primarily engaged in fluorocarbon manufacturing that had been surveyed in Task 2 was identified (No. 435.19). The inventory for this facility after inclusion of the recommended changes was reviewed, and all devices and SCCs that specifically related to fluorocarbon manufacturing were identified. A composite profile was then developed by weighting the profiles for each of these SCCs in proportion to their rate of emissions at the facility. The devices, SCCs, emissions, and percent that each profile was weighted are as follows:

Device	SCC	TOG Emissions (tons/year)	Percent of Total
101	3-01-127-02	1.8	6.6
102	3-01-127-03	12.5	46.1
103	3-01-127-12	2.0	7.4
104	3-01-127-13	7.3	26.9
105	3-01-127-14	0.3	1.1
106	3-01-127-11	3.2	11.8
Total		27.1	99.9

Profile 783--Industrial Surface Coating-Solvent Based Paint. From conversations with industrial surface coating manufacturers, it was concluded that the term "paint" is a general word used to categorize surface coatings that would more appropriately be classified as enamels, primers, and lacquers. Therefore, a composite profile was developed for paint from the profiles for enamels, primers, and lacquers. To estimate the relative amounts of enamels, primers, and lacquers that were used in the SOCAB and might be classified as paints, the surveyed facilities from the EIS file and their emission fee data were reviewed. These data provided a detailed breakdown of emissions by coating type. Using the survey results and emission fee data, total emissions for the surveyed facilities were calculated by coating type. These emission totals were: enamel--1003.6 tons/year; primer--356.8 tons/year; lacquer--207.0 tons/year.

The species profile developed for paint was a composite of the profiles for these coatings in proportion to their individual emission totals. The profiles that were used for the composite and their weighting are as follows.

Profile Number and Name	Percent of Composite Profile
711--Composite Lacquer	13.2
712--Composite Primer	22.8
713--Composite Enamel	64.0

Profile 784--Synthetic Rubber Manufacturing-Styrene-Butadiene Rubber. AP-42 (EPA, 1983) contains a discussion of emissions from synthetic rubber manufacturing which states that styrene-butadiene rubber contains less than 45 percent styrene. This report also states that VOC emissions from the various processes are primarily styrene and butadiene. From this information, a rough estimate of the composition of organic gas emissions of synthetic rubber manufacturing was made.

Profile 787--Carbon Black Manufacturing. AP-42 (EPA, 1983) presents a species profile for the main process vent from carbon black manufacturing by the oil furnace process. The oil furnace process accounts for over 90 percent of carbon black manufacturing in the United States, and the majority of emissions from this process come from the main process vent. Therefore, this species profile was assumed to be applicable to general carbon black manufacturing.

6 TASK 4: INVENTORY IMPROVEMENT

PROCEDURES USED TO DEVELOP RECOMMENDATIONS FOR CHANGES TO THE 1979 INVENTORY

This section describes the procedures used to develop recommendations for changes to the 1979 inventory on the basis of new information described in Sections 4 and 5. The first step in developing these recommendations was to review existing information in the Emission Data System (EDS), including turnaround documents (TADs) and summary inventory printouts for the facilities under consideration. The TADs contain a complete set of the information in EDS, whereas the summary inventory printouts are organized by SCC for each facility and contain the following information:*

Device identification number
Permit identification number
Process rate
Process rate units
NO_x emission factor
NO_x emissions
TOG emission factor
TOG emissions

During the initial review of the TADs and summary inventory printouts, data for devices possibly needing revision, such as entries for unspecific SCCs, were identified. In addition, if a SCC for a facility did not appear reasonable considering the SIC code, the appropriate device was identified.

The next step was to compare the existing inventory with other available emission information--primarily that contained in the Task 2 survey responses and the 1979 emission fee data. On the basis of this comparison, changes to the inventory were developed for specific point sources, which in many cases required the development of new SCCs.

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* Some of this information (e.g., permit number and process rate) is not available for devices at all facilities.

Description of Recommended Changes

Study recommendations for changes to the inventory were generated for each facility in a document containing four major sections. The first section of each document contained identifying facility information and the name of a facility contact. This introductory information included

Facility identification number
Company and facility name
Facility location
Name, title, and telephone number of an appropriate individual

The second section, labeled recommended changes, contained instructions for adding, deleting, or modifying data for devices at the facility. The third section, documentation, described the supporting activity data, emission factors, and general approach that were used to calculate the revised emissions. The documentation section was correlated with the recommended changes section through the use of consistent entry numbers. The final section, uncertainties after recommended changes, presented uncertainty codes and associated comments for devices and is discussed in detail later in this section. The facility-specific recommended changes were developed in this manner so that ARB staff would be able to use this information to make corresponding changes to the EDS data base at a later date.

An example of the format and content of the document developed for each facility receiving inventory changes is presented in Exhibit 6-1 for a surface coating facility with relatively low emissions. This facility is only one of the many types of facilities that were surveyed and revised in the inventory. The specific changes recommended for a more representative set of six facilities, together with the summary inventory printouts for these facilities, are presented in this same format in Appendix F.

Development of New SCCs

During the development of inventory changes to individual facilities, we generated and entered SCCs that had not been used before. These new SCCs permitted a more specific identification of certain emission sources at the surveyed facilities, which improved the overall inventory. Better identification of the operations at these facilities through the use of new SCCs resulted in the assignment of more specific speciation profiles, which, in turn, reduced inventory uncertainty. Thus, for each new SCC, either an existing or a new species profile developed for organic gases in this study was assigned. The 148 new SCCs and their assigned profile codes are presented in Table 6-1.

EXHIBIT 6-1.

An Example of the Changes Recommended for a Specific Facility.

Facility ID: "Number"
"Facility Name"

Facility Location:
"Address"

Contact Name:
"Name"
"Title"
"Phone No."

A. Recommended Changes

(1) Delete Device 1 with SCC 4-01-002-99 Organic Solvent-Vapor Degreasing - Open Top - Miscellaneous.
TOG Emissions - 0.0 ton/yr.

(2) Delete Device 2 with SCC 4-02-999-99 Organic Solvent - Surface Coating - Miscellaneous.
TOG Emissions - 1.7 ton/yr.

(3) Add Device 101 with SCC 4-01-002-03 Organic Solvent - Vapor Degreasing - Open Top - Perchloroethylene.
TOG Emissions - 6.1 ton/yr.
Assumed operating hours - 8 hr/day, 5 day/wk, 52 wk/yr.

(4) Add Device 102 with SCC 4-02-001-01 Organic Solvent - Surface Coating - Paint General - Solvent Base Ctng.
TOG Emissions - 0.1 ton/yr.
Assumed operating hours - 8 hr/day, 5 day/wk, 52 wk/yr.

(5) Add Device 102 with SCC 4-02-004-01 Organic Solvent - Surface Coating - Lacquer - General.
TOG Emissions - 0.3 ton/yr.
Assumed operating hours - 8 hr/day, 5 day/wk, 52 wk/yr.

(continued)

EXHIBIT 6-1 (continued)

(6) Add Device 102 with SCC 4-02-005-01 Organic Solvent - Surface Coating - Enamel - General.
TOG Emissions - 4.6 ton/yr.
Assumed operating hours - 8 hr/day, 5 day/wk, 52 wk/yr.

(7) Add Device 102 with SCC 4-02-006-01 Organic Solvent - Surface Coating - Primer - General.
TOG Emissions - 1.3 ton/yr.
Assumed operating hours - 8 hr/day, 5 day/wk, 52 wk/yr.

(8) Add Device 103 with SCC 4-02-009-01 Organic Solvent - Surface Coating - Thinning Solvent - Miscellaneous.
TOG Emissions - 5.5 ton/yr.
Assumed operating hours - 8 hr/day, 5 day/wk, 52 wk/yr.

(9) Add Device 103 with SCC 4-02-009-06 Organic Solvent - Surface Coating - Thinning Solvent - Cellosolve.
TOG Emissions - 1.4 ton/yr.
Assumed operating hours - 8 hr/day, 5 day/wk, 52 wk/yr.

(10) Add Device 103 with SCC 4-02-009-22 Organic Solvent - Surface Coating - Thinning Solvent - Toluene.
TOG Emissions - 1.8 ton/yr.
Assumed operating hours - 8 hr/day, 5 day/wk, 52 wk/yr.

B. Documentation

(1) This device was deleted to allow for more specific identification of each solvent that was used in vapor degreasing in 1979.

(2) This device was deleted to allow for more specific identification of each solvent that was used in surface coating in 1979.

(3) 1979 usage of perchlorethylene comes from questionnaire responses.
An emission factor of 13.5 lb/gal was taken from SCAQMD, Fee Form B-3, Emission Factor Table.
(898 gal/yr) (13.5 lb/gal) (1 ton/2000 lb) = 6.1 ton/yr.

(4) 1979 usage of epoxy enamel comes from questionnaire responses.
An emission factor of 5.5 lb/gal was taken from SCAQMD, Fee Form B-3, Emission Factor Table.
(33 gal/yr) (5.5 lb/gal) (1 ton/2000 lb) = 0.1 ton/yr.

(continued)

EXHIBIT 6-1 (concluded)

(5) 1979 usage of polyurethane comes from questionnaire responses.
An emission factor of 5.2 lb/gal was taken from SCAQMD, Fee Form B-3, Emission Factor Table.
(129 gal/yr) (5.2 lb/gal) (1 ton/2000 lb) = 0.3 ton/yr.

(6) 1979 usage of enamel comes from questionnaire responses.
An emission factor of 4.5 lb/gal was taken from SCAQMD, Fee Form B-3, Emission Factor Table.
(2029 gal/yr) (4.5 lb/gal) (1 ton/2000 lb) = 4.6 ton/yr.

(7) 1979 usage of primer comes from questionnaire responses.
An emission factor of 5.0 lb/gal was taken from SCAQMD, Fee Form B-3, Emission Factor Table.
(519 gal/yr) (5.0 lb/gal) (1 ton/2000 lb) = 1.3 ton/yr.

(8) 1979 usage of RhoSolv 703 & RhoSolv 778 comes from questionnaire responses.
An emission factor of 7.0 lb/gal was taken from SCAQMD, Fee Form B-3, Emission Factor Table.
(770 gal/yr) (7.0 lb/gal) (1 ton/2000 lb) = 2.7 ton/yr;
(787 gal/yr) (7.0 lb/gal) (1 ton/2000 lb) = 2.8 ton/yr.
Total 5.5 ton/yr.

(9) 1979 usage of butyl cellosolve comes from questionnaire responses.
An emission factor of 7.5 lb/gal was taken from SCAQMD, Fee Form B-3, Emission Factor Table.
(365 gal/yr) (7.5 lb/gal) (1 ton/2000 lb) = 1.4 ton/yr.

(10) 1979 usage of toluene comes from questionnaire responses.
An emission factor of 7.2 lb/gal was taken from SCAQMD, Fee Form B-3, Emission Factor Table.
(495 gal/yr) (7.2 lb/gal) (1 ton/2000 lb) = 1.8 ton/yr.

C. Uncertainties After Recommended Changes

Device(s)	Uncertainty Code(s)	Comments
101-108	42	
101-108	1	Usage has been extrapolated from 1982 data
102	34	Made up of epoxy enamel
103	34	Consists of polyurethane
107	34	Consists of butyl cellosolve

TABLE 6-1. New source classification codes developed in this study.

SCC Code	Profile Code	Description of SCC
10200405	504	EXT COMB BOILER-INDUSTRIAL-RESIDUAL OIL-NOT CLASSIFIED
10200604	3	EXT COMB BOILER-INDUSTRIAL-NATURAL GAS-NOT CLASSIFIED
10300604	3	EXT COMB BOILER-COMMERCIAL/INSTITUTIONAL-NATURAL GAS-NOT CLASSIFIED
30100920	761	CHEMICAL MFG-SOAP/DETERGENTS-PETROLEUM SULFONATE-GENERAL PROCESS
30100921	31	CHEMICAL MFG-SOAP/DETERGENTS-PETROLEUM SULFONATE-WASTEWATER TREATMENT
30100922	761	CHEMICAL MFG-SOAP/DETERGENTS-PETROLEUM SULFONATE-VALVES,PUMPS,ETC
30101403	783	CHEMICAL MFG-PAINT MFG-RESIN PRODUCT-GENERAL
30101404	196	CHEMICAL MFG-PAINT MFG-ARCHITECTURAL COATING
30101405	783	CHEMICAL MFG-PAINT MFG-INDUSTRIAL COATING
30101511	66	CHEMICAL MFG-VARNISH MFG- RESIN REACTOR
30101818	751	CHEMICAL MFG. - PLASTICS PRODUCTION-ABS RESIN-GENERAL
30101819	752	CHEMICAL MFG. - PLASTICS PRODUCTION-POLYSTYRENE FOAM-BLOWING
30101861	510	CHEMICAL MFG-PLASTIC PRODUCTION-POLYVINYL CHLORIDE-VALVES,PUMPS,ETC
30101862	505	CHEMICAL MFG-PLASTICS PRODUCTION-UNSPEC. RESIN-VALVES,PUMPS,ETC
30112505	78	CHEMICAL MFG-ORGANIC CHEMICALS-ETHYLENE DICHLORIDE-VALVES,PUMPS,ETC
30112702	764	CHEMICAL MFG-ORGANIC CHEMICALS-FLUOROCARBON - 12/11
30112703	765	CHEMICAL MFG-ORGANIC CHEMICALS-FLUOROCARBON - 23/22
30112704	766	CHEMICAL MFG-ORGANIC CHEMICALS-FLUOROCARBON - 113/114
30112711	770	CHEMICAL MFG-ORGANIC CHEM.-FLUOROCARBON PACKAGING-MISC FLUOROCARBONS
30112712	767	CHEMICAL MFG-ORGANIC CHEM.-FLUOROCARBON PACKAGING-FLUOROCARBONS 11
30112713	768	CHEMICAL MFG-ORGANIC CHEM.-FLUOROCARBON PACKAGING-FLUOROCARBONS 113
30112714	769	CHEMICAL MFG-ORGANIC CHEM.-FLUOROCARBON PACKAGING-FLUOROCARBONS 114
30112721	773	CHEMICAL MFG-ORGANIC CHEM.-FLUOROCARBONS-VALVES,PUMPS,ETC
30113215	219	CHEMICAL MFG-ORGANIC CHEMICALS-ORGANIC ACIDS PRODUCT W/ ACETONE
30125901	600	CHEMICAL MFG-ORGANIC CHEMICALS-AUTO SPECIALTY PRODUCTS-MIXING TANKS
30125902	600	CHEMICAL MFG-ORGANIC CHEMICALS-AUTO SPECIALTY PRODUCTS-VALVES,PUMPS,ETC
30601501	600	PETROLEUM INDUSTRY-PETROLEUM REFINING-SULFUR PLANT-TAIL GAS VENTS
30800601	784	RUBBER/PLASTICS-RUBBER PRODUCT-SYNTHETIC RUBBER-BLENDING
31000101	758	OIL AND GAS PROD.-CRUDE OIL PRODUCTION-VALVES-UNSPECIFIED SERVICE
31000102	757	OIL AND GAS PROD.-CRUDE OIL PRODUCTION-VALVES-GAS SERVICE
31000103	756	OIL AND GAS PROD.-CRUDE OIL PRODUCTION-VALVES-LIQUID SERVICE
31000104	759	OIL AND GAS PROD.-CRUDE OIL PRODUCTION-FITTINGS-UNSPECIFIED SERVICE
31000105	757	OIL AND GAS PROD.-CRUDE OIL PRODUCTION-FITTINGS-GAS SERVICE
31000106	756	OIL AND GAS PROD.-CRUDE OIL PRODUCTION-FITTINGS-LIQUID SERVICE
31000107	756	OIL AND GAS PROD.-CRUDE OIL PRODUCTION-PUMP SEALS
31000108	757	OIL AND GAS PROD.-CRUDE OIL PRODUCTION-COMPRESSOR SEALS
31000109	757	OIL AND GAS PROD.-CRUDE OIL PROD-PRESSURE RELIEF VALVES-NO RUPTURE DISCS.
31000111	756	OIL AND GAS PROD.-CRUDE OIL PRODUCTION-WELL HEADS
31000121	296	OIL AND GAS PROD.-CRUDE OIL PRODUCTION-WELL CELLARS
31000122	296	OIL AND GAS PROD.-CRUDE OIL PRODUCTION-SUMPS AND PITS
31000131	31	OIL AND GAS PROD.-CRUDE OIL PROD-MECHANICAL OIL/WATER SEPARATORS
31000141	600	OIL AND GAS PROD.-CRUDE OIL PRODUCTION-FIREFLOOD
31000142	31	OIL AND GAS PROD.-CRUDE OIL PRODUCTION-OIL/WATER SEPARATION
31000203	756	OIL AND GAS PRODN.-NATURAL GAS PRODN-VALVES-LIQUID SERVICE
31000204	759	OIL AND GAS PRODN.-NATURAL GAS PRODN-FITTINGS-UNSPECIFIED SERVICE

TABLE 6-1 (continued)

SCC Code	Profile Code	Description of SCC
31000205	757	OIL AND GAS PRODN.-NATURAL GAS PRODN-FITTINGS-GAS SERVICE
31000206	756	OIL AND GAS PRODN.-NATURAL GAS PRODN-FITTINGS-LIQUID SERVICE
31000207	756	OIL AND GAS PRODN.-NATURAL GAS PRODN-PUMP SEALS
31000208	757	OIL AND GAS PRODN.-NATURAL GAS PRODN-COMPRESSOR SEALS
31000209	757	OIL AND GAS PRODN.-NATURAL GAS PRODN-PRES RELIEF VALVES-NO RUPTURE DISCS
31000211	757	OIL AND GAS PRODN.-NATURAL GAS PRODN-WELL HEADS
40100208	221	ORGANIC SOLVENT-VAPOR DEGREASING-OPEN TOP-METHYLETHTYLKETONE (MEK)
40100209	754	ORGANIC SOLVENT-VAPOR DEGREASING-OPEN TOP-CHLOROSOLVE
40100210	506	ORGANIC SOLVENT-VAPOR DEGREASING-OPEN TOP-UNSPECIFIED HALOGENATED SOLVENTS
40100307	86	ORGANIC SOLVENT-COLD CLEANING-STODDARD SOLVENT
40200111	783	ORGANIC SOLVENT-SURFACE COATING-PAINT-POLYVINYL CHLORIDE
40200927	230	ORGANIC SOLVENT-SURFACE COATING-THINNING SOLVENT-HEXANE
40200928	512	ORGANIC SOLVENT-SURFACE COATING-THINNING SOLVENT-METHYLENE CHLORIDE
40200929	718	ORGANIC SOLVENT-SURFACE COATING-THINNING SOLVENT-LACQUER THINNER
40200930	87	ORGANIC SOLVENT-SURFACE COATING-THINNING SOLVENT- 1,1,1-TRICHLOROETHANE
40200931	782	ORGANIC SOLVENT-SURFACE COATING-THINNING SOLVENT-HEXYLENE GLYCOL
40200932	301	ORGANIC SOLVENT-SURFACE COATING-THINNING SOLVENT-HEPTANE
40200933	785	ORGANIC SOLVENT-SURFACE COATING-THINNING SOLVENT-ETHYLENE OXIDE
40202601	753	ORGANIC SOLVENT-SURFACE COATING-RESINS-FIBERGLASS RESIN
40202602	753	ORGANIC SOLVENT-SURFACE COATING-RESINS-GEL COAT
40300117	753	STORAGE-FIXED ROOF TANKS-BREATHING LOSS-STYRENE
40300118	219	STORAGE-FIXED ROOF TANKS-BREATHING LOSS-ACETONE
40300119	221	STORAGE-FIXED ROOF TANKS-BREATHING LOSS-METHYLETHYLKETONE (MEK)
40300120	31	STORAGE-FIXED ROOF TANKS-BREATHING LOSS-RECOVERED OIL
40300121	760	STORAGE-FIXED ROOF TANKS-BREATHING LOSS-FUEL OIL
40300122	761	STORAGE-FIXED ROOF TANKS-BREATHING LOSS-LIGHT NAPHTHA
40300123	760	STORAGE-FIXED ROOF TANKS-BREATHING LOSS-TURBINE FUEL
40300124	761	STORAGE-FIXED ROOF TANKS-BREATHING LOSS-GAS FUEL
40300125	78	STORAGE-FIXED ROOF TANKS-BREATHING LOSS-ETHYLENE DICHLORIDE
40300126	762	STORAGE-FIXED ROOF TANKS-BREATHING LOSS-BTX
40300127	771	STORAGE-FIXED ROOF TANKS-BREATHING LOSS-CARBON TETRACHLORIDE
40300128	772	STORAGE-FIXED ROOF TANKS-BREATHING LOSS-ORTHO-XYLENE
40300129	716	STORAGE-FIXED ROOF TANKS-BREATHING LOSS-ASPHALT
40300130	761	STORAGE-FIXED ROOF TANKS-BREATHING LOSS-NAPHTHA
40300131	271	STORAGE-FIXED ROOF TANKS-BREATHING LOSS-TRICHLOROETHYLENE
40300132	289	STORAGE-FIXED ROOF TANKS-BREATHING LOSS- SEC-BUTYL ALCOHOL
40300133	786	STORAGE-FIXED ROOF TANKS-BREATHING LOSS- METHANOL
40300162	753	STORAGE-FIXED ROOF TANKS-WORKING LOSS-STYRENE
40300163	219	STORAGE-FIXED ROOF TANKS-WORKING LOSS-ACETONE
40300164	221	STORAGE-FIXED ROOF TANKS-WORKING LOSS-METHYLETHYLKETONE (MEK)
40300165	31	STORAGE-FIXED ROOF TANKS-WORKING LOSS-RECOVERED OIL
40300166	760	STORAGE-FIXED ROOF TANKS-WORKING LOSS-FUEL OIL
40300167	761	STORAGE-FIXED ROOF TANKS-WORKING LOSS-LIGHT NAPHTHA
40300168	760	STORAGE-FIXED ROOF TANKS-WORKING LOSS-TURBINE FUEL
40300169	761	STORAGE-FIXED ROOF TANKS-WORKING LOSS-GAS FUEL

TABLE 6-1 (continued)

SCC Code	Profile Code	Description of SCC
40300170	78	STORAGE-FIXED ROOF TANKS-WORKING LOSS-ETHYLENE DICHLORIDE
40300171	762	STORAGE-FIXED ROOF TANKS-WORKING LOSS-BTX
40300172	771	STORAGE-FIXED ROOF TANKS-WORKING LOSS-CARBON TETRACHLORIDE
40300173	772	STORAGE-FIXED ROOF TANKS-WORKING LOSS-ORTHO-XYLENE
40300174	716	STORAGE-FIXED ROOF TANKS-WORKING LOSS-ASPHALT
40300175	761	STORAGE-FIXED ROOF TANKS-WORKING LOSS-NAPHTHA
40300176	271	STORAGE-FIXED ROOF TANKS-WORKING LOSS-TRICHLOROETHYLENE
40300177	289	STORAGE-FIXED ROOF TANKS-WORKING LOSS- SEC-BUTYL ALCOHOL
40300178	786	STORAGE-FIXED ROOF TANKS-WORKING LOSS- METHANOL
40300220	31	STORAGE-FLOATING ROOF TANKS-STANDING LOSS-RECOVERED OIL
40300221	760	STORAGE-FLOATING ROOF TANKS-STANDING LOSS-FUEL OIL
40300222	761	STORAGE-FLOATING ROOF TANKS-STANDING LOSS-LIGHT NAPHTHA
40300223	760	STORAGE-FLOATING ROOF TANKS-STANDING LOSS-TURBINE FUEL
40300224	761	STORAGE-FLOATING ROOF TANKS-STANDING LOSS-GAS OIL
40300230	710	STORAGE-FLOATING ROOF TANKS-STANDING LOSS-AVGAS.
40300250	100	STORAGE-FLOATING ROOF TANKS-WORKING LOSS-JET FUEL
40300251	761	STORAGE-FLOATING ROOF TANKS-WORKING LOSS-KEROSENE
40300252	760	STORAGE-FLOATING ROOF TANKS-WORKING LOSS-DISTILLATE FUEL
40300265	31	STORAGE-FLOATING ROOF TANKS-WORKING LOSS-RECOVERED OIL
40300266	760	STORAGE-FLOATING ROOF TANKS-WORKING LOSS-FUEL OIL
40300267	761	STORAGE-FLOATING ROOF TANKS-WORKING LOSS-LIGHT NAPHTHA
40300268	760	STORAGE-FLOATING ROOF TANKS-WORKING LOSS-TURBINE FUEL
40300269	761	STORAGE-FLOATING ROOF TANKS-WORKING LOSS-GAS OIL
40300275	710	STORAGE-FLOATING ROOF TANKS-WORKING LOSS-AVGAS.
40300298	297	STORAGE-FLOATING ROOF TANKS-STANDING LOSS-NOT CLASSIFIED
40300474	127	STORAGE-UNDERGROUND TANKS-WORKING LOSS-VARNISH
40399901	600	STORAGE-TANK CLEANING-NOT CLASSIFIED
40400121	600	BULK TERMINALS-STORAGE-ORGANIC CHEMICAL-UNSPECIFIED
40400122	220	BULK TERMINALS-STORAGE-FIXED ROOF-ETHYL ACETATE
40400123	774	BULK TERMINALS-STORAGE-FIXED ROOF-ISOBUTYL ACETATE
40400124	775	BULK TERMINALS-STORAGE-FIXED ROOF-ISOBUTYL ALCOHOL
40400125	776	BULK TERMINALS-STORAGE-FIXED ROOF-ISOBUTYL ISOBUTYRATE
40400126	228	BULK TERMINALS-STORAGE-FIXED ROOF-ISOPROPYL ACETATE
40400127	777	BULK TERMINALS-STORAGE-FIXED ROOF-METHYL AMYL KETONE
40400128	778	BULK TERMINALS-STORAGE-FIXED ROOF-METHYL ISOBUTYL KETONE
40400129	779	BULK TERMINALS-STORAGE-FIXED ROOF- N-BUTYL ACETATE
40400130	289	BULK TERMINALS-STORAGE-FIXED ROOF- N-BUTYL ALCOHOL
40400131	780	BULK TERMINALS-STORAGE-FIXED ROOF- N-PROPYL ACETATE
40400132	781	BULK TERMINALS-STORAGE-FIXED ROOF- N-PROPYL ALCOHOL
40400136	514	BULK TERMINAL-STORAGE TANK-FIXED ROOF-LUBE OILS
40400137	760	BULK TERMINAL-STORAGE TANK-FIXED ROOF-DIST. FUEL
40400138	760	BULK TERMINAL-STORAGE TANK-FIXED ROOF-FUEL OIL
40400161	31	BULK TERMINALS-MISCELLANEOUS-SUMPS AND PITS
40400162	31	BULK TERMINALS-MISCELLANEOUS-MECHANICAL OIL/WATER SEPARATORS
40400233	100	BULK PLANTS-STORAGE-FIXED ROOF-JET FUEL

TABLE 6-1 (concluded)

SCC Code	Profile Code	Description of SCC
40400234	761	BULK PLANTS-STORAGE-FIXED ROOF-KEROSENE
40400235	710	BULK PLANTS-STORAGE-FIXED ROOF-GASOLINE
40400236	760	BULK PLANTS-STORAGE-FIXED ROOF-LUBE OILS
40400261	31	BULK PLANTS-MISCELLANEOUS-SUMPS AND PITS
40400262	31	BULK PLANTS-MISCELLANEOUS-MECHANICAL OIL/WATER SEPARATORS
40400285	710	BULK PLANTS-STORAGE-FLOATING ROOF- GASOLINE
40400399	296	OIL AND GAS PRODUCTION-CRUDE OIL STORAGE-UNSPECIFIED
40600111	78	PETROLEUM MARKETING-TANK CARS/TRUCKS-ETHYLENE DICHLORIDE-SUBMERGED LOADING
40600206	760	PETROLEUM MARKETING-MARINE VESSELS-FUEL OIL-LOADING
40600207	762	PETROLEUM MARKETING-MARINE VESSELS-BTX-LOADING
40700151	600	CHEMICAL MARKETING-MISCELLANEOUS-VALVES,FLANGES,PUMPS
40700201	85	CHEMICAL MARKETING-TANK CARS/TRUCKS-SUBMERGED LOADING-PERCHLOROETHYLENE
40700202	87	CHEMICAL MARKETING-TANK CARS/TRUCKS-SUBMERGED LOADING-1,1,1-TRICHLOROETHANE

Assignment of New Profiles to Existing SCCs

This study resulted in many new TOG speciation profiles. To fully benefit from this improved data set, the original assignment of species profiles to existing SCCs was reviewed to determine if more appropriate profiles were available. As a result, the existing SCCs and CESs shown in Table 6-2 were assigned new species profiles.

