Note: This is a reference cited in *AP 42, Compilation of Air Pollutant Emission Factors, Volume I Stationary Point and Area Sources.* AP42 is located on the EPA web site at www.epa.gov/ttn/chief/ap42/

The file name refers to the reference number, the AP42 chapter and section. The file name "ref02_c01s02.pdf" would mean the reference is from AP42 chapter 1 section 2. The reference may be from a previous version of the section and no longer cited. The primary source should always be checked.

AP-42 Section Number: **10.6.2**

Reference Number: **4**

Title: **Emission Test Report: HAP Emission Testing of Selected Sources at a Partic-Board Facility, EMB Report 92-Par-02**

Weyerhaeuser Co., Moncure, NC

May 1993

United States
Environmental Protection
Agency

Office of Air Quality
Planning and Standards
Research Triangle Park, NC 27711

EMB Report 92-PAR-02
Volume I
May 1993

Air

Particleboard Production Facility Emission Test Report

Weyerhaeuser Company
Moncure, North Carolina

Office of Air Quality
Clean Air
OAQPS
Planning and Standards

EMISSION TEST REPORT

HAP EMISSION TESTING OF SELECTED SOURCES AT A PARTICLEBOARD PRODUCTION FACILITY

WEYERHAEUSER COMPANY
Moncure, North Carolina

Submitted to:

ETS International, Inc.
1401 Municipal Road, NW
Roanoke, VA 24012-1309

Prepared for:

U. S. Environmental Protection Agency
Emission Measurement Branch, MD-19
Research Triangle Park, North Carolina 27711

EMB Work Assignment Manager: Dennis Holzschuh
EMB Project Officer: J.E. McCarley

Prepared by:

ROY F. WESTON, INC.
1000 Perimeter Park Drive, Suite E
Morrisville, NC 27560

Program Manager: James Serne, P.E.
Test Director: Michael Kirkman

WESTON Work Order No. 10202-001-001-0000
May 10, 1993

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SECTION 1
INTRODUCTION

1.1 BACKGROUND

The purpose of this test program was to assist EPA in the development of emission factors for selected hazardous air pollutants (HAPs) emitted from several processes associated with the wood products industry. Roy F. Weston, Inc. (WESTON) was contracted to conduct the air emissions testing at Weyerhaeuser Company (WEYCO) in Moncure, North Carolina during September 10 to September 27, 1992. The processes that were tested include:

- Medium Density Fiberboard (MDF) particle dryer B - cyclone outlet
- Medium Density Fiberboard Press - 5 roof vents
- Two Microboard dryers - inlets and outlets to electric charged fluidized bed (EFB) cyclones
- Microboard press - 8 roof vents

The MDF particle dryer and the microboard dryers are the only sources with control devices. A detailed description of the processes is presented in Section 2. A summary of the emission results is presented in Section 3. Parameters and sampling locations are further discussed in Section 4. Descriptions of sampling and analytical methods are included in Section 5. Quality control measures employed during this program are described in Section 6. Emission factors developed for each process are presented in Section 7. Appendices (A-E) containing information for verification of this report have been compiled in Volumes II through IV.

1.2 PROGRAM OBJECTIVES

The objectives of the test program were to:

- Collect valid, representative samples during normal process operation conditions of the sources to be evaluated.
- Measure the emissions of aldehyde/ketones, condensible particulate, PM_{10}, semivolatile organics, total hydrocarbons, total particulate matter, and volatile organics at the MDF particle dryer B cyclone outlet (MDF cyclone outlet).

organics, total hydrocarbons, total particulate matter, and volatile organics at the MDF particle dryer B cyclone outlet (MDF cyclone outlet).

- Measure aldehyde/ketones, condensible particulate, PM_{10}, and total hydrocarbon emissions from the MDF press vents (5 locations).

- Measure simultaneously the emissions of condensible particulate, PM_{10}, and total hydrocarbons at inlet and outlet locations of the EFB's on the microboard core layer particle dryer (core EFB) and the microboard surface layer particle dryer (surface EFB).

- Measure carbon monoxide, formaldehyde (plus other aldehydes and ketones), nitrogen oxide (NO_x), semivolatile organic, and volatile organic emissions at the outlet locations of the core EFB and surface EFB.

- Measure aldehyde/ketones, condensible particulate, and PM_{10} emissions from the microboard press room exhausts (3 of 6 vents).

- Measure the total hydrocarbon emissions from the six microboard press room exhausts.

- Measure the emissions of condensible particulate, formaldehyde (plus other aldehydes and ketones), PM_{10}, and total hydrocarbons from the microboard cooling press room exhausts.

- Obtain sufficient process and control device information to allow the assessment of representative operating conditions.

- Document all data in a comprehensive report.

1.3 KEY PERSONNEL

Figure 1-1 presents the organization and major lines of communication for this test program.

1.4 OUTLINE OF TEST PROGRAM

The types of samples collected were dependent on the location being evaluated. Pollutants that were measured include:

- Aldehyde/ketones
- Carbon monoxide
- Condensible particulate
- Nitrogen Oxides (NO_x)
- PM_{10}
- Particulate matter
- Semivolatile organics
- Total hydrocarbons
- Volatile organics

Table 1-1 is a test log which presents the sampling locations, emissions measured, test dates, types of sampling, and run numbers.

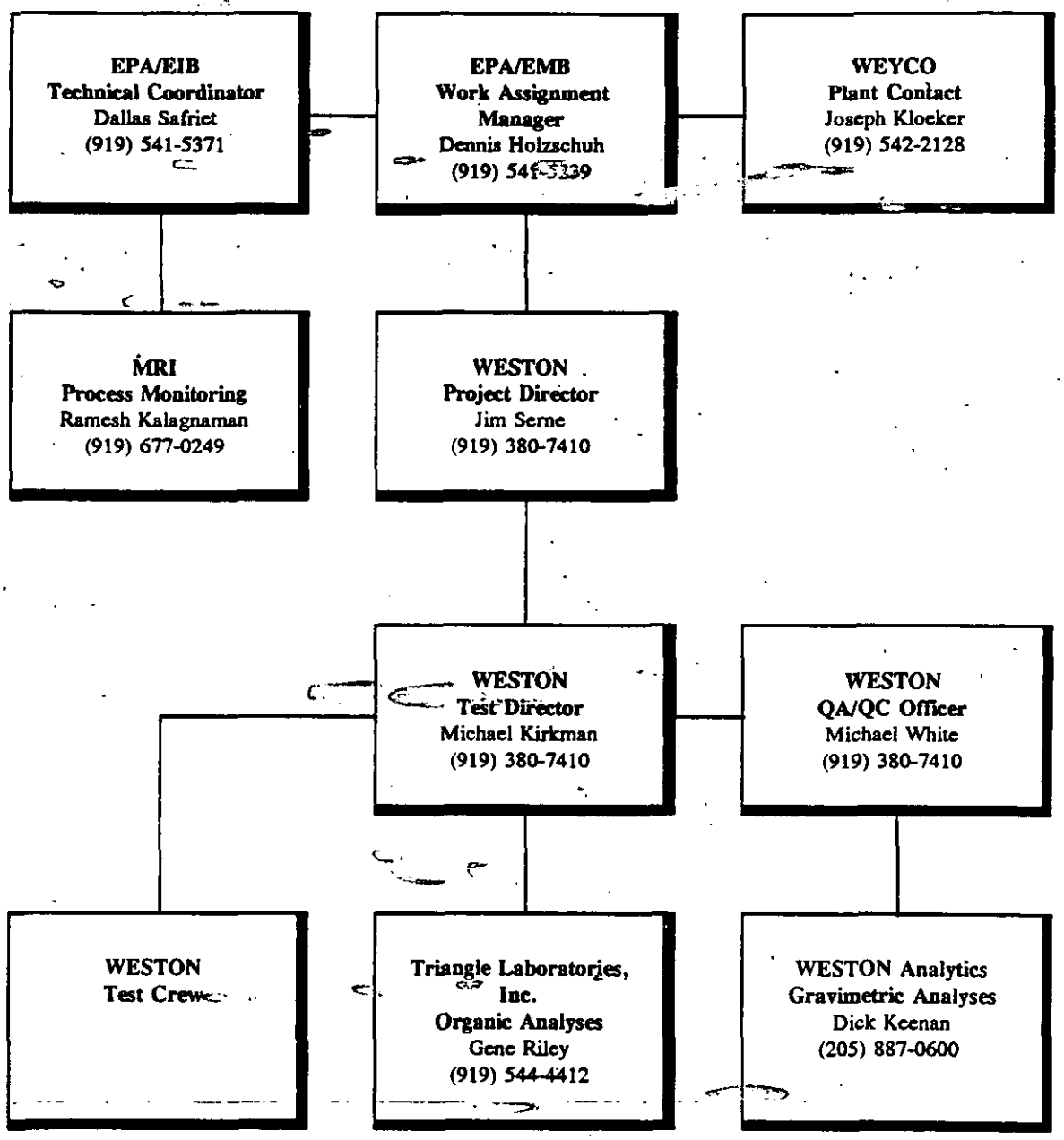

Figure 1-1.

Test Program Organization Chart

TABLE 1-1

Test Log

Sampling Location	Emissions Measured	Type of Sampling	Run Numbers\Test Date\Clock Time Repetition		
			1	2	3
MDF Cyclone Outlet (WBYCO ID-DB) Stack 1	Aldehydes/ Ketones	Method 0011	MDFCO-M0011-1 9/26 (1326-1457)	MDFCO-M0011-2 9/26 (1626-1741)	MDFCO-M0011-3 9/26 (1843-2018)
	Particulate & Condensibles	Method 5/202	MDFCO-M5/202-1 9/25 (1327-1457)	MDFCO-M5/202-2 9/25 (1626-1745)	MDFCO-M5/202-3 9/25 (1843-2021)
	PM10	Method 201A	MDFCO-M201A-1 9/25 (1116-1457)	MDFCO-M201A-2 9/26 (1707-1937)	MDFCO-M201A-3 9/27 (945-1248)
	Semivolatile HAPs	Method 0010	MDFCO-M0010-1 9/26 (1135-1456)	MDFCO-M0010-2 9/26 (1706-1945)	MDFCO-M0010-3 9/27 (955-1200)
	Total Hydrocarbons	Method 25A	MDFCO-M25A-1 9/25 (1255-1458)	MDFCO-M25A-2 9/25 (1540-1742)	MDFCO-M25A-3 9/25 (1824-2018)
	Volatile HAPs	Method 0030	MDFCO-M0030-1 9/26 (1135-1456)	MDFCO-M0030-2 9/26 (1545-1855)	MDFCO-M0030-3 9/27 (955-1200)
MDF Press Stack 2 (WTW-2)	Aldehydes/ Ketones	Method 0011	MDFP2-M0011-1 9/11 (1928-2050)	MDFP2-M0011-2 9/12 (848-1021)	MDFP2-M0011-3 9/12 (1211-1427)
	PM10 & Condensibles	Method 201A/202	MDFP2-M201A/202-2 9/10 (1148-1739)	MDFP2-M201A/202-2 9/11 (740-1145)	MDFP2-M201A/202-3 9/11 (1353-1821)
	Total Hydrocarbons	Method 25A	MDFP2-M25A-1 9/11 (1934-2100)	MDFP2-M25A-3A 9/12 (1211-1335)	MDFP2-M25A-3C 9/12 (1335-1446)
MDF Press Stack 3 (WTW-1)	Aldehydes/ Ketones	Method 0011	MDFP3-M0011-1 9/11 (1928-2050)	MDFP3-M0011-2 9/12 (848-1009)	MDFP3-M0011-3 9/12 (1211-1410)
	PM10 & Condensibles	Method 201A/202	MDFP3-M201A/202-2 9/10 (1148-1742)	MDFP3-M201A/202-2 9/11 (740-1158)	MDFP3-M201A/202-3 9/11 (1352-1803)
	Total Hydrocarbons	Method 25A	MDFP3-M25A-1 9/11 (1934-2100)	MDFP3-M25A-3A 9/12 (1211-1335)	MDFP3-M25A-3C 9/12 (1335-1446)
MDF Press Stack 4 (WTW-5)	Aldehydes/ Ketones	Method 0011	MDFP4-M0011-1 9/12 (1802-1939)	MDFP4-M0011-2 9/13 (938-1132)	MDFP4-M0011-3 9/13 (1248-1420)
	PM10 & Condensibles	Method 201A/202	MDFP4-M201A/202-2 9/12 (1625-2059)	MDFP4-M201A/202-2 9/13 (840-1253)	MDFP4-M201A/202-3 9/13 (1408-1812)
	Total Hydrocarbons	Method 25A	MDFP4-M25A-1 9/12 (1753-2038)	MDFP4-M25A-2 9/13 (830-1022)	MDFP4-M25A-3 9/13 (1249-1533)
MDF Press Stack 5 (WTW-3)	Aldehydes/ Ketones	Method 0011	MDFP5-M0011-1 9/12 (1757-1904)	MDFP5-M0011-2 9/13 (935-1111)	MDFP5-M0011-3 9/13 (1246-1420)
	PM10 & Condensibles	Method 201A/202	MDFP5-M201A/202-2 9/12 (1625-2122)	MDFP5-M201A/202-2 9/13 (840-1226)	MDFP5-M201A/202-3 9/13 (1348-1842)
	Total Hydrocarbons	Method 25A	MDFP5-M25A-1 9/12 (1753-2038)	MDFP5-M25A-2 9/13 (830-1022)	MDFP5-M25A-3 9/13 (1249-1533)
MDF Press Stack 6 (WTW-4)	Aldehydes/ Ketones	Method 0011	MDFP6-M0011-1 9/11 (1928-2056)	MDFP6-M0011-2 9/12 (848-1019)	MDFP6-M0011-3 9/12 (1212-1418)
	PM10 & Condensibles	Method 201A/202	MDFP6-M201A/202-2 9/10 (925-1458)	MDFP6-M201A/202-2 9/11 (735-1159)	MDFP6-M201A/202-3 9/11 (1353-1756)
	Total Hydrocarbons	Method 25A	MDFP6-M25A-1 9/11 (1934-2100)	MDFP6-M25A-3A 9/12 (1211-1335)	MDFP6-M25A-3C 9/12 (1335-1446)

(continued next page)

TABLE 1-1 (continued)

Test Log

Sampling Location	Emissions Measured	Type of Sampling	Run Numbers\Test Date\Clock Time Repetition		
			1	2	3
Surface EFB Inlet Stack 9	Particulate & Condensibles	Method 5/202	MBSLI-M5/202-2 9/16 (1221-1354)	MBSLI-M5/202-3 9/16 (1505-1620)	MBSLI-M5/202-4 9/17 (839-955)
	Total Hydrocarbons	Method 25A	MBSLI-M25A-1 9/16 (1145-1330)	MBSLI-M25A-2 9/16 (1518-1630)	MBSLI-M25A-3 9/17 (840-1030)
Surface EFB Outlet Stack 10 (1510)	Aldehydes/ Ketones	Method 0011	MBSLO-M0011-1 9/16 (1145-1307)	MBSLO-M0011-2 9/16 (1505-1620)	MBSLO-M0011-3 9/17 (859-1016)
	Carbon Monoxide	Method 10	MBSLO-CEM-1 9/16 (1145-1330)	MBSLO-CEM-2 9/16 (1518-1630)	MBSLO-CEM-3 9/17 (840-1030)
	Nitrogen Oxides	Method 7E	MBSLO-CEM-1 9/16 (1145-1330)	MBSLO-CEM-2 9/16 (1518-1630)	MBSLO-CEM-3 9/17 (840-1030)
	PM 10 & Condensibles	Method 201A/202	MBSLO-M201A/202-2 9/16 (1225-1357)	MBSLO-M201A/202-3 9/16 (1550-1719)	MBSLO-M201A/202-4 9/17 (839-1027)
	Semivolatile HAPs	Method 0010	MBSLO-M0010-1 9/17 (1227-1509)	MBSLO-M0010-2 9/17 (1713-1950)	MBSLO-M0010-3 9/18 (1225-1508)
	Volatile HAPs	Method 0030	MBSLO-M0030-1 9/17 (1227-1509)	MBSLO-M0030-2 9/17 (1717-1901)	MBSLO-M0030-3 9/18 (1225-1412)
Core EFB Inlet Stack 7	Particulate & Condensibles	Method 5/202	MBCLI-M5/202-2 9/15 (1210-1411)	MBCLI-M5/202-3 9/15 (1547-1729)	MBCLI-M5/202-4 9/15 (1858-2024)
	Total Hydrocarbons	Method 25A	MBCLI-M25A-1 9/14 (1723-1852)	MBCLI-M25A-4 9/15 (1648-1748)	MBCLI-M25A-5 9/15 (1900-2000)
Core EFB Outlet Stack 8 (1520)	Aldehydes/ Ketones	Method 0011	MBCLO-M0011-1 9/14 (1711-1816)	MBCLO-M0011-2 9/15 (1304-1409)	MBCLO-M0011-3 9/15 (1633-1738)
	Carbon Monoxide	Method 10	MBCLO-CEM-3 9/15 (1407-1507)	MBCLO-CEM-4 9/15 (1648-1748)	MBCLO-CEM-5 9/15 (1900-2000)
	Nitrogen Oxides	Method 7E	MBCLO-CEM-1 9/14 (1723-1852)	MBCLO-CEM-4 9/15 (1648-1748)	MBCLO-CEM-5 9/15 (1900-2000)
	PM 10 & Condensibles	Method 201A/202	MBCLO-M201A/202-2 9/15 (1204-1411)	MBCLO-M201A/202-3 9/15 (1546-1736)	MBCLO-M201A/202-4 9/15 (1857-2029)
	Semivolatile HAPs	Method 0010	MBCLO-M0010-1 9/17 (1204-1533)	MBCLO-M0010-2 9/17 (1801-2035)	MBCLO-M0010-3 9/18 (1249-1551)
	Total Hydrocarbons	Method 25A	MBCLO-CEM-1 9/14 (1723-1852)	MBCLO-CEM-4 9/15 (1648-1748)	MBCLO-CEM-5 9/15 (1900-2000)
	Volatile HAPs	Method 0030	MBCLO-M0030-1 9/17 (1219-1446)	MBCLO-M0030-2 9/17 (1804-2022)	MBCLO-M0030-3 9/18 (1255-1529)
Microboard Press Stack 11 (DEF-1)	Aldehydes/ Ketones	Method 0011	MBP11-M0011-1 9/19 (1636-1753)	MBP11-M0011-2 9/21 (1810-1927)	MBP11-M0011-3 9/22 (1421-1639)
	PM 10 & Condensibles	Method 201A/202	MBP11-M201A/202-1 9/19 (1044-1513)	MBP11-M201A/202-2 9/21 (1810-1927)	MBP11-M201A/202-3 9/22 (906-1309)
	Total Hydrocarbons	Method 25A	MBP11-M25A-1 9/19 (1505-1800)	MBP11-M25A-2 9/21 (1900-2003)	MBP11-M25A-3 9/22 (1352-1545)
Microboard Press Stack 12 (DEF-3)	Aldehydes/ Ketones	Method 0011	MBP12-M0011-1 9/19 (1636-1754)	MBP12-M0011-2 9/21 (1810-1927)	MBP12-M0011-3 9/22 (1421-1639)
	PM 10 & Condensibles	Method 201A/202	MBP12-M201A/202-1 9/19 (1041-1528)	MBP12-M201A/202-2 9/21 (858-1325)	MBP12-M201A/202-3 9/22 (906-1305)
	Total Hydrocarbons	Method 25A	MBP12-M25A-1 9/19 (1505-1800)	MBP12-M25A-2 9/21 (1900-2003)	MBP12-M25A-3 9/22 (1352-1545)

(continued next page)

TABLE 1-1 (continued)

Test Log

Sampling Location	Emissions Measured	Type of Sampling	Run Numbers\Test Date\Clock Time Repetition		
			1	2	3
Microboard Press Stack 13 (DEP-5)	Aldehydes/ Ketones	Method 0011	MBP13-M0011-1 9/19 (1636-1751)	MBP13-M0011-2 9/21 (1810-1923)	MBP13-M0011-3 9/22 (753-927)
	PM10 & Condensibles	Method 201A/202	MBP13-M201A/202-1 9/19 (1021-1518)	MBP13-M201A/202-2 9/21 (858-1301)	MBP13-M201A/202-3 9/22 (904-1256)
	Total Hydrocarbons	Method 25A	MBP13-M25A-1 9/19 (1509-1800)	MBP13-M25A-2 9/21 (1900-2003)	MBP13-M25A-3 9/22 (1352-1545)
MB Cooling Room Stack 14 (DEP-7)	Aldehydes/ Ketones	Method 0011	MBCR14-M0011-1 9/22 (1733-1900)	MBCR14-M0011-2 9/22 (1931-2059)	MBCR14-M0011-3 9/24 (753-927)
	PM10 & Condensibles	Method 201A/202	MBCR14-M201A/202-1 9/23 (1055-1459)		
	Total Hydrocarbons	Method 25A	MBCR14-M25A-1 9/22 (1733-1900)	MBCR14-M25A-2 9/22 (1900-2105)	
MB Cooling Room Stack 15 (DEP-8)	Aldehydes/ Ketones	Method 0011	MBCR15-M0011-1 9/22 (1733-1900)	MBCR15-M0011-2 9/22 (1931-2059)	MBCR15-M0011-3 9/24 (753-927)
	PM10 & Condensibles	Method 201A/202	MBCR15-M201A/202-1 9/23 (1055-1502)		
	Total Hydrocarbons	Method 25A	MBCR15-M25A-1 9/22 (1733-1900)	MBCR15-M25A-2 9/22 (1900-2105)	
Microboard Press Stacks 16, 17, 18 (DEP-2,4,6)	Total Hydrocarbons	Method 25A	MDFP16-M25A-1 9/19 (0900-1000)	MDFP16-M25A-2 9/19 (1022-1129)	MDFP16-M25A-3 9/21 (0900-1200)
	Total Hydrocarbons	Method 25A	MDFP16-M25A-4 9/21 (1210-1328)		

(continued next page)

SECTION 2
PROCESS DESCRIPTION AND OPERATION

2.1 INTRODUCTION

Facility B in Moncure, North Carolina, produces medium density fiberboard (MDF) and a furniture-grade particleboard called microboard. Facility B purchased the MDF mill on September 28, 1974, and in 1986 expanded the plant by constructing the microboard line, which began production in October 1987. The MDF mill has a rated annual production capacity of 93 x 10^6 square feet on a 3/4 inch basis and produced 71.2 x 10^6 square feet in 1991. The microboard line has a rated production capacity of 120 x 10^6 square feet on a 3/4 inch basis and produced 92.2 x 10^6 square feet in 1991. The two mills employ a total of 330 employees, and both mills run three shifts, 7 days a week. Every 2 weeks the plants shut down for 12 hours of maintenance. In 1991 the MDF line operated 6,907 hours and the microboard line operated 6,571 hours. The rated production capacity net shippable is calculated using the production rate per hour on a 3/4-inch basis and multiplying it by 8,760 available hours per year, taking into account an average of 7 percent waste. The facility is permitted to operate 8,400 hours per year.

2.2 PROCESS DESCRIPTION

Wood furnish (wood chips and sawdust) is received by truck and railcar and is deposited into a common receiving bin that serves both mills. The truck dump bin is a three-sided, aboveground metal enclosure with a chain drag conveyor at the bottom. The bin is equipped with a hydraulic hoist that lifts the entire truck and tilts it approximately 45 degrees, allowing the furnish to flow out of the back of the trailer and into the receiving bin. Unloading a trailer takes less than a minute. The wood furnish takes only a few seconds to empty into the receiving bin once it starts to flow; the remainder of the time is spent raising and lowering the truck. Because a common receiving bin is used for both sawdust and wood chips, the bin must be completely emptied of wood chips before any sawdust can

be dumped into the bin, and vice-versa. The sawdust or wood chips are taken from the receiving bin by a conveyor to the microboard or MDF plant storage piles. The storage piles for the microboard plant are covered by an A-frame structure that is approximately 60 ft high, 50 ft wide, and 300 ft long. Wood chips are stored on an open pad. Conveyors deposit the materials on the storage piles, and front-end loaders scoop it up and drop it into a process feed bin located at the end of the structure. Logs are received by truck and deposited in an open storage yard.

2.2.1 Medium-Density Fiberboard Mill

The MDF mill is approximately 20 years old and now produces 10,600 ft^2/hr (0.859 in. thick), which is approximately 36,800 lb/hr of board with an average finished product density of 48.5 lb/ft^3. With the exception of the press, which has been upgraded, all of the process equipment has been replaced over the years. The mill uses almost exclusively whole tree hardwood chips (very little, if any, limbs or pine) that it receives from offsite chip mills. The wood mix consists of 50 percent hardwoods (oak and hickory) and 50 percent soft hardwoods (poplar, maple, beech, birch, gum, sweetgum, sycamore).

A process flow diagram of the MDF production process is presented in Figure 2-1. The MDF production process begins as wood chips received by truck at the unloading bin are screened to remove undesirable chips and metal and washed in a water bath to remove dirt and other debris.

The cleaned chips are conveyed to two presteaming bins to heat and loosen the wood fibers, after which the chips are sent to refiners where the chips are mechanically pulped. The two refiner lines each process approximately 26,000 lb/hr of material (dry basis).

The separated fibers enter a blow line, where wax, formaldehyde scavenger, and urea/formaldehyde resin are blended with the fibers. The wax coats the surface of the fibers to retard their tendency to absorb excessive amounts of the resin used to bind the fibers. The fibers exiting the blow line contain approximately 7.8 percent resin by weight.

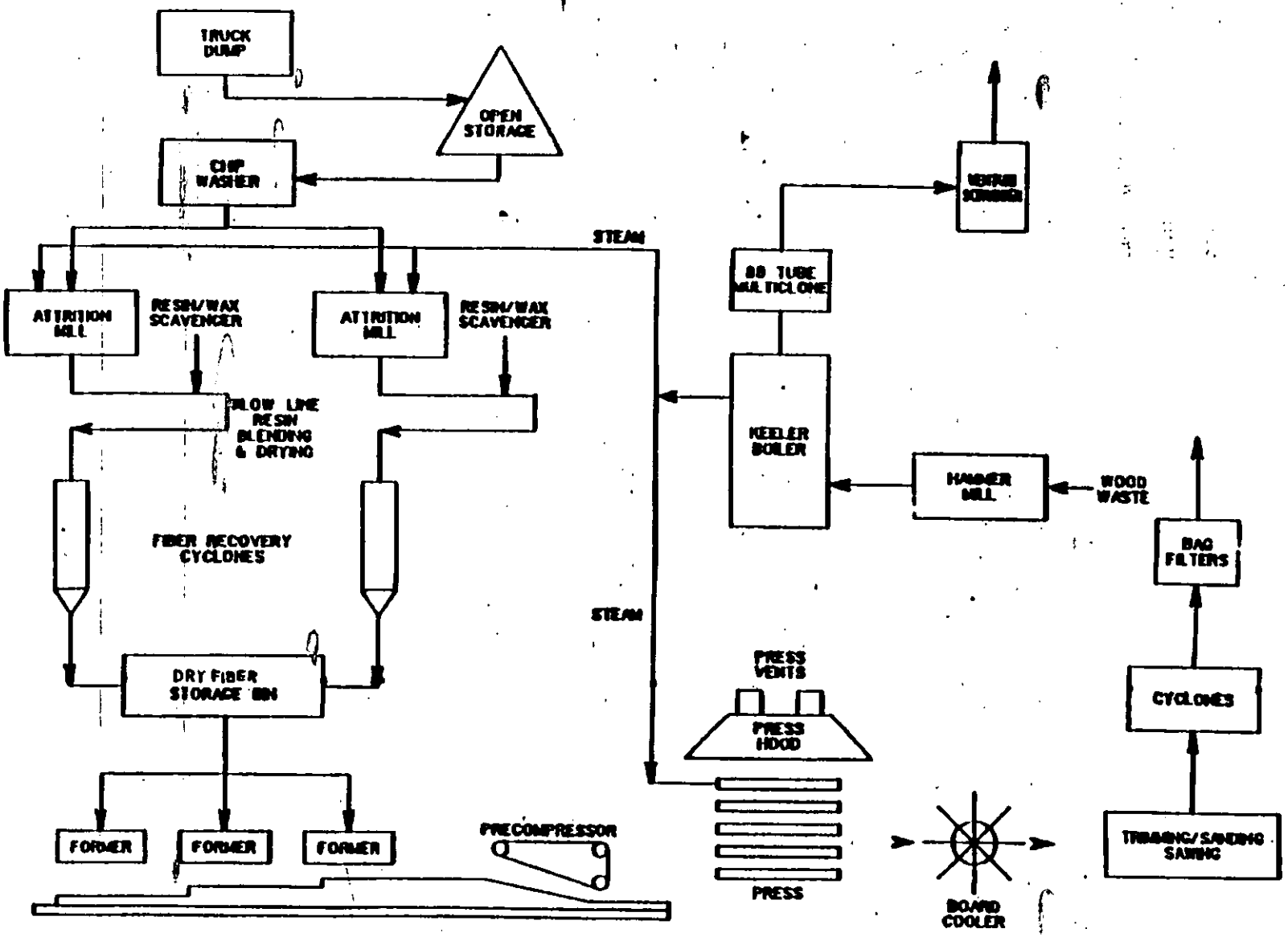

FIGURE 2-1
Process Flow Diagram for Medium Density Fiberboard Production

After resin blending in the blow line, the fibers enter a 54-inch diameter steam- and thermal-oil heated drying tube, where they are dried to approximately 8.5 to 9 percent moisture. The dried fibers are collected by a 17-ft diameter high efficiency cyclone, weighed, and sent to a dry storage bin.

From the dry storage bin, the fiber is sent to one of three formers. The formers lay the fiber on an 5-foot-wide, continuous moving mat in three layers, which are precompressed by a system of belts and rollers. The continuously precompressed mat is cut into 68 in. x 296 in. sections by a flying cutoff saw. The individual mats are sent to a staging area in preparation for loading into the press. The mats are fed into a 6.5 ft x 25.5 ft eight-opening steam-heated press. The press is capable of producing panels between 3/8-in. and 1-1/2-in. in 3/32-in. increments. The average cycle time in 1992 was 18.8 seconds per 1/16 in. of finished thickness as of November 1. Steam for the press is supplied by the 80,000 lb/hr fixed grate Keeler boiler. The boiler is grate fired by wood waste. The ash is sent to a recycler for use in a potting soil mixture. Particulate matter (PM) emissions from the boiler are controlled by an 88-tube multiclone, followed by a wide-gap venturi wet scrubber. The design pressure drop across the scrubber is 8 in. of water column.

The press and unloader area is enclosed at the top and is equipped with three exhaust fans to pull escaping vapors from the press and unloader. The gases exiting the press are vented directly to the atmosphere. Two area roof fans also assist in ventilating the press area.

The panels exiting the press are sent to a horizontal board cooler, where they are allowed to cool at ambient temperature. Once cooled, the panels are sent to be sanded, inspected, and cut into various sizes. Panels not meeting the industry specifications are labeled as second-grade product and are sold or are sent to the hammermill for preparation as fuel to the boiler. The mill generates approximately 8,000 lb of trim waste per hour for 12 hours per day; most of the trim waste is sent to a hogger and then to the presteaming bins for reuse as board furnish. The remainder of the board trim is used as boiler fuel. The sawdust and sanderdust generated in the panel finishing operations are collected in several

baghouses and sent to a silo. These waste materials are ultimately used as fuel for the Keeler boiler.

2.2.2 Microboard Mill

The microboard mill has been on-line since October 1987. The mill press produces 14,785 ft^2/hour of 0.813-in. thick board having a density of 43.2 lb/ft^3. This corresponds to approximately 43,573 lb/hr of board with an average finished product density of 42.5 lb/ft^3. The microboard mill processes primarily pine wood (core = 100 percent southern pine, 95 percent long leaf loblolly logs, 5 percent short leaf pine logs; surface = 60 percent southern pine sawdust, 40 percent hardwood sawdust) into a furniture-grade particleboard panel. The panel is made up of five layers. The inner layer consists of wood flakes and is sandwiched between two layers of sawdust. The outer surfaces comprise sanderdust, giving the panel a very smooth blemish-free surface that is necessary for applying thin laminates and veneers. The board can be made in any thickness between 3/8 in. and 1-3/16 in. in 1/16-in. increments.

A process flow diagram of the microboard plant is shown in Figure 2-2. Sawdust is received by truck, deposited at the truck unloading bin and conveyed to the sawdust A-frame storage building. Logs, used to make flakes, are also received by truck and are unloaded by a gantry crane onto the log yard. The gantry crane loads the logs onto a conveyor that sends them to a slasher saw and a debarker. The bark is sent to a fuel storage bin for use as fuel in the Wellons burners. The debarked logs are sent to a flaker where rotating cutting knives reduce the logs in thin flakes. The flakes, which are considerably smaller than those used to produce oriented strandboard, are stored in a bin in preparation for drying.

