-----Original Message-----
From: Gilleland, Elisabeth [mailto:EGilleland@PattonBoggs.com]
Sent: Monday, January 05, 2004 4:30 PM
To: lauriski-david@msha.gov
Cc: Chajet, Henry
Subject: Counsel of MARG Diesel Coalition - Hard copy to follow via US Mail

Dear Dave:

Enclosed are copies of: 1) Characterizations of Lung Cancer in Cohort Studies and a NIOSH Study on Health Effects of Diesel Exhaust in Miners 2) Dr. Jerry Chase's resume; and 3) a letter to Chairman Norwood delivering the attached report by Dr Chase. On behalf of the MARG Diesel Coalition, we respectfully request that you re-open the DPM metal / nom metal rulemaking record and place these materials into the record. The report by Dr Chase is critical to the pending DPM rule since its demonstrates that the initial review of data from the NIOSH study of health effects of miners exposed to diesel exhaust does not show any excess of lung cancers above the expected rate for the general population of similar age.

Thank you for your consideration.

Sincerely,

Henry Chajet
Counsel to MARG Diesel Coalition
Patton Boggs
HC/eag

Enclosures

cc MARG Diesel Coalition Members

<<Gerald R. Chase CV(version1)>> <<Congressman Norwood Letter 11.12.03 regarding Dr. Chase's Report(version1)>> <<Characterizations of Lung Cancer in Cohort Studies and a NIOSH Study on Health(version2A)>>

Characterizations of Lung Cancer in Cohort Studies and a NIOSH *Study on Health Effects of Diesel Exhaust in Miners by: Dr. Gerald Chase*

Prepared with support from the MARG Diesel Coalition.

Summary
Based on the limited data available to date, the number and pattern of lung cancer deaths reported in the NIOSH study slides are in agreement with lung cancer deaths from the general population for the age groups involved, and less than what NIOSH appears to have predicted. Based on that limited information and the analysis presented here, levels and ranges of crude percentages of lung cancer deaths such as those in the study slides are possible without attributing any excess cancers to the study subject matter: diesel exhaust. The overall percentage of 9.8% lung cancer deaths falls within the range of percentages that would be expected from white males in the general population (white males are the clear preponderant gender and race/ethnicity group in the cohort of miners) and there are no significant differences between the reported percentages by mine. The NIOSH feasibility study considerably underestimated the number of miners eligible for inclusion in the study; the provisional number of 13,602 in the slides is 68% greater than the "about 8,200" expected, using the employment records from only eight mines instead of the "top 10" anticipated from the feasibility study. If the other assumptions used by NIOSH in the feasibility study are appropriate (e.g., an assumed Relative Risk of 1.7), then the number of lung cancers reported in the slides is notably less than would have been predicted. These findings are essentially the same whether mortality data are used from the entire U.S. or the states and counties where the mines are located. There are other probably important factors, unrelated to any possible exposure to diesel exhaust, that could increase the number of lung cancers reported. Well documented increased smoking among blue collar workers would increase the number of lung cancers expected in such a cohort. Including lung cancers not actually considered the underlying cause of death is another such factor. Similar numbers of lung cancer deaths have been reported in several other recently-published mortality studies of miners from various countries, including the U.S., none of which show a significant excess of lung cancer.

Introduction
In assessing whether the lung cancer experienced by a cohort suggests an increased risk of lung cancer compared with the general population (or an appropriate subpopulation) the most commonly used measure is the Standardized Mortality Ratio (SMR). The SMR essentially addresses the question: If the group under study (i.e., the cohort) had been drawn at random from the general population, is there an unexpected excess number of lung cancer deaths? In asking the question, factors such as age, sex, race, calendar periods and geographic region are taken into account. The June 20, 1997 draft protocol called for "a usual SMR analysis of all causes of death that occur in the cohort with stratification by age, race, gender and calendar time will be conducted." It also stated

"the mortality experience of the cohort will be compared to the U.S. population and to county/state populations…" The draft protocol also calls for additional analyses using SMRs and standardized rate ratios (SRRs).

However, the PowerPoint chart titled "Lung Cancer Deaths* by Mine" (* Death indication from death certificate and not all administrative workers have been excluded.) and reproduced below does not present SMRs. The chart shows, by mine, the number of deaths, and the number and percent of lung cancer deaths. The percentages of lung cancer deaths range from a low of 6.0 for Mine F to a high of 14.0 for Mine C, with the overall percentage of 9.8.

Table 1

Lung Cancer Deaths* by Mine

		Lung Cancer	
Mine	N	Counts	Percent
A	101	10	9.9%
B	504	46	9.1%
C	86	12	14.0%
D	123	13	10.6%
E	200	23	11.5%
F	384	23	6.0%
G	609	62	10.2%
H	358	42	11.7%
Total	2365	231	9.8%

* Death indication from death certificate and not all administrative workers have been excluded.

