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Planning and Standards
Research Triangle Park NC 27711

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Air



Enabling Document for Regulations Governing Compliance Extensions for Early Reductions of Hazardous Air Pollutants

NESHAAP

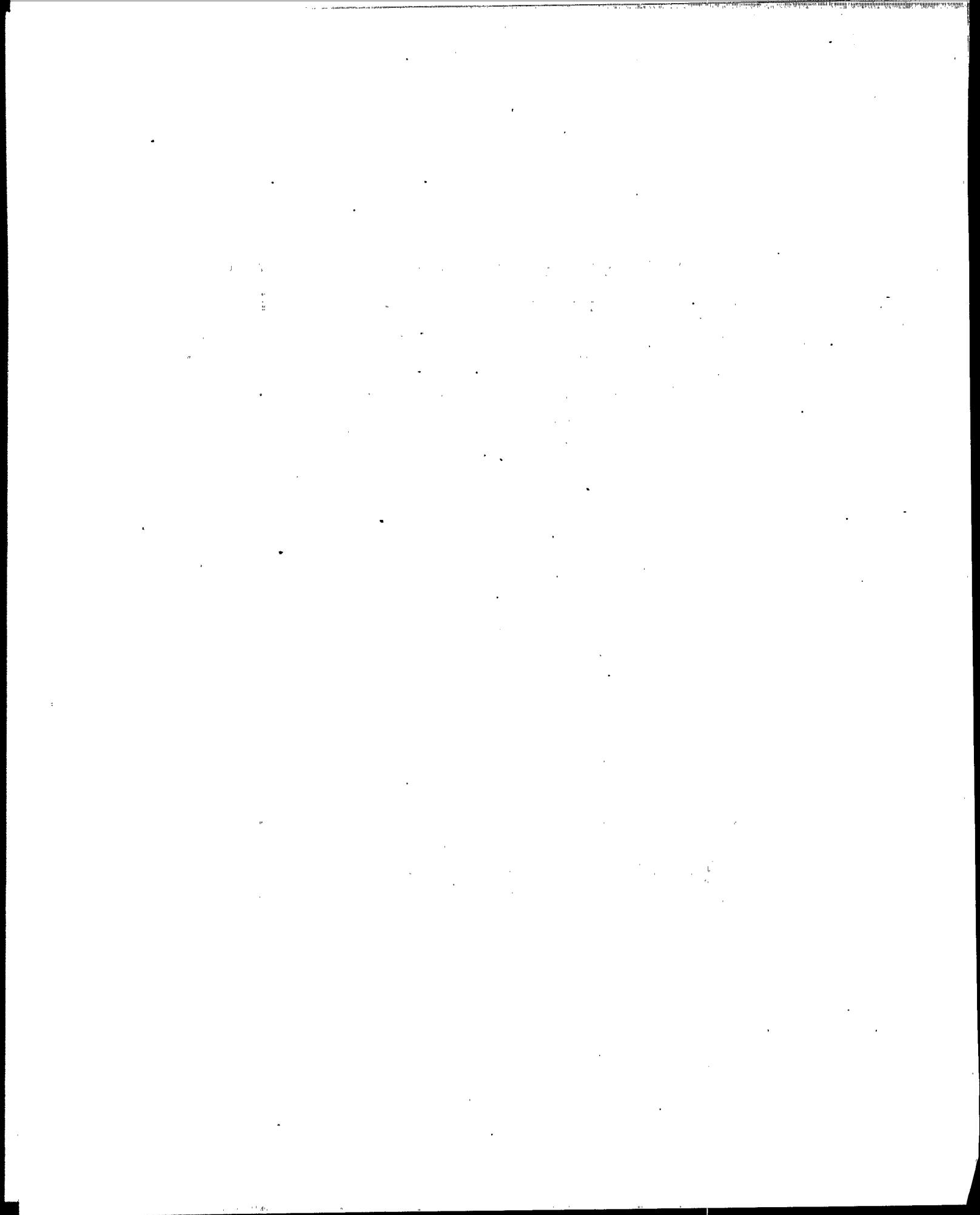


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1.0 INTRODUCTION AND OVERVIEW

The purpose of this Enabling Document is to provide practical information on implementation of the Early Reductions Program, including explanations of the requirements and procedures for early reductions demonstration submittals and review of the submittals. The primary goal is to enable the Regional Offices of the U. S. Environmental Protection Agency (EPA) and States to better understand the Program and their roles, and thereby, better implement the Program.

On November 15, 1990, the Clean Air Act (CAA) was amended. Significant changes were made to Section 112 of the CAA establishing national emission standards for hazardous air pollutants (HAP's). One of the new features of the CAA is an incentive program by which an owner or operator can obtain a six-year extension of compliance with an applicable Section 112(d) standard for achieving early reductions in hazardous air pollutant emissions.

The purpose of the program is to encourage early reductions in HAP emissions. Source owners and operators that participate in the Program will gain the benefit of more time to develop strategies for compliance with Section 112(d) standards. Ideally, this will give them an opportunity to develop more cost-effective emission reduction approaches. In addition, participating companies can enjoy the benefit of improved community relations when they become publicly recognized for taking positive steps to improve the environment.

At the same time, the public benefits because HAP emissions are significantly reduced earlier than they would be if sources delayed control until they were subject to Section 112(d) standards. Moreover, the Early Reductions Program has the potential to not only lower annual emissions early, but also lower overall long-term emissions from the source. The long-term environmental benefit is illustrated by example in Table 1-1. Consider a source emitting HAP's at a rate of 100 tons per year. Assume that this source achieves a 90-percent reduction in HAP emissions, to a

**TABLE 1-1. EMISSIONS COMPARISON
EARLY REDUCTIONS VS. SECTION 112(d) STANDARD**

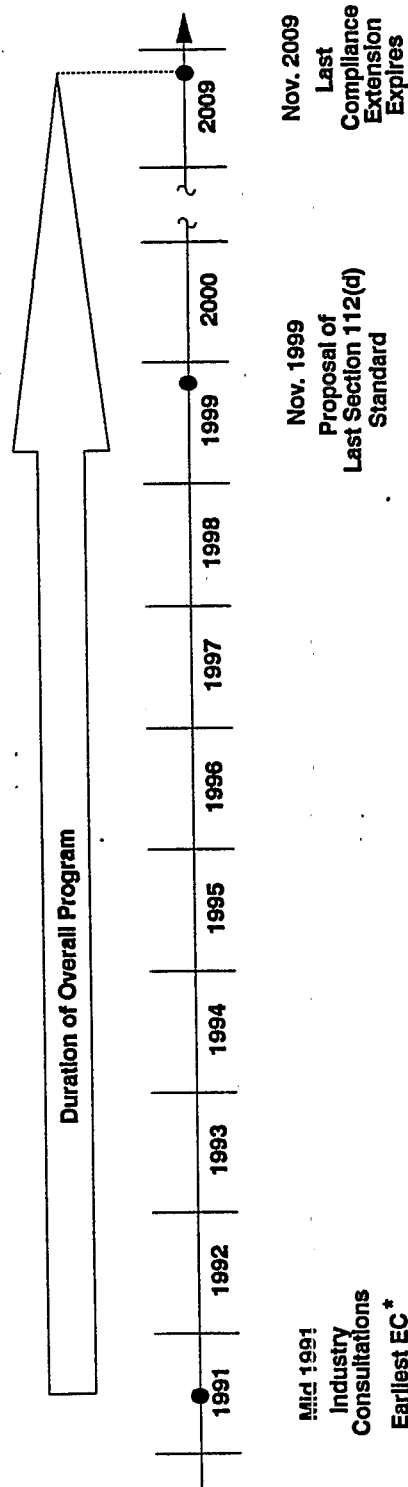
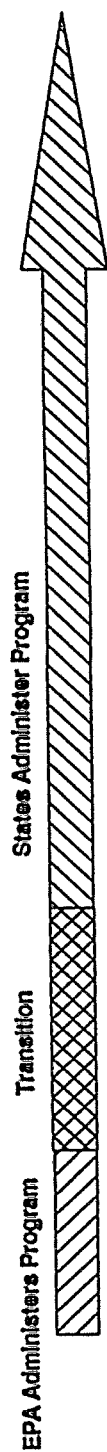
<u>TIME</u> (YEARS)	<u>CONTROL SCENARIO</u>	
	<u>§112(d) STANDARD</u>	<u>EARLY REDUCTIONS</u>
1 (year between proposal and promulgation)	100	10
2	100	10
3	100	10
4 (third year after promulgation)	100	10
5	2	10
6	2	10
7	2	10
8	2	10
9	2	10
10 (last year of compliance extension)	2	10
TOTALS	412	100

Assumptions: 100 ton/yr source (uncontrolled); Section 112(d) standard achieves 98-percent control; Section 112(d) standard compliance date is 3 years after promulgation; 9 years after Section 112(d) standard promulgation, Section 112(d) standard applies to source which received a compliance extension.

rate of 10 tons per year, just prior to proposal of an applicable Section 112(d) standard, and receives a six-year compliance extension. In comparison, consider an identical 100 ton per year source which does not achieve early reductions, but complies with the Section 112(d) standard three years after the standard is promulgated. Assuming the Section 112(d) standard requires 98 percent reduction, the source participating in the Early Reductions Program would emit only 100 tons of HAP's over a ten-year period in comparison to 412 tons from the source that waits and complies with the Section 112(d) regulation. After that time, both sources would be subject to the Section 112(d) standard and HAP emissions can be assumed to be equal.

The Early Reductions Program has long-term implications on the State and Regional EPA permitting authorities that will administer the Program. As illustrated in Figure 1-1, the duration of the overall program will be about 18 years, from 1991 until November 2009. Figure 1-1 illustrates that some submittals for the Program (enforceable commitments) were received beginning in 1991. The last compliance extension for the last Section 112(d) standard promulgated under Title III of the Act will expire by November of 2009 (if all standards are promulgated by the year 2000), thus formally ending the effects of the Early Reductions Program. Initially, the Program will be administered by the EPA Regional Offices. Then, as the individual permitting programs of the States are approved under Title V, the respective States will take over administration of the Program.

On December 29, 1992, the EPA promulgated regulations governing compliance extensions for early reductions of HAP's under subpart D of 40 CFR 63 (57 FR 61970). The rule establishes requirements and procedures for source owners and operators to follow in order to obtain compliance extensions, and for reviewing agencies to follow in evaluating requests for extensions.

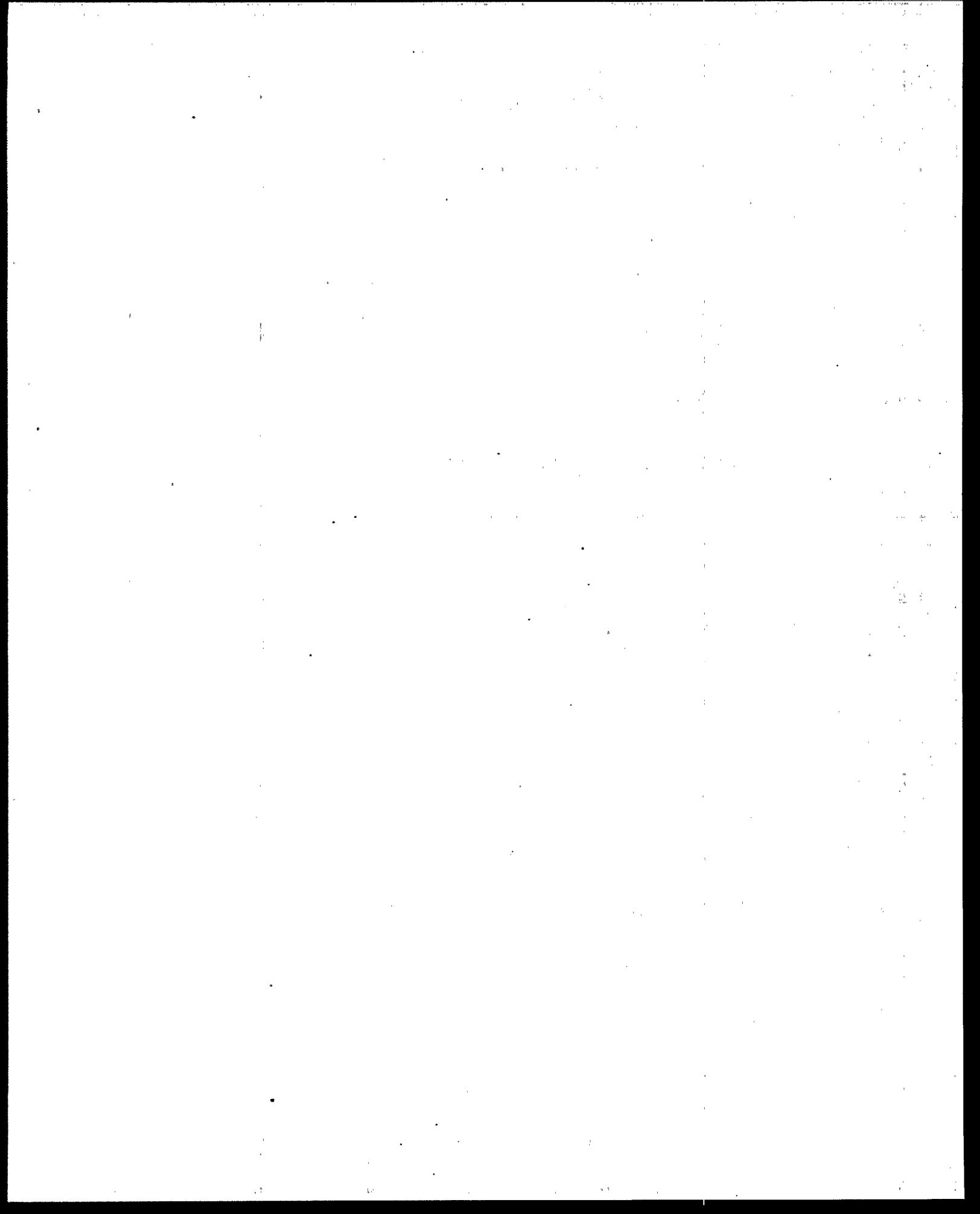


* EC: Enforceable Commitment

Figure 1-1. Early Reductions Program: Duration of Overall Program

The regulations are organized according to the following sections:

Section 63.70	Applicability.
Section 63.71	Definitions.
Section 63.72	General provisions for compliance extensions.
Section 63.73	Source.
Section 63.74	Demonstration of early reduction.
Section 63.75	Enforceable commitments.
Section 63.76	Review of base year emissions.
Section 63.77	Application procedures.
Section 63.78	Early reduction demonstration evaluation.
Section 63.79	Approval of applications.
Section 63.80	Enforcement.
Section 63.81	Rule for special situations.



2.0 THE REGULATIONS

This chapter provides a discussion of the individual sections of the proposed regulation. Where appropriate, the underlying rationale for specific parts of the regulation are discussed and guidance on implementation of the regulations is provided. In addition, the EPA has published a separate document that addresses questions regarding the rule. This document is entitled "Questions and Answers about the Early Reductions Program" (EPA-450/3-92-005, January 1992) and is available from the EPA library.

SECTION 63.70 - APPLICABILITY

The rules of the Early Reductions Program only apply to owners or operators of sources who voluntarily apply for a compliance extension from Section 112(d) standards. The provisions of the rule also apply to State or local agencies who are given authority by the EPA to operate a permit program under Title V of the CAA.

SECTION 63.71 - DEFINITIONS

This section identifies any terms that require special interpretations. All terms that are not found in this section are given the same meaning as in the CAA or in General Provisions of Part 63 of the Code of Federal Regulations.

SECTION 63.72 - GENERAL PROVISIONS FOR COMPLIANCE EXTENSIONS

This section of the regulation basically restates the main provisions outlined under Section 112(i)(5) of the Clean Air Act (CAA). Under these provisions, the Administrator or a State acting pursuant to a permitting program approved under Title V shall by permit allow an existing source to meet an alternative emission limitation in lieu of an emission limitation promulgated under Section 112(d) standard, for a period of 6 years from the compliance date of the applicable standard, providing the source owner or operator:

- (1) demonstrates that the source has achieved (i) 90 percent overall (95 percent for particulate emissions) reduction in base year HAP emissions and (ii) a 90 (95) percent reduction in base year HAP emissions adjusted for high-risk pollutant weighting factors; and
- (2) that such reduction is achieved before proposal of an applicable Section 112(d) standard, or before January 1, 1994, provided that an enforceable commitment was made prior to proposal of the earliest applicable standard to that source.

As illustrated in Figure 2-1, this creates two paths for participation in the Early Reductions Program. For sources that achieve reductions prior to proposal of an applicable Section 112(d) standard, the owner or operator can submit a permit application along with a demonstration of early reductions. For sources that cannot achieve the early reductions before proposal, but can achieve such reductions before January 1, 1994, the owner or operator can submit an enforceable commitment to reduce base year emissions by 90 (95) percent, achieve the reduction before January 1, 1994, and submit a permit application prior to December 1, 1993 demonstrating the early reduction. The difference between the two paths is the timing of the reductions with respect to proposal of an applicable Section 112(d) standard, and the ability to submit an enforceable commitment in the case of the initial Section 112(d) standards. In either case, the end result of a successful early reductions demonstration is an alternate emission limitation issued by permit which grants the owner or operator a six-year extension from compliance with an applicable Section 112(d) standard.

In addition to reducing aggregate HAP emissions by 90 (95) percent, the general provisions require a separate 90 (95) percent reduction demonstration taking into account high-risk pollutant weighting factors. The owner or operator must multiply the base year and post-reduction emissions of each individual HAP by the weighting factor associated with the HAP and show that HAP emissions adjusted for high-risk pollutants also have been reduced by 90 (95) percent. Additional discussion of this demonstration is provided in later sections.

TWO PATHS TO PARTICIPATION IN THE EARLY REDUCTIONS PROGRAM

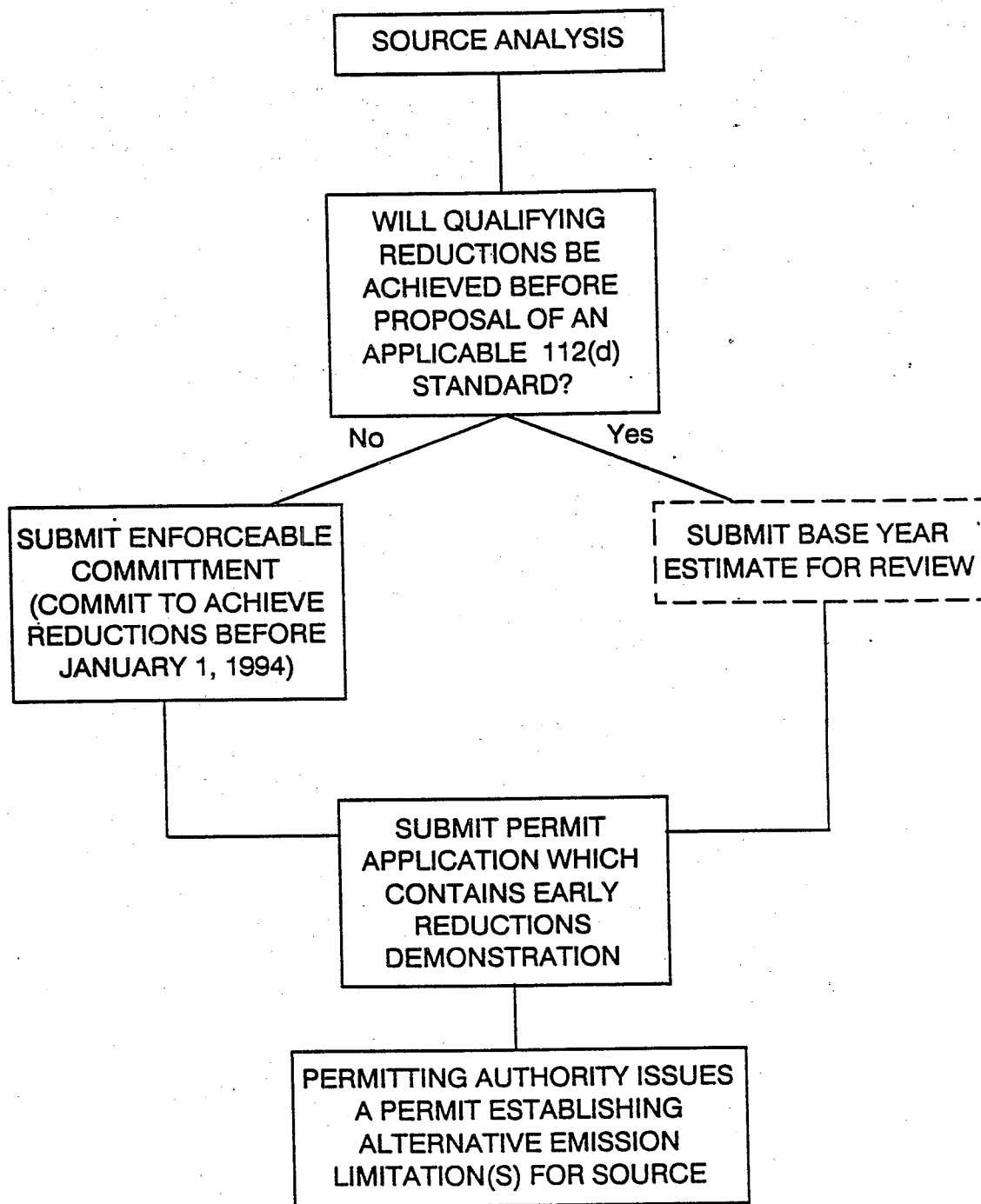


Figure 2-1. Overview of the Early Reductions Program.

The CAA specifically gives States the right to require more than 90 (95) percent aggregate or individual pollutant reduction when the States are issuing permits under this program. In addition, other procedures or requirements may apply to the source at the State level. For example, a source may be required to obtain State preconstruction and operating permits for any action it undertakes under the Early Reductions Program, or the source may have to meet separate control requirements imposed by existing State regulations for toxic air pollutants.

SECTION 63.73 - SOURCE

For purposes of the Early Reductions Program, source is defined as follows:

- (1) A building, structure, facility or installation identified as a source by the EPA in Appendix B (of the rule);
- (2) All portions of an entire contiguous plant site under common ownership or control that emit hazardous air pollutants;
- (3) Any portion of an entire contiguous plant site under common ownership or control that emit HAP's and can be identified as a facility, building, structure, or installation for purposes of establishing standards under Section 112(d) of the CAA; or
- (4) Any individual emission point or combination of emission points within a contiguous plant site under common ownership or control, provided that emission reduction from such point or aggregation of points constitutes a significant reduction of hazardous air pollutant emissions of the entire contiguous plant site;

For purposes of paragraph (4) of this section, emissions reductions are considered significant if they are made from base year HAP emissions of not less than (1) a total of 10 tons per year where the total emissions of hazardous air pollutants in the base year from the entire contiguous plant site is greater than 25 tons; or (2) a total of 5 tons per year of hazardous air pollutants where the total emissions of hazardous air pollutants in the base year from the entire contiguous plant site is less than 25 tons per year.

Depending on a particular Section 112(d) standard, a source may be defined broadly or narrowly, from a discrete emission point up to and including an entire plant. This definition of source is consistent with the broad flexibility encompassed under Section 111(a)(3) of the CAA and is designed to enhance the attractiveness of the Early Reductions Program.

The scope of the definition is best illustrated by examining each paragraph of the definition. Under paragraph (1), the EPA has, to date, identified only one group of emission points as a source for purposes of establishing Section 112(d) standards. These are equipment leak emission points from synthetic organic chemical facilities and other related facilities identified in the Hazardous Organic NESHAP (National Emission Standard for Hazardous Air Pollutants), or HON. Fugitive emissions from equipment leaks have been identified as a source for purposes of establishing standards under Section 112(d) with sufficient certainty to consider them separately. The EPA has engaged in an extensive regulatory negotiation to establish proposed Section 112(d) standards for equipment leaks from HON plants. [See the March 6, 1991 issue of the Federal Register (56 FR 9315).] The draft regulation defines source as the collection of applicable equipment (valves, pumps, connectors, etc.) within a process unit that uses as a reactant or makes one of the organics listed as hazardous in Section 112(b) of the CAA Amendments. In addition, the HON covers certain HAP's in other selected industries, such as pharmaceutical manufacturing and pesticide production. For the purposes of the negotiated rule, the process unit comprises all equipment from the feedstock storage tanks through end product disposition and wastewater treatment.

The negotiated regulation for equipment leaks will require that certain equipment in HAP service within a process unit to which the standards are applicable must be viewed as a whole. This is the case for valves, pumps, or connectors within a process unit, which must be considered together, as the regulation is written in terms of percent leaking components across a process unit. That is, valves, pumps, or connectors cannot be split up such that some of the valves in a process unit have an early reduction alternative emission limitation and the rest meet the Section 112(d)

standard. For example, it must be that either all valves within a process unit are in the Early Reductions Program or none are.

The logic for requiring inclusion of all the valves, pumps, or connectors from a process unit, does not extend to the other equipment covered by the equipment leak rule, such as pressure relief devices or product accumulator vessels, which will be subject to individual standards applicable to each device or vessel, and not all devices or vessels as a group. Equipment subject to such "piece-specific" standards could individually be assigned alternative emission limits as part of an early reductions source or meet the Section 112(d) standard, and are not constrained by the process unit coverage.

Equipment leaks are treated as a separate class because they can occur throughout the plant wherever process equipment handles fluids and are not associated with any particular type of discrete emission point, e.g., storage or process vents. The negotiating committee recognized the need to treat equipment leaks separately. Thus, for purposes of early reductions, the definition of source for these types of emissions will be what is reflected in the regulatory language in the notice published on March 6, 1991. The EPA notes that tentatively identifying equipment leaks as a source for early reductions is in no way meant to limit how "source" will be defined for the purposes of any particular Section 112(d) standard, including the HON equipment leak standard.