Sawdust received from the sawdust storage pile is air-sifted to remove dirt, rocks, and other debris. The sawdust and flakes are kept separate in the process and are dried separately in two single-pass rotary drum dryers. The flakes are dried to a moisture content of between 2.0 and 2.5 percent and sawdust is dried to a moisture content of about 6 to 6.5 percent. The dryers are heated with exhaust gases from the Wellons burner and from heat supplied by McConnel suspension dust burners. The core layer dryer maintains an inlet

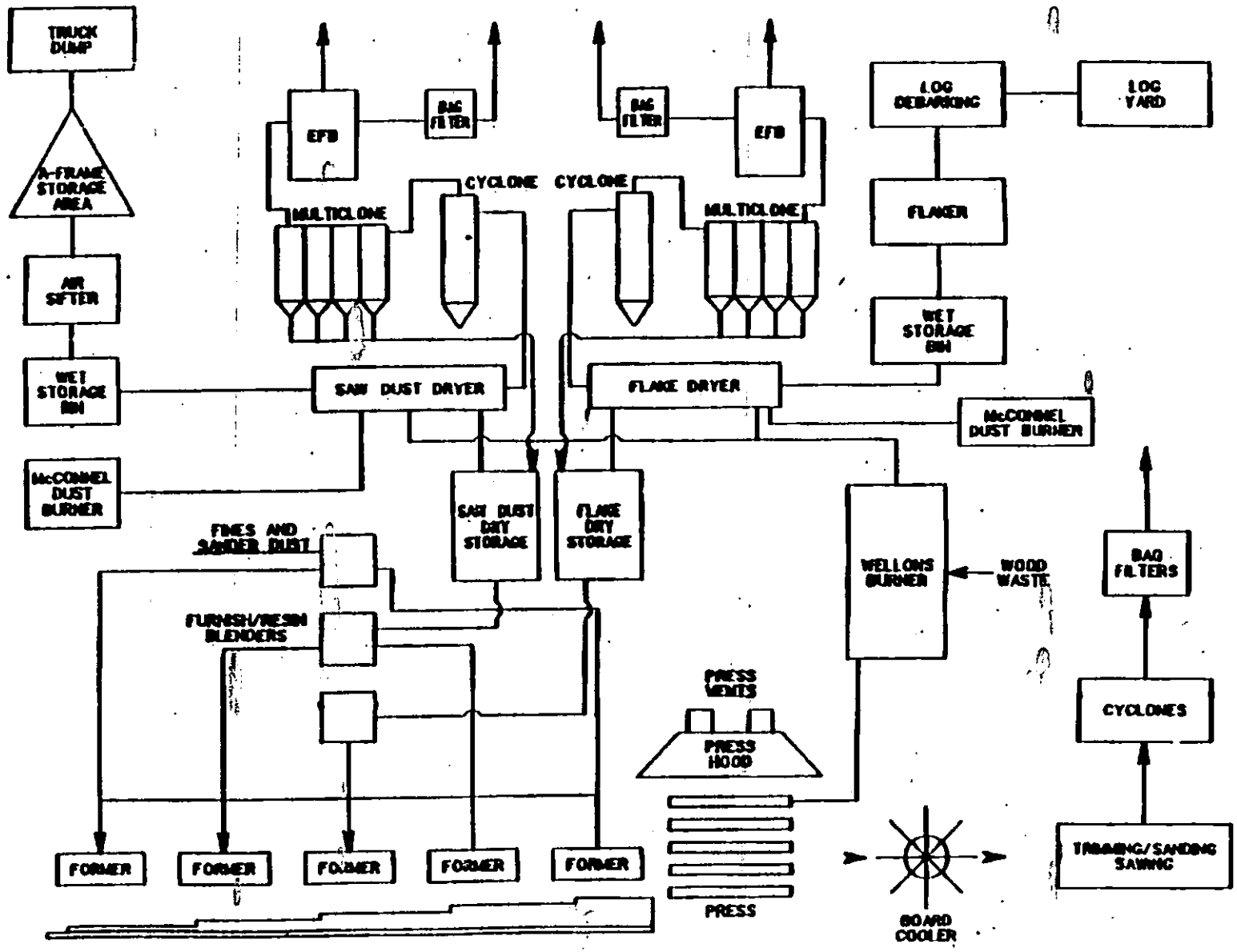

FIGURE 2-2
Process Flow Diagram for Microboard (Particleboard) Production

temperature of approximately 480° to 680°C (900° to 1250°F) and an outlet temperature of 130° to 140°C (260° to 280°F). An inlet temperature of 320° to 480°C (600° to 900°F) and an outlet temperature of 91° to 96°C (195° to 205°F) are maintained on the surface layer dryer. Exhaust gases exiting the dryers are sent through to a bank of four high- efficiency multiclones for PM removal. An electrified filter bed (EFB) downstream from the multiclones collects fine PM and condensible organic materials.

In the EFB, fine dust particles in the dryer exhaust are given an electrostatic charge in the corona formed by the ionizers and then are deposited on electrically polarized filter beds of pea gravel. The pea gravel is continuously removed from the filtration region and cleaned externally in a pneumatic conveyor. The dust removed from the gravel is conveyed to a small bag filter, and cleaned gravel is returned to the EFB. Particulate matter collected in the small bag filter is sent to a nursery and mixed with potting soil.

The sticky nature of the condensing wood resins in the dryer exhaust and the presence of high moisture and PM concentration often result in a build-up of this material on the ionizer ring of the EFB, thereby decreasing the EFB's removal efficiency. Each system is equipped with an automatic sand-blast cleaning system that periodically removes the resins and particulate that stick to the ionizer ring. Sticky wood resins also tend to buildup on the core layer EFB gravel. As a result, Facility B continuously exchanges the gravel in the core EFB with the gravel in the surface EFB and vice versa in an effort to remove the condensed wood resins from the gravel formerly in the core EFB.

From the dryers, the dried sawdust and flakes are screened to separate the various particle sizes and stored in separate dry storage bins. Sanderdust from the board sanding operation is also collected in a storage bin. All three furnish materials are resinated with urea/formaldehyde resin in separate blenders and sent to the formers. The formers deposit the furnish in a continuous manner on a 9.4-foot (113-in.) wide moving caul screen in the five layers described above. The thickness of each layer depends on the thickness of the panel being produced.

After the mat is formed, it is cut into 24.67 foot (296 in.) lengths by a flying cutoff saw. The individual mats are loaded into a 9.94 ft x 24.97 ft (119-1/4 in. x 297-1/2 in.) five-opening press that is heated by thermal oil to 350°F. The mats are heated under pressure in the press to densify the mat and cure the resins holding the wood particles together. The average press time required to cure the panels is about 3.5 minutes. The average cycle time in 1992 was 15.8 sec per 1/16 in. of thickness as of November 1. Hot gases exiting the press are exhausted out of the building by six roof-mounted exhaust fans.

After they are removed from the press, the panels are sent to a board cooler. From the board cooler, the panels are sanded by a 10-ft-wide, eight-head sander. After sanding, the panels are cut by a panel saw into various sizes to satisfy customer orders.

The most notable sources of fugitive PM emissions at the Moncure mill are the truck dump area, and the two A-frame storage areas and the microboard silo area. All of the external conveyors used to transport material through the plant are covered and appear to have minimal PM emissions.

2.3 DESCRIPTION OF PROCESS PARAMETERS MONITORED DURING TESTING

Emission measurements were taken from five process units: MDF Dryer B, the MDF press, the microboard core flake dryer, the microboard surface flake dryer, and the microboard press. Additional samples were also collected to measure the fugitive emissions from the MDF press unloader area, microboard press unloader area, and microboard cooling area. The following sections describe the process parameters monitored during the test. Copies of production reports were obtained for each day that tests were conducted.

2.3.1 MDF Press

Parameters that were monitored during the test include the following:

1. MDF dryer processing rates (Thayer scale readings) for both dryers, A and B;
2. Resin addition rate;
3. Wax addition rate;

4. Scavenger addition rate;
5. Number of press cycles that occurred during the testing period; and
6. Size of boards produced (thickness, length, and width).

The amount of material processed by the dryers is monitored continuously. Both instantaneous processing rate in lb/hr and the cumulative flow in lb are displayed continuously. Resin application rates also are displayed continuously. Resin and wax addition rates are expressed as percent of the maximum flow rates of 20 gallons per minute (gal/min) and 2.2 gal/min, respectively. Scavenger addition rate (gal/min) is displayed continuously. Press cycles are recorded continuously. Noting the exact number of press cycles that took place during the testing period enabled accurate estimation of the board production rate during the testing period.

2.3.2 MDF Dryer B

Parameters that were monitored during the test include the following:

1. Processing rate of MDF dryer B;
2. Resin addition rate;
3. Wax addition rate; and
4. Scavenger addition rate.

To estimate the process rate for MDF Dryer B, the cumulative material flow readings taken at the beginning and end of the test were used.

2.3.3 Core and Surface Flake Dryers

Parameters that were monitored during the test include the following:

1. Percent of the maximum capacity at which the dryer was operating;
2. Temperatures at the inlet and outlet of the dryer;
3. Sanderdust burning rate; and
4. EFB operating parameters, ionizer voltage, ionizer current, bed voltage, and bed current.

The dryer process rates were estimated by simply obtaining the flake flow rate (on a dry basis) corresponding to the percent setting from the calibration curves provided by Facility B

for both dryers.

2.3.4 Microboard Press

Parameters that were monitored during the test include the following:

1. Percent of the maximum capacity at which the dryer was operating;
2. Temperatures at the inlet and outlet of the dryer;
3. Sanderdust burning rate;
4. EFB operating parameters, ionizer voltage, ionizer current, bed voltage, and bed current;
5. Number of press cycles that occurred during the testing period; and
6. Size of boards produced (thickness, length, and width).

Noting the exact number of press cycles that took place during the testing period is sufficient to enable accurate estimation of the board production during the testing period.

2.4 SUMMARY OF PROCESS RATES

Using the data that were recorded as described above, process rates were estimated for each run. The only exception is the PM-10 test for the microboard cooling area. There is no process rate that corresponds to the cooling area. At any given time, there are a fixed number of boards cooling off on a rack. Tables A-1 through A-7 contain summaries of process data for all the tests conducted at Facility B.

TABLE 2-1. PROCESS DATA FOR TESTING AT MDF PRESS VENTS 1, 2, AND 4

Pollutant	Run No.	Date	Time[a]	Board specifications			Average production rate, $10^3/ft^2$ (actual)/hr[b]
				Thickness, in.	Length x width, ft	Board density, lb/ft^3	
PM-10	1	9/10/92	09:25 - 17:42	0.625	24 x 5	48.6	10.5
	2	9/11/92	07:35 - 11:59	0.625	24 x 5	48.6	17.2[c]
	3	9/11/92	13:52 - 18:07	0.625	24 x 5	48.6	13.9
Aldehydes and ketones	1	9/11/92	19:28 - 20:55	0.625	24 x 5	48.6	13.9[d]
	2	9/12/92	08:48 - 10:21	0.75	24 x 5	47.1	11.5
	3	9/12/92	12:11 - 14:28	0.75	24 x 5	47.1	12.8

[a]Testing on stacks 1, 2, and 4 were carried out at different times. The time duration specified above corresponds to the time when the first probe was introduced and when the last probe was removed, irrespective of the stack. This duration also includes any down time, if applicable.

[b]Production rates were estimated based on notes marked on the press cycle strip chart. These notes corresponded to times when the test started and when the test ended. Thus, the production rate was estimated by simply counting the number of press cycles that took place within a specified time interval. Each press cycle produced 8 boards, each 24 ft long and 5 ft wide or 4 ft wide, as indicated in the table.

[c]For run No. 2, because the mark on the stripchart corresponding to when the test started was not clear, the process rate was estimated based on the amount of material generated by the two dryers during the testing period, based on the assumption that all this material was used up to produce the boards during that time interval. Because the density of the board is known, the amount of material in pounds was divided by the density to obtain the volume of board produced. The volume of board in turn was divided by the board thickness to obtain the actual surface area.

[d]For run No. 1, because the mark on the stripchart corresponding to when the test started was not clear, the process rate was determined to be equal to that of PM-10 run No. 3. This assumption is valid because the same product was produced during the aldehyde/ketone run No. 1 as was produced during the PM-10 run No. 3.

TABLE 2-2. PROCESS DATA FOR TESTING AT MDF PRESS VENTS 3 AND 5

Pollutant	Run No.	Date	Time[a]	Board specifications			Average production rate, $10^3/ft^2$ (actual)/hr[b]
				Thickness, in.	Length x width, ft	Board density, lb/ft^3	
PM-10	1	9/12/92	16:25 - 21:24	0.75	24 x 5	47.1	11.9
	2	9/13/92	08:40 - 12:53	0.75	24 x 4	46.7	10.3
	3	9/13/92	13:43 - 18:44	0.75	24 x 4	46.7	15.4
Aldehydes and ketones	1	9/12/92	17:53 - 19:47	0.75	24 x 5	47.1	11.8
	2	9/13/92	09:35 - 11:34	0.75	24 x 4	46.7	10.6
	3	9/13/92	12:46 - 14:20	0.75	24 x 4	46.7	10.1

[a]Testing on stacks 3 and 5 were carried out at different times. The time duration specified above corresponds to the time when the first probe was introduced and when the last probe was removed, irrespective of the stack. This time interval also includes any down time, if applicable.

[b]Production rates were estimated based on notes marked on the press cycle strip chart. These notes corresponded to times when the test started and when the test ended. Thus, the production rate was estimated by simply counting the number of press cycles that took place within a specified time interval. Each press cycle produced 8 boards, each 24 ft long and 5 ft wide or 4 ft wide as indicated in the table.

TABLE 2-3. PROCESS DATA FOR TESTING ON MDF DRYER B CYCLONE OUTLET

Pollutant	Run No.	Date	Time[a]	Furnish flow rate, dry basis, tons/hr[b]
PM	1	9/25/92	13:27 - 14:27	9.02
	2	9/25/92	16:26 - 17:45	9.41
	3	9/25/92	18:43 - 20:21	8.72
Aldehydes and ketones	1	9/25/92	13:26 - 15:00	9.02
	2	9/25/92	16:26 - 17:45	9.41
	3	9/25/92	18:43 - 20:21	8.72
PM-10	1	9/26/92	11:16 - 14:57	7.66
	2	9/25/92	17:06 - 19:38	7.41
	3	9/27/92	09:45 - 12:48	8.54
Semivolatiles and volatiles	1	9/26/92	11:06 - 15:07	7.66
	2	9/25/92	17:06 - 19:38	7.41
	3	9/27/92	09:41 - 12:57	8.54

[a]The time duration specified above corresponds to the time when the probe was first introduced and when the probe was finally removed and includes port changes and any applicable down time.
[b]The furnish flow rate, dry basis, was estimated based on readings of cumulative flow of furnish, minus the additive rates of resin, wax, and scavenger, and minus the moisture content.

TABLE 2-4. PROCESS DATA FOR TESTING AT THE CORE DRYER ELECTRIFIED FILTER BED (EFB) OUTLET

Pollutant	Run No.	Date	Time[a]	Core flake drying rate, dry basis, (tons/hr)[b]
PM-10	1	9/14/92	16:02 - 18:58	13.13
	2	9/15/92	12:04 - 14:11	12.43
	3	9/15/92	15:46 - 17:36	11.88
	4	9/15/92	18:57 - 20:30	12.31
Condensibles	1	9/14/92	16:19 - 19:10	13.14
	2	9/15/92	12:03 - 14:11	12.51
	3	9/15/92	15:47 - 17:29	11.8
	4	9/15/92	18:58 - 20:24	12.31
Aldehydes and ketones	1	9/14/92	17:11 - 18:16	11.12
	2	9/15/92	13:04 - 14:10	12.31
	3	9/15/92	16:34 - 17:38	12.22
Semivolatiles	1	9/17/92	12:04- 15:33	12.31
	2	9/17/92	18:01 - 20:35	12.31
	3	9/18/92	12:49- 15:51	12.31
Volatiles	1	9/17/92	12:19 - 14:46	12.31
	2	9/17/92	18:01 - 20:22	12.31
	3	9/18/92	12:55- 15:29	12.31

[a]The time duration specified above corresponds to the time when the probe was first introduced and when the probe was finally removed and includes port changes and any applicable down time.
[b]The core flake drying rate is estimated based on the operating capacity of the dryer during the test. The operating capacity is set by the operator as a percent of the total flow. A calibration curve was provided by the facility which gives the mass flow rate on a dry basis corresponding to different fractions of the total capacity.

TABLE 2-5. PROCESS DATA FOR TESTING AT THE SURFACE DRYER ELECTRIFIED FILTER BED (EFB) OUTLET

Pollutant	Run No.	Date	Time[a]	Surface flake drying rate, dry basis, (tons/hr)[b]
PM-10	1	9/16/92	12:25 - 13:58	9.64
	2	9/16/92	15:50 - 17:19	9.64
	3	9/17/92	08:39 - 10:27	8.02
Condensibles	1	9/16/92	12:21 - 13:54	9.64
	2	9/16/92	15:39 - 16:59	9.64
	3	9/17/92	08:39 - 10:27	8.41
Aldehydes and ketones	1	9/16/92	11:43 - 13:01	9.64
	2	9/16/92	15:05 - 16:20	9.64
	3	9/17/92	08:59 - 10:16	8.71
Semivolatiles	1	9/17/92	12:27 - 15:09	9.64
	2	9/17/92	17:13 - 19:50	9.64
	3	9/18/92	12:25 - 15:08	8.61
Volatiles	1	9/17/92	12:29 - 15:09	9.64
	2	9/17/92	17:17 - 19:01	9.64
	3	9/18/92	12:25 - 14:12	8.7
PM-10[c]	1	9/18/92	09:25 - 10:52	9.64

[a]The time duration specified above corresponds to the time when the probe was first introduced and when the probe was finally removed and includes port changes and any applicable down time.
[b]The surface flake drying rate is estimated based on the operating capacity of the dryer during the test. The operating capacity is set by the operator as a percent of the total flow. A calibration curve was provided by the facility which gives the mass flow rate on a dry basis corresponding to different fractions of the total capacity.
[c]Simultaneous inlet and outlet test (one run only).

TABLE 2-6. PROCESS DATA FOR TESTING AT MICROBOARD PRESS VENTS 1, 3, AND 5

Pollutant	Run No.	Date	Time[a]	Board specifications		Average production rate, 10^3 ft^2 (actual)/hr[b]
				Thickness, inches	Length x width, ft	
PM-10	1	9/19/92	10:20 - 15:28	0.625	24 x 9	17.3
	2	9/21/92	08:58 - 13:25	1	24 x 9	14.4
	3	9/22/92	09:04 - 13:10	0.625	24 x 9	16.4
Aldehydes and ketones	1	9/19/92	16:35 - 17:53	0.625	24 x 9	18.6
	2	9/21/92	18:10 - 19:23	1	24 x 9	14.4[c]
	3	9/22/92	14:21 - 15:39	0.625	24 x 9	16.4

[a]Testing on stacks 1, 3, and 5 were carried out at different times. The time duration specified above corresponds to the time when the first probe was introduced and when the last probe was removed, irrespective of the stack and includes any applicable down time.

[b]Production rates were estimated based on notes marked on the press cycle strip chart. These notes corresponded to times when the test started and when the test ended. Thus, the production rate was estimated by simply counting the number of press cycles that took place within a specified time interval. Each press cycle produced 5 boards, each 24 ft long and 9 ft wide.

[c]For run No. 2, since the mark on the stripchart corresponding to when the test started was not clear, the process rate was determined to be equal to that of PM-10 run No. 2. This assumption is valid because the same product was produced during the aldehyde/ketone run No. 2 as was produced during the PM-10 run No. 2.

TABLE 2-7. PROCESS DATA FOR TESTING AT MICROBOARD PRESS UNLOADER VENTS 1 AND 2

Pollutant	Run No.	Date	Time[a]	Board specifications		Average production rate, 10^3 ft^2 (actual)/hr[b]
				Thickness, inches	Length x width, ft	
Aldehydes and ketones	1	9/22/92	17:33 - 19:00	0.625	24 x 9	17.1
	2	9/22/92	19:31 - 20:59	0.625	24 x 9	17.7
	3	9/24/92	07:53 - 09:27	0.625	24 x 9	15.4
PM-10	1	9/24/92	10:54 - 14:59	0.625	24 x 9	15.9

[a]Testing on stacks 1 and 2 were carried out at different times. The time duration specified above corresponded to the time when the first probe was introduced and when the last probe was removed, irrespective of the stack and includes any applicable down time.

[b]Production rates were estimated based on notes marked on the press cycle strip chart. These notes corresponded to times when the test started and when the test ended. Thus, the production rate was estimated by simply counting the number of press cycles that took place within a specified time interval. Each press cycle produced 5 boards, each 24 ft long and 9 ft wide.

SECTION 3
SUMMARY OF RESULTS

3.1 PRESENTATION

The tabulated results from all of the testing performed at WEYCO are presented in this section. The results are presented in tables which are organized by pollutant group. Tables 3-1 through 3-7 summarize the test results for sampling performed at the MDF and Microboard test locations. Individual run summaries are presented in Tables 3-8 through 3-57; refer to the "List of Tables and Figures" for a cross reference. Detailed results of all the testing can be found in Appendix A; field and analytical data are provided in Appendix B.

3.2 DISCUSSION

3.2.1 Aldehyde/Ketones

Tables 3-1 and 3-2 summarize the aldehyde/ketones results for the MDF and Microboard sampling locations, respectively. Individual run summaries are presented in Tables 3-8 through 3-20.

Testing for aldehyde/ketones was performed using EPA Method 0011 (M0011). All sample trains contained three impingers except for run MBCLO-M0011-3 performed at the Core EFB Outlet which contained four impingers. Each impinger was analyzed separately to verify sample train collection efficiency.

Formaldehyde was the major compound present at all sources. The m-tolualdehyde and p-tolualdehyde could not be chromatographically resolved. Therefore, the data has been calculated for a mixture of m- and p-tolualdehyde.

TABLE 3-1

MDF ALDEHYDES/KETONES AVERAGE EMISSIONS SUMMARY

Aldehyde/Ketones Emissions	MDF Cyclone Outlet	Stack 2	Stack 3	Stack 4	Stack 5	Stack 6
CONCENTRATION, µg/dscm*						
FORMALDEHYDE	36,400	51,300	65,800	8,030	6,580	13,000
ACETALDEHYDE	336	543	494	75.9	67.0	111
ACROLEIN	56.7	57.7	129	24.0	22.2	24.9
ACETONE	104	236	159	77.5	71.2	238
PROPIONALDEHYDE	28.1	26.1	45.6	10.1	7.50	0.359
CROTONALDEHYDE	49.4	90.1	43.2	37.6	32.8	28.1
n-BUTYRALDEHYDE	73.2	175	105	66.4	64.1	151
METHYL ETHYL KETONE	164	58.6	77.5	3.33	3.86	12.1
BENZALDEHYDE	67.2	30.2	25.2	15.8	20.8	11.0
ISOVALERALDEHYDE	48.5	102	55.4	39.1	38.6	28.3
VALERALDEHYDE	54.2	124	107	63.1	71.1	53.0
o-TOLUALDEHYDE	19.5	21.9	52.0	9.87	15.0	7.35
m/p-TOLUALDEHYDE	97.3	120	62.8	11.9	18.5	18.7
HEXALDEHYDE	67.5	115	107	99.8	102	71.6
2,5-DIMETHYL BENZALDEHYDE	9.91	122	85.4	29.3	34.4	20.4
CONCENTRATION, ppm dry by volume						
FORMALDEHYDE	29.2	41.1	52.7	6.44	5.27	10.4
ACETALDEHYDE	0.183	0.296	0.270	0.0414	0.0366	0.0605
ACROLEIN	0.0243	0.0247	0.0553	0.0103	0.00953	0.0107
ACETONE	0.0432	0.0977	0.0660	0.0321	0.0295	0.0990
PROPIONALDEHYDE	0.0116	0.0108	0.0189	0.00417	0.00311	0.000149
CROTONALDEHYDE	0.0170	0.0310	0.0148	0.0129	0.0113	0.00967
n-BUTYRALDEHYDE	0.0244	0.0584	0.0349	0.0221	0.0214	0.0505
METHYL ETHYL KETONE	0.0547	0.0196	0.0258	0.00111	0.00129	0.00403
BENZALDEHYDE	0.0152	0.00684	0.00571	0.00359	0.00471	0.0125
ISOVALERALDEHYDE	0.0136	0.0284	0.0155	0.0109	0.0108	0.0459
VALERALDEHYDE	0.0152	0.0346	0.0298	0.0176	0.0199	0.0148
o-TOLUALDEHYDE	0.00390	0.00439	0.0104	0.00197	0.00300	0.00147
m/p-TOLUALDEHYDE	0.0193	0.0241	0.0126	0.00237	0.00371	0.00375
HEXALDEHYDE	0.0162	0.0277	0.0257	0.0240	0.0244	0.0172
2,5-DIMETHYL BENZALDEHYDE	0.00178	0.0219	0.0153	0.00526	0.00618	0.00367
EMISSION RATE, LB/HR						
FORMALDEHYDE	12.6	2.18	3.04	0.583	1.35	1.35
ACETALDEHYDE	0.116	0.0230	0.0229	0.00548	0.0138	0.0116
ACROLEIN	0.0197	0.00244	0.00595	0.00174	0.00454	0.00259
ACETONE	0.0356	0.0100	0.00730	0.00555	0.0146	0.0254
PROPIONALDEHYDE	0.00972	0.00108	0.00212	0.000732	0.00154	0.0000375
CROTONALDEHYDE	0.0171	0.00384	0.00200	0.00277	0.00665	0.00296
n-BUTYRALDEHYDE	0.0254	0.00743	0.00488	0.00484	0.0131	0.0163
METHYL ETHYL KETONE	0.0571	0.00247	0.00359	0.000244	0.000789	0.00127
BENZALDEHYDE	0.0234	0.00128	0.00116	0.00115	0.00425	0.00116
ISOVALERALDEHYDE	0.0169	0.00432	0.00257	0.00285	0.00789	0.00296
VALERALDEHYDE	0.0189	0.00527	0.00494	0.00459	0.0145	0.00551
o-TOLUALDEHYDE	0.00668	0.000930	0.00241	0.000729	0.00306	0.000752
m/p-TOLUALDEHYDE	0.0333	0.00513	0.00291	0.000852	0.00380	0.00195
HEXALDEHYDE	0.0235	0.00488	0.00495	0.00722	0.0208	0.00746
2,5-DIMETHYL BENZALDEHYDE	0.00346	0.00520	0.00396	0.00214	0.00703	0.00214

TABLE 3-2

MICROBOARD ALDEHYDES/KETONES AVERAGE EMISSIONS SUMMARY

Aldehyde/Ketones Emissions	Core EFB Outlet	Surface EFB Outlet	Stack 11	Stack 12	Stack 13	Stack 14	Stack 15
CONCENTRATION, µg/dscm*							
FORMALDEHYDE	13,900	967	30,300	29,900	27,600	6,520	6,410
ACETALDEHYDE	6,060	265	375	380	333	153	159
ACROLEIN	1,960	42.0	125	88.6	75.8	37.6	46.7
ACETONE	7,860	662	765	684	487	223	250
PROPIONALDEHYDE	882	20.1	< 7.58	< 4.77	< 8.35	< 5.32	< 1.03
CROTONALDEHYDE	841	42.1	49.3	28.8	37.9	27.6	40.6
n-BUTYRALDEHYDE	2,450	96.7	125	99.3	102	60.3	80.6
METHYL ETHYL KETONE	761	< 17.1	18.2	17.8	16.9	12.9	13.9
BENZALDEHYDE	9,810	422	111	104	105	47.4	51.9
ISOVALERALDEHYDE	1,510	55.8	110	96.8	86.1	42.6	51.9
VALERALDEHYDE	1,160	203	174	156	134	57.9	77.4
o-TOLUALDEHYDE	870	33.8	10.9	5.14	5.44	4.10	2.26
m/p-TOLUALDEHYDE	2,170	236	61.5	57.9	46.4	22.4	24.7
HEXALDEHYDE	1,840	314	399	390	320	122	133
2,5-DIMETHYL BENZALDEHYDE	435	74.8	18.5	14.9	35.3	10.7	9.38
CONCENTRATION, ppm dry by volume							
FORMALDEHYDE	11.1	0.775	24.3	23.9	22.1	5.22	5.14
ACETALDEHYDE	3.30	0.145	0.205	0.207	0.182	0.0836	0.0865
ACROLEIN	0.839	0.0180	0.0536	0.0380	0.0325	0.0161	0.0200
ACETONE	3.27	0.275	0.317	0.284	0.202	0.0926	0.104
PROPIONALDEHYDE	0.365	0.00830	< 0.00314	< 0.231	< 0.00346	< 0.0022	< 0.000427
CROTONALDEHYDE	0.289	0.0145	0.0169	0.00991	0.0130	0.00950	0.0140
n-BUTYRALDEHYDE	0.816	0.0323	0.0416	0.0331	0.0339	0.0201	0.0269
METHYL ETHYL KETONE	0.254	< .00570	0.0305	0.0135	0.00565	0.00430	0.00465
BENZALDEHYDE	2.22	0.0956	0.0251	0.0236	0.0237	0.0107	0.0117
ISOVALERALDEHYDE	0.418	0.0156	0.0307	0.0271	0.0241	0.00190	0.0145
VALERALDEHYDE	0.324	0.0660	0.0486	0.0436	0.0376	0.0162	0.0216
o-TOLUALDEHYDE	0.174	0.00676	0.00218	0.00391	0.00108	0.000821	0.000327
m/p-TOLUALDEHYDE	0.435	0.0473	0.0123	0.0116	0.00929	0.00449	0.00495
HEXALDEHYDE	0.442	0.0754	0.0959	0.0936	0.0768	0.0292	0.0319
2,5-DIMETHYL BENZALDEHYDE	0.0783	0.0134	0.00332	0.00268	0.00634	0.00192	0.00168
EMISSION RATE, lb/hr							
FORMALDEHYDE	2.00	0.177	0.851	1.24	1.00	0.372	0.376
ACETALDEHYDE	0.872	0.0487	0.0105	0.0158	0.0121	0.00880	0.00939
ACROLEIN	0.280	0.00774	0.0359	0.00369	0.00275	0.00215	0.00274
ACETONE	1.14	0.122	0.0209	0.0284	0.0176	0.0127	0.0146
PROPIONALDEHYDE	0.128	0.00368	< 0.000226	< 0.000195	< 0.000309	< 0.000322	< 0.0000599
CROTONALDEHYDE	0.123	0.00776	0.00139	0.00120	0.00137	0.00160	0.00240
n-BUTYRALDEHYDE	0.355	0.0178	0.00348	0.00413	0.00368	0.00348	0.00476
METHYL ETHYL KETONE	0.110	< 0.00313	0.000493	0.000740	0.000617	0.000744	0.000824
BENZALDEHYDE	1.41	0.0775	0.00308	0.00433	0.00381	0.00270	0.00317
ISOVALERALDEHYDE	0.216	0.0103	0.00305	0.00403	0.00313	0.00245	0.00306
VALERALDEHYDE	0.168	0.0374	0.00480	0.00648	0.00487	0.00333	0.00458
o-TOLUALDEHYDE	0.126	0.00621	0.000308	0.000214	0.000200	0.000231	0.000135
m/p-TOLUALDEHYDE	0.311	0.0434	0.00173	0.00241	0.00170	0.00128	0.00145
HEXALDEHYDE	0.266	0.0578	0.0109	0.0162	0.01160	0.00697	0.00783
2,5-DIMETHYL BENZALDEHYDE	0.0640	0.0138	0.000531	0.000622	0.00127	0.000620	0.000553

Review of the individual impinger analyses for run MDFCO-M0011-2 indicates that the first and second impinger samples may have been mislabeled during the recovery or analysis phase. Similar data anomalies exist for runs MDFP3-M0011-2, MBP11-M0011-1, and MBCR14-M0011-2.

Comparison of the individual impinger analyses demonstrates no significant breakthrough of any of the compounds of interest except acetone and acetaldehyde. Measured quantities of all compounds in the final impingers were near or at reported minimum detection limits. Acetone and acetaldehyde did not exhibit the same trend of impinger collection efficiency. It appears that EPA Method 0011 (M0011) may be inappropriate for quantifying acetone and acetaldehyde emissions from these sources. Acetone values from the EPA Method 0030 (VOST) runs for the MDF Cyclone Outlet, Surface EFB, and Core EFB averaged 0.009, 0.28, and 3.54 pounds per hour, respectively. Acetone values determined by M0011 averaged 0.0356, 0.12, and 1.14 pounds per hour at the same three locations, respectively. Acetone is a common laboratory solvent and is also used to recover particulate and PM_{10} trains. M0011 has not been validated for acetone and previous sampling efforts under other EPA Work Assignments have reported problems with the use of M0011 to quantify acetone emissions. Although precautions were taken to prevent contamination, there is a possibility of field or laboratory contamination.