Are there significant differences in Table 1?

Before looking at the overall percentage of 9.8, it is informative to ask: Are there statistically significant differences in the percentages of lung cancer deaths in the above table? Put another way, could the observed percentages have easily occurred by chance, or is it highly unlikely to observe such differences if there are basically no differences between mines? The chi-square test can be used to investigate that question. The value of the test statistic for the table is 10.6, with seven (7) degrees of freedom, giving a "P-value" of 0.17. Thus, the differences observed in the percentages of lung cancer deaths could easily have been due to chance. The value of 0.17 is clearly larger than the conventional thresholds of 0.05 (i.e., 1 in 20) or 0.01 (i.e., 1 in 100) that are used to judge statistically significant differences. The range and distribution of percentages are not unusual for the number of deaths in the eight mines. Even though the crude percentages do not allow a meaningful comparison with population percentages, it may be helpful to look at some percentages in the general population to get a feeling regarding the overall percentage of 9.8.

What is known about the workers in the study?
The following table has been constructed using the information from the PowerPoint sheet labeled "**Year of Birth**":

Table 2

Birth year	Count	Percent	Youngest age still alive at end of 1997	Percent Younger	Oldest age still alive at end of 1997	Percent less than or equal to age of oldest
<1910	565	4.2%	88	95.8%	Unknown	100.0%
1910-1919	1,004	7.4%	78	88.5%	87	95.8%
1920-1929	1,459	10.7%	68	77.7%	77	88.5%
1930-1939	1,902	14.0%	58	63.8%	67	77.7%
1940-1949	3,186	23.4%	48	40.3%	57	63.8%
1950-1959	4,015	29.5%	38	10.8%	47	40.3%
1960-1969	1,233	9.1%	28	1.7%	37	10.8%
1970-1979	238	1.7%	18	0.0%	27	1.7%
Total	13,602	100.0%				

* 142 individuals had a missing year of birth and not all administrative workers have been excluded.

Even though it is not possible to determine where the individuals worked, the ages at which they completed their first year of cumulative employment in one or more of the mines, and the ages and locations of the deaths that have occurred, it is possible to use the above information to see if the percentages of lung cancer deaths reported in the earlier table are unexpectedly high.

Table 3
Cohort Information

Gender	Count	Percent
Males	13,002	94.6%
Females	637	4.6%
Not reported	105	0.8%
Total	13,744*	100.0%

* Total cohort size does not exclude all administrative workers at this time.

From the Table 3, 94.6% of the tentative cohort described in the PowerPoint sheets is male. Additional information from the nested case-control study from 7 of the 8 mines shows that 99.0% of the lung cancer cases (200 of 202) were men and 89.1% (180 of 202) were white. Therefore, white males have been selected for the following examples.

Percentages of lung cancer deaths in the general population
In 1995 there were 997,277 white male deaths in the U.S., with 80,088 (8.0%) of those coded to lung cancer (International Classification of Disease, Revision 9 – ICD9) as the

underlying cause of death. Is the 9.8% from the PowerPoint sheets comparable to the 8.0% and, if so, is there reason to expect it is unusually large? First, it is not comparable, so the second question cannot be answered; but some insight can be gained. It is not comparable for a number of reasons, for example, the deaths occurred over a number of years, we don't know the detailed breakdown of the race of the cohort, and we don't know the years and ages that the cohort was "followed." Nevertheless, is there enough information to ask the question "is it possible to see 9.8% lung cancer deaths in a group of miners?" The answer is yes. Consider the following percentages for of lung cancer deaths among white males for the U.S. and Wyoming for 1995:

Table 4
Some selected percentages of lung cancer deaths among white males for the U.S. and Wyoming for 1995

	U.S.				WY		
Age	**Lung Cancer Deaths**	**Total Deaths**	**Percent**		**Lung Cancer Deaths**	**Total Deaths**	**Percent**
all ages	80088	997277	8.0%		140	1929	7.3%
55-59	6139	47443	12.9%		14	94	14.9%
60-64	9699	69377	14.0%		19	135	14.1%
65-69	14357	102592	14.0%		25	195	12.8%
70-74	16301	135885	12.0%		26	244	10.7%
75-79	13089	147548	8.9%		19	282	6.7%

About 50% of all deaths among white males occur in the age range 55-79 covered in the table. The above age range is likely to cover an even higher percentage of the deaths in the cohort of mine workers, since they don't even enter the cohort until a year of accumulated work in the mines. Furthermore, the distribution of birth years in Table 1 suggests that well over 50% of the deaths in the cohort occurred in this age range (albeit over many years, not just 1995).

