TEXAS AIR CONTROL BOARD

STATE IMPLEMENTATION PLAN FOR THE CONTROL OF LEAD AIR POLLUTION

MARCH 21, 1980

Texas Air Control Board

State Implementation Plan for the

Control of Lead Air Pollution

Errata

Errata: On page 10, paragraph II A 3 b (2) (a) (Monitoring Plan), 4th line from bottom of page, immediately following the words "is adopted by the TACB" insert the following sentences:

"At any time prior to the date on which its monitoring plan is due to be submitted to the TACB, an affected source may submit in lieu thereof, a point source control plan based on mathematical atmospheric dispersion modeling rather than monitoring. Such control plan must conform essentially with the requirement of paragraph II A 3 b (2)(b) (Point Source Control Plan). Such control plan, if accepted, would exempt the affected source from any requirement of this SIP for monitoring."

STATE IMPLEMENTATION PLAN FOR THE CONTROL OF LEAD AIR POLLUTION

March 21, 1980

EXECUTIVE SUMMARY

This proposed State Implementation Plan for the Control of Lead Air Pollution has been prepared for submittal to the Environmental Protection Agency (EPA) as required by Section 110 of the Federal Clean Air Act (FCAA). The Plan shows how the Texas Air Control Board, acting for the State of Texas, intends to assure attainment of the standard for ambient air lead concentrations of 1.5 micrograms per cubic meter by November 5, 1982 (or, with possible extensions by November 5, 1984).

Although the Texas Air Control Board for several years has operated high-volume air samplers at approximately 100 locations throughout the State, data from these samplers has shown that only one sampler (in El Paso) has recorded lead levels in excess of the lead standard. Controls already provided for by the Federal Motor Vehicle Control Program and by the Federal plan to reduce the use of lead in gasoline should result in attainment of the standard at this sampling location by the required date. In other areas, around large industrial sources of lead emissions, where the standard may be exceeded, but where no air quality monitors are located, the plan calls for ambient air quality monitors to be installed and operated by the owner/operator of the lead source. If these monitors indicate that the standard is being exceeded, the owner/operator must then submit to the TACB a control plan which commits to sufficient emission reductions to result in attainment of the standard by the required date. If a control plan is adequate, the TACB will issue a TACB order that it be carried out by the affected plant.

In addition, the Plan calls for siting of air quality monitors specifically for measuring representative lead concentrations in large urban areas. If any such monitors reveal areas with excessive lead concentrations, the lead control strategy will be revised to provide for attainment in these areas as well.

STATE IMPLEMENTATION PLAN FOR THE

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STATE IMPLEMENTATION PLAN FOR THE CONTROL OF LEAD AIR POLLUTION

I. INTRODUCTION

A. Requirement

On October 5, 1978, the Administrator of the Environmental Protection Agency promulgated a lead ambient air quality standard of 1.5 $\mu g/m^3$ quarterly arithmetic mean. The provisions of Section 110 of the 1977 Amendments to the Federal Clean Air Act require that each state submit an implementation plan for the control of any such criteria pollutant within nine months of EPA's promulgation of a standard for that pollutant. Also under the provisions of Section 110, EPA has four months to approve the plan, with attainment of the standard required by three years from the approval date. Since the lead standard was promulgated on October 5, 1978, the plan was due on July 5, 1979; EPA approval was due on November 5, 1979, and attainment is required by November 5, 1982.

B. Delay in Submittal

The Lead Industries Association brought suit against EPA on November 21, 1978 and the TACB petitioned EPA on December 8, 1978 for a delay in plan submittal pending a final disposition of this court suit. EPA in a letter of February 2, 1979 denied the request for a delay. The TACB has been developing this plan since that date, but completion has been delayed because of the higher priority placed upon development of a SIP Revision to meet the requirements of Part D of the Federal Clean Air Act.

C. Scope

The following control strategy is written in response to and in accordance with Section 110 of the 1977 Federal Clean Air Act Amendments as interpreted by the EPA in 40 CFR 51.80. This plan is limited in scope to meeting the federal requirements for such a plan, and does not address other TACB control policies or activities undertaken under authority of the Texas Clean Air Act that are not related to the federal requirements. Since its sole purpose is limited to meeting federal requirements, any portion of this plan which is later determined by the TACB not to be required by federal law, regulation, or policy guidance will be withdrawn from the plan.

II. CONTROL STRATEGY FOR THE ATTAINMENT OF THE NATIONAL AMBIENT AIR QUALITY STANDARD FOR LEAD

A. Determination of Lead Problem Areas

1. EPA Designation of Areas for Lead Planning

The provisions of 40 CFR 51.80 require that each state determine which areas have or are expected to have lead concentrations in excess of the standard through evaluation of existing ambient air monitoring data, evaluation of additional ambient data to be obtained under the plan requirements, estimation of air quality through use of current information and mathematical dispersion models, and analysis of anticipated changes in lead emissions. In accordance with Section 110(a)(1) of the 1977 Amendments to the Federal Clean Air Act, EPA also requires the development of control strategies which provide for such emissions reductions as may be needed to demonstrate attainment of the standard three years from date of approval of plan. Two-year extensions may be granted under certain conditions as specified in Section 110(c) of the Federal Clean Air Act. The following three types of areas have been defined by EPA as requiring specific analysis.

a. Areas in the vicinity of significant point sources of lead. Specifically:

1) The following point sources with annual emissions of five tons or more of lead or lead compounds measured as elemental lead,

Primary Lead Smelters
Secondary Lead Smelters
Primary Copper Smelters
Lead Gasoline Additive Plants
Lead-acid Storage Battery Manufacturing Plants that Produce 2000 or more Batteries Per Day

2) Any other point source that emits 25 or more tons per year of lead or lead compounds measured as elemental lead.

Emissions inventories and estimations of air quality through use of mathematical dispersion modeling of emissions inventory data are required for each source which falls into one of the above mentioned categories with particular emphasis to be placed on primary lead smelters. From this information it is to be

determined if a problem does exist or can be anticipated. Control strategies must be developed for any known or anticipated problem areas.

b. Any area that has lead air concentrations in excess of the national standard for lead. A summary and analysis of all air quality data since January 1, 1974 is required to determine which, if any, areas have or had lead air concentrations in excess of the national standard for lead during this period of time. Control strategies are required for any such area.

c. Urbanized areas with population greater than 500,000 (1970 Census). Air quality monitors are required in these urbanized areas to determine if there are areas in which the lead air concentrations are in excess of the lead standard, other than those already determined by the summary and analysis of currently available air quality data. Control strategies will be required for any such area in which the standard is exceeded. In each area one monitor must be located to sample "neighborhood" lead concentrations and one must sample "roadway" concentrations.

2. TACB Evaluation of Areas for Lead Planning

a. Areas in vicinity of significant lead sources

Detailed emissions inventory data have been compiled for all sources which are included in any one of the categories listed in 1. a. 1) above. A total of 11 such sources currently are located in the state. Estimates of air quality through the use of mathematical dispersion modeling of these emission inventory data have indicated that there may be a problem meeting the ambient lead standard in the vicinity of four of these sources. The results of the mathematical dispersion modeling are discussed in greater detail in Section II.C., Control Strategies for Individual Point Sources.

b. Areas which exceed ambient standard

All lead ambient air quality data reported since January 1, 1974 have been summarized and analyzed to determine which, if any, areas have or had ambient air lead concen-

trations in excess of the national standard. Table 1 contains a summary of lead ambient air quality data for 1974 through 1978 from representative monitoring sites in Texas cities with 500,000 or more population or where concentrations in excess of the standard have been measured. Data for other monitoring sites, which are on file at the Texas Air Control Board, show no values exceeding the 1.5 $\mu g/m^3$ standard.

The lead data from air quality monitors used in this summary have been evaluated and determined to be reliable and representative of the ambient conditions within 4.0 kilometers of each monitor. As shown in Table 1, only one such monitor (SAROAD #1700027 F01), located in downtown El Paso, has recorded lead values in excess of the national standard.

c. Other potential problem areas

Monitors are being sited (see the Air Quality Surveillance section of this Lead SIP) in accordance with the ambient air monitoring requirements EPA has promulgated with regard to lead for urbanized areas with over 500,000 population (1970 Census) and in El Paso where lead levels above the standard have been measured. If any exceedances are detected in the future, additional planning areas will be defined and appropriate control strategies will be developed.

B. Designation of Nonattainment Areas

The Clean Air Act as amended in 1977 is not specific as to the requirements for designation of nonattainment areas for any pollutant such as lead for which a National Ambient Air Quality Standard was promulgated after the date of the 1977 Amendments. Specific designation requirements are, however, established in Section 107(d)(1) for pollutants for which standards were published prior to that date. Since no specific requirement has been established for lead nonattainment area designation, this plan does not include any such recommended designation.

TABLE 1

SUMMARY OF LEAD AIR QUALITY DATA

SAROAD MONITOR NO.	LOCATION	QUARTERLY ARITHMETIC MEAN CONCENTRATION OF LEAD																			
		1974				1975				1976				1977				1978			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
2330003 F	Alief	*	.25	*	*	*	*	*	.41	.13	.16	*	.45	*	*	.21	*	.23	.19	.35	*
2560034 F	Houston	*	*	*	*	*	*	*	1.13	*	*	.75	*	.42	.24	.27	.70	*	.38	.47	.85
1310045 F	Dallas	.33	*	*	*	.34	.27	.36	*	.27	.30	.37	*	.37	.20	.19	.51	.43	.37	.31	.50
2670001 F	Irving	ND	ND	*	*	*	.20	.23	.30	*	*	*	*	*	.17	*	*	*	.29	*	*
4570034 F	San Antonio	ND	ND	ND	ND	ND	ND	ND	ND	*	*	*	*	*	*	*	*	*	*	*	*
4570036 F	San Antonio	*	*	*	*	*	.25	.38	*	.33	*	*	*	.55	.22	*	.96	.43	.35	*	*
1880002 F	Fort Worth	ND	ND	ND	ND	ND	ND	ND	*	.17	.41	.34	.48	.44	.23	.17	.46	.31	.30	.26	.61
1880003 F	Fort Worth	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	*	1.00	*	.70	.60	1.08	.72	.76	.98	1.27
1700027 F	El Paso	1.71	1.12	1.25	*	*	*	*	1.45	1.14	.95	*	*	1.74	.96	.67	2.15	2.07	1.20	1.14	*
1700028 F	El Paso	ND	ND	*	*	*	*	*	*	*	*	.28	.78	.59	.31	.21	.81	.66	.31	.25	.67

ND - No Data

* - Less than 75% Data Return

C. Control Strategy for Individual Point Sources

1. Identification of Sources Which Fit the EPA Criteria for Lead Point Sources

A list of 41 sources with the potential to emit significant quantities of lead was compiled from the TACB emissions inventory and compliances files, and from the Texas Manufacturer's Directory. Updated emissions inventory questionnaires for lead emissions were completed for each of these sources. Evaluation of the information contained in these questionnaires using EPA criteria narrowed the initial lead point sources for which detailed analysis must be performed to determine if the standard is exceeded. Table 2 lists these 11 designated lead point sources with the total emissions of elemental lead from each source and projected increases in emissions by 1982. These projections are based upon construction permits already granted. The inventory is based upon 1977 and 1978 data depending on data availability.

2. Estimation of Air Quality Through Use of Mathematical Dispersion Modeling of Lead Point Source Emissions Data

Using the emissions data described above, computer based mathematical atmospheric dispersion techniques (models) were used to estimate maximum quarterly average lead levels. The Texas Climatological Model (TCM) was used for all areas except El Paso where the Valley Model was used. These mathematical models were modified to use the frequency distribution of climatological data on a quarterly basis. Maximum concentrations obtained are summarized in Table 3 by calendar quarter for each of the 11 sources. Since these models do not take into account any removal of particulate matter by settling or impaction between the source and the monitor, these results are probably conservative (higher than actual) estimates of the true concentrations. Air quality monitoring will be required to confirm the accuracy of these estimates.

3. Results of TACB Evaluation of Lead Point Sources

a. Lead Point Sources Which Do Not Cause the Lead Standard to be Exceeded

1) Significant Lead Point Sources

TABLE 2

LEAD EMISSIONS INVENTORY

REGION	COMPANY	LOCATION	EMISSIONS (TONS/YEAR)	PERMITTED INCREASES 1978-1982
7	Nalco Chemical Co.	Freeport	10	0
7	Ethyl Corporation	Pasadena	61 (242)*	0
7	Houston Lead Co.	Houston	34	0
8	Gould Inc.	Frisco	22	0
8	Dixie Metal Co.	Dallas	52	0
8	ESB Inc.	Dallas	7	0
8	RSR Corporation	Dallas	24**	0
10	PPG Industries	Beaumont	66 (374)*	0
11	ASARCO	El Paso	65	0
12	Lone Star Steel	Lone Star	60	0
12	Tyler Pipe Co.	Tyler	52	0

* Total organic and inorganic lead; however, only inorganic lead emissions inventory figures were used for the purpose of modeling.

** Does not include an emission reduction for the negative pressure maintained in the lead casting building.

TABLE 3

RESULTS OF MODELING POINT SOURCE LEAD EMISSIONS

COMPANY	TACB ACCOUNT NUMBER	LOCATION	ESTIMATED MAXIMUM CONCENTRATION BY CALENDAR QUARTER ($\mu g/m^3$)			
			FIRST	SECOND	THIRD	FOURTH
Nalco Chemical	BL-0039-S	Freeport	0	0	1	0
Ethyl Corp.	HG-0225-N	Pasadena	1	2*	1	1
Houston Lead	HG-0352-F	Houston	8	17	14	8
Gould Inc.	CP-0029-G	Frisco	3.5	5	5	4
Dixie Metal	DB-0299-P	Dallas	21	16	24	22
ESB Inc.	DB-0340-U	Dallas	3	4	3	3
RSR Corp.	DB-0700-M	Dallas	<1**	<1**	<1**	<1.5**
PPG Ind.	JE-0049-K	Beaumont	0	0	0	0
ASARCO	EE-0007-G	El Paso	0.5***	0***	0***	0.5***
Lone Star Steel	MS-0008-G	Lone Star	3*	2*	3*	3*
Tyler Pipe	SK-0041-T	Tyler	1	1	1	1

*No concentrations in excess of 1.5 $\mu g/m^3$ occur in areas of public exposure.

**Since the emissions inventory for this source does not include emissions reductions for the negative pressure maintained in the lead casting building (the emissions from which are the only significant contributor to the predicted ambient maximum concentration), any reduction attributed to this indirect control measure would result in a prediction of an ambient concentration below the values listed.

***Values approaching 1.0 $\mu g/m^3$ were predicted for points on IH10 where it runs through ASARCO property. These values are not included, however, since they neither reflect concentrations in an area where people reside nor can they be confirmed by properly siting a monitor to sample the source impact without vehicular lead influence.

a) Point sources which do not cause standard to be exceeded anywhere

As determined by the results of mathematical atmospheric dispersion techniques shown in Table 3, emissions from the following five sources, which meet EPA criteria requiring an analysis, probably do not cause the lead standard to be exceeded in any area outside of the plant boundaries:

Nalco Chemical Co., County Rd. 229, Freeport
Tyler Pipe, Sub. of Tyler Corp., U.S. Hwy. 69, NW of Tyler
RSR Corporation, (Murph Metals Inc.) 2823 North Westmoreland, Dallas
ASARCO, Paisano Drive, El Paso
PPG Industries, P.O. Box 3785, Beaumont

b) Point sources which do not cause standard to be exceeded in areas of public exposure

The results of mathematical dispersion modeling of emissions from the following two lead point sources indicate that lead levels in excess of the standard will not occur in areas of public exposure:

Ethyl Corporation, La Porte Rd., Pasadena
Lone Star Steel, Lone Star

2) Control Strategy

Since no increase in emissions is expected from these seven sources and because the mathematical dispersion estimates are conservative, these modeling results can be interpreted as demonstrating attainment of the lead standard for these seven sources.

3) Maintenance

The maintenance of the lead standard in the vicinity of these seven sources will be accomplished by application of stringent controls on new sources through the provisions of Rule 131.08.00.003(a)(14) of TACB Regulation VI.

b. Lead Point Sources Which May Cause the Lead Standard To Be Exceeded in Areas of Public Exposure

1) Significant Lead Point Sources

As indicated by mathematical dispersion modeling and shown in Table 3, emissions from the following four sources may cause the lead standard to be exceeded in the calendar quarter of maximum estimated concentration:

Houston Lead Co., 300 Holmes Rd., Houston
Gould, Inc., Metals Div., P.O. Box 250, Frisco
Dixie Metal Company, 3030 McGowan, Dallas
ESB Inc., 8600 Denton Dr., Dallas

Actual monitored air quality data will be required for each of these sources to determine if the standard is exceeded and if additional control is needed to demonstrate attainment of the lead standard by November 5, 1982.

2) Control Strategy for Demonstration of Attainment of the Lead Standard for Lead Point Sources

a) Monitoring plan

Each of the four point sources listed in paragraph 3.b.1.) must develop a plan to monitor ambient air (air to which the public is exposed) in the vicinity of the source. Authority for requiring such monitoring is contained in Rule 131.01.00.009 of the TACB General Rules. The monitoring plan must be submitted to the Executive Director of TACB within 60 days after this Lead Implementation Plan is adopted by the TACB, be approved by the Executive Director of TACB, and be in effect within 90 days after approval by the Executive Director. The monitoring plan must be in effect no later than 6 months after this Lead Implementation Plan is adopted by the TACB. Each monitoring plan shall contain, at a minimum, the items shown in Table 4 and must also fulfill the following requirements:

TABLE 4 MINIMUM CONTENTS OF LEAD MONITORING PLAN

I. SOURCE ENVIRONMENT DESCRIPTION (within one mile of source)

- topographical description
- land-use description
- topographical map of source and environs (including location of existing stationary sources, roadways, and monitoring sites)
- climatological description
- quarterly wind roses (from meteorological data collected at the lead source or other representative meteorological data-specify period of record used)

II. SAMPLING PROGRAM DESCRIPTION

- time period for which lead will be measured
- rationale for location of monitors
- rationale for joint utilization of monitoring network by other lead sources

III. MONITOR SITE DESCRIPTION

- Universal Transverse Mercator (UTM) coordinates
- height of sampler (air intake) above ground
- distance from obstructions and heights of obstructions
- distance from other lead sources (stationary and mobile)
- average daily traffic of nearest roadway
- photographs of each site (five photos: one in each cardinal direction looking out from each existing sampler or where a future sampler will be located, and one closeup of each existing sampler or where a future sampler will be located. Ground cover should be included in the closeup photograph.)