For the runs performed at the Core EFB Outlet, there were significant levels of acetaldehyde in the third impingers. In this case, there is no explanation for carry over. It is not possible to determine if all the acetaldehyde emissions were collected by the M0011 sample train or if unknown quantities purged through the impingers. M0011 has not been validated for acetaldehyde.

Since the formaldehyde concentrations at most of the sources were high, the use of three impingers was needed to insure capture in the train. The formaldehyde catch in the third impinger was generally less than one percent of the catch in the first impinger.

The sample containers containing impinger one samples for runs MDFP2-M0011-3 and MDFP6-M0011-1 were broken in transit to the laboratory for analysis. Therefore, for MDF Press Stacks 2 and 6, the emission results for these runs were not reported.

3.2.2 Particulate and Condensibles

An EPA Method 5/202 (M5/202) sample train was used to determine the particulate and condensible particulate emissions at the core and surface EFB inlets and the MDF cyclone outlet. The particulate and condensible particulate emissions are summarized in Table 3-3. Tables 3-21 through 3-23 summarize the individual runs.

For run MDFCO-M5/202-3, the isokinetic sampling rate was higher than EPA criteria allows (100 ± 10%) at 116.1%. This was due to improper sample rate procedures. Sampling at over-isokinetic rates should give results that are lower than actual if large particles (aerodynamically greater than 50 microns) are present in the gas stream. The sampling location is located downstream from a cyclone and, therefore the particle size should be less than 50 microns. The bias attributable to sampling over-isokinetic should be negligible. The filterable emissions that were reported are probably lower than actual emissions by less than five percent. The condensible particulate emissions are not affected and are judged correct as reported.

The water residue blank determination was greater than allowed for EPA Method 5 particulate samples. Therefore, the inorganic particulate samples were not corrected for water residue.

An additional test run was done at the surface and core EFB inlets to coincide with additional PM_{10} runs performed at the EFB outlets.

3.2.3 PM_{10}

The PM_{10} and condensible particulate emissions from the MDF press stacks and all microboard test locations were determined using an EPA Method 201A/202 sample train. The PM_{10} emissions from the MDF cyclone outlet were determined using an EPA Method

201A constant rate sample train. The PM_{10} and condensible particulate emissions are summarized in Table 3-3. Individual run summaries are presented in Tables 3-24 through 3-35.

EPA Method 201A requires a maximum of 12 sample points be used. Due to cyclonic flow being present at the MDF cyclone outlet, 24 sample points were used in an attempt to insure a more accurate flow determination.

For all runs performed at the MDF Press Stacks, the PM_{10} sizing device (including in-stack filters) could not be positioned in the stack on the first two sampling points of each traverse axis due to the length of the cyclone head. This sampling limitation was also encountered on the first run of the microboard press stacks. For the second and third runs performed at the microboard press stacks and the runs performed at the microboard cooling room stacks, the third point on each traverse axis was sampled three repetitions so that the sizing device was inside the stack for the duration of the tests.

If the PM_{10} head is not in the stack during sampling, there is the potential for the condensible gases to collect on the filter since it is at a cooler temperature than the flue gas. This is a significant issue when the stack gases are much hotter than the ambient temperature. For the MDF press stacks 2 and 3, the temperature difference was approximately 30° F. The temperature difference for MDF stacks 4, 5, and 6 was approximately 10° F. For the microboard stacks the temperature difference was about 20° F. Due to this small temperature differential, the impact on the data quality is insignificant.

After review of the data for stacks 11, 12 and 13, there is no discernable difference in the results for the two different sampling approaches at these locations. Any variabilities associated with the results are probably due to the imprecision of the sample recovery and gravimetric techniques of EPA Method 201A in analysis of particulate catches that are less than 50 milligrams. The MDF Press locations are very similar to the Microboard Press locations and thus there is probably no significant bias of the results for the MDF Press.

TABLE 3-3

PM10 & TOTAL PARTICULATE AVERAGE EMISSIONS SUMMARY

SAMPLING LOCATION	FILTERABLE (PM10)		FILTERABLE (PM10) + NON-EXTRACTABLE CONDENSIBLES		FILTERABLE (PM10) + NON-EXTRACTABLE & EXTRACTABLE CONDENSIBLES		TOTAL PARTICULATE (Includes PM10)	
	grains/DSCF*	pound/hr	grains/DSCF*	pound/hr	grains/DSCF*	pound/hr	grains/DSCF*	pound/hr
MDF								
Cyclone Outlet	0.00270	2.26	0.00912 **	7.23 **	0.0110 **	8.76 **	0.0254 ***	20.0 ***
PRESS								
Stack 2	0.00362	0.376	0.00757	0.747	0.00826	0.815	0.0158	1.54
Stack 3	0.00404	0.424	0.0209	2.22	0.0219	2.33	0.0302	3.20
Stack 4	0.00739	0.123	0.00159	0.265	0.0218	0.369	0.00282	0.460
Stack 5	0.000119	0.0580	0.000850	0.410	0.00916	0.441	0.00165	0.794
Stack 6	0.000155	0.0410	0.00147	0.389	0.00227	0.600	0.00381	1.01
MDF/OSB/HD								
Surface EFB								
Inlet	---	---	0.00408 ****	1.64 ****	0.0151 ****	6.07 ****	0.0616	24.6
Outlet	0.00381	1.50	0.00630	3.95	0.00734	4.59	0.0113	7.03
Core EFB								
Inlet	---	---	0.0368 ****	10.0 ****	0.0808 ****	22.0 ****	0.196	53.4
Outlet	0.0240	7.98	0.0587	19.6	0.0773	25.8	0.132	44.6
PRESS								
Stack 11	0.000600	0.0427	0.00189	0.143	0.00282	0.202	0.00359	0.258
Stack 12	0.000747	0.0346	0.00288	0.132	0.00321	0.149	0.00595	0.274
Stack 13	0.000537	0.0471	0.00217	0.193	0.00279	0.247	0.00364	0.324
Stack 14 *****	0.000108	0.0144	0.000740	0.0989	0.000847	0.113	0.00145	0.194
Stack 15 *****	0.000212	0.0300	0.000318	0.0450	0.000379	0.0536	0.00112	0.159

* 68 Degrees F -- 29.92 Inches of Mercury (Hg).
** From Method 5/202 Particulate & Condensible Particulate Runs & Method 201A PM10 Runs
*** From Method 5/202 Particulate & Condensible Particulate Runs
**** From Method 5/202 Particulate & Condensible Particulate Runs - Includes only condensible particulate. There is no PM10 filterable catch.
***** One run only

The sample train from run MBCLO-M201A/202-1 did not meet acceptable post-test leak check requirements. An additional run was performed to replace this run. At the conclusion of run MBSLO-M201A/202-1, the filter was observed to be wet and could not be adequately recovered. An additional run was performed to replace the run.

For runs MBSLO-M201A/202-2 and MBCLO-M201A/202-4, the sample bottle containing the impingers water catch was broken in transit to the laboratory. Therefore, no condensible emission results are calculated for these runs.

3.2.4 Semivolatile Organics

The semivolatile organic emissions summarized in Table 3-4 were determined using EPA Method 0010 (M0010). Tables 3-36 through 3-38 summarize the individual runs.

Semivolatile organic samples were collected at the cyclone outlet and the core and surface EFB outlets. Pinenes were the only compounds detected.

For the core EFB outlet, the reported p-cymene mass for run two was non-detectable. For runs one and three, the total p-cymeme mass collected averaged 1,870 mg. There is no apparent explanation for this. The results for the other pinene compounds (α-pinene, ß-pinene and α-terpineol) showed good agreement for all three runs.

3.2.5 Volatile Organics

EPA Method 0030 (VOST) was used to determine the volatile organic emissions at the MDF cyclone outlet and the EFB outlets. The volumetric flow rates used to report emission rates were obtained from concurrent isokinetic sample runs. Table 3-5 summarizes the volatile organic emissions. The individual runs are summarized in Tables 3-55 through 3-57.

Each VOST run consisted of four pairs of adsorbent tubes. Three of four pairs were analyzed with the fourth pair archived as a backup. Each pair consisted of a Tenax trap, followed by a Tenax Charcoal trap. The traps were analyzed individually on the first set of tubes at each location to determine the tube collection efficiency and breakthrough

TABLE 3–4

SEMIVOLATILE ORGANIC HAPS AVERAGE EMISSIONS SUMMARY

SEMIVOLATILE ORGANIC HAPS EMISSIONS	MDF CYCLONE OUTLET	SURFACE BFB OUTLET	CORE BFB OUTLET
P–CYMENE			
µg per dry std. cubic meter*	N/D	47.0	387
ppm by volume, Dry	N/D	0.00850	0.0693
pounds per hour	N/D	0.00908	0.0542
A–PINENE			
µg per dry std. cubic meter*	144	17,700	196,000
ppm by volume, Dry	0.0255	3.12	34.6
pounds per hour	0.0480	3.36	28.3
B–PINENE			
µg per dry std. cubic meter*	155.0	5,820	68,000
ppm by volume, Dry	0.0274	1.03	12.0
pounds per hour	0.0515	1.11	9.76
A–TERPINEOL			
µg per dry std. cubic meter*	52.7	2,480	14,300
ppm by volume, Dry	0.00265	0.387	2.23
pounds per hour	0.0175**	0.477	2.05

* 68 Deg. F (20 C) -- 29.92 In. Mercury

N/D -- Not Detected

TABLE 3-5

VOLATILE ORGANIC HAPS AVERAGE EMISSIONS SUMMARY

VOLATILE ORGANIC HAPS EMISSIONS	MDF CYCLONE OUTLET	SURFACE EFB OUTLET	CORE EFB OUTLET
CONCENTRATION, µg/dscm*			
A-Pinene	146	27,600	99,200
B-Pinene	148	10,400	53,400
Methylene Chloride	71.0	153	136
Trichlorofluoromethane	44.2	0.268	---
Chloromethane	34.7	644	14.6
n-Hexane	32.4	0.268	---
Acetone	26.5	1,560	18100
Isooctane	14.5	0.268	2.87
P-Cymene	4.06	104	944
Toluene	3.67	62.8	1350
2-Butanone	2.62	---	28.7
1,1,1-Trichloroethane	2.09	---	---
Chloroform	1.90	---	4.63
Styrene	1.04	---	15.4
m-/p-Xylene	1.03	10.2	480
Bromomethane	0.975	---	---
Cumene (isopropylbenzene)	0.924	---	130
Carbon Disulfide	0.351	---	---
Benzene	---	---	105
Iodomethane	---	---	14.1
o-Xylene	---	---	19.4
CONCENTRATION, ppb by volume, Dry			
A-Pinene	25.7	4,870	17,500
B-Pinene	26.1	1,820	9,410
Methylene Chloride	20.1	43.3	38.7
Trichlorofluoromethane	7.74	0.0498	---
Chloromethane	16.5	307	6.94
n-Hexane	9.05	0.0748	---
Acetone	11.0	646	7470
Isooctane	3.05	0.0534	0.604
P-Cymene	0.729	18.6	169
Toluene	0.957	16.4	352
2-Butanone	0.875	---	9.59
1,1,1-Trichloroethane	0.376	---	---
Chloroform	0.385	---	0.931
Styrene	0.252	---	3.57
m-/p-Xylene	0.247	2.31	109
Bromomethane	0.253	---	---
Cumene (isopropylbenzene)	0.203	---	26.0
Carbon Disulfide	0.108	---	---
Bromodichloromethane	---	---	---
Benzene	---	---	32.3
Iodomethane	---	---	2.40
o-Xylene	---	---	4.41
EMISSION RATE, Lb/Hr			
A-Pinene	0.0484	5.29	19.4
B-Pinene	0.0490	1.97	10.4
Methylene Chloride	0.0234	0.0297	0.0268
Trichlorofluoromethane	0.0149	0.0000516	---
Chloromethane	0.0116	0.125	0.00266
n-Hexane	0.0109	0.0000516	---
Acetone	0.00884	0.297	3.54
Isooctane	0.00489	0.0000516	0.000528
P-Cymene	0.00135	0.0200	0.184
Toluene	0.00123	0.0118	0.261
2-Butanone	0.000882	---	0.000524
1,1,1-Trichloroethane	0.000697	---	---
Chloroform	0.000614	---	---
Styrene	0.000364	---	0.00297
m-/p-Xylene	0.000364	0.00193	0.0931
Bromomethane	0.000340	---	---
Cumene (isopropylbenzene)	0.000311	---	0.0252
Carbon Disulfide	0.000113	---	---
Bromodichloromethane	---	---	---
Benzene	---	---	0.0191
Iodomethane	---	---	0.00258
o-Xylene	---	---	0.00373

potential. All other tubes were analyzed as pairs as cited in the method. The sample flow rate and total gas volume was based on the total hydrocarbon (THC) concentrations measured in the field using Method 25A (flame ionization detector). Any locations with high concentration THC were sampled at an appropriately lower flow rate, thus yielding a smaller volume of sample. Despite adjustments in the sample volume, there were instances when the amount of analyte detected exceeded the effective calibration range. Data reported in those instances should be considered estimates.

At all locations the most abundant compounds detected were α-pinene and ß-pinene. For the MDF cyclone outlet, the pinenes were detected at levels above the upper calibration range of 1.0 microgram (μg). Pinene values for the MDF cyclone outlet (MDFCO) ranged from 0.8 to 2.2 μg. The reported quantities for other compounds of interest were well within calibration range. Individual tube analysis of pair 1A demonstrated there was no breakthrough of any compounds detected at significant levels from the MDFCO. The surrogate recoveries for all MDFCO samples were within method requirement. Concentrations reported at the MDFCO for α- and ß-pinenes are considered conservative estimates.

Samples collected at the Microboard surface layer EFB outlet (MBSLO) and the Microboard core layer EFB outlet (MBCLO) were analyzed using a "high level" VOST analysis procedure. This decision was made after saturation levels were detected for α- and ß- pinenes using the standard low level VOST analytical technique for MBSLO-1A (invalid run). The QA/QC criteria for calibration and surrogate recoveries using the high level technique have not been clearly established. All data reported using this procedure should be considered estimates.

For the lower level pinene concentrations observed at the MDFCO, the VOST results are similar to the M0010 (semivolatile) results. For the higher pinene concentrations observed at the surface MBSLO and core MBCLO outlets, the M0010 sample train is considered to be more accurate for quantifying these compounds. It appears that at high concentration levels the VOST tubes become saturated and may not effectively trap these compounds.

3.2.6 CEM

The carbon monoxide, nitrogen oxides, and total hydrocarbon emissions were determined using EPA Methods 10, 7E, and 25A, respectively. The total hydrocarbon emissions are summarized in Table 3-6. Table 3-7 summarizes the carbon monoxide and nitrogen oxides emissions. Individual CEM runs are summarized in Tables 3-39 through 3-53. The carbon monoxide, nitrogen oxides, and total hydrocarbon (THC) emission rates were determined using the air flow rates from concurrent isokinetic runs. Additional THC testing was done at the microboard press stacks 16, 17, and 18. The air flow rates and moisture were not measured. The THC concentrations are presented in parts per million (ppm) wet expressed as propane and are summarized in Table 3-54.

To respond to questions raised by WEYCO and NCASI regarding probe, filter box and the sample line temperatures, a series of tests were conducted to determine the effect of variation of temperature on sample integrity. These tests were conducted during the first two days of testing on the MDF press vents on 11 and 12 September 1992.

Tests were run at three probe and filter box temperature conditions:

- below the stack temperature;
- above the stack temperature; and
- at approximately the stack temperature,

The sample lines were self-regulating and remained in the temperature range of 225-250 degrees Fahrenheit.

Condition 1: (equipment temperature maintained below stack temperature) resulted in the formation of condensation in the probe, filter, and filter housing. The corresponding THC concentrations were observed to be lower than those concentrations determined for higher equipment temperatures. These results verified the fact that organic species were condensing from the gas stream and not reaching the FID instrumentation.

Condition 2: (equipment temperature maintained above stack temperature) resulted in contamination of the sample line. It is believed that the higher temperature caused

TABLE 3–6

AVERAGE TOTAL HYDROCARBON EMISSIONS SUMMARY

SAMPLING LOCATION	CONCENTRATION			Emission Rate
	Parts Per Million		Milligrams Per	
	Wet*	Dry	Dry Std. Cu. Meter**	lb/hr
MDF				
Cyclone Outlet	10.8	12.0	21.9	7.62
PRESS				
Stack 2	19.6	20.3	37.2	1.57
Stack 3	28.2	29.1	53.3	2.50
Stack 4	4.2	4.31	7.90	0.574
Stack 5	2.8	2.85	5.22	1.07
Stack 6	5.6	5.78	10.6	1.09
MICROBOARD				
Surface EFB				
Inlet	39.4	46.0	84.2	14.2
Outlet	30.4	35.1	64.4	11.9
Core EFB				
Inlet	376	490	900	108
Outlet	275	352	646	93.4
PRESS				
Stack 11	44.2	45.8	83.9	2.33
Stack 12	42.4	43.8	80.2	3.34
Stack 13	33.0	34.1	62.5	2.28
Stack 14	14.0	14.5	26.5	1.47
Stack 15	13.0	12.9	23.6	1.34
Stack 16	32.3			
Stack 17	21.9			
Stack 18	31.6			

* As Propane

** 68 Degrees F – – 29.92 Inches of Mercury (Hg).

TABLE 3-7

CARBON MONOXIDE & NITROGEN OXIDES AVERAGE EMISSIONS SUMMARY

SAMPLING LOCATION	CARBON MONOXIDE			NITROGEN OXIDES		
	Concentration		Emission Rate	Concentration		Emission Rate,
	mg/dscm*	ppm,dry	Pound/Hour	mg/dscm*	ppm,dry	Pound/Hour
Surface EFB Outlet	120	100	22	70	37	13
Core EFB Outlet	250	210	36	110	56	16

* milligrams per dry standard cubic meter at 68 Degrees F -- 29.92 Inches of Mercury (Hg).

volatilization of some organic compounds that passed through the filter and condensed on the walls of the sample line. This contamination was observed during successive runs.

Condition 3: (equipment temperature maintained at the stack temperature) was determined to yield the most reliable test results. None of the problems associated with the other two conditions were observed. Tests run with the probe and filter assembly at or near to the source temperature were determined to be the most reliable and representative way to sample the sources at the Weyerhaeuser facility. On all tests conducted after September 12, 1992 the probe and filter assembly were maintained at or near the source temperatures.

3.2.7 Cyclonic Flow at the MDF Cyclone Sampling Location

In accordance with Section 2.4 of Method 1, the MDF cyclone outlet was checked for the presence of cyclonic flow. This test confirmed the presence of cyclonic flow patterns that exceeded the allowable rotation angle α of 20°. Since there is no EPA approved procedure for performing isokinetic and PM_{10} sampling under these conditions, the following strategy was supplied by the EPA Observer on-site in consultation with other EPA/EMB authorities. The yaw angles for each sample point were measured and recorded prior to testing using an angle finder and the alignment procedure described in Section 2.4 of Method 1. The pitot tubes were aligned parallel to the flow at each point and the velocity pressure (ΔP) was measured. The adjusted axial velocity pressure was calculated by multiplying the cosine of the yaw angle times the measured ΔP. The pitot tube was then aligned parallel to the stack walls (straight up and down in the usual configuration) and the resultant velocity pressures (corrected for rotation angle α) for each point were used to perform isokinetic sampling.

TABLE 3-8

ALDEHYDES/KETONES TESTS SUMMARY

MDF Cyclone Outlet (DB)

	MDFCO-M0011-1	MDFCO-M0011-2	MDFCO-M0011-3	Average
Test Date	9/25/92	9/25/92	9/25/92	N/A
Run Start Time	1326	1625	1843	N/A
Run Finish Time	1500	1741	2018	N/A
Test Train Parameters:				
Volume of Dry Gas Sampled, SCF*	46.373	47.326	48.553	N/A
Percent Isokinetic	104.7	97.9	99.2	N/A
Flue Gas Parameters:				
Temperature, Degrees F	158	155	152	155
Volumetric Air Flow Rates				
SCFM*, Dry	87,000	94,900	96,100	92,700
ACFM, Wet	113,000	121,000	123,000	119,000
ALDE./KETONES EMISSION RESULTS:				
FORMALDEHYDE				
µg per dry std. cubic meter*	35,600	38,800	34,900	36,400
ppm by volume, Dry	28.5	31.1	28.0	29.2
kilograms per hour	5.258	6.254	5.697	5.74
pounds per hour	11.591	13.788	12.560	12.6
ACETALDEHYDE				
µg per dry std. cubic meter*	375	167	465	336
ppm by volume, Dry	0.205	0.0912	0.254	0.183
kilograms per hour	0.0555	0.0270	0.0760	0.0528
pounds per hour	0.122	0.0594	0.168	0.116
ACROLEIN				
µg per dry std. cubic meter*	51.8	45.5	72.7	56.7
ppm by volume, Dry	0.0222	0.0195	0.0312	0.0243
kilograms per hour	0.00765	0.00734	0.0119	0.00896
pounds per hour	0.0169	0.0162	0.0262	0.0197
ACETONE				
µg per dry std. cubic meter*	155	61.2	96.0	104
ppm by volume, Dry	0.0644	0.0254	0.0398	0.0432
kilograms per hour	0.0230	0.00987	0.0157	0.0162
pounds per hour	0.0506	0.0218	0.0346	0.0356
PROPIONALDEHYDE				
µg per dry std. cubic meter*	30.5	25.4	28.4	28.1
ppm by volume, Dry	0.0126	0.0105	0.0117	0.0116
kilograms per hour	0.00450	0.00409	0.00463	0.00441
pounds per hour	0.00992	0.00902	0.0102	0.00972
CROTONALDEHYDE				
µg per dry std. cubic meter*	49.5	50.7	48.0	49.4
ppm by volume, Dry	0.0170	0.0174	0.0165	0.0170
kilograms per hour	0.00731	0.00818	0.00784	0.00778
pounds per hour	0.0161	0.0180	0.0173	0.0171
n-BUTYRALDEHYDE				
µg per dry std. cubic meter*	76.1	61.9	81.5	73.2
ppm by volume, Dry	0.0254	0.0207	0.0272	0.0244
kilograms per hour	0.0113	0.00999	0.0133	0.0115
pounds per hour	0.0248	0.0220	0.0293	0.0254
METHYL ETHYL KETONE				
µg per dry std. cubic meter*	155	151	187	164
ppm by volume, Dry	0.0516	0.0503	0.0624	0.0547
kilograms per hour	0.0228	0.0243	0.0305	0.0259
pounds per hour	0.0504	0.0536	0.0673	0.0571

Estimated Catch Weight

* 68 Deg. F (20 C) - - 29.92 In. Mercury

(continued next page)

TABLE 3-8 (continued)

ALDEHYDES/KETONES TESTS SUMMARY

MDF Cyclone Outlet (DB)

	MDFCO-M0011-1	MDFCO-M0011-2	MDFCO-M0011-3	Average
BENZALDEHYDE				
µg per dry std. cubic meter*	54.8	85.1	61.8	67.2
ppm by volume, Dry	0.0124	0.0193	0.0140	0.0152
kilograms per hour	0.00810	0.0137	0.0101	0.0106
pounds per hour	0.0179	0.0302	0.0223	0.0234
ISOVALERALDEHYDE				
µg per dry std. cubic meter*	44.9	40.3	60.4	48.5
ppm by volume, Dry	0.0126	0.0113	0.0169	0.0136
kilograms per hour	0.00664	0.00850	0.00986	0.00766
pounds per hour	0.0146	0.0143	0.0217	0.0169
VALERALDEHYDE				
µg per dry std. cubic meter*	50.3	45.5	66.9	54.2
ppm by volume, Dry	0.0140	0.0127	0.0187	0.0152
kilograms per hour	0.00743	0.00734	0.0109	0.00856
pounds per hour	0.0164	0.0162	0.0241	0.0189
o-TOLUALDEHYDE				
µg per dry std. cubic meter*	25.9	20.9	11.6	19.5
ppm by volume, Dry	0.00518	0.00418	0.00233	0.00390
kilograms per hour	0.00383	0.00337	0.00190	0.00303
pounds per hour	0.00843	0.00743	0.00419	0.00668
m/p-TOLUALDEHYDE				
µg per dry std. cubic meter*	123	145	24.0	97.3
ppm by volume, Dry	0.0245	0.0287	0.00480	0.0193
kilograms per hour	0.0181	0.0233	0.00392	0.0151
pounds per hour	0.0399	0.0515	0.00864	0.0333
HEXALDEHYDE				
µg per dry std. cubic meter*	60.2	51.5	90.9	67.5
ppm by volume, Dry	0.0145	0.0124	0.0218	0.0162
kilograms per hour	0.00889	0.00830	0.0148	0.0107
pounds per hour	0.0196	0.0183	0.0327	0.0235
2,5-DIMETHYL BENZALDEHYDE				
µg per dry std. cubic meter*	8.38	11.9	9.45	9.91
ppm by volume, Dry	0.00150	0.00214	0.00170	0.00178
kilograms per hour	0.00124	0.00193	0.00154	0.00157
pounds per hour	0.00273	0.00424	0.00340	0.00346

Estimated Catch Weight

* 68 Deg. F (20 C) - - 29.92 In. Mercury

TABLE 3-9

ALDEHYDES/KETONES TESTS SUMMARY

MDF Press Stack 2 (WIW-2)

	MDFP2-M0011-1	MDFP2-M0011-2	MDFP2-M0011-3	Average
Test Date	9/11/92	9/12/92	9/12/92	N/A
Run Start Time	1928	848	1211	N/A
Run Finish Time	2050	1021	1427	N/A
Test Train Parameters:				
Volume of Dry Gas Sampled, SCF*	39.08	45.344	46.027	N/A
Percent Isokinetic	101.8	99.2	99.3	N/A
Flue Gas Parameters:				
Temperature, Degrees F	118	111	115	115
Volumetric Air Flow Rates				
SCFM*, Dry	11,207	11,444	11,604	11,418
ACFM, Wet	12,787	12,586	12,814	12,729
ALDE./KETONES EMISSION RESULTS:				
FORMALDEHYDE				
µg per dry std. cubic meter*	55500	47100		51300
ppm by volume, Dry	44.5	37.8		41.1
kilograms per hour	1.06	0.916		0.987
pounds per hour	2.33	2.02		2.18
ACETALDEHYDE				
µg per dry std. cubic meter*	709	376		543
ppm by volume, Dry	0.387	0.205		0.296
kilograms per hour	0.0135	0.00731		0.0104
pounds per hour	0.0298	0.0161		0.0230
ACROLEIN				
µg per dry std. cubic meter*	79.5	35.8		57.7
ppm by volume, Dry	0.0341	0.0154		0.0247
kilograms per hour	0.00151	0.000697		0.00111
pounds per hour	0.00334	0.00154		0.00244
ACETONE				
µg per dry std. cubic meter*	210	262		236
ppm by volume, Dry	0.0869	0.109		0.0977
kilograms per hour	0.00399	0.00509		0.00454
pounds per hour	0.00880	0.0112		0.0100
PROPIONALDEHYDE				
µg per dry std. cubic meter*	50.6	1.56		26.1
ppm by volume, Dry	0.0210	0.000645		0.0108
kilograms per hour	0.000964	0.0000303		0.000515
pounds per hour	0.00212	0.0000668		0.00108
CROTONALDEHYDE				
µg per dry std. cubic meter*	55.1	125		90.1
ppm by volume, Dry	0.0189	0.0431		0.0310
kilograms per hour	0.00105	0.00244		0.00175
pounds per hour	0.00231	0.00537		0.00384
n-BUTYRALDEHYDE				
µg per dry std. cubic meter*	142	208		175
ppm by volume, Dry	0.0473	0.0694		0.0584
kilograms per hour	0.00270	0.00404		0.00337
pounds per hour	0.00596	0.00891		0.00743
METHYL ETHYL KETONE				
µg per dry std. cubic meter*	93.1	24.1		58.6
ppm by volume, Dry	0.0311	0.00805		0.0196
kilograms per hour	0.00177	0.000469		0.00112
pounds per hour	0.00391	0.00103		0.00247

Estimated catch weight.

All catch weights are less than the minimum detection limit (MDL). Value presented calculated using 1/2 MDL for each catch weight.

* 68 Deg. F (20 C) -- 29.92 In. Mercury

(continued next page)

TABLE 3–9 (continued)

ALDEHYDES/KETONES TESTS SUMMARY

Microboard Press Stack 2 (WIW–2)

	MDFP2–M0011–1	MDFP2–M0011–2	MDFP2–M0011–3	Average
BENZALDEHYDE				
µg per dry std. cubic meter*	30.7	29.6		30.2
ppm by volume, Dry	0.00697	0.00671		0.00684
kilograms per hour	0.000585	0.000575		0.000580
pounds per hour	0.00129	0.00127		0.00128
ISOVALERALDEHYDE				
µg per dry std. cubic meter*	73.2	130		102
ppm by volume, Dry	0.0204	0.0363		0.0284
kilograms per hour	0.00139	0.00253		0.00196
pounds per hour	0.00307	0.00558		0.00432
VALERALDEHYDE				
µg per dry std. cubic meter*	82.2	165		124
ppm by volume, Dry	0.0230	0.0461		0.0346
kilograms per hour	0.00157	0.00321		0.00239
pounds per hour	0.00345	0.00708		0.00527
o–TOLUALDEHYDE				
µg per dry std. cubic meter*	29.8	14.0		21.9
ppm by volume, Dry	0.00597	0.00281		0.00439
kilograms per hour	0.000568	0.000273		0.000420
pounds per hour	0.00125	0.000601		0.000930
m/p–TOLUALDEHYDE				
µg per dry std. cubic meter*	56.9	184		120
ppm by volume, Dry	0.0114	0.0368		0.0241
kilograms per hour	0.00108	0.00357		0.00233
pounds per hour	0.00239	0.00788		0.00513
HEXALDEHYDE				
µg per dry std. cubic meter*	128.3	102		115
ppm by volume, Dry	0.0308	0.0245		0.0277
kilograms per hour	0.00244	0.00198		0.00221
pounds per hour	0.00539	0.00437		0.00488
2,5–DIMETHYL BENZALDEHYDE				
µg per dry std. cubic meter*	37.9	206		122
ppm by volume, Dry	0.00681	0.0369		0.0219
kilograms per hour	0.000723	0.00400		0.00236
pounds per hour	0.00159	0.00881		0.00520

Estimated catch weight.

All catch weights are less than the minimum detection limit (MDL). Value presented calculated using 1/2 MDL for each catch weight.