The second part of the definition (paragraph (2)) encompasses the entire contiguous plant site. (See Figure 2-2.) Under paragraph (2) of the definition, if an applicant designates the entire contiguous plant site as the source and demonstrates that the total emissions of HAP's from the contiguous plant site have been reduced by 90 percent (or 95 percent for particulates), then the plant would receive a six-year extension from any and all applicable Section 112(d) standards. The six-year extension is added to the promulgated compliance date for each applicable standard. A plantwide definition of source clearly falls within the definition of source under Section 111(a)(3). Under this definition, a source owner or operator must also

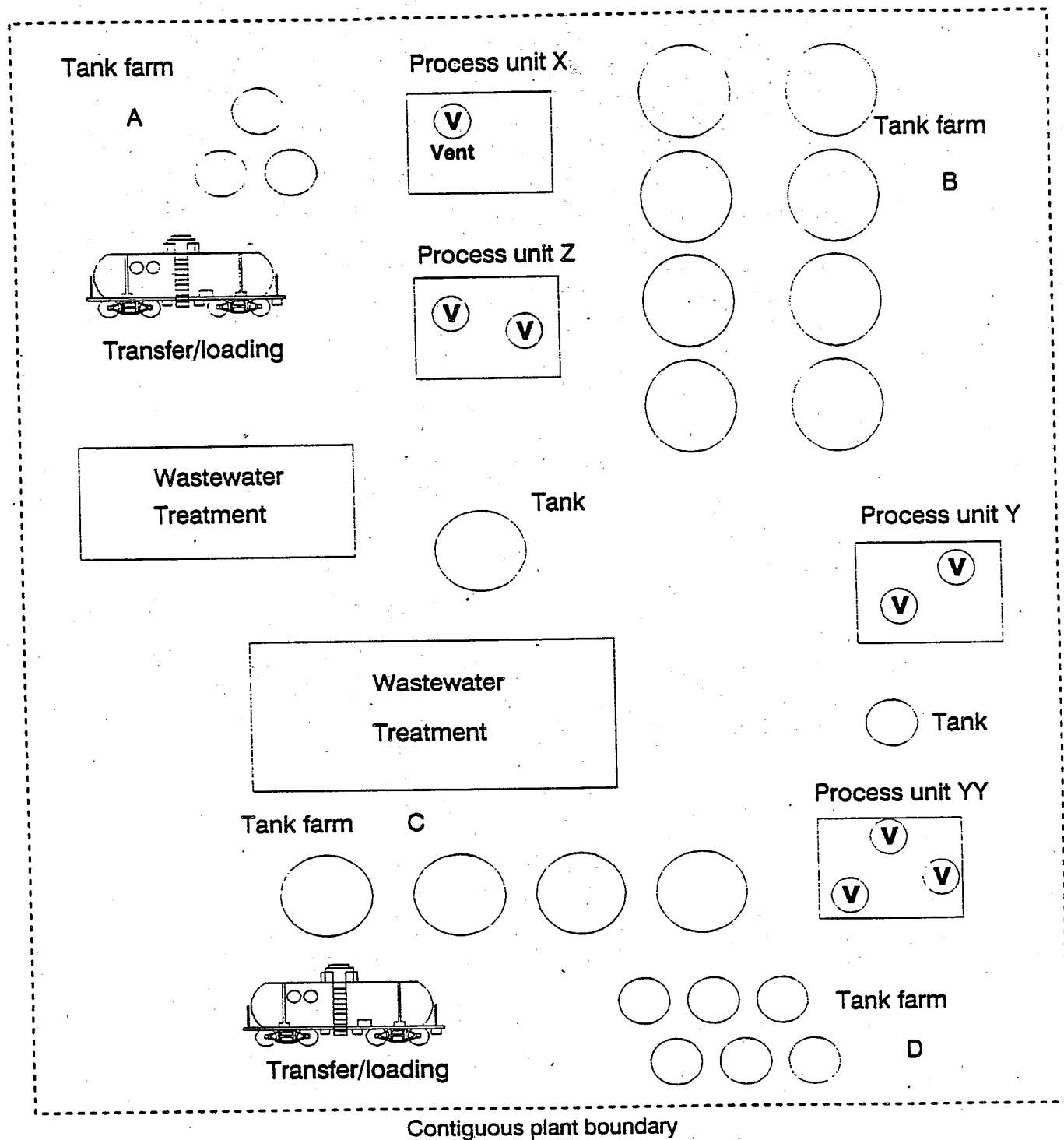


Figure 2-2. Chemical Plant Schematic
(Entire Facility)

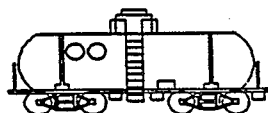
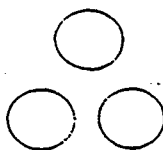
account for HAP emissions from new points or units in the post-reduction calculation, unless the new point or unit can be considered a major source by itself.

A "source" may also be defined to encompass less than an entire plant. However, only those points identified as part of the source would be eligible for the six-year extension from Section 112(d) standards. Under paragraph (3) of the definition, the applicant could identify groups of emission points, that have a functional or geographical relationship to one another and that could be characterized as a facility, building, structure or installation. (See Figure 2-3.) For example, the applicant could identify a group of functionally similar points (Tank Farm B) as a source and achieve a 90-percent reduction across that source. Alternatively, the applicant could identify all tanks in one of the other areas (A, C, or D) as a separate source because each of these areas could be defined as a tank farm installation or facility. Moreover, the applicant could take one or more of the tanks out of service and credit that reduction towards the 90 percent, provided the shutdown was permanent (or at least would last until the end of the compliance extension period). Under paragraph (3), however, the applicant could not identify a tank farm as the source and then subdivide the tank farm to exclude a portion of the tanks because they were already partially controlled. (See Figure 2-4.) This configuration of a source may, however, be acceptable if the designated tanks meet the requirements of paragraph (4).

Generally, geographic grouping to form a source would only be allowed for emission points of the same type within a logical physical area, as in the examples above. Under paragraph (3) it would not be acceptable to aggregate as a source based on a geographical relationship several unrelated tanks, process vents, wastewater units, etc, simply because they were all located on the same side of the road. However, if a building or other enclosed structure houses a collection of emission points, such a source definition would be consistent with Section 111(a)(3)'s definition of source as "any building, structure, facility, or installation." For example, a metal parts coating operation consisting of degreasers, painting lines, and paint strippers within a single enclosed structure could collectively be considered a source. (See Figure 2-5).

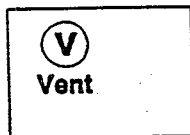
Tank farm

A

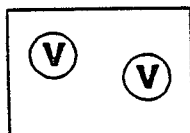


Transfer/loading

Process unit X

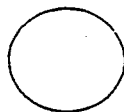


Process unit Z



Wastewater
Treatment

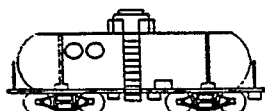
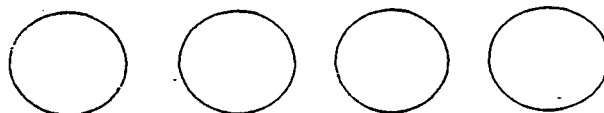
Tank



Wastewater
Treatment

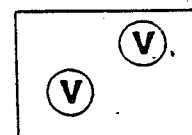
Tank farm

C



Transfer/loading

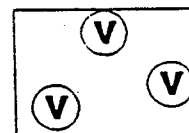
Process unit Y



Tank

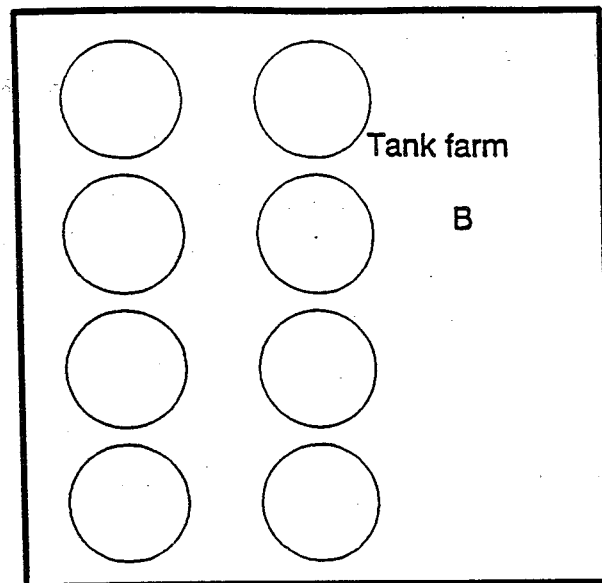
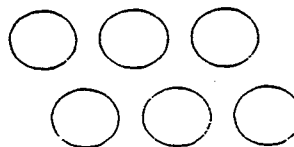


Process unit YY



Tank farm

D



Tank farm

B

Figure 2-3. Chemical Plant Schematic
(Functional and Geographical)

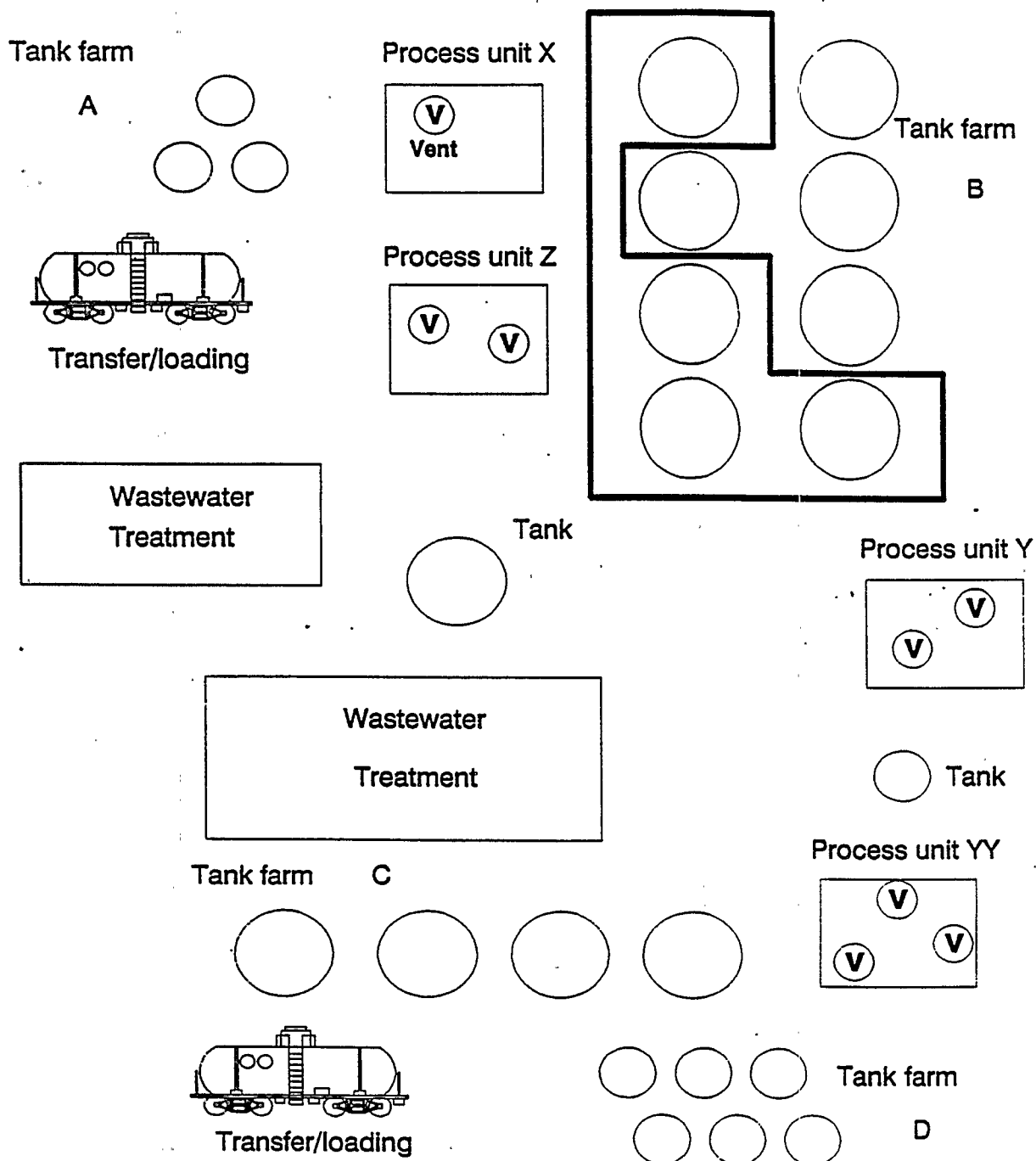
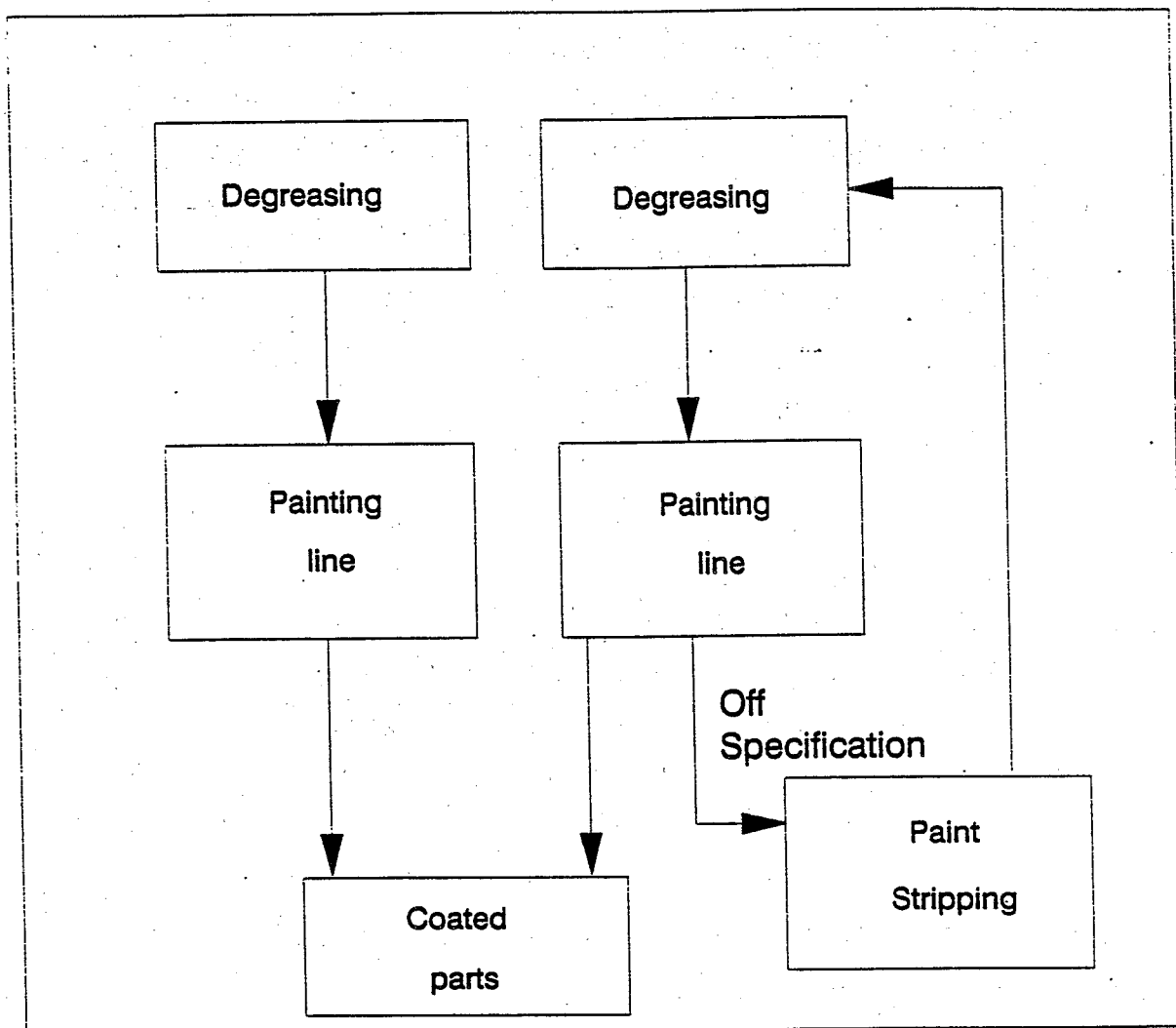


Figure 2-4. Chemical Plant Schematic
(Potentially Unacceptable Selective Grouping)



Enclosed building

Figure 2-5. Metal Coating Operation

Under paragraph (3), the applicant could also identify a process or production unit as a source, such as all equipment associated with the production of chemical X. An applicant, therefore, could identify as one "source" the outlined areas in Figure 2-6 which constitute a process unit and include all tanks in Area A, the vents on Production Unit X, and the tanks in Area C. All points that are substantially dedicated to a particular process must be included in the process unit source. In many instances, however, some components of the plant will be shared by multiple process units, e.g., a wastewater treatment system. For common or shared facilities which serve or are linked with multiple process units, the applicant could consider the common facility as part of a single process unit or treat it as a separate source. The applicant has fairly broad flexibility to identify logical points that constitute a process unit or production train. A 90-percent reduction in HAP emissions from each component would not be required, provided the aggregate overall reduction is 90 percent. However, the applicant must achieve a 90-percent reduction in HAP emissions from the entire process unit.

Under paragraph (4), a "source" may be defined as any group of emission points provided that the aggregation of emission points represents a significant amount of emissions. For the purposes of the Early Reductions Program, the EPA has determined that a significant amount of emissions of HAP's from a source must be: a) at least 10 tons per year where the total emissions of HAP's in the base year from the entire contiguous plant site is greater than 25 tons per year; or b) a 90 (95) percent reduction from base year emissions of at least 5 tons for plants that emitted 25 tons or less of HAP's during the base year.

These source definition examples are meant to be illustrative of the types of groupings that may reasonably fall within the definition of source for purposes of the Early Reductions Program. The definition provides the maximum benefit to an applicant who is capable of making reductions in various parts of its plant, and is trying to make reductions without actual knowledge as to how the EPA will define various components of the plant as "sources" for purposes of particular Section 112(d) standards. Each identified source would receive extensions from applicable

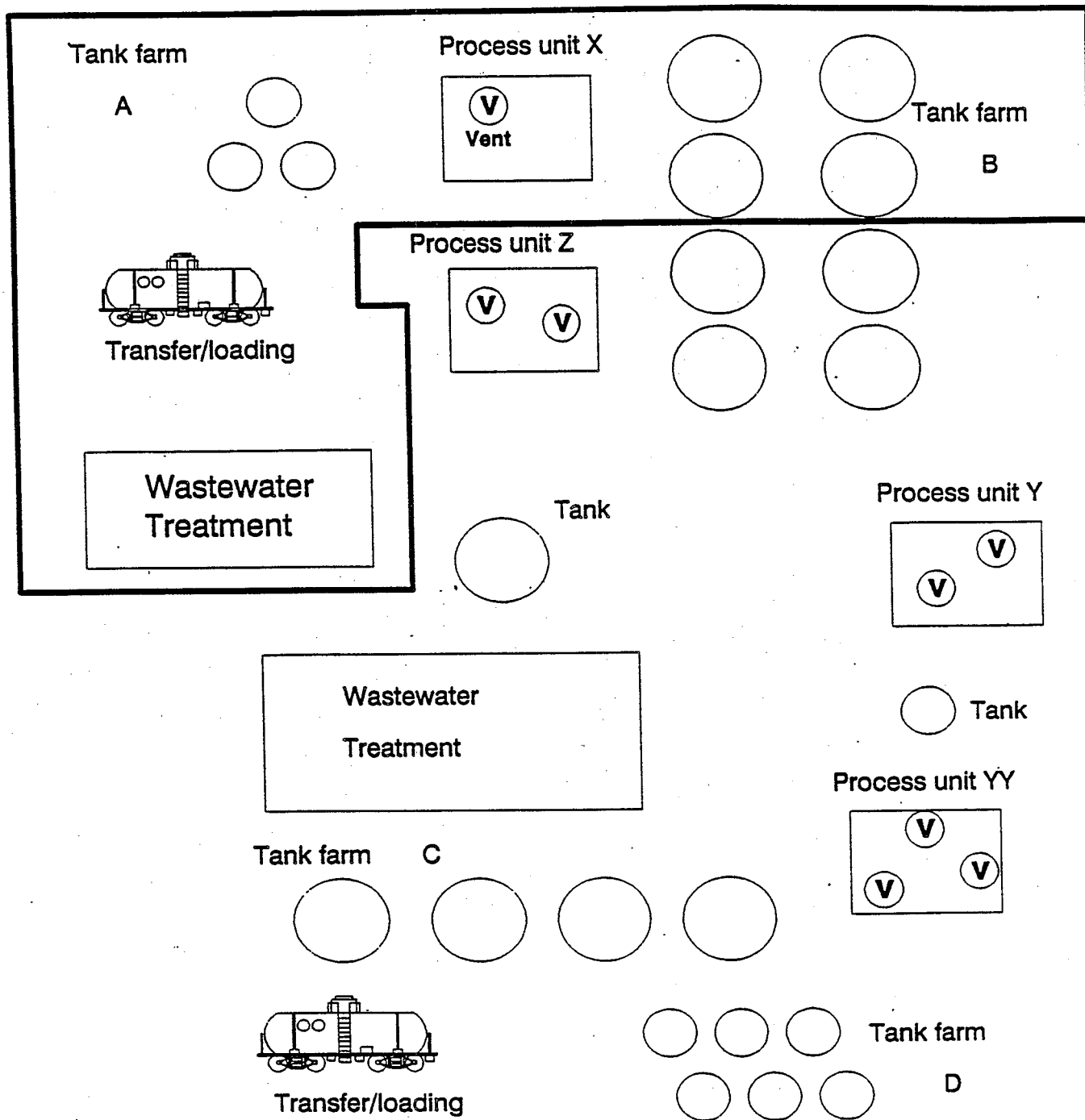


Figure 2-6. Chemical Plant Schematic
(Process Train)

Section 112(d) standards. If a plant owner or operator chose to reduce plantwide emissions by 90 percent, the entire plant would receive an extension from all applicable Section 112(d) standards.

SECTION 63.74 - DEMONSTRATION OF EARLY REDUCTION

This section of the regulation establishes the criteria for demonstrating early reductions in HAP emissions. Demonstration of early reductions is the responsibility of the owner or operator of the facility. In summary, the owner or operator must provide four sets of information in order to demonstrate early reduction. These are:

- Source identifying information,
- Base year emissions,
- Post-reduction emissions, and
- Calculations to show that a 90 (95) percent reduction in HAP emissions has been achieved.

The specific information requirements for demonstration of early reductions are itemized in Table 2-1. Most of the information requirements are straightforward and require no further discussion. Rather than discuss each requirement, the following discussion focuses on several key requirements.

One of the key requirements is evidence that the source conforms to one of the allowable source definition options under Section 63.73. Considerable discussion is provided in the previous section on allowable groupings of emission sources. The key here is for the owner or operator to identify the source definition option selected under Section 63.73 [e.g., paragraph (3)] and provide adequate information to justify the selection.

Another requirement is to specify the base year selected. The regulation requires that the base year must be 1987 or later, with one exception. If the owner or operator can provide evidence that data for the defined source were submitted to the Administrator prior to November 15, 1990 for the year 1985 or 1986 and pursuant to a Section 114 request, that data may also be used to establish a 1985 or 1986 base year emissions. In this case, a copy of the Section 114 request and a copy of the

**TABLE 2-1. INFORMATION REQUIREMENTS FOR DEMONSTRATION
OF EARLY REDUCTIONS**

Source Identifying Information:

- (1) A description of the source including a site plan of the entire contiguous plant site under common control which contains the source, and markings on the site plan locating the parts of the site that constitute the source;
- (2) The activity at the source which causes HAP's;
- (3) A complete list of all emission points of HAP's in the source, including identification numbers and short descriptive titles; and
- (4) A statement showing that the source conforms to one of the allowable definition options from Section 63.73. If the source conforms to the option in Section 63.73(a)(4), the total base year emissions from the source, as determined pursuant to this section, shall be at least:
 - (i) 5 tons per year, for cases in which total HAP emissions from the entire contiguous plant site under common control is less than or equal to 25 tons per year, or
 - (ii) 10 tons per year in all other cases.

Base Year Emissions:

- (1) The base year chosen, where the base year shall be 1987 or later, except that the base year may be 1985 or 1986 if the owner or operator of the source can demonstrate that emission data for the source for 1985 or 1986 were submitted to the Administrator pursuant to an information request issued under Section 114 of the CAA and were received by the Administrator prior to November 15, 1990;
- (2) The best available data on an annual basis of actual emissions during the chosen base year for each HAP emitted from each emission point or group of emission points listed in the source;
- (3) The total base year emissions of all HAP's from the source calculated by summing the data from individual emission points;

**TABLE 2-1. INFORMATION REQUIREMENTS FOR DEMONSTRATION
OF EARLY REDUCTION (continued)**

- (4) The total base year emissions from the source adjusted for high-risk pollutants calculated by multiplying the base year emissions of each HAP by the appropriate weighting factor from Table 2-2 and summing the result;
- (5) The supporting basis for each emission number for each emission point(s), including:
 - (i) For test results submitted as the supporting basis, a description of the test protocol followed, any problems encountered during the testing, and a discussion of the validity of the method for measuring the subject emissions;
 - (ii) For calculations based on emission factors, material balance, or engineering principles and submitted as the supporting basis, a step-by-step description of the calculations, including assumptions used, and a brief rationale for the validity of the calculation method used; and
- (6) Evidence that the emissions from individual sources are not artificially or substantially greater than emissions in other years prior to implementation of emission reduction measures.
- (7) A statement that the base year emissions are within allowable emission levels specified in any applicable law, regulation, or permit condition.