Revision of the MED Inventory

Several procedures were followed in making the actual revisions to the MED files. An important consideration was the conversion to kilograms per hour (kg/hr) of the emission rates presented in tons per year (tons/yr) in the documents developed for facilities receiving inventory changes. The equation we used followed the ARB procedure for converting point source EDS data (tons/yr) to the MED format (kg/hr) for a summer weekday (Johns, 1983).

$$\text{kg/hr} = \text{tons/yr}\ \frac{(\text{fraction for July})\ (\text{fraction for Thursday})\ (907.1848\ \text{kg/ton})}{(\text{hours/day})\qquad\qquad (\text{weeks/month})}$$

where

Fraction for July = fraction of emissions occurring in July;

Fraction for Thursday = 1/number of days per week of operation, in most cases;

Hours per day = end hour - begin hour + 1, for source operations;

Weeks per month = 4.345

Information on seasonal operations for individual facilities was limited. Therefore, the fraction for July equaled 1/12 during the conversion process. The fraction for Thursday used the ARB convention as follows:

TABLE 6-2. Existing SCCs and CESs assigned new species profiles.

SCC Code	Old Profile	New Profile	Description of SCC
20100201	7	719	INTERNAL COMBUSTION-ELEC GEN- NATURAL GAS-TURBINE
20100202	10	719	INTERNAL COMBUSTION-ELEC GEN- NATURAL GAS-RECIPROCATING
20200201	7	719	INTERNAL COMBUSTION-INDUSTRIAL-NATURAL GAS-TURBINE
20200202	10	719	INTERNAL COMBUSTION-INDUSTRIAL-NATURAL GAS-RECIPROCATING
20200802	10	719	INTERNAL COMBUSTION-INDUSTRIAL-NATURAL GAS- RECIPROCATING
20299997	10	719	INTERNAL COMBUSTION-GASEOUS MATERIAL COMBUSTION
20300201	10	719	INTERNAL COMBUSTION-COMM/INSTIT-NATURAL GAS-RECIPROCATING
20400301	7	719	INTERNAL COMBUSTION-ENGINE TESTING-TURBINE-NATURAL GAS
30100501	600	787	CHEMICAL MFG- CARBON BLACK-CHANNEL PROCESS
30100502	600	787	CHEMICAL MFG- CARBON BLACK-THERMAL PROCESS
30100503	600	787	CHEMICAL MFG- CARBON BLACK-FURNACE PROC GAS-MAIN PROCESS VENT
30100504	600	787	CHEMICAL MFG- CARBON BLACK- FURNACE PROCESS OIL- VENT
30100505	600	787	CHEMICAL MFG- CARBON BLACK- FURNACE PROCESS GAS/OIL
30100506	600	787	CHEMICAL MFG- CARBON BLACK-TRANSPORT AIR VNT
30100507	600	787	CHEMICAL MFG- CARBON BLACK-PELLET DRYER
30100508	600	787	CHEMICAL MFG- CARBON BLACK-BAGGING/LOADING
30100509	600	787	CHEMICAL MFG- CARBON BLACK-FURNACE PROCESS-FUGITIVE EMISSION
30100599	600	787	CHEMICAL MFG- CARBON BLACK-OTHER/NOT CLASIFD-**
30101401	125	783	CHEMICAL MFG- GENERAL PAINTS- MIXING/HANDLING
30101402	125	783	CHEMICAL MFG-IND PROC-PAINT MFG-PIGMENT KILN
30101499	125	783	CHEMICAL MFG- GENERAL PAINTS- UNCLASSIFIED
30101817	600	752	CHEMICAL MFG-PLAST PRODN-POLYSTYRENE-GENERAL
30101837	600	753	CHEMICAL MFG- POLYESTER RESINS
30101901	600	763	CHEMICAL MFG-ORGAN CHEM-PHTHALIC ANHYDRID-XYLENE OXDN-RXR
30101902	600	763	CHEMICAL MFG-ORGAN CHEM-PHTHALIC ANHYDRID-XYLENE OXDN-TREAT
30101903	600	763	CHEMICAL MFG- PHTHALIC ANHYDRIDE- UNCONTROLLED
30101904	600	763	CHEMICAL MFG-ORGAN CHEM-PHTHALIC ANHYDRID-NAPTLN OXDN-DISTN
30101905	600	763	CHEMICAL MFG-ORGAN CHEM-PHTHALIC ANHYDRID-NAPTLN OXDN-RXR
30101906	600	763	CHEMICAL MFG-ORGAN CHEM-PHTHALIC ANHYDRID-NAPTLN OXDN-TREAT
30101907	600	763	CHEMICAL MFG-ORGAN CHEM-PHTHALIC ANHYDRID-NAPTLN OXDN-DISTN
30102699	600	784	CHEMICAL MFG- SYNTHETIC RUBBER
30105001	600	714	CHEMICAL MFG- GENERAL ADHESIVES
31000199	296	758	OIL & GAS PRODUCTION- CRUDE- NOT CLASSIFIED
31000299	520	758	OIL & GAS PRODUCTION- NATURAL GAS- NOT CLASSIFIED
31088801	600	758	OIL & GAS PRODUCTION-FUGITIVE EMIS-NOT CLASSIFIED
40100207	271	755	ORGANIC SOLVENT- DEGREASING- TRICHLOROTRIFLUOROETHANE
40200101	125	783	ORGANIC SOLVENT- COATINGS- PAINT- POLYMERIC HOT AIR DRIED
40200110	125	783	ORGANIC SOLVENT- COATINGS- PAINT- SOLVENT-BASED
40200199	125	783	ORGANIC SOLVENT- COATING- NOT CLASSIFIED(PAINT)
40200201	196	717	ORGANIC SOLVENT- COATING- WATER-BASED PAINT GENERAL
40200210	196	717	ORGANIC SOLVENT- COATING- WATER-BASED PAINT GENERAL
40200401	149	711	ORGANIC SOLVENT- COATING- GENERAL LACQUER
40200410	149	711	ORGANIC SOLVENT- COATING- GENERAL LACQUER
40200499	148	711	ORGANIC SOLVENT- COATING- NOT CLASSIFIED(LAQUER)
40200501	156	712	ORGANIC SOLVENT- COATING- ENAMEL- GENERAL
40200510	156	712	ORGANIC SOLVENT- COATING- ENAMEL- GENERAL

TABLE 6-2 (continued)

SCC Code	Old Profile	New Profile	Description of SCC
40200599	136	712	ORGANIC SOLVENT- COATING- COMPOSITE
40200601	134	713	ORGANIC SOLVENT- COATING- PRIMER- GENERAL
40200610	134	713	ORGANIC SOLVENT- COATING- PRIMER- GENERAL
40200699	136	713	ORGANIC SOLVENT- COATING- COMPOSITE
40200701	141	714	ORGANIC SOLVENT- COATING- ADHESIVE- GENERAL
40200710	142	714	ORGANIC SOLVENT- COATING- ADHESIVE- GENERAL
40200799	136	714	ORGANIC SOLVENT- COATING- COMPOSITE
40200801	136	783	ORGANIC SOLVENT- COATING- OVEN- UNSPECIFIED
40200802	136	783	ORGANIC SOLVENT- COATING- OVEN- <175 F- UNSPECIFIED
40200803	136	783	ORGANIC SOLVENT- COATING- OVEN- >175 F
40200810	136	783	ORGANIC SOLVENT- COATING- OVEN- GENERAL
40200899	136	783	ORGANIC SOLVENT- COATING- OVEN- UNSPECIFIED
40200911	98	710	ORGANIC SOLVENT-SRFC COATING-THINNING SOLVENT-GASOLINE
40300101	98	710	PETRO STORAGE- GASOLINE- FIXED ROOF TANK- BREATHING LOSS
40300103	98	710	PETRO STORAGE- GASOLINE- FIXED ROOF TANK- WORKING LOSS
40300107	514	760	PETRO STORAGE- DIST OIL - FIXED ROOF TANK- BREATHING LOSS
40300152	514	760	PETRO STORAGE- DIST OIL- FIXED ROOF TANK- WORKING LOSS
40300201	98	710	PETRO STORAGE- GASOLINE- FLOATING ROOF- STANDING LOSS
40300202	98	710	PETRO STORAGE- GASOLINE- FLOATING ROOF- WORKING LOSS
40300207	514	760	PETRO STORAGE- DISTILLATE OIL- FLOATING ROOF- STANDING LOSS
40300302	98	710	PETRO STORAGE- GASOLINE- VAR VAPOR SPACE- WORKING LOSS
40300305	514	760	PETRO STORAGE- DIST OIL- VAR VAPOR SPACE- WORKING LOSS
40301001	98	710	PETRO STORAGE-FIXED ROOF TNKS-GAS-RVP 13-67K BBL-BREATHING
40301002	98	710	PETRO STORAGE-FIXED ROOF TNKS-GAS-RVP 10-67K BBL-BREATHING
40301003	98	710	PETRO STORAGE-FIXED ROOF TNKS-GAS-RVP 7-67K BBL-BREATHING
40301004	98	710	PETRO STORAGE-FIXED ROOF TNKS-GAS-RVP 13-250K BBL-BREATHNG
40301005	98	710	PETRO STORAGE-FIXED ROOF TNKS-GAS-RVP 10-250K BBL-BREATHNG
40301006	98	710	PETRO STORAGE-FIXED ROOF TNKS-GAS-RVP 7-250K BBL-BREATHNG
40301007	98	710	PETRO STORAGE-FIXED ROOF TNKS-GAS-RVP 13-WORKING LOSS
40301008	98	710	PETRO STORAGE- GASOLINE RVP10- FIXED ROOF- WORKING LOSS
40301009	98	710	PETRO STORAGE-FIXED ROOF TNKS-GAS-RVP 7-WORKING LOSS
40301019	514	760	PETRO STORAGE- DIST #2- FIXED ROOF- 67K BBL-BREATHING
40301020	514	760	PETRO STORAGE- DIST #2- FIXED ROOF- 250K BBL-BREATHING
40301021	514	760	PETRO STORAGE- DIST #2- FIXED ROOF- WORKING LOSS
40301101	98	710	PETRO STORAGE-FLOAT ROOF TNKS-GAS-RVP 13-67K BBL-STAND LOS
40301102	98	710	PETRO STORAGE- GASOLINE STORAGE LOSS
40301103	98	710	PETRO STORAGE-FLOAT ROOF TNKS-GAS-RVP 7-67K BBL-STAND LOS
40301104	98	710	PETRO STORAGE-FLOAT ROOF TNKS-GAS-RVP 13-250K BBL-STAND LS
40301105	98	710	PETRO STORAGE- GASOLINE RVP10- FLOATING- 250K BBL STANDING LOSS
40301106	98	710	PETRO STORAGE-FLOAT ROOF TNKS-GAS-RVP 7-250K BBL-STAND LS
40301107	98	710	PETRO STORAGE-FLOAT ROOF TNKS-GAS-RVP 13-67K BBL- WITHDRAW
40301108	98	710	PETRO STORAGE- GASOLINE RVP13/10/7- FLOATING- 250K BBL WITHDRAWAL
40301115	514	760	PETRO STORAGE- DIST #2- FLOATING- 67K BBL STANDING LOSS
40301116	514	760	PETRO STORAGE- DIST #2- FLOATING- 250 K BBL STANDING LOSS
40301120	514	760	PETRO STORAGE-FLOAT ROOF TNKS-DIST.OIL #2-WITHDRAWAL LOSS
40301131	98	710	PETRO STORAGE-FLOAT ROOF TNKS-EXTNL-PRMRY SEAL-GAS

TABLE 6-2 (continued)

SCC Code	Old Profile	New Profile	Description of SCC
40301135	514	760	PETRO STORAGE-FLOAT ROOF TNKS-EXTNL-PRMRY SEAL-DIST.OIL #2
40301141	98	710	PETRO STORAGE-FLOAT ROOF TNKS-EXTNL-SCDRY SEAL-GAS
40301145	514	760	PETRO STORAGE-FLOAT ROOF TNKS-EXTNL-SCDRY SEAL-DIST.OIL #2
40301151	98	710	PETRO STORAGE-FLOAT ROOF TNKS-INTERN ROOF-GAS
40301155	514	760	PETRO STORAGE-FLOAT ROOF TNKS-INTERN ROOF-DIST. OIL #2
40301201	98	710	PETRO STORAGE- GASOLINE RVP13- VAR VAPOR SPACE- FILLING LOSS
40301202	98	710	PETRO STORAGE-VAR.VAPOR SP.TNKS-GAS-RVP 10-FILLING LOSS
40301203	98	710	PETRO STORAGE-VAR.VAPOR SP.TNKS-GAS-RVP 7-FILLING LOSS
40301206	514	760	PETRO STORAGE-VAR.VAPOR SP.TNKS-DIST FUEL #4-FILLING LOSS
40400101	98	710	BULK TERMINALS-FIXED ROOF TNKS-GAS-RVP 13-67K BBL-BREATHING
40400102	98	710	BULK TERMINALS- GASOLINE RVP10- FIXED ROOF- 67K BBL BREATHING LOSS
40400103	98	710	BULK TERMINALS-FIXED ROOF TNKS-GAS-RVP 7-67K BBL-BREATHING
40400104	98	710	BULK TERMINALS-FIXED ROOF TNKS-GAS-RVP 13-250K BBL-BREATHNG
40400105	98	710	BULK TERMINALS-FIXED ROOF TNKS-GAS-RVP 10-250K BBL-BREATHNG
40400106	98	710	BULK TERMINALS-FIXED ROOF TNKS-GAS-RVP 7-250K BBL-BREATHNG
40400107	98	710	BULK TERMINALS-FIXED ROOF TNKS-GAS-RVP 13-WORKING LOSS
40400108	98	710	BULK TERMINALS- GASOLINE RVP10- FIXED ROOF- WORKING LOSS
40400109	98	710	BULK TERMINALS-FIXED ROOF TNKS-GAS-RVP 7-WORKING LOSS
40400110	98	710	BULK TERMINALS-FLOAT ROOF TNKS-GAS-RVP 13-67K BBL-STAND LOS
40400111	98	710	BULK TERMINALS- GASOLINE RVP10- FLOATING- 67K BBL STANDING LOSS
40400112	98	710	BULK TERMINALS- GASOLINE RVP7- FLOATING- 67K BBL STANDING LOSS
40400113	98	710	BULK TERMINALS-FLOAT ROOF TNKS-GAS-RVP 13-250K BBL-STAND LS
40400114	98	710	BULK TERMINALS- GASOLINE RVP10- FLOATING- 250K BBL STANDING LOSS
40400115	98	710	BULK TERMINALS-FLOAT ROOF TNKS-GAS-RVP 7-250K BBL-STAND LS
40400116	98	710	BULK TERMINALS- GASOLINE RVP13/10/7- FLOATING- 67K BBL WITHDRAWAL
40400117	98	710	BULK TERMINALS- GASOLINE RVP13/10/7- FLOATING- 250K BBL WITHDRAWAL
40400118	98	710	BULK TERMINALS-VAR.VAPOR SP.TNKS-GAS-RVP 13-10.5K BBL-FILL LS
40400119	98	710	BULK TERMINALS-VAR.VAPOR SP.TNKS-GAS-RVP 10-10.5K BBL-FILL LS
40400120	98	710	BULK TERMINALS-VAR.VAPOR SP.TNKS-GAS-RVP 7-10.5K BBL-FILL LS
40400151	98	710	BULK TERMINALS-MISC-LEAKS FROM VALVES-FLANGES & PUMPS
40400154	98	710	BULK TERMINALS-MISC-TANK TRUCK VAPOR-LEAKS
40400250	98	710	BULK PLANTS-MISC-LOADING RACKS
40600101	98	710	PETRO MARKETING- GASOLINE LOADING- TANK CARS/TRUCKS
40600105	514	760	PETRO MARKETING- DIST OIL- TANK TRUCKS- LOADING
40600126	98	710	PETRO MARKETING- GASOLINE- TANK TRUCKS- SUBMERGED LOADING
40600130	514	760	PETRO MARKETING- DIST OIL- TANK TRUCKS- SUBMERGED LOADING
40600131	98	710	PETRO MARKETING- GASOLINE- TANK TRUCKS- SUBMERGED LOADING
40600135	514	760	PETRO MARKETING- DIST OIL- TANK TRUCKS- SUBMERGED LOADING
40600136	98	710	PETRO MARKETING- GASOLINE- TANK TRUCKS- SPLASH LOADING
40600140	514	760	PETRO MARKETING-TNK CARS/TRKS-DIST OIL-SPLASH-LOAD-NORMAL SCV
40600141	98	710	PETRO MARKETING-TNK CARS/TRKS-GAS-SBMRG-LOAD-BALANCE SVC
40600144	98	710	PETRO MARKETING-TNK CARS/TRKS-GAS-SPLASH-LOAD-BALANCE SCV
40600147	98	710	PETRO MARKETING-TNK CARS/TRKS-GASOLINE-SBMRG-LOAD-CLEAN TANK
40600151	98	710	PETRO MARKETING- GASOLINE- TANK TRUCKS- UNLOADING
40600155	514	760	PETRO MARKETING-TNK CARS/TRKS-DIST OIL-UNLOAD **
40600161	514	760	PETRO MARKETING-TNK CARS/TRKS-DIST OIL-SBMRG-LOAD-CLEAN-TANK

TABLE 6-2 (continued)

SCC Code	Old Profile	New Profile	Description of SCC
40600162	98	710	PETRO MARKETING-TNK CARS/TRKS-GAS-TRANSIT-LOADED W/ FUEL
40600163	98	710	PETRO MARKETING-TNK CARS/TRKS-GAS-TRANSIT-LOADED W/ VAPOR
40600201	98	710	PETRO MARKETING- GASOLINE- MARINE VESSELS- LOADING
40600205	514	760	PETRO MARKETING- DIST OIL- MARINE VESSELS- LOADING
40600226	98	710	PETRO MARKETING-MARINE VESSELS-GASOLINE-UNLOADING **
40600230	514	760	PETRO MARKETING-MARINE VESSELS-DISTIL OIL-UNLOADING **
40600231	98	710	PETRO MARKETING-MARINE VESSELS-GAS SHIP-CLEAN TANK
40600232	98	710	PETRO MARKETING-MARINE VESSELS-GAS BARGE-LOADING
40600233	98	710	PETRO MARKETING-MARINE VESSELS-GAS BARGE-CLEAN TANK
40600234	98	710	PETRO MARKETING-MARINE VESSELS-GAS SHIP-LOADING-BALLASTED
40600235	98	710	PETRO MARKETING-MARINE VESSELS-GAS BARGE-LOADING-BALLASTED
40600236	98	710	PETRO MARKETING-MARINE VESSELS-GAS SHIP-UNCLEAN TANK
40600237	98	710	PETRO MARKETING-MARINE VESSELS-GAS BARGE-UNCLEAN TANK
40600238	98	710	PETRO MARKETING-MARINE VESSELS-GAS BARGE-UNCLEAN TANK
40600239	98	710	PETRO MARKETING-MARINE VESSELS-GAS SHIP-AVERAGE TAAK
40600240	98	710	PETRO MARKETING-MARINE VESSELS-GAS BARGE-AVERAGE TANK
40600241	98	710	PETRO MARKETING-MARINE VESSELS-GAS TANKER-BALLASTING
40600242	98	710	PETRO MARKETING-MARINE VESSELS-GAS-TANKER
40600246	514	760	PETRO MARKETING-MARINE VESSELS-DIST OIL TANKER-LOADING
40600251	514	760	PETRO MARKETING-MARINE VESSELS-DIST OIL TANKER-LOADING
40600257	514	760	PETRO MARKETING-MARINE VESSELS-DISTIL OIL-TRANSIT LOSS
40600301	98	710	PETRO MARKETING-SERVICE STATIONS-STAGE I-SPLASH FILLING
40600302	98	710	PETRO MARKETING- GASOLINE- SERVICE STATIONS- SUBMERGED FILL
40600303	98	710	PETRO MARKETING- GASOLINE- STATION TANKS- SUBMERGED LOADING
40600304	98	710	PETRO MARKETING- GASOLINE- STATION TANKS- SUBMERGED LOADING
40600305	98	710	PETRO MARKETING- GASOLINE- STATION TANKS- UNLOADING
40600306	98	710	PETRO MARKETING-SERVICE STATIONS-STAGE I-SUB FILL-BALANCED
40600307	98	710	PETRO MARKETING-SERVICE STATIONS-STAGE I-BREATH-UNDRGD TNK
40600399	98	710	PETRO MARKETING- GASOLINE- STATION TANKS- UNSPECIFIED
40600401	98	710	PETRO MARKETING- GASOLINE- STATION TANKS- VAPOR NO CONTROL
40600402	98	710	PETRO MARKETING- GASOLINE- STATION TANKS- LIQUID NO CONTROL
40600403	98	710	PETRO MARKETING- GASOLINE- STATION TANKS- CONTROLS
40600499	98	710	PETRO MARKETING- GASOLINE- STATION TANKS- NOT CLASSIFIED
40688801	98	710	PETRO MARKETING- GASOLINE- FUGITIVE EMISSIONS
40688802	98	710	PETRO MARKETING-FUGITIVE EMIS-NOT CLASSIFIED
40688803	98	710	PETRO MARKETING-FUGITIVE EMIS-NOT CLASSIFIED
40688804	98	710	PETRO MARKETING-FUGITIVE EMIS-NOT CLASSIFIED
40688805	98	710	PETRO MARKETING-FUGITIVE EMIS-NOT CLASSIFIED
AAA11676	98	710	AIRPORT- VEHICLE REFUELING- GASOLINE
AAA17947	96	783	SURFACE COATING- CANS & CONTAINERS
AAA18697	96	783	SURFACE COATING- EDUCATIONAL SERVICES
AAA19018	96	783	SURFACE COATING- AIR TRANSPORTATION
AAA19026	96	783	SURFACE COATING- MISCELLANEOUS SERVICES
AAA19034	96	783	SURFACE COATING- MISCELLANEOUS MANUFACTURING
AAA19109	96	783	SURFACE COATING- TRANSPORTATION EQUIPMENT #1
AAA19190	96	783	SURFACE COATING- TIRE MANUFACTURING- RUBBER & PLASTICS

TABLE 6-2 (concluded)

SCC Code	Old Profile	New Profile	Description of SCC
AAA19315	96	783	SURFACE COATING- WOOD FURNITURE & FIXTURES
AAA20107	96	783	SURFACE COATING- MISCELLANEOUS SERVICES- WHOLESALE & RETAIL
AAA20586	96	783	SURFACE COATING- AMUSEMENTS & MOTION PICTURES
AAA24729	96	783	SURFACE COATING- PRINT & PUBLISHING
AAA24794	96	783	SURFACE COATING- RUBBER & PLASTICS MANUFACTURING
AAA24877	96	783	SURFACE COATING- FURNITURE & FIXTURES- COTTON GIN
AAA24935	96	783	SURFACE COATING- TEXTILES & APPAREL
AAA25056	96	783	SURFACE COATING- WHOLESALE & RETAIL AUTO
AAA25213	96	783	SURFACE COATING- FABRICATED STEEL
AAA25262	96	783	SURFACE COATING- IRON & STEEL FOUNDRY
AAA25916	96	783	SURFACE COATING- GLASS PRODUCTS
AAA27854	96	783	SURFACE COATING- TRANSPORTATION EQUIPMENT #2
AAA27920	96	783	SURFACE COATING- TRANSPORTATION EQUIPMENT #3
AAA27995	96	783	SURFACE COATING- LUMBER & WOOD PRODUCTS
AAA28464	96	783	SURFACE COATING- MACHINERY CONSTRUCTION
AAA31583	96	783	SURFACE COATING- MW PRODUCTS
AAA31963	96	783	SURFACE COATING- FABRICATED STRUCTURAL METAL
AAA32342	96	783	SURFACE COATING- LUMBER & WOOD
AAA34835	96	783	SURFACE COATING- PAINT MANUFACTURING
AAA35212	96	783	SURFACE COATING- NON FERROUS METALS
AAA37861	96	783	SURFACE COATING- TRANSPORTATION EQUIPMENT- MISSLES
AAA39024	96	783	SURFACE COATING- CHEMICAL & ALLIED
AAA42358	96	783	SURFACE COATING- RUBBER & PLASTICS FABRICATION
AAA42416	96	783	SURFACE COATING- MACHINERY- ELECTRICAL COMPONENTS
AAA46466	98	710	GASOLINE EVAPORATION- TANK BREATHING LOSS- BULK PLANTS
AAA46474	98	710	GASOLINE EVAPORATION- TANK WORKING LOSS- BULK PLANTS
AAA46482	98	710	GASOLINE EVAPORATION- TANK CARS & TRUCKS WORKING LOSS
AAA46490	98	710	GASOLINE EVAPORATION- MARKETING- STORAGE & TRANSFER- BULK
AAA46532	98	710	GASOLINE EVAPORATION AT SERVICE STATIONS- TANK WORKING LOSS
AAA46540	98	710	GASOLINE EVAPORATION AT SERVICE STATIONS- VEHICLE REFUELING
AAA46557	98	710	GASOLINE EVAPORATION AT SERVICE STATIONS- TANK BREATHING LOSS
AAA46565	98	709	GASOLINE EVAPORATION AT SERVICE STATIONS- SPILLAGE
AAA46581	98	710	GASOLINE EVAPORATION- TANKER LOADING
AAA46631	98	710	GASOLINE EVAPORATION- BARGE LOADING
AAA46730	98	710	GASOLINE EVAPORATION- TANKER/BARGE BALLASTING
AAA46748	156	783	SURFACE COATING- EVAPORATION- MANUFACTURING & INDUSTRIAL
AAA46755	196	717	SURFACE COATING- EVAPORATION- WATER BASED
AAA46771	136	718	SURFACE COATING- EVAPORATION- SOLVENT
AAA46870	26	716	ASPHALT PAVING- CUTBACK ASPHALT EVAPORATION
AAA46888	26	715	ASPHALT PAVING- ROAD OIL EVAPORATION
AAA66787	10	719	INTERNAL COMBUSTION- NATURAL GAS
AAA74682	7	719	FUEL COMBUSTION (COGENERATION)
AAA90003	514	760	ALFALFA DESSICATION - APPLICATION LOSS - CHEVRON WEEDOIL
AAA90004	514	760	ALFALFA DESSICATION - EVAPORATION LOSS - CHEVRON WEEDOIL

Days per Week	Fraction for Thursday
1	0.20000
2	0.00000*
3	0.20000
4	0.20000
5	0.20000
6	0.16667
7	0.14286

To determine the number of hours per day of point source operations, we used the beginning and ending hours of equipment activity; we determined these beginning and ending hours from the daily hours of equipment operation, again using the ARB procedure.

Daily Hours of Operation	Begin Hour	End Hour
1	8	15
2	8	15
3	8	15
4	8	15
5	8	15
6	9	14
7	9	15
8	8	15
9	8	16
10	7	16
11	7	17
12	6	17
13	8	20
14	8	21
15	8	22
16	8	23
17	7	23
18	6	23
19	3	21
20	3	22

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* This value is assigned by ARB by convention; the 2 days per week are assumed to be a weekend.

21	2	22
22	1	22
23	1	23
24	0	23

To make the conversion from tons/yr to kg/hr, therefore, it was necessary to estimate the number of days/week and hours/day of operation for each source to be added to the inventory. Because we had obtained summaries of the TADs for many surveyed facilities, we used the days/week and hours/day information given in the TADs for devices at a facility. In cases for which we did not have facility TADs, operating schedules were estimated from a knowledge of typical source operations and from survey responses.

Several other procedures were followed in revising the inventory:

(1) If emissions other than TOG or NO_x were listed in the inventory for a facility device that was to be deleted from the file, all emissions for the device were deleted.

(2) If some but not all devices with the same SCC at a facility were to be deleted, then the ratio of the individual emissions was used to determine the amount of emissions to retain.

(3) When emissions from multiple devices with the same SCC were added for a facility, the emissions were summed before being entered into the file.

(4) If an SCC was added and the same SCC already existed and was retained for a facility in the file, then the new emission rate for the SCC was entered separately from the emission rate for the existing SCC.

(5) New emission rates were rounded to the nearest tenth of a kg/hr unless the value was less than 0.05 kg/hr, in which case we rounded the value to one significant digit and entered the new emission rate.

One specific change to emissions in the area source file was made in addition to the reassignment of speciation profiles. As discussed in Section 4 and Appendix B, revisions were made to the inventory for emissions from internal combustion engines that affected both the point and area source MED files. To change the area source file, the ratio of the total area source emissions for CES 66787 (internal combustion engines, natural gas) in the original file to the revised emissions by pollutant was used to derive multipliers for revising the inventory. The following factors were used for every grid cell with CES 66787 emissions in the area source file:

TOG	NO_x	CO	SO_x
0.4633	0.3582	0.3903	1.0

Before entering the revisions to the inventory, we first produced a new set of the original point, area, and speciation files on the computing system. Changes were then made to these MED files, and the new files were transmitted to the ARB. No changes were made to the stack data file.