* 68 Deg. F (20 C) – – 29.92 In. Mercury

TABLE 3-10

ALDEHYDES/KETONES TESTS SUMMARY

MDF Press Stack 3 (WIW-1)

	MDFP3-M0011-1	MDFP3-M0011-2	MDFP3-M0011-3	Average
Test Date	9/11/92	9/12/92	9/12/92	N/A
Run Start Time	1928	848	1211	N/A
Run Finish Time	2050	1009	1410	N/A
Test Train Parameters:				
Volume of Dry Gas Sampled, SCF*	44.324	44.366	44.571	N/A
Percent Isokinetic	103.5	106.0	102.4	N/A
Flue Gas Parameters:				
Temperature, Degrees F	120	114	119	118
Volumetric Air Flow Rates				
SCFM*, Dry	12,386	12,106	12,579	12,357
ACFM, Wet	14,025	13,497	14,111	13,878
ALDE./KETONES EMISSION RESULTS:				
FORMALDEHYDE				
µg per dry std. cubic meter*	63900	72400	61100	65800
ppm by volume, Dry	51.2	58.0	49.0	52.7
kilograms per hour	1.34	1.49	1.31	1.38
pounds per hour	2.96	3.28	2.88	3.04
ACETALDEHYDE				
µg per dry std. cubic meter*	421	497	565	494
ppm by volume, Dry	0.230	0.271	0.308	0.270
kilograms per hour	0.00887	0.0102	0.0121	0.0104
pounds per hour	0.0196	0.0226	0.0266	0.0229
ACROLEIN				
µg per dry std. cubic meter*	163	141	83.2	129
ppm by volume, Dry	0.0697	0.0604	0.0357	0.0553
kilograms per hour	0.00342	0.00290	0.00178	0.00270
pounds per hour	0.00754	0.00639	0.00392	0.00595
ACETONE				
µg per dry std. cubic meter*	110	279	87.9	159
ppm by volume, Dry	0.0456	0.116	0.0365	0.0660
kilograms per hour	0.00231	0.00575	0.00188	0.00331
pounds per hour	0.00510	0.0127	0.00414	0.00730
PROPIONALDEHYDE				
µg per dry std. cubic meter*	18.3	85.2	33.3	45.6
ppm by volume, Dry	0.00759	0.0353	0.0138	0.0189
kilograms per hour	0.000386	0.00175	0.000711	0.000962
pounds per hour	0.000850	0.00386	0.00157	0.00212
CROTONALDEHYDE				
µg per dry std. cubic meter*	43.8	39.0	46.7	43.2
ppm by volume, Dry	0.0151	0.0134	0.0161	0.0148
kilograms per hour	0.000922	0.000802	0.00100	0.000910
pounds per hour	0.00203	0.00177	0.00220	0.00200
n-BUTYRALDEHYDE				
µg per dry std. cubic meter*	128	80.4	105	105
ppm by volume, Dry	0.0428	0.0268	0.0352	0.0349
kilograms per hour	0.00270	0.00165	0.00225	0.00222
pounds per hour	0.00595	0.00365	0.00497	0.00488
METHYL ETHYL KETONE				
µg per dry std. cubic meter*	146	47.0	39.6	77.5
ppm by volume, Dry	0.0486	0.0157	0.0132	0.0258
kilograms per hour	0.00307	0.000966	0.000847	0.00163
pounds per hour	0.00676	0.00213	0.00187	0.00359

* 68 Deg. F (20 C) -- 29.92 In. Mercury

(continued next page)

TABLE 3-10 (continued)

ALDEHYDES/KETONES TESTS SUMMARY

Microboard Press Stack 3 (WIW-1)

	MDFP3-M0011-1	MDFP3-M0011-2	MDFP3-M0011-3	Average
BENZALDEHYDE				
µg per dry std. cubic meter*	22.3	27.9	25.4	25.2
ppm by volume, Dry	0.00506	0.00632	0.00575	0.00571
kilograms per hour	0.000469	0.000573	0.000542	0.000530
pounds per hour	0.00103	0.00126	0.00119	0.00116
ISOVALERALDEHYDE				
µg per dry std. cubic meter*	55.8	50.1	60.2	55.4
ppm by volume, Dry	0.0156	0.0140	0.0168	0.0155
kilograms per hour	0.00117	0.00103	0.00129	0.00116
pounds per hour	0.00259	0.00227	0.00284	0.00257
VALERALDEHYDE				
µg per dry std. cubic meter*	177	62.1	80.8	107
ppm by volume, Dry	0.0494	0.0173	0.0226	0.0298
kilograms per hour	0.00372	0.00128	0.00173	0.00224
pounds per hour	0.00821	0.00282	0.00381	0.00494
o-TOLUALDEHYDE				
µg per dry std. cubic meter*	110	17.5	28.5	52.0
ppm by volume, Dry	0.0220	0.00350	0.00571	0.0104
kilograms per hour	0.00231	0.000360	0.000610	0.00109
pounds per hour	0.00510	0.000794	0.00134	0.00241
m/p-TOLUALDEHYDE				
µg per dry std. cubic meter*	89.2	39.8	59.4	62.8
ppm by volume, Dry	0.0179	0.00796	0.0119	0.0126
kilograms per hour	0.00188	0.000819	0.00127	0.00132
pounds per hour	0.00414	0.00180	0.00280	0.00291
HEXALDEHYDE				
µg per dry std. cubic meter*	122	92.3	106	107
ppm by volume, Dry	0.0293	0.0222	0.0255	0.0257
kilograms per hour	0.00257	0.00190	0.00227	0.00226
pounds per hour	0.00566	0.00419	0.00500	0.00495
2,5-DIMETHYL BENZALDEHYDE				
µg per dry std. cubic meter*	195	23.1	38.0	85.4
ppm by volume, Dry	0.0350	0.00414	0.00683	0.0153
kilograms per hour	0.00411	0.000475	0.000813	0.00180
pounds per hour	0.00906	0.00105	0.00179	0.00396

* 68 Deg. F (20 C) -- 29.92 In. Mercury

TABLE 3-11

ALDEHYDES/KETONES TESTS SUMMARY

MDF Press Stack 4 (WIW-5)

	MDFP4-M0011-1	MDFP4-M0011-2	MDFP4-M0011-3	Average
Test Date	9/12/92	9/13/92	9/13/92	N/A
Run Start Time	1802	938	1248	N/A
Run Finish Time	1936	1132	1420	N/A
Test Train Parameters:				
Volume of Dry Gas Sampled, SCF	44.335	52.7	51.242	N/A
Percent Isokinetic	102.6	101.6	102.6	N/A
Flue Gas Parameters:				
Temperature, Degrees F	96	89	97	94
Volumetric Air Flow Rates				
SCFM*, Dry	17,434	20,929	20,150	19,504
ACFM, Wet	18,588	22,007	21,541	20,712
ALDE./KETONES EMISSION RESULTS:				
FORMALDEHYDE				
µg per dry std. cubic meter*	8870	7230	7980	8030
ppm by volume, Dry	7.11	5.80	6.40	6.44
kilograms per hour	0.263	0.257	0.273	0.264
pounds per hour	0.579	0.567	0.602	0.583
ACETALDEHYDE				
µg per dry std. cubic meter*	90.8	59.0	77.9	75.9
ppm by volume, Dry	0.0495	0.0322	0.0425	0.0414
kilograms per hour	0.00269	0.00210	0.00267	0.00248
pounds per hour	0.00593	0.00462	0.00588	0.00548
ACROLEIN				
µg per dry std. cubic meter*	27.1	24.1	20.7	24.0
ppm by volume, Dry	0.0116	0.0103	0.00886	0.0103
kilograms per hour	0.000802	0.000858	0.000708	0.000789
pounds per hour	0.00177	0.00189	0.00156	0.00174
ACETONE				
µg per dry std. cubic meter*	105	56.3	71.0	77.5
ppm by volume, Dry	0.0436	0.0233	0.0294	0.0321
kilograms per hour	0.00311	0.00200	0.00243	0.00252
pounds per hour	0.00687	0.00441	0.00536	0.00555
PROPIONALDEHYDE				
µg per dry std. cubic meter*	12.7	16.1	1.38	10.1
ppm by volume, Dry	0.00528	0.00666	0.000571	0.00417
kilograms per hour	0.000378	0.000572	0.000472	0.000332
pounds per hour	0.000832	0.00126	0.000104	0.000732
CROTONALDEHYDE				
µg per dry std. cubic meter*	31.1	39.5	42.0	37.6
ppm by volume, Dry	0.0107	0.0136	0.0144	0.0129
kilograms per hour	0.000920	0.00141	0.00144	0.00126
pounds per hour	0.00203	0.00310	0.00317	0.00277
n-BUTYRALDEHYDE				
µg per dry std. cubic meter*	69.3	62.3	67.5	66.4
ppm by volume, Dry	0.0231	0.0208	0.0225	0.0221
kilograms per hour	0.00205	0.00222	0.00231	0.00219
pounds per hour	0.00453	0.00489	0.00510	0.00484
METHYL ETHYL KETONE				
µg per dry std. cubic meter*	3.19	3.35	3.45	3.33
ppm by volume, Dry	0.00106	0.00112	0.00115	0.00111
kilograms per hour	0.0000944	0.000119	0.000118	0.000110
pounds per hour	0.000208	0.000263	0.000260	0.000244

Estimated Catch Weight.

All catch weights are less than the minimum detection limit (MDL). Values presented calculated using 1/2 MDL for each catch weight.

* 68 Deg. F (20 C) -- 29.92 In. Mercury

(continued next page)

TABLE 3-11 (continued)

ALDEHYDES/KETONES TESTS SUMMARY

MDF Press Stack 4 (WIW-5)

	MDFP4-M0011-1	MDFP4-M0011-2	MDFP4-M0011-3	Average
BENZALDEHYDE				
µg per dry std. cubic meter*	17.5	12.7	17.2	15.8
ppm by volume, Dry	0.00397	0.00289	0.00391	0.00359
kilograms per hour	0.000519	0.000453	0.000590	0.000521
pounds per hour	0.00114	0.00100	0.00130	0.00115
ISOVALERALDEHYDE				
µg per dry std. cubic meter*	39.0	35.5	42.7	39.1
ppm by volume, Dry	0.0109	0.00992	0.0119	0.0109
kilograms per hour	0.00116	0.00126	0.00146	0.00129
pounds per hour	0.00255	0.00278	0.00322	0.00285
VALERALDEHYDE				
µg per dry std. cubic meter*	66.1	58.3	64.8	63.1
ppm by volume, Dry	0.0185	0.0163	0.0181	0.0176
kilograms per hour	0.00196	0.00207	0.00222	0.00208
pounds per hour	0.00432	0.00457	0.00489	0.00459
o-TOLUALDEHYDE				
µg per dry std. cubic meter*	6.37	8.04	15.2	9.87
ppm by volume, Dry	0.00128	0.00161	0.00303	0.00197
kilograms per hour	0.000189	0.000286	0.000519	0.000331
pounds per hour	0.000416	0.000630	0.00114	0.000729
m/p-TOLUALDEHYDE				
µg per dry std. cubic meter*	15.1	8.71	11.7	11.9
ppm by volume, Dry	0.00303	0.00174	0.00234	0.00237
kilograms per hour	0.000448	0.000310	0.000401	0.000386
pounds per hour	0.000988	0.000683	0.000884	0.000852
HEXALDEHYDE				
µg per dry std. cubic meter*	117	79.7	103	99.8
ppm by volume, Dry	0.0281	0.0192	0.0247	0.0240
kilograms per hour	0.00347	0.00284	0.00352	0.00328
pounds per hour	0.00765	0.00625	0.00775	0.00722
2,5-DIMETHYL BENZALDEHYDE				
µg per dry std. cubic meter*	29.5	29.5	28.9	29.3
ppm by volume, Dry	0.00529	0.00529	0.00520	0.00526
kilograms per hour	0.000873	0.00105	0.000991	0.000971
pounds per hour	0.00192	0.00231	0.00218	0.00214

Estimated Catch Weight.

All catch weights are less than the minimum detection limit (MDL). Values presented calculated using 1/2 MDL for each catch weight.

* 68 Deg. F (20 C) -- 29.92 In. Mercury

TABLE 3-12

ALDEHYDES/KETONES TESTS SUMMARY

MDF Press Stack 5 (WTW-3)

	MDFP5-M0011-1	MDFP5-M0011-2	MDFP5-M0011-3	Average
Test Date	9/12/92	9/13/92	9/13/92	N/A
Run Start Time	1757	935	1246	N/A
Run Finish Time	1904	1111	1420	N/A
Test Train Parameters:				
Volume of Dry Gas Sampled, SCF*	50.183	49.171	47.463	N/A
Percent Isokinetic	100.4	103.7	101.9	N/A
Flue Gas Parameters:				
Temperature, Degrees F	95	87	95	92
Volumetric Air Flow Rates				
SCFM*, Dry	56,600	54,200	53,300	54,700
ACFM, Wet	60,200	57,300	56,500	58,000
ALDE./KETONES EMISSION RESULTS:				
FORMALDEHYDE				
µg per dry std. cubic meter*	7,070	5,820	6,840	6,580
ppm by volume, Dry	5.67	4.66	5.49	5.27
kilograms per hour	0.681	0.536	0.620	0.612
pounds per hour	1.50	1.18	1.37	1.35
ACETALDEHYDE				
µg per dry std. cubic meter*	76.0	59.6	65.5	67.0
ppm by volume, Dry	0.0415	0.0325	0.0357	0.0366
kilograms per hour	0.00731	0.00549	0.00593	0.00625
pounds per hour	0.0161	0.0121	0.0131	0.0138
ACROLEIN				
µg per dry std. cubic meter*	20.4	16.5	29.8	22.2
ppm by volume, Dry	0.00875	0.00708	0.0128	0.00953
kilograms per hour	0.00196	0.00152	0.00270	0.00206
pounds per hour	0.00433	0.00336	0.00594	0.00454
ACETONE				
µg per dry std. cubic meter*	73.9	63.9	75.9	71.2
ppm by volume, Dry	0.0306	0.0265	0.0315	0.0295
kilograms per hour	0.00711	0.00589	0.00687	0.00662
pounds per hour	0.0157	0.0130	0.0152	0.0146
PROPIONALDEHYDE				
µg per dry std. cubic meter*	9.2	1.44	11.9	7.50
ppm by volume, Dry	0.00379	0.00060	0.00493	0.00311
kilograms per hour	0.00088	0.000132	0.00108	0.000697
pounds per hour	0.00194	0.000292	0.00238	0.00154
CROTONALDEHYDE				
µg per dry std. cubic meter*	15.5	35.9	46.9	32.8
ppm by volume, Dry	0.00532	0.0123	0.0161	0.0113
kilograms per hour	0.00149	0.00331	0.00424	0.00301
pounds per hour	0.00328	0.00729	0.00936	0.00665
n-BUTYRALDEHYDE				
µg per dry std. cubic meter*	59.8	58.9	73.7	64.1
ppm by volume, Dry	0.0200	0.0197	0.0246	0.0214
kilograms per hour	0.00576	0.00543	0.00667	0.00595
pounds per hour	0.0127	0.0120	0.0147	0.0131
METHYL ETHYL KETONE				
µg per dry std. cubic meter*	3.52	3.59	4.46	3.86
ppm by volume, Dry	0.00117	0.00120	0.00149	0.00129
kilograms per hour	0.000339	0.000331	0.000404	0.000358
pounds per hour	0.00075	0.00073	0.00089	0.000789

Estimated Catch Weight

All catch weights are less than the minimum detection limit (MDL). Values presented calculated using 1/2 MDL for each catch weight.

* 68 Deg. F (20 C) - - 29.92 In. Mercury

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TABLE 3-12

ALDEHYDES/KETONES TESTS SUMMARY

MDF Press Stack 5 (WTW)

	MDFP5-M0011-1	MDFP5-M0011-2	MDFP5-M0011-3	Average
BENZALDEHYDE				
µg per dry std. cubic meter*	21.8	10.8	29.8	20.8
ppm by volume, Dry	0.00495	0.00244	0.00675	0.00471
kilograms per hour	0.00210	0.000993	0.00270	0.00193
pounds per hour	0.00463	0.00219	0.00594	0.00425
ISOVALERALDEHYDE				
µg per dry std. cubic meter*	33.1	39.5	43.1	38.6
ppm by volume, Dry	0.00924	0.0110	0.0121	0.0108
kilograms per hour	0.00318	0.00364	0.00391	0.00358
pounds per hour	0.00702	0.00802	0.00862	0.00789
VALERALDEHYDE				
µg per dry std. cubic meter*	60.5	76.8	75.9	71.1
ppm by volume, Dry	0.0169	0.0215	0.0212	0.0199
kilograms per hour	0.00582	0.00708	0.00687	0.00659
pounds per hour	0.0128	0.0156	0.0152	0.0145
o-TOLUALDEHYDE				
µg per dry std. cubic meter*	14.1	11.5	19.3	15.0
ppm by volume, Dry	0.00282	0.00230	0.00387	0.00300
kilograms per hour	0.00135	0.00106	0.00175	0.00139
pounds per hour	0.00299	0.00233	0.00386	0.00306
m/p-TOLUALDEHYDE				
µg per dry std. cubic meter*	18.3	17.2	20.1	18.5
ppm by volume, Dry	0.00366	0.00345	0.00402	0.00371
kilograms per hour	0.00176	0.00159	0.00182	0.00172
pounds per hour	0.00388	0.00350	0.00401	0.00380
HEXALDEHYDE				
µg per dry std. cubic meter*	102	85	118	102
ppm by volume, Dry	0.0245	0.0205	0.0282	0.0244
kilograms per hour	0.00982	0.00788	0.0106	0.00945
pounds per hour	0.0216	0.0174	0.0235	0.0208
2,5-DIMETHYL BENZALDEHYDE				
µg per dry std. cubic meter*	25.3	46.7	31.2	34.4
ppm by volume, Dry	0.00455	0.00838	0.00561	0.00618
kilograms per hour	0.00244	0.00430	0.00283	0.00319
pounds per hour	0.00537	0.00948	0.00624	0.00703

Estimated Catch Weight

All catch weights are less than the minimum detection limit (MDL). Values presented calculated using 1/2 MDL for each catch weight.

* 68 Deg. F (20 C) - - 29.92 In. Mercury

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TABLE 3–13

ALDEHYDES/KETONES TESTS SUMMARY

MDF Press Stack 6 (WIW–4)

	MDFP6–M0011–1	MDFP6–M0011–2	MDFP6–M0011–3	Average
Test Date	9/11/92	9/12/92	9/12/92	N/A
Run Start Time	1928	848	1212	N/A
Run Finish Time	2056	1019	1418	N/A
Test Train Parameters:				
Volume of Dry Gas Sampled, SCF*	48.156	51.99	46.808	N/A
Percent Isokinetic	104.5	106.9	106.1	N/A
Flue Gas Parameters:				
Temperature, Degrees F	95	88	95	93
Volumetric Air Flow Rates				
SCFM*, Dry	28,800	29,400	26,600	28,300
ACFM, Wet	30,900	31,000	28,300	30,100
ALDE./KETONES EMISSION RESULTS:				
FORMALDEHYDE	Sample not analyzed			
µg per dry std. cubic meter*		11,900	14,072	13,000
ppm by volume, Dry		9.54	11.3	10.4
kilograms per hour		0.594	0.637	0.615
pounds per hour		1.31	1.40	1.35
ACETALDEHYDE				
µg per dry std. cubic meter*		95.8	126	111
ppm by volume, Dry		0.0522	0.0687	0.0605
kilograms per hour		0.00478	0.00570	0.00524
pounds per hour		0.0105	0.0126	0.0116
ACROLEIN				
µg per dry std. cubic meter*		21.1	28.7	24.9
ppm by volume, Dry		0.00903	0.0123	0.0107
kilograms per hour		0.00105	0.00130	0.00118
pounds per hour		0.00232	0.00286	0.00259
ACETONE				
µg per dry std. cubic meter*		303	174	238
ppm by volume, Dry		0.126	0.0723	0.0990
kilograms per hour		0.0151	0.00788	0.0115
pounds per hour		0.0333	0.0174	0.0254
PROPIONALDEHYDE				
µg per dry std. cubic meter*		0.340	0.377	0.359
ppm by volume, Dry		0.000141	0.000156	0.000149
kilograms per hour		0.0000169	0.0000171	0.0000170
pounds per hour		0.0000374	0.0000376	0.0000375
CROTONALDEHYDE				
µg per dry std. cubic meter*		29.9	26.4	28.1
ppm by volume, Dry		0.0103	0.00907	0.00967
kilograms per hour		0.00149	0.00119	0.00134
pounds per hour		0.00329	0.00263	0.00296
n–BUTYRALDEHYDE				
µg per dry std. cubic meter*		245	57.3	151
ppm by volume, Dry		0.0818	0.0191	0.0505
kilograms per hour		0.0122	0.00259	0.00741
pounds per hour		0.0270	0.00572	0.0163
METHYL ETHYL KETONE				
µg per dry std. cubic meter*		13.6	10.6	12.1
ppm by volume, Dry		0.00453	0.00352	0.00403
kilograms per hour		0.000578	0.000478	0.000578
pounds per hour		0.00149	0.00105	0.00127

Estimated Catch Weight.

All catch weights are less than the minimum detection limit (MDL). Values presented calculated using 1/2 MDL.

* 68 Deg. F (20 C) – – 29.92 In. Mercury

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TABLE 3–13

ALDEHYDES/KETONES TESTS SUMMARY

MDF Press Stack 6 (WIW–4)

	MDFP6–M0011–1	MDFP6–M0011–2	MDFP6–M0011–3	Average
BENZALDEHYDE	Sample not analyzed			
µg per dry std. cubic meter*		12.2	9.8	11.0
ppm by volume, Dry		0.00277	0.0222	0.0125
kilograms per hour		0.000610	0.000444	0.000527
pounds per hour		0.00134	0.000978	0.00116
ISOVALERALDEHYDE				
µg per dry std. cubic meter*		26.5	30.2	28.3
ppm by volume, Dry		0.00740	0.0843	0.0459
kilograms per hour		0.00132	0.00137	0.00135
pounds per hour		0.00291	0.00301	0.00296
VALERALDEHYDE				
µg per dry std. cubic meter*		43.5	62.6	53.0
ppm by volume, Dry		0.0121	0.0175	0.0148
kilograms per hour		0.00217	0.00283	0.00250
pounds per hour		0.00478	0.00624	0.00551
o–TOLUALDEHYDE				
µg per dry std. cubic meter*		3.40	11.3	7.35
ppm by volume, Dry		0.000680	0.00226	0.00147
kilograms per hour		0.000169	0.000512	0.000341
pounds per hour		0.000374	0.00113	0.000752
m/p–TOLUALDEHYDE				
µg per dry std. cubic meter*		16.3	21.1	18.7
ppm by volume, Dry		0.00326	0.00423	0.00375
kilograms per hour		0.000813	0.000956	0.000885
pounds per hour		0.00179	0.00211	0.00195
HEXALDEHYDE				
µg per dry std. cubic meter*		63.2	80.0	71.6
ppm by volume, Dry		0.0152	0.0192	0.0172
kilograms per hour		0.00315	0.00362	0.00339
pounds per hour		0.00695	0.00798	0.00746
2,5–DIMETHYL BENZALDEHYDE				
µg per dry std. cubic meter*		19.0	21.9	20.4
ppm by volume, Dry		0.00341	0.00393	0.00367
kilograms per hour		0.000949	0.000990	0.000969
pounds per hour		0.00209	0.00218	0.00214

Estimated Catch Weight.

All catch weights are less than the minimum detection limit (MDL). Values presented calculated using 1/2 MDL.

* 68 Deg. F (20 C) – – 29.92 In. Mercury

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TABLE 3-14

ALDEHYDES/KETONES TESTS SUMMARY

Surface EFB Outlet (1510)

	MBSLO-M001I-1	MBSLO-M001I-2	MBSLO-M001I-3	Average
Test Date	9/16/92	9/16/92 9/16/5	9/17/92	N/A
Run Start Time	1143	1505	859	N/A
Run Finish Time	1307	1620	1016	N/A
Test Train Parameters:				
Volume of Dry Gas Sampled, SCF*	50.825	48.925	48.255	N/A
Percent Isokinetic	100.4	99.2	96.2	N/A
Flue Gas Parameters:				
Carbon Dioxide, %	2.1	2.0	1.9	2.0
Temperature, Degrees F	226	221	215	221
Volumetric Air Flow Rates				
SCFM*, Dry	49,900	48,500	49,400	49,300
ACFM, Wet	74,000	72,500	74,300	73,600
ALDE./KETONES EMISSION RESULTS:				
FORMALDEHYDE				
µg per dry std. cubic meter*	677	1,700	525	967
ppm by volume, Dry	0.543	1.36	0.421	0.775
kilograms per hour	0.0574	0.140	0.0440	0.0804
pounds per hour	0.127	0.308	0.0971	0.177
ACETALDEHYDE				
µg per dry std. cubic meter*	181	456	159	265
ppm by volume, Dry	0.0985	0.249	0.0866	0.145
kilograms per hour	0.0153	0.0376	0.0133	0.0221
pounds per hour	0.0337	0.0829	0.0294	0.0487
ACROLEIN				
µg per dry std. cubic meter*	50.0	58.5	17.6	42.0
ppm by volume, Dry	0.0214	0.0251	0.00753	0.0180
kilograms per hour	0.00424	0.00482	0.00147	0.00351
pounds per hour	0.00934	0.0106	0.00325	0.00774
ACETONE				
µg per dry std. cubic meter*	547	707	732	662
ppm by volume, Dry	0.227	0.293	0.304	0.275
kilograms per hour	0.0464	0.0583	0.0614	0.0554
pounds per hour	0.102	0.129	0.135	0.122
PROPIONALDEHYDE				
µg per dry std. cubic meter*	15.3	35.4	9.51	20.1
ppm by volume, Dry	0.00633	0.0146	0.00394	0.00830
kilograms per hour	0.00129	0.00292	0.000798	0.00167
pounds per hour	0.00285	0.00643	0.00176	0.00368
CROTONALDEHYDE				
µg per dry std. cubic meter*	44.5	54.9	27.1	42.1
ppm by volume, Dry	0.0153	0.0189	0.00930	0.0145
kilograms per hour	0.00377	0.00452	0.00227	0.00352
pounds per hour	0.00830	0.00997	0.00501	0.00776
n-BUTYRALDEHYDE				
µg per dry std. cubic meter*	101	112	77.6	96.7
ppm by volume, Dry	0.0336	0.0373	0.0259	0.0323
kilograms per hour	0.00853	0.00923	0.00651	0.00809
pounds per hour	0.0188	0.0203	0.0144	0.0178
METHYL ETHYL KETONE				
µg per dry std. cubic meter*	4.86	31.0	15.4	17.1
ppm by volume, Dry	0.00162	0.0104	0.00513	0.00570
kilograms per hour	0.000412	0.00256	0.00129	0.00142
pounds per hour	0.000908	0.00564	0.00284	0.00313

Estimated Catch Weight

All catch weights are less than the minimum detection limit (MDL). Values presented calculated 1/2 MDL for each catch weight.

* 68 Deg. F (20 C) - - 29.92 In. Mercury

(continued next page)

TABLE 3–14 (continued)

ALDEHYDES/KETONES TESTS SUMMARY

Surface EFB Outlet (1510)

	MBSLO–M0011–1	MBSLO–M0011–2	MBSLO–M0011–3	Average
BENZALDEHYDE				
µg per dry std. cubic meter*	305	699	261	422
ppm by volume, Dry	0.0692	0.159	0.0592	0.0956
kilograms per hour	0.0258	0.0577	0.0219	0.0351
pounds per hour	0.0570	0.127	0.0483	0.0775
ISOVALERALDEHYDE				
µg per dry std. cubic meter*	51.4	79.4	36.6	55.8
ppm by volume, Dry	0.0144	0.0222	0.0102	0.0156
kilograms per hour	0.00436	0.00655	0.00307	0.00466
pounds per hour	0.00960	0.0144	0.00677	0.0103
VALERALDEHYDE				
µg per dry std. cubic meter*	157	210	241	203
ppm by volume, Dry	0.0439	0.0587	0.0673	0.0566
kilograms per hour	0.0133	0.0173	0.0202	0.0169
pounds per hour	0.0293	0.0382	0.0445	0.0374
o–TOLUALDEHYDE				
µg per dry std. cubic meter*	21.5	51.2	28.5	33.8
ppm by volume, Dry	0.00431	0.0103	0.00571	0.00676
kilograms per hour	0.00182	0.00423	0.00239	0.00282
pounds per hour	0.00402	0.00932	0.00528	0.00621
m/p–TOLUALDEHYDE				
µg per dry std. cubic meter*	185	400	124	236
ppm by volume, Dry	0.0370	0.0800	0.0247	0.0473
kilograms per hour	0.0157	0.0330	0.0104	0.0197
pounds per hour	0.0345	0.0727	0.0229	0.0434
HEXALDEHYDE				
µg per dry std. cubic meter*	232	362	348	314
ppm by volume, Dry	0.0557	0.0868	0.0837	0.0754
kilograms per hour	0.0197	0.0298	0.0292	0.0262
pounds per hour	0.0433	0.0658	0.0644	0.0578
2,5–DIMETHYL BENZALDEHYDE				
µg per dry std. cubic meter*	49.3	94.5	80.5	74.8
ppm by volume, Dry	0.00886	0.0170	0.0145	0.0134
kilograms per hour	0.00418	0.00780	0.00676	0.00624
pounds per hour	0.00921	0.0172	0.0149	0.0138

Estimated Comb Weight

All comb weights are less than the minimum detection limit (MDL). Values presented calculated 1/2 MDL for each comb weight

* 68 Deg. F (20 C) - - 29.92 In. Mercury

TABLE 3-15

ALDEHYDES/KETONES TESTS SUMMARY

Core EFB Outlet (1520)

	MBCLO-M0011-1	MBCLO-M0011-2	MBCLO-M0011-3	Average
Test Date	9/14/92	9/15/92	9/15/92	N/A
Run Start Time	1711	1304	1633	N/A
Run Finish Time	1816	1409	1738	N/A
Test Train Parameters:				
Volume of Dry Gas Sampled, SCF*	48.372	47.868	48.275	N/A
Percent Isokinetic	105.2	101.3	99.5	N/A
Flue Gas Parameters:				
Carbon Dioxide, %	3.6	3.5	3.6	
Temperature, Degrees F	248	250	252	250
Volumetric Air Flow Rates				
SCFM*, Dry	37,400	38,400	39,500	38,400
ACFM, Wet	63,400	65,100	66,813	65,100
ALDE./KETONES EMISSION RESULTS:				
FORMALDEHYDE				
µg per dry std. cubic meter*	10,700	16,500	14,600	13,900
ppm by volume, Dry	8.56	13.0	11.7	11.1
kilograms per hour	0.679	1.06	0.982	0.907
pounds per hour	1.50	2.34	2.16	2.00
ACETALDEHYDE				
µg per dry std. cubic meter*	6,080	6,210	5,880	6,060
ppm by volume, Dry	3.32	3.39	3.21	3.30
kilograms per hour	0.387	0.405	0.394	0.396
pounds per hour	0.852	0.894	0.870	0.872
ACROLEIN				
µg per dry std. cubic meter*	2,760	2,150	972	1,960
ppm by volume, Dry	1.18	0.920	0.417	0.839
kilograms per hour	0.176	0.140	0.0652	0.127
pounds per hour	0.387	0.309	0.144	0.280
ACETONE				
µg per dry std. cubic meter*	7,930	3,850	11,800	7,860
ppm by volume, Dry	3.29	1.60	4.91	3.27
kilograms per hour	0.504	0.251	0.794	0.517
pounds per hour	1.11	0.554	1.75	1.14
PROPIONALDEHYDE				
µg per dry std. cubic meter*	776	319	1,550	882
ppm by volume, Dry	0.321	0.132	0.641	0.365
kilograms per hour	0.0493	0.0209	0.104	0.0580
pounds per hour	0.109	0.0460	0.229	0.128
CROTONALDEHYDE				
µg per dry std. cubic meter*	413	480	1,630	841
ppm by volume, Dry	0.142	0.165	0.559	0.289
kilograms per hour	0.0263	0.0314	0.109	0.0556
pounds per hour	0.0579	0.0692	0.241	0.123
n-BUTYRALDEHYDE				
µg per dry std. cubic meter*	1,990	942	4,410	2,450
ppm by volume, Dry	0.664	0.314	1.47	0.816
kilograms per hour	0.127	0.0615	0.296	0.161
pounds per hour	0.279	0.136	0.652	0.355
METHYL ETHYL KETONE				
µg per dry std. cubic meter*	702	763	817	761
ppm by volume, Dry	0.234	0.254	0.273	0.254
kilograms per hour	0.0447	0.0498	0.0548	0.0498
pounds per hour	0.0984	0.110	0.121	0.110

* 68 Deg. F (20 C) - - 29.92 In. Mercury

(continued next page)

TABLE 3-15

ALDEHYDES/KETONES TESTS SUMMARY

Core EFB Outlet (1520)

	MBCLO-M0011-1	MBCLO-M0011-2	MBCLO-M001-3	Average
BENZALDEHYDE				
µg per dry std. cubic meter*	8,680	11,800	8,940	9,810
ppm by volume, Dry	1.97	2.67	2.03	2.22
kilograms per hour	0.552	0.770	0.600	0.641
pounds per hour	1.22	1.70	1.32	1.41
ISOVALERALDEHYDE				
µg per dry std. cubic meter*	1,360	1,600	1,570	1,510
ppm by volume, Dry	0.3796	0.4334	0.4396	0.418
kilograms per hour	0.0864	0.101	0.106	0.0978
pounds per hour	0.190	0.223	0.233	0.216
VALERALDEHYDE				
µg per dry std. cubic meter*	634	1,650	1,190	1,160
ppm by volume, Dry	0.177	0.460	0.334	0.324
kilograms per hour	0.0403	0.108	0.0801	0.0760
pounds per hour	0.0888	0.237	0.177	0.168
o-TOLUALDEHYDE				
µg per dry std. cubic meter*	698	967	945	870
ppm by volume, Dry	0.140	0.194	0.189	0.174
kilograms per hour	0.0444	0.0632	0.0634	0.0570
pounds per hour	0.0978	0.139	0.140	0.126
m/p-TOLUALDEHYDE				
µg per dry std. cubic meter*	2,550	3,130	840	2,170
ppm by volume, Dry	0.510	0.626	0.168	0.435
kilograms per hour	0.162	0.204	0.0564	0.141
pounds per hour	0.357	0.450	0.124	0.311
HEXALDEHYDE				
µg per dry std. cubic meter*	1,550	1,790	2,180	1,840
ppm by volume, Dry	0.373	0.429	0.523	0.442
kilograms per hour	0.0987	0.117	0.146	0.121
pounds per hour	0.218	0.257	0.322	0.266
2,5-DIMETHYL BENZALDEHYDE				
µg per dry std. cubic meter*	132	162	1,010	435
ppm by volume, Dry	0.0237	0.0291	0.1820	0.0783
kilograms per hour	0.00840	0.0106	0.0680	0.0290
pounds per hour	0.0185	0.0234	0.150	0.0640

* 68 Deg. F (20 C) - - 29.92 In. Mercury

TABLE 3-16

ALDEHYDES/KETONES TESTS SUMMARY

Microboard Press Stack 11 (DEF-1)

	MBP11-M0011-1	MBP11-M0011-2	MBP11-M0011-3	Average
Test Date	9/19/92	9/21/92	9/22/92	N/A
Run Start Time	1635	1810	1421	N/A
Run Finish Time	1753	1927	1539	N/A
Test Train Parameters:				
Volume of Dry Gas Sampled, SCF*	42.196	37.935	39.05	N/A
Percent Isokinetic	100.0	104.5	100.1	N/A
Flue Gas Parameters:				
Temperature, Degrees F	111	111	115	112
Volumetric Air Flow Rates				
SCFM*, Dry	8,030	6,910	7,420	7,450
ACFM, Wet	8,980	7,800	8,290	8,360
ALDE./KETONES EMISSION RESULTS:				
FORMALDEHYDE				
µg per dry std. cubic meter*	33,300	23,500	34,100	30,300
ppm by volume, Dry	26.7	18.8	27.3	24.3
kilograms per hour	0.454	0.275	0.429	0.386
pounds per hour	1.00	0.607	0.947	0.851
ACETALDEHYDE				
µg per dry std. cubic meter*	336	368	422	375
ppm by volume, Dry	0.184	0.201	0.230	0.205
kilograms per hour	0.00459	0.00431	0.00532	0.00474
pounds per hour	0.0101	0.00951	0.0117	0.0105
ACROLEIN				
µg per dry std. cubic meter*	221	81.9	72.3	125
ppm by volume, Dry	0.0947	0.0351	0.0310	0.0536
kilograms per hour	0.00301	0.000961	0.000912	0.00163
pounds per hour	0.00664	0.00212	0.00201	0.00359
ACETONE				
µg per dry std. cubic meter*	518	1,050	726	765
ppm by volume, Dry	0.215	0.434	0.301	0.317
kilograms per hour	0.00707	0.0123	0.00915	0.00950
pounds per hour	0.0156	0.0270	0.0202	0.0209
PROPIONALDEHYDE				
µg per dry std. cubic meter*	20.9	0.930	0.900	7.58
ppm by volume, Dry	0.00866	0.000385	0.000374	0.00314
kilograms per hour	0.000285	0.0000109	0.0000114	0.000103
pounds per hour	0.000629	0.0000241	0.0000251	0.000226
CROTONALDEHYDE				
µg per dry std. cubic meter*	64.4	42.8	40.7	49.3
ppm by volume, Dry	0.0221	0.0147	0.0140	0.0169
kilograms per hour	0.000879	0.000502	0.000513	0.000631
pounds per hour	0.00194	0.00111	0.00113	0.00139
n-BUTYRALDEHYDE				
µg per dry std. cubic meter*	128	129	117	125
ppm by volume, Dry	0.0427	0.0432	0.0389	0.0416
kilograms per hour	0.00175	0.00152	0.00147	0.00158
pounds per hour	0.00385	0.00335	0.00324	0.00348
METHYL ETHYL KETONE				
µg per dry std. cubic meter*	4.18	26.1	24.4	18.2
ppm by volume, Dry	0.00140	0.00870	0.0815	0.0305
kilograms per hour	0.0000571	0.000306	0.000308	0.000224
pounds per hour	0.000126	0.000674	0.000679	0.000493

Estimated Catch Weight.