Percentages of lung cancer deaths in states and counties
Tables 5 and 6 show that the percentages of lung cancer deaths for the four (4) states and five (5) counties in which the eight (8) mines are located have similar percentages to those for the entire U.S. in the late 1980s. With smaller populations in the states and counties, more variation is expected to occur in the empirical percentages. Perusal of Tables 5 and 6 shows that for every age group there are percentages of lung cancer deaths in the states and counties that are both larger and smaller than the entire U.S. Thus, it is reasonable to use U.S. rates to generate examples.

Table 5
Percentages of lung cancer deaths among white males for the U.S., NM, MO, OH, and WY averaged over five years, 1985-1989 and 5-year age groups from 45-49 to 80-84 and 85+

Ages	US	NM	MO	OH	WY
45-49	8.4%	5.2%	9.7%	9.4%	5.7%
50-54	11.6%	8.2%	14.2%	12.2%	11.8%
55-59	13.6%	10.9%	14.6%	14.8%	10.3%
60-64	13.8%	9.7%	14.8%	14.4%	12.4%
65-69	12.5%	9.2%	13.9%	13.1%	9.1%
70-74	10.4%	8.9%	11.0%	10.6%	8.4%
75-79	7.9%	6.6%	8.4%	7.9%	6.0%
80-84	5.3%	4.1%	5.2%	5.1%	5.7%
85+	2.5%	1.9%	2.6%	2.4%	2.4%

Table 6
Percentages of lung cancer deaths among white males for the U.S., and the five counties where mines are located, averaged over five years, 1985-1989 and 5-year age groups from 45-49 to 80-84 and 85+

Ages	US	Eddy County NM	Lea County NM	Sainte Genevieve County, MO	Lake County OH	Sweet-water County WY
45-49	8.4%	3.3%	6.5%	14.3%	7.9%	0.0%
50-54	11.6%	4.8%	11.4%	0.0%	11.6%	9.5%
55-59	13.6%	19.7%	11.0%	14.3%	16.3%	7.7%
60-64	13.8%	12.6%	10.0%	24.1%	14.9%	10.6%
65-69	12.5%	12.1%	14.9%	11.4%	13.2%	3.6%
70-74	10.4%	12.6%	6.9%	11.9%	11.3%	3.5%
75-79	7.9%	10.0%	10.6%	10.6%	10.6%	7.8%
80-84	5.3%	7.2%	1.1%	2.9%	5.8%	8.5%
85+	2.5%	2.4%	2.7%	1.8%	4.0%	1.7%

Table A1 in the Appendix shows the percentages of lung cancer deaths among all deaths for U.S. white males averaged over selected five-year age groups and five-year calendar periods that cover most of the years of study. It is predictable that most of the deaths and lung cancer deaths will have occurred in the more recent calendar periods. The reason for that is that overall death rates steadily increase with age after about age 30 and lung cancer death rates also steadily increase with age until about 80 and then decrease somewhat. However, at some point in the age range 65-69 the overall death rate is increasing faster, resulting in a gradual decrease in the percentage of lung cancer deaths. For example, for the years 90-94 in Table A1, the percentages of lung cancer deaths are

11.0%, 13.8%, 14.7%, 13.9%, and 11.5%, respectively, for the age ranges 50-54, 55-59, 60-64, 65-69, and 70-74 for white males.

Referring to Table 1, 88.5% of the cohort alive at the end of 1997 was age 77 or younger. Based on the mortality rates in 1984 (a life table not given here – selected because it is in the range where many of the deaths are expected to have occurred), 6.8% of white males surviving to age 20 will die by age 50 and 51% will die between ages 50 and 77. Furthermore, using the life table for 1984 and those data for the years 80-84 in Table A1, 9.8% of all white male deaths that occur between the ages of 20 and 77, inclusive, are lung cancer deaths.

Additional examples of percent lung cancer deaths are given in Table 7 below. The 1984 Life Table for white males was again used for overall death rates, but the column for the years 85-89 in Table A1 was used.

Table 7
Examples of percent lung cancer deaths for white males surviving to selected ages and followed for 30 to 50 years, based on 1984 U.S. Life Table and the mortality experience of white males averaged over 1985-1989 from Table A1

Beginning age	Years followed	Age of survivors at end	Percent lung cancer deaths
20	50	70	11.2
20	40	60	9.0
20	30	50	3.9
25	50	75	11.2
25	40	65	11.0
25	30	55	7.1
30	50	80	10.5
30	40	70	11.7
30	30	60	10.0
37	50	87	9.2
40	50	90	8.8
40	40	80	10.7
40	30	70	12.3

The examples given in Table 7 illustrate that the percentage of total lung cancer deaths in Table 1 is well within the range using mortality of U.S. White Males in the 1980s.