IV. MONITOR DESCRIPTION

- name of manufacturer
- description of calibration system to be used
- type of flow control and flow recorder

V. DATA REPORTING

- format of data submission
- frequency of data reporting

VI. QUALITY ASSURANCE PROGRAM

- calibration frequency
- independent audit program
- internal quality control procedures
- data precision and accuracy calculation procedures

(1) Siting criteria

Monitors must be sited to measure lead concentrations representative of the three types of areas listed below and described in Appendix A. The sites selected must be in residential areas (those areas in which people continuously reside for a period of not less than 90 days), away from any significant vehicular lead sources (not less than 15 meters from any street, highway or railroad right-of-way) and must be specifically agreed to by the TACB. At least one monitor must be located in each area. If any areas lie entirely within the plant boundaries, the associated monitor should be located outside of and near the plant boundary.

(a) Area of maximum public exposure

An area bounded by radial lines drawn 22 1/2 degrees on either side of the line connecting the emission point or centroid of all emission points on the company property and the point of estimated highest concentration as determined by mathematical dispersion techniques, by the company property line, and by an arc drawn with a radius of one kilometer, centered at the emission point (or centroid) within the company property.

(b) Area of decreased public exposure

An area bounded by the same radial lines as above, and by arcs drawn at one and four kilometers from the emission point (or centroid).

(c) Upwind area

An area bounded by the company property line, the upwind extensions of the ± 22 1/2 degree radial lines discussed above, and an arc drawn with a radius of one kilometer, centered on the emission point (or centroid).

(2) Operating schedule

Monitors must be operated for 24-consecutive hours on a 6-day sampling schedule, or a more frequent schedule if desired, and operated on that schedule for an entire quarter. Data shall be obtained for a least four consecutive quarters. Valid quarterly data shall consist of the arithmetic mean of at least 75% (12) of the possible 15 or 16 individual 24-hour values for a one-in-six-day sampling schedule.

(3) Monitoring method

The monitoring method used must be a reference or equivalent method for lead; the filters must be appropriate for the analysis method used.

(4) Analysis method

Twenty-four hour average lead concentrations must be determined by Atomic Absorption or X-ray Fluorescence methods or equivalent method approved by the Executive Director of TACB.

(5) Additional monitoring requirements

Monitors must be sited, data must be collected and submitted to the TACB, and a quality assurance program must be implemented in accordance with the lead monitoring criteria specified in the "Guideline for Short-term Lead Monitoring in the Vicinity of Point Sources", EPA/OAQPS No. 1.2-122, March 26, 1979.

(6) Use of state and local monitors

Data from properly sited state and locally operated monitors may be used to satisfy certain source

monitor requirements if specifically agreed to by the TACB.

b) Point source control plan

(1) Requirement

If the data collected by the monitors sited in response to the above stated monitoring requirements indicate that the emissions from the source caused an exceedance of the National Ambient Air Standard for lead of 1.5 $\mu g/m^3$ quarterly arithmetic mean, a point source control plan must be developed. In such a case monitoring must continue for at least four calendar quarters after the standard is last exceeded, or four quarters after all implemented controls are in full routine operation, whichever occurs later.

(2) Contents

Based upon this monitoring data, a control plan must be developed which will provide for emissions reductions sufficient to attain the lead standard as soon as practicable, but no later than November 5, 1982 (or, with possible extension by November 5, 1984). The control plan will be submitted to the TACB within six months of any recorded exceedance of the standard but no later than December 1, 1981. The control plan will include the following:

(a) Specified control measures to be implemented.

(b) Timetables for the implementation of all control measures.

(c) Emissions inventories for the quarter with the highest measured concentration and the corresponding quarter of 1983 for each emission point.

(d) Specification of the anticipated emissions reduction from each control measure to be implemented for each emission point.

(e) Estimation of the ambient air quality in the quarter in 1983 corresponding to the quarter with the highest measure concentrations, and all quarters between that quarter and November 5, 1982 in the area affected by the source. A TACB approved mathematical dispersion model must be used for this estimation.

(f) Commitment to implement additional control measures as necessary if the standard is exceeded in the future.

(3) Extension of attainment date

An extension of the attainment date to November 5, 1984 may be requested if the plan demonstrates that attainment by November 5, 1982 is not feasible. The Governor of the State of Texas has requested, in his letter transmitting this Lead SIP to EPA, that the EPA grant a two-year extension of the attainment date under Section 110(e) of the FCAA in the event that the future monitoring show levels of lead which cannot be adequately reduced by available technology within the three year period.

(4) Review by TACB

The TACB will review the control plan to determine if the proposed control measures are adequate to demonstrate attainment of the standard.

(a) Acceptable plans

If the plan is acceptable, the TACB will adopt it by TACB Order after public hearings and incorporate it as a supplement to this control strategy section of the State Implementation Plan for Lead. The Board Order

will contain compliance schedules, source surveillance provisions, and specific emission limitations for each emission point. TACB approval of the control plan does not absolve the owner/operator of any specified source from the requirement of meeting the ambient lead standard by November 5, 1982 (or November 5, 1984 with extension approval).

(b) Unacceptable plan

If the plan is not acceptable, it will be returned to the owner/operator for revision. Failure of a lead source owner/operator to submit an approvable plan by date specified will be considered a violation of TACB requirements and will result in appropriate enforcement action. In addition such violation of this State Implementation Plan for the Control of Lead Air Pollution will make the source vulnerable to EPA noncompliance penalties.

(c) Maintenance of standard

Maintenance of the lead standard, once attained, in the vicinity of the above listed lead point sources will be accomplished by the application of stringent controls on new or modified sources through the provisions of Rule 131. 08.00.003(a)(14) of TACB Regulation VI, and continuing surveillance of existing sources (see Section VI - Source Surveillance).

D. Control Strategy for the Areas in the Vicinity of Ambient Monitors Which Record Exceedance of the Lead Standard

1. Description of the Problem

a. Ambient Air Quality Data

Analysis of valid ambient air quality data recorded since January 1, 1974 shows exceedances of the lead standard of 1.5 $\mu g/m^3$ quarterly arithmetic mean at only one monitoring site in the state - a downtown El

Paso monitor (SAROAD #170027 F01). As shown in the Summary of Air Quality Data (Table 1) the highest quarterly average lead concentration for this site was 2.15 $\mu g/m^3$ as recorded in the fourth quarter of 1977.

b. Monitor Influences

Two lead emissions sources have been determined to be the primary influences on concentrations measured at this monitor site - a large smelter and vehicle exhaust emissions. Particulate filters used to determine lead concentrations were analyzed by x-ray fluorescence (XRF) for the presence of additional elements. The findings indicate that approximately 60% of the lead impacting upon the monitor was from vehicle exhaust emissions as estimated from the correlation between lead and bromine (a constituent of automobile exhaust only) concentration data. The remaining 40% of the lead correlates with various metallic elements, usually zinc, typical of the emissions from a smelter. For the purposes of demonstration of attainment of the lead standard, the reduction percentages are apportioned using the results of this XRF data analysis.

2. Control Strategy to Demonstrate Attainment of the Lead Standard at El Paso Monitor (SAROAD #1700027 F01)

a. Reduction Requirements

In order to establish the reduction requirements necessary to attain the national ambient air quality standard for lead at this monitor, 40 CFR 51.85 suggests the use of the modified rollback reduction model,

$$\frac{\text{(Design Value-Ambient Standard)}}{\text{(Design Value-Background}} = \text{\% Reduction Required,}$$

be employed.

Substituting the measured high quarterly concentration of 2.15 $\mu g/m^3$ and ambient standard of 1.5 $\mu g/m^3$ in this model and considering ambient lead background to be negligible, one obtains the following:

$$\frac{(2.15\ \mu g/m^3 - 1.5\ \mu g/m^3)}{2.15\ \mu g/m^3} = 30\%$$ Reduction Required

b. Anticipated Reductions

The two primary influences on the lead concentrations at this monitor are emissions from a lead smelter (ASARCO) and from mobile sources (vehicle exhaust emissions).

1) Reduction of Lead in Gasoline

The federal program to phase out the use of lead as a gasoline additive is anticipated to result in vehicle lead emissions reductions as shown in Table 5. This table shows the lead emissions from the light and heavy duty vehicles for urban El Paso County as estimated[1] using vehicle miles traveled (VMT) provided by State Department of Highways and Public Transportation.

TABLE 5

VEHICLE LEAD EMISSIONS

YEAR	URBAN LIGHT- AND HEAVY-DUTY VEHICLE LEAD EMISSIONS (TONS)
1977	163.4
1978	155.4
1979	155.2
1980	107.2
1981	72.7
1982	69.4

Reductions 78-82: 86.0 tons/yr = 55.3% reduction.

2) Control Measures Implemented at ASARCO

Texas Air Control Board Order 75-5 and an Agreed Order of Injunction, May 14, 1975,

[1] "Projecting Automotive Lead Emissions", Supplementary Guidelines for Lead Implementation Plans, EPA-450/2-78-038, July 1979, pp 43-59.

require installation of agreed-upon abatement equipment at the ASARCO smelter. This abatement equipment will be installed and operational by the attainment date of 1982. These specified control measures are calculated to result in the following emission reductions:

YEAR	ASARCO LEAD EMISSIONS (TONS)
1978	81.7
1982	25.6

Reduction 78-82: 56.1 tons/yr = 68.6% reduction.

3) Total Anticipated Reductions

The percentages of influence from each of the two primary lead emissions sources are as stated above - 40% ASARCO and 60% vehicle exhaust. The anticipated reductions from these two sources are summarized in Table 6. The combined effect is that the anticipated reductions is sufficient to demonstrate attainment of the lead standard at this monitor site by November 5, 1982.

3. Maintenance of the Lead Standard

Maintenance of the lead standard, once attained at any monitoring site which has previously recorded exceedances of the standard, will be accomplished by the application of stringent controls on new sources through the provisions of Rule 131.08.00.003(a)(14) of the TACB Regulation VI. An expanded air monitoring program, as described in the air quality surveillance section of this Lead SIP, will detect any additional or future air quality problem. If any exceedances are detected in the future, additional planning areas will be defined and appropriate control strategies will be developed.

III. RULES AND REGULATIONS

This plan requires no changes or additions to the TACB Rules and Regulations. Legally enforceable Board Orders

TABLE 6

ANTICIPATED AND REQUIRED

LEAD EMISSIONS REDUCTIONS

EL PASO NONATTAINMENT MONITOR

SOURCE	ANTICIPATED REDUCTIONS (%)	RELATIVE INFLUENCE AT MONITOR SITE (%)	WEIGHTED ANTICIPATED REDUCTIONS (%)	TOTAL REQUIRED REDUCTIONS (%)
ASARCO	69	40	28	
Motor Vehicles	55	60	33	
TOTAL		100	61	30

will be used to insure compliance of affected sources with the National Ambient Air Quality Standard for Lead.

IV. AIR QUALITY SURVEILLANCE

A. General

The following lead air quality surveillance network is established by the TACB in response to and in accordance with the provisions of 40 CFR Part 51.17b. A full description of each monitor and its location will be on file for public inspection between the hours of 8:00 a.m. and 5:00 p.m., Monday through Friday excluding state holidays at the Texas Air Control Board, 6330 Highway 290 East, Austin, Texas 78723.

B. Lead Air Quality Surveillance Network

1. Location of Monitors

Using existing total suspended particulate monitors where feasible, two permanent lead ambient air quality monitoring stations will be established in each of the following locations and will be operational as soon as possible but no later than two years after the date of the approval of this plan by the Administrator of EPA. Two will be located in each of the following urbanized areas:

Dallas	San Antonio
Houston	Fort Worth
El Paso	

These monitors will be part of the National Air Monitoring Stations (NAMS) network and will conform to EPA criteria for lead ambient air quality monitoring by a method equivalent to that specified in Appendix G of 40 CFR Part 50.

2. Siting Criteria for Lead Monitors

Each urbanized area listed above will have one permanent lead ambient air quality monitor sited in accordance with the specifications listed below for a roadway site and one permanent monitor sited in accordance with the specifications listed below for a neighborhood site.

a. Specifications for Roadway Site

1) Located adjacent to a major roadway with

average daily traffic (ADT) exceeding 50,000 or the roadway with the largest traffic volume if no roadway has an ADT exceeding 50,000.

2) Located adjacent to a section of the roadway that is at or below ground level and where traffic is moving at fairly high and constant rates of speed.

3) An area as close as possible to the roadway which represents population exposure (five to fifteen meters where possible).

4) Located in an area where people reside or work and no greater than five meters above ground level.

b. Specifications for Neighborhood Site

1) Located in an area of high traffic and population density but at least fifteen meters from the nearest roadway (over 2000 vehicles per day).

2) Located at or near children play areas or schools where possible.

3) Located as close to the ground level as practical, but no greater than five meters above ground level.

C. Effect of the Lead Air Quality Surveillance Network

The lead air quality surveillance network outlined in this section will provide data on ambient concentrations of lead which will allow the TACB to determine if and where problem areas exist. If such areas are detected, the control strategy section of this plan will be revised accordingly.

V. NEW SOURCE REVIEW

Procedures for review of new lead sources are identical to those for sources of other pollutants, as specified in Regulation VI of the Texas Air Control Board. This regulation requires that the owner/operator of any new or modified source of pollution apply for and receive a construction permit prior to the beginning of any actual work on the facility. Further details of this procedure are described in the section on "New Source Review" in the State Implementation Plan.

VI. SOURCE SURVEILLANCE

Procedures for source surveillance of lead facilities are similar to those for sources of other pollutants with exception that the provisions of the Board Order will be used as the criteria for determining compliance, rather than a Regulation. This surveillance includes:

1. Monitoring the status of compliance of all major stationary emission sources in the State.

2. Periodic testing and investigation of all major stationary sources.

3. Investigating and taking necessary action with respect to complaints.

4. Automatic data processing of reports for management purposes.

Further details of the surveillance activity are contained in the section on "Source Surveillance" in the State Implementation Plan.

VII. COMPLIANCE SCHEDULES

Legally enforceable compliance schedules and source surveillance procedures will be incorporated in the appropriate Board Orders for sources for which control plans are required. These sources will be monitored in accordance with the Board Order to insure achievement of the lead standard by the required compliance date and continued maintenance of the standard. Those sources not in compliance by the dates specified in the Board Order or that request a delay of compliance will be the subject of appro riate enforcement action.

VIII. LEGAL AUTHORITY

The State of Texas has the legal authority necessary to implement the Control Strategy for Lead under provisions of the Texas Clean Air Act (Article 4477-5, Vernon's Texas Civil Statutes, as amended). Further details of this legal authority are described in the section on "Legal Authority" in the State Implementation Plan.

IX. RESOURCES

The Texas Air Control Board has the necessary resources and manpower to implement the control strategy for lead. A detailed description of these resources are described in the section on "Resources" in the State Implementation Plan.

X. PUBLIC HEARINGS

Public hearings were held on this Lead SIP at the locations and times listed below. Copies of the Notice of Public Hearings and Certification that public hearings were held are contained in Appendix B.

A. Location and Date

Arlington	August 6, 1979
Houston	August 7, 1979
El Paso	August 8, 1979
Beaumont	August 8, 1979

B. Attendance and Participation

	Attendance	Oral Presentations	Written Presentations
Arlington	14	2	2
Houston	43	1	1
El Paso	26	4	2
Beaumont	11	1	0
Total	94	8	5
Additional written statements mailed to Austin			7
Total written statements			12

II. CONTROL STRATEGY FOR THE ATTAINMENT OF THE NATIONAL AMBIENT AIR QUALITY STANDARD FOR LEAD

D. Control Strategy for El Paso

1. Description of the Problem

a. Ambient Air Quality Data

During the period January 1, 1980, to December 31, 1982, particulate lead concentrations in ambient air were measured at 18 monitoring sites in El Paso. These monitoring sites used hi-volume air sampling devices which collected particulate matter on a single 24-hour period out of every six (6) calendar days. Analysis of available quality assured data for that period shows that the National Ambient Air Quality Standard (NAAQS) for lead, 1.5 ug/m^3 quarterly arithmetic mean, was exceeded 25 times at nine of those sites. The sites at which the standard was exceeded and number of exceedances per site are shown in Figure 1. The quarterly lead concentrations for each El Paso monitoring site are presented in Table 5. As shown in Table 5, the NAAQS for lead was exceeded during nine calendar quarters from January 1, 1980, to December 31, 1982, at the International Boundary and Water Commission (IBWC) site (SAROAD Number 1700031G02). The highest quarterly average lead concentration measured at this site during this period, 10.22 ug/m^3, occurred in the second quarter of 1981. The second and third highest quarterly lead averages measured in El Paso, 10.07 ug/m^3 and 7.05 ug/m^3, also occurred at the IBWC site during the third quarters of 1981 and 1982, respectively.

The IBWC site is located in an industrial area in West El Paso on a water lock above the Rio Grande River. The monitor is located in an area void of vegetative cover approximately 2 miles northwest of downtown El Paso, 0.25 miles west of the lead smelter, 0.2 miles from a brick plant located in New Mexico and 0.2 miles from a brick plant located in Juarez, Mexico.