Post-Reduction Emissions:

- (1) For each emission point or defined group of emission points listed in the source, a description of all reduction and/or control measures employed to achieve the required emission reduction;
- (2) The best available data on an annual basis of actual emissions of all HAP from each emission point(s) in the source following employment of reduction measures;
- (3) The total post-reduction emissions of all HAP's from the source calculated by summing the individual emission data;

**TABLE 2-1. INFORMATION REQUIREMENTS FOR DEMONSTRATION
OF EARLY REDUCTION (concluded)**

- (4) The total post-reduction emissions adjusted for high-risk pollutants calculated by multiplying the post-reduction emissions for each pollutant by the appropriate weighting factor and summing the results;
- (5) The supporting basis for each emission number, including;
 - (i) For test results submitted as the supporting basis, a description of the test protocol followed, any problems encountered during the testing, and a discussion of the validity of the method for measuring the subject emissions; and
 - (ii) For calculations based on emission factors, material balance, or engineering principles and submitted as the supporting basis, a step-by-step description of the calculations, including assumptions used, and a brief rationale for the validity of the calculation method used;
- (6) Evidence that all emission reductions were achieved prior to proposal of an applicable standard issued under Section 112(d) of the CAA; or prior to January 1, 1994 for sources subject to enforceable commitments;
- (7) An accounting of all emissions increases within the plant site that are a result of emission reductions within the early reductions source (increase hours of operation, replacement equipment, etc.); and
- (8) Evidence that there was no increase in radionuclide emissions from the source.

information provided in response to the request would be sufficient evidence.

The owner or operator must also provide evidence that base year emissions were not artificially or substantially higher than years prior to reduction measures. Here, the owner or operator of the source needs to compile and present information that clearly indicates the base year chosen is not unusual with respect to emissions. This generally entails determining emissions from the source for several years. In cases where annual emissions from the source are shown to be proportional to production rate, production rates for three or four years preceding implementation of emission reduction measures should be provided. In addition, the owner or operator should include a written rationale explaining why emissions from the early reductions source are proportional to production. In other situations, emissions may be more dependent on the hours of operation or the quantity of a particular material processed. It is the responsibility of the source owner or operator to take the initiative in identifying a reasonable parameter for demonstrating that emissions in the base year were not artificially or substantially high.

In addition to reducing total HAP emissions by 90 (95) percent, there are some restrictions regarding high-risk pollutants. A total of forty-seven (47) high-risk pollutants are identified in the early reduction regulations. The EPA has devised a weighting procedure to limit the use of offsetting reductions where emissions of any high-risk pollutant(s) are not reduced by 90 (95) percent. The list of high-risk pollutants and their respective weighting factors are presented in Table 2-2.

The weighting factors for the carcinogens on this list are based on estimated carcinogenic potency of the substances. Noncarcinogens on this list were subjectively assigned a value of 10. There is no quantitative means of comparing carcinogenic and noncarcinogenic health effects at this time. The list and the respective weighting factors are subject to change as new information becomes available. Any changes will be published in the Federal Register. As noted in Table 2-2, all HAP's not included in the high-risk list are assigned a weighting factor of one.

When high-risk pollutants are emitted from the source, the owner or operator must make a second 90 (95) percent reduction demonstration, one in which HAP

TABLE 2-2. WEIGHTING FACTORS FOR HIGH-RISK POLLUTANTS

Pollutant	CAS Number	Weighting Factor*
<u>Carcinogens</u>		
2-Acetylaminofluorine	53963	100
Acrolein	107028	100
Acrylamide	79061	10
Acrylic Acid	79107	10
Acrylonitrile	107131	10
Arsenic Compounds	0	100
Asbestos	1332214	100
Benzene	71432	10
Benzidene	92875	1000
Beryllium Compounds	0	10
Bis (chloromethyl) ether	542881	1000
1,3 - Butadiene	106990	10
Cadmium Compounds	0	10
Chlordane	57749	100
2-Chloroacetophenone	532274	100
Chromium Compounds	0	100
Chloromethyl methyl ether	107302	10
Coke oven emissions	0	10
Diazomethane	334883	10
Dibenzofuran	132649	10
1,2-Dibromo-3-chloropropane	96128	10
Dichloroethyl ether	111444	10
Dimethylcarbamoyl chloride	79447	100
1,2-Diphenylhydrazine	122667	10
Ethylene dibromide	106934	10
Ethylenimine (aziridine)	151564	100
Ethylene oxide	75218	10
Heptachlor	76448	100
Hexachlorobenzene	118741	100

TABLE 2-2. WEIGHTING FACTORS FOR HIGH-RISK POLLUTANTS
(concluded)

Pollutant	CAS Number	Weighting Factor*
Hexachlorocyclopentadiene	277474	10
Hydrazine	302012	100
Manganese compounds	0	10
Mercury Compounds	0	100
Methylene diphenyl diisocyanate	101688	10
Methyl hydrazine	60344	10
Methyl isocyanate	624839	10
Nickel compounds	0	10
N-Nitrosodimethylamine	62759	100
N-Nitroso-N-methylurea	684935	1000
Parathion	56382	10
Phosgene	75445	10
Phosphine	7803512	10
Phosphorus	7723140	10
1,2-Propylenimine	75558	100
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1746016	100,000
Toxaphene	8001352	100
Vinyl chloride	75014	10

*HAP not on the high risk list have a weighting factor of 1

emissions are adjusted for high-risk pollutants. The applicant must use the applicable weighting factors according to the following equation to make this second demonstration:

$$\text{Percent Reduction} = \frac{\sum M_i F_i - \sum MC_i F_i}{\sum M_i F_i} \times 100$$

Where:

M_i = mass of base year emissions of pollutant i

MC_i = mass of post-reduction emissions of pollutant i

F_i = weighting factor for pollutant i

This weighting procedure is a direct response to the mandate in Section 112(i)(5)(E) of the CAA that specifies that the Administrator shall limit the use of offsetting reductions in emissions of other HAP's to compensate for lesser reductions for high-risk pollutants. Originally, the EPA considered requiring 90 (95) percent reduction of each individual high-risk pollutant. Many of the high-risk pollutants, however, are emitted in very small, trace amounts. Reduction of these emissions by 90 (95) percent can be extremely difficult or even technically infeasible. Strict adherence to this requirement would prevent participation for many potential applicants. The EPA determined that this was not consistent with encouraging participation in the Early Reductions Program and devised the weighting procedure, which does not force reduction of any specific high-risk pollutants. However, because the weighting factors magnify the importance of high-risk pollutant emissions, significant (non-trace) emissions must be reduced in order to achieve "weighted" 90 (95) percent reduction.

Although sources emitting both gaseous and particulate HAP's generally would have to demonstrate separately 90 and 95 percent reductions to qualify, there is one

exception. Some sources may have individual emission points that emit both gaseous and particulate HAP's. For these emission points, a weighted-average-percent reduction between 90 and 95 percent may be demonstrated. The required reduction in such a case is determined by the relative amounts of gases and particulates emitted by the point. For example, if an emission point emits equal amounts of gaseous and particulate HAP's, then the weighted-percent reduction is halfway between 90 and 95, or 92.5 percent. The percent reduction required for total HAP's shall be calculated as follows:

$$\% W = \frac{0.9 (\sum Mg) + 0.95 (\sum Mp)}{\sum Mg + \sum Mp} \times 100$$

Where: % W = the required percent-reduction
Mg = the base year mass rate (e.g. kg/yr) of each gaseous HAP
Mp = the base year mass rate (e.g. kg/yr) of each particulate HAP

The same percent reduction calculated above for an emission point that emits both gases and particulates also must be applied in the weighted post-reduction demonstration.

In general, source testing is required as the supporting basis for base year and post-reduction emissions. In order of preference, the source testing options are: an EPA Reference Method (40 CFR 60 Appendix A and 40 CFR 61 Appendix B), an EPA conditional method, or a test method validated by Method 301. Method 301, "The Field Validation of Emission Concentrations from Stationary Sources", is included in Appendix A to 40 CFR Part 63. A list of validated methods may be obtained from the Emission Measurement Technical Information Center (MD-19), U. S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711.

Calculations based on engineering principles, emission factors, or material balance may be acceptable if the applicant demonstrates to the satisfaction of the permitting authority that:

- (1) no source test method exists;
- (2) it is not technologically or economically feasible to perform source tests;
- (3) it can be demonstrated that the accuracy of a calculated estimate is comparable to source testing;
- (4) the base year conditions no longer exists, and emission data cannot be produced by performing source tests under current conditions and converting test results to reflect base year conditions more accurately than a calculation procedure; or
- (5) emissions from one or a set of points are insignificantly small compared to total source emissions.

The first situation should be straightforward; either there is, or there is not, a source test method. It is possible that an owner or operator would be unaware of an existing method. Application reviewers would need to have a reference listing of available methods. In other instances, even if a test method exists, testing may not be the most appropriate method for determining the emissions from an emission point. For example, if process emissions vary considerably, limited testing may not accurately reflect the true annual emissions. The situations outlined in statements (2) through (5) above are not straightforward and may be considered in combination with one another. For example, the significance of an emission point may contribute to the determination of what is technologically or economically feasible or whether the calculated value is comparable to testing. To apply these reasons to a particular source, the owner or operator and reviewer need to use a common sense approach along with knowledge of the emission point to determine if a calculation procedure is appropriate for establishing emissions.

In general, the owner or operator or reviewer should consider how much uncertainty would be introduced through the calculation procedure versus source

testing. In some cases, the reviewer may be able to quantify the relative uncertainty. In other situations it may only be possible to make a qualitative judgement of the accuracy. If the uncertainty in emissions is insignificant when compared to the total emissions from the facility or when compared to the uncertainty from source tests, then a calculation procedure is acceptable. For example, a source has defined three emission points. Total emissions from two of the three emission points are established by source testing to be 100 ton/year. The third emission point by reasonable calculation emits about 0.5 ton/year. Testing for this emission point is not necessary. Even if the calculations underestimated the emissions, the resulting emissions would not significantly affect the total emissions.

The applicant and the reviewer should not lose sight of the overall goal of the reductions demonstration which is to determine whether or not the source has made the necessary 90 (95) percent reduction in emissions of HAP's. The major emission points within the source are the critical data points. The most accurate means of establishing emissions should be used for these emissions. The most accurate means may or may not be testing. Smaller, insignificant emissions should be established using the best procedures considering that source testing may not be required. Test methods that are unusually expensive or that require equipment to be dismantled or production halted should not be imposed on emission points that contribute insignificantly to the overall emissions.

The applicant is responsible for providing sufficient data to the reviewer to determine if calculations are acceptable in lieu of testing. If the reviewer needs additional technical assistance, support is available through the Office of Air Quality Planning and Standards early reductions team.

If the source owner or operator uses calculation techniques other than those prescribed in one of the EPA documents, the burden is on the owner or operator to convince the permitting authority that the techniques used are sound and the best available means for establishing emissions.

The early reductions rule allows the use of EPA average emission factors for estimating base year equipment leak emissions (such as from pumps, valves, etc.)

only if no reductions in equipment leak emissions are claimed as part of the reduction demonstration. Use of these factors may produce significant overestimates of base year emissions in many cases. However, source owners or operators could establish base year estimates for equipment leaks specific to their sources consistent with other equipment leak emission estimating protocols already established by the EPA in the document entitled "Protocols for Generating Unit-Specific Emission Estimates for Equipment Leaks of VOC and VHAP," EPA-450/3-88-010, October, 1988. These protocols allow the use of "leak/no leak" factors or "stratified" emission factors, which better approximate an individual source's actual emissions, as well as actual bagging data to establish source-specific emission factors. The specific protocol selected should be used for both base year and post-reduction emissions, so that apparent reductions are not construed as simply a change in the methodology. The source should have screening data on most components proposed to be covered within the source definition, to which the appropriate emission factors are applied to determine total equipment leak emissions. Also, a source owner or operator may propose an alternative estimating method to account for equipment leak emissions from the source. Such methods would be reviewed and approved or denied on a case-by-case basis.

Emissions reported for base year and post-reduction conditions may not exceed allowable emission levels specified in any applicable law, regulation, or permit condition. Sources with base year emissions that exceeded allowable emission levels may still participate in the Early Reductions Program, but the base year emissions used to demonstrate 90 (95) percent reduction will be the allowable level and not the actual emission level.

To demonstrate a 90-percent (95 percent for particulate emissions) HAP emission reduction, source owners and operators may take credit for emission reductions achieved for any reason. The early reduction provisions in the CAA and in the rule do not distinguish between reductions achieved voluntarily and those that result from other regulatory requirements, including emission standards promulgated under Section 112 prior to the CAA Amendments of 1990. Therefore, HAP emission

reductions required by State, local, and even Federal regulations qualify toward the early reduction goal, if the reduction was achieved after the base year. This includes reductions under the recent benzene NESHAP. To the extent justified, air emission reductions achieved under the 33/50 Program can also be credited toward the Early Reductions Program. The overlap between this program and the Early Reductions Program is discussed fully in Section 4.0 of this document. Emission reductions resulting from shutdown or curtailment of production can also be included, provided that they are "permanent", i.e., for the duration of the 6-year Section 112(d) standard extension period. A unit that starts up during the Section 112(d) standard extension period to replace production lost through shutdown or curtailment (where the emission reduction was used in the early reduction demonstration) must be included in the post-reduction emissions. For example, if the owner or operator of a source that includes a butadiene unit, shuts the unit down but builds a new one on the other side of the plant three years into the Section 112(d) standard extension period, the new unit must be included in the post-reduction emissions determination, because it has replaced the production of the old unit.

SECTION 63.75 - ENFORCEABLE COMMITMENTS

This section of the rule contains special provisions for sources that will be affected by Section 112(d) standards proposed prior to 1994. Anticipated standards for specific source categories are presented in Table 2-3. Since standards may be proposed for some sources in the near future, facilities affected by these standards may not have enough time to achieve reductions before proposal. If the source can achieve the reductions prior to proposal of a Section 112(d) standard, it may do so and submit a permit application when Part 71 Federal regulations have been promulgated or the Title V program for their State is in place, whichever occurs first. If it can not achieve reductions prior to proposal, this section establishes a set of procedures by which these sources can participate in the Early Reductions Program.

**TABLE 2-3. STANDARDS ANTICIPATED FOR PROPOSAL
PRIOR TO 1994**

Source

**Synthetic Organic Chemical Manufacturing
Industry**

**Dry Cleaners Using Perchloroethylene
(proposed 12/9/91)**

Commercial Sterilizers

**Chromium Electroplating and Chromic
Acid Anodizing**

Industrial Cooling Towers

Halogenated Solvent Cleaners

Gasoline Marketing

The sources may participate by:

- (1) entering into an enforceable commitment before proposal of an applicable Section 112(d) standard; and
- (2) achieving the reduction prior to January 1, 1994.

The applicant submits the enforceable commitment to the appropriate EPA Regional Office and sends a copy each to the State; The EPA's Stationary Source Compliance Division (SSCD), Mail Code EN-341-W, 401 M. Street, S.W., Washington, DC 20460, and the EPA Emissions Standards Division (ESD) (MD-13), Research Triangle Park, North Carolina 27711. All correspondence should be addressed to the attention of the Early Reductions Officer. Addresses for the Regional Offices are provided in Table 2-4. This will ensure that all involved parties are aware of the applicant's plans for early reductions and will facilitate review of the submittal.

The information required in the enforceable commitment is similar to that required for a permit application. In summary, the enforceable commitment consists of four components:

- A properly signed statement of commitment,
- Source identifying information,
- Base year emissions, and
- General plan for achieving the required reductions.

A list of the specific requirements for enforceable commitments is provided in Table 2-5. The source identifying information and base year emission requirements are identical to the requirements for demonstration of early reductions. An example enforceable commitment is provided in Appendix A to provide guidance to owners and operators planning to enter the Program.

The plan for achieving reductions may be general (i.e., not specify the type control on each emission point), but should demonstrate that the source has seriously considered the types of control that may be required to control the source by

TABLE 2-4. EPA REGIONAL OFFICE ADDRESSES

Enforceable commitments must be submitted to the appropriate EPA Regional Office at the following addresses, attention of the Early Reductions Officer:

Director, Air, Pesticides, and Toxics Management Division, EPA Region I (AAA),
John F. Kennedy Federal Building, Boston, MA 02203

Director, Air and Waste Management Division, EPA Region II, Jacob K. Javits
Federal Plaza, New York, NY 10278

Director, Air Toxics and Radiation Management Division, EPA Region III,
841 Chestnut Street, Philadelphia, PA 19107

Director, Air, Pesticides, and Toxics Management Division, EPA Region IV,
345 Courtland Street, N.E., Atlanta, GA 30365

Director, Air and Radiation Division, EPA Region V, 230 South Dearborn Street,
Chicago, IL 60604

Director, Air, Pesticides and Toxics Division, EPA Region VI, 1445 Ross Avenue,
12th Floor, Suite 1200, Dallas, TX 75202

Director, Air, and Toxics Division, EPA Region VII, 726 Minnesota Avenue,
Kansas City, KS 66101

Director, Air and Toxics Division, EPA Region VIII, 999 18th Street, Suite 500,
Denver, CO 80202-2405

Director, Air and Toxics Division, EPA Region IX, 1235 Mission Street,
San Francisco, CA 94103

Director, Air and Toxics Division, EPA Region X, 1200 Sixth Avenue,
Seattle, WA 98101

TABLE 2-5. COMPONENTS OF AN ENFORCEABLE COMMITMENT

Source Identifying Information:

- (1) A description of the source including a site plan of the entire contiguous plant site under common control which contains the source, and markings on the site plan locating the emission points that constitute the source;
- (2) The activity at the source which causes HAP's;
- (3) A complete list of all emission points of HAP's in the source, including identification numbers and short descriptive titles; and
- (4) A statement showing that the source conforms to one of the allowable definition options from Section 63.73. If the source conforms to the option in Section 63.73(a)(4), the total base year emissions from the source, as determined pursuant to this section, shall be at least:
 - (i) 5 tons per year, for cases in which total HAP emissions from the entire contiguous plant site under common control are less than or equal to 25 tons per year, or
 - (ii) 10 tons per year in all other cases.

Base Year Emissions:

- (1) The base year chosen, where the base year shall be 1987 or later except that the base year may be 1985 or 1986 if the owner or operator of the source can demonstrate that emission data for the source for 1985 or 1986 were submitted to the Administrator pursuant to an information request issued under Section 114 of the CAA and were received by the Administrator prior to November 15, 1990;
- (2) The best available data on an annual basis of actual emissions during the chosen base year for each HAP emitted from each emission point or group of emission points listed in the source;
- (3) The total base year emissions of all HAP's from the source calculated by summing the data from individual emission points;
- (4) The total base year emissions from the source adjusted for high-risk pollutants calculated by multiplying the base year emissions of each HAP by the appropriate weighting factor from Table 2-2 and summing the result;

**TABLE 2-5. COMPONENTS OF AN ENFORCEABLE COMMITMENT
(continued)**

- (5) The supporting basis for each emission number for each emission point(s), including:
- (i) For test results submitted as the supporting basis, a description of the test protocol followed, any problems encountered during the testing, and a discussion of the validity of the method for measuring the subject emissions; and
 - (ii) For calculations based on emission factors, material balance, or engineering principles and submitted as the supporting basis, a step-by-step description of the calculations, including assumptions used and their bases, and a brief rationale for the validity of the calculation method used; and
- (6) Evidence that the emissions from individual sources are not artificially or substantially greater than emissions in other years prior to implementation of emission reduction measures.

General Control Plan:

- (1) The general plan, for achieving the required hazardous air pollutant emissions reductions at the source including descriptions of emission control equipment to be employed, process changes or modifications to be made, and any other emission reduction measures to be used; and

Statement of Commitment:

- (1) A statement of commitment, signed by a responsible official of the source, containing the following:
- (i) A statement providing the post-reduction emission level for total HAP emissions and total HAP emissions adjusted for high-risk pollutants, as applicable, from the source on an annual basis which reflects a 90-percent (95-percent for particulate pollutants) reduction from base year emissions;
 - (ii) A statement certifying that the base year emission data submitted as part of the enforceable commitment constitute the best available data for base year emissions from the source and are correct to the best of the responsible official's knowledge;

TABLE 2-5. COMPONENTS OF AN ENFORCEABLE COMMITMENT (concluded)

- (iii) A statement that it is understood by the source owner or operator that submission of base year emissions constitutes a response to an EPA request under the authority of Section 114 of the CAA and that the commitment is subject to enforcement according to §63.80;
- (iv) A statement committing the source owner or operator to achieving the required emission levels before January 1, 1994; and
- (v) A statement that the base year emissions are within allowable emission levels specified in any applicable law, regulation, or permit condition.

90 (95) percent. In order to make an enforceable commitment, a company would need to have determined with at least some degree of accuracy that the planned emission reduction is achievable.

The commitment must be signed by the owner, operator or responsible party at the source. The wording of the statement should follow closely the statement presented in the regulation under Section 63.75 which reads:

"I certify to the best of my knowledge that the base year emissions given above are correct and constitute the best available data for base year emissions from the source, and acknowledge that these estimates are being submitted in response to an EPA request under Section 114 of the Clean Air Act. I further certify that the base year emissions provided for all emission points in the source do not exceed allowable emission levels specified in any applicable law, regulation, or permit condition. I commit to achieve before January 1, 1994 the stated post-reduction emission level(s) at the source, which will provide the 90 (95) percent reduction required to qualify for the compliance extension, and acknowledge that this commitment is enforceable as specified in Title 40 Part 63 Subpart D of the Code of Federal Regulations"

The owner or operator of a source may rescind its commitment at any time prior to December 1, 1993, without penalty. Any source that rescinds its commitment must comply with the applicable standard issued under Section 112 (d) of the CAA by the compliance date specified in such a standard.

Sources found submitting false information in their commitment for early reductions shall be subject to enforcement action under Section 113 of the CAA or other Federal statutes. This is an important consideration for a company to weigh when preparing the commitment. All data and information submitted should be carefully reviewed to verify its accuracy and veracity. The EPA may exercise its authority to ensure the integrity of information contained in the commitments by conducting audits of any or all submittals. The purpose of this activity is to encourage sources to make only serious commitments that can be supported with acceptable emission data.

Enforceable commitments for several different sources within a contiguous facility may be aggregated into one submittal, provided that base year emissions and post-reduction emission levels committed to are identified separately for each source.

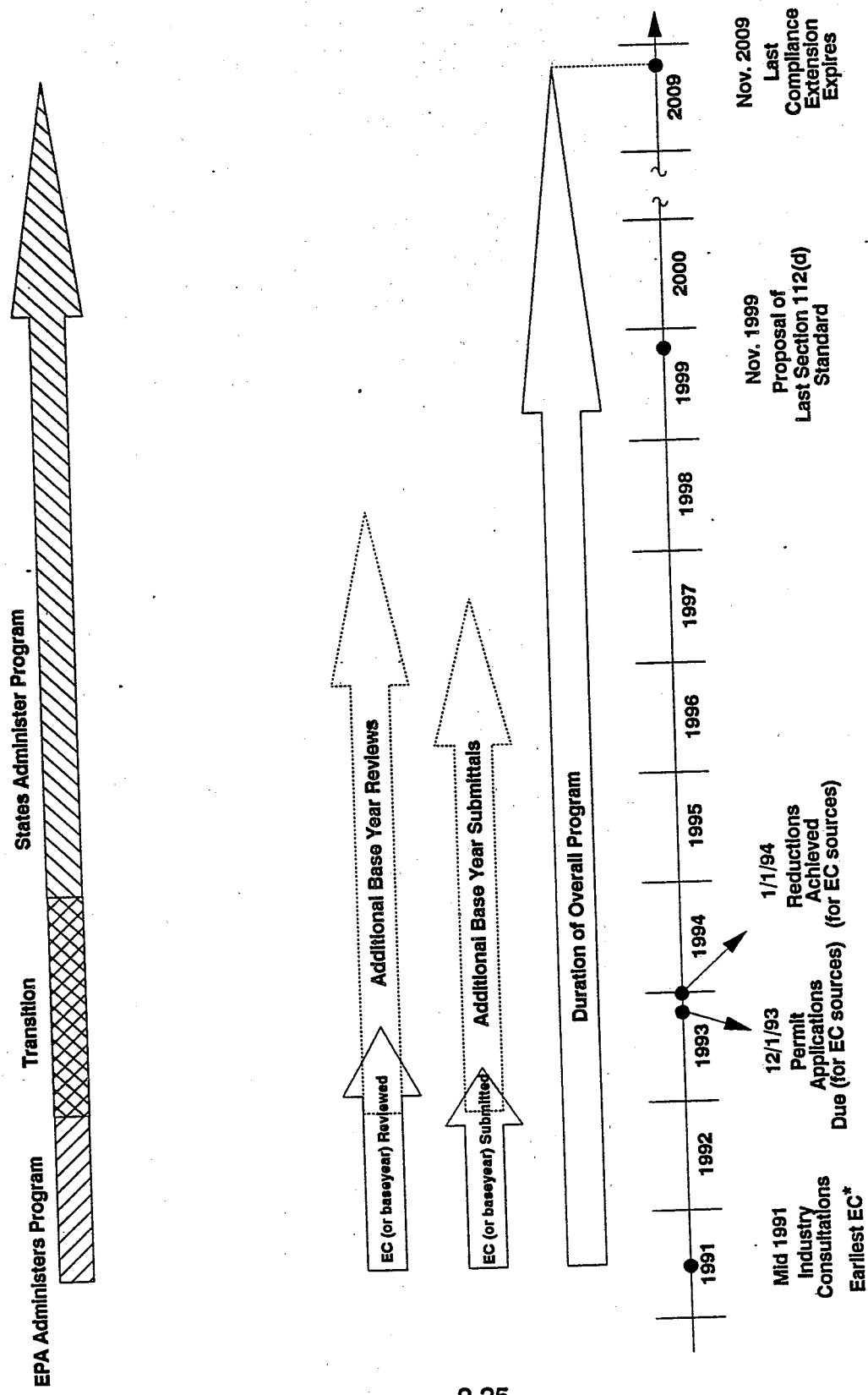
A single enforceable commitment submittal may not involve sources from more than one contiguous facility.