RESULTS OBTAINED FROM INVENTORY REVISIONS

Results obtained using the "old inventory category" (OIC) system (among others) for grouping sources are presented in this section. It was necessary to generate new OIC codes for combinations of SIC/SCC pairs because (1) new SCCs and new SIC/SCC pairs were developed in this study, and (2) many existing SIC/SCC pairs in the original inventory were not assigned OIC codes in our November 1982 version of the file "category." The OIC codes we assigned to SIC/SCC pairs for reporting purposes are listed in Appendix G.

In addition, two unusual SCCs in the original point source file appeared to be in error. The SCCs occurred at two facilities, Nos. 6550 and 7182, in Los Angeles County. We revised these two SCCs to what appeared to be their correct codes. There were also four SCCs that were not assigned speciation profiles in the original MED files: 4-02-002-07, 4-02-004-11, 4-02-005-11, and 4-09-009-22. A miscellaneous profile was used to speciate emissions for these SCCs.

Appendix H contains a listing of all facilities in the point source file that underwent revisions during the study. The revised emission rates for devices at these facilities were developed from several sources of information including survey responses and SCAQMD emission fee data. The emission changes affected facilities in all four counties of the SOCAB and included additions, deletions, and modifications, primarily for TOG and NO_x; revisions to SO_x, CO, and PM were also made for combustion equipment at some facilities. All changes were initially generated on a tons/yr basis and then converted to kg/hr for the MED inventory as described. In addition, minor revisions to the MED files for surveyed facilties were also occasionally incorporated (e.g., the revision of an SIC code). All changes to the MED inventory were documented in a set of handwritten pages for each facility (e.g., SCC entries, tons/yr and kg/hr emission rates, beginning and ending hours, justification for the revisions) for subsequent use by the ARB and SCAQMD in updating their data bases. This documentation has been transmitted to the ARB.

A substantial body of data is contained in the documentation of study recommendations for changes to the inventory. Changes in emission rates were made to 241 facilities. We made an average of about seven changes per facility, so about 1500 MED entries (or computer records) were revised during the project. In addition to these changes, modifications to the MED inventory were incorporated for speciation profiles. Most of the emission changes to the MED point source file were on the order of 0.2 to 5.0 kg/hr, but changes as large as 150 kg/hr were also made. Eight cases of double counting of facilities were also uncovered. Double-counted facilities were deleted from the MED file, as appropriate. This topic is discussed later in this section.

Emission Data and Classes of Organic Gases

The overall effects of these revisions on inventory totals are demonstrated through a comparison of tables containing categories of emissions for the original and revised inventories. Tables 6-3 and 6-4 present emission rates using the OIC system of categorizing sources for the original and revised inventories, respectively. Emissions from the point and area source files are summarized in these tables, but the totals do not represent the complete SOCAB inventory because on-road motor vehicle emissions are excluded. In all of these tables, SOCAB emissions are given in tons/day for a 1979 summer weekday. Emissions of TOG and ROG are expressed as methane and NO_x emissions are expressed as nitrogen dioxide.

Although changes to the spatial resolution (e.g., from oil field revisions) and temporal resolution (e.g., from the modified diurnal profile for power plants) of the inventory cannot be ascertained from such tabulations, Tables 6-3 and 6-4 do show that overall TOG and ROG emissions have increased by 6.2 and 7.5 tons/day (0.2 and 1.0 percent), but that NO_x emissions have decreased by 15.6 tons/day (3.0 percent). Total CO and SO_x emissions have decreased a fraction. We note that some particulate matter emissions not shown in the tables were added to the inventory for petroleum refining activities.

A comparison of source categories presented in these tables reveals some interesting trends. Important changes occur within the petroleum industry for organic gases. Emissions of TOG from petroleum production (OIC 120 plus 410) increase, whereas ROG emissions decrease somewhat. Both petroleum refining (OIC 130 plus 420) TOG and ROG emissions decrease, as do petroleum marketing (OIC 430) TOG and ROG emissions. However, the reactivity of petroleum production emissions has been reduced significantly as measured by the ROG/TOG ratio for OIC 410. The same ratio for petroleum refining (OIC 420) has hardly changed.

TABLE 6-3. Original emission data by OIC code.

(Tons per day)

CODE	SOURCE NAME	TOG	ROG	CO	NOX	SOX
100	FUEL COMBUSTION	0.00	0.00	0.00	0.00	0.00
110	AGRICULTURAL	0.00	0.00	0.00	0.03	0.00
120	OIL AND GAS PRODUCTION	3.79	0.66	1.07	7.48	0.10
130	PETROLEUM REFINING	11.05	4.67	3.68	59.35	6.21
140	OTHER MANUFACTURING/INDUSTRIAL	7.35	3.03	71.13	62.41	16.04
150	ELECTRIC UTILITIES	12.03	8.41	14.21	136.36	89.38
160	OTHER SERVICES AND COMMERCE	3.75	0.82	2.07	25.25	1.64
170	RESIDENTIAL	1.84	0.67	1.75	27.30	0.05
199	OTHER	15.78	2.11	12.73	43.92	0.66
200	WASTE BURNING	0.00	0.00	0.00	0.00	0.00
210	AGRICULTURAL DEBRIS	0.06	0.02	0.76	0.00	0.00
220	RANGE MANAGEMENT	0.00	0.00	0.00	0.00	0.00
230	FOREST MANAGEMENT	0.00	0.00	0.00	0.00	0.00
240	INCINERATION	0.16	0.04	0.43	0.42	3.39
299	OTHER	0.00	0.00	0.34	0.00	0.00
300	SOLVENT USE	0.00	0.00	0.00	0.00	0.00
310	DRY CLEANING	11.60	8.20	0.00	0.00	0.00
320	DEGREASING	33.94	23.15	0.00	0.13	0.00
330	ARCHITECTURAL COATING	88.91	87.98	0.00	0.00	0.00
340	OTHER SURFACE COATING	141.40	138.71	0.38	0.39	0.04
350	ASPHALT PAVING	32.28	22.83	0.00	0.00	0.00
360	PRINTING	12.40	12.04	0.01	0.13	0.00
370	DOMESTIC	46.26	39.63	0.00	0.00	0.00
380	INDUSTRIAL SOLVENT USE	23.16	22.64	0.00	0.02	0.00
399	OTHER	2.03	1.88	0.00	0.00	0.00
400	PETROLEUM PROCESS, STORAGE & TRANSFER	0.00	0.00	0.00	0.00	0.00
410	OIL AND GAS EXTRACTION	56.86	40.45	0.00	0.11	0.00
420	PETROLEUM REFINING	55.51	49.13	15.82	13.30	56.81
430	PETROLEUM MARKETING	372.18	84.02	0.00	0.03	0.00
499	OTHER	12.43	10.84	0.02	0.08	0.00
500	INDUSTRIAL PROCESSES	0.00	0.00	0.00	0.00	0.00
510	CHEMICAL	10.60	7.89	2.57	0.50	2.16
520	FOOD AND AGRICULTURAL	10.03	8.28	0.25	0.35	0.02
560	MINERAL PROCESSES	1.11	0.75	6.97	4.27	3.10
570	METAL PROCESSES	4.31	2.26	164.61	5.64	10.90
580	WOOD AND PAPER	0.13	0.09	0.00	0.07	0.00
599	OTHER	4.11	3.88	0.01	0.49	0.03
600	MISC PROCESSES	0.00	0.00	0.00	0.00	0.00
610	PESTICIDE APPLICATION	15.34	13.07	0.00	0.00	0.00
620	FARMING OPERATIONS	137.34	15.73	0.00	0.00	0.00
630	CONSTRUCTION AND DEMOLITION	0.00	0.00	0.00	0.00	0.00
640	ENTRAINED ROAD DUST - PAVED	0.00	0.00	0.00	0.00	0.00
650	ENTRAINED ROAD DUST - UNPAVED	0.00	0.00	0.00	0.00	0.00
660	UNPLANNED FIRES	85.95	47.77	499.94	10.77	0.00
680	SOLID WASTE LANDFILL	1638.83	18.16	0.00	0.00	0.00
699	OTHER	13.31	9.42	0.13	0.67	0.09
700	ON ROAD VEHICLES	0.00	0.00	0.00	0.00	0.00
710	LIGHT DUTY PASSENGER	0.00	0.00	0.00	0.00	0.00
720	LIGHT AND MEDIUM DUTY TRUCKS	0.00	0.00	0.00	0.00	0.00
730	HEAVY DUTY GAS TRUCKS	0.00	0.00	0.00	0.00	0.00

TABLE 6-3 (concluded)

CODE	SOURCE NAME	TOG	ROG	CO	NOX	SOX
740	HEAVY DUTY DIESEL TRUCKS	0.00	0.00	0.00	0.00	0.00
750	MOTORCYCLES	0.00	0.00	0.00	0.00	0.00
800	OTHER MOBILE	0.00	0.00	0.00	0.00	0.00
810	OFF ROAD VEHICLES	31.04	26.07	103.70	8.22	0.87
820	TRAINS	6.53	5.98	10.04	21.09	2.14
830	SHIPS	1.78	1.63	3.51	12.70	17.37
850	AIRCRAFT - GOVERNMENT	0.17	0.17	1.53	0.49	0.07
860	AIRCRAFT - OTHER	19.56	18.94	83.79	11.99	1.12
870	MOBILE EQUIPMENT	24.07	19.56	160.87	73.27	5.36
880	UTILITY EQUIPMENT	12.42	10.39	110.97	1.66	0.05
900	UNSPECIFIED SOURCES	0.00	0.00	0.00	0.00	0.00
TOTAL		2962.42	771.98	1278.27	528.90	217.61

TABLE 6-4. Revised emission data by OIC code.

(Tons per day)

CODE	SOURCE NAME	TOG	ROG	CO	NOX	SOX
100	FUEL COMBUSTION	0.00	0.00	0.00	0.[illegible]	0.00
110	AGRICULTURAL	0.00	0.00	0.00	0.[illegible]	0.00
120	OIL AND GAS PRODUCTION	4.00	0.54	1.22	3.[illegible]7	0.10
130	PETROLEUM REFINING	19.63	3.40	2.98	65.[illegible]	6.26
140	OTHER MANUFACTURING/INDUSTRIAL	7.41	3.03	71.15	63.[illegible]2	16.15
150	ELECTRIC UTILITIES	13.49	8.37	14.77	137.[illegible]	89.88
160	OTHER SERVICES AND COMMERCE	3.74	0.80	2.97	25.[illegible]	1.63
170	RESIDENTIAL	1.84	0.67	1.75	27.[illegible]	0.05
199	OTHER	7.54	1.15	9.36	17.[illegible]	0.06
200	WASTE BURNING	0.00	0.00	0.00	0.[illegible]	0.00
210	AGRICULTURAL DEBRIS	0.06	0.02	0.76	0.[illegible]	0.[illegible]
220	RANGE MANAGEMENT	0.00	0.00	0.00	0.[illegible]	0.00
230	FOREST MANAGEMENT	0.00	0.00	0.59	0.00	0.00
240	INCINERATION	0.16	0.04	0.45	0.[illegible]1	3.55
299	OTHER	[illegible]	0.[illegible]	0.34	[illegible]	0.[illegible]
300	SOLVENT USE	0.00	0.00	0.00	[illegible]	0.[illegible]
310	DRY CLEANING	1[illegible].65	8.20	0.00	0.[illegible]	0.[illegible]
320	DEGREASING	34.87	23.55	0.00	0.13	0.[illegible]
330	ARCHITECTURAL COATING	93.46	89.58	0.00	0.[illegible]	0.[illegible]
340	OTHER SURFACE COATING	153.93	151.19	0.39	0.[illegible]9	0.[illegible]
350	ASPHALT PAVING	33.70	32.21	0.00	0.[illegible]	0.[illegible]
360	PRINTING	12.40	12.04	0.01	0.13	0.[illegible]
370	DOMESTIC	46.26	39.63	0.69	0.[illegible]	0.[illegible]
380	INDUSTRIAL SOLVENT USE	29.07	26.37	0.00	0.17	0.[illegible]
399	OTHER	1.85	1.77	0.03	0.[illegible]	0.[illegible]
400	PETROLEUM PROCESS, STORAGE & TRANSFER	0.00	0.00	0.00	0.[illegible]	0.[illegible]
410	OIL AND GAS EXTRACTION	66.91	36.[illegible]	0.[illegible]	0.[illegible]3	0.[illegible]
420	PETROLEUM REFINING	48.70	[illegible].59	16.17	13.[illegible]	54.[illegible]
430	PETROLEUM MARKETING	367.40	79.62	0.00	0.[illegible]3	0.[illegible]
499	OTHER	9.06	7.89	0.02	0.[illegible]	0.[illegible]
500	INDUSTRIAL PROCESSES	0.00	0.00	0.00	0.[illegible]	0.[illegible]
510	CHEMICAL	[illegible].61	[illegible].53	2.56	0.[illegible]	2.16
520	FOOD AND AGRICULTURAL	[illegible].92	[illegible].24	0.25	0.[illegible]	0.[illegible]2
560	MINERAL PROCESSES	1.11	[illegible].75	6.37	[illegible]7	3.[illegible]
570	METAL PROCESSES	[illegible].25	[illegible].22	164.61	5.[illegible]4	10.[illegible]
580	WOOD AND PAPER	[illegible].13	0.09	0.00	0.07	0.[illegible]
599	OTHER	4.81	4.[illegible]	0.31	0.[illegible]	0.[illegible]3
600	MISC PROCESSES	0.00	0.[illegible]	0.[illegible]	0.[illegible]	0.[illegible]
610	PESTICIDE APPLICATION	1[illegible].34	1[illegible].07	0.0[illegible]	0.[illegible]	0.[illegible]
620	FARMING OPERATIONS	13[illegible].34	1[illegible].73	0.0[illegible]	0.[illegible]	0.[illegible]
630	CONSTRUCTION AND DEMOLITION	[illegible]	[illegible]	0.00	[illegible]	0.[illegible]
640	ENTRAINED ROAD DUST - PAVED	[illegible]	0.00	0.0[illegible]	0.[illegible]	0.[illegible]
650	ENTRAINED ROAD DUST - UNPAVED	[illegible]	0.00	0.[illegible]	[illegible]	0.[illegible]
660	UNPLANNED FIRES	8[illegible].95	47.77	49[illegible].94	10.[illegible]7	0.[illegible]
680	SOLID WASTE LANDFILL	16[illegible].83	1[illegible].16	0.00	0.[illegible]	0.[illegible]
699	OTHER	12.[illegible]	8.94	0.13	0.[illegible]7	0.[illegible]9
700	ON ROAD VEHICLES	0.00	0.00	0.00	0.[illegible]	0.[illegible]
710	LIGHT DUTY PASSENGER	0.00	[illegible]	0.00	0.[illegible]	0.[illegible]
720	LIGHT AND MEDIUM DUTY TRUCKS	0.00	0.[illegible]	0.00	0.[illegible]	0.[illegible]
73	HEAVY DUTY GAS TRUCKS	[illegible]	0.00	0.00	0.[illegible]	0.[illegible]

TABLE 6-4 (concluded)

CODE	SOURCE NAME	TOG	ROG	CO	NOX	SOX
74Ø	HEAVY DUTY DIESEL TRUCKS	Ø.ØØ	Ø.ØØ	Ø.ØØ	Ø.ØØ	Ø.ØØ
75Ø	MOTORCYCLES	Ø.ØØ	Ø.ØØ	Ø.ØØ	Ø.ØØ	Ø.ØØ
8ØØ	OTHER MOBILE	Ø.ØØ	Ø.ØØ	Ø.ØØ	Ø.ØØ	Ø.ØØ
81Ø	OFF ROAD VEHICLES	31.Ø4	2[illegible].Ø7	1Ø[illegible].7Ø	8.[illegible]	[illegible]
82Ø	TRAINS	6.53	5.98	1Ø.Ø4	21.[illegible]	2.14
83Ø	SHIPS	1.70	1.63	3.51	12.[illegible]	17.37
85Ø	AIRCRAFT - GOVERNMENT	Ø.17	Ø.17	1.53	[illegible]	Ø.Ø7
86Ø	AIRCRAFT - OTHER	19.56	18.94	83.79	11.[illegible]	1.[illegible]
87Ø	MOBILE EQUIPMENT	24.Ø7	19.56	1ØØ.87	73.77	[illegible]
88Ø	UTILITY EQUIPMENT	12.42	1Ø.39	11Ø.97	1.[illegible]	[illegible]
9ØØ	UNSPECIFIED SOURCES	Ø.ØØ	Ø.ØØ	Ø.ØØ	Ø.ØØ	Ø.ØØ
TOTAL		2968.62	779.45	1275.28	513.2[illegible]	215.5Ø

Furthermore, some surface coating (OIC 340) TOG and ROG emissions have increased, as have industrial solvent use (OIC 380) TOG and ROG emissions. The ROG/TOG ratio has hardly changed for miscellaneous fuel combustion (OIC 199); both TOG and ROG emissions have decreased for this category. Moreover, the asphalt paving (OIC 350) ROG/TOG ratio has increased substantially due to revised species profiles. We conclude from this comparison that important changes to organic gas reactivity in the inventory have occurred as a result of this study.

In the case of NO_x emissions, the major changes occur for the petroleum refining (OIC 130) and miscellaneous (OIC 199) fuel combustion groups--NO_x emissions for refining have increased and those for unspecified sources have decreased. These NO_x changes are the result of specific identification of internal combustion engines as part of the petroleum refining sector.

Another means of reviewing the results in the original and revised inventories is provided in Tables 6-5 and 6-6, which show emissions for each speciation profile. All profiles numbered in the 700 series were developed in this study, so Table 6-6 is longer than Table 6-5. The TOG and ROG emissions for profile 600, a category used for those sources without an appropriate speciation profile, have been reduced in the revised inventory as a result of the reassignment of new profiles appropriate to several of those source types. Other profile-to-profile comparisons are less meaningful. For example, TOG and ROG emissions for profile 96 are signficantly reduced, but a large percentage of the surface coating solvent emissions in the revised inventory have been assigned new species profiles in the 700 series. In addition, overall changes in NO_x emissions from internal combustion engines are demonstrated in these tables by comparing the original NO_x emissions for profiles 7 and 10 in Table 6-5 with the revised NO_x emissions for profile 719 in Table 6-6.

Tables 6-7 and 6-8 provide information on the reactivity of organic gas emissions for source categories in the original and revised files. Individual TOG species were placed into six carbon-bond classes to generate these two tables:

Olefins (OLE)
Paraffins (PAR)
Aromatics (ARO)
Carbonyls (CARB)
Ethylene (ETH)
Unreactive

TABLE 6-5. Original emission data by profile code.

(Tons per day)

CODE	PROFILE NAME	TOG	ROG	CO	NOX	SOX
3	EXTERNAL COMBUSTION BOILER- NATURAL GAS	6.36	2.31	8.11	123.77	3.19
4	BOILERS- REFINERY GAS	4.55	3.00	7.20	44.51	3.40
5	BOILERS- COKE OVEN GAS	1.57	0.23	7.00	3.82	27.14
7	INTERNAL COMB. ENG. - TURBINE- NATURAL G	3.77	0.70	2.46	6.84	0.02
9	INDUSTRIAL ICE- DISTILLATE OIL	2.68	2.00	2.95	4.33	0.51
10	INDUSTRIAL ICE- NAT. GAS- RECIPROCATING	26.36	2.98	0.66	58.79	0.01
11	COKE OVEN STACK GAS- PRIMARY METALS	2.22	0.84	32.34	0.72	0.80
13	IRON SINTERING- PRIMARY METALS	0.09	0.02	92.42	1.16	8.66
21	ASPHALT ROOFING- BLOWING OPERATION	0.06	0.06	0.00	0.00	0.00
22	ASPHALT ROOFING- DIPPING	1.13	1.05	0.01	0.05	0.04
25	ASPHALT CONCRETE- ROT. DRYER- NAT. GAS	0.10	0.04	0.79	0.99	0.00
26	ASPHALT CONCRETE- IN PLACE ROAD ASPHALT	32.28	22.83	0.00	0.05	0.00
29	REFINERY CO BOILER- FCC	0.78	0.42	14.09	8.91	33.62
31	REFINERY- FUGI. EMISS. FROM COVERED DRAI	1.39	1.26	0.34	0.02	0.28
35	REFINERY COOLING TOWERS FUGITIVE EMISSIO	0.00	0.00	0.00	0.00	0.00
39	PETRO INDUSTRY- COMPRESSOR SEALS- REFINE	0.53	0.40	0.00	0.00	0.00
47	PETRO MARKETING- RELIEF VALVES- LPG	0.26	0.14	0.00	0.00	0.00
51	REFINERY FLARES- NATURAL GAS	0.06	0.02	0.12	0.03	0.03
53	REFINERY- CATALYTIC REFORMER- GENERAL FU	2.98	2.18	0.15	0.05	0.07
66	VARNISH MANUFACTURING	0.05	0.05	0.00	0.00	0.00
72	PRINT. INK COOKING- GENERAL	0.00	0.00	0.00	0.00	0.00
76	PESTICIDE USE- COMPOSITE DOMESTIC & COMM	14.50	12.49	0.00	0.00	0.00
78	ETHYLENE DICHLORIDE MANUFACTURING	0.00	0.00	0.00	0.00	0.00
79	FLARES- CHEMICAL MANUFACTURING	0.01	0.01	0.00	0.03	3.26
85	PERCHLOROETHYLENE CLEANING SOLVENT	6.66	0.00	0.00	0.00	0.00
86	STODDARD CLEANING SOLVENT	24.58	24.58	0.00	0.00	0.00
87	1,1,1-TRICHLOROETHANE CLEANING SOLVENT	4.58	0.00	0.00	0.00	0.00
90	DEGREASING- TOLUENE	0.01	0.01	0.00	0.00	0.00
96	SURFACE COATING SOLVENT- GENERAL	77.09	75.43	0.37	0.23	0.00
98	GASOLINE EVAP-COMPOSITE WORKING & BREATH	86.79	84.91	0.00	0.00	0.00
100	JET FUEL EVAP	1.57	1.57	0.00	0.00	0.00
121	OPEN BURNING DUMP- LANDSCAPE/PRUNING	0.00	0.00	0.00	0.00	0.00
122	BAR SCREEN WASTE INCINERATOR- SOLID WAST	0.09	0.01	0.32	0.38	0.10
125	POLYMERIC SURFACE COATING- HOT AIR DRIED	14.25	14.25	0.00	0.05	0.00
127	SURFACE COATING EVAP- GENERAL VARNISH/SH	2.50	2.50	0.00	0.00	0.00
134	SURFACE COATING EVAP- GENERAL PRIMER	4.27	4.21	0.00	0.00	0.00
136	SURFACE COATING EVAP- METAL PRIMER	36.56	35.93	0.01	0.01	0.00
141	SURFACE COATING EVAP- LABEL ADHESIVES	7.39	7.39	0.00	0.00	0.00
142	SURFACE COATING EVAP- METAL FURNITURE AD	0.46	0.46	0.00	0.00	0.00
148	SURFACE COATING LACQUER- METAL FURNITURE	8.34	8.12	0.00	0.00	0.00
149	SURFACE COATING LACQUER- PAPERBOARD PROD	10.99	10.34	0.00	0.00	0.00
156	SURFACE COATING EVAP- GENERAL COMPOSITE	11.95	11.90	0.00	0.05	0.04
157	SURFACE COATING EVAP- COMPOSITE WOOD FUR	0.00	0.00	0.00	0.00	0.00
159	SURFACE COATING EVAP- SHEET METAL ENAMEL	0.00	0.00	0.00	0.00	0.00
172	FLEX. PRINT.- COMPOSITE OF ALCOHOL BASED	1.37	1.32	0.00	0.00	0.00
182	EVAP- GRAVURE PRINT.- GENERAL SOLVENT	6.98	6.02	0.00	0.90	0.00
185	PETRO STORAGE- FIXED ROOF- TOLUENE	0.83	0.83	0.00	0.00	0.00
195	METHANE SOURCE	0.00	0.00	0.00	0.00	0.00
196	ARCHITECTURAL SURFACE COATINGS- COMPOSIT	69.88	69.30	0.00	0.30	0.00
197	DOMESTIC SOLVENTS- GENERAL COMPOSITE	23.02	22.97	0.00	0.00	0.00

TABLE 6-5 (continued)

CODE	PROFILE NAME	TOG	ROG	CO	NOX	SOX
202	LANDFILL EMISSIONS	1638.83	18.16	0.00	0.00	0.00
203	ANIMAL WASTE DECOMPOSITION	137.34	15.73	0.00	0.00	0.00
211	BEER FERMENTATION- ETHANOL	4.02	4.02	0.00	0.00	0.00
217	COKE OVEN BLAST FURNACE- PROCESS GAS	0.11	0.02	37.19	1.19	0.00
219	ACETONE- PAINT SOLVENT	3.37	3.37	0.00	0.00	0.00
220	SURFACE COATING EVAP- ETHYL ACETATE	0.29	0.21	0.00	0.00	0.00
221	SURFACE COATING EVAP- METHYL ETHYL KETON	2.22	2.22	0.00	0.00	0.00
222	SURFACE COATING EVAP- CELLOSOLVE ACETATE	0.00	0.00	0.00	0.00	0.00
223	SURFACE COATING EVAP- XYLENE SOLVENT	0.03	0.03	0.00	0.03	0.00
225	SURFACE COATING EVAP- MINERAL SPIRITS SP	1.21	1.21	0.00	0.00	0.00
226	SURFACE COATING SOLVENT- ETHYL ALCOHOL	0.40	0.40	0.00	0.00	0.00
227	SURFACE COATING EVAP- SOLVENT- ISOPROPYL	0.78	0.78	0.00	0.00	0.00
228	SURFACE COATING EVAP- SOLVENT- ISOPROPYL	0.13	0.13	0.00	0.00	0.00
229	SURFACE COATING EVAP- SOLVENT- LACTOL SP	1.63	1.63	0.00	0.00	0.00
230	PETRO STORAGE- FIXED ROOF- HEXANE	0.06	0.06	0.00	0.00	0.00
271	TRICHLOROETHYLENE CLEANING SOLVENT	0.31	0.31	0.00	0.00	0.00
274	SYNTHEIC RUBBER AUTO TIRE PRODUCTION	0.00	0.00	0.00	0.00	0.00
280	SURFACE COATING PRIMER- WATER BASED AUTO	0.00	0.00	0.00	0.00	0.00
281	SURFACE COATING EVAP- MINERAL SPIRITS	0.00	0.00	0.00	0.00	0.00
282	SURFACE COATING EVAP- NAPHTHA	1.00	1.00	0.00	0.00	0.00
289	SURFACE COATING EVAP- SOLVENT- BUTYL ALC	0.01	0.01	0.00	0.00	0.00
290	SURFACE COATING EVAP- SOLVENT- CELLOSOLV	0.00	0.00	0.00	0.00	0.00
294	CITRUS COATING WAX- FLAVORSEAL 320-0820	0.03	0.03	0.00	0.00	0.00
296	COMPOSITE CRUDE OIL EVAP- FIXED ROOF- PR	0.00	0.00	0.00	0.00	0.00
297	CRUDE OIL EVAP- VAPOR COMPOSITE FROM FIX	82.52	65.77	0.00	0.00	0.18
298	PETRO STORAGE- FIXED ROOF- BENZENE	0.07	0.01	0.00	0.00	0.00
299	PETRO STORAGE- FIXED ROOF- CYCLOHEXANE	0.01	0.01	0.00	0.00	0.00
301	PETRO STORAGE- FIXED ROOF- HEPTANE	0.00	0.00	0.00	0.00	0.00
303	PETRO STORAGE- FIXED ROOF- PENTANE	0.01	0.01	0.00	0.00	0.00
304	EVAP- FLEX. PRINT. PRESS- N-PROPYL ALCOH	3.34	3.15	0.01	0.04	0.00
306	OPEN HEARTH WITH OXYGEN LANCE- STEEL PRO	0.00	0.00	1.20	0.42	0.19
307	FORREST FIRES	64.61	38.05	381.10	10.77	0.00
316	REFINERY- PIPES, VALVES & FLANGES- COMPO	1.38	0.87	0.00	0.00	0.00
321	REFINERY- PUMP SEALS- COMPOSITE	15.81	14.84	0.28	1.36	6.26
500	CATALYST LIGHT DUTY VEHICLES- EXHAUST	0.00	0.00	0.00	0.00	0.00
501	GASOLINE EVAP- CANISTER- LDV HOT SOAKS	0.00	0.00	0.00	0.00	0.00
502	NON-CATALYST LIGHT DUTY VEHICLES- EXHAUS	53.67	44.90	434.37	7.13	0.48
503	DIESEL EXHAUST(ALDEHYDES NOT IN EMISSION	0.00	0.00	0.00	0.00	0.00
504	EXT. COMBUSTION BOILERS- DIST. OR RESID.	7.93	7.19	9.00	112.86	105.88
505	PLASTICS MANUFACTURE- VC & POLYPROPYLENE	3.24	3.24	0.00	0.00	0.00
506	HALOGENATED CLEANING SOLVENTS- MIXED	0.00	0.00	0.00	0.00	0.00
508	JET EXHAUST- COMPOSITE	18.50	18.10	30.18	12.91	1.28
510	PLASTICS MFG- VINYL CHLORIDE	0.03	0.03	0.00	0.00	0.00
511	PLASTICS MFG- POLYPROPYLENE	0.12	0.12	0.00	0.00	0.00
512	ORGANIC SOLVENT- DICHLOROMETHANE	0.00	0.00	0.00	0.00	0.00
513	SURFACE COATING EVAP- METHYL ISOBUTYL KE	0.01	0.01	0.00	0.00	0.00
514	EVAP- CHEVRON WEED OIL	4.64	4.64	0.00	0.00	0.00
515	COMPOSITE INDUSTRIAL DEGREASERS	9.92	6.89	0.00	0.13	0.00
516	COMPOSITE DRY-CLEANING SOLVENTS	0.16	0.00	0.00	0.02	0.00
517	PRINT. EVAP LOSS- GENERAL	1.43	1.43	0.00	0.09	0.00

TABLE 6-5 (concluded)

CODE	PROFILE NAME	TOG	ROG	CO	NOX	SOX
518	AEROSOL SPRAYS- NON-SYNTHETIC	21.70	16.66	0.00	0.00	0.00
519	AEROSOL SPRAYS- SYNTHETIC	1.53	0.00	0.00	0.00	0.00
520	COMPOSITE NATURAL GAS	295.76	5.46	0.01	0.07	0.00
521	DIESEL EXHAUST(ALDEHYDES IN EMISSIONS)	17.01	15.58	31.10	94.51	15.19
522	FORMICA MANUFACTURING	1.26	0.88	0.00	0.09	0.00
523	OPEN BURNING DUMP- LANDSCAPE/PRUNING (MO	22.32	9.69	119.51	0.09	0.00
524	METHYLENE CHLORIDE	0.23	0.00	0.00	0.00	0.00
525	CATALYST EXHAUST (ALDEHYDES IN EMISSIONS	0.00	0.00	0.00	0.00	0.00
526	1979 EXHAUST COMPOSITE 50/50 (ALDEHYDES	0.00	0.00	0.00	0.00	0.00
527	NON-CATALYST EXHAUST (ALDEHYDES IN EMISS	0.00	0.00	0.00	0.00	0.00
600	SPECIES UNKNOWN- ALL CATEGORY COMPOSITE	42.28	29.92	56.96	32.56	6.97
909	MISCELLANEOUS	0.20	0.14	0.00	0.00	0.00
TOTAL		2962.42	771.99	1278.26	528.90	217.61

TABLE 6-6. Revised emission data by profile code.