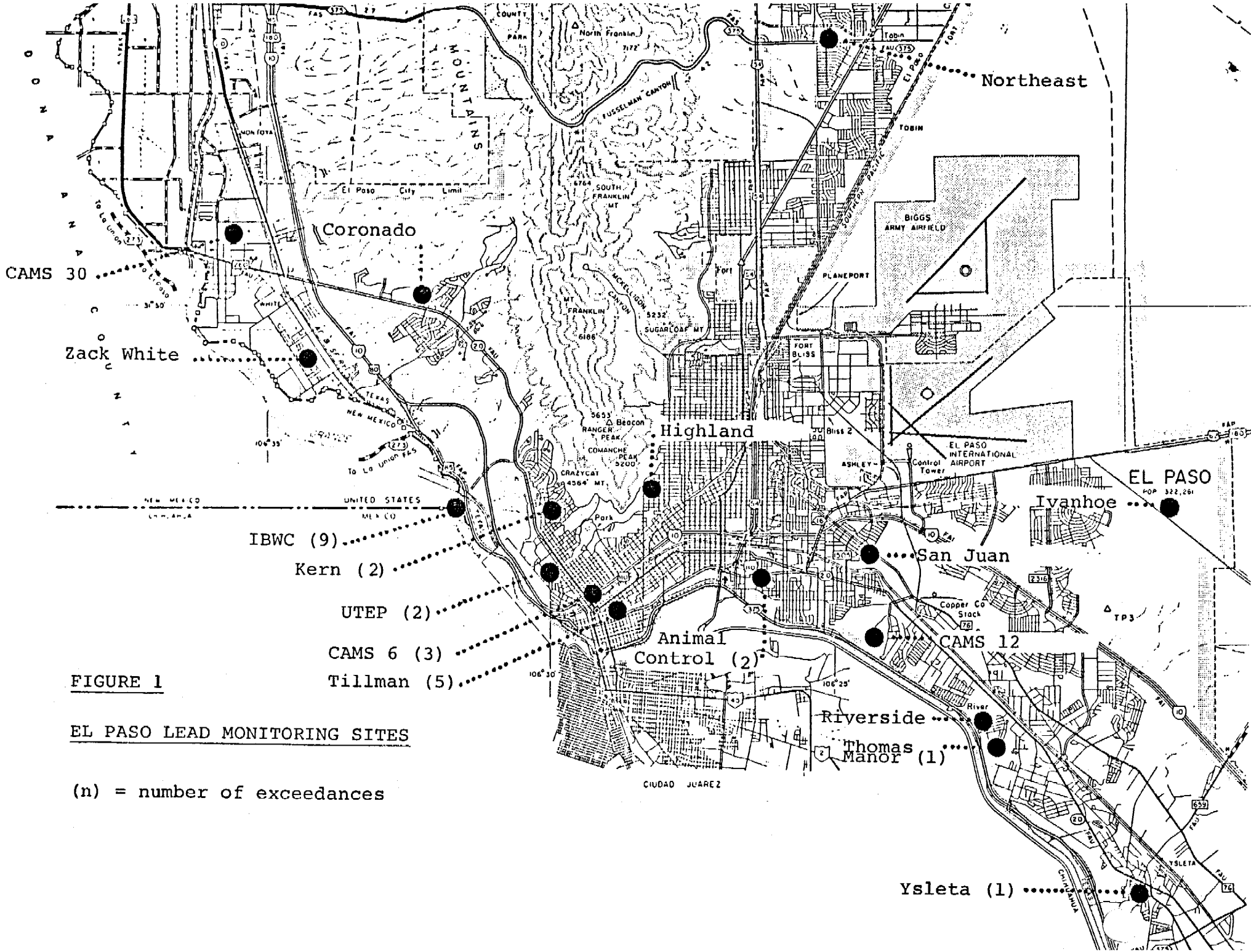

FIGURE 1

EL PASO LEAD MONITORING SITES

(n) = number of exceedances

TABLE 5

EL PASO LEAD MONITORING
1980 - 1982 SUMMARY

SAROAD NUMBER	SITE NAME	QUARTERLY ARITHMETIC MEAN CONCENTRATIONS											
		1980				1981				1982			
		1	2	3	4	1	2	3	4	1	2	3	4
1700002F01	Tillman (TACB)	.90*	nd	nd	2.12*	1.55*	1.42	1.39*	1.72	1.34*	.92	.73	.94
1700002G01	Tillman (EPDH)	2.12	1.54	.91	2.60	1.59	1.29	1.19	1.78	1.47	1.04	.85	1.05
1700007G01	Coronado							.61	.68	.42	.25	.32	.48
1700010G01	Northeast	.45	.38	.35	.58	.34	.20	.26	.44	.34	.26	.23	.25
1700016F01	San Juan					.97*	.63	.39	.90	.78	.40	.46	.52*
1700018G01	Animal Control	1.62	1.14	.66	1.89	1.10	.87	.81	1.26	.94	.58	.61	.70
1700021G01	Thomas Manor	1.40	.59	.34	2.01	.95	.59	.48*	Moved to Riverside				
1700024G01	Highland	.75	.49	.38	1.03	.48	.47	.41	.69	.48	.33	.30	.36
1700025G01	Zack White							.84	.76	.55	.47	.30	.44
1700027F01	CAMS 6	nd	1.57*	.92	1.74*	1.70	1.73	1.29*	1.75	1.54	1.17	.99	1.04
1700028F01	CAMS 12	nd	.54*	nd	1.16*	.55	.49*						
1700029G01	Ivanhoe	.69	.27	.25	.48	.38	.31	.28	.49	.44	.30	.26	.29
1700030G01	Ysleta	1.05	.69	.48	1.69	.79	.59	.43	.70	.49	.41	.36	.48
1700031G02	IBWC	2.06	5.80*	.83	4.71	7.05	10.22	10.07	6.84	1.32	6.38	6.64	6.53
1700033G01	Kern	1.81	1.37	.51	1.48	1.41	1.23	.89	2.01	1.50	1.01	.68	.95
1700036F01	CAMS 30							.67*	.52	.50	.27	.16	.28
1700037F01	UTEP							1.04*	1.96	1.77	1.08	.77	1.04
1700038G01	Riverside							.81*	1.02*	.63*	.47	.44	.60*

nd = No Data
* = Less Than 75% Data Capture

The highest recorded quarterly average lead concentration measured at any El Pasc monitoring site other than IBWC occurred at El Paso Department of Health's (EPDH) Tillman site (SAROAD Number 1700002G01). This value, 2.60 ug/m^3, occurred during the fourth quarter of 1980. The second and third highest quarterly average lead concentrations measured at this site were 2.12 ug/m^3 and 1.78 ug/m^3. These measurements were made in the first quarter of 1980 and fourth quarter of 1981.

During the 1980 through 1982 period the NAAQS for lead was also exceeded at seven other El Paso sites. Exceedances ranged from 2.01 ug/m^3 at the EPDH's Kern site (SAROAD Number 1700033G01), to 1.62 ug/m^3 at the EPDH's Animal Control site (SAROAD Number 1700018G01).

b. Monitor Influences

Three sources of lead have been determined to be the primary contributors to lead concentrations measured at the IBWC monitoring site - a large smelter (ASARCO) lead from vehicle exhaust emissions, and lead present in reentrained soil.

Twelve particulate filters used to determine lead concentrations at this site were analyzed using a scanning electron microscope to detect the presence of "tracer" particulate types. These tracer particulate types aid in determining the source of lead particles collected at the IBWC site. The microscopic analysis showed that between 64 and 94 percent of the lead measured at the IBWC site resulted from particulates of the types emitted by the smelter. Bromine (the mobile source tracer) concentrations indicated that vehicular exhaust accounted for between 2 and 4 percent of the lead measured at the IBWC site. Approximately 2 percent of the measured lead levels were found to result from lead-contaminated soil particles which become airborne and are collected by the monitor. Finally, 15-19 percent of the lead measured at

the IBWC site could not be assigned to a specific emission source or source category. At least a portion of this fraction may result from emissions of lead from adjacent industrial sources located in New Mexico and Mexico.

Nine particulate filters from the EPDH Tillman site were analyzed to determine source contributions. The analysis showed that between 33 and 51 percent of the lead measured at this site resulted from particles typical of smelter emissions. Vehicular exhaust accounted for between 22 and 35 percent of the lead and soil for 3 percent of the lead. Approximately 23-27 percent of the lead measured at this site could not be assigned to a specific source or source category.

For the purposes of demonstrating attainment of the lead standard, emission reductions from each contributing source or source category have been apportioned using the results of this scanning electron microscope analysis[1]. Additional information on the methods used to apportion the effect of emissions reductions is included in Appendix E.

2. Control Strategy to Demonstrate Attainment of the Lead Standard at El Paso Monitors

a. Reduction Requirements

Using the highest quarterly average lead concentration measured at each monitoring site in El Paso during the period 1980-1982, and the modified rollback reduction model (as suggested by EPA at 40CFR51.85 and shown below) the amount of emission reductions necessary for a rollback demonstration of attainment was calculated for each of the nine El Paso monitoring sites at which the lead NAAQS

[1] Identification of the Sources of Total Suspended Particulates and Particulate Lead in the El Paso Area by Quantitative Microscopic Analysis, Energy Technology Consultants, March, 1983

was exceeded. The results of these calculations are shown in Table 6.

$$\frac{\text{high value } (ug/m^3) - 1.5\ ug/m^3}{\text{high value } (ug/m^3)} \times 100\% = \text{required reduction}$$

Table 6

REDUCTION REQUIREMENTS AT EL PASO MONITORS

Monitor	SAROAD Number	Calculated Reduction Requirement
Tillman TACB	1700002F01	12.8%
Tillman EPDH	1700002G01	42.3%
Animal Control	1700018G01	20.6%
Thomas Manor	1700021G01	25.4%
CAMS 6	1700027F01	14.3%
Ysleta Clinic	1700030G01	11.2%
IBWC	1700031G02	85.3%
Kern	1700033G01	25.4%
UTEP	1700037F01	23.5%

In a letter dated May 18, 1983, TACB requested that EPA determine whether lead measurements made at the IBWC site were appropriate for use to establish the amount of emission reductions necessary to demonstrate attainment of the NAAQS for lead in El Paso. EPA responded on May 27, 1983, stating that lead concentrations measured at the IBWC monitor represent ambient air and that TACB should use data from this site in determining emission reduction requirements. Thus, a quarterly average of 10.22 ug/m^3 lead measured at the IBWC site would be the rollback design value.

b. Anticipated Reductions

1) Reduction of Lead in Gasoline

The federal program to phase out the use of lead as a gasoline additive is anticipated to result in vehicle lead emission reductions as shown in Table 7. This table shows the lead emissions from the light and heavy duty vehicles for urban El Paso County as estimated[1] using vehicle miles traveled, average speed and vehicle fleet mix input data provided by State Department of Highways and Public Transportation. Appendix C contains specific information used to calculate lead emissions from vehicle exhaust.

Table 7

VEHICLE LEAD EMISSIONS

YEAR	URBAN LIGHT-AND HEAVY-DUTY VEHICLE LEAD EMISSIONS (TONS)
1980	111.53
1981	80.19
1982	75.76
1983	61.80
1984	52.02
1985	45.41
1986	39.91
1987	35.56

Estimated Reduction 80-87:
75.97 tons = 68.1%

Estimated Reduction 81-87:
44.63 tons = 55.7%

2) Control Measures To Be Implemented at The ASARCO Inc., Smelter

Texas Air Control Board Order 75-5 and an Agreed Order of Injunction,

[1]"Updated Projections for Motor Vehicle Lead Emissions", Supplementary Guidelines for Lead Implementation Plans, EPA-450/2-83-002, March, 1983.

May 14, 1975, required installation of agreed-upon abatement equipment at the ASARCO smelter. In addition, following an Administrative Enforcement Conference (AEC) held on February 10, 1983, ASARCO submitted a compliance plan which included a commitment to implement measures expected to further reduce lead emissions. Emissions control measures scheduled to be implemented at ASARCO between 1981 and 1985 as a result of the 1975 Order and the February 10, 1983, commitments are expected to result in the following emission reductions:

YEAR	ASARCO Lead Emissions (Tons)*
1981	349.54
1985	335.1

Reduction 81-85: 14.44 tons/yr.

*1981 emissions are based on actual production rates, while 1985 emissions are based on maximum production rates.

Documentation concerning the ASARCO commitments and calculation of lead emissions and estimated reductions is contained in Appendix D.

Because the measures included in the 1975 Board Order and the February 10, 1983, compliance plan were not sufficient to demonstrate attainment of the lead NAAQS, dispersion modeling was utilized to determine what additional controls might be required at the ASARCO smelter (See Appendix D). The Industrial Source Complex - Long Term Model (ISC-LT) was utilized to estimate emission reduction impacts at elevations less than 3820 feet below mean sea level, including areas immediately around the smelter. The

Valley-BID Model was used to calculate impacts for areas above the 3820 feet threshold elevation.

The maximum modeled value occurred some distance from the smelter. The modeled maximum concentration areas did not coincide with the location of the monitors measuring the highest lead concentrations. The maximum predicted concentrations were significantly higher than maximum measured lead concentrations. Emissions reductions sufficient to demonstrate attainment at calculated maximum concentration areas would, therefore, be greater than those needed to demonstrate attainment for other areas of El Paso.

An iterative process of choosing additional controls and using the model to determine the predicted contribution from the ASARCO Inc. smelter, was continued until a set of specific controls that could be implemented to demonstrate attainment of the lead NAAQS was identified. Lead contributions from soil re-entrainment and vehicle exhaust emissions were also accounted for in this process. These controls were then reviewed through the public hearing process to determine economic reasonableness and technical feasibility. The resultant reasonably available control measures (RACT) are listed in Table III of Appendix D.

Full implementation of all emissions reduction measures listed in Table III of Appendix D is expected to reduce emissions from the smelter, when operating at full capacity, from 335.1 to 174.62 tons/year by the end of 1987.

The modified rollback analysis, described earlier, was utilized to estimate the emission reduction impact at each of the monitor sites

TABLE 8

MODIFIED ROLLBACK COMPARISON OF REQUIRED AND PREDICTED PERCENTAGE REDUCTIONS IN LEAD CONCENTRATIONS AT SPECIFIC EL PASO MONITORS

Monitor Site	SAROAD Number	Maximum Exceedance ug/m^3	Year Maximum Exceedance Occurred	Calculated Reduction Requirement %	El Paso Mobile Lead Reduction %	Mobile Contribution at Site %	Mobile Reduction at Site %	Soil Lead Contribution at Site %	Soil Lead Reduction at Site %	ASARCO Reduction %	ASARCO Contribution at Site %	ASARCO Reduction at Site %	Total Predicted (Mobile + ASARCO) Reduction %
Tillman (TACB)	1700002F01	1.72	1981	12.8	55.7	12-20	6.7-11.1	2	0	60.0	47-71	28.2-42.6	34.9-53.7
Tillman (EPHD)	1700002G01	2.60	1980	42.3	68.1	22-35	15.0-23.8	3	0	60.0	33-51	19.8-30.6	34.8-54.4
Animal Control	1700018G01	1.89	1980	20.6	68.1	ND	NC	ND	NC	NC	ND	NC	NC
Thomas Manor	1700021G01	2.01	1980	25.4	68.1	ND	NC	ND	NC	NC	ND	NC	NC
CAMS 6	1700027F01	1.75	1981	14.3	55.7	(12-35)	6.7-19.5	(2-3)	0	63.0	(33-71)	20.8-44.7	27.5-64.2
Ysleta	1700030G01	1.69	1980	11.2	68.1	ND	NC	ND	NC	NC	ND	NC	NC
IBWC	1700031G02	10.22	1981	85.3	55.7	2-4	1.1-2.2	2	0	79.9	64-94	51.1-75.1	52.2-77.3
Kern	1700033G01	2.01	1981	25.4	55.7	ND	NC	ND	NC	NC	ND	NC	NC
UTEP	1700037F01	1.96	1981	23.5	55.7	6-14	3.3-7.8	1	0	66.7	57-100	38.0-66.7	43.9-74.5

( ) = Interpolated ND = No Data NC = Not Calculated

and to provide an independent verification of the dispersion modeling results. Table 8 shows the results of this effort at each monitoring site at which the standard was exceeded. As demonstrated in Table 8, the range of emissions reductions anticipated to result from the phase out of lead in gasoline and the additional controls to be implemented at the smelter is greater than or equal to the required reductions for all monitoring sites except the IBWC. Additional information to support the modified rollback analysis is contained in Appendix E.

At the IBWC monitor site estimates of the emission reductions expected to result from the phase out of lead in gasoline and from implementation of additional emission controls at the smelter range from 52.2 to 77.3 percent. The required emission reductions calculated by the rollback methodology is 85.3 percent. Since this monitor was sited to detect smelter emissions impact, the results of the ISC-LT modeling of this receptor were also reviewed. The results of this modeling indicate a maximum predicted ambient level of 1.24 ug/m^3 at the site.

3) Total Anticipated Reductions

From 1981 through 1987, a 55.7 percent reduction is expected to occur in the inventory of lead emissions from mobile sources due to the phase out of lead as a gasoline additive. A 48 percent reduction is expected to occur in the inventory of lead emissions from the ASARCO, Inc. El Paso smelter due to the controls currently being implemented and the RACT controls included in Table III of Appendix D.

Using the ISC-LT model to predict the impact of these emissions reductions in the vicinity of the smelter, the

Valley model to predict the impact in elevated terrain and rollback calculations to review the impact at monitor sites, the additional controls result in a demontration of attainment of the lead standard in all areas except eleven model receptor sites. Levels predicted for each of these receptors are less than 2.0 ug/m^3. These receptor sites are not located in populated areas and the concentrations predicted are based on dispersion models that may be considered to be accurate to a factor of two and on a maximum lead production figure that is 50 percent higher than production rates achieved during the previous 96 years of operation in El Paso. Furthermore, the highest modeled value, 1.99 ug/m^3, is a considerable reduction from the highest modeled value based on estimated emissions with no further controls, 33.8 ug/m^3. Therefore, the control strategy as outlined in Appendix D can reasonably be expected to result in ambient lead concentrations at or below the 1.5 ug/m^3 standard by 1987.

Since there are receptor sites at which modeling predicts levels over the standard, the TACB will continue to carefully monitor the ambient lead concentrations and to evaluate the actual ambient impact of the controls as implemented in comparison to the predicted impacts. Accordingly, the ambient and emissions data for each year will be reviewed to determine progress toward attainment of the NAAQS. Reviews will be conducted annually for up to two years after the date of implementation of all proposed controls. If the results of this annual review indicate that adequate progress toward attainment of the standard is not being made, additional controls will be reviewed and proposed.

3. Maintenance of the Lead Standard

Maintenance of the lead standard, once attained, will be accomplished by the application of stringent controls on new sources through the provisions of Rule 116.3(a)(14) of TACB Regulation VI.

In addition to this new source review and the annual reviews discussed previously, an expanded air monitoring program has been implemented to detect any additional or future exceedances of the lead NAAQS. Special purpose monitoring sites located to measure lead concentrations in residential areas have been established near ASARCO. Sample savers have been installed on all El Paso lead monitors. These devices could result in a reduction in measured lead concentrations. Additional control strategies will be developed to address any future exceedances of the lead NAAQS which may be detected in El Paso.