Appendix A of this document provides guidance for submitting enforceable commitments. The appendix details the types of information needed for a complete submittal. Appendix A also includes an example enforceable commitment that can be referred to by companies preparing submittal packages.

SECTION 63.76 - REVIEW OF BASE YEAR EMISSIONS

The rule specifies review of base year emissions data for all enforceable commitments. Review of base year emissions prior to submittal of a permit application is also specified if a source requests such a review. The overall schedule for review of base year emissions submitted as part of an enforceable commitment or as a request for base year review is presented in Figure 2-7. In addition, the schedule for review of base year emissions relative to the submittal date is presented in Figure 2-8. This schedule varies depending on the completeness and approvability of the submittal. The top line of the figure represents the case in which the initial submittal was complete and approvable without any changes. The bottom line represents the situation in which the submittal was not complete, the revised submittal was not approvable, public comments were received during an extended public comment period and the applicant resubmitted the emissions within 90 days. It does not represent worst case because each event only required one revision. For review requests sent to the State, a copy of the request shall also be submitted to the Region. Prior to approval of the State permit program, review requests should be sent to the appropriate Regional Office and copies should be sent to the applicable State agency, and the early reductions officers in SSCD and ESD. (See addresses in Section 63.75)

Within 30 days of receipt of an enforceable commitment or a request for review of base year emissions, the EPA Regional Office will notify the applicant whether the submittal is complete or incomplete. At this point in the review process, the determination is whether all information required in the enforceable commitment has



* EC: Enforceable Commitment

Figure 2-7. Early Reductions Program: Duration of Key Activities

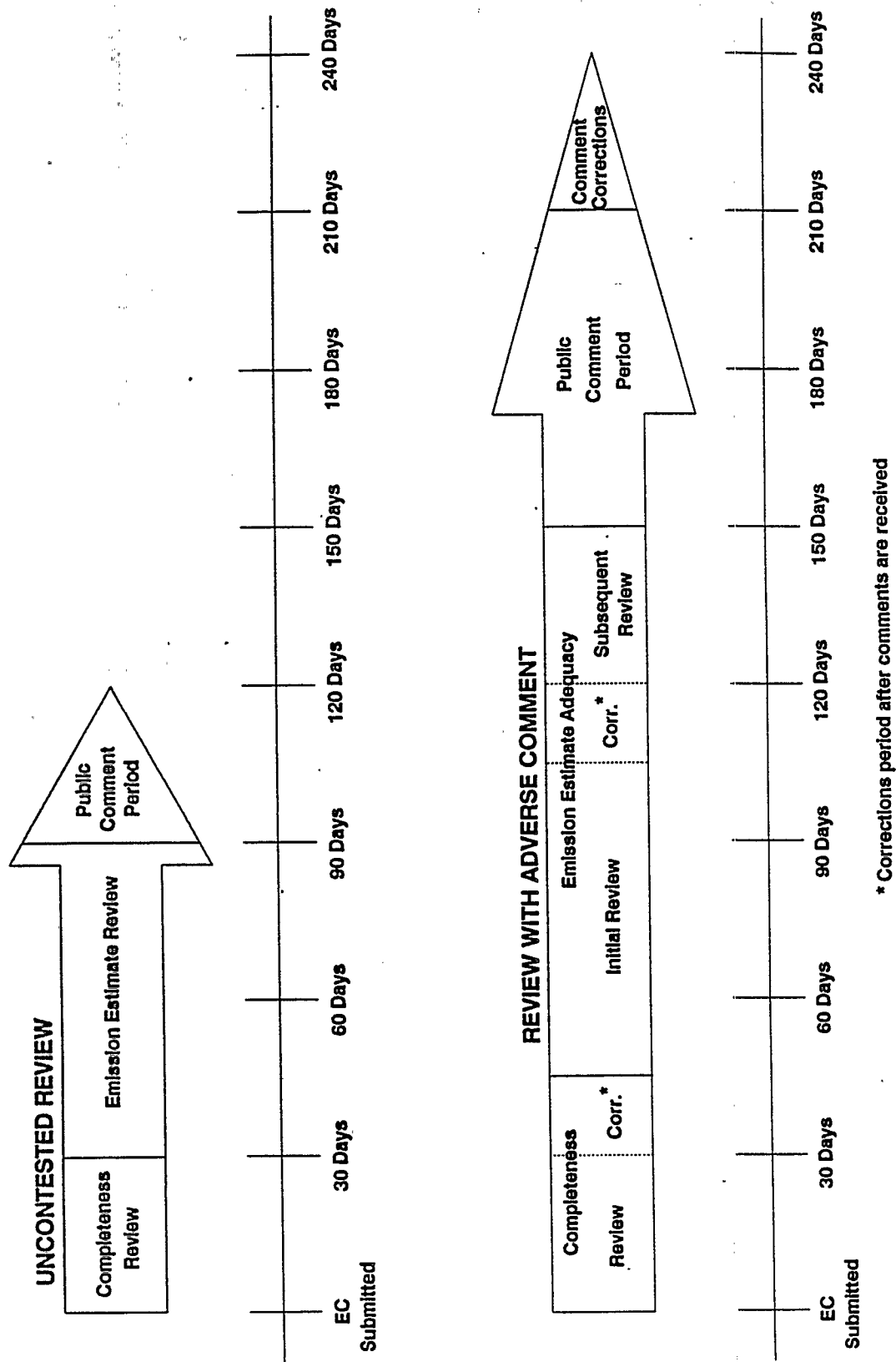


Figure 2-8. Example Review Times for Enforceable Commitment (or Base Year) Review

been supplied, not necessarily whether the information is adequate for the purposes of the Early Reductions Program. However, the EPA will identify any obvious technical deficiencies in the submittal at this time in order to facilitate the review process and allow the source to make necessary changes prior to technical review.

The EPA Headquarters will publish a monthly list of all complete submittals nationally. If the EPA determines that the enforceable commitment is incomplete, the deficiencies in the submittal will be provided to the owner or operator of the source, who must correct the deficiencies and resubmit the base year emissions data before further review can proceed.

Within 60 days of a completeness determination, the EPA will judge the adequacy of the enforceable commitment or emissions data submission and give notice of that determination. If the EPA determines that the base year emissions are approvable, a notice providing the aggregate base year emissions will be published by advertisement in the area affected. The advertisement will explain that the emissions submitted for base year review or as part of an enforceable commitment are being proposed for approval and note the availability of additional nonconfidential information contained in the enforceable commitment for public inspection in at least one location in the community in which the source is located. A 30-day public comment period will be provided, with an opportunity to extend it to 60 days and/or hold a public hearing upon request by an interested party.

In some instances, companies participating in the Program may declare certain information in their submittals to be confidential and, therefore, not available for review by the public. The amount of confidential information in a submittal should be relatively small and should not significantly affect the public's ability to review and evaluate submittals. To help ensure this, the EPA recently published a FEDERAL REGISTER notice (56 FR 7042; February 24, 1991) specifying categories of data that qualify as "emissions data" and thus can not be regarded as confidential has been published under the CAA. Such data include but is not limited to: identification of the facility and emission points, emission types (type of release point and specific pollutants), emission rates, release heights, descriptions of terrain and surrounding

structures, stack or vent diameters at point of emission, release velocities, release temperatures, frequencies of releases, durations of releases, concentrations, densities of emission streams or average molecular weights, boiler or process design capacities, emission estimation methods, percent space heat, and hourly maximum design rates. When parts of a submittal are claimed confidential by the source, efforts should be made by the submitting company to create a complete and coherent nonconfidential submittal to accompany the confidential version. Additional guidance regarding confidential information is given in Appendix A.

If the EPA determines that the base year emissions are not approvable because the supporting data or calculations are incorrect or deficient in some manner, the applicant will be notified of the decision and the reasons for the decision. The applicant must make the necessary corrections and resubmit the base year emissions data to remain in the Program. There is no time limit for resubmittal of the base year emissions data that were submitted for early review; however, it is assumed that applicant would resubmit as quickly as possible to allow adequate time after approval to implement the emission reduction plans. Revisions to base year data included in an enforceable commitment, however, must be resubmitted within 90 days, or the company must notify the EPA that revised data will eventually be submitted. Otherwise, the enforceable commitment could be considered withdrawn. The permitting agency would send a notice to this effect to the applicant. The source must then comply on the same schedule as other sources subject to any applicable Section 112(d) standard. If the applicant chooses to resubmit corrected emissions data, the EPA will review the revised estimate within 30 days and, if approvable, will notify the company and publish a notice to that effect.

If, during the public comment period, no adverse public comments are received by the reviewing agency on the proposed base year emissions for a source, the data submission shall be considered approved at the close of the public comment period. The reviewing agency will send notice of approval to the applicant and publish a similar notice by advertisement in the area affected.

In the event that adverse comments are received, the reviewing agency has the authority to determine which, if any, public comments need to be addressed for the base year emissions to be approved. If the reviewing agency agrees that corrections are needed, it will notify the applicant of the disapproval and the reasons for the disapproval. An applicant may then correct disapproved base year emissions data and submit the revised base year emissions data or revised enforceable commitment. The same time limitations for resubmittal of base year emissions data apply as described in the above paragraph.

If the reviewing agency is satisfied that the revised submission accounts for the adverse comments, it will send notice of approval to the applicant and publish the approval by advertisement in the area affected. The revised submission will not undergo another public comment period. If the applicant does not address all the comments, the agency shall return the submission with a list of reasons for disapproval. The same time limitations for resubmittal apply as described in the above paragraph.

The reviewing agency may determine that the adverse comments do not warrant changes to the submittal. If this is the case, the reviewing agency will send notice of approval to the applicant and publish the approval and the reasons for not accepting the adverse comments by advertisement in the area affected.

Once base year emissions have been approved, the EPA will honor the data and will not change criteria for approval arbitrarily. However, review of base year emissions does not provide an absolute shield against changes. Discovery of incorrect or fraudulent information in the emissions data or supporting materials even after its initial approval could potentially invalidate the base year data and require revision to it. In the case of fraudulent information, the EPA may bring an enforcement action against the source owner or operator under Section 113 of the CAA. Such discrepancies could be discovered at any stage of the process, including during review of the permit application. Base year data should be carefully reviewed and approved by knowledgeable company officials before submittal.

SECTION 63.77 - APPLICATION PROCEDURES

The request for a compliance extension and alternative emission limitation will be in the form of a permit application. The application should contain the information necessary to demonstrate achievement of the early emission reductions by the appropriate deadline, as well as any additional information required for a complete permit application (as specified in regulations under Part 70 or 71,¹ which implement permit programs required under Title V of the CAA as amended). In most instances, the application must be received by the appropriate permitting authority before proposal of an applicable Section 112(d) standard. However, there are two exceptions. The first exception is for sources that previously made an enforceable commitment, where the permit application must be received no later than December 1, 1993 (which may be after proposal of an applicable standard). The second exception is for sources which have achieved qualifying reductions prior to proposal of an applicable Section 112(d) standard but which are unable to submit a permit application before proposal because a Federal permit program has not been established (i.e., Part 71 Federal permitting regulations have not been promulgated) and the State does not have a permit program approved pursuant to Title V of the CAA. These permitting programs will be necessary to define the information needed for a complete permit application. This situation may arise within the next year or so, before Part 71 Federal permitting regulations are promulgated and any State permitting programs are approved. Therefore, to take this situation into account, the rule specifies that the deadline for submitting permit applications under the Early Reductions Program is the later of the following dates:

- (1) the date of proposal of an applicable Section 112(d) standard; or

¹ NOTE: Federal Part 71 permitting regulations have not been proposed or promulgated. The final Early Reductions rule, therefore, cannot refer to unissued regulations. When Part 71 regulations are issued for Early Reductions sources, the Early Reductions rule may be amended.

- (2) 120 days after promulgation of Part 71 regulations or 120 days after approval of a State permit program under Title V of the CAA, whichever occurs first.

It is recommended that owners or operators in this situation notify the appropriate EPA Regional Office of their intent to submit a permit application containing an early reductions demonstration. The EPA Regional Office, in turn, will notify the potential applicant when the Part 71 regulations have been promulgated or the appropriate State has received approval for a Title V permit program, whichever occurs earlier. This will give the applicant timely notice of an approaching permit application submittal deadline.

The permit application for sources with an enforceable commitment should demonstrate that a qualifying early reduction has been achieved or, where applicable, will be achieved by January 1, 1994 (as required in Section 63.74 of the proposal rule). Test data to support the post-reduction emissions data may be submitted up to 120 days after the deadline for submittal of the permit application. This submittal allows the source flexibility to provide required post-reduction emission data from tests conducted after final controls or reduction strategies are in place. The permit application should specify appropriate emission limitations for the source and the test method or equivalent means used to determine the emission limitation, as well as appropriate monitoring, reporting, and recordkeeping requirements. Under the Part 70 permitting regulations published July 21, 1992 (57 FR 32250), current EPA plans would require that the permit be issued within nine months after receipt of the complete permit application. Until that time, the enforceable commitment would remain the enforceable instrument for the source. Section 112(i)(5)(B) of the CAA provides that the commitment "shall be enforceable to the same extent as a regulation under this section."

If the relevant State or local agency has an approved Title V permit program, it will be responsible for processing the application according to provisions in 40 CFR Part 70. For sources in States without approved Title V permit programs, applications should be submitted to the EPA pursuant to 40 CFR Part 71. A fee will be required by

States to offset the costs of reviewing Title V permit applications. (If the EPA is the permitting authority, a fee as specified in 40 CFR 71 would be required.)

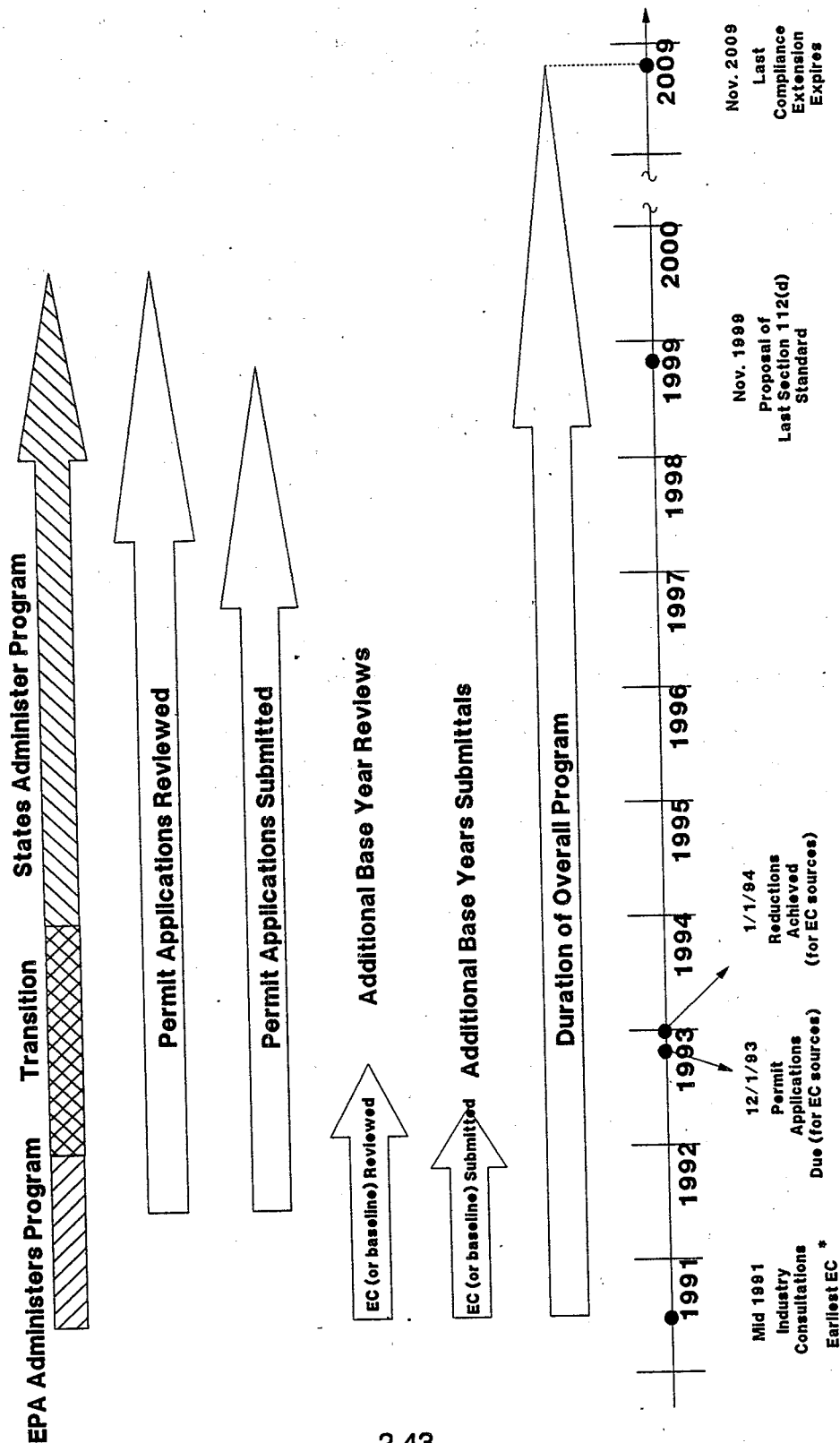
The overall schedule for review of permit applications submitted as part of the Early Reductions Program is presented in Figure 2-9. In order to meet schedules in the CAA, the last Section 112(d) proposal date would be proposed about November 1999. If permit applications must be submitted prior to proposal, and review of the application must be accomplished within 9 months of receipt of a complete application, all early reduction permits will be reviewed by the end of the year 2000. According to this schedule, this is the last year an extension would be granted.

SECTION 63.78 - EARLY REDUCTION DEMONSTRATION EVALUATION

The permitting authority evaluates all available information in determining whether to approve or deny a permit application. This includes information supplied by the source owner or operator in the early reduction demonstration and information received from public comments on the application. Specific to the demonstration of early reductions, the permitting authority would decide whether the information and data required have been provided and whether data were valid considering the following:

1. Did the facility provide the necessary plant identifying information to adequately describe the source and the emission points within the source?
2. Does the source meet one of the definitions described in Section 63.73?
3. Were emission tests conducted in accordance with the procedures and requirements of the early reductions rule?
4. Were justifications acceptable for using something other than testing to establish post-reduction emission data?
5. Are engineering calculations correct and the assumptions underlying the calculations valid?

EARLY REDUCTIONS PROGRAM DURATION OF KEY ACTIVITIES



* EC: Enforceable Commitment

Figure 2-9. Early Reductions Program Duration of Key Activities

6. Have emission factors been appropriately applied and can their use be reasonably expected to represent the emissions from the source accurately?
7. Are material balance data adequately documented by records and sufficiently accurate to give credible emission estimates?
8. Have all HAP emissions from each source for which a compliance extension is requested been documented and included in the calculations?
9. Are base year emissions within allowable limits?
10. Were high-risk weighting factors appropriately applied to all high-risk HAP's?

After evaluating a permit application containing an early reduction demonstration, the permitting authority will make a determination to either approve or deny it. Specific reasons for denial include but are not limited to:

1. The information provided by the owner or operator is incomplete.
2. The source is not correctly identified.
3. The required 90 (95) percent reduction has not been demonstrated or it has not continued to be achieved after demonstration.
4. The base year or post-reduction emission data are incorrect or not sufficiently reliable or well-documented to determine with reasonable certainty that required reductions have been achieved. (Sources which submit base year emission data for review early, including sources which submit an enforceable commitment, should not be subject to a second base year review at the permit application stage. Note, however, that base year emission data could change at this stage if they are found to be based on incorrect or fraudulent information.

5. The emission of HAP's or the performance of emission control measures are sufficiently unreliable as to preclude determination that the required reductions have been or will continue to be achieved.

If the permit is denied, the permitting authority will notify the applicant of the denial and state the reasons for that denial.

SECTION 63.79 - APPROVAL OF APPLICATIONS

If the application is approved, the reviewing agency will establish an enforceable emission limitation for the source by issuing a permit under Title V of the CAA. The enforceable emission limitation will reflect the level of control which qualified the source for the compliance extension. The permit will also include operating conditions and compliance monitoring, reporting, and recordkeeping requirements necessary to ensure continuing compliance.

Although the 90 (95) percent reduction is expressed as an annual emission limitation, the permit itself may contain specific conditions for specific types of emission points. For example, a storage tank may require certain types of equipment, a process may be limited to a certain number of operating hours per year, or an equipment leak program may specify work practices. Other points or control devices may require frequent or continuous monitoring. Alternatively, an owner or operator may be able to receive the overall limitation as the permit condition, if they are able to demonstrate to the permitting authority's satisfaction on a periodic basis that the alternative emission limitation is being achieved, and that control equipment is properly operated and maintained.

The alternative emission limitation would be effective and enforceable immediately upon issuance of the permit for the source and would remain in effect until six years after the compliance date for the applicable Section 112(d) standard. At that time, the source would be required to comply with the standard. Since permits will be issued for periods not to exceed five years, there will be at least two permits in effect over the six-year compliance extension. The second and subsequent permit,

which will be issued when the first one expires, will contain the alternative emission limitation for the remainder of the six-year extension, and as appropriate, the limitations to comply with the Section 112(d) standard.

A source in a nonattainment area (an area where a national ambient air quality standard is exceeded) may need to obtain offsets for new construction or modification activities. Emission reductions of HAP's required for the purpose of obtaining an alternative emission limitation under Section 112(i)(5) of the CAA are not creditable for the purpose of meeting an offset requirement under Section 173(a)(1). The HAP reductions are not allowed as offsets in this instance because Section 173(c)(2) of the CAA states: "Emission reductions otherwise required by this Act shall not be creditable as emission reductions for purposes of any such offset requirement." A source successfully participating in the Early Reductions Program will be granted an alternative emission limitation (for the duration of the compliance extension period) in lieu of a Section 112(d) emission standard. Therefore, the reduction of HAP emissions under the Early Reductions Program is a substitute for the reduction of HAP emissions as "required" under a Section 112(d) standard.

However, a source owner or operator may use as offsets any reductions in HAP emissions in excess of those required to qualify for an extension under the Early Reductions Program or reductions in non-HAP emissions which are coincidentally obtained through use of the HAP emission reduction measures, if such reductions are not required by any other provision of the CAA and meet the other requirements for offsets under New Source Review (NSR) rules. These reductions are allowed as offsets pursuant to Section 173(c)(2) of the CAA which further states: "Incidental emission reductions which are not otherwise required by this Act shall be creditable as emission reductions for such purposes..." As a simple example, consider a source emitting ethylene (a non-HAP) and ethylene oxide (a HAP) that is controlled for purposes of qualifying for a compliance extension under the Early Reductions Program. Assume that the control measures used reduced ethylene oxide emissions by 92 percent or 46 tons per year and also reduced ethylene emissions by 20 tons per year, although there is not a requirement to reduce the ethylene emissions.

Further, assume that the permit issued to the source requires a continuing 92-percent reduction. In this instance, the 20 ton-per-year reduction in ethylene emissions may be used, if needed, to offset an increase in volatile organic compound emissions from new construction or a modification of an existing source. Additionally, since the source achieved a 2-percent HAP reduction beyond that required to obtain an extension, the extra 2-percent reduction, or 1 ton per year in this example, may also be used as an offset.

Emission reductions of HAP's achieved under the Early Reductions Program may be used for netting purposes under the NSR rules with some limitations. In general, an owner or operator considering a physical or operational change at a major stationary source (as defined in the NSR rules) will be subject to (1) the requirements of Section 173(a) [e.g., offsets, application of LAER] in nonattainment areas or ozone transport regions or (2) the requirements for Prevention of Significant Deterioration (PSD) [e.g., application of BACT] in attainment or unclassifiable areas, unless the changes will not cause a "significant net emissions increase" in pollutants subject to NSR. To determine the net emissions increase for NSR purposes, the owner or operator is allowed to sum the emissions increase from the proposed change with any creditable increases and decreases elsewhere at the plant.

The NSR rules and the EPA's "Emissions Trading Policy Statement (ETPS)" (51 FR 43823, December 4, 1986) limit the creditability of some decreases in emissions for this "netting" procedure. For example, the NSR rules for nonattainment areas state that a decrease in emissions is creditable only to the extent that "...the reviewing authority has not relied on it in issuing any permit under regulations approved pursuant to 40 CFR Part 51 Subpart I or the State has not relied on it in demonstrating attainment or reasonable further progress;..." [40 CFR 51.165(a)(1)(vi)(E)]. The PSD rules contain similar language. Essentially what this restriction does is prevent sources from obtaining two credits for one reduction, where the credits are related to the same air quality objective (which in this case is the attainment/maintenance of national ambient air quality standards). Thus, as an

example, a source cannot use an emissions reduction to meet reasonable further progress requirements and as a reduction credit in netting calculations.

However, under the ETPS, HAP decreases credited under the Early Reductions Program also may be credited for purposes of determining the net emissions increase for a plant change proposed at a later time, provided of course that the reduced HAP's also are pollutants subject to the NSR rules and that the decreases meet all other requirements for netting. In such situations, the HAP decreases produce benefits for two different air quality objectives and one credit can be given toward each; the HAP credit is associated with the air toxics reduction objectives of Section 112 of the CAA and the NSR credit is associated with the attainment/maintenance of national ambient air quality standards and PSD. The amount of the HAP reduction creditable in these situations will be limited if the netting calculations involve HAP emissions increases. Specifically, the creditable HAP reductions from the Early Reductions Program will be reduced by the amount of any increase in HAP emissions involved in the netting calculations. If no HAP increases are involved, the entire HAP reduction is creditable.