All catch weights are less than the minimum detection limit (MDL). Vals presented calculated using 1/2 MDL for each catch weight.

* 68 Deg. F (20 C) - - 29.92 In. Mercury

(continued next page)

TABLE 3-16 (continued)

ALDEHYDES/KETONES TESTS SUMMARY

Microboard Press Stack 11 (DEF-1)

	MBP11-M0011-1	MBP11-M0011-2	MBP11-M0011-3	Average
BENZALDEHYDE				
µg per dry std. cubic meter*	87.9	108	137	111
ppm by volume, Dry	0.0199	0.0245	0.0310	0.0251
kilograms per hour	0.00120	0.00127	0.00172	0.00140
pounds per hour	0.00264	0.00279	0.00380	0.00308
ISOVALERALDEHYDE				
µg per dry std. cubic meter*	88.7	118	123	110
ppm by volume, Dry	0.0248	0.0330	0.0344	0.0307
kilograms per hour	0.00121	0.00139	0.00155	0.00138
pounds per hour	0.00267	0.00306	0.00342	0.00305
VALERALDEHYDE				
µg per dry std. cubic meter*	126	217	180	174
ppm by volume, Dry	0.0351	0.0606	0.0503	0.0486
kilograms per hour	0.00171	0.00255	0.00227	0.00218
pounds per hour	0.00377	0.00561	0.00500	0.00480
o-TOLUALDEHYDE				
µg per dry std. cubic meter*	11.7	6.52	14.5	10.9
ppm by volume, Dry	0.00234	0.00130	0.00290	0.00218
kilograms per hour	0.000160	0.0000765	0.000182	0.000140
pounds per hour	0.000352	0.000169	0.000402	0.000308
m/p-TOLUALDEHYDE				
µg per dry std. cubic meter*	61.1	50.3	73.2	61.5
ppm by volume, Dry	0.0122	0.0101	0.0147	0.0123
kilograms per hour	0.000833	0.000590	0.000923	0.000782
pounds per hour	0.00184	0.00130	0.00204	0.00173
HEXALDEHYDE				
µg per dry std. cubic meter*	232	588	378	399
ppm by volume, Dry	0.0557	0.141	0.0908	0.0959
kilograms per hour	0.00316	0.00690	0.00477	0.00494
pounds per hour	0.00697	0.0152	0.0105	0.0109
2,5-DIMETHYL BENZALDEHYDE				
µg per dry std. cubic meter*	34.3	14.0	7.2300	18.5
ppm by volume, Dry	0.00616	0.00251	0.00130	0.00332
kilograms per hour	0.000468	0.000164	0.0000912	0.000241
pounds per hour	0.00103	0.000361	0.000201	0.000531

Estimated Catch Weight.

All catch weights are less than the minimum detection limit (MDL). Value presented calculated using 1/2 MDL for each catch weight.

* 68 Deg. F (20 C) -- 29.92 In. Mercury

TABLE 3–17

ALDEHYDES/KETONES TESTS SUMMARY

Microboard Press Stack 12 (DEF–3)

	MBP12–M0011–1	MBP12–M0011–2	MBP12–M0011–3	Average
Test Date	9/19/92	9/21/92	9/22/92	N/A
Run Start Time	1635	1810	1421	N/A
Run Finish Time	1754	1927	1539	N/A
Test Train Parameters:				
Volume of Dry Gas Sampled, SCF*	53.973	51.416	49.987	N/A
Percent Isokinetic	100.5	97.3	92.5	N/A
Flue Gas Parameters:				
Temperature, Degrees F	112	112	116	113
Volumetric Air Flow Rates				
SCFM*, Dry	11,100	11,000	11,200	11,100
ACFM, Wet	12,400	12,300	12,600	12,400
ALDE./KETONES EMISSION RESULTS:				
FORMALDEHYDE				
µg per dry std. cubic meter*	31,200	24,200	34,200	29,900
ppm by volume, Dry	25.0	19.4	27.4	23.9
kilograms per hour	0.591	0.451	0.651	0.564
pounds per hour	1.30	0.995	1.43	1.24
ACETALDEHYDE				
µg per dry std. cubic meter*	338	377	424	380
ppm by volume, Dry	0.185	0.206	0.231	0.207
kilograms per hour	0.00641	0.00703	0.00808	0.00717
pounds per hour	0.0141	0.0155	0.0178	0.0158
ACROLEIN				
µg per dry std. cubic meter*	89.0	85.8	91.1	88.6
ppm by volume, Dry	0.0382	0.0368	0.0391	0.0380
kilograms per hour	0.00169	0.00160	0.00174	0.00167
pounds per hour	0.00372	0.00353	0.00383	0.00369
ACETONE				
µg per dry std. cubic meter*	466	966	619	684
ppm by volume, Dry	0.193	0.401	0.257	0.284
kilograms per hour	0.00884	0.0180	0.0118	0.0129
pounds per hour	0.0195	0.0397	0.0260	0.0284
PROPIONALDEHYDE				
µg per dry std. cubic meter*	10.5	0.687	2.83	4.66
ppm by volume, Dry	0.00433	0.000284	0.00117	0.00193
kilograms per hour	0.000198	0.0000128	0.0000538	0.0000883
pounds per hour	0.000437	0.0000282	0.000119	0.000195
CROTONALDEHYDE				
µg per dry std. cubic meter*	26.8	35.7	24.0	28.8
ppm by volume, Dry	0.00922	0.0123	0.00825	0.00991
kilograms per hour	0.000508	0.000666	0.000485	0.000553
pounds per hour	0.00112	0.00147	0.00101	0.00120
n–BUTYRALDEHYDE				
µg per dry std. cubic meter*	81.1	125	91.8	99.3
ppm by volume, Dry	0.0271	0.0417	0.0306	0.0331
kilograms per hour	0.00154	0.00233	0.00175	0.00187
pounds per hour	0.00339	0.00514	0.00386	0.00413
METHYL ETHYL KETONE				
µg per dry std. cubic meter*	3.93	24.7	24.7	17.8
ppm by volume, Dry	0.0157	0.0165	0.00825	0.0135
kilograms per hour	0.0000744	0.000461	0.000471	0.000335
pounds per hour	0.000164	0.00102	0.00104	0.000740

Estimated Catch Weight.

All catch weights are less than the minimum detection limit (MDL). Values presented calculated using 1/2 MDL for each catch weight.

* 68 Deg. F (20 C) – – 29.92 In. Mercury

(continued next page)

TABLE 3–17 (continued)

ALDEHYDES/KETONES TESTS SUMMARY

Microboard Press Stack 12 (DEF–3)

	MBP12–M0011–1	MBP12–M0011–2	MBP12–M0011–3	Average
BENZALDEHYDE				
µg per dry std. cubic meter*	77.2	106	129	104
ppm by volume, Dry	0.0175	0.0240	0.0293	0.0236
kilograms per hour	0.00146	0.00197	0.00246	0.00197
pounds per hour	0.00322	0.00435	0.00543	0.00433
ISOVALERALDEHYDE				
µg per dry std. cubic meter*	67.4	115	108	96.8
ppm by volume, Dry	0.0188	0.0322	0.0302	0.0271
kilograms per hour	0.00128	0.00215	0.00206	0.00183
pounds per hour	0.00281	0.00474	0.00454	0.00403
VALERALDEHYDE				
µg per dry std. cubic meter*	88.0	229	150	156
ppm by volume, Dry	0.0247	0.0641	0.0420	0.0436
kilograms per hour	0.00167	0.00427	0.00287	0.00294
pounds per hour	0.00369	0.00942	0.00632	0.00648
o–TOLUALDEHYDE				
µg per dry std. cubic meter*	8.50	4.81	2.12	5.14
ppm by volume, Dry	0.00170	0.00962	0.000424	0.00391
kilograms per hour	0.000161	0.0000896	0.0000404	0.0000970
pounds per hour	0.000355	0.000198	0.0000890	0.000214
m/p–TOLUALDEHYDE				
µg per dry std. cubic meter*	54.3	48.8	70.6	57.9
ppm by volume, Dry	0.0109	0.00976	0.0141	0.0116
kilograms per hour	0.00103	0.000909	0.00135	0.00109
pounds per hour	0.00227	0.00200	0.00297	0.00241
HEXALDEHYDE				
µg per dry std. cubic meter*	207	613	350	390
ppm by volume, Dry	0.0497	0.147	0.0840	0.0936
kilograms per hour	0.00392	0.0114	0.00666	0.00733
pounds per hour	0.00863	0.0252	0.0147	0.0162
2,5–DIMETHYL BENZALDEHYDE				
µg per dry std. cubic meter*	25.5	16.5	2.83	14.9
ppm by volume, Dry	0.00458	0.00296	0.000507	0.00268
kilograms per hour	0.000483	0.000307	0.0000538	0.000281
pounds per hour	0.00107	0.000677	0.000119	0.000622

Estimated Catch Weight.

All catch weights are less than the minimum detection limit (MDL). Values presented calculated using 1/2 MDL for each catch weight.

* 68 Deg. F (20 C) – – 29.92 In. Mercury

TABLE 3-18

ALDEHYDES/KETONES TESTS SUMMARY

Microboard Press Stack 13 (DEP-5)

	MBP13-M0011-1	MBP13-M0011-2	MBP13-M0011-3	Average
Test Date	9/19/92	9/21/92	9/22/92	N/A
Run Start Time	1635	1810	1421	N/A
Run Finish Time	1751	1923	1536	N/A
Test Train Parameters:				
Volume of Dry Gas Sampled, SCF*	47.204	46.547	48.2	N/A
Percent Isokinetic	102.1	100.8	100.4	N/A
Flue Gas Parameters:				
Temperature, Degrees F	110	109	118	113
Volumetric Air Flow Rates				
SCFM*, Dry	9,600	9,580	9,960	9,710
ACFM, Wet	10,800	10,700	11,200	10,900
ALDE./KETONES EMISSION RESULTS:				
FORMALDEHYDE				
µg per dry std. cubic meter*	30,300	21,700	30,700	27,600
ppm by volume, Dry	24.3	17.4	24.6	22.1
kilograms per hour	0.495	0.353	0.519	0.456
pounds per hour	1.09	0.778	1.14	1.00
ACETALDEHYDE				
µg per dry std. cubic meter*	354	357	289	333
ppm by volume, Dry	0.193	0.194	0.158	0.182
kilograms per hour	0.00577	0.00580	0.00490	0.00549
pounds per hour	0.0127	0.0128	0.0108	0.0121
ACROLEIN				
µg per dry std. cubic meter*	96.5	78.1	52.7	75.8
ppm by volume, Dry	0.0414	0.0335	0.0226	0.0325
kilograms per hour	0.00157	0.00127	0.000893	0.00125
pounds per hour	0.00347	0.00280	0.00197	0.00275
ACETONE				
µg per dry std. cubic meter*	426	743	292	487
ppm by volume, Dry	0.177	0.308	0.121	0.202
kilograms per hour	0.00694	0.0121	0.00495	0.00799
pounds per hour	0.0153	0.0267	0.0109	0.0176
PROPIONALDEHYDE				
µg per dry std. cubic meter*	5.24	0.760	19.0	8.35
ppm by volume, Dry	0.00217	0.000314	0.00789	0.00346
kilograms per hour	0.000085	0.0000123	0.000322	0.000140
pounds per hour	0.000188	0.0000272	0.000711	0.000309
CROTONALDEHYDE				
µg per dry std. cubic meter*	48.6	38.7	26.4	37.9
ppm by volume, Dry	0.0167	0.0133	0.00906	0.0130
kilograms per hour	0.000793	0.000630	0.000446	0.000623
pounds per hour	0.00175	0.00139	0.000984	0.00137
n-BUTYRALDEHYDE				
µg per dry std. cubic meter*	113	111	80.6	102
ppm by volume, Dry	0.0377	0.0370	0.0269	0.0339
kilograms per hour	0.00184	0.00180	0.00136	0.00167
pounds per hour	0.00406	0.00397	0.00301	0.00368
METHYL ETHYL KETONE				
µg per dry std. cubic meter*	3.74	27.3	19.8	16.9
ppm by volume, Dry	0.00125	0.00911	0.00660	0.00565
kilograms per hour	0.0000610	0.000445	0.000335	0.000280
pounds per hour	0.000135	0.000980	0.000738	0.000617

Estimated Catch Weight.

All catch weights are less than the minimum detection limit (MDL). Value presented calculated using 1/2 MDL for each catch weight.

* 68 Deg. F (20 C) - - 29.92 In. Mercury

(continued next page)

TABLE 3-18 (continued)

ALDEHYDES/KETONES TESTS SUMMARY

Microboard Press Stack 13 (DEF-5)

	MBP13-M0011-1	MBP13-M0011-2	MBP13-M0011-3	Average
BENZALDEHYDE				
µg per dry std. cubic meter*	80.0	108	125	105
ppm by volume, Dry	0.0181	0.0246	0.0284	0.0237
kilograms per hour	0.00131	0.00177	0.00212	0.00173
pounds per hour	0.00288	0.00389	0.00467	0.00381
ISOVALERALDEHYDE				
µg per dry std. cubic meter*	72.6	97.9	87.9	86.1
ppm by volume, Dry	0.0203	0.0273	0.0246	0.0241
kilograms per hour	0.00118	0.00159	0.00149	0.00142
pounds per hour	0.00261	0.00351	0.00328	0.00313
VALERALDEHYDE				
µg per dry std. cubic meter*	86.8	212	104	134
ppm by volume, Dry	0.0242	0.0593	0.0291	0.0376
kilograms per hour	0.00142	0.00346	0.00176	0.00221
pounds per hour	0.00312	0.00762	0.00388	0.00487
o-TOLUALDEHYDE				
µg per dry std. cubic meter*	3.74	2.28	10.3	5.44
ppm by volume, Dry	0.00075	0.000455	0.00205	0.00108
kilograms per hour	0.0000610	0.0000370	0.000174	0.0000907
pounds per hour	0.000134	0.000082	0.000383	0.000200
m/p-TOLUALDEHYDE				
µg per dry std. cubic meter*	15.0	53.9	70.3	46.4
ppm by volume, Dry	0.00299	0.0108	0.0141	0.00929
kilograms per hour	0.000244	0.000877	0.00119	0.000770
pounds per hour	0.000538	0.00193	0.00262	0.00170
HEXALDEHYDE				
µg per dry std. cubic meter*	183	505	271	320
ppm by volume, Dry	0.0440	0.121	0.0651	0.0768
kilograms per hour	0.00299	0.00822	0.00459	0.00527
pounds per hour	0.00659	0.0181	0.0101	0.0116
2,5-DIMETHYL BENZALDEHYDE				
µg per dry std. cubic meter*	10.5	49.3	46.2	35.3
ppm by volume, Dry	0.00188	0.00885	0.00829	0.00634
kilograms per hour	0.000171	0.000803	0.000781	0.000585
pounds per hour	0.000307	0.00177	0.00172	0.00127

Estimated Catch Weight.

All catch weights are less than the minimum detection limit (MDL). Value presented calculated using 1/2 MDL for each catch weight.

* 68 Deg. F (20 C) -- 29.92 In. Mercury

TABLE 3-19

ALDEHYDES/KETONES TESTS SUMMARY

Microboard Cooling Room Stack 14 (DEF-7)

	MBCR14-M0011-1	MBCR14-M0011-2	MBCR14-M0011-3	Average
Test Date	9/22/92	9/22/92	9/24/92	N/A
Run Start Time	1733	1931	753	N/A
Run Finish Time	1900	2059	937	N/A
Test Train Parameters:				
Volume of Dry Gas Sampled, SCF*	45.218	51.11	56.35	N/A
Percent Isokinetic	101.5	96.2	99.5	N/A
Flue Gas Parameters:				
Temperature, Degrees F	127	123	103	118
Volumetric Air Flow Rates				
SCFM*, Dry	14,400	15,300	16,300	15,300
ACFM, Wet	16,600	17,400	17,600	17,200
ALDE./KETONES EMISSION RESULTS:				
FORMALDEHYDE				
µg per dry std. cubic meter*	7,710	6,750	5,090	6,520
ppm by volume, Dry	6.18	5.41	4.08	5.22
kilograms per hour	0.189	0.176	0.141	0.169
pounds per hour	0.417	0.387	0.311	0.372
ACETALDEHYDE				
µg per dry std. cubic meter*	163	149	148	153
ppm by volume, Dry	0.0890	0.0810	0.0807	0.0836
kilograms per hour	0.00401	0.00387	0.00411	0.00399
pounds per hour	0.00883	0.00853	0.00905	0.00880
ACROLEIN				
µg per dry std. cubic meter*	42.2	37.3	33.2	37.6
ppm by volume, Dry	0.0181	0.0160	0.0142	0.0161
kilograms per hour	0.00103	0.000971	0.000922	0.000976
pounds per hour	0.00228	0.00214	0.00203	0.00215
ACETONE				
µg per dry std. cubic meter*	288	213	169	223
ppm by volume, Dry	0.120	0.0883	0.0702	0.0926
kilograms per hour	0.00707	0.00554	0.00470	0.00577
pounds per hour	0.0156	0.0122	0.0104	0.0127
PROPIONALDEHYDE				
µg per dry std. cubic meter*	0.781	1.38	13.8	5.32
ppm by volume, Dry	0.000323	0.000572	0.00571	0.00220
kilograms per hour	0.0000192	0.0000360	0.000383	0.000146
pounds per hour	0.0000422	0.0000793	0.000844	0.000322
CROTONALDEHYDE				
µg per dry std. cubic meter*	18.7	36.6	27.6	27.6
ppm by volume, Dry	0.00644	0.0126	0.00948	0.00950
kilograms per hour	0.000460	0.000953	0.000766	0.000726
pounds per hour	0.00101	0.00210	0.00169	0.00160
n-BUTYRALDEHYDE				
µg per dry std. cubic meter*	49.2	75.3	56.4	60.3
ppm by volume, Dry	0.0164	0.0251	0.0188	0.0201
kilograms per hour	0.00121	0.00196	0.00157	0.00158
pounds per hour	0.00266	0.00432	0.00345	0.00348
METHYL ETHYL KETONE				
µg per dry std. cubic meter*	10.2	17.3	11.3	12.9
ppm by volume, Dry	0.00339	0.00576	0.0038	0.00430
kilograms per hour	0.000249	0.000450	0.000313	0.000337
pounds per hour	0.000549	0.000991	0.000691	0.000744

Estimated Catch Weight.

All catch weights are less than the minimum detection limit (MDL). Values presented calculated using 1/2 MDL for each catch weight.

* 68 Deg. F (20 C) -- 29.92 In. Mercury

(continued next page)

TABLE 3-19 (continued)

ALDEHYDES/KETONES TESTS SUMMARY

Microboard Cooling Room Stack 14 (DEF-7)

	MBCR14-M0011-1	MBCR14-M0011-2	MBCR14-M0011-3	Average
BENZALDEHYDE				
µg per dry std. cubic meter*	53.1	53.9	35.1	47.4
ppm by volume, Dry	0.0120	0.0122	0.00796	0.0107
kilograms per hour	0.00130	0.00140	0.000974	0.00123
pounds per hour	0.00287	0.00309	0.00215	0.00270
ISOVALERALDEHYDE				
µg per dry std. cubic meter*	39.8	50.4	37.6	42.6
ppm by volume, Dry	0.0111	0.0141	0.0105	0.0119
kilograms per hour	0.000977	0.00131	0.00104	0.00111
pounds per hour	0.00215	0.00289	0.00230	0.00245
VALERALDEHYDE				
µg per dry std. cubic meter*	57.0	63.6	53.3	57.9
ppm by volume, Dry	0.0159	0.0178	0.0149	0.0162
kilograms per hour	0.00140	0.00165	0.00148	0.00151
pounds per hour	0.00308	0.00365	0.00326	0.00333
o-TOLUALDEHYDE				
µg per dry std. cubic meter*	7.03	2.76	2.50	4.10
ppm by volume, Dry	0.00141	0.000553	0.000500	0.000821
kilograms per hour	0.000172	0.000072	0.0000700	0.000105
pounds per hour	0.000380	0.000159	0.000153	0.000231
m/p-TOLUALDEHYDE				
µg per dry std. cubic meter*	24.2	24.9	18.2	22.4
ppm by volume, Dry	0.00484	0.00498	0.00364	0.00449
kilograms per hour	0.000594	0.000648	0.000505	0.000582
pounds per hour	0.00131	0.00143	0.00111	0.00128
HEXALDEHYDE				
µg per dry std. cubic meter*	133	120	112	122
ppm by volume, Dry	0.0319	0.0289	0.0268	0.0292
kilograms per hour	0.00326	0.00313	0.00310	0.00316
pounds per hour	0.00718	0.00690	0.00683	0.00697
2,5-DIMETHYL BENZALDEHYDE				
µg per dry std. cubic meter*	3.12	22.1	6.89	10.7
ppm by volume, Dry	0.000561	0.00397	0.00124	0.00192
kilograms per hour	0.0000767	0.000576	0.000191	0.000281
pounds per hour	0.000169	0.00127	0.000422	0.000620

Estimated Catch Weight.

All catch weights are less than the minimum detection limit (MDL). Values presented calculated using 1/2 MDL for each catch weight.

* 68 Deg. F (20 C) -- 29.92 In. Mercury

TABLE 3-20

ALDEHYDES/KETONES TESTS SUMMARY

Microboard Cooling Room Stack 15 (DEP-8)

	MBCR15-M0011-1	MBCR15-M0011-2	MBCR15-M0011-3	Average
Test Date	9/22/92	9/22/92	9/24/92	N/A
Run Start Time	1733	1951	753	N/A
Run Finish Time	1900	2059	927	N/A
Test Train Parameters:				
Volume of Dry Gas Sampled, SCF*	43.332	46.113	50.717	N/A
Percent Isokinetic	94.6	94.0	96.6	N/A
Flue Gas Parameters:				
Temperature, Degrees F	128	123	104	118
Volumetric Air Flow Rates				
SCFM*, Dry	14,700	15,900	17,000	15,900
ACFM, Wet	16,900	18,100	18,100	17,700
ALDE./KETONES EMISSION RESULTS:				
FORMALDEHYDE				
µg per dry std. cubic meter*	7,730	6,710	4,780	6,410
ppm by volume, Dry	6.20	5.38	3.83	5.14
kilograms per hour	0.193	0.181	0.138	0.171
pounds per hour	0.425	0.399	0.305	0.376
ACETALDEHYDE				
µg per dry std. cubic meter*	180	145	151	159
ppm by volume, Dry	0.0982	0.0789	0.0824	0.0865
kilograms per hour	0.00450	0.00391	0.00437	0.00426
pounds per hour	0.00991	0.00862	0.00963	0.00939
ACROLEIN				
µg per dry std. cubic meter*	61.1	40.6	38.3	46.7
ppm by volume, Dry	0.0262	0.0174	0.0164	0.0200
kilograms per hour	0.00153	0.00110	0.00111	0.00124
pounds per hour	0.00336	0.00242	0.00244	0.00274
ACETONE				
µg per dry std. cubic meter*	332	214	203	250
ppm by volume, Dry	0.138	0.0886	0.0840	0.104
kilograms per hour	0.00830	0.00577	0.00586	0.00664
pounds per hour	0.0183	0.0127	0.0129	0.0146
PROPIONALDEHYDE				
µg per dry std. cubic meter*	1.63	0.770	0.700	1.03
ppm by volume, Dry	0.000675	0.000317	0.000288	0.000427
kilograms per hour	0.0000407	0.0000207	0.0000201	0.0000272
pounds per hour	0.0000897	0.0000456	0.0000444	0.0000599
CROTONALDEHYDE				
µg per dry std. cubic meter*	46.4	39.8	35.5	40.6
ppm by volume, Dry	0.0160	0.0137	0.0122	0.014
kilograms per hour	0.00116	0.00108	0.00103	0.00109
pounds per hour	0.00256	0.00237	0.00226	0.00240
n-BUTYRALDEHYDE				
µg per dry std. cubic meter*	92.9	75.0	73.8	80.6
ppm by volume, Dry	0.0310	0.0250	0.0246	0.0269
kilograms per hour	0.00232	0.00203	0.00213	0.00216
pounds per hour	0.00511	0.00447	0.00471	0.00476
METHYL ETHYL KETONE				
µg per dry std. cubic meter*	16.3	13.0	12.5	13.9
ppm by volume, Dry	0.00544	0.00434	0.00418	0.00465
kilograms per hour	0.000407	0.000352	0.000362	0.000374
pounds per hour	0.000897	0.000775	0.000799	0.000824

Estimated Catch Weight.

All catch weights are less than minimum detection limit (MDL). Value presented calculated using 1/2 MDL for each catch weight.

* 68 Deg. F (20 C), 29.92 in. Mercury

(continued next page)

TABLE 3-20 (continued)

ALDEHYDES/KETONES TESTS SUMMARY

Microboard Cooling Room Stack 15 (DEF-8)

	MBCR15-M0011-1	MBCR15-M0011-2	MBCR15-M0011-3	Average
BENZALDEHYDE				
µg per dry std. cubic meter*	64.4	53.6	37.6	51.9
ppm by volume, Dry	0.0146	0.0121	0.00852	0.0117
kilograms per hour	0.00161	0.00161	0.00109	0.00144
pounds per hour	0.00354	0.00356	0.00240	0.00317
ISOVALERALDEHYDE				
µg per dry std. cubic meter*	63.6	49.8	42.5	51.9
ppm by volume, Dry	0.0178	0.0139	0.0119	0.0145
kilograms per hour	0.00159	0.00134	0.00123	0.00139
pounds per hour	0.00350	0.00296	0.00271	0.00306
VALERALDEHYDE				
µg per dry std. cubic meter*	78.2	94.2	59.9	77.4
ppm by volume, Dry	0.0219	0.0263	0.0167	0.0216
kilograms per hour	0.00195	0.00254	0.00173	0.00207
pounds per hour	0.00431	0.00561	0.00382	0.00458
o-TOLUALDEHYDE				
µg per dry std. cubic meter*	1.63	3.06	2.09	2.26
ppm by volume, Dry	0.000326	0.000613	0.0000418	0.000327
kilograms per hour	0.0000407	0.0000827	0.0000604	0.0000613
pounds per hour	0.0000897	0.000182	0.000133	0.000135
m/p-TOLUALDEHYDE				
µg per dry std. cubic meter*	31.0	23.7	19.5	24.7
ppm by volume, Dry	0.00620	0.00475	0.00390	0.00495
kilograms per hour	0.000773	0.000641	0.000564	0.000659
pounds per hour	0.00170	0.00141	0.00124	0.00145
HEXALDEHYDE				
µg per dry std. cubic meter*	167	118	114	133
ppm by volume, Dry	0.0401	0.0283	0.0274	0.0319
kilograms per hour	0.00417	0.00318	0.00330	0.00355
pounds per hour	0.00919	0.00702	0.00728	0.00783
2,5-DIMETHYL BENZALDEHYDE				
µg per dry std. cubic meter*	12.2	6.89	9.05	9.38
ppm by volume, Dry	0.00219	0.00124	0.00162	0.00168
kilograms per hour	0.000305	0.000186	0.000262	0.000251
pounds per hour	0.000673	0.000410	0.000577	0.000553

Estimated Catch Weight.

All catch weights are less than minimum detection limit (MDL). Values presented calculated using 1/2 MDL for each catch weight.