APPENDIX C

MOBILE LEAD EMISSIONS
URBAN EL PASO AREA

Year	Annual Urban Vehicle Lead Emissions Tons/Yr
1980	111.53
1981	80.19
1982	75.76
1983	61.80
1984	52.02
1985	45.41
1986	39.91
1987	35.56

	Light Duty Vehicles	Light Duty Trucks (small)	Light Duty Trucks (heavy)	Heavy Duty Gas	Total
1980	50.7	20.0	15.7	25.13	111.53
1981	34.7	14.3	9.3	21.89	80.19
1982	31.9	13.1	7.6	23.16	75.76
1983	24.0	10.8	5.7	21.30	61.80
1984	18.5	9.1	4.4	20.02	52.02
1985	14.4	7.6	3.5	19.91	45.41
1986	11.4	6.7	2.6	19.21	39.91
1987	8.8	5.6	2.2	18.96	35.56

For all calculations, a draft copy of "Supplementary Guidelines for Lead Implementation Plans - Updated Projections for Motor Vehicle Lead Emissions," EPA-450/2-83-002, March, 1983 was the source document. The new guidelines change the previous ones by incorporating the effect of the new EPA lead phase-down regulations, more recent on-road passenger car and light duty truck fuel economy data, an estimate of increased "dieselization" of the light and heavy duty fleet, more recent projections of the percent of vehicles from 1975 and beyond that require the use of unleaded gasoline, and the effects of misfueling and discretionary fuel switching.

Lead emissions from mobile sources are calculated based on the percentage of burned lead exhausted at different speeds, the lead content of gasoline, vehicle fuel economy, and the model year mix of vehicles on the road. The lead content of gasoline and the model year mix are a function of the calendar year of interest. For example, the 1981 model year was given a lead content of 1.15 grams per gallon by EPA. Vehicle fuel economy is averaged for all vehicles of the same model year.

Equations used for calculating lead emissions have been formulated for two separate conditions by EPA in the guideline document. One equation is applicable for obtaining emission rates from automotive sources operating on an individual roadway (line source). This basic equation can be modified to calculate automotive emissions on an area source basis. For the El Paso urban area the area source equation was used. Following is the area source equation:

$$e_{n,s} = \frac{V}{C_s}\left[\left(Pb_{NL,n}(0.92)(0.75) + Pb_{L,n}(0.08)(0.30)\right)\sum_{i=1975}^{n}\left(\frac{m_i F_{NL,i}}{E_{c,i}}\right)\right.$$

(emission rate for period of time, n, at speed, s)

$$+\left(Pb_{L,n}(0.929)(0.75) + Pb_{NL,n}(0.071)(0.75)\right)\sum_{i=n-19}^{1974}\left(\frac{m_i F_{L,i}}{E_{c,i}}\right)$$

$$\left.+\left(Pb_{L,n}(0.725)(0.75) + Pb_{NL,n}(0.275)(0.75)\right)\sum_{i=1975}^{n}\left(\frac{m_i F_{L,i}}{E_{c,i}}\right)\right] \quad (2)$$

For calculating mobile lead emissions, the guideline document perscribed using four of the eight vehicle categories. These are: Light Duty Gas Vehicles, Light Duty Gas Trucks 1, Light Duty Gas Trucks 2, and Heavy Duty Gas Trucks. (The other four categories not used were considered to emit insignificant quantities of lead: Light Duty Diesel vehicles, Light Duty diesel trucks, Heavy Duty diesel trucks, and Motor Cycles.) A different set of calculations was performed on each category. For Light Duty Gas Vehicles (LDV) the previously-citied equation was solved by using the Vehicle Miles Traveled (VMT), speed, and VMT mix taken from the data supplied by the Highway Department and the applicable tables contained in the EPA guidelines. (See Attachments 1 and 2) Each year of interest was calculated separately using the equation and data applicable to that year in the EPA tables and Highway data. Similarly for Light Duty Gas Trucks 1 (LDT1) of 6000 pounds or less and Light Duty Gas Trucks 2 (LDT2) of 6001 to 8500 pounds, the emissions were calculated using the applicable tables contained in the EPA guidelines.

Heavy Duty Gasoline (HDGT) powered trucks were assumed to burn leaded gasoline until 1988. Fuel economy for any calendar year was assumed to be equal to 5.0 miles/gallon. The emission rate for heavy duty gasoline powered trucks was calculated by using the following equation and the applicable table in the EPA guidelines.

$$e_{n,s} = 0.75 \, V \, \frac{Pb_{L,n}}{5.0}$$

After calculating emissions for each type of vehicle, these emissions were added to give total emissions for the area under study.

Attachment 1

INTEROFFICE MEMORANDUM

HAP HEMPHILL
TACB
WALT DIBBLE

TO: Mr. Robert L. Lewis Attention: Mr. Rod Moe

Date March 10, 1981

FROM: Phil Wilson

Responsible

SUBJECT: Estimate of Vehicle Miles of Travel and Average Speed

Desk D-10M

Reference is made to your memorandum of January 20, 1981, requesting estimates of urban and rural vehicle miles of travel and average speeds for 37 counties in Texas for submission to the Texas Air Control Board.

Attached are our estimates of vehicle miles and speeds for each of the counties for the years 1979 thru 1987.

The Departmental T.T. Tables were used in these estimates and supplemented with vehicle mile data from urban traffic assignments in areas where data was available.

All the VMT estimates are shown as annual VMT. A daily VMT may be obtained by dividing the annual VMT by 365.

Should you have any questions relative to these estimates please contact Mr. John Waggoner or Mr. Jimmy Olson.

Attachment

JPO/sma

RECEIVED
MAR 11 1981
Highway Design Division
D-8

Estimated Annual Rural and Urban
Vehicle Miles of Travel and Average Speeds

1979-1987

El Paso County

Year	V.M.T. Rural	V.M.T. Urban	V.M.T. Total	Average Speed Rural	Average Speed Urban
1979	267,910,000	2,151,675,000	2,419,585,000	54	32
1980	279,955,000	2,249,495,000	2,529,450,000	54	32
1981	292,365,000	2,351,695,000	2,644,060,000	54	32
1982	305,505,000	2,458,275,000	2,763,780,000	54	32
1983	319,375,000	2,569,965,000	2,889,340,000	54	32
1984	333,975,000	2,686,765,000	3,020,740,000	54	31
1985	348,940,000	2,808,675,000	3,157,615,000	54	31
1986	364,635,000	2,936,060,000	3,300,695,000	54	31
1987	381,060,000	3,069,285,000	3,450,345,000	54	31

Attachment 2

COMMISSION
ROBERT H. DEDMAN, CHAIRMAN
A. SAM WALDROP
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STATE DEPARTMENT OF HIGHWAYS
AND PUBLIC TRANSPORTATION
DEWITT C. GREER STATE HIGHWAY BLDG.
AUSTIN, TEXAS 78701

ENGINEER-DIRECTOR
MARK G. GOODE

October 6, 1981

IN REPLY REFER TO
FILE NO.

D-8 P
815.6

Mr. Roger R. Wallis
Texas Air Control Board
6330 Hwy. 290 East
Austin, Texas 78723

Dear Mr. Wallis:

In a letter dated December 9, 1980, you requested our assistance in furnishing input data for the Mobile II computer program. Since then we have provided a number of materials for your use to Mr. Walt Dibble: unpaved roads for city streets and counties, vehicle age by county, TT tables of VMT, manual traffic counts, VMT and speed projections (1979-1987) for 37 counties. This information was provided by the Transportation Planning Division (D-10) headed by Mr. Phillip L. Wilson.

A vehicle registration data update through 1980 is attached along with hot and cold start estimates for major urban areas of Texas. We use the Brazos County estimates for smaller cities. The basis for the hot and cold start estimates are the travel demand models developed by D-10 used to estimate average trip length and a FHWA research report by Mr. George W. Ellis, a copy of which is attached. The simplified method was used. The registration data was provided by the Motor Vehicle Division (D-12) headed by Mr. R. W. Townsley. National estimates were used for distribution of light trucks 1 and 2.

National estimates of annual miles driven by vehicle and type should also be used. We can provide no local data for this.

Also attached are VMT mix projections (1980-2000) based on several references also attached. Our Air Quality Modeling Task Force reports of September 9 and September 29 explain the methodology used in making these projections. Mr. Walt Dibble and Dr. Hap Hemphill have copies of these.

For temperature we recommend using mean-maximum temperature for August for VOC and nitrogen oxides and mean minimum temperature for December for carbon monoxide. This would be for worst case conditions. Local Climatological Data published by the National Weather Service is an excellent source for mean temperatures.

Please let us know if we may be of any additional assistance.

Sincerely yours

M. G. Goode
Engineer-Director

Original Signed
By: R. L. LEWIS

R. L. Lewis, Chief Engineer
of Highway Design

Attachment

cc: D-10
D-12

RDM/sw

VMT MIX FROM ROD 21 SEPT 1981

LDGV	LDGT1	LDGT2	HDGV	LDDV	LDDT	HDDV	MC	
.573	.204	.116	.049	.005	.000	.047	.006	YEAR 1980
.558	.209	.118	.049	.008	.000	.051	.007	YEAR 1981
.556	.208	.118	.046	.011	.000	.054	.007	YEAR 1982
.546	.208	.118	.044	.018	.002	.057	.007	YEAR 1983
.540	.207	.118	.041	.025	.002	.060	.007	YEAR 1984
.533	.207	.117	.039	.032	.002	.063	.007	YEAR 1985
.523	.207	.116	.036	.041	.004	.066	.007	YEAR 1986
.513	.206	.116	.034	.050	.005	.069	.007	YEAR 1987
.503	.205	.116	.031	.061	.006	.071	.007	YEAR 1988
.491	.204	.115	.029	.072	.007	.075	.007	YEAR 1989
.479	.204	.114	.027	.084	.008	.077	.007	YEAR 1990
.472	.205	.115	.017	.095	.009	.080	.007	YEAR 1991
.460	.203	.113	.022	.104	.009	.082	.007	YEAR 1992
.451	.202	.113	.019	.112	.010	.086	.007	YEAR 1993
.444	.202	.112	.017	.119	.011	.088	.007	YEAR 1994
.436	.201	.112	.015	.126	.012	.091	.007	YEAR 1995
.432	.201	.111	.012	.130	.013	.094	.007	YEAR 1996
.426	.201	.111	.010	.135	.013	.097	.007	YEAR 1997
.423	.200	.111	.008	.138	.014	.099	.007	YEAR 1998
.419	.200	.111	.006	.141	.014	.102	.007	YEAR 1999
.417	.199	.110	.004	.143	.015	.105	.007	YEAR 2000

Appendix D

Demonstration of Attainment of the
National Ambient Air Quality Standard (NAAQS)
For Lead In Areas to which the Public Has Access Near the
Smelter Operated By ASARCO, Incorporated, in El Paso, Texas

Receptor modeling studies in the El Paso area have demonstrated that the major identifiable portions of monitored lead concentrations are due to emissions from mobile sources and from the ASARCO, Incorporated (ASARCO) smelter. A lesser portion of the lead concentrations monitored at each site have been attributed to re-entrained soil.

The highest ambient lead concentrations measured in El Paso were found in the vicinity of the ASARCO smelter. In that area, the greatest portion of measured lead concentrations were attributed to the smelter in the receptor model analysis (Final Report prepared by Energy Technology Consultants, "Identification of the Sources of Total Suspended Particulates and Particulate Lead in the El Paso Area by Quantitative Microscopic Analysis", March 1983). The demonstration of attainment of the lead NAAQS discussed below is based on predicted concentrations at all locations around the smelter to which the public has access. It was assumed that the controls resulting in acceptable ambient impacts in the area immediately surrounding the smelter would also result in emission reductions necessary to demonstrate attainment in all other areas of the city, including the downtown area.

The technical approach to the problem can be summarized as follows:

(1) A lead emission inventory for stationary lead emission sources in the area of interest was developed.

(2) Appropriate computer models and typical meteorological data from the ASARCO weather station (1976-1979 weather data was used to define typical quarterly meteorology) were used to predict the impact on ambient air of past emissions from the smelter. The Industrial Source Complex Model (ISC-LT) was used for the relatively flat terrain in the vicinity of the smelter below an elevation of 3820 feet above sea level. The Valley BID Model was used for the terrain above that elevation. The receptor grid chosen in the ISC-LT provided for identification of property line ground level concentrations. Options in the Valley-BID Model were selected to properly simulate plume behavior in complex terrain.

(3) The estimated past and future impact of mobile source and soil-related lead emissions on ambient concentrations both in the vicinity of the smelter and in downtown El Paso were estimated.

(4) The results of steps (2) and (3) were used to compare modeled predictions of past ambient lead concentrations with values measured at nearby monitors to determine whether the computer models required calibration to more accurately predict past and future ambient concentrations.

(5) Estimated emissions at maximum operating rates were modeled, and then possible additional control measures were evaluated using the models in an effort to develop a set of controls demonstrating attainment of the lead NAAQS at locations off ASARCO's property.

(6) Attainment of the standard in the downtown El Paso area was demonstrated by determining the expected concentrations of lead in the downtown area due to soil re-entrainment and mobile source-related lead emissions and adding the predicted concentration from stationary sources based on modeling.

Step (1) involved a detailed emission inventory analysis which included an estimate of fugitive emissions. Total actual lead emissions from the smelter during 1982 are estimated to have been 282.3 tons per year of which 136.2 tons per year were fugitive emissions and 146.1 tons per year were stack emissions (see attached Tables 1-A and 1-C). In addition, the lead emissions from the smelter assuming operation at maximum capacity with those controls existing or proposed by ASARCO were estimated. Those estimated emissions are 335.1 tons per year of which 188.0 tons per year are fugitive emissions and 147.1 tons per year are stack emissions (Table 1-B).

TABLE II summarizes the results of steps (2), (3), and (4). A comparison of predicted and measured values revealed that the uncalibrated models were making reasonable predictions of ambient concentrations in the vicinity of the smelter, so model calibration was not deemed necessary. At both the IBWC (SAROAD #1700031G02, Figure 1) and McNutt Road (Anapra-SAROAD #0340-15) monitor locations, the ISC-LT model predicted values above the monitored value for one quarter and below the monitored value for three quarters of 1982. This may indicate a tendency for the model predictions to be somewhat low, although neither monitor is located very well for model comparisons. For instance, the IBWC monitor is located 48 feet below the base of the copper stack with a fairly sharp elevation change between the smelter and the monitor. The ISC-LT model does not account for the effect of such terrain changes on air flow patterns. In the case of the McNutt Road monitor, there is intervening elevated terrain on a straight line path between the smelter and the monitor. In addition, the valley narrows considerably just to the southeast of the McNutt Road monitor. These terrain features can affect air flow patterns and pollutant dispersion significantly, but are not considered in the ISC-LT model.

Another factor that could affect the model predictions is the fact that 1982 meteorological data was not available for use in predicting 1982 monitored values. Considering these shortcomings and the lack of data from better situated monitoring locations, it was concluded that while there was some evidence in favor of calibrating the ISC-LT model or reexamining the emission calculations, there was not enough evidence to adequately justify taking such steps.

The Kern Fire Station monitor (SAROAD #1700033G01) was the only monitoring location considered to be suitable for making comparisons with Valley-BID model predictions. As shown in Table II, the model predictions agreed well with monitored values at this one site. More monitoring locations would be desirable in order to support general statements about the model's accuracy in predicting ambient concentrations. However, the limited data available does support the reasonableness of the model as a tool in making an attainment demonstration.

The past impact of lead emissions from mobile sources in the area of the smelter was estimated by using values from the CAMS 12 Rim Road monitor (also referred to as the UTEP monitor, SAROAD #1700037F01) (see Figure 1). Using a bromine tracer technique, 1982 quarterly values of mobile source-related lead were estimated to be 0.29, 0.21, 0.13, and 0.20 ug/m^3 at the monitor location. The average value, which was used in the analysis, was 0.21 ug/m^3. Measurements from this monitor represent worst case values for this area because the monitor is 2.5 Km from the smelter in the directon of downtown El Paso. A similar analysis using CAMS 6 (SAROAD #170027F01) (see Figure 1) as a site representative of the downtown area revealed 1982 quarterly averages of 0.64, 0.53, 0.45, and 0.46 ug/m^3 yielding an average 1982 mobile source-related impact of 0.52 ug/m^3.

The impact of soil re-entrainment on ambient lead concentrations was determined by (1) estimating the background concentrations resulting from re-entrainment of soil from areas other than the ASARCO property and then (2) including estimated emissions from the grounds of the ASARCO property in the dispersion modeling. The average background concentrations of lead due to the re-entrainment of soil from areas other than ASARCO property were estimated by analyzing monitored values for the 3rd quarter of 1980 during which the smelter was shut down due to a strike. Monitors (other than the IBWC monitor) west of the Franklin Mountains were used to define an appropriate background value representative of the area around the smelter. The IBWC monitor was excluded because its measurements were assumed to be strongly influenced by re-entrainment of soil from ASARCO's property. The average background value was determined as follows:

Kern	(SAROAD # 1700033G01)*	0.51 ug/m^3
Sunland Park, NM	(SAROAD # 0340-04)*	0.27 ug/m^3
Anapra, NM	(SAROAD # 0340-15)	0.32 ug/m^3
(McNutt Road)*		
	AVERAGE	0.37 ug/m^3

* (See Figure 1 for location)

A portion of this 0.37 ug/m^3 average background value is due to mobile source emissions. To estimate the contribution from mobile sources, the estimated mobile source-related lead concentration for the area around the smelter estimated by the bromine tracer technique (0.21 ug/m^3) was corrected to 1980 using the estimated ratio of mobile source lead emissions for 1980 to mobile source emissions for 1982 (Table IV). The resulting estimate of mobile source-related background concentration in this area is 0.31 ug/m^3 for 1980. By subtracting this background concentration from the average total background values, it was concluded that soil re-entrainment contributed about 0.06 ug/m^3 to measured values during 1980. This can only be considered a rough estimate of the soil-related contribution, but does confirm that this influence on measured values is rather small.