(Tons per day)

CODE	PROFILE NAME	TOG	ROG	CO	NOX	SOX
3	EXTERNAL COMBUSTION BOILER-NATURAL GAS	6.35	2.31	8.10	123.28	3.19
4	BOILERS-REFINERY GAS	4.55	3.00	7.23	44.40	3.40
5	BOILERS-COKE OVEN GAS	1.57	0.23	7.03	[illegible]	27.14
7	INTERNAL COMBUSTION ENGINE-TURBINE-NATURAL GAS	0.00	0.00	0.03	[illegible]	[illegible]
9	INDUSTRIAL ICE-DISTILLATE OIL	0.47	0.72	1.85	3.72	0.62
10	INDUSTRIAL ICE-NATURAL GAS-RECIPROCATING	0.00	0.00	0.06	[illegible]	[illegible]
11	COKE OVEN STACK GAS-PRIMARY METALS	2.22	0.34	32.34	0.72	0.00
13	IRON SINTERING-PRIMARY METALS	0.09	0.02	92.42	1. 6	[illegible]
21	ASPHALT ROOFING-BLOWING OPERATION	0.01	0.01	0.01	[illegible]	[illegible]
22	ASPHALT ROOFING-DIPPING	1.13	1.05	0.01	0.05	0.04
25	ASPHALT CONCRETE-ROTARY DRYER-NATURAL GAS FIRED	0.10	0.04	0.79	0.29	[illegible]
26	ASPHALT CONCRETE-IN PLACE ROAD ASPHALT	5.08	3.59	0.00	[illegible]	[illegible]
29	REFINERY CO BOILER-FCC	0.56	0.30	14.11	8.70	33.28
31	REFINERY-FUGITIVE EMISS. FROM COV. DRAIN/SEP PITS	2.23	2.00	0.34	0.01	0.27
35	REFINERY COOLING TOWERS FUGITIVE EMISSIONS	0.15	0.15	0.00	[illegible]	[illegible]
39	PETRO INDUSTRY-COMPRESSOR SEALS-REFINERY GAS	0.63	0.47	0.00	0.00	0.00
47	PETRO MARKETING-RELIEF VALVES-LPG	1.15	0.60	0.00	[illegible]	[illegible]
51	REFINERY FLARES-NATURAL GAS	0.06	0.02	0.12	0.03	[illegible]
53	REFINERY-CATALYTIC REFORMER-GENERAL FUGITIVE EMISS	1.36	0.99	0.15	[illegible]	[illegible]
66	VARNISH MANUFACTURING	0.11	0.11	0.00	[illegible]	[illegible]
72	PRINTING INK COOKING-GENERAL	0.00	0.00	0.00	[illegible]	0.00
76	PESTICIDE USE-COMPOSITE DOMESTIC & COMMERCIAL	14.50	12.49	0.03	0.00	[illegible]
78	ETHYLENE DICHLORIDE MANUFACTURING	0.07	0.07	0.01	[illegible]	[illegible]
79	FLARES-CHEMICAL MANUFACTURING	0.01	0.01	0.00	[illegible]	[illegible]
85	PERCHLOROETHYLENE CLEANING SOLVENT	6.77	0.00	0.00	[illegible]	0.00
86	STODDARD CLEANING SOLVENT	24.60	24.60	0.05	[illegible]	[illegible]
87	1,1,1-TRICHLOROETHANE CLEANING SOLVENT	4.55	0.00	0.00	0.00	[illegible]
90	DEGREASING-TOLUENE	0.00	0.00	0.00	[illegible]	[illegible]
95	SURFACE COATING SOLVENT-GENERAL	3[illegible].85	3[illegible].15	0.37	0.23	[illegible]
98	GASOLINE EVAP-COMP WORK. & BREATH. TANK LOSS	0.00	0.30	0.00	[illegible]	0.00
100	JET FUEL EVAPORATION	2.06	2.02	0.00	[illegible]	0.00
122	BAR SCREEN WASTE INCINERATOR-SOLID WASTE	0.09	0.01	0.32	[illegible]	0.10
125	POLYMERIC SURFACE COATING-HOT AIR DRIED	0.00	0.00	0.00	[illegible]	[illegible]
127	SURFACE COATING EVAP-GENERAL VARNISH/SHELLAC	2.16	2.16	0.00	[illegible]	[illegible]
134	SURFACE COATING EVAP-GENERAL PRIMER	0.05	0.00	0.00	[illegible]	[illegible]
136	SURFACE COATING EVAP- METAL PRIMER	0.00	[illegible]	0.30	[illegible]	[illegible]
141	SURFACE COATING EVAP-LABEL ADHESIVES	0.00	[illegible]	0.00	[illegible]	0.00
142	SURFACE COATING EVAP-METAL FURNITURE ADHESIVES	[illegible]	[illegible]	0.00	[illegible]	[illegible]
146	SURFACE COATING LACQUER-METAL FURNITURE	[illegible]	0.00	0.00	[illegible]	[illegible]
149	SURFACE COAT. LACQUER-PAPERBOARD PROD. & CONTAINER	[illegible]	[illegible]	0.00	[illegible]	[illegible]
156	SURFACE COATING EVAP-GENERAL COMPOSITE ENAMEL	[illegible]	0.02	0.00	[illegible]	[illegible]
157	SURFACE COAT. EVAP-COMPOSITE WOOD FURNITURE ENAMEL	[illegible]	0.30	0.55	[illegible]	[illegible]
159	SURFACE COATING EVAP-SHEET METAL ENAMEL	0.00	0.00	0.00	[illegible]	0.00
172	FLEXOGRAPHIC PRINT-COMP OF ALCOHL BASED SOLV.-EVAP	1.37	1.32	0.00	[illegible]	[illegible]
182	EVAPORATION-GRAVURE PRINTING-GENERAL SOLVENT	[illegible]	6.02	0.00	[illegible]	[illegible]
185	PETRO STORAGE-FIXED ROOF-TOLUENE	[illegible]	[illegible]	0.00	[illegible]	[illegible]
195	METHANE SOURCE	[illegible]	0.00	0.00	[illegible]	[illegible]
196	ARCHITECTURAL SURFACE COATINGS-COMPOSITE SOLVENT	5[illegible].[illegible]	53.47	0.00	[illegible]	[illegible]
197	DOMESTIC SOLVENTS-GENERAL COMPOSITE	23.[illegible]	22.97	0.03	[illegible]	[illegible]
202	LANDFILL EMISSIONS	163[illegible].83	16.16	0.05	[illegible]	0.00

TABLE 6-6 (continued)

CODE	PROFILE NAME	TOG	ROG	CO	NOX	SOX
203	ANIMAL WASTE DECOMPOSITION	137.34	15.73	0.00	0.00	0.00
211	BEER FERMENTATION-ETHANOL	4.02	4.02	0.00	0.00	0.00
217	COKE OVEN BLAST FURNACE-PROCESS GAS	5.11	0.00	37.19	1.19	0.00
219	ACETONE-PAINT SOLVENT	4.25	4.25	0.00	0.00	0.00
220	SURFACE COATING EVAP-ETHYL ACETATE	0.29	0.22	0.00	0.00	0.00
221	SURFACE COATING EVAP-METHYL ETHYL KETONE	3.02	3.02	0.00	0.00	0.00
222	SURFACE COATING EVAP-CELLOSOLVE ACETATE	0.02	0.02	0.00	0.00	0.00
223	SURFACE COATING EVAP-XYLENE SOLVENT	0.04	0.04	0.00	0.03	0.00
225	SURFACE COATING EVAP-MINERAL SPIRITS SPECIES	2.35	2.35	0.00	0.00	0.00
226	SURFACE COATING SOLVENT-ETHYL ALCOHOL	0.68	0.68	0.00	0.00	0.00
227	SURFACE COATING EVAP-SOLVENT-ISOPROPYL ALCOHOL	0.55	0.55	0.00	0.00	0.00
228	SURFACE COATING EVAP-SOLVENT-ISOPROPYL ACETONE	0.14	0.14	0.00	0.00	0.00
229	SURFACE COATING EVAP-SOLVENT-LACTOL SPIRITS	1.37	1.37	0.00	0.00	0.00
230	PETRO STORAGE-FIXED ROOF-HEXANE	0.15	0.15	0.00	0.00	0.00
271	TRICHLOROETHYLENE CLEANING SOLVENT	0.35	0.35	0.00	0.00	0.00
274	SYNTHEIC RUBBER AUTO TIRE PRODUCTION	0.00	0.00	0.00	0.00	0.00
280	SURF COAT PRIMER-WATER BAS. AUTO PAINT SPRAY BOOTH	0.00	0.00	0.00	0.00	0.00
281	SURFACE COATING EVAPORATION-MINERAL SPIRITS	0.00	0.00	0.00	0.00	0.00
282	SURFACE COATING EVAPORATION-NAPHTHA	1.69	1.69	0.00	0.00	0.00
289	SURFACE COATING EVAPORATION-SOLVENT-BUTYL ALCOHOL	0.02	0.02	0.00	0.00	0.00
290	SURFACE COATING EVAPORATION-SOLVENT-CELLOSOLVE	0.02	0.02	0.00	0.00	0.00
294	CITRUS COATING WAX-FLAVORSEAL 320-0820	0.03	0.03	0.00	0.00	0.00
296	COMPOSITE CRUDE OIL EVAP-FIXED ROOF-PRODUCTION	12.80	8.77	0.00	0.00	0.00
297	CRUDE OIL EVAP-VAPOR COMP FROM FIXED ROOF TANKS	32.19	25.66	0.00	0.00	0.11
298	PETRO STORAGE-FIXED ROOF-BENZENE	0.07	0.01	0.00	0.00	0.00
299	PETRO STORAGE-FIXED ROOF-CYCLOHEXANE	0.00	0.00	0.00	0.00	0.00
301	PETRO STORAGE-FIXED ROOF-HEPTANE	0.03	0.03	0.00	0.00	0.00
303	PETRO STORAGE-FIXED ROOF-PENTANE	0.00	0.00	0.00	0.00	0.00
304	EVAP-FLEXOGRAPHIC PRINTING PRESS-N-PROPYL ALCOHOL	3.35	3.15	0.01	0.14	0.00
306	OPEN HEARTH WITH OXYGEN LANCE-STEEL PRODUCTION	0.00	0.00	1.23	0.42	0.19
307	FORREST FIRES	64.61	38.05	381.13	10.77	0.00
316	REFINERY-PIPES, VALVES & FLANGES-COMPOSITE	3.62	2.28	0.00	0.00	0.00
321	REFINERY-PUMP SEALS-COMPOSITE	12.24	11.49	0.25	1.[illegible]	3.87
500	CATALYST LIGHT DUTY VEHICLES-EXHAUST	0.00	0.00	0.00	0.00	0.00
501	GASOLINE EVAPORATION-CANISTER-LDV HOT SOAKS	0.00	0.00	0.00	0.00	0.00
502	NON-CATALYST LIGHT DUTY VEHICLES-EXHAUST	53.67	44.90	434.37	7.13	0.48
503	DIESEL EXHAUST(ALDEHYDES NOT IN EMISSIONS)	0.00	0.00	0.00	0.00	0.00
504	EXTERNAL COMBUSTION BOILERS-DISTILLATE OR RESIDUAL	7.36	7.13	0.01	110.33	185.98
505	PLASTICS MANUFACTURE-VC & POLYPROPYLENE MIXED	3.29	3.29	0.00	0.00	0.00
506	HALOGENATED CLEANING SOLVENTS-MIXED	0.00	0.00	0.00	0.00	0.00
508	JET EXHAUST-COMPOSITE	13.49	12.09	30.16	12.02	1.28
510	PLASTICS MFG-VINYL CHLORIDE	0.10	0.10	0.00	0.00	0.00
511	PLASTICS MFG-POLYPROPYLENE	0.00	0.00	0.00	0.00	0.00
512	ORGANIC SOLVENT-DICHLOROMETHANE	0.01	0.00	0.00	0.00	0.00
513	SURFACE COATING EVAPORATION-METHYL ISOBUTYL KETONE	0.01	0.01	0.00	0.00	0.00
514	EVAPORATION-CHEVRON WEED OIL	0.00	0.00	0.00	0.00	0.00
515	COMPOSITE INDUSTRIAL DEGREASERS	9.37	6.51	0.00	0.13	0.00
516	COMPOSITE DRY-CLEANING SOLVENTS	0.16	0.00	0.00	0.00	0.00
517	PRINTING EVAPORATION LOSS-GENERAL	1.43	1.43	0.00	0.00	0.00
518	AEROSOL SPRAYS-NON-SYNTHETIC	21.70	16.66	0.00	0.00	0.00

TABLE 6-6 (continued)

CODE	PROFILE NAME	TOG	ROG	CO	NOX	SOX
519	AEROSOL SPRAYS-SYNTHETIC	1.53	0.00	0.00	0.00	0.00
520	COMPOSITE NATURAL GAS	283.47	5.34	0.01	0.27	0.00
521	DIESEL EXHAUST(ALDEHYDES IN EMISSIONS)	17.01	15.58	31.10	94.[illegible]	15.19
522	FORMICA MANUFACTURING	1.03	0.73	0.00	0.00	0.00
523	OPEN BURNING DUMP-LANDSCAPE/PRUN. (MOD. KVB 121)	22.32	9.69	119.51	0.00	0.00
524	METHYLENE CHLORIDE	0.24	0.00	0.00	0.00	0.00
525	CATALYST EXHAUST (ALDEHYDES IN EMISSIONS)	0.00	0.00	0.00	0.00	0.00
526	1979 EXHAUST COMP. 50/50 (ALDEHYDES IN EMISSIONS)	0.00	0.00	0.00	0.00	0.00
527	NON-CATALYST EXHAUST (ALDEHYDES IN EMISSIONS)	0.00	0.00	0.00	0.00	0.00
600	SPECIES UNKNOWN-ALL CATEGORY COMPOSITE	35.79	25.33	54.78	32.51	7.07
701	LIQUID GASOLINE-UNLEADED REGULAR-SUMMER BLEND	0.00	0.00	0.00	0.00	0.00
702	LIQUID GASOLINE- LEADED REGULAR-SUMMER BLEND	0.00	0.00	0.00	0.00	0.00
703	LIQUID GASOLINE-UNLEADED PREMIUM-SUMMER BLEND	0.00	0.00	0.00	0.00	0.00
704	LIQUID GASOLINE- LEADED PREMIUM-SUMMER BLEND	0.00	0.00	0.00	0.00	0.00
705	GASOLINE VAPORS-UNLEADED REGULAR-SUMMER BLEND	0.00	0.00	0.00	0.00	0.00
706	GASOLINE VAPORS- LEADED REGULAR-SUMMER BLEND	0.00	0.00	0.00	0.00	0.00
707	GASOLINE VAPORS-UNLEADED PREMIUM-SUMMER BLEND	0.00	0.00	0.00	0.00	0.00
708	GASOLINE VAPORS- LEADED PREMIUM-SUMMER BLEND	0.00	0.00	0.00	0.00	0.00
709	LIQUID GASOLINE-COMPOSITE OF PRODUCT-SUMMER BLEND	3.49	6.37	0.00	0.00	0.00
710	GASOLINE VAPORS-COMPOSITE OF PRODUCT-SUMMER BLEND	71.[illegible]4	71.64	0.00	0.00	0.00
711	INDUSTRIAL SURFACE COATING-COMPOSITE LACQUER	22.12	21.81	0.00	0.00	0.00
712	INDUSTRIAL SURFACE COATING-COMPOSITE ENAMEL	17.52	16.90	0.00	0.00	0.[illegible]4
713	INDUSTRIAL SURFACE COATING-COMPOSITE PRIMER	6.99	6.82	0.00	0.00	0.00
714	INDUSTRIAL SURFACE COATING-COMPOSITE ADHESIVE	8.47	8.47	0.00	0.00	0.00
715	SLOW CURE ASPHALT	5.65	5.65	0.00	0.00	0.00
716	MEDIUM CURE ASPHALT	23.0[illegible]	23.00	0.00	0.00	0.00
717	ARCHITECTURAL SURFACE COATING-WATER BASED PAINT	13.41	13.43	0.00	0.00	0.00
718	ARCHITECTURAL SURFACE COATING-COMPOSITE SOLVENT	24.[illegible]	24.26	0.00	0.00	0.00
719	INTERNAL COMBUSTION ENGINE-RECIPROCATING-NAT. GAS	21.97	2.72	8.88	54.[illegible]	0.[illegible]4
721	LIQUID GASOLINE-UNLEADED REGULAR-WINTER BLEND	0.00	0.00	0.00	0.00	0.00
722	LIQUID GASOLINE- LEADED REGULAR-WINTER BLEND	0.00	0.00	0.00	0.00	0.00
723	LIQUID GASOLINE-UNLEADED PREMIUM-WINTER BLEND	0.00	0.00	0.00	0.00	0.00
724	LIQUID GASOLINE- LEADED PREMIUM-WINTER BLEND	0.00	0.00	0.00	0.00	0.00
725	GASOLINE VAPORS-UNLEADED REGULAR-WINTER BLEND	0.00	0.00	0.00	0.00	0.00
726	GASOLINE VAPORS- LEADED REGULAR-WINTER BLEND	0.00	0.00	0.00	0.00	0.00
727	GASOLINE VAPORS-UNLEADED PREMIUM-WINTER BLEND	0.00	0.00	0.00	0.00	0.00
728	GASOLINE VAPORS- LEADED PREMIUM-WINTER BLEND	0.00	0.00	0.00	0.00	0.00
729	LIQUID GASOLINE-COMPOSITE OF PRODUCT-WINTER BLEND	0.00	0.00	0.00	0.00	0.00
730	GASOLINE VAPORS-COMPOSITE OF PRODUCT-WINTER BLEND	0.00	0.00	0.00	0.00	0.00
731	HEATED GASOLINE VAPORS-UNLEAD REGULAR-SUMMER BLEND	0.00	0.00	0.00	0.00	0.00
732	AGIT. GASOLINE VAPORS-UNLEAD REGULAR-SUMMER BLEND	0.00	0.00	0.00	0.00	0.00
751	ACRYLONITRILE-BUTADIENE-STYRENE (ABS) RESIN MFG.	0.01	0.01	0.00	0.00	0.00
752	POLYSTYRENE RESIN MFG.	0.45	0.45	0.00	0.00	0.00
753	STYRENE	0.44	0.44	0.00	0.00	0.00
754	CHLOROSOLVE	0.26	0.16	0.00	0.00	0.00
755	TRICHLOROTRIFLOUROETHANE	0.34	0.00	0.00	0.00	0.00
756	OIL AND GAS PRODUCTION FUGITIVES-LIQUID SERVICE	0.12	0.06	0.00	0.00	0.00
757	OIL AND GAS PRODUCTION FUGITIVES-GAS SERVICE	1.05	0.32	0.00	0.00	0.00
758	OIL & GAS PRODUCTION FUGITIVES-VALVES-UNSPECIFIED	33.83	18.03	0.00	0.00	0.00
759	OIL & GAS PROD FUGITIVES-FITTINGS-UNSPECIFIED	9.15	4.16	0.00	0.00	0.00

TABLE 6-6 (concluded)

CODE	PROFILE NAME	TOG	ROG	CO	NOX	SOX
760	EVAPORATIVE EMISSIONS-DISTILLATE FUEL	4.37	4.05	0.00	0.00	0.00
761	EVAPORATIVE EMISSIONS-NAPHTHA	0.62	0.60	0.00	0.00	0.00
762	BTX (BENZENE/TOLUENE/XYLENE)	2.01	2.00	0.00	0.00	0.00
763	PHTHALIC ANHYDRIDE MFG-XYLENE OXIDATION	0.12	0.09	2.54	0.00	0.00
764	FLUOROCARBON-12/11 MANUFACTURING	0.05	0.00	0.00	0.00	0.00
765	FLUOROCARBON-23/22 MANUFACTURING	0.01	0.00	0.00	0.00	0.00
766	FLUOROCARBON-113/114 MANUFACTURING	0.01	0.00	0.00	0.00	0.00
767	FLUOROCARBON-11	0.00	0.00	0.00	0.00	0.00
768	FLUOROCARBON-113	0.00	0.00	0.00	0.00	0.00
769	FLUOROCARBON-114	0.00	0.00	0.00	0.00	0.00
770	CHLOROFLUOROCARBONS	0.00	0.00	0.00	0.00	0.00
771	CARBON TETRACHLORIDE	0.00	0.00	0.00	0.00	0.00
772	ORTHO-XYLENE	0.00	0.00	0.00	0.00	0.00
773	FLUOROCARBON MFG-VALVES, PUMPS, ETC	0.93	0.00	0.00	0.00	0.00
774	ISOBUTYL ACETATE	0.00	0.00	0.00	0.00	0.00
775	ISOBUTYL ALCOHOL	0.00	0.00	0.00	0.00	0.00
776	ISOBUTYL ISOBUTYRATE	0.01	0.01	0.00	0.00	0.00
777	METHYL AMYL KETONE	0.00	0.00	0.00	0.00	0.00
778	METHYL ISOBUTYL KETONE	0.00	0.00	0.00	0.00	0.00
779	N-BUTYL ACETATE	0.00	0.00	0.00	0.00	0.00
780	N-PROPYL ACETATE	0.00	0.00	0.00	0.00	0.00
781	N-PROPYL ALCOHOL	0.00	0.00	0.00	0.00	0.00
782	HEXYLENE GLYCOL	0.07	0.07	0.00	0.00	0.00
783	INDUSTRIAL SURFACE COATING-SOLVENT BASED PAINT	78.44	77.15	0.01	0.00	0.00
784	SYNTHETIC RUBBER MFG-STYRENE-BUTADIENE RUBBER	1.20	1.21	0.00	0.00	0.00
785	ETHYLENE OXIDE	0.05	0.02	0.00	0.00	0.00
786	METHYL ALCOHOL	0.08	0.08	0.00	0.00	0.00
787	CARBON BLACK MANUFACTURING	0.00	0.00	0.00	0.00	0.00
909	MISCELLANEOUS	0.17	0.12	0.00	0.00	0.00
TOTAL		2968.62	773.46	1275.27	513.28	215.50

TABLE 6-7. Original classes of organic gases by OIC code.

(Tons per day)

CODE	SOURCE NAME	OLE	PAR	ARO	CARB	ETH
100	FUEL COMBUSTION	0.00	0.00	0.00	0.00	0.00
110	AGRICULTURAL	0.00	0.00	0.00	0.00	0.00
120	OIL AND GAS PRODUCTION	0.00	0.28	0.01	0.35	0.02
130	PETROLEUM REFINING	0.89	2.93	0.02	0.21	0.61
140	OTHER MANUFACTURING/INDUSTRIAL	0.21	2.12	0.13	0.17	0.41
150	ELECTRIC UTILITIES	0.42	6.21	0.22	0.44	1.12
160	OTHER SERVICES AND COMMERCE	0.05	0.63	0.01	0.05	0.08
170	RESIDENTIAL	0.00	0.55	0.03	0.06	0.00
199	OTHER	0.04	1.68	0.06	0.10	0.23
200	WASTE BURNING	0.00	0.00	0.00	0.00	0.00
210	AGRICULTURAL DEBRIS	0.00	0.01	0.00	0.00	0.01
220	RANGE MANAGEMENT	0.00	0.00	0.00	0.00	0.00
230	FOREST MANAGEMENT	0.00	0.00	0.00	0.00	0.00
240	INCINERATION	0.00	0.02	0.00	0.01	0.01
299	OTHER	0.00	0.00	0.00	0.00	0.00
300	SOLVENT USE	0.00	0.00	0.00	0.00	0.00
310	DRY CLEANING	0.00	8.20	0.00	0.00	0.00
320	DEGREASING	0.00	21.71	0.00	0.00	1.44
330	ARCHITECTURAL COATING	0.00	74.74	9.96	3.29	0.00
340	OTHER SURFACE COATING	0.00	105.04	25.63	8.03	0.01
350	ASPHALT PAVING	1.85	20.32	0.00	0.00	0.67
360	PRINTING	0.00	10.71	0.57	0.76	0.00
370	DOMESTIC	0.00	38.68	0.00	0.95	0.00
380	INDUSTRIAL SOLVENT USE	0.00	20.14	1.44	0.98	0.07
399	OTHER	0.00	1.66	0.14	0.05	0.03
400	PETROLEUM PROCESS, STORAGE & TRANSFER	0.00	0.00	0.00	0.00	0.00
410	OIL AND GAS EXTRACTION	0.00	39.64	0.77	0.00	0.03
420	PETROLEUM REFINING	0.23	42.44	6.15	0.28	0.03
430	PETROLEUM MARKETING	0.83	61.82	21.37	0.00	0.00
499	OTHER	0.02	9.05	1.76	0.00	0.01
500	INDUSTRIAL PROCESSES	0.00	0.00	0.00	0.00	0.00
510	CHEMICAL	0.08	6.29	1.15	0.06	0.31
520	FOOD AND AGRICULTURAL	0.00	7.60	0.46	0.00	0.21
560	MINERAL PROCESSES	0.00	0.63	0.08	0.01	0.03
570	METAL PROCESSES	0.04	1.33	0.17	0.00	0.72
580	WOOD AND PAPER	0.00	0.08	0.01	0.00	0.00
599	OTHER	1.49	1.30	0.06	0.00	1.03
600	MISC PROCESSES	0.00	0.00	0.00	0.00	0.00
610	PESTICIDE APPLICATION	0.00	10.10	2.65	0.29	0.03
620	FARMING OPERATIONS	0.00	15.73	0.00	0.00	0.00
630	CONSTRUCTION AND DEMOLITION	0.00	0.00	0.00	0.00	0.00
640	ENTRAINED ROAD DUST - PAVED	0.00	0.00	0.00	0.0[illegible]	0.00
650	ENTRAINED ROAD DUST - UNPAVED	0.00	0.00	0.00	0.00	0.00
660	UNPLANNED FIRES	4.73	15.47	0.01	0.87	26.70
680	SOLID WASTE LANDFILL	0.39	14.58	3.20	0.0[illegible]	0.00
699	OTHER	0.00	7.93	1.03	0.0[illegible]	0.46
700	ON ROAD VEHICLES	0.00	0.00	0.00	0.0[illegible]	0.00
710	LIGHT DUTY PASSENGER	0.00	0.00	0.06	0.0[illegible]	0.00
720	LIGHT AND MEDIUM DUTY TRUCKS	0.00	0.00	0.00	0.0[illegible]	0.00
730	HEAVY DUTY GAS TRUCKS	0.00	0.00	0.00	0.0[illegible]	0.00

TABLE 6-7 (concluded)

CODE	SOURCE NAME	OLE	PAR	ARO	CARB	ETH
740	HEAVY DUTY DIESEL TRUCKS	0.00	0.00	0.00	0.00	0.00
750	MOTORCYCLES	0.00	0.00	0.00	0.00	0.00
800	OTHER MOBILE	0.00	0.00	0.00	0.00	0.00
810	OFF ROAD VEHICLES	1.92	14.36	4.56	1.55	3.67
820	TRAINS	0.18	4.62	0.14	0.30	0.74
830	SHIPS	0.05	1.26	0.04	0.08	0.20
850	AIRCRAFT - GOVERNMENT	0.01	0.11	0.05	0.00	0.00
860	AIRCRAFT - OTHER	0.99	12.22	5.24	0.33	0.16
870	MOBILE EQUIPMENT	0.76	13.73	2.19	0.76	2.11
880	UTILITY EQUIPMENT	0.79	5.62	1.89	0.62	1.47
900	UNSPECIFIED SOURCES	0.00	0.00	0.00	0.00	0.00
TOTAL		15.98	601.55	91.21	20.60	42.64

TABLE 6-8. Revised classes of organic gases by OIC code.