The principle behind this policy limitation is similar to that behind the netting restriction in the NSR rule mentioned above, namely that a reduction should not receive two benefits or credits (double counting) for the same air pollution control objective. The objective of the Early Reductions Program under Section 112 of the CAA is to achieve significant reductions of HAP's at existing facilities. Sources that achieve such HAP reductions in accordance with the rules promulgated today receive credit for the reductions in the form of a six-year compliance extension for applicable Section 112(d) standards. If the reductions also were allowed to be used as netting reduction credits for physical or operational changes involving increases in HAP's, then the reductions in effect would be promoting HAP increases elsewhere at the plant site by helping such facilities net out of NSR control requirements. Under such a scenario, an owner or operator could receive a six-year compliance extension to Section 112(d) standards for some portion of the plant, net out of NSR control

requirements, and have overall HAP emissions equal to preexisting levels. Clearly this is not a result consistent with the objectives of the CAA.

To illustrate the effect of this policy, consider a plant site in which a portion of the facility (e.g., a process unit) participates in the Early Reductions Program and achieves a 50 tons per year reduction of HAP's, which also are particulate matter. Later, the owner or operator proposes a physical or operational change at another section of the plant which would increase particulate emissions by 75 tons per year, and none of the emissions increase would be HAP's. In this case, the owner or operator can use all of the HAP reductions from the Early Reductions Program to net against the particulate emissions increase because no HAP increases are involved. However, if 30 tons per year of the proposed 75 ton increase are HAP's, then only 20 tons per year of the HAP reductions under the Early Reductions Program could be used as reduction credits in any netting calculations (20 tons per year is the amount by which the HAP reduction exceeds the proposed HAP increase). Finally, if 50 or more tons per year of the proposed 75 ton increase would be HAP emissions, then none of the HAP reductions from the Early Reductions Program could be used to net against the particulate emissions increase (because the HAP increase from the proposed modification is equal to or greater than the HAP reductions from the Early Reductions Program).

It should be noted that this netting policy for HAP reductions is applicable only for NSR programs. Under Section 112(g) of the CAA, the EPA must promulgate separate requirements for modification of HAP sources. The provisions to implement Section 112(g) are under development but will not become effective in a State until the State has obtained approval of a Title V permitting program.

SECTION 63.80 - ENFORCEMENT

All base year and post-reduction emissions information submitted as part of a permit application or an enforceable commitment are considered to have been requested by the Administrator under the authority of Section 114 of the CAA.

Therefore, any fraudulent statements contained in the such submittals will be considered violations of Section 114 and are actionable under Section 113 of the CAA. In appropriate situations, fraudulent statements in these submittals will be considered violations of 18 U.S.C. 1001, the general false swearing provision of the United States Code.

If an early reductions demonstration in a permit application is disapproved, whether or not the source is subject to an enforceable commitment, the owner or operator must comply with any applicable Section 112(d) standards. Failure to comply with the applicable Section 112(d) standards is actionable under Section 113 of the CAA. Similarly, failure to comply with an alternative emission limitation is actionable under Section 113 of the CAA.

SECTION 63.81 - RULE FOR SPECIAL SITUATIONS

When a source is subject to multiple Section 112(d) standards, the proposal date of the first applicable standard is the proposal date which governs the deadline for the Early Reductions Program. In other words, a permit application or enforceable commitment must be submitted prior to proposal of the earliest Section 112(d) standard that applies to any emission point in the source definition. The extension for compliance, however, begins on the compliance date of the Section 112(d) standard applicable to the emission point. This will lead to different compliance extension expiration dates for different emission points in a source subject to more than one Section 112(d) standard.

3.0 PROGRAM IMPLEMENTATION

The EPA is committed to making the Early Reductions Program a success and will play an active role in implementation of the early reductions regulations. The EPA recognizes the burden this Program could put on the EPA Regional Offices and State agencies. In an effort to assist the Regional Offices and the states, the EPA has developed a management system for review of enforceable commitments and is also committing a pool of its staff to implementation of the Program. Depending on the needs of the Program, the EPA may develop similar management systems for the review of permit applications under the Early Reductions Program.

The objective of this chapter is to prepare the Regional EPA and State reviewers for implementation of the Program. With this in mind, the intent of this chapter is to define the roles of the EPA Headquarters staff, the Regional Offices, and the States in implementing the program. In addition, the appendices provide checklists, tracking forms, and examples of the types of materials reviewing agencies will need to generate.

ENFORCEABLE COMMITMENTS

Initial activity on the Early Reductions Program will be the submittal of enforceable commitments. In fact, enforceable commitments and base year reviews are the only submittals the EPA Regions and States will be able to process at the outset. Neither the EPA Regions nor the States will be able to process a permit application until late 1993.

The reviewing agency (the EPA Regions or later the State) is encouraged to hold preapplication meetings with potential early reductions source representatives, if there is an opportunity to do so. In many cases, the first knowledge that a company wishes to participate in the Program will be when an application is received. However, in situations where the applicant gives advance notice that an application is being prepared, the Regional Office should take advantage of the opportunity to hold a

preapplication meeting. This can be particularly useful in cases such as chemical manufacturing complexes where there are many emission points and the potential exists for numerous source definitions.

As mentioned above, the EPA has developed a management system for review of enforceable commitments. This draft management system is intended to ensure that necessary support is provided to Regional Office reviewers during the early implementation phase of the Early Reductions Program (i.e. post-proposal) and that consistent review and decision-making occurs. The EPA Headquarters will be learning about the scope and complexity of the implementation task, and can minimize problems through regular communication and consultation. This is a highly visible rulemaking, and several constituent groups will follow its progress with a keen interest. The EPA will likely be asked for progress reports and information on how the Program is working. Thus, the internal tracking of important milestones using a computerized reporting system is being emphasized. The Headquarters team will prepare periodic summary reports as necessary.

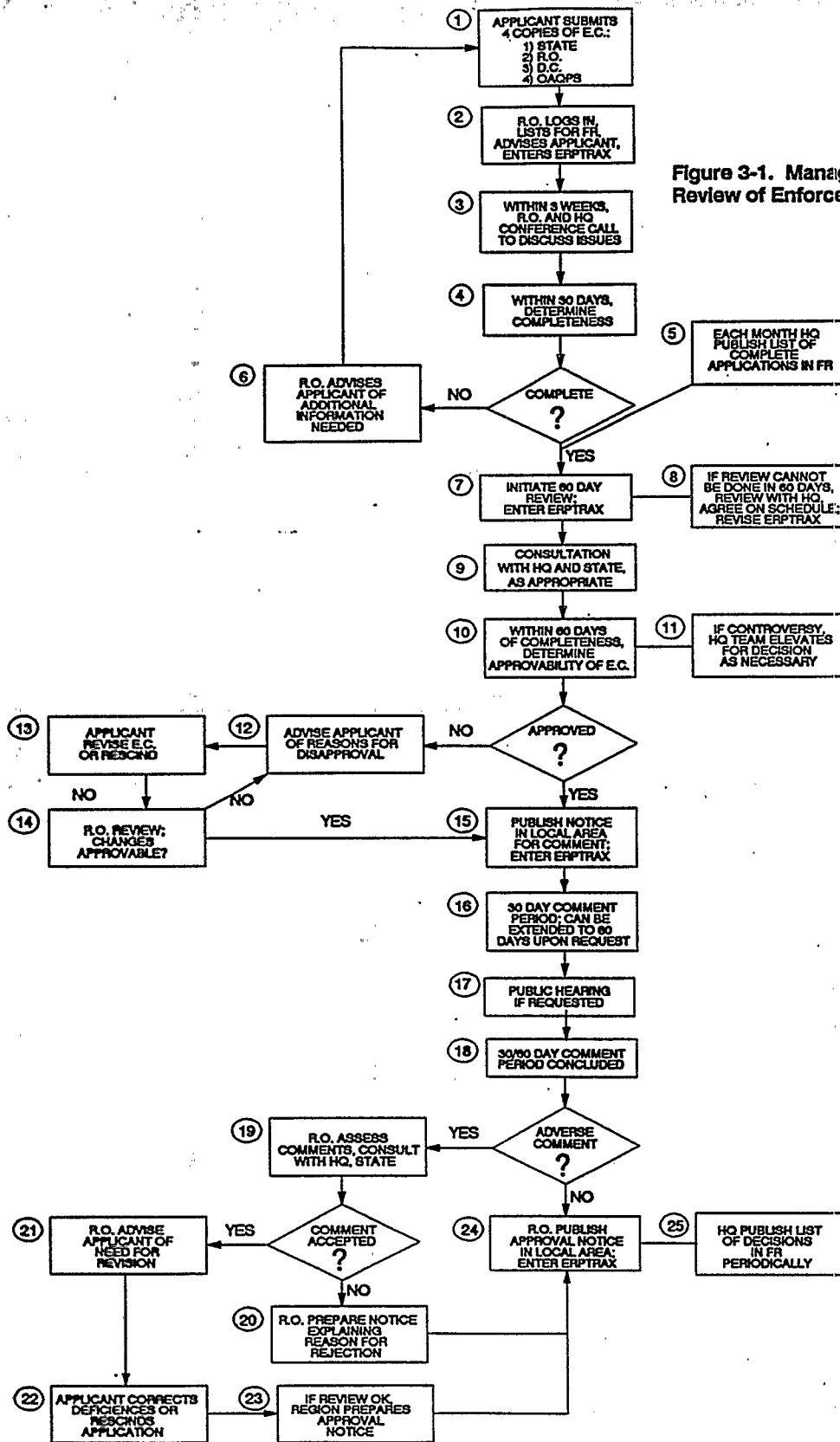
The Early Reductions Program Tracking System (ERPTRAX) is a computer based system for internal EPA use that provides up-to-date tracking information on Early Reductions activity in each Region. It allows significant milestones in the review process to be scheduled and tracked, such as receipt by the Regional Office, and the status of completeness and technical reviews and resubmittals. These tracking needs are mirrored in the early reductions regulations, and the extension is a natural one. Moreover, the system is user friendly, enabling direct input and access by the Regional Office and Headquarters staff.

STEPS IN THE SYSTEM

A schematic of this system is presented in Figure 3-1 and the individual steps are described below.

1. The applicant prepares four copies of the enforceable commitment submittal, sending one to the Regional Office, one to the State, one to SSCD, and one to OAQPS.
2. The Regional Office logs in and advises the applicant of receipt; the date of receipt is entered into ERPTRAX.
3. Within 3 weeks of receipt of application, the Regional Office initiates a conference call with the Headquarters team (and as appropriate, the State) to discuss preliminary assessment, identify issues (including schedule) and get Headquarters commitment for their opinion on completeness.
4. Within 30 days after receipt of the application, the Regional Office, after consultation with Headquarters, makes a completeness determination. (In the early phase of the Early Reductions Program, the Headquarters team will have responsibility for final decisions if there is a dispute.)
5. The OAQPS/DC will prepare and submit for publication a FR notice listing all "complete" enforceable commitment applications received in the previous month.
6. If the application is incomplete, the Regional Office advises the applicant that additional information is needed. This may involve asking for submittal of additional material, or returning the application for substantive revision. The applicant may comply or decide to rescind the application. If a response is not received within 90 days, the application may be considered withdrawn.
7. If the application is deemed complete, the Regional Office enters the completeness date in the computer tracking system and initiates the 60-day application technical review.

Figure 3-1. Management System for Review of Enforceable Commitments



8. If the application cannot be reviewed for approvability in 60 days, the Regional Office should discuss the problem with the Headquarters team. Review periods longer than 60 days should be exceptions, not the rule, and should directly stem from the complexity and scope of a submittal. If it is determined that a longer review time is needed, a new schedule should be established and the applicant so advised. (NOTE: If there has been a pre-application conference, the possibility of extended review should be discussed at that time.) The Regional Office will enter any revised schedules into the computer tracking system.
9. Throughout the application review process, the Regional Office, Headquarters team (and State, as appropriate) should consult via conference call to discuss issues. Within the review period, the Headquarters team (and State) will provide their assessment of the approvability of the application to the Regional Office.
10. Within 60 days (or otherwise agreed upon schedule), the Regional Office will decide on approvability of the application after consultation with the Headquarters team (and the State).
11. If there is a dispute regarding the approvability of the application, it will be the Headquarters team's responsibility to promptly elevate the issue to get a decision. No action is to be taken until a decision is made.
12. If the application is not approvable, the Regional Office will advise the applicant of the deficiencies and the necessary corrective action. (NOTE: The applicant should be advised of significant deficiencies as soon as they are identified.)
13. The applicant may correct deficiencies and submit a revised enforceable commitment to the Regional Office, or rescind the application. Responsibility lies with the applicant for resubmitting the revised commitment in a timely manner. If a response is not received within 90 days, the application may be considered withdrawn.
14. The Regional Office reviews new information for approvability, consulting with the Headquarters team and the State as necessary. If the revised submittal is

not approvable, steps 13 and 14 are repeated with the applicant. If the submittal is approvable, the review process proceeds to step 16.

15. If approvable, the Regional Office will publish a local notice of intent to approve and request public comment (30-day comment period). The Region enters the notice date into the computer tracking system.
16. The thirty-day comment period can be extended to 60 days upon request of an interested party. Local notifications of extension are published by the Regional Office, and the Regional Office also informs the applicant about the extension.
17. If so requested by an interested party, a public hearing on the application may be conducted in the local area.
18. The Regional Office provides comments to the applicant, Headquarters team and State.
19. If adverse comments are received, the Regional Office consults with the Headquarters team (and State) concerning disposition.
20. If comments are not accepted, the Regional Office prepares an approval notice explaining reasons for not accepting comments.
21. If comments are accepted, the Regional Office assesses necessary corrective action and advises the applicant.
22. The applicant may correct any deficiencies and submit them to the Regional Office, or rescind the application. If a response is not received within 90 days, the application may be considered withdrawn.
23. If revisions are acceptable, the Regional Office prepares an approval notice explaining adverse comments and corrective action taken. If revisions are not acceptable, steps 21 and 22 are repeated.
24. The Regional Office publishes a local notice of approval, and enters the date into the computer tracking system.
25. Headquarters includes approval information in the monthly FR notice on complete applications received.

REVIEWER CHECKLISTS FOR ENFORCEABLE COMMITMENTS

Three standard forms are provided in Appendix C to assist reviewers in processing Early Reductions submittals. The forms are designed to be used for either an enforceable commitment or for base year review. Proper use of the forms will require a basic understanding of the Early Reductions Program. For example, a reviewer should be familiar with the flexible source definition. An explanation of how to use each form is given below.

Form A - Source Data Sheet

The source data sheet is used to track a source through the entire review process. A source data sheet should be completed for each specific source. If a company submits an enforceable commitment for three sources in one facility, three source data sheets should be completed.

The source data sheet includes space for general source identification information such as company, location, plant contact, source, and base year. Space is also provided to identify contacts within the EPA Regional Offices and appropriate local agencies. A "submittal diary" is included on the sheet enabling the reviewer to track key dates in the review process such as the dates of approval for completeness and technical review.

Finally, the source data sheet includes space for making notations on the status of the submittal. For example, if the submittal was considered incomplete during the first completeness review, the date the submittal was returned to the applicant for revision can be noted.

Form B - Completeness Review

Form B is to be used for completeness reviews for both enforceable commitments and base year reviews. Page 1 of this form is a summary sheet that includes general identification information and space to summarize deficiencies in the review. Space is also provided to note any obvious technical deficiencies noted during completeness review. Although the purpose of the completeness review is only to

assure that all necessary information is included in the submittal, any technical deficiencies noted during the review should be identified. This will enable the applicant to make any appropriate changes in their submittal prior to technical review, therefore facilitating the review process.

Pages 2 and 3 are a checklist of items that must be present in the submittal. For an enforceable commitment, Sections A through C must be completed. Only Sections B and C must be completed for base year reviews. Every item should be checked "Yes" or "N/A" for a submittal to be complete.

Page 4 of Form B provides a format for conducting completeness checks for each emission point in the source. Space is provided for 15 emission points. If a source includes more than 15 emission points, this page can be copied as necessary.

Each emission point can be listed on the form using an emission point identification number or description provided by the source. The reviewer can systematically check for completeness using either the blocks under "testing" or "calculations," depending upon the method used to estimate base year emissions. Symbols such as checkmarks or dashes can be used to complete all applicable boxes on the form, or letters such as "Y," "N," and "N/A" corresponding to "Yes," "No," and "Not Applicable." For example, if an EPA approved test method is used for the emission estimate, a checkmark would be placed in the box for "EPA Methods" and dashes would be placed in all other boxes indicating "Not Applicable." Similarly, if a material balance was used and complete information was provided describing the material balance procedures, "N/A" would be placed in all boxes corresponding to testing and AP-42, and "Y" would be placed in the boxes for "Rationale for not Testing," "Material Balance," "Discussion of Method," and "Detailed Calculations."

Because of the complexity of some submittals and the numerous alternatives for presenting emissions data, many completeness determinations will be more subjective than others. The table provided in Form B lends to an objective review for completeness. In some cases, yes or no answers may not be adequate. Some space has been provided on the form for making notes and additional pages may be needed by the reviewer. The final column on the form is for making the completeness

determination by judging the emission estimates for each emission point as either complete or deficient. When an emission point is marked deficient, some explanation of the deficiency will be needed to assist applicants in making necessary changes to their submittal.

Form C - Technical Review

Form C includes 2 pages. Page 1 is a table for tracking the technical review of each emission point. Page 2 includes a list of statements designed to initiate the thought process needed to determine if the emissions data are valid and accurate. It is not necessary for the reviewer to complete page 2 for each specific emission point. Rather, the reviewer can use these statements to ensure thorough review of the emissions data.

A detailed review of the estimation methodology and calculations will need to be performed on many, if not all, emission points. It will be left to the discretion of the reviewer to pick individual emission points for detailed reviews. Obviously, all of the larger emission points should be checked thoroughly while other emission points can be checked randomly. It may be possible to check every emission point in smaller sources while selecting only major emission points in sources containing a large number of emission points.

BASE YEAR SUBMITTALS

The other activity that Regional Offices and States will immediately become involved with is review of base year submittals. One provision of the early reductions rule is that a facility owner or operator considering participation in the Program can request a review of base year emissions. This allows the source owner or operator to establish the base year emission level for the source prior to submitting a permit application.

The review of base year submittals is nearly identical to the review of enforceable commitment submittals. The only difference is that base year submittals will not include a commitment to reduce HAP emissions or a general control plan.

Base year submittals will also be entered into the EPA's early reductions tracking system. The steps for review of base year submittals will be identical to those presented in Figure 3-1 for the review of enforceable commitments.

PERMIT APPLICATIONS

As indicated earlier, the EPA may develop a management system for permit applications containing early reductions sources similar to the system presented in this chapter for enforceable commitments and base year submittals. Such a system will not be introduced until after the permitting program is in place.

4.0 INTERFACE WITH THE 33/50 PROGRAM

The 33/50 Program is part of the EPA's overall pollution prevention strategy and the first of its new pollution prevention initiatives. Like the Early Reductions Program, participation in this program is fully voluntary. Many of the companies that are currently participating in the 33/50 Program may also participate in the Early Reductions Program. The two programs are complementary, and the intent of this chapter is to minimize confusion over the differing requirements and encourage participation in both programs.

DESCRIPTION OF THE 33/50 PROGRAM

The 33/50 Program was announced in February 1991 and is one of the major components of the EPA's pollution prevention strategy. This program is designed to encourage voluntary reduction of toxic releases and off-site transfers of 17 chemicals. The 17 targeted chemicals are:

- Benzene
- Cadmium and Cadmium Compounds
- Carbon Tetrachloride
- Chloroform (Trichloromethane)
- Chromium and Chromium Compounds
- Cyanide Compounds and Hydrogen Cyanide
- Lead and Lead Compounds
- Mercury and Mercury Compounds
- Methylene Chloride (Dichloromethane)
- Methyl Ethyl Ketone
- Methyl Isobutyl Ketone
- Nickel and Nickel Compounds
- Tetrachloroethylene (perchloroethylene)
- Toluene
- 1,1,1-Trichloroethane (methyl chloroform)
- Trichloroethylene
- Xylene (all isomers)

This list of chemicals is drawn from the Toxics Release Inventory (TRI) and based on recommendations from the EPA program offices. The following factors were considered in developing the list: high production; high releases and off-site transfers

relative to total production as indicated by TRI reports; potential for pollution prevention activities; and potential for a wide range of health and environmental effects.

The 33/50 Program establishes a national goal to reduce releases and off-site transfers of these 17 chemicals by one-third by the end of 1992 and one-half by the end of 1995 with emphasis on the use of pollution prevention techniques. The baseline for these reduction goals is the 1988 TRI. Based on the TRI, aggregate releases and off-site transfers of the targeted chemicals were 1.4 billion pounds in 1988.

Thus far, the Administrator has asked thousands of U. S. companies to participate in this program. Each company has been asked to examine its processes to identify and implement cost-effective pollution prevention practices related to the 33/50 Program chemicals. Companies have also been asked to develop written commitments to publicly state their reduction goals and how they plan to achieve them. The following are general guidelines and milestones for what the EPA has asked companies to do.

- May 15, 1991 - receipt of company-wide numerical commitments.
- July 30, 1991 - receipt of facility specific and chemical specific numerical commitments including discussion of pollution prevention activities, as appropriate.
- November 30, 1991 - receipt of updated information, as needed, on company and facility specific commitments as a result of activities with other regulatory planning or toxic use reduction programs, or the Early Reductions Program for Section 112(d) standards under the Clean Air Act.

Progress in achieving the 33/50 Program goals will be monitored through the use of information reported to the TRI.

INTERFACE BETWEEN THE 33/50 PROGRAM AND THE EARLY REDUCTIONS PROGRAM

The EPA intends to implement the 33/50 Program and the Early Reductions Program in a coordinated manner to minimize confusion over their differing requirements and to encourage participation. The Early Reductions Program is being implemented by a rule defining procedures and requirements that must be followed to obtain a compliance extension.

Any HAP emission reductions documented under the Early Reductions Program can also be submitted and credited under the 33/50 Program and vice versa. Reduction credits are not "used up" when applied to one of these programs. However, reductions achieved under the 33/50 Program will not necessarily qualify a source for a compliance extension under the Early Reductions Program. In general, the Early Reductions Program documentation requirements are more stringent. Also, sufficient control must be employed to achieve at least 90 (95) percent reduction in base year HAP emissions from the source.

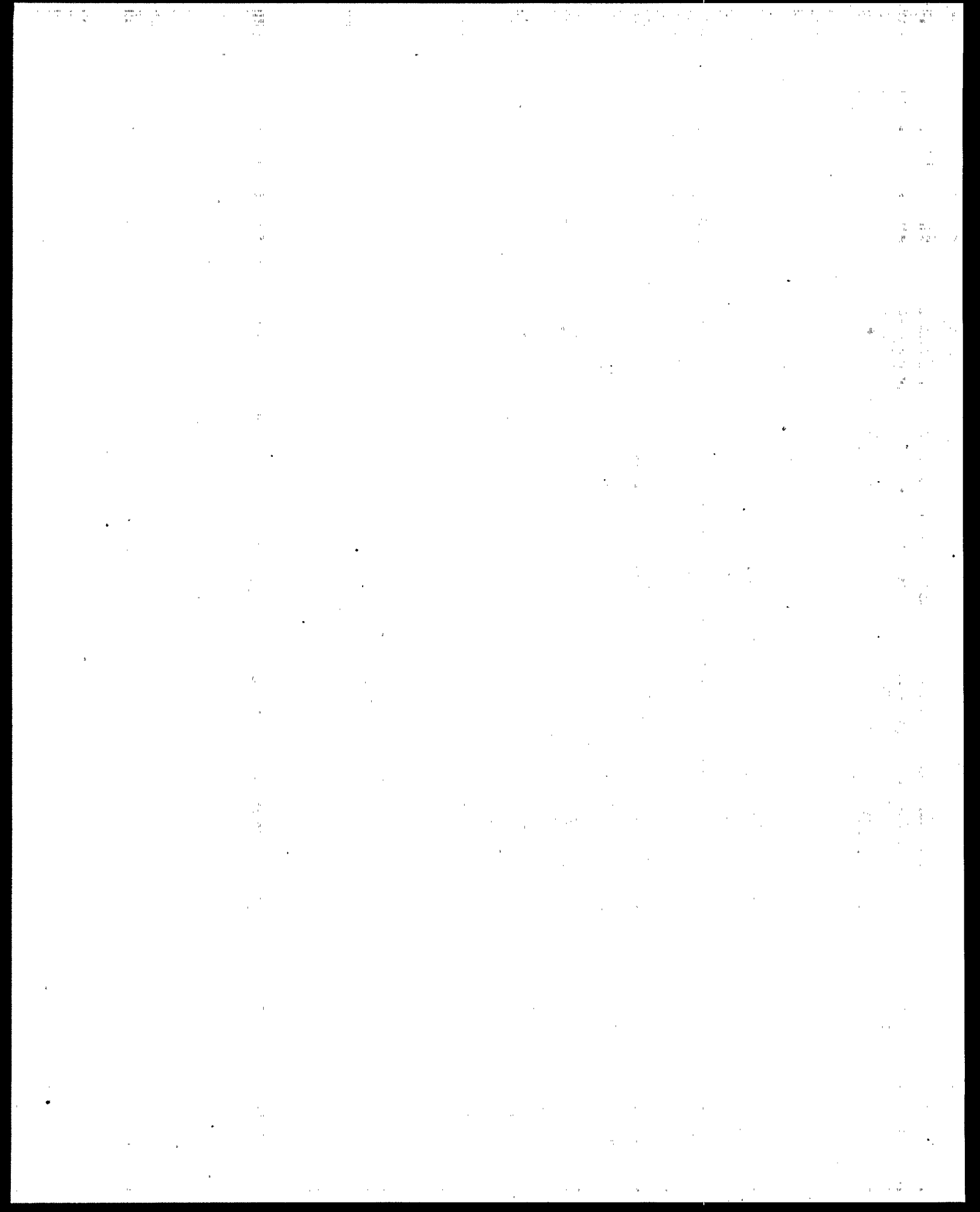
Although the 90 (95) percent reduction requirement for the Early Reductions Program may seem much higher than the reductions goals of the 33/50 Program, it is important to note the differences in the emission sources. Under the Early Reductions Program, an owner or operator may choose to define the source as a subset of the emission points within the plant site. In the 33/50 Program, the source is always the entire plant site. Therefore, by voluntarily reducing air emissions from a single source or group of sources by 90 (95) percent, a source owner or operator may or may not achieve the 33/50 Program goal of reduction from all media. Additionally, it is important to note the differences in base years. The base year for the Early Reductions Program is generally 1987 or later, whereas the base year for the 33/50 Program is 1988. It should also be noted that properly documented reductions under the 33/50 Program may qualify for credit under the Early Reductions Program because of the flexibility afforded an applicant in defining a source as a subpart of an entire facility.