Having determined appropriate values for average mobile source and soil-related background concentrations, the next step (5) was to use the Valley-BID and ISC-LT models to predict the impact of smelter emissions on lead concentrations when the smelter is operating at maximum capacity. The maximum predicted contribution of the smelter, assuming operation with existing controls plus those controls proposed by ASARCO prior to the lead SIP development process, was 33.8 ug/m^3 during the fourth calendar quarter (south of the smelter on Paisano Drive). This indicated a need for further controls to demonstrate attainment of the NAAQS. Assuming different combinations of additional controls and using the model to determine the predicted contribution from affected facilities on the ASARCO property, a set of controls was sought that would demonstrate attainment of the lead NAAQS taking into consideration the expected background concentrations due to soil re-entrainment and mobile source emissions.

Initial modeling showed that fugitive emissions from the smelter were the largest contributors to lead concentrations off the smelter property. In order to determine the potential for further control, a comprehensive control plan including the use of control equipment and workplace practices to minimize all sources of fugitive lead emissions was developed. These fugitive control measures are included in the controls listed in Table III. Secondary hoods offering a 95% capture efficiency with the exhaust routed to particulate control equipment was determined to represent reasonably available control technology (RACT) for the copper converters. Complete enclosure of the copper converter building was examined as a possible additional control option for the converters but was eliminated from further consideration because of the additional estimated cost (approximately $200,000), the relatively small benefit of 1.7 tons per year reduced lead emissions, and 0.02 ug/m^3 reduced impact in elevated terrain. The option of installing a complete enclosure vented to a baghouse instead of local exhaust hoods vented to a wet scrubber on dust handling from the copper department electrostatic precipitators and zinc deleading baghouse moisturization system was investigated. This option was also eliminated from further consideration as RACT because of the additional estimated cost (approximately $125,000), the relatively small benefit of 0.5 tons per year reduced lead emissions, and 0.01 ug/m^3 reduced impact in elevated terrain.

Modeling using the fugitive emission control scenario continued to show predicted values above the lead NAAQS, so possible control of stack emissions was considered. A review of lead emissions from stacks revealed that all potentially significant stack emissions of lead are controlled with an electrostic precipitator followed by a sulfuric acid plant, with an electrostatic precipitator alone, or with a baghouse. Such control devices, if properly designed and operated, are representative of the state-of-the-art in particulate control, so there appeared to be little potential for substantial reductions in lead emissions from stacks. Some benefit could be gained by raising the heights of the stacks having the largest predicted ambient impact. Four stacks (emission points #E-10, E-11, E-12, and E-22) in the copper and lead raw material handling area contributed 0.89 ug/m^3 of the total 1.16 ug/m^3 predicted impact from stack emissions near the plant as predicted by ISC-LT and 1.43 ug/m^3 of 1.56 ug/m^3 at 1.5 KM ESE of the copper stack and 1.26 ug/m^3 of 1.52 ug/m^3 at 2.0 KM N of the copper stack as predicted by the Valley model. If each of these four stacks were raised to minimize downwash (while remaining below the good engineering practice (GEP) stack height), then the maximum predicted smelter impact would be reduced from 1.79 ug/m^3 at 2.0 KM N of the copper stack to a maximum of 1.67 ug/m^3 at 1.5 KM ESE of the copper stack in elevated terrain. Raising these four stacks was estimated to cost almost $1 million and would only reduce the maximum smelter predicted impact 0.12 ug/m^3 in elevated terrain, which was the area showing the highest predicted lead levels. Considering the relatively high cost, moderate benefit at critical receptors, and the fact that no emissions would be reduced, raising these stacks was eliminated from further consideration. As raising any of the other stacks did not offer potential for making a significant reduction in total predicted lead concentrations, such measures were not considered as possible regulatory requirements.

The resulting control scenario consisting of stringent emission controls on all significant fugitive lead emission sources, continued to result in a predicted value slightly above the 1.5 ug/m^3 NAAQS during all calendar quarters. The maximum value, 1.99 ug/m^3, is predicted to occur 2.0 Km north of the main copper stack during the third calendar quarter. Of the 1.99 ug/m^3 maximum value, 1.26 ug/m^3 is predicted to come from the four stacks discussed previously, all of which are controlled by baghouses. Because baghouses typically offer state-of-the-art particulate control, there appeared to be little potential for additional control measures that could be applied to reduce these emissions such that the total predicted lead concentration would be below the NAAQS.

These four stacks already have a TACB permit allowable limit of 0.02 grains of particulate matter per standard cubic foot. This grain loading limit is generally consistent with the 0.022 grains per dry standard cubic foot limit set for certain facilities in the Environmental Protection Agency's New Source Performance Standards (NSPS) for Primary Copper Smelters and Primary Lead Smelters. The NSPS were established based on a review of the capabilities of control equipment in such service. Individual facilities, however, may be capable of meeting emission limitations which are lower than the NSPS values. The lead emission values used in the dispersion modeling for three of the stacks in question (E-10, E-11, and E-12) are based on 50% of the permit allowable

particulate emission limitation, adjusted for the lead content of the dust captured in the different baghouses. This lower limit appears to be achievable based on stack sampling performed in August 1979. There was insufficient data to support a lower emission limitation for the remaining stack (E-22, copper ore bedding).

It was decided not to pursue the possibility of even lower stack emission limitations than those currently proposed for a number of reasons:

(1) Such lower limits would necessarily be pushing the limits of baghouse technology and would have to be set carefully in order to be achievable. Significant additional study would have been required which would have needlessly delayed the adoption of other needed lead emission controls.

(2) Considering that predicted lead concentrations are reduced from a maximum value of 15.57 ug/m^3 for 1982 to a value of 1.99 ug/m^3 after all proposed controls are implemented, there is a reasonable possibility that the proposed controls will actually result in attainment of the standard. Dispersion models are inexact tools and emissions resulting in a 1.99 ug/m^3 predicted value could easily result in actual impacts below the 1.5 ug/m^3 standard.

(3) The proposed control scenario resulted in predicted attainment of the NAAQS in all the residential areas surrounding the smelter. The predicted exceedence is in an area where it is extremely unlikely that anyone would receive continuous exposure throughout a calendar quarter. Therefore, public health would appear to be adequately protected by this control scenario.

Table III lists the specific controls on which this control strategy is based. These controls are considered to represent reasonably available control technology (RACT) for lead emissions from this smelter. As mentioned previously, if the controls listed in Table III are applied, the maximum total predicted lead concentration in public access areas after 1985 is 1.99 ug/m^3. Of this value, 1.80 ug/m^3 is from the smelter, an estimated 0.06 ug/m^3 is from soil re-entrainment, and 0.13 ug/m^3 is from mobile source-related lead emissions. The additional controls are expected to reduce emissions at maximum capacity from 335.1 tons per year to 174.6 tons per year. Table V lists, for each quarter, the maximum ambient concentration predicted and its location assuming the controls listed in Table III are applied. The reduction in the mobile source-related lead concentration is assumed to be proportional to the expected reduction in urban light and heavy-duty vehicle lead emissions (Table IV).

Having determined the maximum predicted impact in the vicinity of the smelter after the proposed controls are implemented, attainment of the lead NAAQS in the downtown area was verified (step 6) by adding the predicted smelter impact in the vicinity of CAMS 6 (see Figure 1) to the

soil and mobile source-related lead concentrations expected after 1985 . First, the effect of soil re-entrainment was estimated based on monitoring results during the smelter strike. The CAMS 6 site was felt to give the best indication of the influence of soil re-entrainment on ambient lead levels in the downtown area during the 3rd quarter of 1980 because of its central location and because it is the only downtown monitor with full bromine tracer analytical results for that quarter. The quarterly average lead value during this quarter was 0.92 ug/m^3. The bromine tracer technique indicated that this entire value could be accounted for by mobile source emissions, so it was concluded that the effect of soil re-entrainment on lead concentrations in the downtown area was negligible.

The 1982 average mobile source-related lead concentration was 0.52 ug/m^3 at CAMS 6. Assuming a reduction in the mobile source-related lead concentrations proportional to the expected reduction in urban light and heavy-duty vehicle lead emissions, the value after 1985 should be less than 0.31 ug/m^3. The impact of soil re-entrainment on lead concentrations in the downtown area was assumed to be minimal as discussed. The maximum predicted impact of stationary source emissions at CAMS 6 is 0.20 ug/m^3 in the first quarter of the year. Therefore, the total predicted lead concentration in the downtown area after 1985 is less than 0.51 ug/m^3, confirming that the proposed controls should provide for attainment of the standard in the downtown area.

Considering the fact that the dispersion modeling leaves some doubt whether the proposed controls will actually result in attainment of the lead NAAQS in the immediate vicinity of the smelter, ambient monitoring should be performed as necessary to verify whether the currently proposed controls are adequate. If such monitoring reveals violations of the lead NAAQS after all required controls are implemented, then a comprehensive review of remaining smelter lead emissions should be undertaken to identify additional control measures that would provide for attainment of the lead NAAQS.

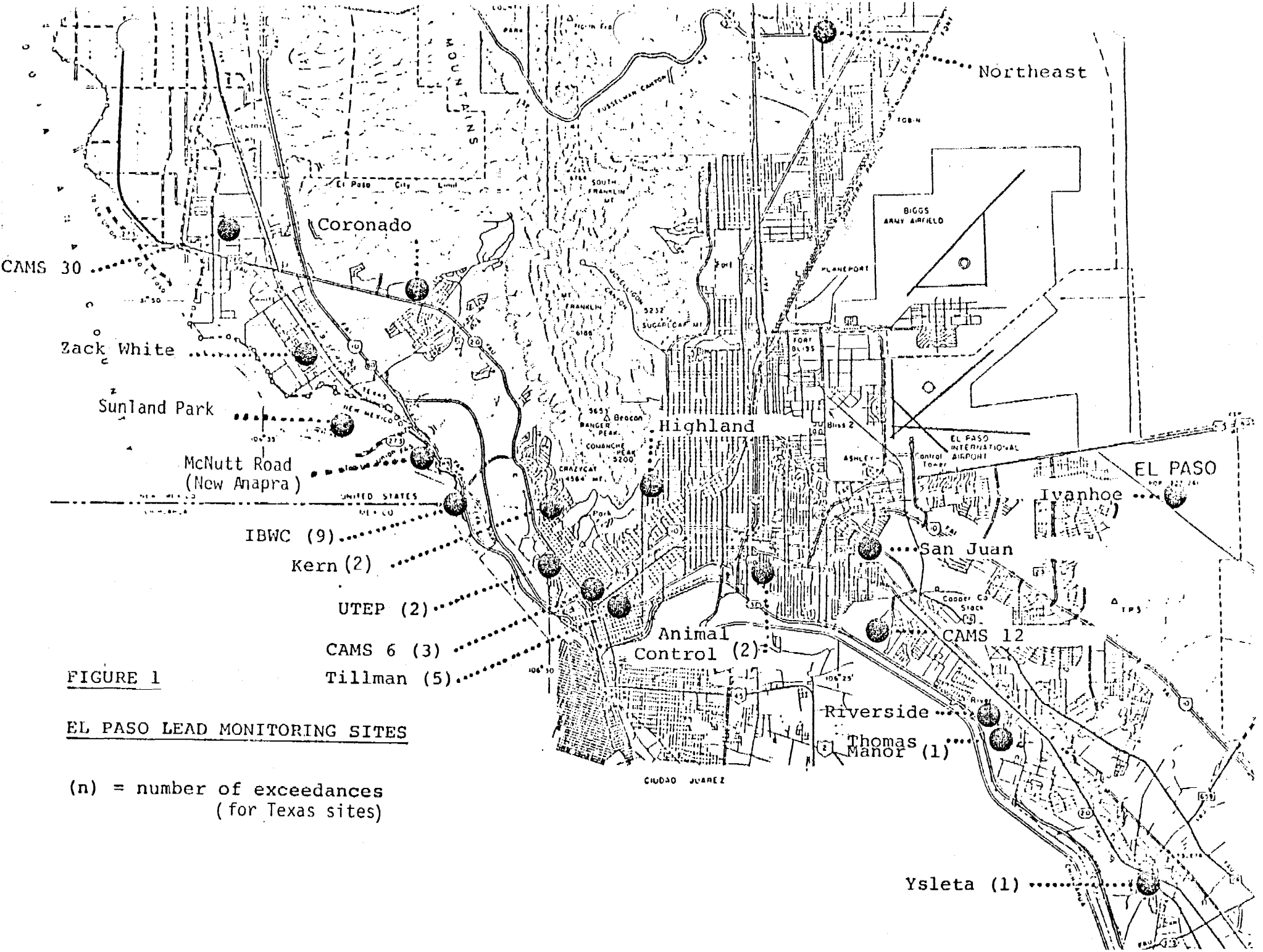

FIGURE 1

EL PASO LEAD MONITORING SITES

(n) = number of exceedances
(for Texas sites)

TABLE I-A
ESTIMATED PAST
ASARCO/EL PASO
LEAD EMISSIONS

Emission Point	Description	1978 (Actual) (T/Yr)	1981 (Actual) (T/Yr)	1982 1st Q (Actual)	1982 2nd Q (Actual)	1982 3rd Q (Tons/Qtr)	1982 4th Q (Tons/Qtr)
E-11F	Lead Ore unload, store handle	72.9	0	0	0	0	0
E-21F	Copper Ore unload, store handle	4.7	0	0	0	0	0
E-11	Lead Ore unload	0	11.8	2.65	2.55	2.23	2.34
E-21	Copper Ore unload	0	0.23	0.059	0.046	0.052	0.049
E-10	Convey	0	1.16	0.28	0.24	0.24	0.24
E-12	Lead Bedding	0	7.13	1.60	1.54	1.35	1.41
E-22	Copper Bedding	0	16.66	4.21	3.28	3.7	3.49
E-13	Lead Stack	86.42	75.92	17.17	15.4	12.64	13.53
F-ST	Sinter Transfer to charge cars	5.69	5.57	1.26	1.13	0.93	0.99
F-CD6	D&L BH Dust Handle	21.41	13.2	4.2	3.98	3.64	3.26
F-CD16	Sinter ESP Dust Handle	0	0.67	0.09	0.2	0.22	0.2
E-17	Blast Furnace BH Stacks	4.49	5.0	0.97	0.96	0.73	0.99
F-BFT	Blast Furnace Taps	0.33	0.37	0.07	0.07	0.05	0.07
F-BFC	Blast Furnace Charge	0.33	0.37	0.07	0.07	0.05	0.07
F-BFU	Blast Furnace Upset	80.7	89.8	17.43	17.22	13.04	17.72
F-LT	Lead Transfer	1.67	1.86	0.36	0.36	0.27	0.36

ESTIMATED ASARCO
EL PASO
TABLE I-A
LEAD EMISSIONS
Page 2.

Emission Point	Description	1978 (Actual) (T/Yr)	1981 (Actual) (T/Yr)	1982 1st Q (Actual)	1982 2nd Q	1982 3rd Q (Tons/Qtr)	1982 4th Q
F-DK	Dross Kettles	2.58	2.87	0.56	0.55	0.42	0.57
F-CD7	Blast Furnace BH Dust Handle	3.02	3.14	0.99	0.64	0.48	0.67
F-DR	Dross Reverb Charge/tap	1.63	1.81	0.35	0.35	0.26	0.36
F-LC	Lead Casting	0.33	0.37	0.07	0.07	0.05	0.07
F-SPD	Lead Slag at Dump	0.024	0.026	0.005	0.005	0.004	0.005
F-CB	Converter Building	39.91	42.95	10.35	8.49	10.27	9.23
E-15	#2 Acid Plant	0	0.58	0.14	0.11	0.14	0.12
E-23	Copper Stack	32.98	35.19	8.48	6.95	8.41	7.56
E-24	Copper Annulus	0.83	0.91	0.22	0.18	0.22	0.20
E-26	#1 Acid Plant	14.68	16.11	3.88	3.18	3.85	3.46
E-27	S. Anode Furnace	0.02	0.02	0.005	0.005	0.005	0.005
E-28	N. Anode Furnace	0.02	0.02	0.005	0.005	0.005	0.005
E-RSF	Reverb Settling Furnace	0.22	0.25	0.06	0.05	0.06	0.05
F-CRC	Roaster Charge	0.08	0.08	0.02	0.015	0.02	0.018
F-CT	Calcine Tap	0.22	0.25	0.06	0.05	0.06	0.05
F-RSF	Reverb and Settle Furnace Slag	0.11	0.12	0.03	0.02	0.03	0.02
F-RSD	Reverb Slag Dump	0.11	0.12	0.03	0.02	0.03	0.02
E-31	Zinc Stack	8.11	9.90	2.13	1.25	0.50	0.18
F-ZN	Zinc Fugitive	0.92	1.12	0.27	0.20	0.14	0.11
E-41	Antimony Stack	0.2	0.2	0.05	0.05	0.05	0.05

ESTIMATED ASARCO
LEAD EMISSIONS
TABLE I-A
Page 3.

Emission Point	Description	1978 (Actual) (T/Yr)	1981 (Actual) (T/Yr)	1982 1st Q (Actual)	1982 2nd Q	1982 3rd Q (Tons/Qtr)	1982 4th Q
E-51	Cadmium Stack	0.78	0.94	0.27	0.13	0.18	0
Process Sub-Total		385.41	346.72	78.40	69.28	64.33	67.47
					279.48		
F-GD	Lead From Grounds	2.82	2.82		2.82		
PLANT TOTAL		388.23	349.54		282.30		

TABLE I-B

ESTIMATED FUTURE ASARCO/EL PASO
LEAD EMISSIONS AT MAXIMUM PLANT CAPACITY

Emission Point	DESCRIPTION	Table III Reference	Without Further Controls(1) (Tons/yr)	With Additional Controls (Tons/yr)
E-11F	Lead Ore unload, store handle		0	0
E-21F	Copper Ore unload, store handle		0	0
E-11	Lead Ore unload	B-11	17.8	17.8
E-21	Copper Ore unload	B-11	0.3	0.3
E-10	Convey	B-11	1.6	1.6
E-12	Lead Bedding	B-11	10.75	10.75
E-22	Copper Bedding	B-11	21.5	21.5
E-13	Lead Stack	A-1,A-2,B-11	56.0	56.0
F-ST	Sinter Transfer to charge cars	B-1	10.0	0.10
F-CD6	D&L BH Dust Handle	B-2	30	0.30
F-CD16	Sinter ESP Dust Handle	B-2	1.6	0.16
E-17	Blast Furnace BH Stacks	B-11	9.4	9.4
F-BFT	Blast Furnace Taps	A-5	0.1	0.1
F-BFC	Blast Furnace Charge	A-4	0.7	0.7
F-BFU	Blast Furnace Upset	A-4, B-4	78.8	12.61
F-LT	Lead Transfer	B-5	3.5	0.5

TABLE I-B
ESTIMATED FUTURE ASARCO/EL PASO
LEAD EMISSIONS AT MAXIMUM PLANT CAPACITY
Page 2.