(Tons per day)

CODE	SOURCE NAME	OLE	PAR	ARO	CARB	ETH
100	FUEL COMBUSTION	0.00	0.00	0.00	0.00	0.00
110	AGRICULTURAL	0.00	0.00	0.00	0.00	0.00
120	OIL AND GAS PRODUCTION	0.05	0.41	0.01	0.04	0.03
130	PETROLEUM REFINING	0.53	2.62	0.03	0.00	0.11
140	OTHER MANUFACTURING/INDUSTRIAL	0.24	2.09	0.13	0.17	0.00
150	ELECTRIC UTILITIES	0.46	6.43	0.23	0.11	1.[illegible]
160	OTHER SERVICES AND COMMERCE	0.00	0.59	0.02	0.05	0.57
170	RESIDENTIAL	0.00	0.55	0.03	0.03	0.00
199	OTHER	0.13	0.77	0.07	0.07	0.10
200	WASTE BURNING	0.00	0.00	0.00	0.00	0.00
210	AGRICULTURAL DEBRIS	0.00	0.01	0.00	0.00	0.01
220	RANGE MANAGEMENT	0.00	0.00	0.00	0.00	0.00
230	FOREST MANAGEMENT	0.00	0.00	0.00	0.00	0.00
240	INCINERATION	0.00	0.02	0.00	0.01	0.01
299	OTHER	0.00	0.00	0.00	0.00	0.00
300	SOLVENT USE	0.00	0.00	0.00	0.00	0.00
310	DRY CLEANING	0.00	8.20	0.00	0.00	0.00
320	DEGREASING	0.00	22.00	0.00	0.10	1.44
330	ARCHITECTURAL COATING	1.22	75.07	10.71	2.[illegible]	0.00
340	OTHER SURFACE COATING	0.09	92.68	55.23	3.18	0.01
350	ASPHALT PAVING	0.78	23.83	7.49	0.01	0.11
360	PRINTING	0.00	10.71	0.57	0.76	0.00
370	DOMESTIC	0.00	38.68	0.00	0.95	0.00
380	INDUSTRIAL SOLVENT USE	0.00	25.39	1.74	1.15	0.08
399	OTHER	0.00	1.55	0.17	0.05	0.01
400	PETROLEUM PROCESS, STORAGE & TRANSFER	0.00	0.00	0.00	0.00	0.00
410	OIL AND GAS EXTRACTION	0.00	35.68	0.15	0.00	0.93
420	PETROLEUM REFINING	0.26	40.70	0.84	0.75	0.03
430	PETROLEUM MARKETING	0.82	74.13	2.20	2.45	0.02
499	OTHER	0.01	7.72	0.09	0.05	0.02
500	INDUSTRIAL PROCESSES	0.00	0.00	0.00	0.00	0.00
510	CHEMICAL	0.22	3.61	1.32	0.13	0.24
520	FOOD AND AGRICULTURAL	0.00	7.57	0.46	0.00	0.20
560	MINERAL PROCESSES	0.00	0.63	0.03	0.01	0.03
570	METAL PROCESSES	0.04	1.29	0.16	0.00	0.72
580	WOOD AND PAPER	0.00	0.08	0.01	0.00	0.00
599	OTHER	2.02	1.21	0.31	0.05	1.02
600	MISC PROCESSES	0.00	0.00	0.00	0.00	0.00
610	PESTICIDE APPLICATION	0.00	10.10	2.65	0.29	0.03
620	FARMING OPERATIONS	0.00	15.73	0.05	0.00	0.00
630	CONSTRUCTION AND DEMOLITION	0.00	0.00	0.00	0.00	0.00
640	ENTRAINED ROAD DUST - PAVED	0.00	0.00	0.00	0.00	0.00
650	ENTRAINED ROAD DUST - UNPAVED	0.00	0.00	0.00	0.00	0.00
660	UNPLANNED FIRES	4.73	15.47	0.01	0.87	26.70
680	SOLID WASTE LANDFILL	0.39	14.58	0.20	0.00	0.00
699	OTHER	0.00	7.53	1.98	0.00	0.44
700	ON ROAD VEHICLES	0.00	0.00	0.00	0.00	0.00
710	LIGHT DUTY PASSENGER	0.00	0.00	0.00	0.00	0.00
720	LIGHT AND MEDIUM DUTY TRUCKS	0.00	0.00	0.00	0.00	0.00
730	HEAVY DUTY GAS TRUCKS	0.00	0.00	0.00	0.00	0.00

TABLE 6-8 (concluded)

CODE	SOURCE NAME	OLE	PAR	ARO	CARB	ETH
740	HEAVY DUTY DIESEL TRUCKS	0.00	0.00	0.00	0.00	0.00
750	MOTORCYCLES	0.00	0.00	0.00	0.[illegible]	0.09
800	OTHER MOBILE	0.00	0.00	0.00	0.00	0.00
810	OFF ROAD VEHICLES	1.92	14.36	4.56	1.[illegible]5	3.67
820	TRAINS	0.18	4.62	0.14	0.[illegible]	0.74
830	SHIPS	0.05	1.26	0.04	0.[illegible]	0.29
850	AIRCRAFT - GOVERNMENT	0.01	0.11	0.05	0.00	0.00
860	AIRCRAFT - OTHER	0.99	12.22	5.24	0.[illegible]3	0.16
870	MOBILE EQUIPMENT	0.76	13.73	2.19	0.76	2.11
880	UTILITY EQUIPMENT	0.79	5.62	1.89	0.[illegible]2	1.47
900	UNSPECIFIED SOURCES	0.00	0.00	0.00	0.00	0.00
TOTAL		16.79	600.56	102.99	17.76	41.36

Emissions of the five reactive classes of organic gases are thus given in these tables in tons/day as methane for 1979. On-road motor vehicle emissions are excluded from these tables as well.

Emissions for two of the five classes of pollutants--OLE and ARO--increased, and emissions for three classes--PAR, CARB, and ETH--decreased in the revised inventory. One of the most important effects of the modifications to the inventory is an increase of 11.8 tons/day in the aromatic component of the inventory. This is chiefly the result of the improved speciation profiles for surface coating categories. The aromatic portion of emissions from OIC 340 (other surface coating) has increased more than 100 percent in the revised inventory. A major aromatic increase has also occurred for asphalt paving (OIC 350) emissions, but as discussed in Section 5, there is uncertainty associated with the new asphalt profiles. At the same time, substantial decreases in the aromatic portion of petroleum refining and marketing (OICs 420 and 430) emissions have resulted primarily from revised speciation profiles for gasoline. Similar conclusions regarding the aromatic component of the ROG inventory can be drawn from a comparison of Tables 6-9 and 6-10, which present classes of organic gases by profile code. Tables 6-7 through 6-10 generally indicate a more reactive mix of organic gases overall in the revised inventory.

Organic Gas Species

Appendix E provides a listing of the 68 new speciation profiles, including individual organic gas species for each profile. One result of the use of the new profiles is the addition of many new species that were not a part of the original SOCAB inventory. Table 6-11 lists species that were added to the inventory together with their SAROAD numbers and molecular weights.

Tables 6-12 and 6-13 list TOG emissions in the MED point and area source files by reactive and unreactive species for the original and revised inventories, respectively. Individual organic gas species contained in the speciation profiles for each inventory are given in these tables on a weight percent basis. Two weight percents are listed: one column in the table lists the percent of the point and area source inventory; the other column is similar, but excludes landfill emissions, which are primarily unreactive and make up a large portion of the TOG inventory.

Finally, Table 6-14 identifies the approximate relationship between existing and new speciation profiles. This table was created by comparing the original profiles and new profiles for existing SCCs that were reassigned revised profile numbers. The relationship in the table is approximate

TABLE 6-9. Original classes of organic gases by profile code.

(Tons per day)

CODE	PROFILE NAME	OLE	PAR	ARO	CARB	ETH
3	EXTERNAL COMBUSTION BOILER- NATURAL GAS	0.00	1.92	0.11	0.28	0.00
4	BOILERS- REFINERY GAS	0.58	2.25	0.00	0.18	0.00
5	BOILERS- COKE OVEN GAS	0.00	0.02	0.00	0.00	0.21
7	INTERNAL COMB. ENG. - TURBINE- NATURAL G	0.00	0.00	0.00	0.70	0.00
9	INDUSTRIAL ICE- DISTILLATE OIL	0.68	0.55	0.00	0.00	0.77
10	INDUSTRIAL ICE- NAT. GAS- RECIPROCATING	0.00	2.55	0.00	0.14	0.30
11	COKE OVEN STACK GAS- PRIMARY METALS	0.04	0.13	0.01	0.00	0.65
13	IRON SINTERING- PRIMARY METALS	0.00	0.01	0.00	0.00	0.01
21	ASPHALT ROOFING- BLOWING OPERATION	0.00	0.06	0.00	0.00	0.00
22	ASPHALT ROOFING- DIPPING	0.00	1.02	0.00	0.00	0.02
25	ASPHALT CONCRETE- ROT. DRYER- NAT. GAS	0.00	0.03	0.00	0.00	0.00
26	ASPHALT CONCRETE- IN PLACE ROAD ASPHALT	1.85	20.32	0.00	0.02	0.67
29	REFINERY CO BOILER- FCC	0.00	0.15	0.00	0.27	0.00
31	REFINERY- FUGI. EMISS. FROM COVERED DRAI	0.00	1.26	0.00	0.00	0.00
35	REFINERY COOLING TOWERS FUGITIVE EMISSIO	0.00	0.00	0.00	0.00	0.00
39	PETRO INDUSTRY- COMPRESSOR SEALS- REFINE	0.04	0.36	0.00	0.00	0.00
47	PETRO MARKETING- RELIEF VALVES- LPG	0.01	0.13	0.00	0.00	0.00
51	REFINERY FLARES- NATURAL GAS	0.00	0.01	0.00	0.01	0.00
53	REFINERY- CATALYTIC REFORMER- GENERAL FU	0.00	2.13	0.04	0.00	0.00
66	VARNISH MANUFACTURING	0.00	0.04	0.00	0.01	0.00
72	PRINT. INK COOKING- GENERAL	0.00	0.00	0.00	0.00	0.00
76	PESTICIDE USE- COMPOSITE DOMESTIC & COMM	0.00	9.61	2.60	0.29	0.00
78	ETHYLENE DICHLORIDE MANUFACTURING	0.00	0.00	0.00	0.00	0.00
79	FLARES- CHEMICAL MANUFACTURING	0.00	0.00	0.00	0.00	0.00
85	PERCHLOROETHYLENE CLEANING SOLVENT	0.00	0.00	0.00	0.00	0.00
86	STODDARD CLEANING SOLVENT	0.00	24.58	0.00	0.00	0.00
87	1,1,1-TRICHLOROETHANE CLEANING SOLVENT	0.00	0.00	0.00	0.00	0.00
90	DEGREASING- TOLUENE	0.00	0.00	0.01	0.00	0.00
96	SURFACE COATING SOLVENT- GENERAL	0.00	66.17	6.68	2.59	0.00
98	GASOLINE EVAP-COMPOSITE WORKING & BREATH	1.03	57.51	26.37	0.00	0.00
100	JET FUEL EVAP	0.00	1.57	0.00	0.00	0.00
121	OPEN BURNING DUMP- LANDSCAPE/PRUNING	0.00	0.00	0.00	0.00	0.00
122	BAR SCREEN WASTE INCINERATOR- SOLID WAST	0.00	0.00	0.00	0.00	0.01
125	POLYMERIC SURFACE COATING- HOT AIR DRIED	0.00	4.19	9.77	0.29	0.00
127	SURFACE COATING EVAP- GENERAL VARNISH/SH	0.00	2.13	0.00	0.37	0.00
134	SURFACE COATING EVAP- GENERAL PRIMER	0.00	3.34	0.38	0.49	0.00
136	SURFACE COATING EVAP- METAL PRIMER	0.00	29.98	3.33	2.62	0.00
141	SURFACE COATING EVAP- LABEL ADHESIVES	0.00	2.23	4.99	0.16	0.00
142	SURFACE COATING EVAP- METAL FURNITURE AD	0.00	0.34	0.09	0.03	0.00
148	SURFACE COATING LACQUER- METAL FURNITURE	0.00	6.02	1.38	0.72	0.00
149	SURFACE COATING LACQUER- PAPERBOARD PROD	0.00	7.75	1.23	1.36	0.00
156	SURFACE COATING EVAP- GENERAL COMPOSITE	0.00	9.83	0.79	1.29	0.00
157	SURFACE COATING EVAP- COMPOSITE WOOD FUR	0.00	0.00	0.00	0.00	0.00
159	SURFACE COATING EVAP- SHEET METAL ENAMEL	0.00	0.00	0.00	0.00	0.00
172	FLEX. PRINT.- COMPOSITE OF ALCOHOL BASED	0.00	1.31	0.00	0.01	0.00
182	EVAP- GRAVURE PRINT.- GENERAL SOLVENT	0.00	4.99	0.61	0.42	0.00
185	PETRO STORAGE- FIXED ROOF- TOLUENE	0.00	0.12	0.71	0.00	0.00
195	METHANE SOURCE	0.00	0.00	0.00	0.00	0.00
196	ARCHITECTURAL SURFACE COATINGS- COMPOSIT	0.00	59.18	8.27	1.85	0.00
197	DOMESTIC SOLVENTS- GENERAL COMPOSITE	0.00	22.02	0.00	0.95	0.00

TABLE 6-9 (continued)

CODE	PROFILE NAME	OLE	PAR	ARO	CARB	ETH
202	LANDFILL EMISSIONS	0.39	14.58	3.20	0.00	0.00
203	ANIMAL WASTE DECOMPOSITION	0.00	15.73	0.00	0.00	0.00
211	BEER FERMENTATION- ETHANOL	0.00	4.02	0.00	0.00	0.00
217	COKE OVEN BLAST FURNACE- PROCESS GAS	0.01	0.01	0.00	0.00	0.00
219	ACETONE- PAINT SOLVENT	0.00	3.37	0.00	0.00	0.00
220	SURFACE COATING EVAP- ETHYL ACETATE	0.00	0.21	0.00	0.00	0.00
221	SURFACE COATING EVAP- METHYL ETHYL KETON	0.00	1.67	0.00	0.56	0.00
222	SURFACE COATING EVAP- CELLOSOLVE ACETATE	0.00	0.00	0.00	0.00	0.00
223	SURFACE COATING EVAP- XYLENE SOLVENT	0.00	0.01	0.02	0.00	0.00
225	SURFACE COATING EVAP- MINERAL SPIRITS SP	0.00	1.21	0.00	0.00	0.00
226	SURFACE COATING SOLVENT- ETHYL ALCOHOL	0.00	0.40	0.00	0.00	0.00
227	SURFACE COATING EVAP- SOLVENT- ISOPROPYL	0.00	0.78	0.00	0.00	0.00
228	SURFACE COATING EVAP- SOLVENT- ISOPROPYL	0.00	0.13	0.00	0.00	0.00
229	SURFACE COATING EVAP- SOLVENT- LACTOL SP	0.00	1.63	0.00	0.00	0.00
230	PETRO STORAGE- FIXED ROOF- HEXANE	0.00	0.06	0.00	0.00	0.00
271	TRICHLOROETHYLENE CLEANING SOLVENT	0.00	0.00	0.00	0.00	0.31
274	SYNTHEIC RUBBER AUTO TIRE PRODUCTION	0.00	0.00	0.00	0.00	0.00
280	SURFACE COATING PRIMER- WATER BASED AUTO	0.00	0.00	0.00	0.00	0.00
281	SURFACE COATING EVAP- MINERAL SPIRITS	0.00	0.00	0.00	0.00	0.00
282	SURFACE COATING EVAP- NAPHTHA	0.00	1.00	0.00	0.00	0.00
289	SURFACE COATING EVAP- SOLVENT- BUTYL ALC	0.00	0.01	0.00	0.00	0.00
290	SURFACE COATING EVAP- SOLVENT- CELLOSOLV	0.00	0.00	0.00	0.00	0.00
294	CITRUS COATING WAX- FLAVORSEAL 320-0820	0.00	0.01	0.02	0.00	0.00
296	COMPOSITE CRUDE OIL EVAP- FIXED ROOF- PR	0.00	0.00	0.00	0.00	0.00
297	CRUDE OIL EVAP- VAPOR COMPOSITE FROM FIX	0.00	64.67	1.10	0.00	0.00
298	PETRO STORAGE- FIXED ROOF- BENZENE	0.00	0.01	0.00	0.00	0.00
299	PETRO STORAGE- FIXED ROOF- CYCLOHEXANE	0.00	0.01	0.00	0.00	0.00
301	PETRO STORAGE- FIXED ROOF- HEPTANE	0.00	0.00	0.00	0.00	0.00
303	PETRO STORAGE- FIXED ROOF- PENTANE	0.00	0.01	0.00	0.00	0.00
304	EVAP- FLEX. PRINT. PRESS- N-PROPYL ALCOH	0.00	2.91	0.00	0.24	0.00
306	OPEN HEARTH WITH OXYGEN LANCE- STEEL PRO	0.00	0.00	0.00	0.00	0.00
307	FORREST FIRES	4.22	11.02	0.00	0.55	22.25
316	REFINERY- PIPES, VALVES & FLANGES- COMPO	0.00	0.86	0.01	0.00	0.00
321	REFINERY- PUMP SEALS- COMPOSITE	0.00	14.23	0.61	0.00	0.00
500	CATALYST LIGHT DUTY VEHICLES- EXHAUST	0.00	0.00	0.00	0.00	0.00
501	GASOLINE EVAP- CANISTER- LDV HOT SOAKS	0.00	0.00	0.00	0.00	0.00
502	NON-CATALYST LIGHT DUTY VEHICLES- EXHAUS	3.40	24.27	8.17	2.70	6.36
503	DIESEL EXHAUST(ALDEHYDES NOT IN EMISSION	0.00	0.00	0.00	0.00	0.00
504	EXT. COMBUSTION BOILERS- DIST. OR RESID.	0.24	5.80	0.17	0.00	0.97
505	PLASTICS MANUFACTURE- VC & POLYPROPYLENE	1.49	0.75	0.00	0.00	1.00
506	HALOGENATED CLEANING SOLVENTS- MIXED	0.00	0.00	0.00	0.00	0.00
508	JET EXHAUST- COMPOSITE	0.92	11.80	5.11	0.26	0.00
510	PLASTICS MFG- VINYL CHLORIDE	0.00	0.00	0.00	0.00	0.03
511	PLASTICS MFG- POLYPROPYLENE	0.08	0.04	0.00	0.00	0.00
512	ORGANIC SOLVENT- DICHLOROMETHANE	0.00	0.00	0.00	0.00	0.00
513	SURFACE COATING EVAP- METHYL ISOBUTYL KE	0.00	0.01	0.00	0.00	0.00
514	EVAP- CHEVRON WEED OIL	0.00	2.88	1.76	0.00	0.00
515	COMPOSITE INDUSTRIAL DEGREASERS	0.00	5.67	0.00	0.00	1.22
516	COMPOSITE DRY-CLEANING SOLVENTS	0.00	0.00	0.00	0.00	0.00
517	PRINT. EVAP LOSS- GENERAL	0.00	1.31	0.00	0.12	0.00

TABLE 6-9 (concluded).

CODE	PROFILE NAME	OLE	PAR	ARO	CARB	ETH
518	AEROSOL SPRAYS- NON-SYNTHETIC	0.00	16.66	0.00	0.00	0.00
519	AEROSOL SPRAYS- SYNTHETIC	0.00	0.00	0.00	0.00	0.00
520	COMPOSITE NATURAL GAS	0.00	5.46	0.00	0.00	0.00
521	DIESEL EXHAUST(ALDEHYDES IN EMISSIONS)	0.48	12.02	0.37	0.78	1.93
522	FORMICA MANUFACTURING	0.00	0.85	0.00	0.03	0.00
523	OPEN BURNING DUMP- LANDSCAPE/PRUNING (MO	0.51	4.41	0.00	0.32	4.46
524	METHYLENE CHLORIDE	0.00	0.00	0.00	0.00	0.00
525	CATALYST EXHAUST (ALDEHYDES IN EMISSIONS	0.00	0.00	0.00	0.00	0.00
526	1979 EXHAUST COMPOSITE 50/50 (ALDEHYDES	0.00	0.00	0.00	0.00	0.00
527	NON-CATALYST EXHAUST (ALDEHYDES IN EMISS	0.00	0.00	0.00	0.00	0.00
600	SPECIES UNKNOWN- ALL CATEGORY COMPOSITE	0.00	25.17	3.28	0.00	1.46
909	MISCELLANEOUS	0.00	0.12	0.02	0.00	0.01
TOTAL		15.98	601.56	91.21	20.60	42.64

TABLE 6-10. Revised classes of organic gases by profile code.

(Tons per day)

CODE	PROFILE NAME	OLE	PAR	ARO	CARB	ETH
3	EXTERNAL COMBUSTION BOILER-NATURAL GAS	0.00	1.92	0.11	0.[illegible]6	0.00
4	BOILERS-REFINERY GAS	0.58	2.25	0.00	0.[illegible]8	0.[illegible]
5	BOILERS-COKE OVEN GAS	0.00	0.02	0.00	0.00	0.21
7	INTERNAL COMBUSTION ENGINE-TURBINE-NATURAL GAS	0.00	0.00	0.00	0.[illegible]	0.[illegible]
9	INDUSTRIAL ICE-DISTILLATE OIL	0.25	0.20	0.0[illegible]	0.[illegible]	0.[illegible]
10	INDUSTRIAL ICE-NATURAL GAS-RECIPROCATING	0.00	0.00	0.00	0.[illegible]	0.00
11	COKE OVEN STACK GAS-PRIMARY METALS	0.04	0.13	0.01	0.[illegible]	0.65
13	IRON SINTERING-PRIMARY METALS	0.00	0.01	0.00	0.00	0.[illegible]
21	ASPHALT ROOFING-BLOWING OPERATION	0.00	0.01	0.00	0.[illegible]	0.[illegible]
22	ASPHALT ROOFING-DIPPING	0.00	1.02	0.00	0.[illegible]	0.02
25	ASPHALT CONCRETE-ROTARY DRYER-NATURAL GAS FIRED	0.00	0.03	0.00	0.[illegible]	0.[illegible]
26	ASPHALT CONCRETE-IN PLACE ROAD ASPHALT	0.29	3.20	0.00	0.[illegible]	0.11
29	REFINERY CO BOILER-FCC	0.00	0.11	0.05	0.[illegible]	0.[illegible]
31	REFINERY-FUGITIVE EMISS. FROM COV. DRAIN/SEP PITS	0.00	[illegible].00	0.00	0.[illegible]	0.[illegible]
35	REFINERY COOLING TOWERS FUGITIVE EMISSIONS	0.00	0.15	0.00	0.[illegible]	0.[illegible]
39	PETRO INDUSTRY-COMPRESSOR SEALS-REFINERY GAS	0.04	0.43	0.00	0.[illegible]	0.[illegible]
47	PETRO MARKETING-RELIEF VALVES-LPG	0.04	[illegible].56	0.00	0.[illegible]	0.[illegible]
51	REFINERY FLARES-NATURAL GAS	0.00	0.01	0.00	0.[illegible]1	0.00
53	REFINERY-CATALYTIC REFORMER-GENERAL FUGITIVE EMISS	0.00	0.98	0.02	0.[illegible]	0.[illegible]
66	VARNISH MANUFACTURING	0.00	0.10	0.00	0.[illegible]2	0.[illegible]
72	PRINTING INK COOKING-GENERAL	0.00	0.00	0.00	0.[illegible]	0.[illegible]
76	PESTICIDE USE-COMPOSITE DOMESTIC & COMMERCIAL	0.00	9.61	2.60	0.[illegible]	0.[illegible]
78	ETHYLENE DICHLORIDE MANUFACTURING	0.00	0.00	0.00	0.[illegible]	0.[illegible]7
79	FLARES-CHEMICAL MANUFACTURING	0.00	0.00	0.00	0.[illegible]	0.[illegible]
85	PERCHLOROETHYLENE CLEANING SOLVENT	0.00	0.00	0.00	0.[illegible]	0.00
86	STODDARD CLEANING SOLVENT	0.00	24.6[illegible]	0.00	0.[illegible]	0.[illegible]
87	1,1,1-TRICHLOROETHANE CLEANING SOLVENT	0.00	0.00	0.0[illegible]	0.[illegible]	0.[illegible]
90	DEGREASING-TOLUENE	0.00	0.00	[illegible].00	0.[illegible]	0.[illegible]
96	SURFACE COATING SOLVENT-GENERAL	0.00	28.20	2.85	1.[illegible]	0.[illegible]
98	GASOLINE EVAP-COMP WORK. & BREATH. TANK LOSS	0.00	0.00	0.0[illegible]	0.[illegible]	0.[illegible]
100	JET FUEL EVAPORATION	0.00	[illegible].06	0.[illegible]	0.[illegible]	0.[illegible]
122	BAR SCREEN WASTE INCINERATOR-SOLID WASTE	0.00	0.00	0.00	0.[illegible]	0.[illegible]1
125	POLYMERIC SURFACE COATING-HOT AIR DRIED	0.00	0.00	0.00	0.[illegible]	0.[illegible]
127	SURFACE COATING EVAP-GENERAL VARNISH/SHELLAC	0.[illegible]	1.25	0.00	0.[illegible]	0.[illegible]
134	SURFACE COATING EVAP-GENERAL PRIMER	0.00	0.00	0.00	0.[illegible]	0.[illegible]
138	SURFACE COATING EVAP- METAL PRIMER	0.00	0.00	0.00	0.[illegible]	0.00
141	SURFACE COATING EVAP-LABEL ADHESIVES	0.00	0.00	0.00	0.[illegible]	0.[illegible]
142	SURFACE COATING EVAP-METAL FURNITURE ADHESIVES	0.00	0.00	0.[illegible]	0.[illegible]	0.[illegible]
143	SURFACE COATING LACQUER-METAL FURNITURE	0.[illegible]	0.00	0.[illegible]	0.[illegible]	0.[illegible]
149	SURFACE COAT. LACQUER-PAPERBOARD PROD. & CONTAINER	0.[illegible]	0.[illegible]	0.00	0.[illegible]	0.[illegible]
156	SURFACE COATING EVAP-GENERAL COMPOSITE ENAMEL	0.[illegible]	0.[illegible]	0.[illegible]	0.[illegible]	0.[illegible]
157	SURFACE COAT. EVAP-COMPOSITE WOOD FURNITURE ENAMEL	0.00	0.00	0.[illegible]	0.[illegible]	0.[illegible]
159	SURFACE COATING EVAP-SHEET METAL ENAMEL	0.00	0.00	0.00	0.[illegible]	0.[illegible]
172	FLEXOGRAPHIC PRINT-COMP OF ALCOHL BASED SOLV.-EVAP	0.00	1.31	0.00	0.[illegible]1	0.[illegible]
182	EVAPORATION-GRAVURE PRINTING-GENERAL SOLVENT	0.[illegible]	[illegible].99	0.61	0.[illegible]2	0.[illegible]
185	PETRO STORAGE-FIXED ROOF-TOLUENE	0.[illegible]	0.[illegible]7	0.43	0.[illegible]	0.[illegible]
195	METHANE SOURCE	0.00	0.[illegible]	0.00	0.[illegible]	0.00
196	ARCHITECTURAL SURFACE COATINGS-COMPOSITE SOLVENT	0.00	4[illegible].66	6.38	1.[illegible]3	0.00
197	DOMESTIC SOLVENTS-GENERAL COMPOSITE	0.00	2[illegible].02	0.00	0.[illegible]5	0.[illegible]
202	LANDFILL EMISSIONS	0.39	14.58	3.20	0.[illegible]	0.[illegible]