* 68 Deg. F (20 C) - - 29.92 In. Mercury

TABLE 3-21

PARTICULATE & CONDENSIBLE PARTICULATE TESTS SUMMARY

MDF Cyclone Outlet (DB)

	MDFCO-M5/202-1	MDFCO-M5/202-2	MDFCO-M5/202-3	Average
Test Date	9/25/92	9/25/92	9/25/92	N/A
Run Start Time	1327	1626	1843	N/A
Run Finish Time	1457	1745	2021	N/A
Test Train Parameters:				
Volume of Dry Gas Sampled, SCF*	58.466	52.337	54.193	N/A
Percent Isokenetic	104.1	108.2	111.2	N/A
Flue Gas Parameters:				
Temperature, Degrees F	160	158	156	158
Volumetric Air Flow Rates				
SCFM*, Dry	86,900	94,200	94,900	92,000
ACFM, Wet	113,000	121,000	124,000	119,000
PARTICULATE RESULTS:				
Filterable				
Concentration, grains/DSCF*	0.0158	0.0174	0.0181	0.0171
Emission Rate, kilograms/hour	5.32	6.39	6.69	6.13
Emission Rate, pounds/hour	11.7	14.1	14.8	13.5
Extractable Condensibles				
Concentration, grains/DSCF*	0.00108	0.00203	0.00262	0.00191
Emission Rate, kilograms/hour	0.365	0.745	0.966	0.692
Emission Rate, pounds/hour	0.806	1.64	2.13	1.53
Non-Extractable Condensibles				
Concentration, grains/DSCF*	0.0106	0.00174	0.00695	0.00642
Emission Rate, kilograms/hour	3.57	0.637	2.56	2.26
Emission Rate, pounds/hour	7.86	1.41	5.65	4.97
Total Particulate				
Concentration, grains/DSCF*	0.0274	0.0212	0.0277	0.0254
Emission Rate, kilograms/hour	9.25	7.77	10.2	9.08
Emission Rate, pounds/hour	20.4	17.1	22.5	20.0

* 68 Deg. F (20 C) -- 29.92 In. Mercury

TABLE 3-22

PARTICULATE & CONDENSIBLE PARTICULATE TESTS SUMMARY

Surface EFB Inlet

	MBSLI-M5/202-2	MBSLI-M5/202-3	MBSLI-M5/202-4	Average
Test Date	9/16/92	9/17/92	9/18/92	N/A
Run Start Time	1539	839	925	N/A
Run Finish Time	1659	955	1052	N/A
Test Train Parameters:				
Volume of Dry Gas Sampled, SCF*	42.322	41.684	43.169	N/A
Percent Isokenetic	98.8	100.1	100.9	N/A
Flue Gas Parameters:				
Carbon Dioxide, %	2.0	2.0	2.0	2.0
Temperature, Degrees F	224	218	223	222
Volumetric Air Flow Rates				
SCFM*, Dry	47,717	46,349	46,648	46,905
ACFM, Wet	72,155	68,812	71,070	70,679
PARTICULATE RESULTS:				
Filterable				
Concentration, grains/DSCF*	0.0492	0.0415	0.0487	0.0465
Emission Rate, kilograms/hour	9.12	7.49	8.83	8.48
Emission Rate, pounds/hour	20.1	16.5	19.5	18.7
Extractable Condensibles				
Concentration, grains/DSCF*	0.00667	0.00900	0.0174	0.0110
Emission Rate, kilograms/hour	1.24	1.62	3.16	2.01
Emission Rate, pounds/hour	2.73	3.57	6.98	4.43
Non-Extractable Condensibles				
Concentration, grains/DSCF*	0.00445	0.00381	0.00393	0.00406
Emission Rate, kilograms/hour	0.825	0.687	0.713	0.742
Emission Rate, pounds/hour	1.82	1.51	1.57	1.64
Total Particulate				
Concentration, grains/DSCF*	0.0603	0.0543	0.0701	0.0616
Emission Rate, kilograms/hour	11.2	9.79	12.7	11.2
Emission Rate, pounds/hour	24.7	21.6	28.0	24.8

* 68 Deg. F (20 C) -- 29.92 In. Mercury

TABLE 3-23

PARTICULATE & CONDENSIBLE PARTICULATE TESTS SUMMARY

Core EFB Inlet

	MBCLI-M5/202-2	MBCLI-M5/202-3	MBCLI-M5/202-4	Average
Test Date	9/15/92	9/15/92	9/15/92	N/A
Run Start Time	1010	1547	1619	N/A
Run Finish Time	1411	1729	1910	N/A
Test Train Parameters:				
Volume of Dry Gas Sampled, SCF*	30.695	30.781	30.654	N/A
Percent Isokenetic	105.8	107.0	108.2	N/A
Flue Gas Parameters:				
Carbon Dioxide, %	3.0	3.7	3.0	3.2
Temperature, Degrees F	261	262	262	262
Volumetric Air Flow Rates				
SCFM*, Dry	32,142	31,891	31,401	31,811
ACFM, Wet	57,657	56,530	57,014	57,067
PARTICULATE RESULTS:				
Filterable				
Concentration, grains/DSCF*	0.107	0.0893	0.149	0.115
Emission Rate, kilograms/hour	13.4	11.1	18.2	14.2
Emission Rate, pounds/hour	29.5	24.4	40.1	31.3
Extractable Condensibles				
Concentration, grains/DSCF*	0.0452	0.0497	0.0370	0.0440
Emission Rate, kilograms/hour	5.65	6.16	4.52	5.44
Emission Rate, pounds/hour	12.5	13.6	9.96	12.0
Non-Extractable Condensibles				
Concentration, grains/DSCF*	0.0343	0.0384	0.0377	0.0368
Emission Rate, kilograms/hour	4.29	4.76	4.60	4.55
Emission Rate, pounds/hour	9.46	10.5	10.1	10.0
Total Particulate				
Concentration, grains/DSCF*	0.187	0.177	0.224	0.196
Emission Rate, kilograms/hour	23.3	22.0	27.3	24.2
Emission Rate, pounds/hour	51.4	48.5	60.2	53.4

* 68 Deg. F (20 C) -- 29.92 In. Mercury

TABLE 3-24

PM10 TESTS SUMMARY

MDF Cyclone Outlet (DB)

	MDFCO-M201A-1	MDFCO-M201A-2	MDFCO-M201A-3	Average
Test Date	9/25/92	9/26/92	9/27/92	N/A
Run Start Time	1116	1707	945	N/A
Run Finish Time	1457	1937	1248	N/A
Test Train Parameters:				
Volume of Dry Gas Sampled, SCF*	44.173	47.411	49.711	N/A
Percent Isokenetic	110.1	112.9	115.1	N/A
Flue Gas Parameters:				
Temperature, Degrees F	154	148	151	151
Volumetric Air Flow Rates				
SCFM*, Dry	101,000	100,000	96,900	99,300
ACFM, Wet	131,000	128,000	125,000	128,000
Dia. of Particles in Cyclone, Microns	9.52	9.54	9.52	9.53
PM10 EMISSION RESULTS:				
Concentration, grains/DSCF*	0.00115	0.00104	0.00590	0.00270
Emission Rate, kilograms/hour	0.453	0.405	2.22	1.03
Emission Rate, pounds/hour	0.998	0.893	4.90	2.26
TOTAL PARTICULATE EMISSIONS (Includes PM10):				
Concentration, grains/DSCF*	0.0267	0.0208	0.0359	0.0278
Emission Rate, kilograms/hour	10.5	8.09	7.44	8.67
Emission Rate, pounds/hour	23.1	17.8	16.4	19.1
PARTICULATE FRACTIONATION:				
> PM10, %	95.7	95.0	83.6	91.4
< PM10, %	4.33	5.01	16.4	8.58

*68 Deg. F (20 C) -- 29.92 In. Mercury

TABLE 3-25

PM10 TESTS SUMMARY

MDF Press Stack 2 (WIW-2)

	MDFP2-M201A/202-1	MDFP2-M201A/202-2	MDFP2-M201A/202-3	Average
Test Date	9/10/92	9/11/92	9/11/92	N/A
Run Start Time	1148	740	1253	N/A
Run Finish Time	1739	1145	1821	N/A
Test Train Parameters:				
Volume of Dry Gas Sampled, SCF*	116.411	101.57	109.198	N/A
Percent Isokenetic	105.4	107.4	101.1	N/A
Flue Gas Parameters:				
Temperature, Degrees F	123	114	121	119
Volumetric Air Flow Rates				
SCFM*, Dry	11,600	11,200	11,700	11,500
ACFM, Wet	13,100	12,500	13,300	13,000
Dia. of Particles in Cyclone, Microns	9.61	9.89	9.83	9.78
PM10 EMISSION RESULTS:				
Including extractable/non-extractable condensibles				
Concentration, grains/DSCF*	0.0119	0.00678	0.00608	0.00826
Emission Rate, kilograms/hour	0.537	0.295	0.277	0.370
Emission Rate, pounds/hour	1.18	0.650	0.611	0.815
Including only non-extractable condensibles				
Concentration, grains/DSCF*	0.0106	0.00656	0.00561	0.00757
Emission Rate, kilograms/hour	0.475	0.286	0.256	0.339
Emission Rate, pounds/hour	1.05	0.630	0.564	0.747
Without condensibles (Filterable)				
Concentration, grains/DSCF*	0.00363	0.00406	0.00376	0.00382
Emission Rate, kilograms/hour	0.164	0.177	0.171	0.171
Emission Rate, pounds/hour	0.361	0.389	0.378	0.376
TOTAL PARTICULATE EMISSIONS (Includes PM10):				
Concentration, grains/DSCF*	0.0207	0.0144	0.0117	0.0156
Emission Rate, kilograms/hour	0.932	0.626	0.535	0.698
Emission Rate, pounds/hour	2.06	1.38	1.18	1.54
PARTICULATE FRACTIONATION:				
> PM10, %	42.4	52.9	48.2	47.8
< PM10, %	57.6	47.1	51.8	52.2

* 68 Deg. F (20 C) -- 29.92 In. Mercury

TABLE 3-26

PM10 TESTS SUMMARY

MDF Press Stack 3 (WIW-1)

	MDFP3-M201A/202-1	MDFP3-M201A/202-2	MDFP3-M201A/202-3	Average
Test Date	9/10/92	9/11/92	9/11/92	N/A
Run Start Time	1148	739	1352	N/A
Run Finish Time	1742	1158	1803	N/A
Test Train Parameters:				
Volume of Dry Gas Sampled, SCF	115.788	110.621	106.81	N/A
Percent Isokenetic	96.0	92.3	91.8	N/A
Flue Gas Parameters:				
Temperature, Degrees F	125	119	123	122
Volumetric Air Flow Rates				
SCFM*, Dry	11,900	12,400	12,500	12,300
ACFM, Wet	13,700	14,100	14,200	14,000
Dia. of Particles in Cyclone, Microns	9.68	9.64	9.62	9.65
PM10 EMISSION RESULTS:				
Including extractable/non-extractable condensibles				
Concentration, grains/DSCF*	0.0108	0.00756	0.0473	0.0219
Emission Rate, kilograms/hour	0.502	0.363	2.30	1.06
Emission Rate, pounds/hour	1.11	0.800	5.07	2.33
Including only non-extractable condensibles				
Concentration, grains/DSCF*	0.00950	0.00583	0.0473	0.0209
Emission Rate, kilograms/hour	0.440	0.280	2.30	1.01
Emission Rate, pounds/hour	0.971	0.617	5.07	2.22
Without condensibles (Filterable)				
Concentration, grains/DSCF*	0.00454	0.00393	0.00364	0.00404
Emission Rate, kilograms/hour	0.211	0.189	0.177	0.192
Emission Rate, pounds/hour	0.464	0.416	0.391	0.424
TOTAL PARTICULATE EMISSIONS (Includes PM10):				
Concentration, grains/DSCF*	0.0209	0.0143	0.0555	0.0302
Emission Rate, kilograms/hour	0.968	0.687	2.70	1.45
Emission Rate, pounds/hour	2.13	1.51	5.96	3.20
PARTICULATE FRACTIONATION:				
> PM10, %	48.1	47.1	14.9	36.7
< PM10, %	51.9	52.9	85.1	63.3

* 68 Deg. F (20 C) -- 29.92 In. Mercury

TABLE 3-27

PM10 TESTS SUMMARY

MDF Press Stack 4 (WIW-5)

	MDFP4-M201A/202-1	MDFP4-M201A/202-2	MDFP4-M201A/202-3	Average
Test Date	9/12/92	9/13/92	9/13/92	N/A
Run Start Time	1625	840	1408	N/A
Run Finish Time	2059	1253	1812	N/A
Test Train Parameters:				
Volume of Dry Gas Sampled, SCF*	106.97	109.521	94.097	N/A
Percent Isokenetic	100.7	94.8	103.3	N/A
Flue Gas Parameters:				
Temperature, Degrees F	96	89	97	94
Volumetric Air Flow Rates				
SCFM*, Dry	19,400	20,800	19,100	19,800
ACFM, Wet	20,800	21,900	20,200	21,000
Dia. of Particles in Cyclone, Microns	9.89	9.98	9.92	9.93
PM10 EMISSION RESULTS:				
Including extractable/non-extractable condensibles				
Concentration, grains/DSCF*	0.00169	0.00213	0.00272	0.00218
Emission Rate, kilograms/hour	0.127	0.172	0.202	0.167
Emission Rate, pounds/hour	0.281	0.380	0.446	0.369
Including only non-extractable condensibles				
Concentration, grains/DSCF*	0.00169	0.000690	0.00239	0.00159
Emission Rate, kilograms/hour	0.127	0.0559	0.178	0.120
Emission Rate, pounds/hour	0.281	0.123	0.392	0.265
Without condensibles (Filterable)				
Concentration, grains/DSCF*	0.000505	0.000268	0.00144	0.000739
Emission Rate, kilograms/hour	0.0381	0.0217	0.107	0.0560
Emission Rate, pounds/hour	0.0840	0.0478	0.236	0.123
TOTAL PARTICULATE EMISSIONS (Includes PM10):				
Concentration, grains/DSCF*	0.00248	0.00318	0.00280	0.00282
Emission Rate, kilograms/hour	0.187	0.258	0.208	0.218
Emission Rate, pounds/hour	0.413	0.568	0.459	0.480
PARTICULATE FRACTIONATION:				
> PM10, %	32.0	33.2	2.92	22.7
< PM10, %	68.0	66.8	97.1	77.3

* 68 Deg. F (20 C) -- 29.92 In. Mercury

TABLE 3–28

PM10 TESTS SUMMARY

MDF Press Stack 5 (WIW–3)

	MDFP5–M201A/202–1	MDFP5–M201A/202–2	MDFP5–M201A/202–3	Average
Test Date	9/12/92	9/13/92	9/13/92	N/A
Run Start Time	1625	840	1348	N/A
Run Finish Time	2122	1226	1842	N/A
Test Train Parameters:				
Volume of Dry Gas Sampled, SCF*	118.616	94.875	117.675	N/A
Percent Isokenetic	90.8	103.0	90.9	N/A
Flue Gas Parameters:				
Temperature, Degrees F	96	88	97	94
Volumetric Air Flow Rates				
SCFM*, Dry	58,200	52,600	59,500	56,800
ACFM, Wet	62,200	55,100	63,300	60,200
Dia. of Particles in Cyclone, Microns	9.75	9.85	9.75	9.78
PM10 EMISSION RESULTS:				
Including extractable/non–extractable condensibles				
Concentration, grains/DSCF*	0.00125	0.00111	0.000393	0.000916
Emission Rate, kilograms/hour	0.283	0.226	0.0910	0.200
Emission Rate, pounds/hour	0.623	0.498	0.201	0.441
Including only non–extractable condensibles				
Concentration, grains/DSCF*	0.00120	0.000960	0.000393	0.000850
Emission Rate, kilograms/hour	0.271	0.196	0.0910	0.186
Emission Rate, pounds/hour	0.597	0.432	0.201	0.410
Without condensibles (Filterable)				
Concentration, grains/DSCF*	0.000247	0.0000976	0.0000131	0.000119
Emission Rate, kilograms/hour	0.0559	0.0199	0.00303	0.0263
Emission Rate, pounds/hour	0.123	0.0440	0.00669	0.0580
TOTAL PARTICULATE EMISSIONS (Includes PM10):				
Concentration, grains/DSCF*	0.00215	0.00192	0.000879	0.00165
Emission Rate, kilograms/hour	0.486	0.392	0.203	0.360
Emission Rate, pounds/hour	1.07	0.865	0.448	0.794
PARTICULATE FRACTIONATION:				
> PM10, %	41.8	42.4	55.2	46.5
< PM10, %	58.2	57.6	44.8	53.5

* 68 Deg. F (20 C) -- 29.92 In. Mercury

TABLE 3-29

PM10 TESTS SUMMARY

MDF Press Stack 6 (WIW-4)

	MDFP6-M201A/202-1	MDFP6-M201A/202-2	MDFP6-M201A/202-3	Average
Test Date	9/10/92	9/11/92	9/11/92	N/A
Run Start Time	925	735	1353	N/A
Run Finish Time	1458	1159	1756	N/A
Test Train Parameters:				
Volume of Dry Gas Sampled, SCF*	111.539	109.311	105.314	N/A
Percent Isokenetic	110.6	105.6	111.1	N/A
Flue Gas Parameters:				
Temperature, Degrees F	100	96	98	98
Volumetric Air Flow Rates				
SCFM*, Dry	30,500	31,600	30,500	30,900
ACFM, Wet	33,000	33,900	33,100	33,300
Dia. of Particles in Cyclone, Microns	9.75	9.89	9.69	9.78
PM10 EMISSION RESULTS:				
Including extractable/non-extractable condensibles				
Concentration, grains/DSCF*	0.00284	0.00207	0.00190	0.00227
Emission Rate, kilograms/hour	0.336	0.255	0.226	0.272
Emission Rate, pounds/hour	0.741	0.561	0.497	0.600
Including only non-extractable condensibles				
Concentration, grains/DSCF*	0.00187	0.00155	0.00100	0.00147
Emission Rate, kilograms/hour	0.221	0.191	0.118	0.177
Emission Rate, pounds/hour	0.488	0.420	0.260	0.389
Without condensibles (Filterable)				
Concentration, grains/DSCF*	0.000208	0.000198	0.0000586	0.000155
Emission Rate, kilograms/hour	0.0246	0.0243	0.00694	0.0186
Emission Rate, pounds/hour	0.0543	0.0535	0.0153	0.0410
TOTAL PARTICULATE EMISSIONS (Includes PM10):				
Concentration, grains/DSCF*	0.00434	0.00374	0.00334	0.00381
Emission Rate, kilograms/hour	0.515	0.459	0.396	0.457
Emission Rate, pounds/hour	1.14	1.01	0.872	1.01
PARTICULATE FRACTIONATION:				
> PM10, %	34.7	44.5	43.0	40.7
< PM10, %	65.3	55.5	57.0	59.3

* 68 Deg. F (20 C) -- 29.92 In. Mercury

TABLE 3-30

PM10 TESTS SUMMARY

Surface EFB Outlet (1510)

	MBSLO-M201A/202-2	MBSLO-M201A/202-3	MBSLO-M201A/202-4	Average
Test Date	9/16/92	9/17/92	9/18/92	N/A
Run Start Time	1225	1550	839	N/A
Run Finish Time	1357	1719	1027	N/A
Test Train Parameters:				
Volume of Dry Gas Sampled, SCF*	33.099	36.657	32.361	N/A
Percent Isokenetic	104.8	99.0	106.1	N/A
Flue Gas Parameters:				
Carbon Dioxide, %	2.0	1.9	1.7	1.9
Temperature, Degrees F	219	217	221	219
Volumetric Air Flow Rates				
SCFM*, Dry	47,700	49,900	46,600	48,100
ACFM, Wet	70,600	72,200	70,000	70,900
Dia. of Particles in Cyclone, Microns	9.61	9.78	9.52	9.64
PM10 EMISSION RESULTS:				
Including extractable/non-extractable condensibles				
Concentration, grains/DSCF*	Broken	0.0140	0.00801	0.00734
Emission Rate, kilograms/hour		2.72	1.45	2.08
Emission Rate, pounds/hour		5.99	3.20	4.59
Including only non-extractable condensibles				
Concentration, grains/DSCF*	Broken	0.0124	0.00648	0.00630
Emission Rate, kilograms/hour		2.41	1.17	1.79
Emission Rate, pounds/hour		5.31	2.59	3.95
Without condensibles (Filterable)				
Concentration, grains/DSCF*	0.00149	0.00627	0.00305	0.00361
Emission Rate, kilograms/hour	0.276	1.22	0.552	0.682
Emission Rate, pounds/hour	0.609	2.68	1.22	1.50
TOTAL PARTICULATE EMISSIONS (Includes PM10):				
Concentration, grains/DSCF*	N/A	0.0200	0.0138	0.0113
Emission Rate, kilograms/hour		3.89	2.49	3.19
Emission Rate, pounds/hour		8.57	5.50	7.03
PARTICULATE FRACTIONATION:				
> PM10, %	N/A	30.0	41.9	24.0
< PM10, %	N/A	70.0	58.1	42.7

* 68 Deg. F (20 C) -- 29.92 In. Mercury

TABLE 3-31

PM10 TESTS SUMMARY

Core EFB Outlet (1520)

	MBCLO-M201A/202-2	MBCLO-M201A/202-3	MBCLO-M201A/202-4	Average
Test Date	9/15/92	9/15/92	9/15/92	N/A
Run Start Time	1204	1546	1857	N/A
Run Finish Time	1411	1736	2029	N/A
Test Train Parameters:				
Volume of Dry Gas Sampled, SCF*	32.642	35.152	31.520	N/A
Percent Isokenetic	98.2	95.3	96.9	N/A
Flue Gas Parameters:				
Carbon Dioxide, %	3.0	3.0	3.5	3.2
Temperature, Degrees F	251	252	252.0	252
Volumetric Air Flow Rates				
SCFM*, Dry	38,100	40,200	38,700	39,000
ACFM, Wet	67,000	68,100	67,400	67,500
Dia. of Particles in Cyclone, Microns	9.29	9.37	9.30	9.32
PM10 EMISSION RESULTS:				
Including extractable/non-extractable condensibles				
Concentration, grains/DSCF*	0.0881	0.0664	Sample	0.0773
Emission Rate, kilograms/hour	13.0	10.4	Jar	11.7
Emission Rate, pounds/hour	28.7	22.9	Broken	25.8
Including only non-extractable condensibles				
Concentration, grains/DSCF*	0.0675	0.0499	Sample	0.0587
Emission Rate, kilograms/hour	9.99	7.80	Jar	8.89
Emission Rate, pounds/hour	22.0	17.2	Broken	19.6
Without condensibles (Filterable)				
Concentration, grains/DSCF*	0.0278	0.0154	0.0289	0.0240
Emission Rate, kilograms/hour	4.11	2.40	4.53	3.68
Emission Rate, pounds/hour	9.07	5.29	9.58	7.98
TOTAL PARTICULATE EMISSIONS (Includes PM10):				
Concentration, grains/DSCF*	0.0995	0.165	Not	0.132
Emission Rate, kilograms/hour	14.7	25.8	Calculated	20.3
Emission Rate, pounds/hour	32.4	56.8		44.6
PARTICULATE FRACTIONATION:				
> PM10, %	11.4	59.7	N/A	35.6
< PM10, %	88.6	40.3	N/A	64.4

* 68 Deg. F (20 C) -- 29.92 In. Mercury

TABLE 3-32

PM10 TESTS SUMMARY

Microboard Press Stack 11 (DEF-1)

	MBP11-M201A/202-1	MBP11-M201A/202-2	MBP11-M201A/202-3	Average
Test Date	9/19/92	9/21/92	9/22/92	N/A
Run Start Time	1044	902	906	N/A
Run Finish Time	1513	1240	1309	N/A
Test Train Parameters:				
Volume of Dry Gas Sampled, SCF*	98.927	91.735	105.564	N/A
Percent Isokenetic	105.5	112.0	112.9	N/A
Flue Gas Parameters:				
Temperature, Degrees F	113	108	110	110
Volumetric Air Flow Rates				
SCFM*, Dry	8,710	8,220	8,220	8,380
ACFM, Wet	9,710	9,100	9,140	9,320
Dia. of Particles in Cyclone, Microns	9.63	9.74	9.62	9.66
PM10 EMISSION RESULTS:				
Including extractable/non-extractable condensibles				
Concentration, grains/DSCF*	0.00264	0.00288	0.00295	0.00282
Emission Rate, kilograms/hour	0.0892	0.0919	0.0943	0.0918
Emission Rate, pounds/hour	0.197	0.203	0.208	0.202
Including only non-extractable condensibles				
Concentration, grains/DSCF*	0.00214	0.00272	0.00110	0.00199
Emission Rate, kilograms/hour	0.0723	0.0871	0.0350	0.0648
Emission Rate, pounds/hour	0.159	0.192	0.0772	0.143
Without condensibles (Filterable)				
Concentration, grains/DSCF*	0.000281	0.00123	0.000292	0.000600
Emission Rate, kilograms/hour	0.00951	0.0392	0.00934	0.0194
Emission Rate, pounds/hour	0.0210	0.0865	0.0206	0.0427
TOTAL PARTICULATE EMISSIONS (Includes PM10):				
Concentration, grains/DSCF*	0.00354	0.00372	0.00351	0.00359
Emission Rate, kilograms/hour	0.120	0.119	0.112	0.117
Emission Rate, pounds/hour	0.264	0.262	0.247	0.258
PARTICULATE FRACTIONATION:				
> PM10, %	25.6	22.6	15.8	21.3
< PM10, %	74.4	77.4	84.2	78.7

* 68 Deg. F (20 C) -- 29.92 In. Mercury

TABLE 3-33

PM10 TESTS SUMMARY

Microboard Press Stack 12 (DEF-3)

	MBP12-M201A/202-1	MBP12-M201A/202-2	MBP12-M201A/202-3	Average
Test Date	9/19/92	9/21/92	9/22/92	N/A
Run Start Time	1041	858	906	N/A
Run Finish Time	1528	1325	1305	N/A
Test Train Parameters:				
Volume of Dry Gas Sampled, SCF*	101.816	109.724	98.725	N/A
Percent Isokenetic	96.6	97.9	108.1	N/A
Flue Gas Parameters:				
Temperature, Degrees F	114	110	111	112
Volumetric Air Flow Rates				
SCFM*, Dry	12,400	11,900	10,800	11,700
ACFM, Wet	13,800	13,300	12,100	13,100
Dia. of Particles in Cyclone, Microns	9.78	9.98	9.96	9.91
PM10 EMISSION RESULTS:				
Including extractable/non-extractable condensibles				
Concentration, grains/DSCF*	0.00408	0.00356	0.00200	0.00321
Emission Rate, kilograms/hour	0.0893	0.0749	0.0380	0.0674
Emission Rate, pounds/hour	0.197	0.165	0.0838	0.149
Including only non-extractable condensibles				
Concentration, grains/DSCF*	0.00373	0.00302	0.00183	0.00286
Emission Rate, kilograms/hour	0.0817	0.0637	0.0347	0.0600
Emission Rate, pounds/hour	0.180	0.140	0.0766	0.132
Without condensibles (Filterable)				
Concentration, grains/DSCF*	0.000879	0.000956	0.000406	0.000747
Emission Rate, kilograms/hour	0.0193	0.0201	0.00772	0.0157
Emission Rate, pounds/hour	0.0425	0.0444	0.0170	0.0346
TOTAL PARTICULATE EMISSIONS (Includes PM10):				
Concentration, grains/DSCF*	0.00638	0.00771	0.00375	0.00595
Emission Rate, kilograms/hour	0.140	0.162	0.0712	0.124
Emission Rate, pounds/hour	0.308	0.358	0.157	0.274
PARTICULATE FRACTIONATION:				
> PM10, %	36.1	53.8	46.7	45.5
< PM10, %	63.9	46.2	53.3	54.5

* 68 Deg. F (20 C) -- 29.92 In. Mercury

TABLE 3-34

PM10 TESTS SUMMARY

Microboard Press Stack 13 (DEF-5)

	MBP13-M201A/202-1	MBP13-M201A/202-2	MBP13-M201A/202-3	Average
Test Date	9/19/92	9/21/92	9/22/92	N/A
Run Start Time	1020	858	904	N/A
Run Finish Time	1528	1301	1258	N/A
Test Train Parameters:				
Volume of Dry Gas Sampled, SCF*	106.069	103.756	100.185	N/A
Percent Isokenetic	112.8	111.7	118.1	N/A
Flue Gas Parameters:				
Temperature, Degrees F	112	108	112	110
Volumetric Air Flow Rates				
SCFM*, Dry	10,300	10,600	10,100	10,300
ACFM, Wet	11,500	11,700	11,300	11,500
Dia. of Particles in Cyclone, Microns	9.93	9.92	9.80	9.89
PM10 EMISSION RESULTS:				
Including extractable/non-extractable condensibles				
Concentration, grains/DSCF*	0.00317	0.00275	0.00243	0.00279
Emission Rate, kilograms/hour	0.127	0.114	0.0957	0.112
Emission Rate, pounds/hour	0.281	0.250	0.211	0.247
Including only non-extractable condensibles				
Concentration, grains/DSCF*	0.00214	0.00232	0.00206	0.00217
Emission Rate, kilograms/hour	0.0858	0.0958	0.0811	0.0876
Emission Rate, pounds/hour	0.189	0.211	0.179	0.193
Without condensibles (Filterable)				
Concentration, grains/DSCF*	0.000175	0.000283	0.00116	0.000537
Emission Rate, kilograms/hour	0.00700	0.0117	0.0454	0.0214
Emission Rate, pounds/hour	0.0154	0.0257	0.100	0.0471
TOTAL PARTICULATE EMISSIONS (Includes PM10):				
Concentration, grains/DSCF*	0.00393	0.00396	0.00305	0.00364
Emission Rate, kilograms/hour	0.158	0.163	0.120	0.147
Emission Rate, pounds/hour	0.347	0.360	0.264	0.324
PARTICULATE FRACTIONATION:				
> PM10, %	19.3	30.5	20.2	23.3
< PM10, %	80.7	69.5	79.8	76.7

* 68 Deg. F (20 C) -- 29.92 In. Mercury

TABLE 3-35

PM10 TESTS SUMMARY

Microboard Press Stacks 14&15 (DEF-7&8)

	MBCR14-M201A/202-1	MBCR15-M201A/202-1
Test Date	9/23/92	9/23/92
Run Start Time	1055	1055
Run Finish Time	1459	1502
Test Train Parameters:		
Volume of Dry Gas Sampled, SCF*	100.138	101.894
Percent Isokenetic	112.8	105.9
Flue Gas Parameters:		
Temperature, Degrees F	107	109
Volumetric Air Flow Rates		
SCFM*, Dry	15,600	16,500
ACFM, Wet	17,000	18,100
Dia. of Particles in Cyclone, Microns	10.02	9.92
PM10 EMISSION RESULTS:		
Including extractable/non-extractable condensibles		
Concentration, grains/DSCF*	0.000847	0.000379
Emission Rate, kilograms/hour	0.0514	0.0243
Emission Rate, pounds/hour	0.113	0.0536
Including only non-extractable condensibles		
Concentration, grains/DSCF*	0.000740	0.000318
Emission Rate, kilograms/hour	0.0449	0.0204
Emission Rate, pounds/hour.	0.0989	0.0450
Without condensibles (Filterable)		
Concentration, grains/DSCF*	0.000108	0.000212
Emission Rate, kilograms/hour	0.00654	0.0136
Emission Rate, pounds/hour	0.0144	0.0300
TOTAL PARTICULATE EMISSIONS (Includes PM10):		
Concentration, grains/DSCF*	0.00145	0.00112
Emission Rate, kilograms/hour	0.0879	0.0720
Emission Rate, pounds/hour	0.194	0.159
PARTICULATE FRACTIONATION:		
> PM10, %	41.5	66.2
< PM10, %	58.5	33.8

* 68 Deg. F (20 C) -- 29.92 In. Mercury

TABLE 3-36

SEMIVOLATILE ORGANIC TESTS SUMMARY

MDF Cyclone Outlet (DB)

	MDFCO-M0010-1	MDFCO-M0010-2	MDFCO-M0010-3	Average
Test Date	9-26-92	9-26-92	9-27-92	N/A
Run Start Time	1109	1706	941	N/A
Run Finish Time	1502	1945	1257	N/A
Test Train Parameters:				
Volume of Dry Gas Sampled, SCF*	109.856	105.877	103.978	N/A
Percent Isokinetic	99.0	100.1	101.7	N/A
Flue Gas Parameters:				
Temperature, Degrees F	154	147	150	150
Volumetric Air Flow Rates				
SCFM*, Dry	92,600	88,300	85,400	88,800
ACFM, Wet	119,000	113,000	110,000	114,000
EMISSION RESULTS:				
A-PINENE				
µg per dry std. cubic meter*	129	172	132	144
ppm by volume, Dry	0.0228	0.0304	0.0233	0.0255
kilograms per hour	0.0203	0.0258	0.0191	0.0218
pounds per hour	0.0448	0.0570	0.0422	0.0480
B-PINENE				
µg per dry std. cubic meter*	146	172	147	155
ppm by volume, Dry	0.0258	0.0304	0.0260	0.0274
kilograms per hour	0.0230	0.0258	0.0213	0.0234
pounds per hour	0.0506	0.0569	0.0471	0.0515
A-TERPINEOL				
µg per dry std. cubic meter*	49.0	58.9	50.3	52.7
ppm by volume, Dry	0.00249	0.00268	0.00277	0.00265
kilograms per hour	0.00771	0.00884	0.00730	0.00795
pounds per hour	0.0170	0.0195	0.0161	0.0175

* 68 Deg. F (20 C) -- 29.92 In. Mercury

TABLE 3-37

SEMIVOLATILE ORGANIC TESTS SUMMARY

Surface EFB Outlet (1510)

	MBSLO-M0010-1	MBSLO-M0010-2	MBSLO-M0010-3	Average
Test Date	9-17-92	9-17-92	9-18-92	N/A
Run Start Time	1227	1801	1225	N/A
Run Finish Time	1509	2035	1508	N/A
Test Train Parameters:				
Volume of Dry Gas Sampled, SCF*	99.395	104.195	104.021	N/A
Percent Isokinetic	100.6	98.9	96.7	N/A
Flue Gas Parameters:				
Carbon Dioxide, %	1.9	2.0	2.0	2.0
Temperature, Degrees F	219	221	215	218
Volumetric Air Flow Rates				
SCFM*, Dry	48,645	51,850	52,961	51,152
ACFM, Wet	73,216	76,297	75,684	75,066
EMISSION RESULTS:				
P-CYMENE				
µg per dry std. cubic meter*	46.9	48.5	46.8	47.0
ppm by volume, Dry	0.00841	0.00869	0.00840	0.00850
kilograms per hour	0.00388	0.00427	0.00422	0.00410
pounds per hour	0.00855	0.00941	0.00929	0.00910
A-PINENE				
µg per dry std. cubic meter*	20,859	16,356	15,710	17,642
ppm by volume, Dry	3.68	2.89	2.77	3.12
kilograms per hour	1.72	1.44	1.41	1.53
pounds per hour	3.80	3.18	3.12	3.36
B-PINENE				
µg per dry std. cubic meter*	6,789	5,768	4,886	5814
ppm by volume, Dry	1.20	1.02	0.86	1.03
kilograms per hour	0.56	0.51	0.44	0.50
pounds per hour	1.24	1.12	0.97	1.11
A-TERPINEOL				
µg per dry std. cubic meter*	2,413	2,399	2,642	2485
ppm by volume, Dry	0.376	0.374	0.412	0.387
kilograms per hour	0.199	0.211	0.238	0.216
pounds per hour	0.440	0.466	0.524	0.477

* 68 Deg. F (20 C) -- 29.92 In. Mercury

TABLE 3-38

SEMIVOLATILE ORGANIC TESTS SUMMARY

Core EFB Outlet (1520)

	MBCLO-M0010-1	MBCLO-M0010-2	MBCLO-M0010-3	Average
Test Date	9-17-92	9-17-92	9-18-92	N/A
Run Start Time	1204	1801	1249	N/A
Run Finish Time	1533	2035	1551	N/A
Test Train Parameters:				
Volume of Dry Gas Sampled, SCF*	128.497	111.279	100.098	N/A
Percent Isokinetic	100.8	103.3	103.0	N/A
Flue Gas Parameters:				
Carbon Dioxide, %	4.0	4.0	4.0	4.0
Temperature, Degrees F	254	252	253	253
Volumetric Air Flow Rates				
SCFM*, Dry	38,306	40,463	36,500	38,423
ACFM, Wet	67,398	67,852	65,022	66,757
EMISSION RESULTS:				
P-CYMENE				
µg per dry std. cubic meter*	561	0.159	599	387
ppm by volume, Dry	0.101	0.0000284	0.107	0.0693
kilograms per hour	0.0365	0.0000109	0.0371	0.0246
pounds per hour	0.0806	0.0000240	0.0819	0.0542
A-PINENE				
µg per dry std. cubic meter*	174,281	221,606	191,328	195,738
ppm by volume, Dry	30.8	39.1	33.8	34.6
kilograms per hour	13.3	15.2	11.9	12.8
pounds per hour	25.0	33.6	26.2	28.3
B-PINENE				
µg per dry std. cubic meter*	71,189	61,046	71,671	67,968
ppm by volume, Dry	12.6	10.8	12.7	12.0
kilograms per hour	4.63	4.20	4.45	4.43
pounds per hour	10.2	9.25	9.80	9.76
A-TERPINEOL				
µg per dry std. cubic meter*	16,107	11,336	15,451	14,298
ppm by volume, Dry	2.51	1.77	2.41	2.23
kilograms per hour	1.05	0.779	0.958	0.929
pounds per hour	2.31	1.72	2.11	2.05

Estimated Catch Weight.