Emission Point	DESCRIPTION	Table III Reference	Without Further Controls(1) (Tons/yr)	With Additional Controls (Tons/yr)
F-DK	Dross Kettles	B-5	5.4	0.8
F-CD7	Blast Furnace BH Dust Handle	B-2	6.25	0.06
F-DR	Dross Reverb Charge/tap	B-6	3.4	1.1
F-LC	Lead Casting		0.7	0.7
F-SPD	Lead Slag at Dump		0.05	0.05
F-CB	Converter Building	B-7	41.9	3.2
E-15	#2 Acid Plant		0.7	0.7
E-23	Copper Stack	A-3, B-11	6.6	6.6
E-24	Copper Annulus	B-7, B-11	1.1	6.1
E-26	#1 Acid Plant		0.2	0.2
E-27	S. Anode Furnace		0.03	0.03
E-28	N. Anode Furnace		0.03	0.03
E-RSF	Reverb Settling Furnace		0.3	0.3
F-CRC	Roaster Charge		0.1	0.1
F-CT	Calcine Tap		0.3	0.3
F-RSF	Reverb and Settle Furnace Slag		0.15	0.15
F-RSD	Reverb Slag Dump		0.15	0.15
E-31	Zinc Stack	B-11	18.6	18.6
F-ZN	Zinc Fugitive	B-3	2.1	0.21
E-PM	Pug Mill Scrubber	B-3	0.0	0.38
E-41	Antimony Stack		0.4	0.4

TABLE I-B
ESTIMATED FUTURE ASARCO/EL PASO
LEAD EMISSIONS AT MAXIMUM PLANT CAPACITY
Page 3.

Emission Point	DESCRIPTION	Table III Reference	Without Further Controls(1) (Tons/yr)	With Additional Controls (Tons/yr)
E-51	Cadmium Stack	B-11	1.8	1.8
Process Sub-Total			332.31	173.78
F-GD	Lead From Grounds	B-9 B-10	2.82	0.84
PLANT TOTAL			335.13	174.62

(1) The "emissions without further controls" are calculated considering the effect of control measures ASARCO has agreed to inplement. The calculations do not take into account the enclosure of the converter building which may be required by Texas Air Control Board Order 75-5 and Agreed order of Injunction, May 14, 1975.

TABLE 1-C

SUMMARY OF THE BASIS FOR ASARCO'S LEAD EMISSIONS INVENTORY FOR THE EL PASO, TEXAS SMELTER

Process Emissions

Stack emissions of lead at maximum operating conditions were derived from the best available information for each source in the following descending order:

1. Stack test performed on particulate and lead content at a known process throughput. The emissions were then adjusted to maximum throughput.

2. New Source Performance Standard (NSPS) allowable for particulate and weight percent lead in baghouse dust.

3. TACB permit allowable for particulate adjusted for weight percent lead in baghouse. Four stacks in the unloading-bedding area were limited to 50% of the lead emissions calculated using this method due to anticipated performance shown by a stack test.

4. Amount of particulate captured at known process throughput adjusted to maximum throughput in conjunction with a collection efficiency published by EPA or estimated as a result of discussions with ASARCO. Resulting TSP emissions were converted to lead using the lead content of collected dust.

Actual process emissions for 1978, 1981, and 1982 were calculated based on actual throughput as a percent of maximum at the estimated existing level of control. An upset analysis report for the period from September 1981 through February 1982 was used to estimate bypassing from a primary abatement system to alternate stacks. Production data obtained from ASARCO has been requested by the company to be held confidential.

Fugitive Emissions

Fugitive emissions of lead at maximum operating conditions were derived from particulate emission factors published in the following:

1. AP-42 including Supplements 1-13,

2. EPA-450/2-77-012 (Control Techniques for Lead Air Emissions, Volume II),

3. EPA-600/7-79-045 (Assessment of the Use of Fugitive Emission Control Devices),

4. 81-201-010-13 (Emissions and Emission Controls at a Secondary Lead Smelter prepared by Radian Corporation),

TABLE 1-C
SUMMARY OF THE BASIS FOR ASARCO'S LEAD
EMISSIONS INVENTORY FOR THE EL PASO, TEXAS SMELTER
PAGE 2.

5. Draft Document P-A857 (Workbook for Calculation and Dispersion Modeling of Fugitive Dust Emissions prepared by Environomental Research and Technology, Inc.).

Lead content of particulate emissions were based on either the lead content of the material handled or the lead content of the dust collected in association with the process involved. Fugitive emissions for particular operations within a process for which only a total process emission factor existed were allocated based on an engineering estimate of the percent of total emissionsn attributable to those operations. Operations for which no emission factor could be determined were assigned an emission factor based on similarity to another operation.

Actual fugitive emissions for 1978, 1981 and 1982 were calculated based on actual process throughput as a percent of maximum at the existing level of control.

Detailed calculations of lead emission estimates for maximum production without further control and with the additional proposed controls are shown in Tables VI and VII, respectively.

TABLE II

Predicted and Monitored Lead Concentrations During 1982

Monitor	Quarter	Predicted Impact of Stationary Sources (ug/m^3)	Estimated Gasoline-Related Lead Emissions (ug/m^3)	Background from Soil Re-entrainment (ug/m^3)	Predicted Total Impact (ug/m^3)	Monitored Value (ug/m^3)
ISC-LT MODEL						
IB&WC Monitor (SAROAD # 1700031002)	1st quarter 1982	1.98	0.21	0.06	2.25	1.32
	2nd quarter 1982	1.85	0.21	0.06	2.12	6.38
	3rd quarter 1982	3.66	0.21	0.06	3.93	6.64
	4th quarter 1982	1.49	0.21	0.06	1.76	6.53
McNutt Road (SAROAD # 0340-15)	1st quarter 1982	0.52	0.21	0.06	0.79	1.31
	2nd quarter 1982	0.46	0.21	0.06	0.73	1.26
	3rd quarter 1982	0.99	0.21	0.06	1.26	0.79
	4th quarter 1982	0.40	0.21	0.06	0.67	1.34
Valley-BID Model						
Kern Fire Station (SAROAD # 1700033001)	1st quarter 1982	0.76	0.21	0.06	1.03	1.50
	2nd quarter 1982	0.71	0.21	0.06	0.98	1.01
	3rd quarter 1982	1.13	0.21	0.06	1.40	0.68
	4th quarter 1982	0.38	0.21	0.06	0.65	0.95

TABLE III

Control Measures and Emission Limitations Required at the ASARCO, Incorporated Smelter to Demonstrate Attainment of the Lead NAAQS In All Public Access Areas

A. Controls previously proposed by ASARCO:

1. Expansion of the lead sinter machine ventilation baghouse to ensure compliance with the New Source Performance Standard.

2. Revision of the lead sinter machine ventilation baghouse bulkhead to eliminate the bypassing of lead sinter plant flue gas (acid plant feed) to the lead stack during plant startups and shutdowns.

3. Elimination of excessive opacity (above Regulation I limit of 30%) from the copper stack except for rare and unforeseeable major upsets. Compliance will be achieved by February 28, 1984 through a computerized gas management system, an increase in the copper converter Cottrell capacity, the elimination of leaks in ductwork feeding the acid plant, and replacement of the catalyst in the number 1 acid plant. The company will keep records of the source bypass gases and the frequency and duration of bypassing. This data will be submitted to the Executive Director (or his representative) or representatives of the local air pollution control program upon request.

4. Installation of electric eyes at the top of the lead blast furnaces to detect excessive fugitive emissions during charging.

5. Installation of a new blast furnace ventilation system to minimize emissions from lead and slag tapping .

B. Additional Controls and Emission Limitations Required

1. Enclose the area where lead sinter is transfered to blast furnace charge cars and vent to existing multiclones and baghouse. Ground level lead emissions will be reduced by about 9.9 tons per year. The fact that these emissions occur at ground level makes them significant in terms of impact off the plant property.

2. Transportation of dust collected by the lead sinter electrostatic precipitator, the lead sinter machine ventilation baghouse and blast furnace baghouse in an enclosed conveyor system to a water moisturization system located in an enclosed structure ventilated to a baghouse. Handling of moisturized dust will be by means of an enclosed conveyor system or by transfer to containers in an enclosed structure vented to a baghouse. Ground level lead emissions will be reduced by 37.3 tons per year.

3. Installation of local exhaust hoods vented to a wet scrubber on the copper department electrostatic precipitator dust and zinc deleading baghouse dust moisturization system. Lead emissions will be reduced by an estimated 1.5 tons per year.

4. Installation of automatic tuyere air control systems on all lead blast furnaces. Lead emissions from blast furnace upsets will be reduced by about 66.2 tons per year.

5. Installation of hoods over the receiving and final dross lead kettles capable of capturing at least 85% of the uncontrolled emissions. An estimated lead emission reduction of 7.6 tons per year will result.

6. Improvement of charge and tap hoods on the lead dross reverb furnace in order to capture at least 90% of the uncontrolled emissions. Emissions will be reduced by about 2.3 tons per year.

7. Installation of secondary hoods on all copper converters in order to capture at least 95% of the uncontrolled emissions not captured by the primary hood. Secondary hoods routed to existing converter building ventillation baghouse and vented to copper stack annulus (E-24). This control will reduce lead emissions by an estimated 33.7 tons per year.

8. Prohibition of public access to all land owned by ASARCO east of Interstate 10 and west of Mesa Drive. This measure will prevent public access to an area predicted to exceed the lead NAAQS.

9. Installation and maintainance of chemical sealant and water sprinkler system on ASARCO's main plant property in all open areas other than the slag dump area, raw material storage areas and areas with vehicular traffic. Alternatives offering equivalent control subject to approval by the Executive Director. Emission reduction reported in Item B-10.

10. Paving and cleaning of all vehicular trafficways and chemical sealant and water sprinkling of outside raw material storage areas. Alternatives offering equivalent control subject to approval by the Executive Director. Fugitive emissions from the grounds will be reduced by an estimated 1.98 tons per year by implementing Items B-9 and B-10.

11. Limitation of lead emissions from stacks at the smelter to values consistent with current controls and maximum operating rates as follows:

Emission Point	Description	Emission Limit, lb/hr
E-11	Lead Ore Unload	4.1
E-21	Copper Ore Unload	0.1
E-10	Conveying	0.4
E-12 and E-22	Lead and Copper Bedding	7.4
E-13	Lead Stack	12.8
E-17	Total for Blast Furnace Baghouse Stacks	2.2
E-23	Copper Stack	1.5
E-24	Copper Stack Annulus	1.4
E-31	Zinc Stack	4.3
E-51	Cadmium Stack	0.4

TABLE IV
Vehicle Lead Emissions and
Predicted Concentrations

Year	Urban Light and Heavy-duty Vehicle Lead Emissions (Tons)	Mobile Source-Related Lead Concentrations Near ASARCO (ug/m^3)(1)	Mobile Source-Related Lead Concentrations In Downtown Area (ug/m^3)(2)
1980	111.53	0.31 (E)	1.16 (M)(3)
1981	80.19	0.22 (E)	0.93 (M)(3)
1982	75.76	0.21 (M)	0.52 (M)
1983	61.80	0.17 (E)	0.42 (E)
1984	52.02	0.14 (E)	0.36 (E)
1985	45.41	0.13 (E)	0.31 (E)

(M) - Measured average value using the bromine tracer technique.

(E) - Estimated value assuming ambient mobile source-related lead concentrations are proportional to estimated El Paso area urban light and heavy-duty vehicle lead emissions using 1982 as the base year.

(1) - Mobile source-related lead concentrations near ASARCO are based on measurements at the UTEP monitor (SAROAD #1700037F01).

(2) - Mobile source-related lead concentrations in the downtown area are based on measurements at CAMS 6 (SAROAD #1700027F01).

(3) - Some quarters had less than 75% data capture.

TABLE V

Summary of Maximum Ambient Air
Predicted Quarterly Lead
Concentrations After Additional Control

Quarter	Smelter Contribution (ug/m^3)	Model used	Soil and Mobile Source-Related Background Value (ug/m^3) (1)	Total (ug/m^3)	Location (2)
1	1.43	ISC-LT	0.19	1.62	0.9 Km SE of tl copper stack.
2	1.60	ISC-LT	0.19	1.79	0.6 Km ESE of t copper stack.
3	1.80	Valley	0.19	1.99	2.0 Km N of the copper stack.
4	1.67	ISC-LT	0.19	1.86	1.0 Km SSE of the copper stac on Paisano Driv

(1) - Using the 1985 predicted mobile source-related background value of 0.13 ug/m^3.

(2) - The copper stack is emission point E-23 located at UTM Coordinates 355.764E, 3517.151N.

TABLE VI

Detailed Description of the Derivation of
Lead Emission Estimates for Maximum Production
Without Further Controls

Process: Ore unloading and storage

Permit: C-4151

Allowable: Particulate emissions based on 0.02 gr/SCF. Lead content of particulate emissions based on baghouse dust sampled October 25, 1979. Allowable lead emissions for stacks E-10, E-11, E-12 and E-21 limited to 50% of emissions calculated from allowable particulate and lead content based on stack tests performed August 2-10, 1979.

Emissions:

Emission Point	Description of Operation	Current Allowable Particulate (lb/hr)	Wt% Lead	Proposed Allowable (lb/hr)	Proposed Lead (T/Y)
E-21	Copper Ore Unload	28.46	0.5	0.07	0.3
E-11	Lead Ore Unload	28.46	28.6	4.07	17.8
E-10	Ore Convey	6.0	12.3	0.37	1.6
E-22	Copper Ore Bedding	23.66	20.8*	4.92	21.5
E-12	Lead Ore Bedding	23.66	20.8*	2.46	10.75

* Composite sample.

Process : Lead Sinter Plant

Basis: 90,000 Tons Lead Cast/Yr (maximum).
400,000 Tons Sinter Produced/Yr (maximum).

Sinter Plant Ventillation System

Basis: •Emissions controlled by baghouse (CD-6) to Emission Point E-13. Maximum flow 240,000 ACFM at 90°F and 2% moisture
NSPS applies: 0.022 gr PM/DSCF.
Lead Content: 30 wt% of baghouse dust.

Emissions:	Particulate		Lead	
Emission Point	lb/hr	T/Y	lb/hr	T/Y
E-13 (Lead Stack)	42.6	186.5	12.78	56.0

Sinter Plant Ventillation Baghouse Dust Handling from CD-6

Basis:

- Dust currently handled in partial enclosure (Baghouse cellars) by front end loader to transport car. Car moves to another partial enclosure to load railroad car. Material in railroad car unloaded in ore unloading building.

- Uncontrolled emission factor assumed similar to unloading and handling of copper ore concentrate at 10 lb/T (EPA-450/2-77-012, p. 4-112). This is about three times the value used for lead ore concentrate handling and transfer in EPA-600/7-79-045, p. 7 and should be representative of any baghouse dust handled at the plant.

- Partial enclosures provide 50% control.

- Lead content: 30 wt% of baghouse dust.

- Based on 1978-1982 actual baghouse dust captured, dust at maximum production is estimated at 40,000 T/Y.

Emissions:

Emission Point	Particulate		Lead	
	lb/hr	T/Y	lb/hr	T/Y
F-CD6	22.8*	100	6.85*	30

* Since this is currently not a continuous operation, these values are an annual average only.

Sinter Plant Process ESP Dust Handling From CD-16

Basis:

- Dust caught in process ESP currently conveyed to a dust bin which is vented to a baghouse. The dust is "moisturized" with water in a zig-zag blender in an enclosure. The moisturized dust is loaded into a railroad car for transfer to the unloading building.

- Based on actual ESP dust captured, dust at maximum production is estimated at 25,000 T/Y.

- Particulate emissions factor assumed similar to car charging of sinter at 0.5 lb/T (AP-42, p. 7.6-7).

- Lead content: 26 wt% of ESP Dust.

Emissions:

Emission Point	Particulate		Lead	
	lb/hr	T/Y	lb/hr	T/Y
F-CD16	1.42*	6.25	0.37*	1.6

* Since "moisturizing" is not a continuous operation, these values are an annual average only.

Sinter Transfer From Storage Bins to Transport Cars

Basis:
- Sinter is transferred to transport cars from storage bins. Coke is added on top of the sinter in the car. The loading is controlled by hoods vented to multiclones and CD-6. The hoods are on each side of the transfer point.
- Current capture estimated at 50%.
- Sinter transferred: 400,000 T/Y.
- Uncontrolled particulate emission factor of 0.5 lb/T (AP-42, p. 7.6-7).
- Lead content: 20 wt%.

Emissions:

Emission Point	Particulate		Lead	
	lb/hr	T/Y	lb/hr	T/Y
F-ST	11.4	50	2.28	10

Process: Lead Blast Furnace

Blast Furnace Charge

Basis:
- This area is not controlled. Particulate emission factors range from 0.09 to 0.41 lb/T lead (EPA-450/2-77-012, pp. 4-55 and 4-56) for blast furnace charge/blow/tap. AP-42, p. 7.6-7 gives 0.16 lb/T. Assume 0.08 lb/T for charge and 0.16 lb/T for tap.
- Lead production: 90,000 T/Y.
- Lead content: 20 wt% in sinter charged.

Emissions:

Emission Point	Particulate		Lead	
	lb/hr	T/Y	lb/hr	T/Y
F-BFC	0.82	3.6	.16	0.7

Blast Furnace Tap

Basis:
- New hoods have been installed at the settler, slag hauler and lead ladle which are estimated to have a capture efficiency of 95%.
- Uncontrolled particulate factor: 0.16 lb/T lead (see discussion under Blast Furnace Charge).
- Lead production: 90,000 T/Y.
- Lead content: 25 wt%.