Lung cancer in recently published mortality studies of coal miners
Have other studies reported percentages of lung cancer deaths similar to the 9.8% in Table 1? In 1997 Morfeld et al. published an article in Appl. Occup. Environ. Hyg., (pp. 909-914) on "Coal Mine Dust Exposure and Cancer Mortality in German Coal Miners." Table 6 of that article cited data from fourteen (14) studies, including seven (7) that were published since 1990. Of those seven studies, total deaths and lung cancer deaths were given from six. Those data are given in Table 8. Table 8 illustrates that percentages of

lung cancer deaths in excess of 9-10% have been reported. None of the six cited studies showed a statistically significant excess of lung cancer deaths.

Table 8
Percentages of lung cancer deaths in recent published studies of coal miners

Authors	Location of coal mines	Total deaths	Lung cancer deaths	Percentage lung cancer deaths
Maclaren 1992	U.K.	5852	521	8.9%
Kuempel et al. 1992	U.S.	793	65	8.2%
Swaen et al. 1995	Netherlands	2941	272	9.2%
Une et al. 1995	Japan	169	19	11.2%
Starzynski et al. 1996	Poland	1995	179	9.0%
Morfeld et al. 1997	Germany	317	41	12.9%

Agreement between the reported data and the NIOSH feasibility study
How do the draft data in the PowerPoint presentation compare with the projections in the 1997 protocol that were derived from the earlier feasibility study?

Table 9
Some comparisons of projections from the feasibility study and the actual study

Topic	Feasibility Study - Protocol	Information on Actual Study	Projection based on Number in Cohort*
Number of mines	10	8	
Number in cohort	8,200	13,744	13,744
Number of lung cancer deaths	160 (through 12/31/96)	231 (through 12/31/97)	268 (through 12/31/96)

* Assuming the assumptions in the feasibility study other than the number in cohort are the same.

The feasibility study projected 8,200 miners from ten (10) mines in the study. The PowerPoint sheets show that eight (8) mines have been selected with 13,744 in the cohort (that number should be reduced when all administrative workers are removed). The 160 lung cancer deaths were projected based on 50% of the cohort unexposed and at no increased risk of lung cancer, 25% with low/moderate exposure resulting in a 40% increase in the risk of lung cancer, and 25% at high exposure resulting in a doubling of lung cancer risk. The projection of 8,200 from ten (10) mines is substantially lower than the actual 13,700 from eight (8) mines. If the 160 projected lung cancer deaths were proportionately increased base on the number in the cohort (13,744 is about 68% higher than 8,200), approximately 268 lung cancers would be projected through 12/31/96. Of course, there are insufficient data to reliably make such a projection. Nevertheless, 231 lung cancers through 12/31/97 are definitely not excessive and actually are considerably less from that limited perspective.

Other important factors

There are at least two other important factors that have not been mentioned yet. The first and probably most important is smoking. Even a modest increase in smoking (e.g., age started and years and intensity of smoking) over the general population can account for dramatic increases in lung cancer. Traditionally, blue-collar workers have consistently shown such smoking patterns, which are likely to result in increased percentages of lung cancer deaths. The other factor is that some death certificates mention lung cancer but do not attribute the underlying cause of death to the cancer. It is not clear from the PowerPoint draft whether such deaths are counted as lung cancer deaths; the phrase "death indication" rather than "underlying cause of death" or "cause of death" has been used. The 1997 draft protocol did indicate that "all lung cancer deaths (ICD-O = 162) as specified on the death certificate (underlying or contributing cause) occurring among members of the cohort …" would be used as cases in the nested case-control study, raising the question regarding such deaths in the cohort study. To illustrate the potential impact, in 1991 in the U.S. there were 143,758 lung cancers coded as the underlying cause of death. However, there were an additional 12,274 (an increase of 8.5%) death certificates that mentioned lung cancer even though it was not coded as the cause of death.

Conclusion

Based on the limited data available to date, the number and pattern of lung cancer deaths reported in the NIOSH study slides are in agreement with lung cancer deaths from the general population for the age groups involved, and less that what NIOSH appears to have predicted. These findings are essentially the same whether mortality data are used from the entire U.S. or the states and counties where the mines are located. Well documented increased smoking among blue collar workers would increase the number of lung cancers expected in such a cohort. Similar numbers of lung cancer deaths have been reported in several other recently-published mortality studies of miners from various countries, including the U.S., none of which show a significant excess of lung cancer. Thus, it is not at all unexpected to see levels and ranges of crude percentages of lung cancer deaths such as those in the PowerPoint charts based on the limited information available and without attributing any excess cancers to the study subject matter: diesel exhaust.