As with the 33/50 Program, the EPA encourages participation in the Early

Reductions Program through the adoption of pollution prevention measures. The EPA defines pollution prevention as the use of materials, processes, practices, or products that avoid, reduce or eliminate wastes or toxic releases, through activities such as toxic use reduction, source reduction and closed-loop recycling.

APPENDIX A

Guidelines for Submitting Enforceable Commitments



GUIDELINES FOR SUBMITTING ENFORCEABLE COMMITMENTS

Introduction

The purpose of this appendix is to provide updated guidelines for submitting enforceable commitments. To date, EPA has received over 70 submittals from companies wishing to participate in the Early Reductions Program. Most of these companies are part of the Synthetic Organic Chemicals Manufacturing Industry (SOCMI).

In reviewing these submittals, EPA has gained experience in determining an acceptable format for facilitating review and acceptance of the information provided. This appendix presents a suggested format for organizing a submittal and provides an example of a complete and technically acceptable enforceable commitment.

It is intended that this information will be used by both regulatory agencies and industry to improve the organization and presentation of enforceable commitments. Some of the suggested information is not required by the Early Reductions rule. However, inclusion of this information will help facilitate review of the submittal and will also provide a more thorough document for public review.

Organization of This Appendix

This appendix is organized into six sections. Sections A-E present components of an enforceable commitment. Rationale for including specific information is provided in this part of the report.

Section F is a sample enforceable commitment containing all of the required information for a complete submittal. For the most part, the information included in Section F has been taken from actual enforceable commitments received by EPA.

Note on Confidential Business Information

When parts of a submittal are claimed confidential by the source, efforts should be made to create a complete and coherent nonconfidential submittal to accompany the confidential version. The EPA is sensitive to confidential business information and does not want source owners and operators to reveal information that may jeopardize the company's competitive position. However, the applicant must also realize that there is great public interest in the Early Reductions Program and the nonconfidential information needs to be complete and self-standing. Simply blacking out confidential portions of the submittal or referring to confidential portions provided under a separate cover will not be accepted. The non-confidential version should be devoid of all confidential markings.

The burden of providing a complete nonconfidential submittal will be placed on the applicant. Information considered confidential will need to be described in a way so that someone reviewing the nonconfidential version is able to follow and understand how emissions were computed. If confidential information is used in the computation, the type of information and the methodology used to compute emissions should be described in narrative form. If necessary, calculation inputs can be combined and presented as lumped parameters to protect confidential information, yet provide calculation details.

If confidential information is submitted, it should clearly be stated in the cover letter. The letter should describe the nature and location of the confidential business information in the submittal.

Contents of a Complete Enforceable Commitment

Preferred Order of Presentation

A. Cover Letter

B. Table of Contents

- a) Identification of Major Headings
- b) Page Numbers
- c) List of Tables and Figures
- d) Appendices

C. Site Plan

- a) Plan of Contiguous Facility
- b) Detailed Identification of the Source and Emission Points

D. Source Identifying Information

- a) General Source Description
- b) Activity Causing HAP Emissions
- c) List of Emission Points
 - 1) Identification of emission points using plant ID
 - 2) List of HAP's for each emission point
 - 3) Total emissions for each emission point
 - 4) Total weighted emissions for each emission point
 - 5) Permit ID numbers for each emission point
- d) General Plan for Achieving Reduction
- e) Evidence that Base Year Emissions are not Artificially or Substantially High

E. Emissions Data

- a) Presentation of emissions data

A. Cover Letter

A complete cover letter for an enforceable commitment should include the following:

- 1) A general descriptive identification of the source or sources.
- 2) An identification of the source definition that applies to the source(s).
- 3) Identification of the base year.
- 4) A table summarizing the base year emissions from each source, including both the total HAP emissions and the total HAP emissions adjusted for high risk pollutants, if appropriate.
- 5) A statement certifying that the base year emission estimates represent the best available emission estimates.
- 6) A statement including an understanding that the base year emission estimates constitute a response to an EPA request under authority of section 114 of the Clean Air Act.
- 7) A statement specifying that the base year emissions are within allowable limits specified in any applicable law, regulation, or permit condition.
- 8) A statement committing the source owner or operator to achieving the required post-reduction emissions by January 1, 1994.
- 9) A table showing the post-reduction emission level to be achieved, including both the total HAP emissions and the total HAP's adjusted for high risk pollutants.
- 10) Identification of confidential business information in the submittal.
- 11) The name of the plant contact who would be able to answer any technical questions regarding the submittal.
- 12) The signature of a responsible official representing the company that controls the contiguous area under common control containing the source.

A sample cover letter is provided on the next page. Each of the items listed above are identified by number and with bold typeface.

SAMPLE COVER LETTER

April 1, 1992

Director
Air, Pesticides, and Toxic Management Division
EPA Region IV
345 Courtland Street, N.E.
Atlanta, GA 30365

Re: Enforceable Commitment for XYZ Chemical

Dear Sir/Madam:

In accordance with Title 40 Part 63 of the Code of Federal Regulations, we wish to participate in the Early Reductions Program for one source located within our Raleigh, North Carolina, facility. **This source is identified as a group of emission points located within the contiguous plant site. These emission points are listed in Table 1 on page __ of this submittal.**

(1)

Attached is a site plan of the contiguous facility identifying the Early Reductions source. Also included is a detailed site plan of the source that identifies each emission point using plant identification numbers.

The source conforms to source definition a(4) under section 63.73. A demonstration that the source conforms to this definition is included along with evidence that the base year emissions were not unusually high. As provided in the attachment, the base year (1987) HAP emissions from this source were as follows:

(2)

(3)

(4)

	Total HAP Emissions	Weighted HAP Emissions
Source A	150 tons/yr	235 tons/yr

I certify to the best of my knowledge that the base year emissions given above (5) (6) are correct and constitute the best available data for base year emissions from the source and acknowledge that these estimates are being submitted in response to an EPA request under Section 114 of the Act. I further certify that the base year (7) emissions provided for all emission points in the source do not exceed allowable emission levels specified in any applicable law, regulation, or permit condition. I commit to achieve before January 1, 1994 the stated post-reduction level(s) at the source, which will provide the 90 (95) percent reduction required to qualify for the compliance extension, and acknowledge that this commitment is enforceable as specified in Title 40 Part 63 Subpart D of the Code of Federal Regulations.

We commit to achieve, before January 1, 1994, the following post-reduction emission levels: (8)

	Total HAP Emissions	Weighted HAP Emissions
Source A	15 tons/yr	23.5 tons/yr

(9)

These post-reduction emission levels will provide the 90 percent reduction required to qualify for a compliance extension. I acknowledge that this commitment is enforceable as specified in Title 40, Part 63, Subpart D of the Code of Federal Regulations.

Please note that process information regarding temperature, pressure, and rates (10) of reaction contained in the calculation sheets for the process vents on pages 6-8 of Appendix A are considered confidential.

If you have any questions concerning the content of this submittal, please contact (11) Joe Smith at 919-555-0000.

Sincerely,

George S. Jones
Plant Manager

(12)

B. Table of Contents

Including a Table of Contents in the enforceable commitment will help facilitate the review process. The table should identify each major section of the submittal and give a corresponding page number. Page numbering is critical for the reviewing agencies. The submittal is reviewed concurrently by as many as three regulatory offices. By having page numbers, the respective agencies can discuss various components of the submittal. In addition, page numbering helps the regulatory agency pinpoint deficiencies, subsequently making it easier for industry to address any comments as a result of completeness or technical review.

A sample Table of Contents is given on the following page.

SAMPLE TABLE OF CONTENTS

Table of Contents

	<u>Page</u>
List of Tables	i
List of Figures	ii
Site Plan	
Plan of Contiguous Facility	1
Detailed Identification of the Source and Emission Points	2
Source Identifying Information	
General Source Description	3
Activity Causing HAP Emissions	3
List of Emission Points	4
General Plan for Achieving Reduction	5
Evidence that Base Year Emissions Are Not Artificially or Substantially Greater	6
Emissions Data	7
Process Vent A	8
Process Vent B	11
Storage Tank A	14
Process Wastewater	17

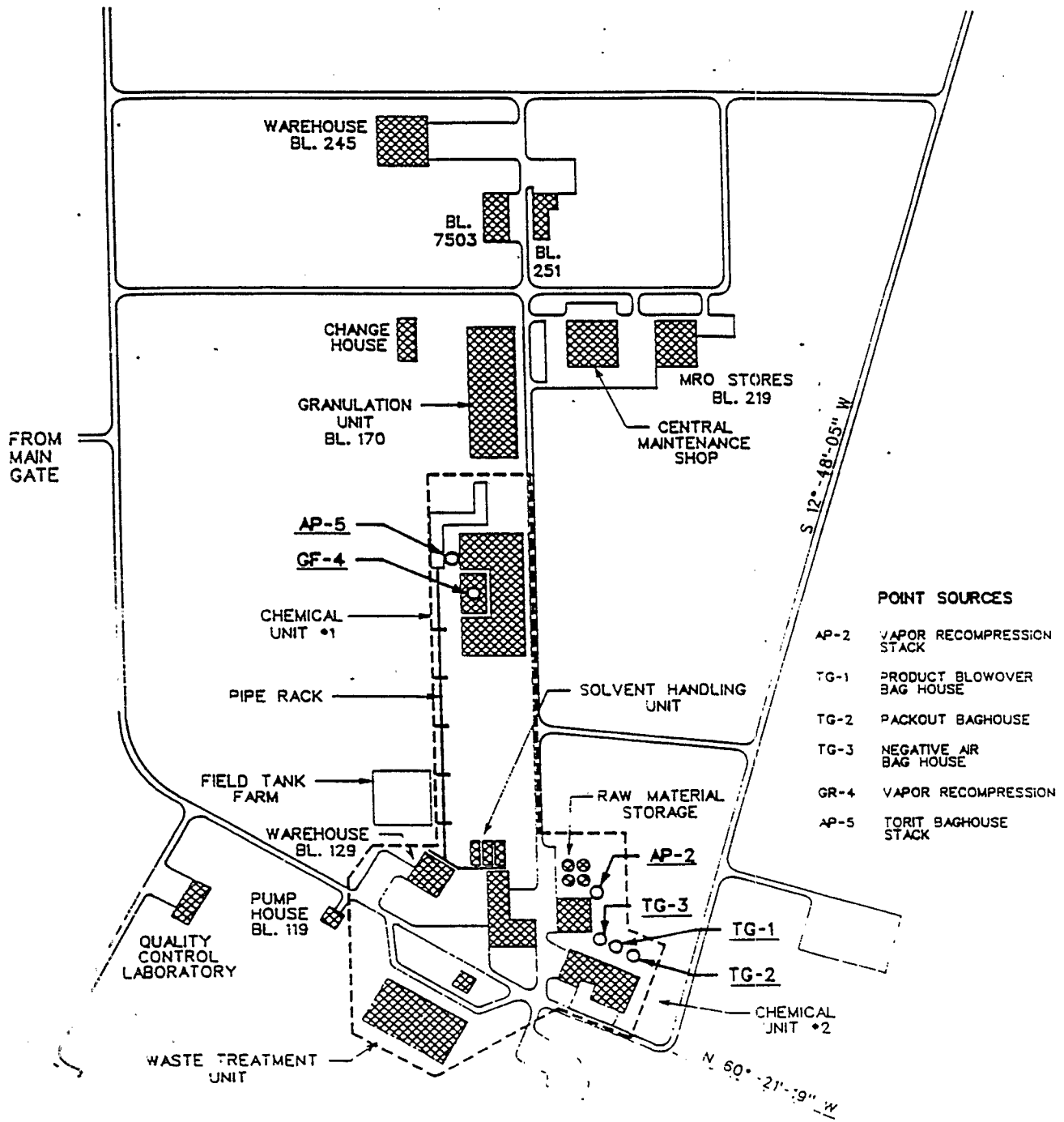
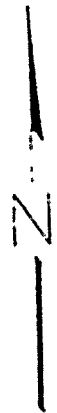
C. Site Plan

The site plan should identify the locations of all emission points within each source identified for the Early Reductions Program. The level of detail for the site plan will be dependent on the complexity of the source and the source definition. For example, if the source definition includes all storage tanks in tank farm A, it should be easy to identify the location of these tanks on a site plan. However, if the source definition is a collection of emission points from various locations at a facility, the site plan must clearly indicate which emission points are included in the source.

In some cases, it may be necessary to include two site plans to identify a source. The first site plan would show the entire contiguous facility and highlight the location of processes or specific emission points that make up the source (a "macro" site plan). The second site plan would magnify the individual processes and identify each specific emission point (a "micro" site plan).

An example of an acceptable site plan is presented on the following page. This site plan shows the boundary of the contiguous facility and also clearly marks each emission point included in the source.

AIR EMISSIONS POINT SOURCES AND TOTAL SOURCE BOUNDARY



SCALE: 1" = 400'

D. Source Identifying Information

The source identifying information includes the following items:

- a) General Source Description
- b) Activity Causing HAP Emissions
- c) List of Emission Points
- d) General Plan for Achieving Reduction
- e) Evidence that Base Year Emissions are Not Artificially or Substantially High

Each of these will be discussed in detail below.

a) General Source Description

The general source description is a narrative description of the source or sources defined for the Early Reductions Program. Examples of satisfactory general source descriptions follow:

Example 1

The source is defined as the set of emission points associated with the Dock Tank Farm. This includes three xylene fixed-roof tanks and one styrene fixed-roof tank and the unloading and loading of xylene and styrene.

The source, as defined for purposes of the Early Reductions Program, conforms to section 63.73 (a)(4). The HAP emissions from the set of emission points defined as the source total more than 10 tons per year.

Example 2

The source is defined as all emission points located in the resins manufacturing department. This includes the storage of raw materials and intermediates, process vents, process storage losses, and the transfer and unloading of raw materials and finished goods.

The source conforms to definition (a)(3) in section 63.73 of the Early Reductions regulation. It can be defined as a facility, structure, or installation for the purposes of establishing standards under Section 112(d) of the Clean Air Act.

b) Activity Causing HAP Emissions

This is also a general narrative statement describing the activity causing the emission of hazardous air pollutants. Examples of satisfactory statements include:

Example 1

HAP's are emitted from the source as a result of raw material and product losses during normal production operations. HAPs are also emitted from the plant laboratory, utility operations, and the pilot plant.

Example 2

HAP's are emitted as a result of volatilization from large exposed surface areas of the treatment units. Wastewater is hard-piped to the treatment processes, and this is the first point of atmospheric exposure.

c) List of Emission Points

Thorough and accurate completion of this section of the enforceable commitment will greatly aid the review for completeness. Careful attention should be given to logically arranging the information. The use of tables is encouraged.

Each emission point must be listed. A logical arrangement sequence would be by source, process, and then individual emission point. A table should include the following columns:

- 1) Emission point, using plant identification code
- 2) Permit ID number of emission point, if applicable
- 3) Description of the emission point
- 4) Each HAP emitted by the emission point
- 5) CAS number for each HAP.

- 6) Emissions of each HAP (lbs/yr or Mg/yr)
- 7) Weighting factor for the HAP
- 8) Weighted HAP emissions

Table 1 in Section F is an example of a complete list of emission points including each of these suggested items.

d) General Plan for Achieving Reductions

The general plan for achieving emission reductions also could be presented in tabular form. This is especially helpful if there are a large number of emission points in the source. The table should include each emission point identified by plant ID number, the description of the emission point, and the reduction plan. In addition, it would be helpful to show the year that each reduction measure was implemented, or is anticipated to be implemented. An example of a complete table is Table 2 in Section F.

e) Evidence that Base Year Emissions are not Artificially or Substantially High

It is critical that the facility demonstrate that the base year emissions are not artificially or substantially greater than emissions in other years prior to implementation of emission reduction measures. In cases where the reduction measures are implemented in the year following the base year, evidence should be provided for the two years prior to the base year. In cases where the reduction measures are implemented several years after the base year, evidence should be provided for all years between the base year and the year in which reduction measures are implemented.

The applicant should provide HAP emissions from the proposed source for at least 3 or 4 years prior to implementation of control measures. To the extent possible, the methodology used to determine emissions should be consistent from year to year, and should be the applicant's best determination. What the EPA considers to be "substantially or artificially high" will be necessarily subjective, taking into consideration the nature of the source, growth, and other factors affecting emissions.

Where HAP emission determinations from the source for other years cannot be readily quantified, a surrogate parameter can be proposed such as production rate for other years in comparison to the base year. However, it is important that the applicant provide an appropriate rationale for why HAP emissions are believed to be related to the

surrogate parameter and to the source as defined. Simply stating that emissions are believed to be related to production is not sufficient, and supporting rationale must be provided. For example, the applicant might state that:

"We believe that emissions are directly related to process production rates. Two process vents account for 95 percent of the base year emissions. Emissions from these two vents are the result of impurities in raw materials. The level of impurities in raw materials is relatively constant. Therefore, the parameter most directly affecting the generation of vent gas is the feed rate of raw materials. The feed rates of raw materials are a direct function of process production rate."

Additional examples are provided in the attached example enforceable commitment.

E. Emissions Data

a) Presentation of Emissions Data

Documentation of base year emissions is the most important component of an enforceable commitment. The facility must show that the base year emission estimates are accurate and based on substantiated information.

For the purposes of facilitating review, it is helpful to present a table listing each emission point and the method used to calculate the emissions from each point. Table 3 in Section F is an example of such a table. The submittal must also include information justifying why emissions testing was not conducted for applicable emission points. The example table shows one way to summarize the rationale for not testing. This is helpful for review purposes, but a more complete rationale should be provided when presenting data for specific points.

A procedures document has been prepared to assist owners and operators in estimating emissions ("Procedures for Establishing Emissions for Early Reduction Compliance Extensions," EPA-450/3-91-012a). It is recommended that the forms presented in this document be used when submitting emissions data. Note that these forms are not a substitute for the underlying documentation, which must also be submitted, but are used to summarize data from emissions points from the source.

In general, base year and post-reduction emissions must consist of documented results from source tests using an EPA Reference Method, EPA Conditional Method, or the source owner's or operator's source test method that has been validated using Method 301. However, section 63.74 (f) of the Early Reductions regulation lists five conditions under which an owner or operator may submit calculations based on engineering principles, emission factors, or material balance data in lieu of results from source tests. It is important that the applicant identify one of the reasons listed under section 63.74 (f) and provide supporting rationale.

When the base year emissions are based on an EPA Reference Method, EPA Conditional Method, or the owner or operator's own method validated using Method 301, at least a short summary of the test and test results should be provided. The dates of the test, the sampling method, number of samples collected, and the basis for the value

used in establishing emissions should be provided. In the case of a non-EPA method validated using Method 301, the supporting validation data should also be provided.

SECTION F

SAMPLE ENFORCEABLE COMMITMENT

XYZ CHEMICAL COMPANY

April 1, 1992

Director
Air, Pesticides, and Toxic Management Division
EPA Region IV
345 Courtland Street, N.E.
Atlanta, GA 30365

Re: Enforceable Commitment for XYZ Chemical

Dear Sir/Madam:

In accordance with Title 40 Part 63 of the Code of Federal Regulations, we wish to participate in the Early Reductions Program for one source located within our Raleigh, North Carolina facility. This source is identified as Source A and contains those emission points listed in Table 1 on page A-9 of this submittal.

Attached is a site plan of the contiguous facility identifying each emission point in Early Reductions source. The source conforms to source definition a(4) under § 63.73. The basis for the source conforming to this definition is included in the attachment, along with evidence that the base year emissions were not unusually high. As provided in the attachment, the base year (1987) HAP emissions from this source were as follows:

	Total HAP Emissions	Weighted HAP Emissions
Source A	225.2 Mg	739.6 Mg

I certify to the best of my knowledge that the base year emissions given above constitute the best available data for base year emissions from the source and are correct to the best of my knowledge, and I acknowledge that these estimates are being submitted in response to an EPA request under Section 114 of the Act. I further certify that the base year emissions provided for all emission points in the source do not exceed allowable emission levels specified in any applicable law, regulation, or permit condition.

We commit to achieve, before January 1, 1994, the following post-reduction emission levels:

	Total HAP Emissions	Weighted HAP Emissions
Source A	22.5 Mg	74.0 Mg

These post-reduction emission levels will provide the 90 percent reduction required to qualify for a compliance extension. I acknowledge that this commitment is enforceable as specified in Title 40, Part 63, Subpart D of the Code of Federal Regulations.

If you have any questions concerning the content of this submittal, please contact Joe Smith at 919-555-0000.

Sincerely,

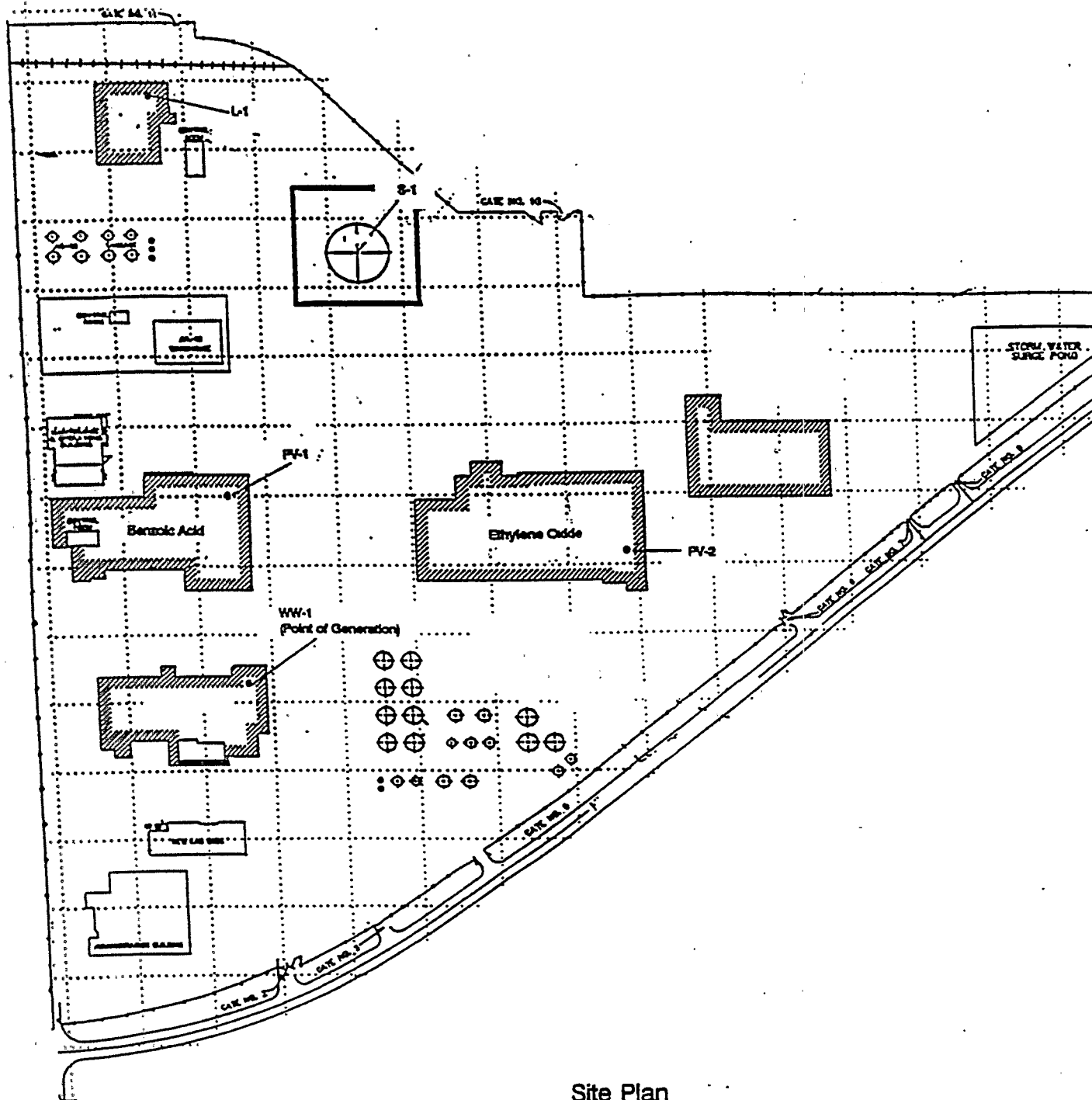
George S. Jones
Plant Manager

XYZ Chemical - Enforceable Commitment Table of Contents

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List of Tables	A-21
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Site Plan Identifying the Source and Emission Points	A-22
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PV-2	A-31
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2 General Plan for Achieving Reduction	A-27
3 Basis for Base Year Emission Estimates	A-28



Site Plan
Identification of Early Reductions Emission Points Included in Source A

a) General Source Description

The source is defined as a collection of emission points located within the contiguous facility. Included in the source are two process vents, one product storage tank, rail car loading for paraxylene, and one process wastewater stream.