Emissions:

Emission Point	Particulate		Lead	
	lb/hr	T/Y	lb/hr	T/Y
F-BFT	.09	0.4	.02	0.1

Blast Furnace Upset

Basis:
- Upsets can occur due to low level in the charge chute (loss of seal) or blockage requiring use of dynamite. If a plugged furnace cannot be relieved through use of dynamite during one shift, the reactor is shutdown and manually cleared with jack hammers.
- Uncontrolled particulate emission factors range from 7-23 lb/T lead (EPA-450/2-77-012, p.4-55). Due to current operating philosophy, assume 7 lb/T lead.
- Lead production: 90,000 T/Y.
- Lead content: 25 wt%.

Emissions:

Emission Point	Particulate		Lead	
	lb/hr	T/Y	lb/hr	T/Y
F-BFU	71.9	315	18	78.8

Blast Furnace Baghouse (CD-7)

Basis:
- A 1982 stack test done by TACB at 70% of maximum capacity showed 6 lb PM/hr.
  Lead Content: 25 wt%.

Emissions:

Emission Point	Particulate		Lead	
	lb/hr.	T/Y	lb/hr	T/Y
E-17	8.57	37.5	2.14	9.4

Lead Transfer to Dross Kettles

Basis:
- Lead collected in ladles at the blast furnace is transferred to the dross kettle area and poured by crane into a receiving dross kettle.
- Uncontrolled emission factor from AP-42, p. 7.6-7 for lead pour, transfer, and slag pour is 0.93 lb PM/T lead. Since there is twice as much slag as lead, use 0.31 lb/T for lead and 0.62 lb/T for slag.
- Lead production: 90,000 T/Y.
- Lead content: 25 wt%.

Emissions:

Emission Point	Particulate lb/hr	Particulate T/Y	Lead lb/hr	Lead T/Y
F-LT	3.2	14	0.8	3.5

Process: Lead Drossing

Receiving and Final Dross Kettles

Basis:
- These three kettles are currently uncontrolled.
- Uncontrolled particulate factor: 0.48 lb/T lead (AP-42, p. 7.6-7).
- Lead production : 90,000 T/Y.
- Lead content: 25 wt%.

Emissions:

Emission Point	Particulate lb/hr	Particulate T/Y	Lead lb/hr	Lead T/Y
F-DK	4.93	21.6	1.23	5.4

Dross Reverb Furnace

Basis:
- The furnace has hoods estimated to have a 70% capture efficiency.
- Uncontrolled particulate factor: 1.0 lb/T lead (EPA-450/2-77-012, p. 4-56).
- Lead production: 90,000 T/Y.
- Lead content: 25 wt%.

Emissions:	Particulate		Lead	
Emission Point	lb/hr	T/Y	lb/hr	T/Y
F-DR	3.08	13.5	.77	3.4

Process: Lead Casting

Basis:
- The lead casting area is uncontrolled.
- Since lead is poured at a temperature slightly above its melting point, uncontrolled lead emission factor: 0.015 lb lead/T lead (81-201-010-13, p. iv).
- Lead production: 90,000 T/Y.

Emissions:	Particulate		Lead	
Emission Point:	lb/hr	T/Y	lb/hr	T/Y
F-LC	.16	0.7	.16	0.7

Blast Furnace Baghouse Dust Handling from CD-7

Basis:
- Operation is similar to dust handling from CD-6 (See Sinter plant ventillation baghouse dust handling from CD-6).
- Based on production data, maximum dust is estimated to be 10,000 T/Y.
- Lead content: 25 wt%.

Emissions:	Particulate		Lead	
Emission Point	lb/hr	T/Y	lb/hr	T/Y
F-CD7	5.7	25	1.43	6.25

Process: Primary Copper Smelting

Converter Building Fugitive

Basis:
- The copper converter building contains several operations which contribute to the total converter building fugitive.

Copper Reverberatory Furnace

- Uncontrolled particulate factor: 8.5 lb/T copper (AP-42, p. 7.3 -7).

•Assume particulate emissions are distributed as follows:

Charge: 20%
Matte tap: 40%
Converter slag return to Reverb: 10%
Slag tap: 30%

•Copper production: 110,000 T/Y.

•Total uncontrolled particulate = 467.5 T/Y.

OPERATION	Emissions (T/Y)	
	Particulate	Lead
Charge: 95% capture in area next to main converter building. Lead content: 3 wt%.	4.7	0.1
Matte Tap: 50% control by local hoods and 90% control by building ventillation system. Lead content: 5 wt%.	9.4	0.5
Converter slag return to reverb: 30% control by local hood and 90% control by building ventillation system. Lead content: 5 wt %.	3.2	0.2
Slag tap (not included in converter building fugitive - see reverb and setting furnace slag).	-	-

Copper Converters

•Uncontrolled particulate factor: 10.5 lb/T copper (AP-42, p. 7.3-7).

•A computerized gas management system is used to reduce blowing air to tuyeres when a converter is rolled out from under the primary hood. This is estimated to reduce uncontrolled fugitive by 20%.

•Based on detailed calculations of thermal and wind effects, annual average building capture with building openings that existed in early 1983 is estimated at 60%. The calculations were based on a published technique for estimating the natural air flow through buildings (1977 Fundamentals Handbook, American Society of Heating, Refrigeration and Air-Conditioning Engineers).

•Copper production: 110,000 T/Y.

•Lead content: 22 wt%

Emissions (T/Y) Particulate	Lead
184.8	40.7

Zinc Fuming Furnace

•Uncontrolled particulate factor: 0.62 lb/T lead (same as slag pouring - see lead transfer to dross kettles).

•Capture estimated at 50% since near north end of building which is more open.

•Lead production: 90,000 T/Y.

•Lead content: 2 wt% for charge and 0.7 wt% for tap.

OPERATION	Emissions (T/Y) Particulate	Lead
Charge	14.0	0.3
Tap	14.0	0.1
Total Converter Building Fugitive (F-CB)*	230.1	41.9

*See copper anode furnaces.

Slag From Zinc Fuming Furnace Pour At Dump

Basis: •Uncontrolled particulate factor:

Pouring:	0.62 lb/T lead	(see lead transfer)
Cooling:	0.47 lb/T lead	(AP-42, p. 7.6-7)
Total	1.09 lb/T lead	

•Lead production: 90,000 T/Y.

•Lead content: 0.1 wt% of slag.

Emissions:	Particulate		Lead	
Emission Point	lb/hr	T/Y	lb/hr	T/Y
F-SPD	11.2	49	0.01	0.05

Process: No. 2 Sulfuric Acid Plant

Basis: •Off-gas from the copper roasters goes to an ESP(CD-9) and then to the No. 2 double contact acid plant.

- Based on production data, maximum dust caught by the ESP would be 8000 T/Y.
- Lead content: 3 wt/%.
- Both the ESP and acid plant are assumed to be 99% efficient for particulate matter removal.
- Off-gas from the lead sinter machine goes to an ESP (CD-16) and then to the No. 2 double contact acid plant.
- Based on production data, maximum dust caught by the ESP would be 25,000 T/Y.
- Lead content: 26 wt%.

Emissions:	Particulate		Lead	
Emission Point	lb/hr	T/Y	lb/hr	T/Y
E-15	0.75	3.3	0.15	0.7

Process: Copper Reverberatory Furnace

Basis:
- Off-gas from the copper reverberatory furnace goes to an ESP (CD-11) and then to the copper stack (E-23).
- Based on production data, maximum dust collected by the ESP would be 6500 T/Y.
- Collection efficiency is estimated at 98%.
- Lead content: 5 wt%.

Emissions:	Particulate		Lead Emission	
Point	lb/hr	T/Y	lb/hr	T/Y
E-23	30.3	132.7	1.51	6.6

Copper Converter Building Ventillation Baghouse (CD-8)

Basis:
- Off-gas from the copper converter building goes to a baghouse (CD-8) and then to the annulus of the copper stack.
- A 1982 TACB stack test at about 70% of maximum capacity showed emissions of 4.2 lb PM/hr and 0.17 lb Pb/hr.

Emissions:	Particulate		Lead	
Emission Point	lb/hr	T/Y	lb/hr	T/Y
E-24	6.0	26.3	0.24	1.1

Process: No. 1 Sulfuric Acid Plant

Basis:

- Off-gas from the copper converters is the only source that goes to No. 1 double contact acid plant.
- Based on production data and the current estimated ESP (CD-10) efficiency, maximum process particulate is estimated to be 8,800 T/Y. This equates to 160 lb/T copper or 40 lb/T ore concentrate. This agrees well with 42 lb/T ore in AP-42, p. 7.3-5.
- The ESP is currently being upgraded. Future efficiency of the ESP and acid plant are both assumed to be 99%.
- Lead content: 22 wt %.

Emissions:	Particulate		Lead	
Emission Point	lb/hr	T/Y	lb/hr	T/Y
E-26	0.2	0.9	0.04	0.2

Process: Copper Anode Furnaces

Basis:

- Uncontrolled particulate factor: 2.5 lb/T copper (EPA 600/7-79-045, p. 9.) This is worst case compared to AP-42, p. 7.3-7 of 1.9 lb/T copper.
- Assume distribution 20% to charge/tap and 80% to stacks (40% to each stack).
- Furnaces are uncontrolled. Assume 50% of charge/tap emissions captured by converter building ventillation system.
- Copper production: 110,000 T/Y.
- Total uncontrolled particulate: 137.5 T/Y.
- Lead content: 0.05 wt%.

Emissions:	Particulate		Lead	
Emission Point	lb/hr	T/Y	lb/hr	T/Y
E-27	12.56	55	.01	.03
E-28	12.56	55	.01	.03
Furnace Charge/Tap*	3.14	13.7	-	-

*This source is really a part of converter building fugitive but since lead emissions are so low, it was not included in the lead emissions inventory.

Process: Copper Ore Roaster

Basis:

- Uncontrolled particulate factor is given as 23 lb/T copper (AP-42, p. 7.3-7). Based on maximum process emissions of 8000 T/Y (equivalent to 145 lb/T copper), a fugitive emission rate of 23 lb/T would be 16% of process emissions. Based on the nature of the drying operation, engineering judgement would not indicate this level of emissions, especially since the copper converter fugitive is only 6.6% (10.5 X 100/160) of process and has a much higher potential for fugitive. Assume copper roaster fugitive is 2.3 lb PM/T copper.
- Distribution is assumed to be 20% charge and 80% tap.
- Copper production: 110,000 T/Y.
- Lead content: 1 wt% at charge and 3 wt% at calcine tap.
- Charge area enclosed but not ventillated to control equipment: assume 50% capture.
- Calcine tap area enclosed and ventillated except for front larry car access: assume 90% capture.

Operation	Emission Point	Emissions			
		Particulate		Lead	
		lb/hr	T/Y	lb/hr	T/Y
Charge	F-CRC	2.89	12.7	.03	0.1
Calcine Tap	F-CT	2.31	10.1	.07	0.3

Copper Reverberatory Furnace Slag

Basis:

- Slag handling is estimated to emit 30% of copper reverb fugitive (see copper reverberatory furnace) or 140.2 T/Y.
- Distribution is assumed to be 50% from the settling furnace stack, 25% from settling furnace charge/tap and 25% from slag dumping.
- Lead content: 0.4 wt%.

Operation	Emission Point	Emissions			
		Particulate		Lead	
		lb/hr	T/Y	lb/hr	T/Y
Settling Furnace Stack	E-RSF	16	70.1	0.06	0.3
Settling Furnace Charge, Tap	F-RSF	8	35	0.03	0.15
Slag Dump	F-RSD	8	35	0.03	0.15

Process: Zinc Department

Basis:
- Zinc fuming maximum dust captured is 35130 T/Y with 9 wt% lead.
- Zinc deleading maximum dust captured is 10940 T/Y with 55 wt% lead.
- Both operations vent to baghouses assumed to be 99.8% efficient and exit to the air at E-31.
- Maximum purchased zinc dust is 38590 T/Y with 9 wt% lead, controlled by baghouse at 99% efficiency.
- Uncontrolled particulate emission factor for purchased dust assume 10 lb PM/T (see sinter plant ventillation baghouse dust handling).

Operation	Emissions			
	Particulate		Lead	
	lb/hr	T/Y	lb/hr	T/Y
Fuming Furnace	16.07	70.4	1.44	6.3
Deleading Furnace	5.0	21.9	2.76	12.1
Purchased Dust	0.43	1.9	0.05	0.2
TOTAL E-31	21.50	94.2	4.25	18.6

Process: Antimony Plant
Permit: C-3638

Basis:
- Permit allowable is 2 lb PM/hr.
- Assume lead content of stack similar to copper roaster at 5 wt%.

Emissions:	Particulate		Lead	
Emission Point	lb/hr	T/Y	lb/hr	T/Y
E-41	2	8.8	0.1	0.4

Process: Cadmium Plant

Basis:
- Lead blast furnace baghouse dust is fed to the cadmium roaster.
- Based on production data, the ratio of cadmium baghouse dust to blast furnace baghouse dust is about 20%. At 10,000 T/Y of blast furnace baghouse dust, cadmium baghouse (CD-13) dust is estimated at 2,000 T/Y with lead content of 9 wt%.
- Baghouse collection efficiency assumed to be 99%.

Emissions:	Particulate		Lead	
Emission Point	lb/hr	T/Y	lb/hr	T/Y
E-51	4.61	20.2	0.41	1.8

Process: Dust Handling from Copper and Zinc Departments.

Basis:

- Particulate collected in control equipment is conveyed to a pug mill and moisturized. The moisturized dust is loaded into railroad cars and returned to the unloading building.

- Particulate handled is as follows:

Copper Roaster ESP(CD-9)	8000 T/Y	@ 3 wt% lead
Copper Reverb ESP(CD-11)	6500 T/Y	@ 5 wt% lead
Copper Converter ESP (CD-10)	8800 T/Y	@ 22 wt% lead
Zinc Deleading BH (CD-12)	10940 T/Y	@ 55 wt% lead

- Total dust handled: 34240 T/Y @ 25wt% lead.

- Uncontrolled particulate factor for moisturized dust: 0.5 lb PM/T (similar to car charging of sinter, AP-42, p. 7.6-7).

Emissions:	Particulate		Lead	
Emission Point	lb/hr	T/Y	lb/hr	T/Y
F-ZN	1.95	8.5	0.48	2.1

<u>Wind Blown Fugitives From Open Areas</u>

Basis:

- There are several open areas in the plant which are potential fugitive emission sources due to wind erosion.

- Uncontrolled particulate emission factor determined from the following equation (Document P-A857, Workbook on Estimation of Emissions and Dispersion Modeling for Fugitive Particulate Sources, p. 3-48):

$$\frac{lb}{Acre\text{-}yr} = 3400 \left(\frac{e}{50}\right)\left(\frac{s}{15}\right)\left(\frac{f}{25}\right)/(0.02\ PE)^2$$

- For areas 1-3 (slag dump) assume:

  e = 38
  S = 1

- For areas 4-16 (roads, storage piles, open areas) assume:

  e = 56
  S = 15

•For all areas f = 36, and PE = 21.

•Lead content of suspended particulate: 1.5 wt%.

•Uncontrolled lead emissions from areas would be:

areas 1 - 3: 0.01 T lead/ acre
areas 4 - 16: 0.23 T lead/acre

•Current level of control is assumed to be as follows:

areas 1 - 3: none
areas 4 - 7, 10, 16: 50% (Based on paving, vegetative cover).
areas 8, 9, 11 - 15: 95% (Based on storage pile sealant and sprinkler system, paving).

Emissions:

Area Number	Size (acres)	Lead (T/Y)
A-1	3.67	0.037
A-2	10.46	0.105
A-3	5.74	0.057
A-4	6.33	0.728
A-5	2.07	0.238
A-6	5.74	0.660
A-7	2.07	0.238
A-8	4.65	0.053
A-9	14.69	0.169
A-10	1.43	0.164
A-11	2.81	0.032
A-12	8.26	0.095
A-13	3.67	0.042
A-14	0.92	0.011
A-15	2.07	0.024
A-16	1.43	0.164
TOTAL	76.01	2.817

TABLE VII

Detailed Description of the Derivation of
Lead Emission Estimates for Maximum Production
With the Additional Proposed Controls

Process: Dust Handling from Lead Department

Basis:

- Dust from the sinter plant ventillation baghouse (CD-6) and the blast furnace baghouse (CD-7) would be conveyed in an enclosed conveyor to the existing zig-zag blender which currently moisturizes sinter plant ESP (CD-16) dust. The zig-zag blender building and the railroad car loading building would be completely enclosed and ventillated to a new baghouse. Capture efficiency should be 100%.

- Dust handled will be as follows:

  CD-6 Dust: 40,000 T/Y @ 30 wt% lead
  CD-7 Dust: 10,000 T/Y @ 25 wt% lead
  CD-16 Dust 25,000 T/Y @ 26 wt% lead

- Total dust handled: 75,000 T/Y @ 28 wt% lead.

- Uncontrolled particulate emission factor for moisturized dust: 0.5 lb/T (similar to car charging of sinter, AP-42, p. 7.6-7).

- The collection efficiency of the new baghouse is assumed to be 90%.

Emissions:

Operation	Particulate (T/Y)	Lead (T/Y)
CD-6 Dust	1.00	0.30
CD-7 Dust	0.26	0.06
CD-16 Dust	0.62	0.16
TOTAL E-ZZ (new)	1.88	0.52

Sinter Transfer From Storage Bins to Transport Cars

Basis:

- This transfer is currently controlled by local exhaust. It is proposed to completely enclose the transfer area and modify existing ducts. The enclosure would still be vented to the existing multiclones and CD-6.

- It is assumed that capture efficiency would be increased to at least 99%.

Emissions:

Emission Point	Particulate		Lead	
	lb/hr	T/Y	lb/hr	T/Y
F-ST	0.11	0.5	0.02	0.1

Lead Blast Furnace Upset

Basis:

- It is proposed to add an automatic tuyere air control system to each of the three lead blast furnaces to maintain even air distribution throughout the blast furnaces. This type of system has been demonstrated to reduce blockage and the need to use dynamite to remove blockage.
- The control efficiency over the existing level of control is assumed to be 84%.