Appendix A

Table A1
Percentages of lung cancer deaths among all deaths for white males averaged over five-year age groups and five-year calendar periods: US*

	Years							
Ages	**60-64**	**65-69**	**70-74**	**75-79**	**80-84**	**85-89**	**90-94**	**95-98**
20-24	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
25-29	0.4%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%
30-34	1.2%	1.2%	1.0%	0.9%	0.6%	0.6%	0.5%	0.6%
35-39	2.4%	2.7%	2.9%	2.7%	2.4%	1.7%	1.5%	1.5%
40-44	3.7%	4.5%	5.1%	5.4%	5.3%	4.5%	3.4%	3.3%
45-49	5.0%	5.8%	7.0%	8.2%	8.7%	8.4%	7.1%	5.9%
50-54	6.1%	7.0%	8.1%	10.1%	11.3%	11.6%	11.0%	9.8%
55-59	6.7%	7.6%	8.9%	10.7%	12.4%	13.6%	13.8%	12.7%
60-64	6.7%	7.7%	8.9%	10.8%	12.3%	13.8%	14.7%	13.9%
65-69	5.7%	6.9%	8.2%	9.9%	11.4%	12.5%	13.9%	14.0%
70-74	4.0%	5.2%	6.6%	8.3%	9.5%	10.4%	11.5%	12.0%
75-79	2.4%	3.4%	4.6%	6.0%	7.1%	7.9%	8.7%	9.0%
80-84	1.3%	1.9%	2.7%	3.8%	4.6%	5.3%	6.0%	6.1%
85+	0.6%	0.8%	1.2%	1.7%	2.2%	2.5%	2.9%	3.0%

* The US table includes 1998, but the state and county tables go only until 1997.

Table A2
Percentages of lung cancer deaths among all deaths for white males averaged over five-year age groups and five-year calendar periods: NM

	Years							
Ages	**60-64**	**65-69**	**70-74**	**75-79**	**80-84**	**85-89**	**90-94**	**95-97**
20-24	0.0%	0.2%	0.0%	0.0%	0.1%	0.0%	0.0%	0.3%
25-29	0.4%	0.0%	0.0%	0.2%	0.1%	0.0%	0.0%	0.0%
30-34	0.3%	0.3%	0.4%	0.2%	0.2%	0.3%	0.3%	0.5%
35-39	0.8%	1.5%	2.5%	1.0%	0.6%	0.6%	0.6%	0.9%
40-44	1.4%	2.3%	3.1%	1.8%	2.4%	2.1%	1.5%	1.1%
45-49	2.7%	3.5%	4.5%	4.0%	3.5%	5.2%	4.0%	2.8%
50-54	4.1%	4.0%	6.0%	7.5%	8.1%	8.2%	7.0%	5.5%
55-59	4.0%	6.6%	6.7%	7.2%	9.8%	10.9%	9.0%	8.4%
60-64	4.6%	5.8%	7.7%	8.7%	9.1%	9.7%	10.6%	9.4%
65-69	4.5%	4.8%	6.3%	8.3%	9.2%	9.2%	12.5%	11.5%
70-74	2.1%	3.9%	4.9%	6.8%	8.0%	8.9%	9.3%	9.4%
75-79	2.2%	2.3%	3.7%	5.0%	5.6%	6.6%	7.8%	7.1%
80-84	0.7%	1.7%	2.3%	3.5%	3.8%	4.1%	5.2%	5.2%
85+	0.4%	0.7%	1.2%	1.5%	2.3%	1.9%	2.3%	2.5%

Table A3
Percentages of lung cancer deaths among all deaths for white males averaged over five-year age groups and five-year calendar periods: Eddy County, NM

Ages	Years							
	60-64	**65-69**	**70-74**	**75-79**	**80-84**	**85-89**	**90-94**	**95-97**
20-24	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
25-29	0.0%	0.0%	0.0%	5.3%	0.0%	0.0%	0.0%	0.0%
30-34	0.0%	5.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
35-39	3.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
40-44	4.7%	0.0%	0.0%	0.0%	3.7%	0.0%	3.4%	0.0%
45-49	4.8%	4.2%	14.3%	2.9%	15.4%	3.3%	0.0%	0.0%
50-54	5.8%	1.6%	9.1%	12.8%	13.0%	4.8%	11.1%	0.0%
55-59	6.6%	10.5%	6.8%	8.2%	10.3%	19.7%	13.6%	7.5%
60-64	8.6%	9.4%	8.9%	13.5%	13.6%	12.6%	12.0%	14.0%
65-69	4.9%	6.3%	10.7%	15.1%	12.3%	12.1%	16.1%	16.4%
70-74	0.0%	5.1%	10.0%	9.7%	10.2%	12.6%	11.5%	10.5%
75-79	2.1%	0.9%	6.6%	5.8%	6.0%	10.0%	9.1%	10.3%
80-84	1.6%	2.1%	0.9%	3.8%	4.9%	7.2%	4.7%	5.0%
85+	1.5%	0.0%	0.0%	0.9%	2.2%	2.4%	2.8%	2.3%