The source, as defined for purposes of the Early Reductions Program, conforms to section 63.73 (a)(4). The HAP emissions from the set of emission points defined as the source total more than 10 tons per year.

b) Activity Causing HAP Emissions

HAP's are emitted from the emission points in the source as a result of raw material and product losses during normal production operations. Two process vents are included in the source. One is the vent on an air oxidation reactor in the benzoic acid process unit. HAP emissions result from the venting of excess air fed to the air oxidation reactor. Some benzene is present in this vent stream. HAP emissions from the other process vent included in the defined source are caused by the venting of byproduct carbon dioxide formed in a chemical reaction. Ethylene oxide, which is a product of the reaction, is carried from the reactor in the byproduct carbon dioxide. Also included in the defined source is a paraxylene loading operation and a xylenes/ethylbenzene fixed roof storage tank. Emissions from the loading operation result from the displacement of vapor from rail cars as the material is loaded. HAP emissions from the fixed roof storage tank result from storage tank breathing and working losses. One wastewater stream is also included in the defined source. HAP's present in this wastewater stream volatilize to the atmosphere during collection and treatment of the wastewater stream.

c) List of Emission Points

Table 1 lists all of the HAP's emitted from the defined source. This table identifies each emission point by plant identification code and also provides the State permit number for each emission point, where appropriate. Weighting factors for each HAP are provided, along with the total HAP emissions for the base year (1987) and also the weighted HAP emissions.

d) General Plan for Achieving Reductions

The general plan for achieving emissions reductions is presented in Table 2.

e) **Evidence that Base Year Emissions are not Artificially or Substantially High**

The HAP emissions from the source are not substantially or artificially higher than in other years prior to implementation of control measures. Emissions determined for other years are included below:

<u>1987 (base year)</u>	<u>1988</u>	<u>1989</u>	<u>1990</u>
225.2	228.4	218.6	215.3

These emissions were based on a combination of using test results PV-1, WW-1), engineering calculations (PV-2), and AP-42 emission factors (L-1, S-1). Emissions were determined from the points in the source for the years listed by prorating (in the case of test results) or using the operating conditions (e.g., throughput) for that year.

(NOTE: Where emission determinations cannot be made from the source for other years, the following description of the emissions/production (throughput) relationship would be acceptable as a surrogate.)

Emissions from the process vents and the wastewater stream included in the defined source are believed to be directly related to the production rates of the respective production units. The vent gas rate for the air oxidation reactor is directly related to the production rate and the benzene concentration of the stream is believed to be constant. Similarly, the vent gas rate from the ethylene oxide reactor is directly related to the production rate of ethylene oxide and the ethylene oxide concentration is believed to be constant. The flow rate of the wastewater stream included in the source is directly related to the production of chloromethanes. The methylene chloride and methanol concentration are believed to be constant. The production rates for the three respective process units are presented below:

PRODUCTION (10³)				
<u>Product</u>	<u>1987</u>	<u>1988</u>	<u>1989</u>	<u>1990</u>
Benzoic Acid	46.6	54.6	58.2	53.6
Ethylene Oxide	75.4	68.0	68.0	69.8
Chloromethanes	390.4	407.9	385.9	385.9

Emissions from the paraxylene loading operation are most directly related to the volume of paraxylene loaded. Annual volumes of paraxylene loaded are presented below:

PARAXYLENE LOADED (10⁶ GALLONS)

<u>1987</u>	<u>1988</u>	<u>1989</u>	<u>1990</u>
18.2	18.4	17.8	18.1

Emissions from the xylene/ethylbenzene storage tank are most directly related to the annual throughput. The composition of the stored material is constant. Annual throughputs for this tank are presented below:

ANNUAL THROUGHPUT (10⁶ GALLONS)

<u>1987</u>	<u>1988</u>	<u>1989</u>	<u>1990</u>
87.96	88.24	88.78	90.23

f) Emission Data

Table 3 presents the basis for establishing base year emissions from each emission point. The table provides rationale for not conducting emission estimates where appropriate. The emission calculations and supporting documentation for the estimates are also provided on the following pages.

TABLE 1. XYZ Chemical Company Base Year Emissions

Source: Source A
Base Year: 1987

Description	Emission Point	Permit #	HAP	CAS #	Weighting Factor	1987 Emissions	Weighted Emissions
Air Oxidation	PV-1	NC2346R1	Benzene	71432	10	55.09	550.90
Carbon Dioxide Vent	PV-2	NC2258R4	Ethylene Oxide	75218	10	0.20	2.00
Rail Car Loading	L-1	NC2346R1	Paraxylene	106423	1	2.09	2.09
Storage Tank	S-1	NC2346R1	Xylene	95476	1	4.01	20.80
	S-1	NC2346R1	Ethylbenzene	100414	1	15.92	15.92
MC Drying Tower Wastewater	WW-1		Methanol	67561	1	108.50	108.50
	WW-1		Methyl Chloride	74873	1	39.40	39.40
TOTAL						225.2	739.61

TABLE 2. General Plan for Achieving Reductions

Description	ID#	Control	Date
Air Oxidation Unit 1	PV-1	Thermal Oxidizer	12/93
CO ₂ Vent	PV-2	None	----
Rail Car Loading	L-1	Vapor Control Unit	1990
Storage Tank	S-1	Internal Floating Roof	1992
Wastewater	WW-1	Steam Stripper	12/93

TABLE 3. Basis for Base Year Emission Estimates

Vent Description	Vent ID #	HAP	Basis	*Reason for Not Testing
Air Oxidation	PV-1	Benzene	EPA Methods 2 & 18	-
CO ₂ Vent	PV-2	Ethylene Oxide	SCG632-81/calcs	3,5
Rail Car Loading	L-1	Paraxylene	EPA-450/3-91-012a	3
Storage Tank	S-1	Xylene/ Ethylbenzene	EPA-450/3-91-012a	3
Wastewater	WW-1	Methanol	EPA Method 25D/18	-
		Methyl Chloride	EPA Method 25D/18	-

- * 1 = No applicable EPA reference method
 2 = Not technically or economically feasible
 3 = Calculation provides comparable accuracy
 4 = Base year conditions no longer exist
 5 = Emissions small compared to total

Source: Source A

CALCULATION WORKSHEET FOR ESTABLISHING HAP EMISSIONS
FROM PROCESS VENTS

HAP: Benzene

Date: 1-29-92

Year: 1987

Calculator: RHH

Process Vent Identification: PV-1

Description: Air Oxidation Unit 1

Process Conditions/Sampling

Date of flow measurement

9-16-81

Method of flow measurement

EPA Method 2

Date of concentration measurement

9-19-81

Method of concentration measurement
(if not an EPA Method give a brief
description and attach protocol)

Method 18

Describe any problems encountered
during testing None

Production rate during flow determination (lbs/hr) 3800

Production rate during sampling (lbs/hr) 3800

Average production rate for the year (lbs/hr) 3800

Stream Characteristics

Annual average vent stream flow rate
(ft³/min)

2070 = Q

Annual average HAP concentration (ppmv)

630 = C

Annual hours of operation (hrs)

7676 = h

Vent stream discharge temperature (°F)

69.9 = T

HAP molecular weight (lb/lb-mole)

78.11 = MW

Pressure at point of discharge (psia)

14.7 = P

HAP high-risk weighting factor

10 = F_{HR}

Control

Control device

None

HAP control efficiency (%)

0 = eff

Calculations^a

Uncontrolled Emissions (E_U) = $\frac{2.54E-09 Q C h MW P}{T + 460}$

Uncontrolled Emissions (E_U) = $\frac{2.54E-09 (2070) (630) (7676) (78.11) (14.7)}{(69.9) + 460}$

=

55.09

Mg/yr

Source: Source A

CALCULATION WORKSHEET FOR ESTABLISHING HAP EMISSIONS
FROM PROCESS VENTS (CONCLUDED)

$$\text{HAP Emissions (E}_{\text{HAP}}) = E_U (1 - \text{eff}/100)$$

$$\text{HAP Emissions (E}_{\text{HAP}}) = 55.09 (1 - 0/100)$$

$$= 55.09 \text{ Mg/yr}$$

$$\text{Weighted HAP Emissions} = E_{\text{HAP}} F_{\text{HR}}$$

$$\text{Weighted HAP Emissions} = (55.09) (10)$$

$$= 550.9 \text{ Mg/yr}$$

If the conditions during testing are not representative of base year of operation, make the appropriate extrapolation below and explain:

If the flow or concentration were not measured using an EPA reference method, EPA conditional method or validated using Method 301, provide justification and supporting calculations:

^aExpression provided in "Procedures for Establishing Emissions for Early Reduction Compliance Extensions" to convert flow and concentration into an annual mass rate; the 2.54E-09 constant is based on the ideal gas law.

Notes on PV-1 Calculations: Following EPA Method 18 procedures, three vent gas samples were obtained in Tedlar bags and analyzed using gas chromatography and a flame ionization detector. The value reported represents the average of three samples. The samples were obtained during a period representative of base year operation. The flow was measured using EPA Method 2.

Source: Source A

CALCULATION WORKSHEET FOR ESTABLISHING HAP EMISSIONS
FROM PROCESS VENTS

HAP: Ethylene Oxide
Year: 1987

Date: 1-29-92
Calculator: RHH

Process Vent Identification: PV-2
Description: EO-1 Carbon Dioxide Vent

Process Conditions/Sampling

Date of flow measurement	<u>1988 Annual</u>
Method of flow measurement	<u>Engineering Calculation</u>
Date of concentration measurement	<u>05/18/89 - 06/02/89</u>
Method of concentration measurement (if not an EPA Method give a brief description and attach protocol)	<u>SCG 632-81</u>
Describe any problems encountered during testing	<u>None</u>
Production rate during flow determination (lbs/hr)	<u>3,602</u>
Production rate during sampling (lbs/hr)	<u>3,500</u>
Average production rate for the year (lbs/hr)	<u>3,602</u>

Stream Characteristics

Annual average vent stream flow rate (ft ³ /min)	<u>----</u> = Q
Annual average HAP concentration (ppmv)	<u>39.5</u> = C
Annual hours of operation (hrs)	<u>7552</u> = h
Vent stream discharge temperature (°F)	<u>----</u> = T
HAP molecular weight (lb/lb-mole)	<u>44</u> = MW
Pressure at point of discharge (psia)	<u>14.7</u> = P
HAP high-risk weighting factor	<u>10</u> = F _{HR}

Control

Control device None
HAP control efficiency (%) 0 = eff

Calculations

SEE ATTACHED CALCULATIONS

Source: Source A

**CALCULATION WORKSHEET FOR ESTABLISHING HAP EMISSIONS
FROM PROCESS VENTS (CONCLUDED)**

$$\text{HAP Emissions (E}_{\text{HAP}}) = E_U (1 - \text{eff}/100)$$

$$\text{HAP Emissions (E}_{\text{HAP}}) = \underline{0.20}(1 - \underline{0}/100)$$

$$= \boxed{0.20} \text{ Mg/yr}$$

$$\text{Weighted HAP Emissions} = E_{\text{HAP}} \cdot F_{\text{HR}}$$

$$\text{Weighted HAP Emissions} = (0.20) (10)$$

$$= \boxed{2.0} \text{ Mg/yr}$$

If the conditions during testing are not representative of base year of operation, make the appropriate extrapolation below and explain:

If the flow or concentration were not measured using an EPA reference method, EPA conditional method or validated using Method 301, provide justification and supporting calculations:

A total of five samples of the carbon dioxide vent gas stream were collected between 05/18/89 and 06/02/89. They were obtained in one liter sample cylinders through the sample port located on the carbon dioxide vent. The samples were obtained during normal process operation. These samples were analyzed using Analytical Method SCG=632-81 (see attached). Three analyses were performed for each sample and then averaged to obtain the EO composition for that sample. The results for each of the five samples (42.1, 38.5, 38.2, 39.6, and 39.1) were averaged to obtain the 39.5 ppm used in our computation of base year emissions.

^aExpression provided in "Procedures for Establishing Emissions for Early Reduction Compliance Extensions" to convert flow and concentration into an annual mass rate; the 2.54E-09 constant is based on the ideal gas law.

As noted, the sampling was actually performed in 1989 and the base year selected is 1987. No data exists for 1987, and we believe that the 1989 results are representative of the base year as well as 1989.

We are not aware of any validated EPA Method for measuring EO concentration and have used SCG 632-81 which is a gas chromatographic procedure using a Poropak QS column and a thermal detector. SCG 632-81 is an industry standard for determining EO concentration and has been used at this facility for more than ten years to evaluate process operations. A copy of the method is attached. Considering the annual quantity of HAP emissions from this source, we feel that the expense of validating this method with Method 301 is not justified.

Detailed Calculations

Assumptions/Knowns:

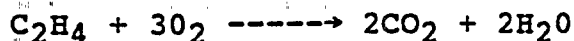
1. The vent gas rate is roughly equal to the rate of by-product CO₂ production. By-product CO₂ formed in the EO reactors is separated from the product stream and exhausted to the atmosphere. The lb-moles of CO₂ in the vent gas is assumed to equal the lb-moles of CO₂ produced in the reactors. Additionally, the lb-moles of ethylene oxide (EO), acetaldehyde (ACH), methane (CH₄) and heavy hydrocarbons (C₂ - C₄) are believed to be negligible compared to the total lb-moles of CO₂ in the vent stream. Therefore, total lb-moles of vent gas is assumed equal to total lb-moles CO₂ produced.
2. Ethylene consumed in reactors = 20,816,172 lbs in 1987.
3. Average reactor selectivity = 83.0% in 1987

Where: % selectivity $\frac{\text{MOLES EO FORMED}}{\text{MOLES C}_2\text{H}_4 \text{ REACTED}} \times 100$

This is based on GC analyses of the reactor product stream. A total of five samples were analyzed in May of 1987. EO and CO₂ concentrations were measured. All reacted C₂H₄ was assumed to form either EO or CO₂. Attached Method SCG-632-81 was used to determine EO concentration.

4. Remainder of C₂H₄ (17.0%) is assumed to form CO₂.
5. Vent gas analysis is on dry basis.

6. Stoichiometric equation for CO₂ production:



CO₂ Production

1. Convert C₂H₄ feed rate from lbs/yr to lb-moles/yr:

$$\text{C}_2\text{H}_4 \text{ Feed} = 2.08\text{E}07 \frac{\text{lbs}}{\text{yr}} \times \frac{1 \text{ lb-mole C}_2\text{H}_4}{28 \text{ lbs C}_2\text{H}_4} = 7.43\text{E}05 \frac{\text{lb-mole C}_2\text{H}_4}{\text{yr}}$$

2. Determine lb-moles of CO₂ (vent gas) produced from C₂H₄ feed. Based on 17% of C₂H₄ being reacted to CO₂:

$$\begin{aligned} \frac{7.43\text{E}05 \text{ lb-moles C}_2\text{H}_4}{\text{yr}} \times \frac{0.17 \text{ lb-moles to CO}_2}{1 \text{ lb-mole C}_2\text{H}_4 \text{ feed}} \times \frac{2 \text{ lb-moles CO}_2}{1 \text{ lb-mole C}_2\text{H}_4} \\ = 2.52\text{E}05 \text{ lb-moles CO}_2 \text{ Produced} \end{aligned}$$

3. Assuming the vent gas rate is equal to the rate of CO₂ production, compute EO emissions:

$$\begin{aligned} \frac{2.52\text{E}05 \text{ lb-moles Vent Gas}}{\text{yr}} \times \frac{39.5 \text{ lb-mole EO}}{\text{EO6 lb-mole Vent Gas}} \times \frac{44 \text{ lbs EO}}{1 \text{ lb-mole EO}} \\ = 438 \text{ lbs EO/yr} \end{aligned}$$

Uncontrolled Emissions

$$(\text{Eu}) = 4.54\text{E}-04(438) = \boxed{0.20} \text{ Mg/yr}$$

$$\text{HAP Emissions (E}_{\text{HAP}}) = \text{Eu} (1 - \text{eff}/100)$$

$$\begin{aligned} \text{HAP Emissions (E}_{\text{HAP}}) &= \underline{0.20} (1 - \underline{0}/100) \\ &= \boxed{0.20} \text{ Mg/yr} \end{aligned}$$

$$\text{Weighted HAP Emissions} = \text{E}_{\text{HAP}} \text{ F}_{\text{HR}}$$

$$\begin{aligned} \text{Weighted HAP Emissions} &= (0.20) (10) \\ &= \boxed{2.0} \text{ Mg/yr} \end{aligned}$$

Testing conditions were representative of base year.

No EPA method available. The method used, SCG 632-81, is a gas chromatographic procedure using a Poropak QS column and a thermal detector. A copy of the method is provided in Exhibit 1.

XYZ CHEMICAL COMPANY
RALEIGH PLANT

Analytical Method SCG-632-81

Analysis of
EO UNIT GAS STREAMS
Gas Chromatographic ProcedureSCOPE

1. This is a gas chromatographic (GC) procedure for determining the composition of EO Unit gas streams. Among the samples that can be analyzed by this method are the reactor feed and product, treated and untreated natural gas, and residual gas.

METHOD SUMMARY

2. The sample is injected by a sample valve and fractionated with Poropak QS. As the components emerge they are detected by thermal conductivity detection and recorded as peaks. The peak areas are adjusted by applying response factors and concentrations in mole percent are calculated by normalizing the corrected peak areas.

UNUSUAL HAZARDS

3. Some of the components of these gases are highly flammable. Store the sample cylinders containing them in the fume hood until time for analysis. Permit only the small amount needed for analysis to escape into the general laboratory atmosphere. Due to the low concentrations and small amount of sample used to purge the sample loop, no special handling is required for samples containing EO.

APPARATUS

4. a. Gas chromatograph, Hp 5710 A, TC, set up as follows:
 - 1) Column: 6' x 1/8", S.S., 0.012" wall, packed with Poropak QS, 80-100 mesh.
 - 2) Gas sample injection valve, 0.5 cc.
 - 3) Injector at 250°C, detector at 300°C, sensitivity at 5.
 - 4) Carrier gas (helium) at 30 ml/min.

- 5) Temperature programmer to hold at 40°C for 2 minutes, then rise to 250°C at 8°C/min.
- b. Strip chart recorder.

CALIBRATION

5. a. Purchase a 1500 psi gas mixture of about the following composition, analyzed by the supplier to show actual concentrations to the nearest 0.01% mole.

1)	Nitrogen	2%
2)	Argon	2%
3)	Methane	12%
4)	Carbon Dioxide	60%
5)	Ethylene	20%
6)	Ethane	1%
7)	Cyclopropane	1%
8)	Propane	0.1%
9)	Ethylene Oxide	0.5%

- b. Inject 0.5 cc of the standard and analyze by the technique described in step 6 below. Measure the area for each component and then determine the "observed %" by area normalization without applying response factors.
- c. Calculate the mole response factor (M.R.F.) for each component as follows:

$$\text{M.R.F.} = \frac{\text{Actual \% mole}}{\text{Observed \% Area}}$$

PROCEDURE

6. a. Prepare the GC for analysis by setting the conditions listed in step 4(a).
- b. Inject 0.5 cc sample, simultaneously starting the temperature program, the computer and the recorder. Make note of the attenuations used. See figure 1 for an example of the chromatogram obtained.
- c. Measure the area of each peak.

CALCULATIONS

7. a. Determine the corrected area (CA) for each peak:

$$CA = (A) \text{ (attenuation) (M.R.F.)}$$

A = peak area (Area units must be consistent throughout)

M.R.F. = mole response factor for the peak.

- b. Normalize the corrected areas to give composition in units of % mole.
- c. Report results to the nearest 0.1%M for routine analysis.

DISCUSSION

8. Some confusion may arise because % mole is used here rather than % weight. This is done to conform to the convention of giving results for gas analyses in % mole. It is advisable to always include the units when reporting results, because most analyses are reported in % weight.

EVALUATION OF THE METHOD

9. This procedure gives results accurate and repeatable to $\pm 10\%$ for the amount present based on the analysis of known concentrations in a standard.

REFERENCE

10. a. Analytical Method SCG-632-76, "Analysis of EO Unit Gas Streams by Gas Chromatograph," and
- b. Analytical Method SCG-1051-77, "Carbon Number Distribution of Olefin Gas Mixtures."

JRR/pac
Raleigh Plant
August 11, 1981
Approved:

Source: Source A

CALCULATION WORKSHEET FOR ESTABLISHING HAP EMISSIONS
FROM LOADING OPERATIONS

HAP: Paraxylene
Year: 1987

Date: 4/1/92
Calculator: SAS

Loading Operation: L1 - PX Loading/Paraxylene Rail Car Loading

Loading Parameters

Cargo carrier (tank truck, rail car, etc.)
Mode of operation (choose from Table 2-16)
Annual volume of liquid loaded (gallons)
Temperature of liquid loaded (°F)
Weight percent HAP in the loaded material
True vapor pressure of the HAP loaded (psia)
[Note: For mixtures, use the HAP partial pressure]
Molecular weight of the HAP (lb/lb-mole)
Saturation factor (see Table 2-16)
HAP high-risk weighting factor

<u>Rail Car</u>	
<u>Submerged Loading</u>	
<u>18,150,000</u>	= G
<u>85</u>	= T
<u>100</u>	
<u>0.21</u>	= P
<u>106</u>	= M
<u>0.5</u>	= S
<u>1</u>	= F _{HR}

Control

Control device
HAP control efficiency (%)

<u>None</u>	
<u>N/A</u>	= eff

Calculation^a

$$\text{Uncontrolled Loading Loss } E_u = 5.65E-06 \frac{S P M G}{T + 460}$$

$$\text{Uncontrolled Loading Loss } E_u = 5.65E-06 \frac{(0.5)(0.21)(106)(18,150,000)}{(85) + 460}$$

$$= \boxed{2.09} \text{ Mg/yr}$$

$$\text{HAP Emissions } (E_{\text{HAP}}) = E_u (1 - \text{eff}/100)$$

$$= (1 - \underline{0}/100)$$

$$= \boxed{2.09} \text{ Mg/yr}$$

Source: Source A

**CALCULATION WORKSHEET FOR ESTABLISHING HAP EMISSIONS
FROM LOADING OPERATIONS (CONCLUDED)**

Calculation (continued)

Weighted HAP Emissions = $E_{HAP} F_{HP}$

= (2.09)(1)

= 2.09 Mg/yr

^aCalculation worksheet and procedure from "Procedures for Establishing Base Year and Post-reduction HAP Emissions."
This procedure is consistent with AP-42.

Source: Source A

**CALCULATION WORKSHEET FOR ESTABLISHING HAP EMISSIONS
FROM FIXED ROOF STORAGE TANKS**

HAP: Xylene

Date: 2-2-92

Year: 1987

Calculator: MTW

Tank designation: S-1

Product: Xylene/Ethylbenzene

Tank Characteristics

Inside diameter, (ft)

100 =D

Height, (ft)

48 =H_T

Capacity, (gal) = $\Pi/4 \cdot D^2 \cdot h \cdot 7.48 \text{ gal/ft}^3$
if not known

2,820,000 =V

Roof color medium gray

Shell color medium gray

Vapor space height, (ft)^a

24 =H

Ambient Conditions

Average atmospheric pressure (psia)
(defaults 14.7 psia)

14.7 =P_A

Average ambient diurnal temperature
(°F)^b

9.5 =Δ_T

Average annual ambient temperature
(°F)

69.8 =T_A

Bulk Liquid Characteristics

Stored liquid temperature (°F)^c

73.3 =T_S

Total throughput per year (gal)

87,956,200 =A_N

Number of turnovers per year^d

31 =N

Molecular weight of HAP (lb/lb mole)

106 =M_{vi}

Vapor pressure of stored material (psia)

0.164 =P

Partial pressure of the HAP at liquid
conditions (psia)

0.033 =P_i

HAP high-risk weighting factor

1 =F_{HR}

Adjustment Factors

Paint factor (see Table 2-3)

1.46 =F_P

Small diameter tank factor^e

1 =C

Turnover factor^f

1 =K_N

Product factor^g

1 =K_C

Source: Source A

CALCULATION WORKSHEET FOR ESTABLISHING HAP EMISSIONS
FROM FIXED ROOF STORAGE TANKS (continued)

Control

Control device None

HAP control efficiency (%)

0

=eff

Calculations^h

Breathing Loss (Mg/yr) =

$$L_B = 1.02E-05 M_{Vi} \left(\frac{P}{P_A - P} \right)^{0.68} D^{1.73} H^{0.51} \Delta T^{0.50} F_P C K_C \frac{P_i}{P}$$
$$= 1.02E05 (106) \frac{0.164}{(14.7) - (0.164)}^{0.68} (100)^{1.73} (24)^{0.51} (9.5)^{0.50} (1.46) (1) (1) \frac{(0.033)}{(0.164)}$$
$$= \boxed{0.6766} \text{ Mg/yr}$$

Working Loss (Mg/yr) = $L_W = 1.09E-08 M_{Vi} P_i V N K_N K_C$

$$= 1.09E-08 (106) (0.033) (2,820,000) (31) (1) (1)$$

$$= \boxed{3.333} \text{ Mg/yr}$$

Total Loss (Mg/yr) =

$$T_L = L_B + L_W = (0.677) + (3.333) = \boxed{4.010} \text{ Mg/yr}$$

If a control device is employed,

HAP Emissions (E_{HAP}) = Total Loss (1 - eff/100)

$$= \frac{4.010}{1 - 0/100}$$

$$= \boxed{4.010} \text{ Mg/yr}$$

Source: Source A

CALCULATION WORKSHEET FOR ESTABLISHING HAP EMISSIONS
FROM FIXED ROOF STORAGE TANKS (concluded)

Weighted HAP Emissions = $E_{HAP} F_{HR}$

$$= (4.010) (1)$$

$$= \boxed{4.010} \text{ Mg/yr}$$

^aIf vapor space height is unknown or shell, assume H equals one half tank height. If tank has a cone roof, adjust vapor space height by adding 1/3 of height of cone.

^bIf average ambient diurnal temperature change is unknown, assume 20°F.

^cStored liquid temperature may be approximated from average annual ambient temperature. See Table 2-2.

$d_N = \frac{AN}{V}$ where N = number of turnovers per year
AN = total throughput per year (gal)
V = tank capacity (gal)

^eFor $D \geq 30\text{ft}$, $C=1$; For $6 \leq D < 30\text{ft}$, $C=0.0771D-0.0013D^2-0.1334$.