Emissions:

Emission Point	Particulate		Lead	
	lb/hr	T/Y	lb/hr	T/Y
F-BFU	11.50	50.4	2.88	12.61

Lead Transfer to Dross Kettles and Receiving and Final Dross Kettles

Basis:

- These operations are currently uncontrolled. It is proposed to add hoods over the dross kettles to control transfer of lead to the kettles, dross removal from the kettles, and fume from the kettles. The hoods would vent to either CD-6 or CD-7.
- Capture efficiency is assumed to be 85%.

Operation	Emission Point	Particulate		Lead	
		lb/hr	T/Y	lb/hr	T/Y
Lead Transfer	F-LT	0.48	2.1	0.12	0.5
Dross Kettles	F-DK	0.74	3.2	0.18	0.8

Dross Reverb Furnace

Basis:

- The existing hoods are estimated to have a capture efficiency of 70%. It is proposed to upgrade the hoods to a capture efficiency of 90%.

Emissions:

Emission Point	Particulate		Lead	
	lb/hr	T/Y	lb/hr	T/Y
F-DR	1.03	4.5	0.25	1.1

Converter Building Fugitive

Basis:

- It is proposed to install air curtain secondary hoods on the three copper converters. These hoods would vent to the existing converter building ventillation baghouse (CD-8) and to the annulus of the copper stack (E-24). Testing has shown that the air curtain hood system is capable of an average capture efficiency of 95%.
- Uncontrolled converter emissions are estimated at 462 T PM/yr and 101.6 T Pb/yr.
- The capture efficiency by the existing building ventillation system for fume escaping the secondary hoods is estimated at 60%.
- Other contributors to converter building fugitive total 45.3 T PM/yr and 1.2 T Pb/yr.

Emissions:	Particulate		Lead	
Emission Point	lb/hr	T/Y	Lb/hr	T/Y
F-CB	15.6	68.4	0.73	3.2

Copper Converter Building Ventillation Baghouse (CD-8)

Basis:

- Fume captured by the copper converter secondary hoods and building ventillation system will be routed to CD-8.
- Lead captured by the hoods and building is 99.6 T/yr.
- The baghouse is assumed to achieve a 95% removal efficiency for the material caught by the hoods and building.
- The existing emission rate is 26.3 T PM/yr and 1.1 T Pb/yr based on a stack test.

Emissions:	Particulate		Lead	
Emission Point	lb/hr	T/Y	lb/hr	T/Y
E-24	12.33	54.0	1.39	6.1

Dust Handling From Copper and Zinc Departments

Basis:

- Particulate matter collected in CD-9, CD-10, CD-11, and CD-12, are currently moisturized in a pug mill and loaded into railroad cars.
- It is proposed that local ventillation hoods be installed and vented to a wet scrubber.

- The hoods are assumed to have a 90% capture efficiency and the scrubber is assumed to be 80% efficient.

- Current emissions are estimated at 8.5 T PM/yr and and 2.1 T Pb/yr.

Emissions:	Particulate		Lead	
Emission Point	lb/hr	T/Y	lb/hr	T/Y
F-ZN	0.19	0.85	0.05	0.21
E-PM (new)	0.35	1.53	0.09	0.38
TOTAL	0.54	2.38	0.14	0.59

Wind Blown Fugitives From Open Areas

Basis: •It is proposed to require that areas 4-7, 10 and 16 be controlled to 95% efficiency by using a chemical sealant and water sprinkler system.

Emissions:

Area Number	Lead (T/Y)
A-4	0.073
A-5	0.024
A-6	0.066
A-7	0.024
A-10	0.016
A-16	0.016

Appendix E

Estimated Percent Reduction in ASARCO, Inc.'s Impact on Lead Concentration at Certain Monitoring Sites as a Result of Possible Additional Controls

This report summarizes the results of dispersion modeling to support a modified rollback analysis related to the El Paso Lead SIP demonstration. Dispersion modeling using the Industrial Source Complex Long Term (ISC-LT) model and appropriate emission inventory information was performed to estimate the percent reduction in ASARCO's contribution to various monitoring sites expected to result from the application of additional controls to the smelter. As a starting point, the additional controls determined to be required in the comprehensive modeling analysis were evaluated. Table III of that analysis lists the additional controls considered (copy attached). The monitor locations evaluated were those listed in the attached Table A.

To evaluate the percent reduction in the smelter's impact, the predicted impact of emissions from the smelter was calculated on the following two bases:

(1) Predicted impact for the quarter for which the highest value was measured at a given monitor using typical meteorology for that calendar quarter and the estimated actual emissions during that quarter.

(2) Predicted impact for the same quarter using the same typical meteorology and the estimated emissions at maximum smelter operating capacity after additional controls are applied.

The percent reduction in ASARCO's impact was calculated as follows:

$$\text{\% Reduction in ASARCO's Impact} = \frac{(1) - (2)}{(1)} \times 100\%$$

It is important to note that model calibration is not necessary to support this analysis because the model is only used to assess the relative change in ASARCO's impact instead of the absolute value in ug/m^3.

Table A summarizes the modeling results which take into consideration the set of controls listed in Table III. It appeared that these controls would result in a successful rollback demonstration at all sites except the IBWC monitor site. The percent reduction at the IBWC site is close to, but still short of the required reduction calculated by rollback methodology. The required reduction percentages and the combined effect of reductions in mobile source-related and smelter lead emissions are presented in the Control Strategy portion of the lead SIP.

TABLE A

Summary of Dispersion Modeling
to Support Rollback Analysis

Monitor	Quarter	Estimated Smelter Impact (ug/m^3)	Smelter Impact After Control (ug/m^3)	Reduction In Smelter Impact (%)
Tillman-TACB	1981, Qtr. 4	0.25	0.10	60.0
Tillman-EPHD	1980, Qtr. 4	0.25	0.10	60.0
CAMS 6	1981, Qtr. 4	0.27	0.10	63.0
IB&WC	1981, Qtr. 2	2.64	0.53	79.9
UTEP	1981, Qtr. 4	0.51	0.17	66.7

TABLE III

Control Measures and Emission Limitations Required at the ASARCO, Incorporated Smelter to Demonstrate Attainment of the Lead NAAQS In All Public Access Areas

A. Controls previously proposed by ASARCO:

1. Expansion of the lead sinter machine ventilation baghouse to ensure compliance with the New Source Performance Standard.

2. Revision of the lead sinter machine ventilation baghouse bulknead to eliminate the bypassing of lead sinter plant flue gas (acid plant feed) to the lead stack during plant startups and shutdowns.

3. Elimination of excessive opacity (above Regulation I limit of 30%) from the copper stack except for rare and unforeseeable major upsets. Compliance will be achieved by February 28, 1984 through a computerized gas management system, an increase in the copper converter Cottrell capacity, the elimination of leaks in ductwork feeding the acid plant, and replacement of the catalyst in the number 1 acid plant. The company will keep records of the source bypass gases and the frequency and duration of bypassing. This data will be submitted to the Executive Director (or his representative) or representatives of the local air pollution control program upon request.

4. Installation of electric eyes at the top of the lead blast furnaces to detect excessive fugitive emissions during charging. Furnaces with excessive charging emissions will be shut down or blast air will be reduced to minimize emissions until the problem is corrected.

5. Installation of a new blast furnace ventilation system to eliminate visible emissions from lead and slag tapping except during rare and unforeseeable major upsets.

B. Additional Controls and Emission Limitations Required

1. Enclose the area where lead sinter is transfered to blast furnace charge cars and vent to existing multiclones and baghouse. Ground level lead emissions will be reduced by about 9.9 tons per year. The fact that these emissions occur at ground level makes them significant in terms of impact off the plant property.

2. Transportation of dust collected by the lead sinter electrostatic precipitator, the lead sinter machine ventilation baghouse and blast furnace baghouse in an enclosed conveyor system to a water moisturization system located in an enclosed structure ventilated to a baghouse. Handling of moisturized dust will be by means of an enclosed conveyor system or by transfer to containers in an enclosed structure vented to a baghouse. Ground level lead emissions will be reduced by 37.3 tons per year.

3. Installation of local exhaust hoods vented to a wet scrubber on the copper department electrostatic precipitator dust and zinc deleading baghouse dust moisturization system. Lead emissions will be reduced by an estimated 1.5 tons per year.

4. Installation of automatic tuyere air control systems on all lead blast furnaces. Lead emissions from blast furnace upsets will be reduced by about 66.2 tons per year.

5. Installation of hoods over the receiving and final dross lead kettles capable of capturing at least 85% of the uncontrolled emissions. An estimated lead emission reduction of 7.6 tons per year will result.

6. Improvement of charge and tap hoods on the lead dross reverb furnace in order to capture at least 90% of the uncontrolled emissions. Emissions will be reduced by about 2.3 tons per year.

7. Installation of secondary hoods on all copper converters in order to capture at least 95% of the uncontrolled emissions not captured by the primary hood. Secondary hoods routed to existing converter building ventillation baghouse and vented to copper stack annulus (E-24). This control will reduce lead emissions by an estimated 33.7 tons per year.

8. Prohibition of public access to all land owned by ASARCO east of Interstate 10 and west of Mesa Drive. This measure will prevent public access to an area predicted to exceed the lead NAAQS.

9. Installation and maintainance of chemical sealant and water sprinkler system on ASARCO's main plant property in all open areas other than the slag dump area, raw material storage areas and areas with vehicular traffic. Alternatives offering equivalent control subject to approval by the Executive Director. Emission reduction reported in Item B-10.

10. Paving and cleaning of all vehicular trafficways and chemical sealant and water sprinkling of outside raw material storage areas. Alternatives offering equivalent control subject to approval by the Executive Director. Fugitive emissions from the grounds will be reduced by an estimated 1.98 tons per year by implementing Items B-9 and B-10.

11. Limitation of lead emissions from stacks at the smelter to values consistent with current controls and maximum operating rates as follows:

Emission Point	Description	Emission Limit, lb/hr
E-11	Lead Ore Unload	4.1
E-21	Copper Ore Unload	0.1
E-10	Conveying	0.4
E-12 and E-22	Lead and Copper Bedding	7.4
E-13	Lead Stack	12.8
E-17	Total for Blast Furnace Baghouse Stacks	2.2
E-23	Copper Stack	1.5
E-24	Copper Stack Annulus	1.4
E-31	Zinc Stack	4.3
E-51	Cadmium Stack	0.4

III. Implementation of the Control Strategy for Lead

A. Sources Determined in 1980 Control Strategy to be Significant Lead Point Sources

1. General Activities

During the early stages of development of the 1980 Lead SIP, a survey of state lead sources was conducted. Source Emissions Inventories were updated and modeling was carried out for each source. Four lead point sources were determined by modeling to have potential for causing exceedances of the National Ambient Air Quality Standard (NAAQS) for lead. They were, Houston Lead Company, Gould, Inc., Dixie Metals Company and ESB Inc. The Texas Air Control Board adopted the Lead SIP on March 21, 1980 and copies were mailed to each of the four sources on June 23, 1980. On January 30, 1981, the sources were instructed to either develop a plan to monitor ambient air or develop a control plan to provide for emissions reductions sufficient to demonstrate attainment of the NAAQS for lead. If monitoring was chosen and exceedances of the NAAQS for lead recorded, then a control plan

would need to be submitted. Monitoring results are provided in Appendix J.

2. Source Specific Activities

a. Houston Lead Company

On June 8, 1981, Houston Lead submitted a point source control plan. Subsequently, in a telephone conversation of October 13, 1981, the company notified the TACB that the plant had been closed down and that there were no plans for re-start. The TACB notified the company on October 21, 1981, of deficiencies in their control plan and requested a formal notice concerning their plant closure. Additionally, the company was advised that should operation of the plant resume, the TACB would require compliance with all portions of the 1980 Lead SIP. An on-site investigation, made on December 8, 1981, confirmed the plant closure.

The 1980 Lead SIP provided for source compliance with the lead NAAQS by

November 5, 1982. Since that date has passed, this source must undergo a TACB review of its control equipment and operational conditions, prior to re-opening to assure that no exceedances of the standard will occur.

Referenced documents and related materials are provided in Appendix C.

b. Gould, Inc.

On March 18, 1980, prior to adoption of the 1980 Lead SIP, Gould, Inc. (Gould) submitted a point source control plan, along with emissions inventory information and modeling results. Negotiations on this plan with the company resulted in an acceptable plan that was submitted to public hearings on February 17, 1982. The plan was adopted by the Board on July 9, 1982, as an amendment to the Lead SIP, and was submitted to EPA on December 3, 1982.

The control plan consisted of the following elements:

- Hard lead ventilation system which was operational by December 1, 1980.
- Blast furnace enclosure which was operational by January 1, 1982.
- Specialty alloy ventilation system which was operational by February 1, 1981.
- Flue dust furnace system which was operational by August 1, 1981.

These controls, along with specific point source emission rate limitations, resulted in a revised emissions inventory of 7.3 tons per year and predicted maximum ambient lead contributions of 1.1 ug/m^3. It was, therefore, determined that the control measures adopted by the Board were sufficient to demonstrate attainment with the NAAQS for lead by November 5, 1982.

Referenced documents and related materials are provided in Appendix D.

c. Dixie Metals Company

On March 9, 1981, Dixie Metals Company (Dixie) submitted a monitoring plan. The plan was evaluated and determined to be unacceptable as submitted. On October 20, 1981, a Notice of Violation was issued to Dixie for failure to submit an acceptable monitoring plan. Dixie responded with a revised plan on October 30, 1981. Negotiations on the monitoring plan concluded with a revised plan being approved on January 31, 1983. The plan provided for three monitors to be located in the vicinity of the plant, two of these to be operated by the company in accordance with TACB procedures and the third being an existing City of Dallas site. Data from all three monitors were to be reported to

TACB. The TACB also placed one special purpose monitoring site near this facility to enhance the monitoring effort with three new sites to be added on October 21, 1983.

Monitoring data collected from April 1, 1982, to September 30, 1983, at these sites has indicated that the lead NAAQS of 1.5 ug/m^3 averaged over a calendar quarter has not been exceeded at Dixie. A value of 1.52 ug/m^3, however, was recorded for the fourth quarter of 1982 (see Appendix J). Values less than or equal to 1.54 ug/m^3 are not considered an exceedance of the standard, however, since Dixie was not operating at 100 percent capacity, a borderline value indicates the potential for an exceedance. Based on this, the TACB conducted a modeling study (see Appendix E) which predicted an exceedance of the standard at maximum production levels. As a result, revisions to TACB

Regulation III, Subchapter B, have been proposed to limit lead emissions from lead smelters in Dallas County. These regulations will limit Dixie's fugitive lead emissions to an estimated 0.04 tons per year (and total lead emissions to 27.54 tons per year) by June 30, 1984, resulting in an estimated maximum ambient lead concentration of 0.57 ug/m^3. Appendix E contains an attainment demonstration based on controls to be implemented as a result of the new regulations.

Special purpose lead monitoring will continue at Dixie to determine the effect of the new regulations. Should an exceedance of the lead NAAQS occur, appropriate action will be taken.

Referenced documents and related materials are contained in Appendix E.

d. ESB, Incorporated

On July 16, 1980, ESB, Incorporated (ESB) responded to the 1980 Lead SIP by stating that the plant was undergoing an indefinite termination of production. On April 22, 1981, the company formally notified the TACB that all manufacturing operations involving the processing of lead and/or lead oxide materials were terminated. Following this, on May 7, 1981, the company submitted an ambient air monitoring plan which was approved by letter dated August 24, 1981. Additionally, the company was advised that should production resume, the TACB would require compliance with all portions of the lead SIP.

The 1980 Lead SIP provided for source compliance with the lead NAAQS by November 5, 1982. Since that date has passed, this source must undergo a TACB review of its control equipment and operational conditions, prior to reopening to assure that no exceedances of the standard will occur.

Referenced documents and related materials are provided in Appendix F.

B. Sources Determined to be Significant Lead Point Sources by Analysis of Lead Monitoring Data

1. ASARCO, Incorporated

See Section III.D.

2. RSR Corporation

The TACB began a special purpose monitoring program at RSR Corporation (RSR) on April 5, 1982. Three monitoring sites, consisting of one monitor each, began data collection on that date. On January 1, 1983, a fourth site, consisting of two monitors, as well as an additional monitor for each of the first three sites, was added. During the period beginning April 1, 1982, and ending September 30, 1983, three exceedances of the NAAQS for lead were recorded, two occurring at one site (see Appendix J). Due to these exceedances, TACB issued a Notice of Violation to RSR on January 28, 1983, and on February 18, 1983, held an Administrative Enforcement Conference

with the company to determine appropriate action. Subsequently, on April 11, 1983, RSR's file was submitted to the Attorney General's office for litigation, and an agreed order was entered on October 17, 1983.

The controls mandated by the agreed order will limit RSR's fugitive lead emissions to an estimated 0.51 tons per year (and total lead emissions to 63.78 tons per year) by June, 1984, resulting in an estimated maximum ambient lead concentration of 1.27 ug/m^3. Appendix G contains an attainment demonstration based on controls to be implemented as a result of the agreed order.

Ambient lead monitoring will continue at RSR to determine the effect of the controls implemented as a result of the agreed order. Should an exceedance of the lead NAAQS occur, appropriate action will be taken.

Referenced documents and related materials are contained in Appendix G.

C. Sources Originally Determined in 1980 Control Strategy as Those Which Do Not Cause the Standard to be Exceeded in Areas of Public Exposure

1. Ethyl Corporation

This company was not required by the 1980 Control Strategy to conduct monitoring or develop a control plan, since no exceedances of the standard were predicted in areas of public exposure. However, the TACB has continued surveillance of this source by way of annual inspections and routine surveillance checks.

An annual inspection on October 2, 1981, and a follow-up phone call of January 19, 1982, document that the lead emitting processes have been permanently shut-down and partially dismantled. (See Appendix H).

2. Lone Star Steel

This company was not required by the 1980 Control Strategy to conduct monitoring or develop a control plan, since modeling predicted no exceedances of the standard in

areas of public exposure. Investigations have shown that the company has been operating on a limited basis since plan development. (See Appendix I).

To determine background lead concentrations in this area, a special purpose monitor began operation on December 1, 1982, and continued until April 30, 1983, at which time the property owner requested the site be moved. A subsequent site, established July 1, 1983, is still in operation (see Appendix J) and will be maintained to establish the source lead contribution when normal production resumes.

D. Control Strategy for El Paso

(proposed El Paso SIP revisions to be inserted)