TABLE 6-10 (continued)

CODE	PROFILE NAME	OLE	PAR	ARO	CARB	ETH
203	ANIMAL WASTE DECOMPOSITION	0.00	15.73	0.00	0.00	0.00
211	BEER FERMENTATION-ETHANOL	0.00	4.02	0.00	0.00	0.00
217	COKE OVEN BLAST FURNACE-PROCESS GAS	0.01	0.01	0.00	0.00	0.00
219	ACETONE-PAINT SOLVENT	0.00	4.25	0.00	0.00	0.00
220	SURFACE COATING EVAP-ETHYL ACETATE	0.00	4.22	0.00	0.00	0.00
221	SURFACE COATING EVAP-METHYL ETHYL KETONE	0.00	2.26	0.00	0.75	0.00
222	SURFACE COATING EVAP-CELLOSOLVE ACETATE	0.00	0.01	0.00	0.01	0.00
223	SURFACE COATING EVAP-XYLENE SOLVENT	0.00	0.01	0.03	0.00	0.00
225	SURFACE COATING EVAP-MINERAL SPIRITS SPECIES	0.00	2.35	0.00	0.00	0.00
226	SURFACE COATING SOLVENT-ETHYL ALCOHOL	0.00	0.68	0.00	0.00	0.00
227	SURFACE COATING EVAP-SOLVENT-ISOPROPYL ALCOHOL	0.00	0.55	0.00	0.00	0.00
228	SURFACE COATING EVAP-SOLVENT-ISOPROPYL ACETONE	0.00	0.14	0.00	0.00	0.00
229	SURFACE COATING EVAP-SOLVENT-LACTOL SPIRITS	0.00	1.37	0.00	0.00	0.00
230	PETRO STORAGE-FIXED ROOF-HEXANE	0.00	0.15	0.00	0.00	0.00
271	TRICHLOROETHYLENE CLEANING SOLVENT	0.00	0.00	0.00	0.00	0.05
274	SYNTHEIC RUBBER AUTO TIRE PRODUCTION	0.00	0.00	0.00	0.00	0.00
280	SURF COAT PRIMER-WATER BAS. AUTO PAINT SPRAY BOOTH	0.00	0.00	0.00	0.00	0.00
281	SURFACE COATING EVAPORATION-MINERAL SPIRITS	0.00	0.00	0.00	0.00	0.00
282	SURFACE COATING EVAPORATION-NAPHTHA	0.00	1.69	0.00	0.00	0.00
289	SURFACE COATING EVAPORATION-SOLVENT-BUTYL ALCOHOL	0.00	0.02	0.00	0.00	0.00
290	SURFACE COATING EVAPORATION-SOLVENT-CELLOSOLVE	0.00	0.02	0.00	0.01	0.00
294	CITRUS COATING WAX-FLAVORSEAL 320-0820	0.00	0.01	0.02	0.00	0.00
295	COMPOSITE CRUDE OIL EVAP-FIXED ROOF-PRODUCTION	0.00	8.77	0.00	0.00	0.00
297	CRUDE OIL EVAP-VAPOR COMP FROM FIXED ROOF TANKS	0.00	25.23	0.43	0.00	0.00
298	PETRO STORAGE-FIXED ROOF-BENZENE	0.00	0.01	0.00	0.00	0.00
299	PETRO STORAGE-FIXED ROOF-CYCLOHEXANE	0.00	0.00	0.00	0.00	0.00
301	PETRO STORAGE-FIXED ROOF-HEPTANE	0.00	0.03	0.00	0.00	0.00
303	PETRO STORAGE-FIXED ROOF-PENTANE	0.00	0.00	0.00	0.00	0.00
304	EVAP-FLEXOGRAPHIC PRINTING PRESS-N-PROPYL ALCOHOL	0.00	2.91	0.00	0.24	0.00
306	OPEN HEARTH WITH OXYGEN LANCE-STEEL PRODUCTION	0.00	0.00	0.00	0.00	0.00
307	FORREST FIRES	4.22	11.02	0.00	0.55	22.25
316	REFINERY-PIPES, VALVES & FLANGES-COMPOSITE	0.00	2.25	0.02	0.00	0.00
321	REFINERY-PUMP SEALS-COMPOSITE	0.00	11.01	0.47	0.00	0.00
500	CATALYST LIGHT DUTY VEHICLES-EXHAUST	0.00	0.00	0.00	0.00	0.00
501	GASOLINE EVAPORATION-CANISTER-LDV HOT SOAKS	0.00	0.00	0.00	0.00	0.00
502	NON-CATALYST LIGHT DUTY VEHICLES-EXHAUST	3.40	24.27	8.17	2.70	6.36
503	DIESEL EXHAUST(ALDEHYDES NOT IN EMISSIONS)	0.00	0.00	0.00	0.00	0.00
504	EXTERNAL COMBUSTION BOILERS-DISTILLATE OR RESIDUAL	0.24	5.75	0.17	0.00	0.96
505	PLASTICS MANUFACTURE-VC & POLYPROPYLENE MIXED	1.51	0.76	0.00	0.00	1.02
506	HALOGENATED CLEANING SOLVENTS-MIXED	0.00	0.00	0.00	0.00	0.00
508	JET EXHAUST-COMPOSITE	0.92	11.79	5.11	0.25	0.00
510	PLASTICS MFG-VINYL CHLORIDE	0.00	0.00	0.03	0.00	0.10
511	PLASTICS MFG-POLYPROPYLENE	0.00	0.00	0.00	0.00	0.00
512	ORGANIC SOLVENT-DICHLOROMETHANE	0.00	0.00	0.00	0.00	0.00
513	SURFACE COATING EVAPORATION-METHYL ISOBUTYL KETONE	0.00	0.00	0.00	0.00	0.00
514	EVAPORATION-CHEVRON WEED OIL	0.00	0.00	0.00	0.00	0.00
515	COMPOSITE INDUSTRIAL DEGREASERS	0.00	5.36	0.00	0.00	1.15
516	COMPOSITE DRY-CLEANING SOLVENTS	0.00	0.00	0.00	0.00	0.00
517	PRINTING EVAPORATION LOSS-GENERAL	0.00	1.31	0.00	0.12	0.00
518	AEROSOL SPRAYS-NON-SYNTHETIC	0.00	15.66	0.00	0.00	0.00

TABLE 6-10 (continued)

CODE	PROFILE NAME	OLE	PAR	ARO	CARB	ETH
519	AEROSOL SPRAYS-SYNTHETIC	0.00	0.00	0.00	0.00	0.00
520	COMPOSITE NATURAL GAS	0.00	5.34	0.00	0.00	0.00
521	DIESEL EXHAUST(ALDEHYDES IN EMISSIONS)	0.48	12.02	0.37	0.78	1.93
522	FORMICA MANUFACTURING	0.00	0.70	0.00	0.03	0.00
523	OPEN BURNING DUMP-LANDSCAPE/PRUN. (MOD. KVB 121)	0.51	4.41	0.00	0.02	4.46
524	METHYLENE CHLORIDE	0.00	0.00	0.00	0.00	0.00
525	CATALYST EXHAUST (ALDEHYDES IN EMISSIONS)	0.00	0.00	0.00	0.00	0.00
526	1979 EXHAUST COMP. 50/50 (ALDEHYDES IN EMISSIONS)	0.00	0.00	0.00	0.00	0.00
527	NON-CATALYST EXHAUST (ALDEHYDES IN EMISSIONS)	0.00	0.00	0.00	0.00	0.00
600	SPECIES UNKNOWN-ALL CATEGORY COMPOSITE	0.00	21.31	2.78	0.00	1.24
701	LIQUID GASOLINE-UNLEADED REGULAR-SUMMER BLEND	0.00	0.00	0.00	0.00	0.00
702	LIQUID GASOLINE- LEADED REGULAR-SUMMER BLEND	0.00	0.00	0.00	0.00	0.00
703	LIQUID GASOLINE-UNLEADED PREMIUM-SUMMER BLEND	0.00	0.00	0.00	0.00	0.00
704	LIQUID GASOLINE- LEADED PREMIUM-SUMMER BLEND	0.00	0.00	0.00	0.00	0.00
705	GASOLINE VAPORS-UNLEADED REGULAR-SUMMER BLEND	0.00	0.00	0.00	0.00	0.00
706	GASOLINE VAPORS- LEADED REGULAR-SUMMER BLEND	0.00	0.00	0.00	0.00	0.00
707	GASOLINE VAPORS-UNLEADED PREMIUM-SUMMER BLEND	0.00	0.00	0.00	0.00	0.00
708	GASOLINE VAPORS- LEADED PREMIUM-SUMMER BLEND	0.00	0.00	0.00	0.00	0.00
709	LIQUID GASOLINE-COMPOSITE OF PRODUCT-SUMMER BLEND	0.09	4.50	1.68	0.10	0.00
710	GASOLINE VAPORS-COMPOSITE OF PRODUCT-SUMMER BLEND	0.92	67.36	0.41	2.04	0.00
711	INDUSTRIAL SURFACE COATING-COMPOSITE LACQUER	0.06	12.09	9.66	0.00	0.00
712	INDUSTRIAL SURFACE COATING-COMPOSITE ENAMEL	0.00	9.26	7.02	0.62	0.00
713	INDUSTRIAL SURFACE COATING-COMPOSITE PRIMER	0.00	3.68	3.05	0.08	0.00
714	INDUSTRIAL SURFACE COATING-COMPOSITE ADHESIVE	0.00	7.95	0.30	0.22	0.00
715	SLOW CURE ASPHALT	0.49	4.23	0.92	0.01	0.00
716	MEDIUM CURE ASPHALT	0.00	16.42	6.58	0.00	0.00
717	ARCHITECTURAL SURFACE COATING-WATER BASED PAINT	0.00	12.49	0.00	0.33	0.00
718	ARCHITECTURAL SURFACE COATING-COMPOSITE SOLVENT	1.22	18.37	4.33	0.03	0.00
719	INTERNAL COMBUSTION ENGINE-RECIPROCATING-NAT. GAS	0.33	2.01	0.00	0.17	0.18
721	LIQUID GASOLINE-UNLEADED REGULAR-WINTER BLEND	0.00	0.00	0.00	0.00	0.00
722	LIQUID GASOLINE- LEADED REGULAR-WINTER BLEND	0.00	0.00	0.00	0.00	0.00
723	LIQUID GASOLINE-UNLEADED PREMIUM-WINTER BLEND	0.00	0.00	0.00	0.00	0.00
724	LIQUID GASOLINE- LEADED PREMIUM-WINTER BLEND	0.00	0.00	0.00	0.00	0.00
725	GASOLINE VAPORS-UNLEADED REGULAR-WINTER BLEND	0.00	0.00	0.00	0.00	0.00
726	GASOLINE VAPORS- LEADED REGULAR-WINTER BLEND	0.00	0.00	0.00	0.00	0.00
727	GASOLINE VAPORS-UNLEADED PREMIUM-WINTER BLEND	0.00	0.00	0.00	0.00	0.00
728	GASOLINE VAPORS- LEADED PREMIUM-WINTER BLEND	0.00	0.00	0.00	0.00	0.00
729	LIQUID GASOLINE-COMPOSITE OF PRODUCT-WINTER BLEND	0.00	0.00	0.00	0.00	0.00
730	GASOLINE VAPORS-COMPOSITE OF PRODUCT-WINTER BLEND	0.00	0.00	0.30	0.00	0.00
731	HEATED GASOLINE VAPORS-UNLEAD REGULAR-SUMMER BLEND	0.00	0.00	0.00	0.00	0.00
732	AGIT. GASOLINE VAPORS-UNLEAD REGULAR-SUMMER BLEND	0.00	0.00	0.00	0.00	0.00
751	ACRYLONITRILE-BUTADIENE-STYRENE (ABS) RESIN MFG.	0.00	0.00	0.00	0.00	0.00
752	POLYSTYRENE RESIN MFG.	0.00	0.06	0.34	0.05	0.00
753	STYRENE	0.00	0.06	0.33	0.06	0.00
754	CHLOROSOLVE	0.00	0.16	0.00	0.00	0.00
75[illegible]	TRICHLOROTRIFLOUROETHANE	0.00	0.00	0.00	0.00	0.00
75[illegible]	OIL AND GAS PRODUCTION FUGITIVES-LIQUID SERVICE	0.00	0.06	0.00	0.00	0.00
7[illegible]	OIL AND GAS PRODUCTION FUGITIVES-GAS SERVICE	0.00	0.32	0.00	0.00	0.00
7[illegible]	OIL & GAS PRODUCTION FUGITIVES-VALVES-UNSPECIFIED	0.00	18.03	0.00	0.03	0.00
7[illegible]	OIL & GAS PROD FUGITIVES-FITTINGS-UNSPECIFIED	0.00	4.16	0.00	0.00	0.00

TABLE 6-10 (concluded)

CODE	PROFILE NAME	OLE	PAR	ARO	CARB	ETH
760	EVAPORATIVE EMISSIONS-DISTILLATE FUEL	0.00	6.05	0.00	0.[illegible]	0.00
761	EVAPORATIVE EMISSIONS-NAPHTHA	0.00	0.53	0.67	0.[illegible]	0.00
762	BTX (BENZENE/TOLUENE/XYLENE)	[illegible]	0.00	0.00	0.[illegible]	0.00
763	PHTHALIC ANHYDRIDE MFG-XYLENE OXIDATION	0.91	0.00	0.03	0.[illegible]	0.00
764	FLUOROCARBON-12/11 MANUFACTURING	0.00	0.00	0.00	0.[illegible]	0.00
765	FLUOROCARBON-23/22 MANUFACTURING	0.00	0.00	0.00	0.[illegible]	0.00
766	FLUOROCARBON-113/114 MANUFACTURING	0.00	0.00	0.00	0.[illegible]	0.00
767	FLUOROCARBON-11	0.00	0.00	0.00	0.[illegible]	0.[illegible]
768	FLUOROCARBON-113	0.00	0.00	0.00	0.[illegible]	0.[illegible]
769	FLUOROCARBON-114	0.00	0.00	0.00	0.[illegible]	0.00
770	CHLOROFLUOROCARBONS	0.00	0.00	0.00	0.[illegible]	0.[illegible]
771	CARBON TETRACHLORIDE	0.00	0.00	0.00	0.[illegible]	0.00
772	ORTHO-XYLENE	0.00	3.70	0.00	0.[illegible]	0.[illegible]
773	FLUOROCARBON MFG-VALVES, PUMPS, ETC	0.00	[illegible]	0.00	0.[illegible]	0.00
774	ISOBUTYL ACETATE	0.00	0.30	0.03	0.[illegible]	0.00
775	ISOBUTYL ALCOHOL	0.00	0.0[illegible]	0.00	0.[illegible]	0.[illegible]
776	ISOBUTYL ISOBUTYRATE	0.00	0.01	0.00	0.[illegible]	0.00
777	METHYL AMYL KETONE	0.00	0.00	0.00	0.[illegible]	0.00
778	METHYL ISOBUTYL KETONE	0.00	0.00	0.00	0.[illegible]	0.[illegible]
779	N-BUTYL ACETATE	0.00	0.00	0.00	0.[illegible]	0.[illegible]
780	N-PROPYL ACETATE	0.00	0.00	0.00	0.[illegible]	0.00
781	N-PROPYL ALCOHOL	0.00	0.00	0.00	0.[illegible]	0.00
782	HEXYLENE GLYCOL	0.00	0.07	0.00	0.[illegible]	0.00
783	INDUSTRIAL SURFACE COATING-SOLVENT BASED PAINT	0.[illegible]	41.92	33.99	1.21	0.[illegible]
784	SYNTHETIC RUBBER MFG-STYRENE-BUTADIENE RUBBER	0.71	0.06	0.37	0.[illegible]	0.[illegible]
785	ETHYLENE OXIDE	0.00	0.02	0.00	0.[illegible]	0.00
786	METHYL ALCOHOL	0.00	0.08	0.00	0.[illegible]	0.[illegible]
787	CARBON BLACK MANUFACTURING	0.00	0.00	0.00	0.[illegible]	0.[illegible]
909	MISCELLANEOUS	0.00	0.10	0.01	0.[illegible]	0.[illegible]1
TOTAL		16.79	600.57	102.99	17.76	41.36

TABLE 6-11. New chemical species in the revised inventory.

Saroad No.	Molecular Weight	Species Name
43215	56.10	ISOBUTYLENE
43243	68.13	ISOPRENE
43266	112.22	C-2-OCTENE
43267	127.05	1-NONENE
43268	140.27	1-DECENE
43269	154.30	1-UNDECENE
43371	118.18	HEXYLENE GLYCOL
43561	114.19	METHYL AMYL KETONE
43825	86.47	CHLORODIFLUOROMETHANE
43826	104.46	CHLOROTRIFLUOROMETHANE
43827	154.47	CHLOROPENTAFLUOROETHANE
43828	170.92	DICHLOROTETRAFLUOROETHANE
43830	118.00	CHLOROFLUOROHYDROCARBONS
45402	122.13	BENZOIC ACID
50006	40.06	PROPADIENE
50028	148.00	PHTHALIC ANHYDRIDE
50029	98.00	MALEIC ANHYDRIDE
50030	76.14	CARBON SULFIDE
50031	60.08	CARBONYL SULFIDE
50032	128.26	3,5,5-TRIMETHYLHEXANE
50033	128.26	2,2,5-TRIMETHYLHEXANE
50034	84.16	T-2-HEXENE
50035	84.16	C-2-HEXENE
50036	72.11	ISOBUTYRALDEHYDE
50037	96.17	1-METHYLCYCLOHEXENE
50038	127.05	C9 OLEFINS
50039	140.27	C10 ALKENES
50040	84.16	2-METHYL-1-PENTENE
50041	98.19	3-HEPTENE
50042	127.05	4-NONENE
50043	120.20	ISOPROPYLBENZENE (CUMENE)
50044	118.18	INDAN
50045	134.22	M-DIETHYLBENZENE
50046	128.19	NAPHTHALENE
50047	134.22	ISOBUTYLBENZENE
50048	116.16	INDENE
50049	120.20	C9 AROMATICS
50050	134.22	C10 AROMATICS
50051	126.59	2-CHLOROTOLUENE
50052	134.22	T-BUTYLBENZENE

TABLE 6-11 (continued)

Saroad No.	Molecular Weight	Species Name
50053	96.94	1,1-DICHLOROETHYLENE
50054	112.22	2,4,4-TRIMETHYL-1-PENTENE
50055	112.22	2,4,4-TRIMETHYL-2-PENTENE
50056	86.14	ISOVALERALDEHYDE
50057	98.19	ETHYLCYCLOPENTANE
50058	112.16	TRIMETHYLCYCLOPENTANE
50059	112.12	DIMETHYLCYCLOHEXANE
50060	129.27	TRIMETHYLCYCLOHEXANE
50061	112.22	ETHYLCYCLOHEXANE
50062	141.24	DIETHYLCYCLOHEXANE
50063	154.30	N-PENTYLCYCLOHEXANE
50064	112.22	C2 CYCLOHEXANE
50065	126.24	C3 CYCLOHEXANE
50066	140.27	C4 CYCLOHEXANE
50067	154.30	C5 CYCLOHEXANE
50068	126.24	C3 ALKYL CYCLOHEXANE
50069	140.27	C4 ALKYL CYCLOHEXANE
50070	142.28	C4 SUBSTITUTED CYCLOHEXANE
50071	154.30	C5 SUBSTITUTED CYCLOHEXANE
50072	170.32	C6 SUBSTITUTED CYCLOHEXANE
50073	154.26	C4 SUBSTITUTED CYCLOHEXANONE
50074	118.17	BUTYL CELLOSOLVE
50075	130.19	C5 ESTER
50076	114.19	2-METHYL-3-HEXANONE
50077	114.19	HEPTANONE
50078	72.10	ALKENE KETONE
50079	136.24	TERPINENE
50080	90.12	BUTANDIOL
50081	60.11	ISOPROPANOL
50082	127.05	ETHYLHEPTENE
50083	182.35	TRIMETHYLDECENE
50084	146.23	C2 ALKYL INDAN
50085	132.21	ALKYL SUBSTITUTED CYCLOHEXANE
50086	166.27	C2 ALKYL DECALIN
50087	156.27	CARVOMENTHOL
50088	150.22	CARVONE
50089	154.26	ISOPULEGONE
50090	112.22	METHYLHEPTENE
50091	128.26	DIMETHYLHEPTANE
50092	187.87	1,2-DIBROMOETHANE

TABLE 6-11 (concluded)

Saroad No.	Molecular Weight	Species Name
50093	92.57	1-CHLOROBUTANE
50094	148.68	3-(CHLOROMETHYL)-HEPTANE
50095	88.15	ETHYL ISOPROPYL ETHER
50096	130.23	DIBUTYL ETHER
50097	128.19	2-BUTYLTETRAHYDROFURAN
50098	140.23	PROPYLCYCLOHEXANONE
50099	162.18	2-(2-BUTOXYETHOXY)-ETHANOL
50100	104.15	1-ETHOXY-2-PROPANOL
50101	130.23	2-ETHYL-1-HEXANOL
50102	116.21	1-HEPTANOL
50103	188.18	2-METHYL-2,4-PENTANEDIOL
50104	102.13	METHYL ISOBUTYRATE
50105	158.24	C8 ESTER
50106	211.19	SUBSTITUTED C7 ESTER
50107	218.24	SUBSTITUTED C9 ESTER

TABLE 6-12. Original organic gas species in weight percent.

SAROAD CODE	NAME	WEIGHT PERCENT	WEIGHT PERCENT *
43105	ISOMERS OF HEXANE	0.441	0.988
43106	ISOMERS OF HEPTANE	0.269	0.604
43107	ISOMERS OF OCTANE	0.209	0.468
43108	ISOMERS OF NONANE	0.619	1.388
43109	ISOMERS OF DECANE	1.393	3.123
43110	ISOMERS OF UNDECANE	0.050	0.113
43111	ISOMERS OF TRIDECANE	0.000	0.000
43112	ISOMERS OF DODECANE	0.000	0.000
43113	ISOMERS OF TETRADECANE	0.000	0.000
43114	ISOMERS OF PENTADECANE	0.000	0.000
43115	C-7 CYCLOPARAFFINS	0.130	0.291
43116	C-8 CYCLOPARAFFINS	0.011	0.024
43117	C-9 CYCLOPARAFFINS	0.005	0.011
43118	MINERAL SPIRITS	0.817	1.833
43119	LACTOL SPIRITS	0.055	0.124
43120	ISOMERS OF BUTENE	0.116	0.261
43121	ISOMERS OF PENTENE	0.063	0.142
43122	ISOMERS OF PENTANE	0.727	1.629
43123	TERPENES	0.055	0.000
43201	METHANE	70.118	34.747
43202	ETHANE	2.271	4.968
43203	ETHYLENE	1.237	2.774
43204	PROPANE	1.288	2.763
43205	PROPYLENE	0.480	1.077
43206	ACETYLENE	0.482	1.081
43207	CYCLOPROPANE	0.000	0.000
43208	PROPYNE	0.000	0.000
43209	METHYLACETYLENE	0.013	0.029
43211	3-METHYL-1-PENTENE	0.000	0.000
43212	N-BUTANE	1.535	3.193
43213	BUTENE	0.129	0.288
43214	ISO-BUTANE	0.776	1.615
43215	ISOBUTYLENE	0.000	0.000
43216	TRANS-2-BUTENE	0.000	0.000
43217	CIS-2-BUTENE	0.000	0.000
43218	1,3-BUTADIENE	0.024	0.054
43219	ETHYLACETYLENE	0.000	0.000
43220	N-PENTANE	0.959	2.027
43223	3-METHYL-1-BUTENE	0.007	0.015
43224	1-PENTENE	0.097	0.217
43225	2-METHYL-1-BUTENE	0.000	0.000
43226	TRANS-2-PENTENE	0.000	0.000
43227	CIS-2-PENTENE	0.000	0.000
43228	2-METHYL-2-BUTENE	0.000	0.000
43229	2-METHYL PENTANE	0.000	0.000
43230	3-METHYL PENTANE	0.000	0.000
43231	HEXANE	1.375	3.084
43232	HEPTANE	0.451	1.010
43233	OCTANE	0.405	0.908
43234	2,3-DIMETHYL-1-BUTENE	0.000	0.000

* WEIGHT PERCENTAGES EXCLUDING LANDFILL EMISSIONS

TABLE 6-12 (continued)

SAROAD CODE	NAME	WEIGHT PERCENT	WEIGHT PERCENT *
43235	NONANE	0.238	0.533
43238	N-DECANE	0.114	0.256
43241	UNDECANE	0.011	0.024
43242	CYCLOPENTANE	0.144	0.074
43245	1-HEXENE	0.015	0.033
43248	CYCLOHEXANE	0.635	1.423
43255	N-DODECANE	0.010	0.022
43258	N-TRIDECANE	0.011	0.025
43259	N-TETRADECANE	0.014	0.031
43260	N-PENTADECANE	0.308	0.691
43261	METHYLCYCLOHEXANE	0.000	0.000
43262	METHYLCYCLOPENTANE	0.000	0.000
43264	CYCLOHEXANONE	0.023	0.051
43265	OCTENE	0.000	0.000
43270	3-METHYL-T-2-PENTENE	0.000	0.000
43271	2,4-DIMETHYLPENTANE	0.000	0.000
43272	METHYLCYCLOPENTENE	0.000	0.000
43273	CYCLOHEXENE	0.000	0.000
43274	2,3-DIMETHYLPENTANE	0.000	0.000
43275	2-METHYLHEXANE	0.000	0.000
43276	2,2,4-TRIMETHYLPENTANE	0.062	0.138
43277	2,4-DIMETHYLHEXANE	0.000	0.000
43278	2,5-DIMETHYLHEXANE	0.000	0.000
43279	2,3,4-TRIMETHYLPENTANE	0.000	0.000
43280	2,3,3-TRIMETHYLPENTANE	0.000	0.000
43281	HEXADECANE	0.008	0.017
43282	HEPTADECANE	0.006	0.014
43283	OCTADECANE	0.006	0.013
43284	NONADECANE	0.004	0.009
43285	EICOSANE	0.000	0.000
43286	HENEICOSANE	0.000	0.000
43287	DOCOSANE	0.000	0.000
43288	ETHYLCYCLOHEXANE	0.000	0.000
43289	C6 OLEFINS	0.000	0.000
43290	C8 OLEFINS	0.123	0.276
43291	2,2-DIMETHYLBUTANE	0.000	0.000
43292	CYCLOPENTENE	0.000	0.000
43293	4-METHYL-T-2-PENTENE	0.000	0.000
43294	C7-OLEFINS	0.000	0.000
43295	3-METHYLHEXANE	0.000	0.000
43296	2,2,3-TRIMETHYLPENTANE	0.000	0.000
43297	4-METHYLHEPTANE	0.000	0.000
43298	3-METHYLHEPTANE	0.000	0.000
43299	2,2,5-TRIMETHYLPENTANE	0.000	0.000
43301	METHYL ALCOHOL	0.289	0.647
43302	ETHYL ALCOHOL	0.753	1.687
43303	N-PROPYL ALCOHOL	0.011	0.025
43304	ISO-PROPYL ALCOHOL	1.178	2.640
43305	N-BUTYL ALCOHOL	0.121	0.271
43306	ISO-BUTYL ALCOHOL	0.014	0.032

* WEIGHT PERCENTAGES EXCLUDING LANDFILL EMISSIONS

TABLE 6-12 (continued)