^fFor turnovers > 36 , $K_N = (180 + N)/(6 * N)$
where K_N = turnover factor (dimensionless)
N = number of turnovers per year
For turnovers ≤ 36 , $K_N = 1$

^g $K_C = 1.0$ for volatile organic liquids

^hExpression for computing HAP emissions are from "Procedures for Establishing Base Year and Post-Reduction HAP Emissions." The calculation procedure is consistent with AP-42.

Source: Source A

CALCULATION WORKSHEET FOR ESTABLISHING HAP EMISSIONS
FROM FIXED ROOF STORAGE TANKS

HAP: Ethylbenzene

Date: 2-2-92

Year: 1987

Calculator: MTW

Tank designation: S-1

Product: Xylene/Ethylbenzene

Tank Characteristics

Inside diameter, (ft)

100

=D

Height, (ft)

48

=H_T

Capacity, (gal) = $\Pi \frac{D^2 h}{4} * 7.48 \frac{\text{gal}}{\text{ft}^3}$

2,820,000

=V

if not known

Roof color medium gray

Shell color medium gray

Vapor space height, (ft)^a

24

=H

Ambient Conditions

Average atmospheric pressure (psia)
(defaults 14.7 psia)

14.7

=P_A

Average ambient diurnal temperature
(°F)^b

9.5

=Δ_T

Average annual ambient temperature
(°F)

69.8

=T_A

Bulk Liquid Characteristics

Stored liquid temperature (°F)^c

73.3

=T_S

Total throughput per year (gal)

87,956,200

=A_N

Number of turnovers per year^d

31

=N

Molecular weight of HAP (lb/lb mole)

106

=M_{vi}

Vapor pressure of stored material (psia)

0.164

=P

Partial pressure of the HAP at liquid
conditions (psia)

0.131

=P_i

HAP high-risk weighting factor

1

=F_{HR}

Adjustment Factors

Paint factor (see Table 2-3)

1.46

=F_P

Small diameter tank factor^e

1

=C

Turnover factor^f

1

=K_N

Product factor^g

1

=K_C

Source: Source A

**CALCULATION WORKSHEET FOR ESTABLISHING HAP EMISSIONS
FROM FIXED ROOF STORAGE TANKS (continued)**

Control

Control device None

HAP control efficiency (%)

0

=eff

Calculations^h

Breathing Loss (Mg/yr) =

$$L_B = 1.02E-05 M_{Vi} \left(\frac{P}{P_A - P} \right)^{0.68} D^{1.73} H^{0.51} \Delta T^{0.50} F_P C K_C \frac{P_i}{P}$$
$$= 1.02E-05 (106) \frac{0.164}{(14.7) - (0.164)}^{0.68} (100)^{1.73} (24)^{0.51} (9.5)^{0.50} (1.46) (1) (1) \frac{(0.131)}{(0.164)}$$
$$= \boxed{2.686} \text{ Mg/yr}$$

Working Loss (Mg/yr) = $L_W = 1.09E-08 M_{Vi} P_i V N K_N K_C$

$$= 1.09E-08 (106) (0.131) (2,820,000) (31) (1) (1)$$

$$= \boxed{13.23} \text{ Mg/yr}$$

Total Loss (Mg/yr) =

$$T_L = L_B + L_W = (2.69) + (13.23) = \boxed{15.92} \text{ Mg/yr}$$

If a control device is employed,

HAP Emissions (E_{HAP}) = Total Loss (1 - eff/100)

$$= \frac{15.92}{1 - \frac{0}{100}}$$

$$= \boxed{15.92} \text{ Mg/yr}$$

Source: Source A

**CALCULATION WORKSHEET FOR ESTABLISHING HAP EMISSIONS
FROM FIXED ROOF STORAGE TANKS (concluded)**

$$\begin{aligned}\text{Weighted HAP Emissions} &= E_{\text{HAP}} F_{\text{HR}} \\ &= (15.92) (1) \\ &= \boxed{15.92} \text{ Mg/yr}\end{aligned}$$

^aIf vapor space height is unknown or shell, assume H equals one half tank height. If tank has a cone roof, adjust vapor space height by adding 1/3 of height of cone.

^bIf average ambient diurnal temperature change is unknown, assume 20°F.

^cStored liquid temperature may be approximated from average annual ambient temperature. See Table 2-2.

^d $N = \frac{AN}{V}$ where N = number of turnovers per year
AN = total throughput per year (gal)
V = tank capacity (gal)

^eFor $D \geq 30\text{ft}$, $C=1$; For $6 \leq D < 30\text{ft}$, $C=0.0771D-0.0013D^2-0.1334$.

^fFor turnovers > 36 , $K_N = (180 + N)/(6 * N)$
where K_N = turnover factor (dimensionless)
N = number of turnovers per year
For turnovers ≤ 36 , $K_N = 1$

^g $K_C = 1.0$ for volatile organic liquids

^hExpression for computing HAP emissions are from "Procedures for Establishing Base Year and Post-Reduction HAP Emissions." The calculation procedure is consistent with AP-42.

SUPPORTING CALCULATIONS FOR VAPOR PRESSURE AND PARTIAL PRESSURE

Tank Designation: S-1

From Chemical Engineer's Handbook

Vapor pressure (3-xylene) = 0.148 psia @ 22.9° C for product quality control (one per day)

Vapor pressure of Ethylbenzene = 0.169 psia @ 22.9° C

Based on liquid analysis by gas chromatograph (one per day), a representative composition of the stored material is 22.5 mol. % xylene and 77.5 mol. % ethylbenzene. The xylene concentration was 21.6 to 23.5 percent. The 22.5 percent used in this calculation is not a computed average, but is believed to be representative.

Using Raoult's Law, partial pressure of xylene =

$$(0.225) (0.148) = 0.033 \text{ psia}$$

and the partial pressure of ethylbenzene =

$$(0.775) (0.169) = 0.131 \text{ psia}$$

Therefore, vapor pressure of the stored material =

$$0.033 + 0.131 = 0.164 \text{ psia}$$

Source: Source A

**CALCULATION WORKSHEET FOR ESTABLISHING HAP EMISSIONS
FROM WASTEWATER SOURCES**

HAP: Methanol
Year: 1987

Date: 4/6/92
Calculator: RHH

Wastewater Stream Identification: WW1
Wastewater Stream Description: Waste acid from the methyl
chloride drying tower

Process Conditions/Sampling

Date of flow measurement		<u>4/24/91</u>
Method of flow measurement	<u>Flow Meter</u>	
Date of concentration measurement		<u>4/24/91</u>
Method of concentration measurement	<u>EPA Method 25D/18</u>	
Production rate during flow determination (lbs/hr)		<u>42,000</u>
Production rate during sampling (lbs/hr)		<u>42,000</u>
Average production rate during base year (lbs/hr)		<u>47,000</u>

Stream Characteristics

Average annual flow rate during discharge (lpm)	<u>78.6</u>	= Q
Average annual HAP concentration (mg/l)	<u>3000</u>	= C _{VOHAP}
Fraction of HAP that would be emitted (see Table 2-18) ^a	<u>0.28</u>	= f _{ei}
Fraction of HAP that would be measured by Method 25D/18 (see Table 2-18) ^a	<u>0.32</u>	= f _{mi}
HAP high-risk weighting factor	<u>1</u>	= F _{HR}

Control

Control device	<u>None</u>	
HAP control efficiency (%)	<u>N/A</u>	= eff

Calculations^b

Wastewater Emissions (WE_u) = $5.26E-04 \cdot Q \cdot C_{VOHAP} \cdot \frac{f_{ei}}{f_{mi}}$

Source: Source A

**CALCULATION WORKSHEET FOR ESTABLISHING HAP EMISSIONS
FROM WASTEWATER SOURCES (CONCLUDED)**

$$\begin{aligned}\text{Wastewater Emissions (WE}_u\text{)} &= 5.26\text{E-}04(78.6)(3000)\frac{(0.28)}{(0.32)} \\ &= \boxed{108.5 \text{ Mg/yr}}\end{aligned}$$

$$\begin{aligned}\text{HAP Emissions (E}_{\text{HAP}}\text{)} &= \text{WE}_u (1 - \text{eff}/100) \\ &= \underline{108.5} (1 - \underline{0}/100) \\ &= \boxed{108.5} \text{ Mg/yr}\end{aligned}$$

$$\begin{aligned}\text{Weighted HAP Emissions} &= \text{E}_{\text{HAP}} \text{ F}_{\text{HP}} \\ &= (108.5)(1) \\ &= \boxed{108.5} \text{ Mg/yr}\end{aligned}$$

^aTable 2-14 in "Procedures for Establishing Emissions for Early Reduction Compliance Extensions."

^bCalculation worksheet and procedure from "Procedures for Establishing Emissions for Early Reduction Compliance Extensions."

Notes on Sampling Method: The flow was measured with a flow meter in a closed channel. Three samples of the wastewater were obtained and analyzed. The protocol prescribed in Method 25D was followed to obtain the samples. Method 18 was performed by splitting the air purge stream and performing the Method 18 analysis (gas chromatography) parallel to the Method 25D analysis.

Source: Source A

CALCULATION WORKSHEET FOR ESTABLISHING HAP EMISSIONS
FROM WASTEWATER SOURCES

HAP: Methyl Chloride
Year: 1987

Date: 4/6/92
Calculator: RHH

Wastewater Stream Identification: WW1
Wastewater Stream Description: Waste acid from the methyl
chloride drying tower

Process Conditions/Sampling

Date of flow measurement		<u>4/24/91</u>
Method of flow measurement	<u>Flow Meter</u>	
Date of concentration measurement		<u>4/24/91</u>
Method of concentration measurement	<u>EPA Method 25D/18</u>	
Production rate during flow determination (lbs/hr)		<u>42,000</u>
Production rate during sampling (lbs/hr)		<u>42,000</u>
Average production rate during base year (lbs/hr)		<u>47,000</u>

Stream Characteristics

Average annual flow rate during discharge (lpm)	<u>100</u>	= Q
Average annual HAP concentration (mg/l)	<u>1000</u>	= C _{VOHAP}
Fraction of HAP that would be emitted (see Table 2-18) ^a	<u>0.75</u>	= f _{ei}
Fraction of HAP that would be measured by Method 25D/18 (see Table 2-18) ^a	<u>1.00</u>	= f _{mi}
HAP high-risk weighting factor	<u>1</u>	= F _{HR}

Control

Control device	<u>None</u>	
HAP control efficiency (%)	<u>N/A</u>	= eff

Calculations^b

Wastewater Emissions (WE_u) = $5.26E-04 Q C_{VOHAP} \frac{f_{ei}}{f_{mi}}$

^aTable 2-14 in "Procedures for Establishing Emissions for Early Reduction Compliance Extensions."

^bCalculation worksheet and procedure from "Procedures for Establishing Emissions for Early Reduction Compliance Extensions."

Source: Source A

**CALCULATION WORKSHEET FOR ESTABLISHING HAP EMISSIONS
FROM WASTEWATER SOURCES (CONCLUDED)**

$$\text{Wastewater Emissions Potential (WE}_u\text{)} = 5.26\text{E-}04(100)(3000)\frac{(0.75)}{(1.00)}$$

$$= \boxed{39.4} \text{ Mg/yr}$$

$$\text{HAP Emissions (E}_{\text{HAP}}\text{)} = \text{WE}_u (1 - \text{eff}/100)$$

$$= 39.4 (1 - 0/100)$$

$$= \boxed{39.4} \text{ Mg/yr}$$

$$\text{Weighted HAP Emissions} = \text{E}_{\text{HAP}} \text{ FHP}$$

$$= (39.4)(1)$$

$$= \boxed{39.4} \text{ Mg/yr}$$

Notes on Sampling Method: The flow was measured with a flow meter in a closed channel. Three samples of the wastewater were obtained and analyzed. The protocol prescribed in Method 25D was followed to obtain the samples. Method 18 was performed by splitting the air purge stream and performing the Method 18 analysis (gas chromatography) parallel to the Method 25D analysis.

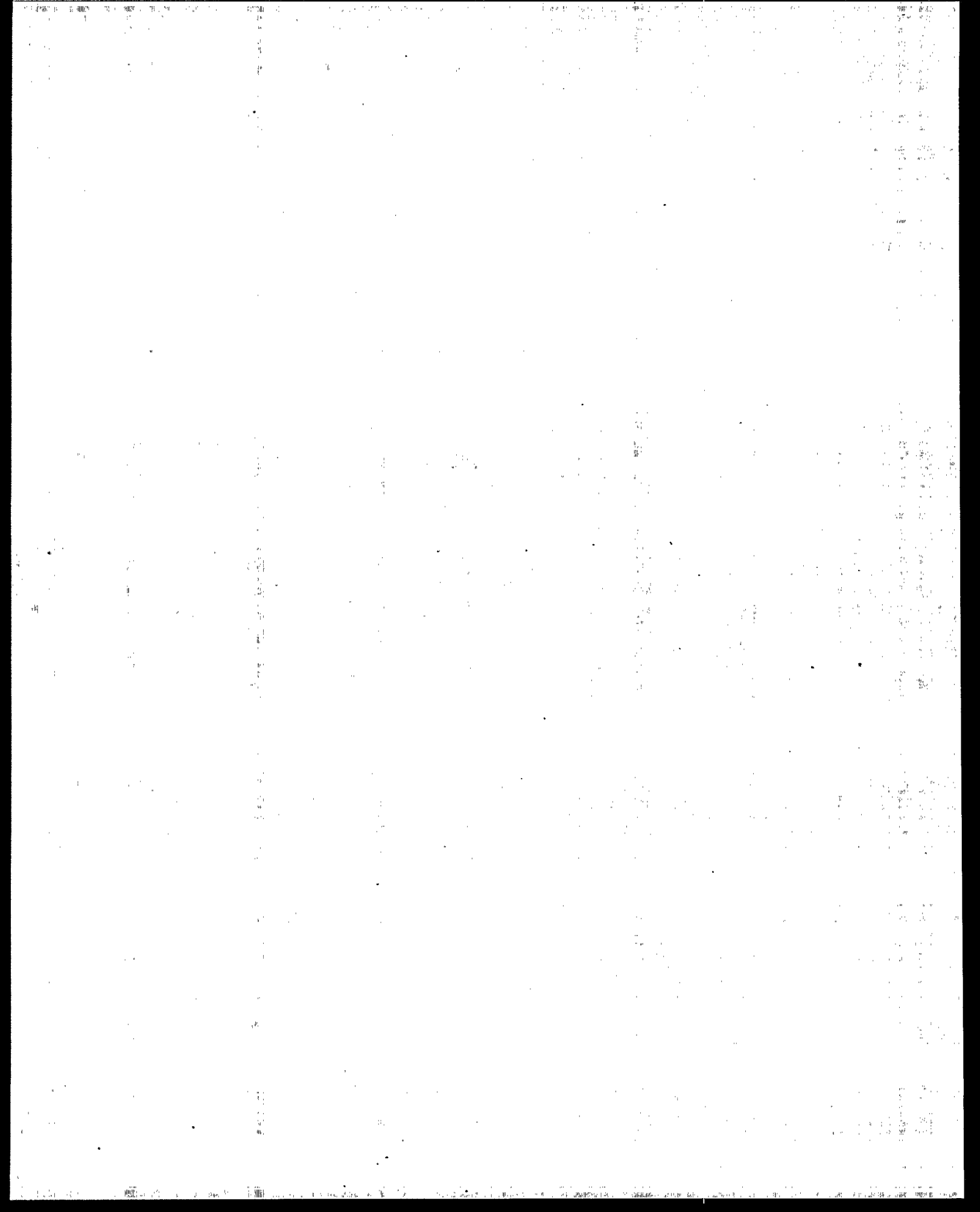
APPENDIX B

Reviewer Checklists

Form A - *Source Data Sheet*

Form B - *Completeness Review*

Form C - *Technical Review*



Early Reductions Program Source Data Sheet

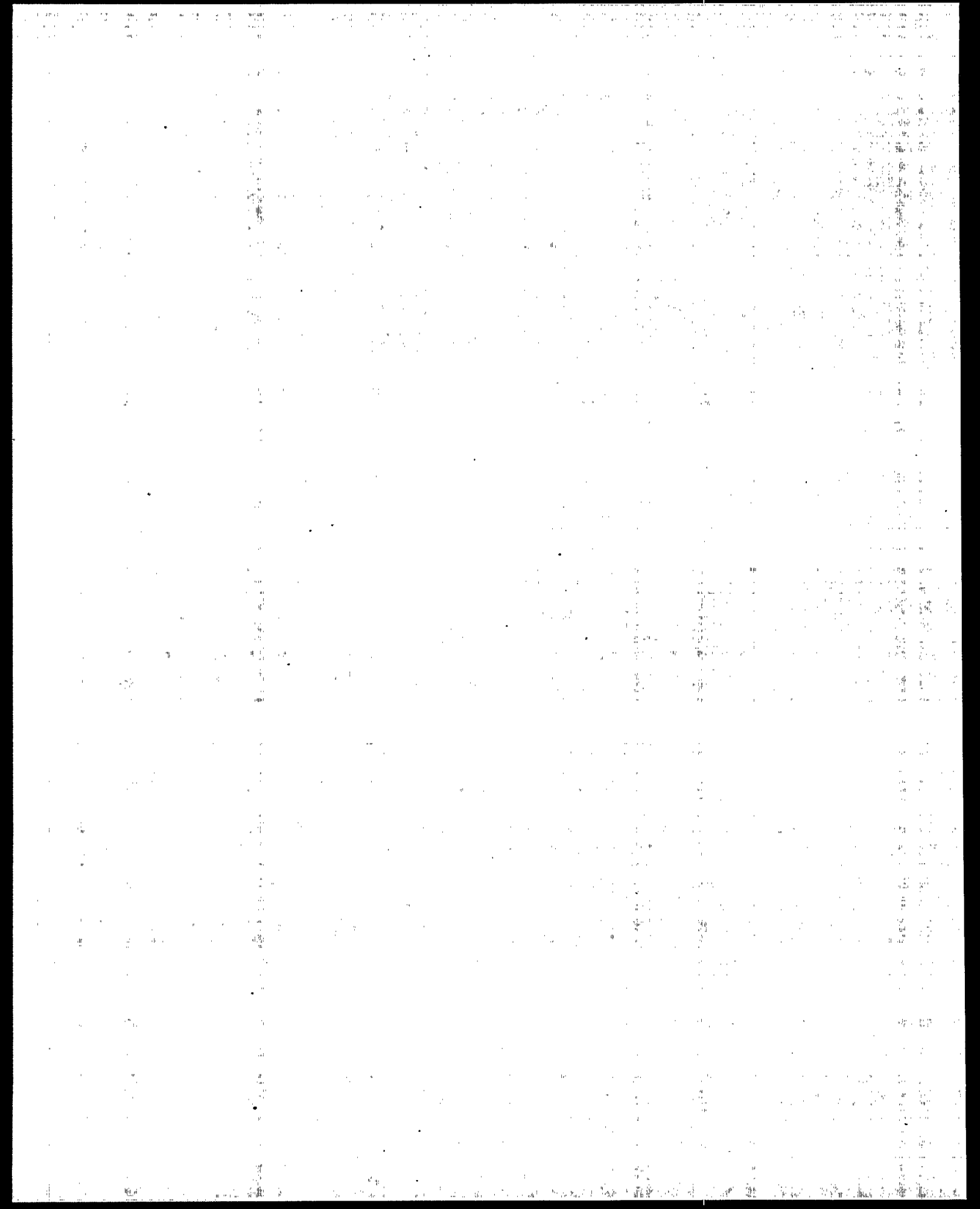
Company		
Location		
Plant Contact (Phone #)		
EPA Region	EPA Regional Contact	
State/Local Agency	State/Local Agency Contact	

☐ Enforceable Commitment ☐ Base Year Review

Source	Base Year Emissions	Post-Reduction Goal
Base Year	Weighted Emissions	Weighted Goal

Submittal Diary - Progress by Date					
Submittal Received	Completeness Approval	Technical Approval	Public Comment Period Begins	Permit Approval	Proposal of Applicable §112(d) Standard

[illegible]



**Early Reductions Program
Completeness Review**

Company/Location	
Source	
<div style="text-align: center;"><input type="checkbox"/> Enforceable Commitment (Complete Sections A - D) <input type="checkbox"/> Base Year Review (Complete Sections B - D)</div>	

Summary of Deficiencies / Completeness Review

Technical Deficiencies Noted During Completeness Review

A. Enforceable Commitments

For enforceable commitments only, is the following information provided:

Yes No N/A

- | | | | |
|--------------------------|--------------------------|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 1. A statement of commitment providing the post-reduction emission level to be achieved by the source? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 2. A statement of commitment providing the post-reduction emission level adjusted for high-risk pollutants? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 3. A statement certifying that the base year emission estimates represent the best available emission estimates? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 4. A statement including an understanding that the base year emission estimates constitute a response to an EPA request under authority of § 114 of the Clean Air Act? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 5. A statement committing the source owner or operator to achieving the required post-reduction emissions by January 1, 1994? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 6. A statement specifying that base year emissions are within allowable limits specified in any applicable law, regulation, or permit condition. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 7. A statement of commitment signed by a responsible official representing the company that controls the contiguous area under common control containing the source? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 8. A general plan describing how emission reductions will be achieved. |

B. General Source Information

Yes No

- | | | | |
|--------------------------|--------------------------|--|---|
| <input type="checkbox"/> | <input type="checkbox"/> | 1. Does the submittal include a site plan of the contiguous area under common control that contains the source(s)? | |
| <input type="checkbox"/> | <input type="checkbox"/> | 2. Is the site plan marked to indicate the location of the source(s)? | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 3. The source definition that describes the source. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 4. The activity causing HAP emissions. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 5. A list of all emission points in the source. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 6. A list of HAP emitted by the source. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 7. A list of high risk HAP emitted by the source. |

C. Base Year Emissions

Yes	No	N/A
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

1. If the base year chosen is 1985 or 1986, is evidence provided that emission data for these years was provided to the Administrator before November 15, 1990?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------	--------------------------

2. Are the total base year emissions provided?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------	--------------------------

3. For each emission point, are base year emissions provided for each HAP?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------	--------------------------

4. For each high risk pollutant, are the total base year emissions adjusted using the high risk weighting factors?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------	--------------------------

5. Is there evidence provided that the base year emissions are not artificially or substantially greater than emissions in the years prior to implementation of reduction measures?

D. Substantiation of Base Year Emission

[illegible]

Notes:

Early Reductions Program Technical Review

Company/Location			
Source		Total Base Year Emissions	

[illegible]

A. Testing

- | Yes | No | N/A | |
|--------------------------|--------------------------|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 1. Was a validated EPA test method used to measure flow? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 2. Was a validated EPA test method used to measure concentration? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 3. Is a description of the test protocol and any problems encountered during testing included? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 4. Was the test method appropriate for the source and pollutants tested? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 5. Are emissions reported as annual emission rates for each hazardous air pollutant? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 6. Is the annual emission rate presented consistent with the test results? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 7. If the test data was collected from a year different from the base year, was the data appropriately scaled to the base year? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 8. Are the pollutants emitted consistent with the described process? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 9. Are the quantities emitted consistent with the quantities expected based on a rough material balance or comparison with similar industries? |

B. Calculations

- | Yes | No | N/A | |
|--------------------------|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 1. Is the rationale for not conducting tests acceptable? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 2. Are all calculations described step-by-step and are all assumptions provided? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 3. Is the calculation method one of the acceptable methods for that source category as presented in one of the EPA documents, or if not, is the method appropriately documented and acceptable? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 4. Were all the calculations performed correctly? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 5. If the emission source is equipment leaks, was some method other than EPA average emission factors used? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 6. Are the pollutants emitted consistent with the described process? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 7. Are the quantities emitted consistent with the quantities expected based on a rough material balance or comparison with similar industries? |

TECHNICAL REPORT DATA

(Please read Instructions on the reverse before completing)

1. REPORT NO. EPA 450/3-91-013		2.		3. RECIPIENT'S ACCESSION NO.	
4. TITLE AND SUBTITLE Enabling Document for Regulations Governing Compliance Extensions for Early Reductions of Hazardous Air Pollutants				5. REPORT DATE December 1992	
				6. PERFORMING ORGANIZATION CODE	
7. AUTHOR(S)				8. PERFORMING ORGANIZATION REPORT NO.	
9. PERFORMING ORGANIZATION NAME AND ADDRESS Office of Air Quality Planning and Standards Environmental Protection Agency Research Triangle Park, North Carolina 27711				10. PROGRAM ELEMENT NO.	
				11. CONTRACT/GRANT NO. 68D10117	
12. SPONSORING AGENCY NAME AND ADDRESS Director, Office of Air Quality Planning & Standards Office of Air & Radiation U.S. Environmental Protection Agency Research Triangle Park, North Carolina 27711				13. TYPE OF REPORT AND PERIOD COVERED	
				14. SPONSORING AGENCY CODE EPA/200/04	
15. SUPPLEMENTARY NOTES					
16. ABSTRACT Regulations governing compliance extensions for early reductions of hazardous air pollutants are promulgated under the authority of section (612)(i)(5) of the Clean Air Act (CAA). These rules would apply to sources that seek compliance extensions from standards promulgated under section (112)(d) of the CAA. This document provides practical information on the implementation of the Early Reductions Program.					
17. KEY WORDS AND DOCUMENT ANALYSIS					
a. DESCRIPTORS		b. IDENTIFIERS/OPEN ENDED TERMS		c. COSATI Field/Group	
Air Pollution Hazardous Air Pollutants National emission standards for hazardous air pollutants Early Reductions		Air Pollution Control		13B	
18. DISTRIBUTION STATEMENT Unlimited		19. SECURITY CLASS (This Report) Unclassified		21. NO. OF PAGES	
		20. SECURITY CLASS (This page) Unclassified		22. PRICE	