Table A4
Percentages of lung cancer deaths among all deaths for white males averaged over five-year age groups and five-year calendar periods: Lea County, NM

Ages	Years							
	60-64	**65-69**	**70-74**	**75-79**	**80-84**	**85-89**	**90-94**	**95-97**
20-24	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
25-29	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
30-34	0.0%	0.0%	0.0%	0.0%	3.0%	0.0%	0.0%	0.0%
35-39	0.0%	4.0%	0.0%	0.0%	0.0%	0.0%	2.6%	0.0%
40-44	0.0%	10.0%	5.3%	4.3%	11.5%	0.0%	0.0%	0.0%
45-49	3.6%	4.3%	6.2%	0.0%	0.0%	6.5%	3.4%	0.0%
50-54	10.6%	9.3%	9.3%	14.5%	8.6%	11.4%	2.7%	15.2%
55-59	3.4%	10.3%	16.9%	11.4%	10.6%	11.0%	14.7%	5.1%
60-64	4.8%	12.2%	7.9%	10.3%	10.5%	10.0%	11.2%	7.5%
65-69	7.5%	8.1%	8.8%	7.3%	14.2%	14.9%	21.6%	17.1%
70-74	5.6%	5.7%	7.7%	8.8%	11.1%	6.9%	14.7%	9.5%
75-79	3.8%	5.5%	3.2%	3.9%	2.3%	10.6%	9.8%	6.2%
80-84	0.0%	0.0%	3.2%	6.6%	4.4%	1.1%	8.1%	4.6%
85+	0.0%	3.7%	0.0%	0.0%	3.0%	2.7%	3.6%	4.9%

Table A5
Percentages of lung cancer deaths among all deaths for white males averaged over five-year age groups and five-year calendar periods: MO

	Years							
Ages	**60-64**	**65-69**	**70-74**	**75-79**	**80-84**	**85-89**	**90-94**	**95-97**
20-24	0.3%	0.1%	0.2%	0.2%	0.0%	0.0%	0.1%	0.2%
25-29	0.7%	0.4%	0.3%	0.3%	0.4%	0.2%	0.0%	0.0%
30-34	1.6%	1.3%	1.3%	0.9%	0.6%	0.9%	0.5%	1.0%
35-39	1.9%	2.9%	4.1%	4.1%	2.8%	1.9%	1.6%	2.4%
40-44	4.2%	4.8%	5.7%	6.0%	5.7%	5.2%	5.0%	3.0%
45-49	5.4%	6.4%	7.3%	8.7%	9.4%	9.7%	8.8%	6.8%
50-54	6.5%	8.0%	9.0%	10.3%	12.7%	14.2%	11.9%	11.1%
55-59	6.9%	8.6%	10.1%	11.3%	13.6%	14.6%	16.0%	14.2%
60-64	7.1%	8.8%	9.4%	11.9%	12.9%	14.8%	15.9%	16.7%
65-69	5.9%	7.5%	8.7%	10.3%	12.5%	13.9%	15.1%	15.2%
70-74	3.9%	5.0%	6.8%	8.6%	10.3%	11.0%	12.9%	12.8%
75-79	2.1%	3.2%	4.2%	6.1%	7.2%	8.4%	9.3%	9.4%
80-84	1.1%	1.8%	2.4%	3.6%	4.7%	5.2%	5.6%	6.5%
85+	0.5%	0.7%	1.1%	1.5%	1.9%	2.6%	2.8%	2.9%

Table A6
Percentages of lung cancer deaths among all deaths for white males averaged over five-year age groups and five-year calendar periods: Sainte Genevieve County, MO