Catch weight less than minimum detection limit (MDL). Values presented calculated using 1/2 MDL.

* 68 Deg. F (20 C) -- 29.92 In. Mercury

TABLE 3-39

TOTAL HYDROCARBONS TEST SUMMARY

MDF Cyclone Outlet (DB)

	MDFCO-M25A-1	MDFCO-M25A-2	MDFCO-M25A-3	Average
Test Date	9/25/92	9/25/92	9/25/92	N/A
Run Start Time	1255	1540	1824	N/A
Run Finish Time	1458	1742	2018	N/A
Dry Mole Fraction*	0.897	0.912	0.904	0.904
Air Flow Rate, SCFM*, Dry	87,000	94,900	96,100	92,700
CEM RESULTS:				
Total Hydrocarbons**				
Concentration				
parts per million, wet	10.4	11.8	10.3	10.8
parts per million, dry	11.6	12.9	11.4	12.0
milligrams / dry std. m3***	21.3	23.6	20.9	21.9
Emission Rate				
Pounds per Hour	6.93	8.41	7.52	7.62
Kilograms per Hour	3.14	3.81	3.41	3.45

* From Concurrent Isokinetic Testing
** As Propane
*** 68 Degrees F -- 29.92 Inches Of Mercury (Hg)

TABLE 3-40

TOTAL HYDROCARBONS TEST SUMMARY

MDF Press Stack 2 (WIW-2)

	MDFP2-M25A-1	MDFP2-M25A-3A	MDFP2-M25A-3C	Average
Test Date	9/11/92	9/12/92	9/12/92	N/A
Run Start Time	1934	1211	1335	N/A
Run Finish Time	2100	1335	1446	N/A
Dry Mole Fraction*	0.955	0.978	0.978	0.970
Air Flow Rate, SCFM*, Dry	11,200	11,400	11,400	11,300
CEM RESULTS:				
Total Hydrocarbons**				
Concentration				
parts per million, wet	24.6	17.4	16.9	19.6
parts per million, dry	25.8	17.8	17.3	20.3
milligrams / dry std. m3***	47.3	32.6	31.7	37.2
Emission Rate				
Pounds per Hour	1.98	1.39	1.35	1.57
Kilograms per Hour	0.898	0.631	0.612	0.714

* From Concurrent Isokinetic Testing
** As Propane
*** 68 Degrees F -- 29.92 Inches Of Mercury (Hg)

TABLE 3-41

TOTAL HYDROCARBONS TEST SUMMARY

MDF Press Stack 3 (WIW-1)

	MDFP3-M25A-1	MDFP3-M25A-3A	MDFP3-M25A-3C	Average
Test Date	9/11/92	9/12/92	9/12/92	N/A
Run Start Time	1934	1211	1335	N/A
Run Finish Time	2100	1335	1446	N/A
Dry Mole Fraction*	0.967	0.970	0.972	0.970
Air Flow Rate, SCFM*, Dry	12,400	12,600	12,600	12,500
CEM RESULTS:				
Total Hydrocarbons**				
Concentration				
parts per million, wet	32.7	26.3	25.6	28.2
parts per million, dry	33.8	27.1	26.3	29.1
milligrams / dry std. m3***	62.0	49.7	48.2	53.3
Emission Rate				
Pounds per Hour	2.88	2.34	2.28	2.50
Kilograms per Hour	1.31	1.06	1.03	1.13

* From Concurrent Isokinetic Testing
** As Propane
*** 68 Degrees F -- 29.92 Inches Of Mercury (Hg)

TABLE 3-42

TOTAL HYDROCARBONS TEST SUMMARY

MDF Press Stack 4 (WIW-5)

	MDFP4-M25A-4	MDFP4-M25A-5	MDFP4-M25A-6	Average
Test Date	9/12/92	9/13/92	9/13/92	N/A
Run Start Time	1753	830	1249	N/A
Run Finish Time	2038	1022	1533	N/A
Dry Mole Fraction*	0.982	0.983	0.981	0.982
Air Flow Rate, SCFM*, Dry	17,400	20,900	20,200	19,500
CEM RESULTS:				
Total Hydrocarbons**				
Concentration				
parts per million, wet	4.5	3.5	4.7	4.2
parts per million, dry	4.58	3.56	4.79	4.31
milligrams / dry std. m3***	8.40	6.53	8.78	7.90
Emission Rate				
Pounds per Hour	0.547	0.511	0.664	0.574
Kilograms per Hour	0.248	0.232	0.301	0.260

* From Concurrent Isokinetic Testing
** As Propane
** 68 Degrees F -- 29.92 Inches Of Mercury (Hg)

TABLE 3-43

TOTAL HYDROCARBONS TEST SUMMARY

MDF Press Stack 5 (WTW-3)

	MDFP5-M25A-4	MDFP5-M25A-5	MDFP5-M25A-6	Average
Test Date	9/12/92	9/13/92	9/13/92	N/A
Run Start Time	1753	830	1249	N/A
Run Finish Time	2038	1022	1533	N/A
Dry Mole Fraction*	0.984	0.975	0.986	0.982
Air Flow Rate, SCFM*, Dry	56,600	54,200	53,300	54,700
CEM RESULTS:				
Total Hydrocarbons**				
Concentration				
parts per million, wet	3.1	2.3	3.0	2.8
parts per million, dry	3.15	2.36	3.04	2.85
milligrams / dry std. m3***	5.77	4.33	5.57	5.22
Emission Rate				
Pounds per Hour	1.22	0.878	1.11	1.07
Kilograms per Hour	0.553	0.398	0.503	0.485

* From Concurrent Isokinetic Testing
** As Propane
*** 68 Degrees F -- 29.92 Inches Of Mercury (Hg)

TABLE 3-44

TOTAL HYDROCARBONS TEST SUMMARY

MDF Press Stack 6 (WTW-4)

	MDFP6-M25A-1	MDFP6-M25A-3A	MDFP6-M25A-3C	Average
Test Date	9/11/92	9/12/92	9/12/92	N/A
Run Start Time	1934	1211	1335	N/A
Run Finish Time	2100	1335	1446	N/A
Dry Mole Fraction*	0.974	0.974	0.974	0.974
Air Flow Rate, SCFM*, Dry	28,800	26,600	26,600	27,300
CEM RESULTS:				
Total Hydrocarbons**				
Concentration				
parts per million, wet	5.5	5.6	5.8	5.6
parts per million, dry	5.65	5.75	5.95	5.78
milligrams / dry std. m3***	10.4	10.5	10.9	10.6
Emission Rate				
Pounds per Hour	1.12	1.050	1.09	1.09
Kilograms per Hour	0.508	0.476	0.494	0.493

* From Concurrent Isokinetic Testing
** As Propane
*** 68 Degrees F -- 29.92 Inches Of Mercury (Hg)

TABLE 3-45

TOTAL HYDROCARBONS TEST SUMMARY

Core EFB Inlet

	MBCLI-M25A-1	MBCLI-M25A-4	MBCLI-M25A-5	Average
Test Date	9/14/92	9/15/92	9/15/92	N/A
Run Start Time	1723	1648	1900	N/A
Run Finish Time	1852	1748	2000	N/A
Dry Mole Fraction*	0.789	0.767	0.749	0.768
Air Flow Rate, SCFM*, Dry	33,200	31,900	31,400	32,200
CEM RESULTS:				
Total Hydrocarbons				
Concentration				
parts per million, wet	344	323	460	376
parts per million, dry	436	421	614	490
milligrams / dry std. m3**	799	772	1,130	900
Emission Rate				
Pounds per Hour	99.4	92.2	132	108
Kilograms per Hour	45.1	41.8	59.9	48.9

* From Concurrent Isokinetic Testing
** 68 Degrees F -- 29.92 Inches Of Mercury (Hg)

TABLE 3-46

TOTAL HYDROCARBONS TEST SUMMARY

Surface EFB Inlet

	MBSLI-M25A-1	MBSLI-M25A-2	MBSLI-M25A-3	Average
Test Date	9/16/92	9/16/92	9/17/92	N/A
Run Start Time	1145	1518	840	N/A
Run Finish Time	1330	1630	1030	N/A
Dry Mole Fraction*	0.854	0.855	0.863	0.857
Air Flow Rate, SCFM*, Dry	41,000	47,700	46,300	45,000
CEM RESULTS:				
Total Hydrocarbons				
Concentration				
parts per million, wet	43.2	50.5	24.4	39.4
parts per million, dry	50.6	59.1	28.3	46.0
milligrams / dry std. m3**	92.8	108	51.9	84.2
Emission Rate				
Pounds per Hour	14.2	19.4	9.00	14.2
Kilograms per Hour	6.44	8.80	4.08	6.44

* From Concurrent Isokinetic Testing
** 68 Degrees F -- 29.92 Inches Of Mercury (Hg)

TABLE 3-47

CARBON MONOXIDE, NITROGEN OXIDES, AND TOTAL HYDROCARBONS TEST SUMMARY

Surface EFB Outlet (1510)

	MBSLO-CEM-1	MBSLO-CEM-2	MBSLO-CEM-3	Average
Test Date	9/16/92	9/16/92	9/17/92	N/A
Run Start Time	1145	1518	840	N/A
Run Finish Time	1330	1630	1030	N/A
Dry Mole Fraction*	0.869	0.857	0.876	0.867
Air Flow Rate, SCFM, Dry*	49,900	48,500	49,400	49,300
CEM RESULTS				
Carbon Monoxide				
Concentration				
parts per million, dry	92.0	174	45.8	104
milligrams / dry std. m^3**	107	203	53.3	121
Emission Rate				
Pounds per Hour	20.0	36.8	9.87	22.2
Kilograms per Hour	9.07	16.7	4.48	10.1
Nitrogen Oxides as NO_2				
Concentration				
parts per million, dry	39.0	36.7	33.8	36.5
milligrams / dry std. m^3**	74.6	70.2	64.6	69.8
Emission Rate				
Pounds per Hour	13.9	12.8	12.0	12.9
Kilograms per Hour	6.31	5.81	5.44	5.85
Total Hydrocarbons***				
Concentration				
parts per million, wet	36.4	34.1	20.8	30.4
parts per million, dry	41.9	39.8	23.7	35.1
milligrams / dry std. m^3**	76.8	73.0	43.4	64.4
Emission Rate				
Pounds per Hour	14.4	13.3	8.04	11.9
Kilograms per Hour	6.53	6.03	3.65	5.40

* From Concurrent Isokinetic Testing
** 68 Degrees F -- 29.92 Inches Of Mercury (Hg)
*** As Propane

TABLE 3-48

CARBON MONOXIDE, NITROGEN OXIDES, AND TOTAL HYDROCARBONS TEST SUMMARY

Core EFB Outlet (1520)

	MBCLO-CEM-1	MBCLO-CEM-4	MBCLO-CEM-5	Average
Test Date	9/14/92	9/15/92	9/15/92	N/A
Run Start Time	1723	1648	1900	N/A
Run Finish Time	1852	1748	2000	N/A
Dry Mole Fraction*	0.786	0.790	0.767	0.781
Air Flow Rate, SCFM, Dry*	37,400	39,500	38,700	38,500
CEM RESULTS				
Nitrogen Oxides as NO_2				
Concentration				
parts per million, dry	59.6	58.7	50.9	56.4
milligrams / dry std. m^3**	114	112	97.3	108
Emission Rate				
Pounds per Hour	16.0	16.6	14.1	15.6
Kilograms per Hour	7.26	7.53	6.40	7.06
Total Hydrocarbons***				
Concentration				
parts per million, wet	213	260	352	275
parts per million, dry	270	328	459	352
milligrams / dry std. m^3**	495	601	841	646
Emission Rate				
Pounds per Hour	69.3	89.0	122	93.4
Kilograms per Hour	31.4	40.4	55.3	42.4

	MBCLO-CEM-3	MBCLO-CEM-4	MBCLO-CEM-5	Average
Test Date	9/14/92	9/15/92	9/15/92	N/A
Run Start Time	1407	1648	1900	N/A
Run Finish Time	1507	1748	2000	N/A
Dry Mole Fraction*				
Air Flow Rate, SCFM*, Dry*	39,000****	39,500	38,700	39,100
CEM RESULTS				
Carbon Monoxide				
Concentration				
parts per million, dry	190	232	220	214
milligrams / dry std. m^3**	221	269	256	249
Emission Rate				
Pounds per Hour	32.2	39.9	37.1	36.4
Kilograms per Hour	14.6	18.1	16.8	16.5

* Calculated from Concurrent Isokinetic Testing
** 68 Degrees F -- 29.92 Inches Of Mercury (Hg)
*** As Propane
**** Average of Runs MBCLO-M0011-2 & MBCLO-M0011-3

TABLE 3-49

TOTAL HYDROCARBONS TEST SUMMARY

Microboard Press Stack 11 (DEF-1)

	MBP11-M25A-1	MBP11-M25A-2	MBP11-M25A-3	Average
Test Date	9/19/92	9/21/92	9/22/92	N/A
Run Start Time	1505	1900	1352	N/A
Run Finish Time	1800	2003	1545	N/A
Dry Mole Fraction*	0.963	0.960	0.976	0.966
Air Flow Rate, SCFM*, Dry	8,030	6,910	7,420	7,450
CEM RESULTS:				
Total Hydrocarbons**				
Concentration				
parts per million, wet	38.7	45.6	48.4	44.2
parts per million, dry	40.2	47.5	49.6	45.8
milligrams / dry std. m^3***	73.7	87.1	90.9	83.9
Emission Rate				
Pounds per Hour	2.22	2.25	2.53	2.33
Kilograms per Hour	1.01	1.02	1.15	1.06

* From Concurrent Isokinetic Testing
** As Propane
*** 68 Degrees F -- 29.92 Inches Of Mercury (Hg)

TABLE 3-50

TOTAL HYDROCARBONS TEST SUMMARY

Microboard Press Stack 12 (DEF-3)

	MBP12-M25A-1	MBP12-M25A-2	MBP12-M25A-3	Average
Test Date	9/19/92	9/21/92	9/22/92	N/A
Run Start Time	1505	1900	1352	N/A
Run Finish Time	1800	2003	1545	N/A
Dry Mole Fraction*	0.969	0.967	0.972	0.969
Air Flow Rate, SCFM*, Dry	11,100	11,000	11,200	11,100
CEM RESULTS:				
Total Hydrocarbons**				
Concentration				
parts per million, wet	28.0	51.9	47.3	42.4
parts per million, dry	28.9	53.7	48.7	43.8
milligrams / dry std. m^3***	53.0	98.4	89.3	80.2
Emission Rate				
Pounds per Hour	2.20	4.06	3.75	3.34
Kilograms per Hour	1.00	1.84	1.70	1.51

* From Concurrent Isokinetic Testing
** As Propane
*** 68 Degrees F -- 29.92 Inches Of Mercury (Hg)

TABLE 3-51

TOTAL HYDROCARBONS TEST SUMMARY

Microboard Press Stack 13 (DEF-5)

	MBP13-M25A-1	MBP13-M25A-2	MBP13-M25A-3	Average
Test Date	9/19/92	9/21/92	9/22/92	N/A
Run Start Time	1505	1900	1352	N/A
Run Finish Time	1800	2003	1545	N/A
Dry Mole Fraction*	0.959	0.968	0.977	0.968
Air Flow Rate, SCFM*, Dry	9,600	9,580	9,960	9,710
CEM RESULTS:				
Total Hydrocarbons**				
Concentration				
parts per million, wet	29.6	29.8	39.7	33.0
parts per million, dry	30.9	30.8	40.6	34.1
milligrams / dry std. m^3***	56.6	56.5	74.4	62.5
Emission Rate				
Pounds per Hour	2.04	2.03	2.78	2.28
Kilograms per Hour	0.925	0.921	1.26	1.04

* From Concurrent Isokinetic Testing
** As Propane
*** 68 Degrees F -- 29.92 Inches Of Mercury (Hg)

TABLE 3-52

TOTAL HYDROCARBONS TEST SUMMARY

Microboard Cooling Room Stack 14 (DEF-7)

	MBCR14-M25A-1	MBCR14-M25A-2	Average
Test Date	9/22/92	9/22/92	N/A
Run Start Time	1733	1900	N/A
Run Finish Time	1900	2105	N/A
Dry Mole Fraction*	0.967	0.970	0.969
Air Flow Rate, SCFM*, Dry	14,400	15,300	14,900
CEM RESULTS:			
Total Hydrocarbons**			
Concentration			
parts per million, wet	14.5	13.5	14.0
parts per million, dry	15.0	13.9	14.5
milligrams / dry std. m^3***	27.5	25.5	26.5
Emission Rate			
Pounds per Hour	1.48	1.46	1.47
Kilograms per Hour	0.671	0.662	0.667

* From Concurrent Isokinetic Testing
** As Propane
*** 68 Degrees F -- 29.92 Inches Of Mercury (Hg)

TABLE 3-53

TOTAL HYDROCARBONS TEST SUMMARY

Microboard Cooling Room Stack 15 (DEF-8)

	MBCR15-M25A-1	MBCR15-M25A-2	Average
Test Date	9/22/92	9/22/92	N/A
Run Start Time	1733	1900	N/A
Run Finish Time	1900	2105	N/A
Dry Mole Fraction*	0.971	0.969	0.970
Air Flow Rate, SCFM*, Dry	14,700	15,900	15,300
CEM RESULTS:			
Total Hydrocarbons**			
Concentration			
parts per million, wet	14.6	10.4	13.0
parts per million, dry	15.0	10.7	12.9
milligrams / dry std. m^3***	27.5	19.6	23.6
Emission Rate			
Pounds per Hour	1.51	1.17	1.34
Kilograms per Hour	0.685	0.531	0.608

* From Concurrent Isokinetic Testing
** As Propane
** 68 Degrees F -- 29.92 Inches Of Mercury (Hg)

TABLE 3-54

TOTAL HYDROCARBONS TEST SUMMARY

Microboard Press Stacks 16, 17, 18 (DEF-2,4,6)

Test Date	9/19/92	9/19/92	9/21/92	9/21/92	N/A
Run Start Time	900	1022	1224	1505	N/A
Run Finish Time	1000	1129	1505	1800	N/A
TOTAL HYDROCARBON CONC., ppm Wet*:					
	MBP16-M25A-1	MBP16-M25A-2	MBP16-M25A-5	MBP16-M25A-6A	Average
	32.8	34	30.6	31.6	32.3
	MBP17-M25A-1	MBP17-M25A-2	MBP17-M25A-5	MBP17-M25A-6A	
	22.3	22.8	21.5	20.8	21.9
	MBP18-M25A-1	MBP18-M25A-2	MBP18-M25A-5	MBP18-M25A-6A	
	27.4	27.0	33.7	38.3	31.6

* As Propane

TABLE 3-55

VOLATILE ORGANIC EMISSIONS SUMMARY

MDF Cyclone Outlet (DB)

	MDFCO-M0030-1	MDFCO-M0030-2	MDFCO-M0030-3	Average
Test Date	9-26-92	9-26-92	9-27-92	
Run Start - Finish Time	1135-1415	1625-1812	955-1125	
Volumetric Air Flow Rates, SCFM*	92,600	88,300	85,400	88,767
TEST RESULTS:				
B-Pinene				
µg per dry std. cubic meter**	130	166	146	148
ppb by volume, Dry	23.0	29.3	25.8	26.1
kilograms per hour	0.0205	0.0249	0.0212	0.0222
pounds per hour	0.0452	0.0549	0.0468	0.0490
A-Pinene				
µg per dry std. cubic meter**	132	172	133	146
ppb by volume, Dry	23.3	30.4	23.4	25.7
kilograms per hour	0.0208	0.0259	0.0193	0.0220
pounds per hour	0.0458	0.0570	0.0425	0.0484
Methylene Chloride				
µg per dry std. cubic meter**	67.8	13.8	131	71.0
ppb by volume, Dry	19.2	3.91	37.2	20.1
kilograms per hour	0.0107	0.00207	0.0191	0.0106
pounds per hour	0.0235	0.00456	0.0420	0.0234
Trichlorofluoromethane				
µg per dry std. cubic meter**	82.1	5.76	44.8	44.2
ppb by volume, Dry	14.4	1.01	7.85	7.74
kilograms per hour	0.0129	0.000864	0.00650	0.00676
pounds per hour	0.0285	0.00191	0.0143	0.0149
Chloromethane				
µg per dry std. cubic meter**	41.7	41.2	21.2	34.7
ppb by volume, Dry	19.9	19.6	10.1	16.5
kilograms per hour	0.00657	0.00618	0.00308	0.00528
pounds per hour	0.0145	0.0136	0.00678	0.0116
n-Hexane				
µg per dry std. cubic meter**	62.3	5.03	29.9	32.4
ppb by volume, Dry	17.4	1.41	8.34	9.05
kilograms per hour	0.00980	0.000755	0.00433	0.00496
pounds per hour	0.0216	0.00167	0.00955	0.0109
Acetone				
µg per dry std. cubic meter**	29.5	25.8	24.2	26.5
ppb by volume, Dry	12.2	10.7	10.0	11.0
kilograms per hour	0.00464	0.00387	0.00351	0.00401
pounds per hour	0.0102	0.00853	0.00774	0.00884
Isooctane				
µg per dry std. cubic meter**	27.4	2.34	13.7	14.5
ppb by volume, Dry	5.77	0.493	2.89	3.05
kilograms per hour	0.00431	0.000351	0.00199	0.00222
pounds per hour	0.00951	0.000775	0.00439	0.00489
P-Cymene				
µg per dry std. cubic meter**	3.90	4.46	3.83	4.06
ppb by volume, Dry	0.699	0.800	0.686	0.729
kilograms per hour	0.000613	0.000670	0.000555	0.000613
pounds per hour	0.00135	0.00148	0.00122	0.00135
Toluene				
µg per dry std. cubic meter**	5.70	2.69	2.61	3.67
ppb by volume, Dry	1.49	0.702	0.681	0.957
kilograms per hour	0.000897	0.000404	0.000378	0.000560
pounds per hour	0.00198	0.000890	0.000834	0.00123
2-Butanone				
µg per dry std. cubic meter**	3.98	2.01	1.89	2.62
ppb by volume, Dry	1.33	0.669	0.630	0.875
kilograms per hour	0.000626	0.000301	0.000274	0.000400
pounds per hour	0.00138	0.000664	0.000604	0.000882
1,1,1-Trichloroethane				
µg per dry std. cubic meter**	2.68	1.69	1.89	2.09
ppb by volume, Dry	0.483	0.304	0.342	0.376
kilograms per hour	0.000421	0.000253	0.000275	0.000316
pounds per hour	0.000929	0.000558	0.000606	0.000697
Chloroform				
µg per dry std. cubic meter**	0.325	0.240	5.15	1.90
ppb by volume, Dry	0.0655	0.0483	1.04	0.385
kilograms per hour	0.0000511	0.0000360	0.000748	0.000278
pounds per hour	0.000113	0.0000793	0.00165	0.000614
Styrene				
µg per dry std. cubic meter**	1.30	0.840	0.968	1.04
ppb by volume, Dry	0.300	0.232	0.223	0.252
kilograms per hour	0.000204	0.000151	0.000140	0.000165
pounds per hour	0.000451	0.000332	0.000309	0.000364
m-/p-Xylene				
µg per dry std. cubic meter**	1.30	0.824	0.968	1.03
ppb by volume, Dry	0.294	0.227	0.219	0.247
kilograms per hour	0.000204	0.000151	0.000140	0.000165
pounds per hour	0.000451	0.000332	0.000309	0.000364
Bromomethane				
µg per dry std. cubic meter**	1.64	1.04	0.240	0.975
ppb by volume, Dry	0.417	0.282	0.0608	0.253
kilograms per hour	0.000259	0.000167	0.0000364	0.000154
pounds per hour	0.000571	0.000368	0.0000802	0.000340
Cumene (isopropylbenzene)				
µg per dry std. cubic meter**	1.30	0.759	0.713	0.924
ppb by volume, Dry	0.260	0.205	0.143	0.203
kilograms per hour	0.000204	0.000115	0.000103	0.000141
pounds per hour	0.000451	0.000253	0.000228	0.000311
Carbon Disulfide				
µg per dry std. cubic meter**	0.325	0.240	0.489	0.351
ppb by volume, Dry	0.103	0.0758	0.146	0.108
kilograms per hour	0.0000511	0.0000360	0.0000670	0.0000514
pounds per hour	0.000113	0.0000793	0.000148	0.000113

* From Concurrent Isokinetic Sampling
** 68 Deg. F (20 C) - - 29.92 In. Mercury
Underlined values indicate all catch weights are less than the minimum detection limit (MDL). Values presented were calculated using 1/2 the MDL for all catch weights.

TABLE 3-56

VOLATILE ORGANIC EMISSIONS SUMMARY

Surface EFB Outlet

	MBSLO-M0030-1	MBSLO-M0030-2	MBSLO-M0030-3	Average
Test Date	9-17-92	9-17-92	9-18-92	N/A
Run Start-Finish Time	1229-1348	1717-1832	1225-1336	N/A
Volumetric Air Flow Rates, SCFM*	47,900	51,900	52,900	50,900
TEST RESULTS:				
A-Pinene				
µg per dry std. cubic meter**	23,100	33,700	26,100	27,600
ppb by volume, Dry	4070	5950	4600	4,870
kilograms per hour	1.88	2.97	2.34	2.40
pounds per hour	4.14	6.56	5.17	5.29
B-Pinene				
µg per dry std. cubic meter**	10300	12900	7870	10,400
ppb by volume, Dry	1810	2270	1390	1,820
kilograms per hour	0.834	1.13	0.708	0.892
pounds per hour	1.84	2.50	1.56	1.97
Acetone				
µg per dry std. cubic meter**	1580	1670	1430	1560
ppb by volume, Dry	654	691	593	646
kilograms per hour	0.129	0.147	0.129	0.135
pounds per hour	0.283	0.324	0.284	0.297
Toluene				
µg per dry std. cubic meter**	93.5	60.7	34.3	62.8
ppb by volume, Dry	24.4	15.8	8.95	16.4
kilograms per hour	0.00761	0.00535	0.00308	0.00535
pounds per hour	0.0168	0.0118	0.00679	0.0118
Chloromethane				
µg per dry std. cubic meter**	0.171	1930	0.301	644
ppb by volume, Dry	0.0815	920	0.143	307
kilograms per hour	0.0000139	0.170	0.0000270	0.0568
pounds per hour	0.0000307	0.375	0.0000596	0.125
m/p-Xylene				
µg per dry std. cubic meter**	10.3	19.9	0.301	10.2
ppb by volume, Dry	2.34	4.51	0.0682	2.31
kilograms per hour	0.000842	0.00176	0.0000270	0.000876
pounds per hour	0.00186	0.00387	0.0000596	0.00193
Methylene Chloride				
µg per dry std. cubic meter**	64.0	193	202	153
ppb by volume, Dry	18.1	54.6	57.3	43.3
kilograms per hour	0.00521	0.0170	0.0182	0.0135
pounds per hour	0.0115	0.0375	0.0401	0.0297
P-Cymene				
µg per dry std. cubic meter**	77.6	71.0	164	104
ppb by volume, Dry	13.9	12.7	29.3	18.6
kilograms per hour	0.00632	0.00626	0.0147	0.00909
pounds per hour	0.0139	0.0138	0.0324	0.0200
Trichlorofluoromethane				
µg per dry std. cubic meter**	0.171	0.332	0.301	0.268
ppb by volume, Dry	0.0299	0.0669	0.0527	0.0498
kilograms per hour	0.0000139	0.0000293	0.0000270	0.0000234
pounds per hour	0.0000307	0.0000645	0.0000596	0.0000516
n-Hexane				
µg per dry std. cubic meter**	0.171	0.332	0.301	0.268
ppb by volume, Dry	0.0477	0.0927	0.0840	0.0748
kilograms per hour	0.0000139	0.0000293	0.0000270	0.0000234
pounds per hour	0.0000307	0.0000645	0.0000596	0.0000516
Isooctane				
µg per dry std. cubic meter**	0.171	0.332	0.301	0.268
ppb by volume, Dry	0.0360	0.0699	0.0543	0.0534
kilograms per hour	0.0000139	0.0000293	0.0000270	0.0000234
pounds per hour	0.0000307	0.0000645	0.0000596	0.0000516

* From Concurrent Isokinetic Testing

** 68 Deg. F (20 C) -- 29.92 In. Mercury

Underlined values indicate all catch weights are less than the minimum detection limit (MDL). Values presented were calculated using 1/2 the MDL for all catch weights.