SAROAD CODE	NAME	WEIGHT PERCENT	WEIGHT PERCENT *
43308	2-BUTYLETHANOL	0.000	0.000
43309	TERT-BUTYL ALCOHOL	0.000	0.000
43310	2-METHOXYETHANOL	0.000	0.000
43311	2-ETHOXYETHANOL	0.099	0.222
43312	1-T-2-C-4-TM-CYCLOPENTANE	0.000	0.000
43320	DIACETONE ALCOHOL	0.000	0.000
43351	ETHYL ETHER	0.000	0.001
43367	GLYCOL ETHER	0.084	0.188
43368	GLYCOL	0.000	0.000
43369	PROPYLENE GLYCOL	0.044	0.098
43370	ETHYLENE GLYCOL	0.014	0.032
43390	TETRAHYDROFURAN	0.000	0.000
43404	ACETIC ACID	0.000	0.000
43432	METHYL ACETATE	0.000	0.000
43433	ETHYL ACETATE	0.153	0.343
43434	PROPYL ACETATE	0.093	0.208
43435	N-BUTYL ACETATE	0.252	0.565
43438	ETHYL ACRYLATE	0.000	0.000
43443	CELLOSOLVE ACETATE	0.000	0.000
43444	ISOPROPYL ACETATE	0.213	0.478
43445	METHYL AMYL ACETATE	0.011	0.025
43446	ISOBUTYL ACETATE	0.035	0.079
43450	DIMETHYL FORMAMIDE	0.012	0.026
43451	ISOBUTYL ISOBUTYRATE	0.144	0.323
43452	2-ETHOXYETHYL ACETATE	0.031	0.071
43502	FORMALDEHYDE	0.186	0.417
43503	ACETALDEHYDE	0.089	0.199
43504	PROPRIONALDEHYDE	0.000	0.000
43510	BUTYRALDEHYDE	0.000	0.000
43511	C3 ALDEHYDE	0.000	0.000
43512	C5 ALDEHYDE	0.000	0.000
43513	C8 ALDEHYDE	0.080	0.179
43551	ACETONE	0.827	1.854
43552	METHYL ETHYL KETONE	1.041	2.333
43559	METHYL N-BUTYL KETONE	0.017	0.037
43560	METHYL ISOBUTYL KETONE	0.174	0.391
43601	ETHYLENE OXIDE	0.000	0.000
43602	PROPYLENE OXIDE	0.000	0.000
43702	ACETONITRILE	0.000	0.000
43704	ACRYLONITRILE	0.000	0.000
43721	ETHYLAMINE	0.046	0.104
43740	TRIMETHYL AMINE	0.046	0.104
43801	METHYL CHLORIDE	0.000	0.000
43802	DICHLOROMETHANE	0.008	0.018
43803	CHLOROFORM	0.000	0.000
43804	CARBON TETRACHLORIDE	0.000	0.000
43807	CARBON TETRABROMIDE	0.000	0.000
43811	TRICHLOROFLOUROMETHANE	0.017	0.039
43812	ETHYL CHLORIDE	0.000	0.000
43813	1,1-DICHLOROETHANE	0.000	0.000

* WEIGHT PERCENTAGES EXCLUDING LANDFILL EMISSIONS

TABLE 6-12 (continued)

SAROAD CODE	NAME	WEIGHT PERCENT	WEIGHT PERCENT *
43814	1,1,1-TRICHLOROETHANE	0.224	0.502
43815	ETHYLENE DICHLORIDE	0.000	0.000
43817	PERCHLOROETHYLENE	0.722	1.246
43819	METHYLENE BROMIDE	0.049	0.110
43820	1,1,2-TRICHLOROETHANE	0.000	0.000
43821	TRICHLOROTRIFLOUROETHANE	0.067	0.150
43822	TRIMETHYLFLUOROSILANE	0.000	0.000
43823	DICHLORODIFLUOROMETHANE	0.017	0.039
43824	TRICHLOROETHYLENE	0.078	0.174
43860	VINYL CHLORIDE	0.056	0.125
45101	NAPHTHA	0.219	0.492
45102	ISOMERS OF XYLENE	1.061	2.255
45103	DIMETHYLETHYLBENZENE	0.000	0.000
45104	ISOMERS OF ETHYLTOLUENE	0.285	0.638
45105	ISOMERS OF BUTYLBENZENE	0.131	0.293
45106	ISOMERS OF DIETHYLBENZENE	0.014	0.032
45107	ISOMERS OF TRIMETHYLBENZENE	0.201	0.451
45108	ISOMERS OF PROPYLBENZENE	0.000	0.000
45201	BENZENE	0.424	0.952
45202	TOLUENE	1.611	3.488
45203	ETHYLBENZENE	0.127	0.284
45204	O-XYLENE	0.000	0.000
45205	M-XYLENE	0.000	0.000
45206	P-XYLENE	0.000	0.000
45207	1,3,5-TRIMETHYLBENZENE	0.000	0.000
45208	1,2,4-TRIMETHYLBENZENE	0.000	0.000
45209	N-PROPYLBENZENE	0.000	0.000
45211	O-ETHYLTOLUENE	0.000	0.000
45212	M-ETHYLTOLUENE	0.000	0.000
45215	TERT-BUTYLBENZENE	0.028	0.063
45216	SEC-BUTYLBENZENE	0.000	0.000
45220	STYRENE	0.000	0.000
45221	A-METHYLSTYRENE	0.000	0.000
45225	1,2,3-TRIMETHYLBENZENE	0.000	0.000
45232	TETRAMETHYLBENZENE	0.000	0.000
45233	TRI/TETRAALKYL BENZENE	0.031	0.070
45234	ISOMERS OF METHYLPROP. BENZENE	0.000	0.000
45300	PHENOLS	0.007	0.016
45401	XYLENE BASE ACIDS	0.000	0.000
45801	MONOCHLOROBENZENE	0.000	0.000
46201	1,4-DIOXANE	0.000	0.000
50001	2,3-DIMETHYLBUTANE	0.000	0.000
50002	2-ETHYL-1-BUTENE	0.000	0.000
50003	C-3-HEXENE	0.000	0.000
50004	2-METHYL-2-PENTENE	0.000	0.000
50005	HEPTENE	0.020	0.045
50006	PROPADIENE	0.000	0.000
50010	METHYLNAPHTHALENE	0.032	0.072
50011	ETHYLNAPHTHALENE	0.006	0.014
50012	DIMETHYLNAPHTHALENE	0.043	0.097

* WEIGHT PERCENTAGES EXCLUDING LANDFILL EMISSIONS

TABLE 6-12 (concluded)

SAROAD CODE	NAME	WEIGHT PERCENT	WEIGHT PERCENT *
50013	PROPYLNAPHTHALENE	0.011	0.024
50014	TRIMETHYLNAPHTHALENE	0.017	0.039
50015	ANTHRACENE	0.001	0.003
50016	METHYLANTHRACENE	0.001	0.003
50017	DIMETHYL-2,3,DIHYDRO-1H-INDENE	0.002	0.005
50018	DIMETHYL ETHER	0.073	0.164
50019	CRYOFLOURANE (FREON 114)	0.017	0.039
50020	B-METHYLSTYRENE	0.000	0.000
50021	O-CRESOL (2-METHYLBENZENOL)	0.000	0.000
50022	M-CRESOL (3-METHYLBENZENOL)	0.000	0.000
50023	P-CRESOL (4-METHYLBENZENOL)	0.000	0.000
50024	BENZYLCHLORIDE	0.000	0.000
50025	A-PINENE	0.000	0.000
50026	B-PINENE	0.000	0.000
50027	D-LIMONENE	0.000	0.000

* WEIGHT PERCENTAGES EXCLUDING LANDFILL EMISSIONS

TABLE 6-13. Revised organic gas species in weight percent.

SAROAD CODE	NAME	WEIGHT PERCENT	WEIGHT PERCENT *
43105	ISOMERS OF HEXANE	0.513	1.148
43106	ISOMERS OF HEPTANE	0.380	0.851
43107	ISOMERS OF OCTANE	0.337	0.754
43108	ISOMERS OF NONANE	0.622	1.392
43109	ISOMERS OF DECANE	1.119	2.504
43110	ISOMERS OF UNDECANE	0.054	0.122
43111	ISOMERS OF TRIDECANE	0.018	0.041
43112	ISOMERS OF DODECANE	0.000	0.000
43113	ISOMERS OF TETRADECANE	0.006	0.013
43114	ISOMERS OF PENTADECANE	0.000	0.000
43115	C-7 CYCLOPARAFFINS	0.127	0.284
43116	C-8 CYCLOPARAFFINS	0.022	0.049
43117	C-9 CYCLOPARAFFINS	0.005	0.011
43118	MINERAL SPIRITS	0.207	0.463
43119	LACTOL SPIRITS	0.046	0.103
43120	ISOMERS OF BUTENE	0.150	0.336
43121	ISOMERS OF PENTENE	0.063	0.141
43122	ISOMERS OF PENTANE	1.346	3.010
43123	TERPENES	0.055	0.000
43201	METHANE	70.102	34.342
43202	ETHANE	2.323	5.073
43203	ETHYLENE	1.189	2.651
43204	PROPANE	1.170	2.413
43205	PROPYLENE	0.447	0.999
43206	ACETYLENE	0.477	1.068
43207	CYCLOPROPANE	0.000	0.000
43208	PROPADIENE	0.003	[illegible]
43209	METHYLACETYLENE	0.013	0.029
43211	3-METHYL-1-PENTENE	0.000	0.000
43212	N-BUTANE	1.873	3.914
43213	BUTENE	0.055	0.122
43214	ISO-BUTANE	0.782	1.027
43215	ISOBUTYLENE	0.000	0.000
43216	TRANS-2-BUTENE	0.036	0.080
43217	CIS-2-BUTENE	0.028	0.054
43218	1,3-BUTADIENE	0.045	0.101
43219	ETHYLACETYLENE	0.000	0.000
43220	N-PENTANE	0.640	1.349
43223	3-METHYL-1-BUTENE	0.016	0.036
43224	1-PENTENE	0.048	0.107
43225	2-METHYL-1-BUTENE	0.031	0.068
43226	TRANS-2-PENTENE	0.039	0.086
43227	CIS-2-PENTENE	0.019	0.043
43228	2-METHYL-2-BUTENE	0.054	0.119
43229	2-METHYL PENTANE	0.000	0.000
43230	3-METHYL PENTANE	0.051	0.114
43231	HEXANE	0.698	1.562
43232	HEPTANE	0.379	0.847
43233	OCTANE	0.171	0.383
43234	2,3-DIMETHYL-1-BUTENE	0.000	0.000

* WEIGHT PERCENTAGES EXCLUDING LANDFILL EMISSIONS

TABLE 6-13 (continued)

SAROAD CODE	NAME	WEIGHT PERCENT	WEIGHT PERCENT *
43235	NONANE	0.275	0.614
43238	N-DECANE	0.161	0.361
43241	UNDECANE	0.067	0.151
43242	CYCLOPENTANE	0.157	0.1[illegible]
43243	ISOPRENE	0.000	0.000
43245	1-HEXENE	0.020	0.045
43248	CYCLOHEXANE	0.438	0.980
43255	N-DODECANE	0.048	0.108
43258	N-TRIDECANE	0.012	0.028
43259	N-TETRADECANE	0.008	0.018
43260	N-PENTADECANE	0.300	0.672
43261	METHYLCYCLOHEXANE	0.293	0.655
43262	METHYLCYCLOPENTANE	0.049	0.109
43264	CYCLOHEXANONE	0.000	0.000
43265	OCTENE	0.001	0.001
43266	C-2-OCTENE	0.000	0.001
43267	1-NONENE	0.001	0.001
43268	1-DECENE	0.000	0.000
43269	1-UNDECENE	0.000	0.001
43270	3-METHYL-T-2-PENTENE	0.002	0.005
43271	2,4-DIMETHYLPENTANE	0.062	0.138
43272	METHYLCYCLOPENTENE	0.000	0.000
43273	CYCLOHEXENE	0.000	0.000
43274	2,3-DIMETHYLPENTANE	0.000	0.000
43275	2-METHYLHEXANE	0.000	0.000
43276	2,2,4-TRIMETHYLPENTANE	0.064	0.144
43277	2,4-DIMETHYLHEXANE	0.222	0.497
43278	2,5-DIMETHYLHEXANE	0.004	0.008
43279	2,3,4-TRIMETHYLPENTANE	0.003	0.007
43280	2,3,3-TRIMETHYLPENTANE	0.000	0.000
43281	HEXADECANE	0.000	0.000
43282	HEPTADECANE	0.000	0.000
43283	OCTADECANE	0.000	0.000
43284	NONADECANE	0.000	0.000
43285	EICOSANE	0.000	0.000
43286	HENEICOSANE	0.000	0.000
43287	DOCOSANE	0.000	0.000
43288	ETHYLCYCLOHEXANE	0.008	0.019
43289	C6 OLEFINS	0.001	0.003
43290	C8 OLEFINS	0.123	0.276
43291	2,2-DIMETHYLBUTANE	0.026	0.058
43292	CYCLOPENTENE	0.006	0.014
43293	4-METHYL-T-2-PENTENE	0.005	0.011
43294	C7-OLEFINS	0.001	0.003
43295	3-METHYLHEXANE	0.013	0.029
43296	2,2,3-TRIMETHYLPENTANE	0.000	0.000
43297	4-METHYLHEPTANE	0.000	0.000
43298	3-METHYLHEPTANE	0.004	0.010
43299	2,2,5-TRIMETHYLPENTANE	0.000	0.000
43301	METHYL ALCOHOL	0.176	0.393

* WEIGHT PERCENTAGES EXCLUDING LANDFILL EMISSIONS

TABLE 6-13 (continued)

SAROAD CODE	NAME	WEIGHT PERCENT	WEIGHT PERCENT *
43302	ETHYL ALCOHOL	0.673	1.597
43303	N-PROPYL ALCOHOL	0.011	0.025
43304	ISO-PROPYL ALCOHOL	0.827	1.850
43305	N-BUTYL ALCOHOL	0.133	0.298
43306	ISO-BUTYL ALCOHOL	0.011	0.024
43208	2-BUTYLETANOL	0.000	0.000
43309	TERT-BUTYL ALCOHOL	0.000	0.050
43310	2-METHOXYETHANOL	0.000	0.050
43311	2-ETHOXYETHANOL	0.001	0.002
43312	1-T-2-C-4-TM-CYCLOPENTANE	0.000	0.000
43320	DIACETONE ALCOHOL	0.000	0.000
43351	ETHYL ETHER	0.000	0.001
43367	GLYCOL ETHER	0.067	0.149
43368	GLYCOL	0.000	0.000
43369	PROPYLENE GLYCOL	0.039	0.088
43370	ETHYLENE GLYCOL	0.014	0.030
43371	HEXYLENE GLYCOL	0.002	0.005
43390	TETRAHYDROFURAN	0.000	0.000
43404	ACETIC ACID	0.000	0.000
43432	METHYL ACETATE	0.000	0.000
43433	ETHYL ACETATE	0.152	0.340
43434	PROPYL ACETATE	0.093	0.207
43435	N-BUTYL ACETATE	0.587	1.314
43438	ETHYL ACRYLATE	0.000	0.000
43443	CELLOSOLVE ACETATE	0.000	0.000
43444	ISOPROPYL ACETATE	0.005	0.010
43445	METHYL AMYL ACETATE	0.000	0.000
43446	ISOBUTYL ACETATE	0.027	0.061
43450	DIMETHYL FORMAMIDE	0.009	0.020
43451	ISOBUTYL ISOBUTYRATE	0.111	0.249
43452	2-ETHOXYETHYL ACETATE	0.025	0.056
43502	FORMALDEHYDE	0.125	0.280
43503	ACETALEHYDE	0.089	0.199
43504	PROPRIONALDEHYDE	0.000	0.050
43510	BUTYRALDEHYDE	0.000	0.000
43511	C3 ALDEHYDE	0.000	0.000
43512	C5 ALDEHYDE	0.000	0.000
43513	C8 ALDEHYDE	0.080	0.179
43551	ACETONE	0.550	1.231
43552	METHYL ETHYL KETONE	0.469	1.049
43559	METHYL N-BUTYL KETONE	0.013	0.028
43560	METHYL ISOBUTYL KETONE	0.100	0.225
43561	METHYL AMYL KETONE	0.000	0.000
43601	ETHYLENE OXIDE	0.002	0.004
43602	PROPYLENE OXIDE	0.000	0.000
43702	ACETONITRILE	0.000	0.000
43704	ACRYLONITRILE	0.000	0.000
43721	ETHYLAMINE	0.046	0.104
43740	TRIMETHYL AMINE	0.046	0.104
43801	METHYL CHLORIDE	0.002	0.005

* WEIGHT PERCENTAGES EXCLUDING LANDFILL EMISSIONS

TABLE 6-13 (continued)

SAROAD CODE	NAME	WEIGHT PERCENT	WEIGHT PERCENT *
438Ø2	DICHLOROMETHANE	Ø.Ø5Ø	Ø.111
438Ø3	CHLOROFORM	Ø.ØØØ	Ø.Ø3Ø
438Ø4	CARBON TETRACHLORIDE	Ø.ØØØ	Ø.ØØØ
438Ø7	CARBON TETRABROMIDE	Ø.ØØØ	Ø.ØØØ
43811	TRICHLOROFLOUROMETHANE	Ø.Ø17	Ø.Ø39
43812	ETHYL CHLORIDE	Ø.ØØ3	Ø.Ø26
43813	1,1-DICHLOROETHANE	Ø.ØØØ	Ø.ØØØ
43814	1,1,1-TRICHLOROETHANE	Ø.222	Ø.497
43815	ETHYLENE DICHLORIDE	Ø.ØØ2	Ø.ØØ6
43817	PERCHLOROETHYLENE	Ø.572	Ø.997
43819	METHYLENE BROMIDE	Ø.Ø49	Ø.1Ø9
4382Ø	1,1,2-TRICHLOROETHANE	Ø.ØØØ	Ø.ØØØ
43821	TRICHLOROTRIFLOUROETHANE	Ø.Ø75	Ø.168
43822	TRIMETHYLFLUOROSILANE	Ø.ØØØ	Ø.Ø2Ø
43823	DICHLORODIFLOUROMETHANE	Ø.Ø18	Ø.Ø41
43824	TRICHLOROETHYLENE	Ø.Ø75	Ø.168
43825	CHLORODIFLUOROMETHANE	Ø.ØØØ	Ø.ØØØ
43826	CHLOROTRIFLUOROMETHANE	Ø.ØØ1	Ø.ØØ2
43827	CHLOROPENTAFLUOROETHANE	Ø.ØØØ	Ø.ØØØ
43828	DICHLOROTETRAFLUOROETHANE	Ø.ØØØ	Ø.ØØØ
4393Ø	CHLOROFLUOROHYDROCARBONS	Ø.ØØØ	Ø.ØØØ
4386Ø	VINYL CHLORIDE	Ø.Ø59	Ø.132
451Ø1	NAPHTHA	Ø.246	Ø.538
451Ø2	ISOMERS OF XYLENE	Ø.649	1.328
451Ø3	DIMETHYLETHYLBENZENE	Ø.ØØØ	Ø.ØØØ
451Ø4	ISOMERS OF ETHYLTOLUENE	Ø.127	Ø.284
451Ø5	ISOMERS OF BUTYLBENZENE	Ø.Ø74	Ø.166
451Ø6	ISOMERS OF DIETHYLBENZENE	Ø.Ø14	Ø.Ø32
451Ø7	ISOMERS OF TRIMETHYLBENZENE	Ø.Ø9Ø	Ø.2Ø1
451Ø8	ISOMERS OF PROPYLBENZENE	Ø.Ø15	Ø.Ø33
452Ø1	BENZENE	Ø.245	Ø.549
452Ø2	TOLUENE	2.349	5.131
452Ø3	ETHYLBENZENE	Ø.164	Ø.366
452Ø4	Ø-XYLENE	Ø.252	Ø.563
452Ø5	M-XYLENE	Ø.Ø14	Ø.Ø31
452Ø6	P-XYLENE	Ø.ØØ9	Ø.Ø2Ø
452Ø7	1,3,5-TRIMETHYLBENZENE	Ø.ØØ3	Ø.ØØ6
452Ø8	1,2,4-TRIMETHYLBENZENE	Ø.ØØ8	Ø.Ø18
452Ø9	N-PROPYLBENZENE	Ø.ØØ1	Ø.ØØ3
45211	O-ETHYLTOLUENE	Ø.ØØ3	Ø.ØØ7
45212	M-ETHYLTOLUENE	Ø.ØØ6	Ø.Ø13
45215	TERT-BUTYLBENZENE	Ø.Ø3Ø	Ø.Ø66
45216	SEC-BUTYLBENZENE	Ø.ØØØ	Ø.ØØØ
4522Ø	STYRENE	Ø.Ø45	Ø.1Ø1
45221	A-METHYLSTYRENE	Ø.ØØØ	Ø.ØØØ
45225	1,2,3-TRIMETHYLBENZENE	Ø.ØØ2	Ø.ØØ5
45232	TETRAMETHYLBENZENE	Ø.ØØØ	Ø.ØØØ
45233	TRI/TETRAALKYL BENZENE	Ø.Ø31	Ø.Ø7Ø
45234	ISOMERS OF METHYLPROP. BENZENE	Ø.ØØØ	Ø.ØØØ
453ØØ	PHENOLS	Ø.ØØ6	Ø.Ø13

* WEIGHT PERCENTAGES EXCLUDING LANDFILL EMISSIONS

TABLE 6-13 (continued)

SAROAD CODE	NAME	WEIGHT PERCENT	WEIGHT PERCENT *
45401	XYLENE BASE ACIDS	Ø.ØØØ	Ø.ØØØ
45402	BENZOIC ACID	Ø.ØØØ	Ø.ØØ1
45801	MONOCHLOROBENZENE	Ø.ØØØ	Ø.ØØØ
46201	1,4-DIOXANE	Ø.ØØØ	Ø.ØØØ
50001	2,3-DIMETHYLBUTANE	Ø.ØØØ	Ø.ØØØ
50002	2-ETHYL-1-BUTENE	Ø.ØØØ	Ø.ØØØ
50003	C-3-HEXENE	Ø.ØØØ	Ø.ØØØ
50004	2-METHYL-2-PENTENE	Ø.ØØØ	Ø.ØØØ
50005	1-HEPTENE	Ø.Ø2Ø	Ø.Ø45
50006	PROPADIENE	Ø.ØØØ	Ø.ØØØ
50010	METHYLNAPHTHALENE	Ø.Ø19	Ø.Ø44
50011	ETHYLNAPHTHALENE	Ø.ØØØ	Ø.ØØØ
50012	DIMETHYLNAPHTHALENE	Ø.ØØØ	Ø.ØØØ
50013	PROPYLNAPHTHALENE	Ø.ØØØ	Ø.ØØØ
50014	TRIMETHYLNAPHTHALENE	Ø.ØØØ	Ø.ØØØ
50015	ANTHRACENE	Ø.ØØØ	Ø.ØØØ
50016	METHYLANTHRACENE	Ø.ØØØ	Ø.ØØØ
50017	DIMETHYL-2,3,DIHYDRO-1H-INDENE	Ø.ØØØ	Ø.ØØØ
50018	DIMETHYL ETHER	Ø.Ø73	Ø.164
50019	CRYOFLOURANE (FREON 114)	Ø.Ø17	Ø.Ø38
50020	B-METHYLSTYRENE	Ø.ØØØ	Ø.ØØØ
50021	O-CRESOL (2-METHYLBENZENOL)	Ø.ØØØ	Ø.ØØØ
50022	M-CRESOL (3-METHYLBENZENOL)	Ø.ØØØ	Ø.ØØØ
50023	P-CRESOL (4-METHYLBENZENOL)	Ø.ØØØ	Ø.ØØØ
50024	BENZYLCHLORIDE	Ø.ØØØ	Ø.ØØØ
50025	A-PINENE	Ø.ØØØ	Ø.ØØØ
50026	B-PINENE	Ø.ØØØ	Ø.ØØ1
50027	D-LIMONENE	Ø.ØØØ	Ø.ØØØ
50028	PHTHALIC ANHYDRIDE	Ø.ØØ2	Ø.ØØ6
50029	MALEIC ANHYDRIDE	Ø.ØØ1	Ø.ØØ2
50030	CARBON SULFIDE	Ø.ØØØ	Ø.ØØØ
50031	CARBONYL SULFIDE	Ø.ØØØ	Ø.ØØØ
50032	3,5,5-TRIMETHYLHEXANE	Ø.ØØ4	Ø.Ø1Ø
50033	2,2,5-TRIMETHYLHEXANE	Ø.ØØ2	Ø.ØØ4
50034	T-2-HEXENE	Ø.ØØ7	Ø.Ø15
50035	C-2-HEXENE	Ø.Ø1Ø	Ø.Ø22
50036	ISOBUTYRALDEHYDE	Ø.ØØØ	Ø.ØØØ
50037	1-METHYLCYCLOHEXENE	Ø.ØØ2	Ø.ØØ4
50038	C9 OLEFINS	Ø.ØØ2	Ø.ØØ5
50039	C1Ø ALKENES	Ø.Ø6Ø	Ø.135
50040	2-METHYL-1-PENTENE	Ø.ØØØ	Ø.ØØØ
50041	3-HEPTENE	Ø.ØØØ	Ø.ØØØ
50042	4-NONENE	Ø.ØØØ	Ø.ØØØ
50043	ISOPROPYLBENZENE (CUMENE)	Ø.ØØØ	Ø.ØØ1
50044	INDAN	Ø.ØØ1	Ø.ØØ2
50045	M-DIETHYLBENZENE	Ø.ØØ1	Ø.ØØ3
50046	NAPHTHALENE	Ø.Ø13	Ø.Ø3Ø
50047	ISOBUTYLBENZENE	Ø.ØØØ	Ø.ØØØ
50048	INDENE	Ø.ØØØ	Ø.ØØØ
50049	C9 AROMATICS	Ø.ØØØ	Ø.ØØØ

* WEIGHT PERCENTAGES EXCLUDING LANDFILL EMISSIONS

TABLE 6-13 (continued)

SAROAD CODE	NAME	WEIGHT PERCENT	WEIGHT PERCENT *
50050	C10 AROMATICS	0.001	0.003
50051	2-CHLOROTOLUENE	0.000	0.000
50052	T-BUTYLBENZENE	0.000	0.000
50053	1,1-DICHLOROETHYLENE	0.000	0.000
50054	2,4,4-TRIMETHYL-1-PENTENE	0.001	0.001
50055	2,4,4-TRIMETHYL-2-PENTENE	0.000	0.000
50056	ISOVALERALDEHYDE	0.000	0.000
50057	ETHYLCYCLOPENTANE	0.018	0.041
50058	TRIMETHYLCYCLOPENTANE	0.014	0.032
50059	DIMETHYLCYCLOHEXANE	0.121	0.270
50060	TRIMETHYLCYCLOHEXANE	0.056	0.125
50061	ETHYLCYCLOHEXANE	0.040	0.090
50062	DIETHYLCYCLOHEXANE	0.066	0.148
50063	N-PENTYLCYCLOHEXANE	0.004	0.009
50064	C2 CYCLOHEXANE	0.051	0.114
50065	C3 CYCLOHEXANE	0.017	0.037
50066	C4 CYCLOHEXANE	0.008	0.017
50067	C5 CYCLOHEXANE	0.008	0.017
50068	C3 ALKYL CYCLOHEXANE	0.076	0.170
50069	C4 ALKYL CYCLOHEXANE	0.040	0.089
50070	C4 SUBSTITUTED CYCLOHEXANE	0.024	0.054
50071	C5 SUBSTITUTED CYCLOHEXANE	0.008	0.018
50072	C6 SUBSTITUTED CYCLOHEXANE	0.005	0.013
50073	C4 SUBSTITUTED CYCLOHEXANONE	0.005	0.010
50074	BUTYL CELLOSOLVE	0.195	0.436
50075	C5 ESTER	0.066	0.147
50076	2-METHYL-3-HEXANONE	0.196	0.440
50077	HEPTANONE	0.043	0.097
50078	ALKENE KETONE	0.017	0.037
50079	TERPINENE	0.037	0.083
50080	BUTANDIOL	0.032	0.071
50081	ISOPROPANOL	0.041	0.092
50082	ETHYLHEPTENE	0.019	0.042
50083	TRIMETHYLDECENE	0.011	0.024
50084	C2 ALKYL INDAN	0.021	0.048
50085	ALKYL SUBSTITUTED CYCLOHEXANE	0.000	0.000
50086	C2 ALKYL DECALIN	0.008	0.017
50087	CARVOMENTHOL	0.013	0.029
50088	CARVONE	0.000	0.000
50089	ISOPULEGONE	0.009	0.020
50090	METHYLHEPTENE	0.013	0.028
50091	DIMETHYLHEPTANE	0.020	0.045
50092	1,2-DIBROMOETHANE	0.000	0.000
50093	1-CHLOROBUTANE	0.010	0.022
50094	3-(CHLOROMETHYL)-HEPTANE	0.003	0.006
50095	ETHYL ISOPROPYL ETHER	0.024	0.053
50096	DIBUTYL ETHER	0.001	0.002
50097	2-BUTYLTETRAHYDROFURAN	0.001	0.002
50098	PROPYLCYCLOHEXANONE	0.005	0.011
50099	2-(2-BUTOXYETHOXY)-ETHANOL	0.004	0.008

* WEIGHT PERCENTAGES EXCLUDING LANDFILL EMISSIONS

TABLE 6-13 (concluded)

SAROAD CODE	NAME	WEIGHT PERCENT	WEIGHT PERCENT *
5Ø1ØØ	1-ETHOXY-2-PROPANOL	Ø.ØØ7	Ø.Ø15
5Ø1Ø1	2-ETHYL-1-HEXANOL	Ø.ØØ5	Ø.Ø1Ø
5Ø1Ø2	1-HEPTANOL	Ø.ØØ4	Ø.ØØ8
5Ø1Ø3	2-METHYL-2,4-PENTANEDIOL	Ø.ØØ6	Ø.Ø14
5Ø1Ø4	METHYL ISOBUTYRATE	Ø.ØØ1	Ø.ØØ1
5Ø1Ø5	C8 ESTER	Ø.ØØ2	Ø.ØØ4
5Ø1Ø6	SUBSTITUTED C7 ESTER	Ø.122	Ø.273
5Ø1Ø7	SUBSTITUTED C9 ESTER	Ø.129	Ø.239

* WEIGHT PERCENTAGES EXCLUDING LANDFILL EMISSIONS

TABLE 6-14. Approximate relationship between new and existing speciation profiles.