	Years							
Ages	**60-64**	**65-69**	**70-74**	**75-79**	**80-84**	**85-89**	**90-94**	**95-97**
20-24	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
25-29	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
30-34	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
35-39	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
40-44	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
45-49	7.5%	0.0%	0.0%	0.0%	0.0%	14.3%	22.2%	0.0%
50-54	3.8%	5.3%	5.3%	0.0%	0.0%	0.0%	33.3%	15.4%
55-59	8.2%	18.2%	13.0%	7.7%	10.0%	14.3%	18.7%	10.0%
60-64	8.0%	17.6%	6.1%	7.7%	6.5%	24.1%	16.7%	20.0%
65-69	1.9%	4.5%	13.3%	9.1%	13.8%	11.4%	17.1%	23.1%
70-74	3.8%	5.7%	2.5%	9.8%	7.7%	11.9%	10.3%	18.2%
75-79	0.0%	2.0%	3.8%	4.2%	9.8%	10.6%	2.6%	3.4%
80-84	2.7%	0.0%	4.7%	4.7%	2.0%	2.9%	1.8%	5.9%
85+	0.0%	0.0%	0.0%	0.0%	0.0%	1.8%	0.0%	3.7%

Table A7
Percentages of lung cancer deaths among all deaths for white males averaged over five-year age groups and five-year calendar periods: OH

	Years							
Ages	**60-64**	**65-69**	**70-74**	**75-79**	**80-84**	**85-89**	**90-94**	**95-97**
20-24	0.2%	0.1%	0.1%	0.0%	0.1%	0.0%	0.1%	0.1%
25-29	0.3%	0.3%	0.2%	0.1%	0.3%	0.2%	0.2%	0.2%
30-34	1.8%	1.1%	1.1%	1.1%	0.8%	1.0%	1.0%	0.8%
35-39	2.7%	3.7%	3.0%	3.3%	3.0%	2.1%	2.0%	2.2%
40-44	4.4%	5.1%	5.9%	5.6%	6.5%	5.1%	4.4%	3.8%
45-49	5.4%	6.1%	7.7%	8.6%	9.0%	9.4%	8.1%	6.7%
50-54	6.9%	7.2%	9.0%	11.1%	12.4%	12.2%	11.8%	11.1%
55-59	7.0%	7.8%	9.4%	11.4%	14.1%	14.8%	15.2%	13.9%
60-64	6.9%	8.2%	9.2%	11.3%	13.1%	14.4%	15.6%	14.7%
65-69	5.4%	6.8%	8.3%	10.1%	11.7%	13.1%	14.9%	14.3%
70-74	3.7%	5.1%	6.3%	8.0%	9.9%	10.6%	11.8%	12.0%
75-79	2.2%	3.3%	4.1%	5.8%	7.3%	7.9%	8.7%	8.6%
80-84	1.0%	1.7%	2.6%	3.6%	4.5%	5.1%	6.1%	6.1%
85+	0.5%	0.7%	1.1%	1.7%	2.3%	2.4%	2.8%	2.8%

Table A8
Percentages of lung cancer deaths among all deaths for white males averaged over five-year age groups and five-year calendar periods: Lake County, OH

	Years							
Ages	**60-64**	**65-69**	**70-74**	**75-79**	**80-84**	**85-89**	**90-94**	**95-97**
20-24	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
25-29	0.0%	0.0%	0.0%	1.6%	0.0%	0.0%	0.0%	0.0%
30-34	0.0%	3.3%	2.0%	0.0%	0.0%	1.7%	2.0%	0.0%
35-39	5.1%	0.0%	8.6%	0.0%	5.6%	1.7%	2.3%	0.0%
40-44	5.7%	7.9%	5.7%	7.1%	4.7%	5.1%	5.4%	8.6%
45-49	6.9%	6.5%	9.7%	3.6%	12.4%	7.9%	13.7%	9.9%
50-54	11.6%	9.0%	12.7%	11.7%	12.9%	11.6%	14.1%	11.4%
55-59	10.0%	6.7%	8.6%	10.2%	12.8%	16.3%	16.9%	17.1%
60-64	6.2%	8.6%	12.0%	10.8%	12.8%	14.9%	16.6%	14.7%
65-69	8.0%	6.0%	11.1%	7.5%	11.2%	13.2%	13.5%	14.0%
70-74	4.2%	6.5%	5.8%	8.3%	9.9%	11.3%	13.3%	15.4%
75-79	1.6%	3.2%	7.1%	7.2%	8.7%	10.6%	8.9%	9.7%
80-84	1.3%	1.8%	2.4%	5.3%	4.7%	5.8%	5.3%	3.0%
85+	0.0%	0.0%	1.0%	2.0%	2.2%	4.0%	3.7%	2.5%

Table A9
Percentages of lung cancer deaths among all deaths for white males averaged over five-year age groups and five-year calendar periods: WY

	Years							
Ages	**60-64**	**65-69**	**70-74**	**75-79**	**80-84**	**85-89**	**90-94**	**95-97**
20-24	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
25-29	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
30-34	0.0%	0.9%	0.7%	0.0%	0.0%	0.5%	0.6%	0.0%
35-39	2.9%	0.0%	2.9%	1.9%	0.5%	2.7%	0.5%	0.0%
40-44	1.5%	2.8%	2.8%	3.8%	2.3%	3.3%	2.3%	1.3%
45-49	3.2%	3.1%	5.4%	3.5%	4.9%	5.7%	8.2%	3.2%
50-54	4.2%	6.0%	4.5%	8.5%	8.0%	11.8%	8.8%	7.9%
55-59	4.5%	7.5%	7.5%	9.3%	10.5%	10.3%	11.3%	10.5%
60-64	5.4%	5.3%	7.4%	8.7%	11.1%	12.4%	14.0%	13.3%
65-69	4.2%	5.9%	6.0%	9.0%	9.8%	9.1%	12.0%	10.8%
70-74	3.0%	5.1%	5.1%	7.4%	6.8%	8.4%	8.9%	10.3%
75-79	1.7%	2.3%	4.9%	4.9%	6.0%	6.0%	8.0%	7.6%
80-84	1.6%	0.7%	1.2%	2.9%	4.9%	5.7%	5.1%	6.0%
85+	0.4%	0.4%	1.0%	1.0%	2.2%	2.4%	2.7%	2.8%

Table A10
Percentages of lung cancer deaths among all deaths for white males averaged over five-year age groups and five-year calendar periods: Sweetwater County, WY

	Years							
Ages	**60-64**	**65-69**	**70-74**	**75-79**	**80-84**	**85-89**	**90-94**	**95-97**
20-24	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
25-29	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
30-34	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
35-39	0.0%	0.0%	0.0%	4.8%	0.0%	0.0%	0.0%	0.0%
40-44	0.0%	0.0%	0.0%	10.5%	4.0%	0.0%	0.0%	0.0%
45-49	0.0%	20.0%	6.1%	3.7%	6.9%	0.0%	10.7%	5.9%
50-54	4.0%	8.8%	6.5%	11.4%	5.6%	9.5%	3.3%	7.7%
55-59	5.5%	13.8%	3.6%	5.8%	12.2%	7.7%	9.7%	16.7%
60-64	6.8%	0.0%	6.3%	13.7%	12.5%	10.6%	22.9%	11.5%
65-69	1.6%	7.5%	3.1%	3.9%	8.6%	3.6%	17.6%	8.8%
70-74	2.4%	7.4%	9.5%	5.0%	4.3%	3.5%	5.3%	6.5%
75-79	4.8%	4.4%	4.3%	4.7%	3.0%	7.8%	7.2%	11.1%
80-84	2.7%	0.0%	1.5%	2.1%	0.0%	8.5%	4.3%	3.8%
85+	0.0%	0.0%	0.0%	0.0%	1.8%	1.7%	6.3%	1.6%

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Litigation support has been provided in many of the areas of specialization and experience. The support has included attorney-client work projects such as designing scientific investigations, literature reviews, and data analysis. The support has also included depositions, expert support during depositions, and court appearances.

Former responsibilities have included management of internal and industry-cooperative epidemiology studies, initiatives such as the development, maintenance, and utilization of Health, Safety, and Environment information, risk assessment, design and analysis of animal studies, and interaction with federal and state agencies dealing with these issues. Schuller International (now JM, and its predecessor) has been an industry leader in establishing cooperative studies conducted by university-based and other independent researchers. There have been epidemiology studies with researchers at over ten universities, including both morbidity and mortality studies. Responsibilities included recruitment, protocol development, data acquisition, analysis, reporting, and oversight. There has been extensive interaction with NIOSH, OSHA, CPSC, EPA, and state-level agencies, at both formal and informal levels. Other responsibilities involved working closely with most groups in the Health, Safety & Environment Department. Budget responsibilities involved primary oversight of internal initiatives and project officer of external studies totaling several million dollars.

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November 12, 2003

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Honorable Charles W. Norwood
Chairman, House Subcommittee on Workforce Protections
U.S. Congress
2452 Rayburn Building
Washington, DC 20515

Dear Dr. Norwood:

Enclosed is a report authored by Dr. Gerald Chase entitled "Characterizations of Lung Cancer in Cohort Studies and a NIOSH Study on Health Effects of Diesel Exhaust in Miners." The report reviews the recently released data produced by NIOSH and NCI regarding potential health effects of diesel exhaust, a study that your committee has followed since its inception in 1992.

We are pleased that the report concludes that the initial, limited data reveal lung cancer rates consistent with the general population with no apparent relationship to the subject of the study: diesel exhaust. We look forward to future data releases from NIOSH.

Sincerely,

Henry Chajet

HC/eag

Enclosure

Cc: Steve Settle