Existing Profile		New Profile	
No.	Description	No.	Description
7	IC engine--turbine, natural gas	719	IC engine--reciprocating, natural gas
10	Industrial IC engine--reciprocating, natural gas	719	IC engine--reciprocating, natural gas
26	Asphalt concrete--in-place road asphalt	715	Slow cure asphalt
		716	Medium cure asphalt
96	Surface coating solvent--general	783	Industrial surface coating--solvent-based paint
98	Gasoline evaporation--working and breathing tank losses	709	Liquid gasoline--composite of product, summer blend
		710	Gasoline vapors--composite of product, summer blend
125	Polymeric surface coating--hot air dried	783	Industrial surface coating--solvent-based paint
134	Surface coating evaporation--general primer	713	Industrial surface coating--composite primer
136	Surface coating evaporation--metal primer	712	Industrial surface coating--composite enamel
		713	Industrial surface coating--composite primer
		714	Industrial surface coating--composite adhesive
		718	Architectural surface coating--composite solvent
		783	Industrial surface coating--solvent-based paint
141	Surface coating evaporation--label adhesives	714	Industrial surface coating--composite adhesive

(continued)

TABLE 6-14 (concluded)

Existing Profile		New Profile	
No.	Description	No.	Description
142	Surface coating evaporation--metal furniture adhesive	714	Industrial surface coating--composite adhesive
148	Surface coating lacquer--metal furniture	711	Industrial surface coating--composite lacquer
149	Surface coating lacquer--paperboard products and containers	711	Industrial surface coating--composite lacquer
156	Surface coating evaporation--general composite enamel	712	Industrial surface coating--composite enamel
		717	Architectural surface coating--water-based paint
		783	Industrial surface coating--solvent-based paint
196	Architectural surface coating--composite solvent	717	Architectural surface coating--water-based paint
271	Trichloroethylene cleaning solvent	755	Trichlorotrifluoroethane
296	Composite crude oil evaporation--production, fixed roof	758	Oil and gas production fugitives--valves, unspecified service
514	Evaporation--Chevron weed oil	760	Evaporative emissions--distillate fuel
520	Composite natural gas	758	Oil and gas production fugitives--valves, unspecified service

because profiles are assigned to SCCs, and there is no direct correspondence between an original profile and a new profile assigned in this study. For example, in some cases several new profiles are used in place of one profile in the original inventory. Also, because several SCCs that were assigned profile No. 600 in the original inventory were reassigned several new profiles in the revised inventory, such profiles are not shown in the table. Furthermore, there are other new profiles used in the revised inventory that are not shown in Table 6-14. This table contains only those profiles that were updated to the new 700 series profiles. New SCCs were assigned new profiles not listed in the table because new SCCs would never have been assigned an old profile.

INVENTORY UNCERTAINTIES

High-resolution inventories are estimates of emission rates for sources located in a defined region. The ability of such inventories to represent actual emission rates is limited by the data and procedures that are employed in the emission estimation process. Analysis of uncertainties in the emission estimates resulting from available data and procedural limitations is an important aspect of the inventory development process. Furthermore, a knowledge of inventory uncertainties is valuable in interpreting emission estimates and in the analysis of results based on these estimates.

This section discusses the findings of our investigation of uncertainties in the 1979 emission inventory, which were found to be an important aspect of the study. The primary reasons for the occurrence of inventory uncertainties were

Systematic uncertainties in emission data and speciation

Random errors

Double counting of facilities

Missing source categories

Operating deviations including equipment upsets, control technology deterioration, operational perturbations, and variances from permit requirements.

Uncertainties for Surveyed Facilities

Uncertainty codes were developed for each modification to the emission estimates developed during the facility survey performed in Task 2. The codes represent an estimation of the uncertainty associated with several components of the emission estimate. The codes and their descriptions are provided in Table 6-15 and were noted in the documentation developed for each surveyed facility. These codes were developed for six different areas of the inventory:

Activity data (e.g., throughput, fuel use, etc.)

Emission factors

Control efficiency

Speciation

Temporal distribution

General uncertainties

Systematic Uncertainties

The survey indicated trends in emission estimates and other information that suggest the presence of systematic uncertainties in the inventory.

Emission Data

Emission totals in the SCAQMD EIS file were frequently derived from emission fee data. However, we found total emissions for refineries in the 1979 EIS file to be inaccurate because the results of a 1975 emission survey were commonly used to develop the 1979 EIS file for refineries. The following list shows that our revised refinery estimates using survey results and other information for emission factors and 1979 activity data resulted in a 16 percent decrease in TOG emissions from surveyed refineries compared with these emissions in the original inventory.

TABLE 6-15. Description of uncertainty codes created for this project.

Activity Data	
1--	Usage of surface coatings or solvents are estimates and are not based on actual purchase records.
2--	Emissions were based on the usage of surface coatings and solvents. However, it is estimated that over 20 percent of these materials are recycled or disposed of as liquids and therefore not emitted by this facility. This approach of estimating emissions on the basis of usage data without consideration of disposal or recycling has been widely used in the past. This approach will result in an overestimation of emissions for some facilities.
3--	Same as code 2 except it is estimated that between 0 and 20 percent of the surface coatings and solvents are recycled or disposed of as liquids.
4--	A potential for double counting emissions from solvents exists because surface coatings are thinned using solvents. Therefore, emissions from these solvents may be counted both as solvents and as the organic content of the coatings.
5--	Emission estimates from tanks and/or loading were based on 1981 emission fee data. It is not known how representative 1981 throughput data are for 1979.
6--	Emission estimates from tanks and/or loading were based on 1981 emission fee data. The facility questionnaire response indicated that 1981 throughput data are representative for 1979.
7--	Emission estimates were based on 1979 fuel use data that should be accurate.
8--	Emissions were based on 1979 throughput data that should be accurate.
9--	Emissions were based on 1981 data. However, these data should be within 20 percent of the actual 1979 data.

continued

TABLE 6-15 (continued)

Emission Factors

11-- Emission estimates are from 1979 emission fee data. No documentation exists on how these emission estimates were derived.

12-- Emission estimates are from 1979 emission fee data. Emission estimates are assumed to have been made using AP-42 storage tank equations.

13-- Emission factors are general to an entire class of surface coatings and solvents. The applicability of these factors in this case is somewhat in question.

14-- Emission factors are somewhat in question because the surface coating or solvent was classified on the basis of engineering judgment.

15-- Emission estimates are from the SCAQMD EDP file. No documentation exists on how these emission estimates were derived.

16-- Emissions were estimated by adjusting 1981 emission estimates on the basis of total refinery feed rates for 1979 and 1981.

17-- Emission factors for chemical processes were developed by SCAQMD prior to 1979. Documentation for these emission factors was not available.

18-- Emission factors for chemical processes were developed on the basis of limited source test data.

Control Efficiency

21-- Emission estimates are from the SCAQMD EDP file. Emission controls exist, but it is not known whether they were accounted for in the emission estimate.

22-- Emission estimates for tanks and/or loading from the 1981 emission fee data were used. It is not known if any additional air pollution controls were installed between 1979 and 1981.

23-- Control efficiency of the incinerator is in question.

continued

TABLE 6-15 (continued)

24-- The amount of flashoff and overspray that might not be controlled by the incinerator is unknown.

Speciation

31-- Speciation is an estimate based on engineering judgment. The weight percent of each species should be plus or minus 10 percentage points.

32-- Speciation is an estimate based on engineering judgment. The weight percent of each species should be plus or minus 25 percentage points.

33-- Speciation is uncertain and based on limited information. However, this speciation is believed to be the most accurate estimate currently available.

34-- Speciation is somewhat in question because the surface coating or solvent was classified on the basis of engineering judgment.

35-- Speciation should be altered by incineration.

Temporal Distribution

41-- Temporal distribution was assumed on the basis of the industry type and is considered to be certain.

42-- Temporal distribution was assumed on the basis of the industry type and is moderately certain.

43-- Temporal distribution was assumed on the basis of the industry type and is somewhat uncertain.

44-- Temporal distribution was based on information provided by the facility and is considered to be certain.

General Uncertainties

51-- Emissions from the use of vacuum trucks to transfer organic materials exist at this facility but could not be quantified.

52-- Emissions from storage tank cleaning exist at this facility but could not be quantified.

continued

TABLE 6-15 (concluded)

53-- Emissions from operations under variance at this facility are significant and are quantified in the 1981 emission fee data.

54-- Emissions from component fugitives (e.g., valves and flanges) were assumed to be negligible because of the low volatility of the material being handled.

84052 11

Facility ID Code in Los Angeles County	TOG Emissions (kg/day) Original	Revised
6	381.6	387.5
10	3711.0	2344.2
23	4540.8	3381.3
2240	549.2	446.0
4208	1445.6	747.8
4210	412.4	414.4
4215	7626.8	7335.2
4217	3063.7	3707.0
5085	1133.3	676.8
5091	610.4	264.9
Total	23,474.8	19,705.1
(tons/day)	(25.9)	(21.7)

In addition, emission estimates in the SCAQMD EDP file were generally made at the time a permit was issued. Because permits have been issued over a number of years, emissions in the EDP file do not reflect 1979 conditions. For example, the following list shows the difference between the original emissions from the EDP file and the revised emissions calculated from activity data reported in the survey for surface coating and solvent usage facilities. The results show the revised TOG emissions for these facilities to be almost four times higher than the corresponding values in the original inventory.

Facility ID Code	TOG Emissions (kg/day) Original	Revised
8241009.19	6.4	44.3
28249008.19	0.8	2.2
28251021.19	40.8	808.6
32227083.19	8.0	23.2
32228044.19	6.4	74.7
32233034.19	1.2	10.0
35216012.19	1.6	21.6
35225017.19	36.0	27.2
37230035.19	31.5	16.3
37242060.19	4.2	21.6
40227027.19	4.0	12.8
40228032.19	21.6	25.6

40230032.19	24.8	53.8
40231113.19	1.8	0.6
40234043.19	3.1	23.2
41221022.19	35.2	78.4
41230107.19	0.0	0.2
42224021.19	69.6	88.0
44223072.19	42.4	16.0
46231057.19	12.6	263.3
49241035.19	76.0	61.1
51234079.19	1.6	0.3
52222048.19	0.6	1.6
54232026.19	61.6	335.2
59230005.19	17.8	192.8
65235022.19	3.2	3.8
56218011.30	4.0	154.4
58208027.30	6.4	26.4
59225014.30	38.4	39.2
61219014.30	1.6	8.8
62209049.30	31.2	49.6
63221021.30	50.4	47.2
64210006.30	0.0	7.2
77223008.33	35.0	45.6
112213028.33	2.4	1.6
72235024.36	3.2	20.0
85237021.36	4.0	0.4
Total (tons/day)	689.4 (0.8)	2606.8 (2.9)

These results show an average 300 percent increase in TOG emissions and indicate that significant systematic trends that either over- or under-predict emissions are present in the inventory.

Speciation

Revisions to speciation profiles assigned to several categories of sources also indicated significant systematic uncertainties in the inventory. For example, there was a large increase in aromatic emissions from surface coating facilities and a large decrease in such emissions from petroleum marketing (gasoline) operations.

Furthermore, SCCs were sometimes incorrect and nonspecific for certain facilities. For instance, the allocation of emissions in the EIS file to specific SCCs was frequently inconsistent with the emission fee data.

Such inconsistency usually leads to the assignment of inappropriate speciation profiles for such SCCs.

Random Error

Errors of a random nature were also found in the inventory. The error of greatest significance affected the TOG estimate for the Yorba Linda oil field. As discussed in Section 4, the original TOG estimate of 27.1 tons/day for this oil field was revised to approximately one-tenth of its original value. It appeared that an error in an emission factor might have resulted from a transcription error.

Double Counting of Facilities

Eight cases of double counting of emissions at six facilities were identified during the study. In each case, an entry from the EIS file representing the total emissions from the facility, and one or more entries from the EDP file also representing a portion of the emissions from that facility, were included in the original inventory. As a result, the entries in the EDP file were considered to represent double counting of inventory emissions.

The fact that eight cases of double counting were discovered during a survey of approximately 160 facilities is significant. We expect there are additional cases of double counting because there are several thousand facilities in the 1979 inventory. We attempted to conclusively verify that these eight entries actually represented cases of double counting, primarily through a review of permit files and emission fee data. In some cases, individuals at these facilities were also contacted.

The general approach used to identify cases of double counting was straightforward and could be used for further investigations. The first step was to compare company names and addresses for facilities in the EDP file with a complete list of all facilities in the EIS file. When a potential case of double counting was discovered, emission fee data were obtained for the facility in the EIS file and permit file information was obtained for the facility in the EDP file. By comparing these sets of information, we identified and later verified those facility emissions that were entered into the inventory more than once.

The following double-counted facilities were deleted from the revised inventory. In each instance, entries under another facility identification code, representing the total emissions for the facility, were retained in the inventory.

Facility Name	Facility ID Code	Original TOG Emissions (kg/day)
Union Carbide	33220011.19	256.8
Chevron Chemical	38214031.19	540.0
Continental Oil/Douglas/ GATX/Pacific Oasis	38214054.19	45.6
Good Tables	39218017.19	8.8
Continental Oil/Douglas/ GATX/Pacific Oasis	44221037.19	494.4
Continental Oil/Douglas/ GATX/Pacific Oasis	44221085.19	42.4
Bentley Laboratories	62209006.30	364.6
Union Oil Company Colton Terminal	89235800.36	204.0
Total (tons/day)		1956.6 (2.2)

Missing Source Categories

Several source categories are not included in the inventory. Some of the more traditional of these categories are

- Storage tank cleaning
- Exempt pumps and compressors
- Petroleum vacuum trucks
- Industrial maintenance coatings
- Certain stationary internal combustion engines
- Junkyards
- Marine fuel transfer
- Aircraft refueling

In addition, it was suspected that fugitive losses and industrial solvent usage at some facilities were unreported.

It was suspected that five source categories were missing from the inventory for several of the facilities surveyed in Task 2. Therefore, five questionnaires were developed to specifically address emissions from fugitive losses (valves, flanges, etc.), solvent usage, stationary internal combustion engines, vacuum trucks, and storage tank cleaning. We frequently found that component fugitive losses were not specifically identified for certain types of sources such as chemical manufacturing facilities and bulk plants. However, because of uncertainties in the composition of total TOG emissions for these sources, it was usually necessary to make a judgment regarding whether isolated changes, such as adding component fugitive emissions, were appropriate for these facilities. In the case of solvent usage, during the survey we found that facilities not normally considered as surface coating operations used solvents that were not included in the inventory. However, the addition of emissions from minor solvent usage at specific facilities might result in double counting if emissions from solvent usage were already accounted for by area source categories. We also found that a substantial number of stationary internal combustion engines were used for standby purposes, but emissions for these engines were not added to the inventory.

If identified during the survey, and where appropriate, emissions from these five source categories were added to the inventory, except in the case of vacuum trucks and storage tank cleaning. Although approximate TOG emission estimates can be made for these two source categories, such estimates were considered too uncertain to be added to the inventory. Nevertheless, the information obtained for these source categories is instructive and useful for future evaluations.

Questionnaires concerning vacuum trucks were sent to most refineries, chemical plants, and bulk terminals participating in the survey. The majority of the surveyed refineries used vacuum trucks for organic materials. On the other hand, a much smaller percentage (less than 25 percent) of the chemical plants and bulk terminals indicated that they used vacuum trucks. Moreover, there were no emission estimates given for vacuum truck usage in the survey responses. Estimates of the amount of organic materials transported annually by vacuum trucks varied widely among facilities. These estimates tended to range between 1000 and 10,000 barrels of organic materials per year. These organic materials were primarily tank bottoms and heavy oils with low vapor pressures.

Questionnaires on storage tank cleaning were also sent to the same types of facilities. The results were similar, with the majority of tank cleaning occurring at refineries. The surveyed refineries each cleaned 2 to 20 tanks in 1979 and emission estimates for some of these operations were developed. Two of these cases are presented as examples:

(1) One refinery cleaned 7 tanks, resulting in estimated TOG emissions of 4.5 tons/yr.

(2) Another refinery cleaned 4 tanks, resulting in estimated TOG emissions of 1.0 ton/yr.

These types of emission estimates were considered uncertain and were therefore not added to the revised inventory.

Missing Facilities

We did not discover individual facilities to be missing from the inventory. However, considering the difficulties associated with identifying such facilities, this does not necessarily imply that all facilities operating in the Basin in 1979 are in the inventory.

Operating Deviations

Excess emissions from equipment operating under variances are not currently included in the emission inventory, but emissions from such source operations can be significant. Starting in 1981, the SCAQMD emission fee forms requested estimates of emissions resulting from these off-design conditions. Examples of some of the more significant operating variances that we reviewed from these forms are

- Flaring of excess process gas
- Fluid catalytic cracking unit upset
- Organic liquid spills
- Equipment start-up
- Repairs to seals on storage tanks

Most of the individual incidents of equipment perturbation that we reviewed resulted in less than one ton of emissions, but some of the incidents resulted in emissions in the range of three to five tons. These incidents covered operational deviations for which variances were obtained. However, we expect that there are other incidents, such as equipment malfunctions, control system failures, and so forth, for which variances are not obtained because of their temporary duration.

Inventory Uncertainty Review by Others

Other investigators have also examined emission inventory uncertainties. In discussing the final 1979 inventory for the SOCAB, SCAQMD enumerated several specific sources of uncertainty in the data base (SCAQMD, 1982a). The following uncertainties were among those cited as leading to both imprecision and bias in the inventory:

Omitted source categories

Speciation profiles based on limited data

Bias toward the correction of erroneously high emission rates

The large number of variable components that affect motor vehicle emissions

The assumption that sources are operating in compliance with regulations

SCAQMD also made estimates in this report of the level of uncertainty in the 1979 inventory. Uncertainties in the daily emissions of ROG and NO_x for most individual source categories were estimated to be in the range of 20 to 40 percent. The overall uncertainty in the total inventory of ROG and NO_x emissions was then calculated as 10 to 11 percent. Also it was noted in the SCAQMD report (SCAQMD, 1982a) that the following activities to improve emission data for sources in the Basin were currently underway:

Continued efforts to improve emission factors and TOG speciation

SCAQMD development of the Automated Equipment Information System (AEIS) to upgrade data for permitted sources

Several specific research projects sponsored by the ARB and EPA

Conclusion

The collective experience of the project team with TOG, ROG, and NO_x inventories for the state, and in particular the SOCAB, suggests that the uncertainty in the overall 1979 SOCAB inventory is in the range of 20 to 30 percent. This estimate is based on judgment rather than on mathematical calculations and is generally consistent with similar findings presented by several other inventory specialists. Because judgment is necessary to develop both estimated and calculated uncertainty estimates, various estimates of inventory uncertainty reflect alternative perspectives of the inventory process.

We conclude that progress has been made in the review and reduction of inventory uncertainties and recommend that further work focus on reducing such uncertainties.

7 CONCLUSIONS AND RECOMMENDATIONS

This study involved a major effort to improve the ROG and NO_x inventory for the SOCAB. Study conclusions and recommendations for activities to further improve the inventory are discussed in this section.

CONCLUSIONS

Emission Data and Classes of Organic Gases

The major effects of study changes in emissions and classes of organic gases in the revised inventory are as follows:

(1) Overall TOG and ROG emissions increased by 6.2 and 7.5 tons/day (0.2 and 1.0 percent), respectively, and NO_x emissions decreased by 15.6 tons/day (-3.0 percent). These percentage changes are within the overall estimated variation for typical inventory emission totals. Thus, on the basis of this study, the 1979 total inventory of TOG and NO_x emissions was found to be a reasonably accurate representation of the actual basin-wide inventory. In addition, significant changes to both individual source and source category emissions and to ROG speciation were made during the study.

(2) Emissions of TOG and ROG for petroleum refining and marketing activities decreased. Although petroleum production TOG emissions increased, ROG emissions decreased as a result of a change in speciation. Emissions of TOG and ROG from certain categories of surface coating and solvent use increased.

(3) Petroleum refining NO_x emissions increased, whereas NO_x emissions from unspecified sources of fuel combustion decreased.

(4) Classes of organic gases: emissions of olefins and aromatics increased, and emissions of paraffins, carbonyls, and ethylene decreased. It is significant that the aromatic component of the inventory increased by 11.8 tons/day primarily as a result of the improved speciation profiles for surface coating categories;

however, substantial decreases in the aromatic portion of petroleum refining and marketing emissions were primarily the result of revised speciation profiles for gasoline. Thus, important inventory changes in organic gas reactivity have occurred as a result of this study.

Speciation

The profiles used to speciate TOG emissions are the most uncertain component of a high-resolution inventory. Because of the need for accurate speciation data and the expectation that this need will increase in the future, the speciation profiles that currently exist fall considerably short of meeting this need. The primary source of speciation data is the EPA VOC species data manual. This document contains many species profiles for a variety of emission source categories, but is lacking in several respects.

(1) Many important source categories are not included in the manual.

(2) Some of the profiles are too limited to be useful. For example, profiles were developed for individual surface coating samples rather than for representative composite samples of a coating type (e.g., enamel, primer, lacquer, etc.).

(3) Some of the profiles are outdated. For instance, the composition of solvents used in surface coatings has changed significantly as a result of regulations regarding the organic content of coatings.

(4) The majority of the profiles are based on engineering evaluations and literature reviews employing limited data, rather than on direct sampling and analysis. As a result, many of the profiles are considered to be uncertain.

This study emphasized improvement in the state of knowledge for reactive species comprising TOG emissions from gasoline evaporative losses, coatings, and solvents. As a result, the speciation of both the overall inventory and several individual categories has been modified, particularly for aromatic organic gases. Furthermore, our new speciation profiles represent the first major update of initial efforts in profile development for non-motor-vehicle sources performed by KVB in 1978. These new profiles are also expected to be used in the development of high-resolution inventories throughout the country. Thus, the work reported here has taken on nationwide significance.

Other Inventory Revisions

Important changes not apparent through a review of emission totals were also made to the inventory:

(1) In particular, revisions were incorporated into the MED file for the diurnal distribution of emissions from power plants, which are the largest stationary source category of NO_x emissions in the inventory.

(2) In addition, there were changes to the spatial resolution of emissions, particularly as a result of the redistribution of TOG emissions among sources of oil and gas production.

Uncertainties

This research effort has improved the understanding of the primary types of uncertainties in high-resolution inventories and has reduced their extent in the 1979 SOCAB inventory. For example, we found that

(1) Eight of the approximately 160 facilities we surveyed had been counted twice.

(2) Eight categories of sources, such as storage tank cleaning, were not accounted for by the 1979 inventory.

(3) A random error of about 27 tons/day of TOG emissions was found in the inventory.

(4) Systematic trends that either over- or underpredict emissions--such as a 2 tons/day increase in TOG emissions from surface coating and solvent usage facilities in the survey--are present in the inventory.

RECOMMENDATIONS

Several recommendations are provided here to guide future activities in the area of emission inventory development.

Organic Gas Speciation

(1) Additional development of TOG speciation profiles for other source categories not examined in this study will lead to further significant improvement in ROG inventories for California. Therefore, the study team recommends that future research programs continue to emphasize the improvement of organic gas speciation profiles. This recommendation is consistent with the major objective of this study--to develop improved modeling-quality inventories of ROG emissions by focusing on categories that have the greatest potential for causing uncertainty in predicting downwind ozone concentrations.

(2) Much work needs to be done in examining and improving TOG species profiles primarily because there has been relatively little effort in this area during the last decade. It is a demanding task to set priorities regarding the source types most needing investigation because so many categories need in-depth evaluation. Furthermore, the level of effort that should be expended is considerable. Nevertheless, the study team, in conjunction with ARB staff, is in a position to assist in establishing these future priorities because of its collective experience in reactive modeling and in generating speciation profiles under various studies, and also because the first task in this project yielded extensive information for ranking source categories for this and future studies.

(3) We recommend that improved profiles be developed from original testing programs and innovative methods such as those used in this study. Many categories need to be examined in depth. For the source types tested in this study, we can make the following statements:

(a) Surface coatings--The changes made to profiles for different coatings have been significant. Further work should be performed to insure that these results are representative and to include additional kinds of coatings.

(b) Petroleum products--Although the speciation of gasoline has been greatly improved, the speciation of other petroleum products remains questionable.

(c) Asphalt--Because of difficulties encountered in analyzing asphalt samples beyond the control of the study team (see Section 5), additional work is needed to examine different types of asphalt.

Quality assurance procedures need to be carefully evaluated and applied throughout the planning and analytical phases of speciation test programs.

(4) We further recommend that the improved speciation profiles developed in this study be used to develop ROG estimates for source categories in other portions of the state. In addition, the improved profiles should be employed for inventories to be used in future photochemical modeling studies. New modeling sensitivity studies should also be performed to focus on the trends established in this project for classes of organic gases.

(5) Consideration should also be given to the reconstruction of profile No. 600, the all-category composite used in cases for which a suitable profile is unavailable. The revised profile should be developed on the basis of the full set of existing and new profiles used in the revised inventory. In addition, the need for improved speciation of NO_x emissions into nitric oxide (NO) and nitrogen dioxide (NO_2) species should be conclusively determined.

Inventory Data Bases

(1) We recommend that the revisions made to the MED inventory in this study also be incorporated into various state and local emission data bases for sources in California.

(2) Particular attention should be given to improvements in the emission estimates for chemical manufacturing facilities. In general, the existing TOG emission estimates were based on generalized emission factors in conjunction with total plant throughput. More specific estimates should be developed to improve the accuracy and level of detail of these estimates.

(3) Since the development of the 1979 inventory, more investigation into questionable data obtained from the data base has occurred at ARB and SCAQMD. Continued emphasis on matching emission fee data to emissions in the EIS file is recommended. We also recommend consideration of a single numbering system for all point sources in the SOCAB, which is under analysis at ARB and SCAQMD, in order to reduce the occurrence of double-counted sources.

Identification of Emissions

(1) It is important to emphasize the need for an accurate categorization of emissions into SCCs. An accurate categorization results in the assignment of appropriate speciation profiles, which, in turn, leads to improved modeling studies. Since the development of the 1979 inventory, more attention is now being given to this activity by SCAQMD. We recommend continued emphasis on the use of the emission fee data to properly allocate emissions into SCCs because of the importance of SCCs in identifying emissions (including toxic air contaminants) by source type, in evaluating control measures, and in assigning appropriate speciation profiles. In addition, the level of detail provided by various documentation sets used to develop the inventory, such as the emission fee data, needs to be retained to the greatest extent possible in the data bases.

(2) The creation of accurate speciation profile and SCC descriptors is also important because they form the basis for the assignment of profiles and SCCs. Furthermore, the level of detail that is selected for the data base should be consistent. It is inappropriate, for example, to assign one device per storage tank for one facility and one device for all tanks for another facility. Generally, we recommend a level of detail that will allow for accurate speciation, but will not be overly burdensome. Examples of this level of detail would be assigning one device for each type of product and storage tank (e.g., crude oil--fixed roof), and for each type of surface coating.

Temporal Distributions

The temporal resolution of small point and area sources should be reviewed because issues relating to several diurnal distributions in the inventory have been noted in the literature (Oliver, Hogo, and Saxena, 1983). Substitute diurnal distributions should be considered to account for the compound nature of aggregated source operations throughout a daily period. Such compound distributions can be based on survey results and other information concerning source operating schedules. For instance, it should be determined if evaporative organic emissions from surface coating and solvent cleaning operations should be distributed over a diurnal period longer than the actual operating hours of the source. Evaporative losses might be distributed equally over 24 hours, for example, to simulate the process and the rate of evaporation for a surface coating facility that operates 8 to 16 hours per day.

Future Studies

The results of the ranking of source categories in Task 1 should be used to establish priorities during the conception and performance of other studies aimed at improving the quality of ROG and NO_x emission inventories.

IMPLICATIONS OF THIS WORK

This study is a part of efforts by the state of California to improve and update its emission inventories. The implications of our work for ARB regulatory programs include the following study findings.

(1) Improvements to emission inventories for the state remain to be made; significant improvement is possible for high-resolution inventories.

(2) Poor speciation data are currently relied upon; these data should be improved because of their importance to ozone modeling studies and to the identification and quantification of toxic air contaminants.

(3) Revisions made in this study to speciation data may be of significance in interpreting the results of previous studies used to identify levels of source control for organic gases.

(4) Uncertainties existing in current inventories can be reduced through detailed evaluations.

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