TABLE 3-57

VOLATILE ORGANIC EMISSIONS SUMMARY

Core EFB Outlet (1520)

	MBCLO-M0030-1	MBCLO-M0030-2	MBCLO-M0030-3	Average
Test Date	9-17-92	9-17-92	9-18-92	
Run Start-Finish Time	1219-1446	1804-1948	1255-1455	
Volumetric Air Flow Rates, SCFM*	48,600	51,900	53,000	51,167
TEST RESULTS:				
A-Pinene				
µg per dry std. cubic meter*	21,700	141,000	135,000	99200
ppb by volume, Dry	3840	24900	23800	17500
kilograms per hour	1.80	12.4	12.1	8.78
pounds per hour	3.96	27.4	26.7	19.4
B-Pinene				
µg per dry std. cubic meter*	15000	74100	71000	53400
ppb by volume, Dry	2640	13100	12500	9410
kilograms per hour	1.24	6.54	6.39	4.72
pounds per hour	2.73	14.4	14.1	10.4
Acetone				
µg per dry std. cubic meter*	4210	20300	29800	18100
ppb by volume, Dry	1740	8380	12300	7470
kilograms per hour	0.348	1.78	2.68	1.60
pounds per hour	0.767	3.93	5.91	3.54
Toluene				
µg per dry std. cubic meter*	698	1440	1910	1350
ppb by volume, Dry	182	375	497	352
kilograms per hour	0.0577	0.127	0.171	0.119
pounds per hour	0.127	0.279	0.378	0.261
P-Cymene				
µg per dry std. cubic meter*	391	1230	1210	944
ppb by volume, Dry	70.1	220	217	169
kilograms per hour	0.0323	0.108	0.109	0.0831
pounds per hour	0.0713	0.239	0.240	0.184
m-/p-Xylene				
µg per dry std. cubic meter*	319	269	852	480
ppb by volume, Dry	72.3	61.0	193	109
kilograms per hour	0.0264	0.0237	0.0766	0.0422
pounds per hour	0.0581	0.0523	0.169	0.0931
Benzene				
µg per dry std. cubic meter*	314	0.520	0.481	105
ppb by volume, Dry	96.7	0.160	0.148	32.3
kilograms per hour	0.0259	0.0000458	0.0000433	0.00868
pounds per hour	0.0572	0.000101	0.0000955	0.0191
Cumene (isopropylbenzene)				
µg per dry std. cubic meter*	89.8	90.5	209	130
ppb by volume, Dry	18.0	18.1	41.9	26.0
kilograms per hour	0.00742	0.00797	0.0188	0.0114
pounds per hour	0.0164	0.0176	0.0415	0.0252
Methylene Chloride				
µg per dry std. cubic meter*	17.1	161	231	136
ppb by volume, Dry	4.83	45.7	65.5	38.7
kilograms per hour	0.00141	0.0142	0.0208	0.0121
pounds per hour	0.00311	0.0314	0.0459	0.0268
2-Butanone				
µg per dry std. cubic meter*	85.2	0.520	0.481	28.7
ppb by volume, Dry	28.4	0.173	0.161	9.59
kilograms per hour	0.00705	0.000046	0.0000433	0.00238
pounds per hour	0.0155	0.000101	0.0000955	0.00524
Chloromethane				
µg per dry std. cubic meter*	42.7	0.520	0.481	14.6
ppb by volume, Dry	20.3	0.248	0.229	6.94
kilograms per hour	0.00353	0.0000458	0.0000433	0.00121
pounds per hour	0.00778	0.000101	0.0000955	0.00266
Iodomethane				
µg per dry std. cubic meter*	41.4	0.520	0.481	14.1
ppb by volume, Dry	7.02	0.0881	0.0816	2.40
kilograms per hour	0.00342	0.0000458	0.0000433	0.00117
pounds per hour	0.00755	0.000101	0.0000955	0.00258
o-Xylene				
µg per dry std. cubic meter*	23.0	0.520	34.8	19.4
ppb by volume, Dry	5.21	0.118	7.90	4.41
kilograms per hour	0.00190	0.0000458	0.00314	0.00170
pounds per hour	0.00419	0.000101	0.00691	0.00373
Styrene				
µg per dry std. cubic meter*	17.5	0.520	28.3	15.4
ppb by volume, Dry	4.04	0.120	6.54	3.57
kilograms per hour	0.00145	0.0000458	0.00255	0.00135
pounds per hour	0.00319	0.000101	0.00562	0.00297
Isooctane				
µg per dry std. cubic meter*	7.61	0.520	0.481	2.87
ppb by volume, Dry	1.60	0.109	0.101	0.604
kilograms per hour	0.000629	0.0000458	0.0000433	0.000239
pounds per hour	0.00139	0.000101	0.0000955	0.000528
Chloroform				
µg per dry std. cubic meter*	2.01	11.4	0.481	4.63
ppb by volume, Dry	0.406	2.29	0.0970	0.931
kilograms per hour	0.000166	0.00100	0.0000433	0.000403
pounds per hour	0.000367	0.00221	0.0000955	0.000891

* 68 Deg. F (20 C) -- 29.92 In. Mercury

Underlined values indicate all catch weights are less than the minimum detection limit (MDL). Values presented were calculated using 1/2 the MDL for all catch weights.

SECTION 4
SAMPLING LOCATIONS

4.1 GENERAL

Emission sampling was conducted at: (1) the MDF cyclone outlet; (2) five roof vents on the MDF particleboard press; (3) microboard core dryer EFB and microboard surface dryer EFB inlets and outlets; (4) six roof stacks exhausting the microboard press room; and, (5) two roof stacks exhausting the microboard press cooling room. Schematics are presented for each of the locations sampled. The test program was focused primarily on flue gas sampling. There was no requirement for any process stream sample collection during the program.

4.2 SAMPLING LOCATION PARAMETERS

Table 4-1 is a summary of the sampling location parameters which includes figure numbers, duct (stack) diameters, upstream and downstream flow disturbance distances from sampling ports, and number of sampling points.

4.3 SAMPLING LOCATIONS DESCRIPTIONS

Several of the exhaust ducts required installation of specially designed and constructed stack extensions. The extensions were built and installed by a local contractor under the supervision of WEYCO and WESTON. It was not economically feasible to install a stack extension at the MDF cyclone outlet.

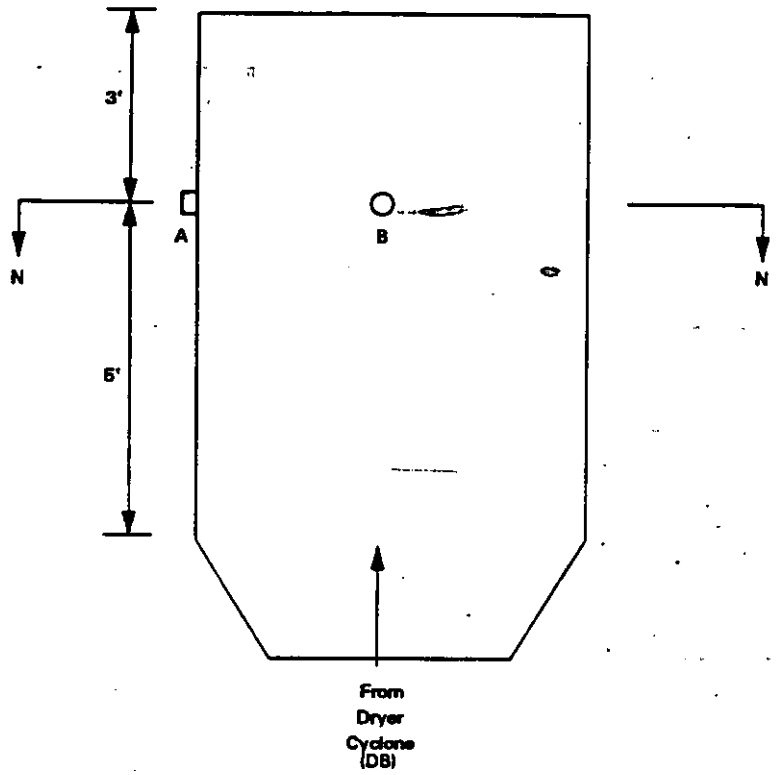
4.3.1 MDF Cyclone Outlet

There are two MDF particle dryers. Dryer B cyclone outlet (stack #1) was chosen for emissions testing. The duct is located approximately 135 feet above grade. This location does not meet the minimum criteria specified in EPA Reference Method 1 for distances from flow disturbances. This is important to note regarding the isokinetic testing, as it likely affects the accuracy of the sample collection and flow measurements. Refer to Section 3 for a discussion of the test results at this sampling location. Figure 4-1 presents a schematic of the sampling location.

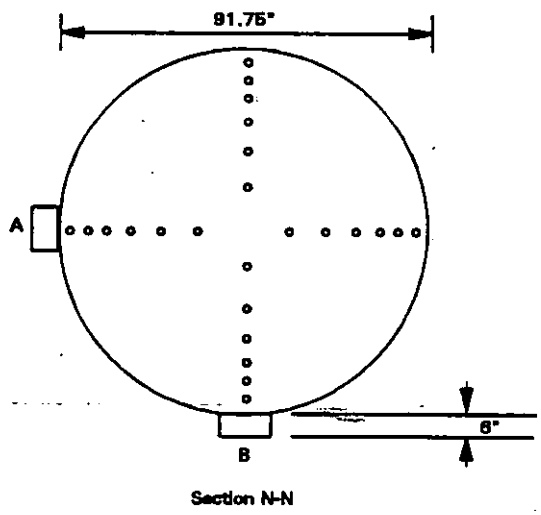
TABLE 4-1

SAMPLING LOCATION PARAMETERS

Sampling Location	Figure #	Duct Diameter, Inches	Flow Disturbance Distance, Feet		Number of Sampling Points
			Upstream	Downstream	
MDF Cyclone B Outlet (Stack 1)	4-1	91.75	5	3	24
MDF Press					
Stack 2	4-3	29	14	5.6	24
Stack 3	4-4	29	14	10.3	24
Stack 4	4-5	37	6.3	1.6	24
Stack 5	4-6	62	10.3	2.4	24
Stack 6	4-7	56 (square)	7.3	2.3	25
Core EFB					
Inlet (Stack 7)	4-8	49.25	2.0	2.3	24
Outlet (Stack 8)	4-9	53.25	33.3	26.6	12
Surface EFB					
Inlet (Stack 9)	4-8	50.0	2.2	4.0	24
Outlet (Stack 10)	4-9	53.25	33.3	26.6	12
Microboard Press Stacks 11, 12, 13, 14, 15	4-11	33	8.3	1.3	24



TRAVERSE POINT NUMBER	DISTANCE FROM INSIDE NEAR WALL (INCHES)
1	5 3/4
2	9 7/8
3	14 5/8
4	20
5	28 3/4
6	36 3/8
7	62 7/8
8	72 5/8
9	79 1/4
10	84 3/4
11	89 3/8
12	93 1/2



Drawing Not to Scale

Figure 4-1
MDF Dryer B Cyclone Outlet Sampling Location (DB)

FIG41.WEY

4.3.2 MDF Press Exhausts

As shown in Figure 4-2, there are a total of five exhausts (stacks #2 - #6) for the MDF press area located on a metal roof that is slightly pitched. Each test location met the minimum criteria specified in EPA Reference Method 1 for distances from flow disturbances.

4.3.2.1 Press Hood Stacks

Stacks #2 and #3, shown in Figures 4-3 and 4-4, respectively, exhaust gases from the MDF press hood. The stacks run vertically approximately 10 feet above the roof level.

4.3.2.2 Press Building Area Roof Exhausts

Stacks #4 and #5, shown in Figures 4-5 and 4-6, respectively, remove air from the room containing the MDF press. To provide suitable test locations, stack extensions were built. The stacks run vertically approximately 15 feet above the roof level. For each stack extension, two 4-inch sample ports were installed. Scaffolding was built to access the sample ports.

4.3.2.3 Press Cooling End Exhaust Stack

The press cooling end exhaust stack sampling location (stack #6), as shown in Figure 4-7, had a gooseneck extension that was removed and an extension was installed to provide a suitable sampling location. Five 4-inch sample ports were installed in the stack. The stack runs vertically approximately 6 feet above the roof level.

4.3.3 Microboard Core Layer and Surface Layer Particle Dryers

Testing was completed simultaneously at the inlet and outlet sampling locations of the core and surface EFB's to determine PM_{10} and total hydrocarbon removal efficiency.

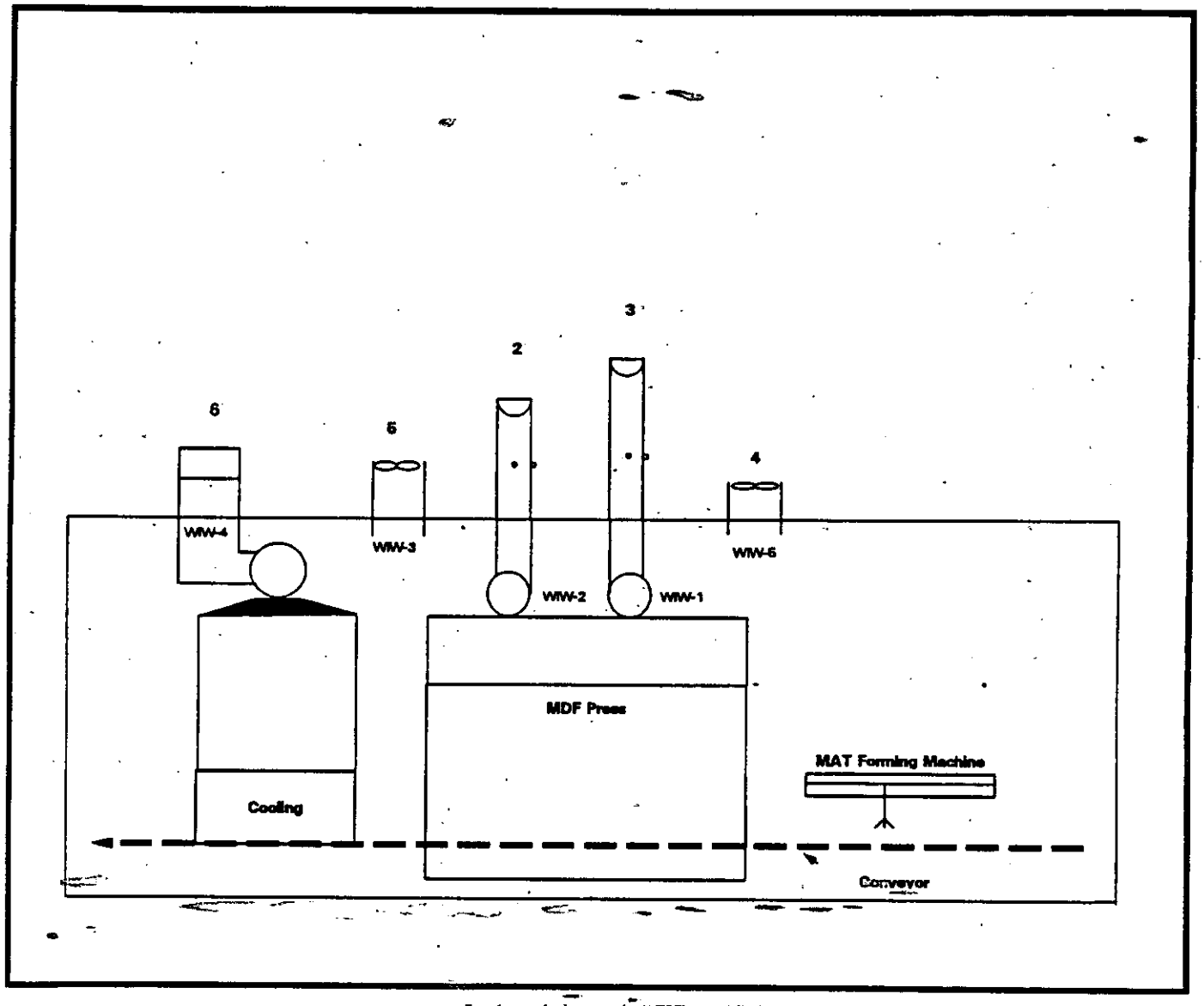
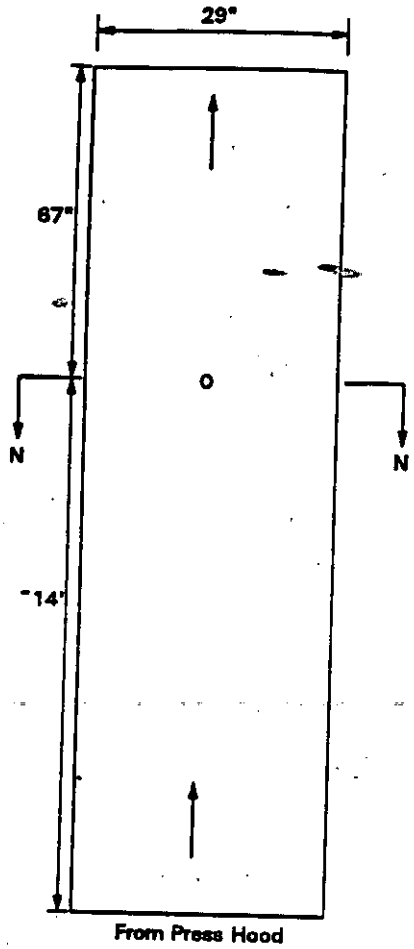
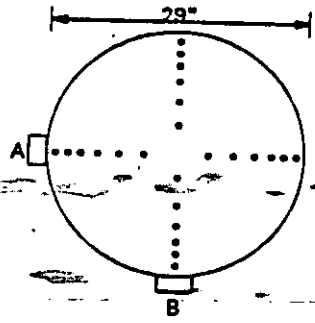


Figure 4-2
MDF Press Building



ISOKENITIC SAMPLING TRAIN	
TRAVERSE POINT NUMBER	DISTANCE FROM INSIDE NEAR WALL (INCHES)
1	1
2	1 7/8
3	3 3/8
4	5 1/8
5	7 1/4
6	10 1/4
7	18 3/4
8	21 3/4
9	23 7/8
10	25 7/8
11	27 1/8
12	28

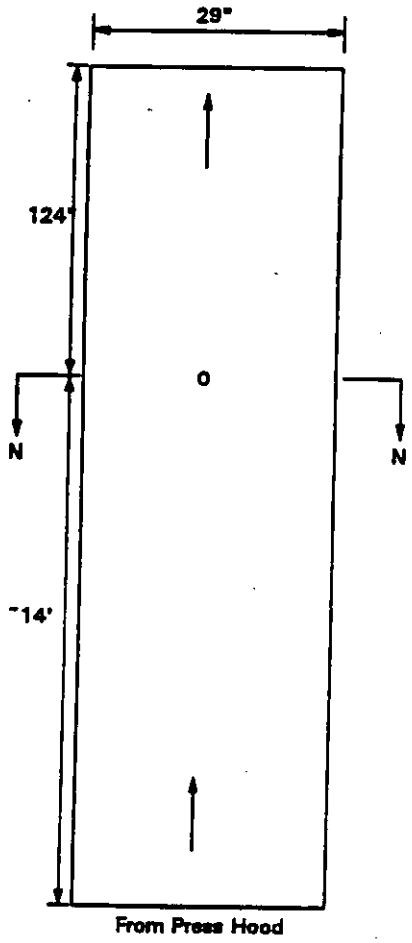


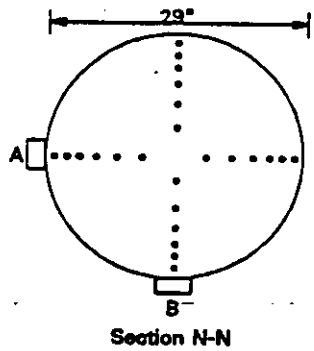
PM 10 SAMPLING TRAIN	
TRAVERSE POINT NUMBER	DISTANCE FROM INSIDE NEAR WALL (INCHES)
1	1 1/4
2	4 1/4
3	8 5/8
4	20 3/8
5	24 3/4
6	27 3/4

Drawing Not to Scale

Figure 4-3
MDF Press Stack #2 Sampling Location (WIW-2)

FIG43.WEY





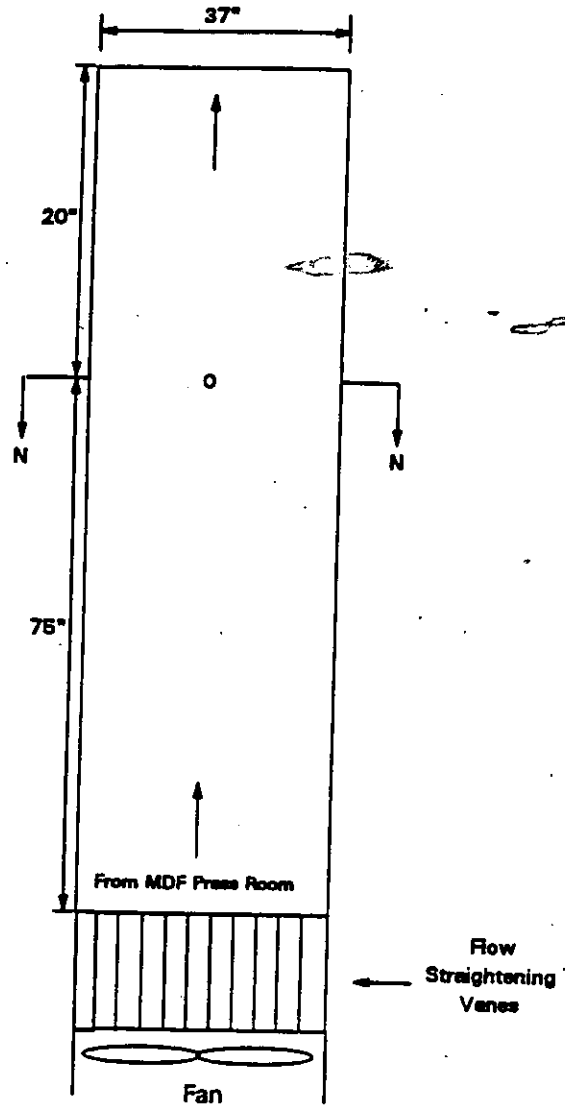
ISOKENITIC SAMPLING TRAIN	
TRAVERSE POINT NUMBER	DISTANCE FROM INSIDE NEAR WALL (INCHES)
1	1
2	1 7/8
3	3 3/8
4	5 1/8
5	7 1/4
6	10 1/4
7	18 3/4
8	21 3/4
9	23 7/8
10	25 7/8
11	27 1/8
12	28

PM 10 SAMPLING TRAIN	
TRAVERSE POINT NUMBER	DISTANCE FROM INSIDE NEAR WALL (INCHES)
1	1 1/4
2	4 1/4
3	8 5/8
4	20 3/8
5	24 3/4
6	27 3/4

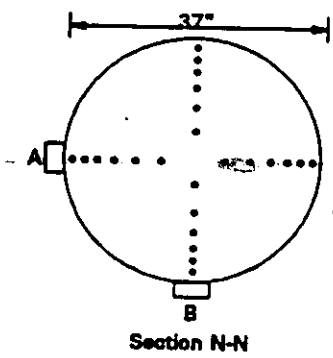
Drawing Not to Scale

Figure 4-4
MDF Press Stack #3 Sampling Location (WIW-1)

FIGUR4-4.WEY



ISOKENETIC SAMPLING TRAIN	
TRAVERSE POINT NUMBER	DISTANCE FROM INSIDE NEAR WALL (INCHES)
1	1
2	2 1/2
3	4 3/8
4	6 1/2
5	9 1/4
6	13 1/8
7	23 7/8
8	27 3/4
9	30 1/2
10	32 5/8
11	34 1/2
12	36

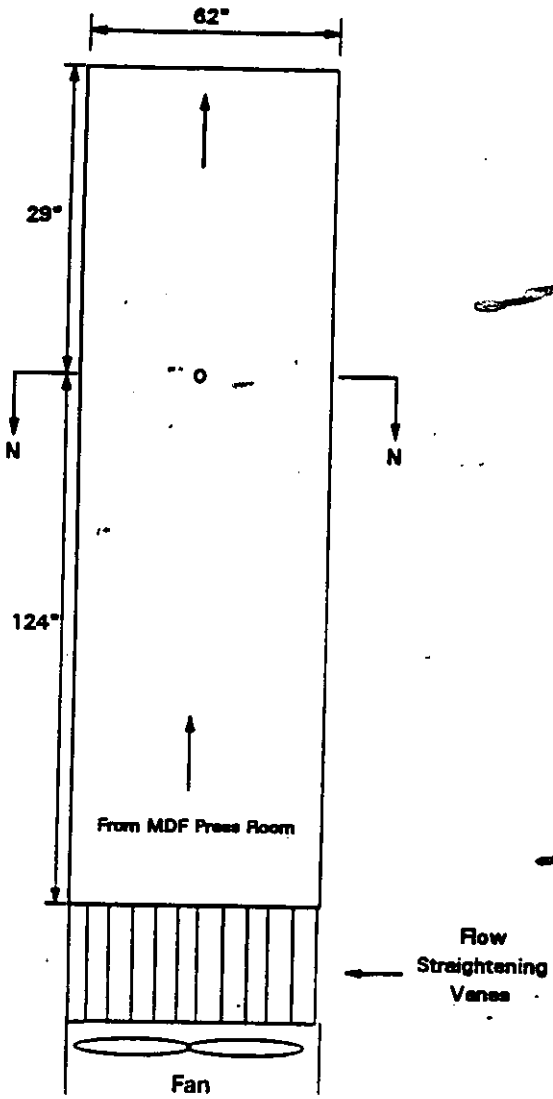


PM 10 SAMPLING TRAIN	
TRAVERSE POINT NUMBER	DISTANCE FROM INSIDE NEAR WALL (INCHES)
1	1 5/8
2	6 3/8
3	11
4	26
5	31 5/8
6	35 3/8

Drawing Not to Scale

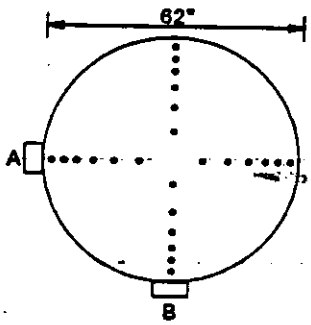
Figure 4-5
MDF Press Stack #4 Sampling Location (WIW-5)

FIGUR4-5.WEY



ISOKENETIC SAMPLING TRAIN	
TRAVERSE POINT NUMBER	DISTANCE FROM INSIDE NEAR WALL (INCHES)
1	1 1/4
2	4 1/8
3	7 3/8
4	11
5	15 1/2
6	22
7	40
8	46
9	51
10	54 5/8
11	57 7/8
12	60 3/4

PM 10 SAMPLING TRAIN	
TRAVERSE POINT NUMBER	DISTANCE FROM INSIDE NEAR WALL (INCHES)
1	2 3/4
2	9
3	18 3/8
4	43 5/8
5	53
6	59 1/4



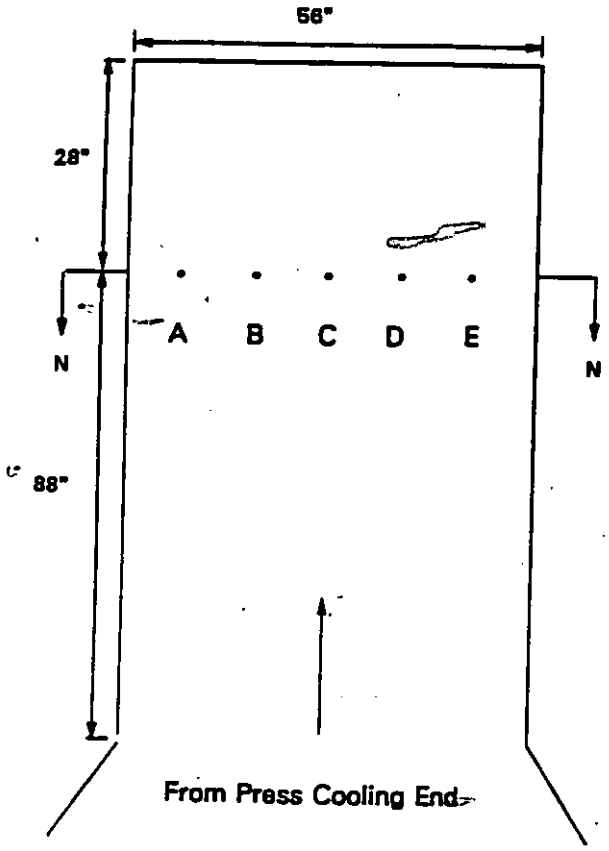
Section N-N

(Isokinetic Sampling Train Points)

Drawing Not to Scale

Figure 4-6
MDF Press Stack #5 Sampling Location (WIW-3)

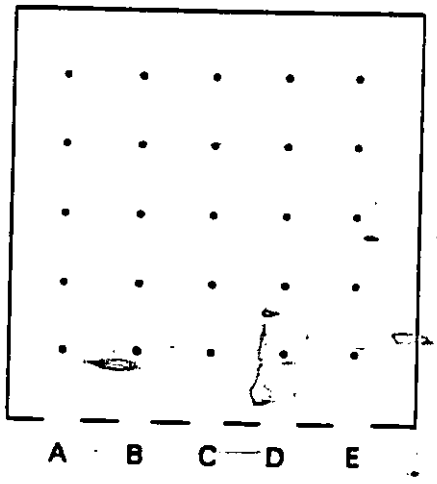
FIGUR4-6.WEY



ISOKENETIC SAMPLING TRAIN	
TRAVERSE POINT NUMBER	DISTANCE FROM INSIDE NEAR WALL (INCHES)
1	5 5/8
2	16 3/4
3	28
4	39 1/4
5	50 3/8

PM 10 SAMPLING TRAIN	
TRAVERSE POINT NUMBER	DISTANCE FROM INSIDE NEAR WALL (INCHES)
1	7
2	21
3	35
4	49

Note: Ports A, C, & E were sampled for PM10 emissions



Section N-N

(Isokinetic Sampling Train Points)

Drawing Not to Scale

Figure 4-7
MDF Press Stack #6 Sampling Location (WIW-4)

FIGUR4-7.WEY

4.3.3.1 Core EFB Inlet

Figure 4-8 is a schematic of the core EFB inlet sampling location (stack #7). This duct runs horizontally and is accessed from a platform approximately 100 feet above grade. There is an abort gate adjacent to the sampling location that was locked shut during the test program. This location did not meet the minimum criteria specified in EPA Reference Method 1 for distances from flow disturbances. This is important to note regarding the isokinetic testing as the accuracy of the sample collection and flow measurements may be affected.

4.3.3.2 Core EFB Outlet

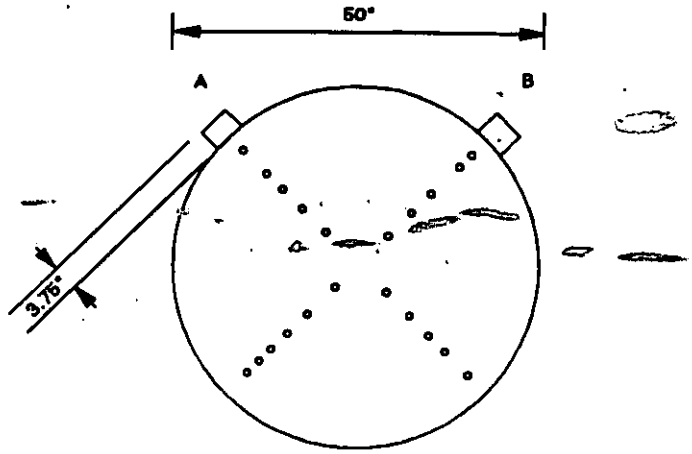
Figure 4-9 is a schematic of the core EFB outlet sampling location (stack #8). This duct runs vertically and is accessed from a platform approximately 100 feet above grade. This location met the minimum criteria specified in EPA Reference Method 1 for distances from flow disturbances.

4.3.3.3 Surface EFB Inlet and Outlet

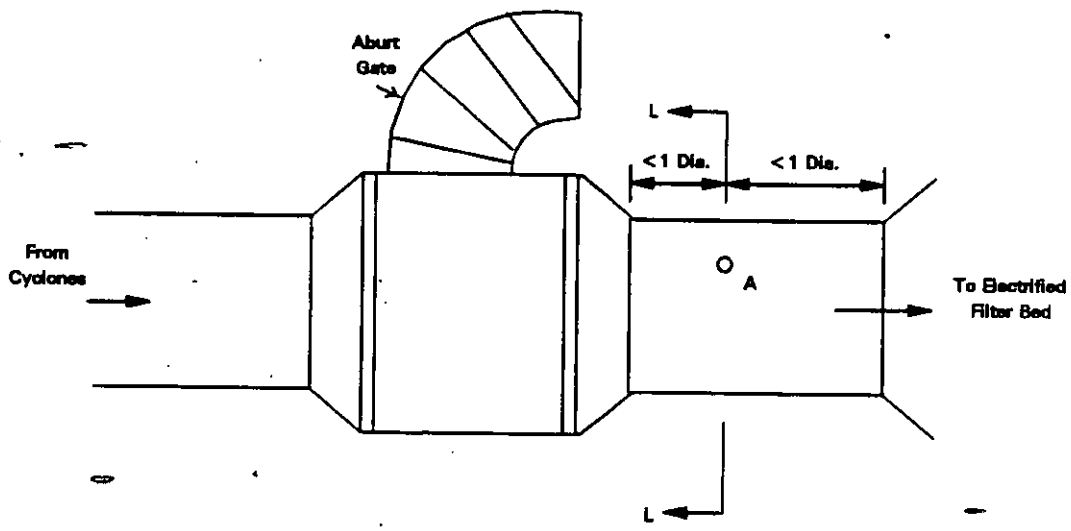
The surface EFB inlet sampling location (stack #9) is similar to the core EFB inlet sampling location. Refer to Figure 4-8 for a schematic of the sampling location. The surface EFB outlet sampling location (stack #10) is identical to the core EFB outlet sampling location. Refer to Figure 4-9 for a schematic of the sampling location.

4.3.4 Microboard Press Room and Cooling Area

For the microboard press, there are a total of eight identical exhausts, as shown in Figure 4-10, located on two different roofs. Six exhausts (stacks #11 - #13, #16 - #18) service the area above the microboard press. Two exhausts (stacks #14 and #15) serve the cooling area. In order to provide suitable test locations, stack extensions were built. The stacks, run vertically approximately 10 feet above the roof level, as shown in Figure 4-11. These locations met the minimum criteria specified in EPA Reference Method 1 for distances from disturbances. Scaffolding was necessary to access the sample ports. To access each stack, two 4-inch ports were installed at 90°.



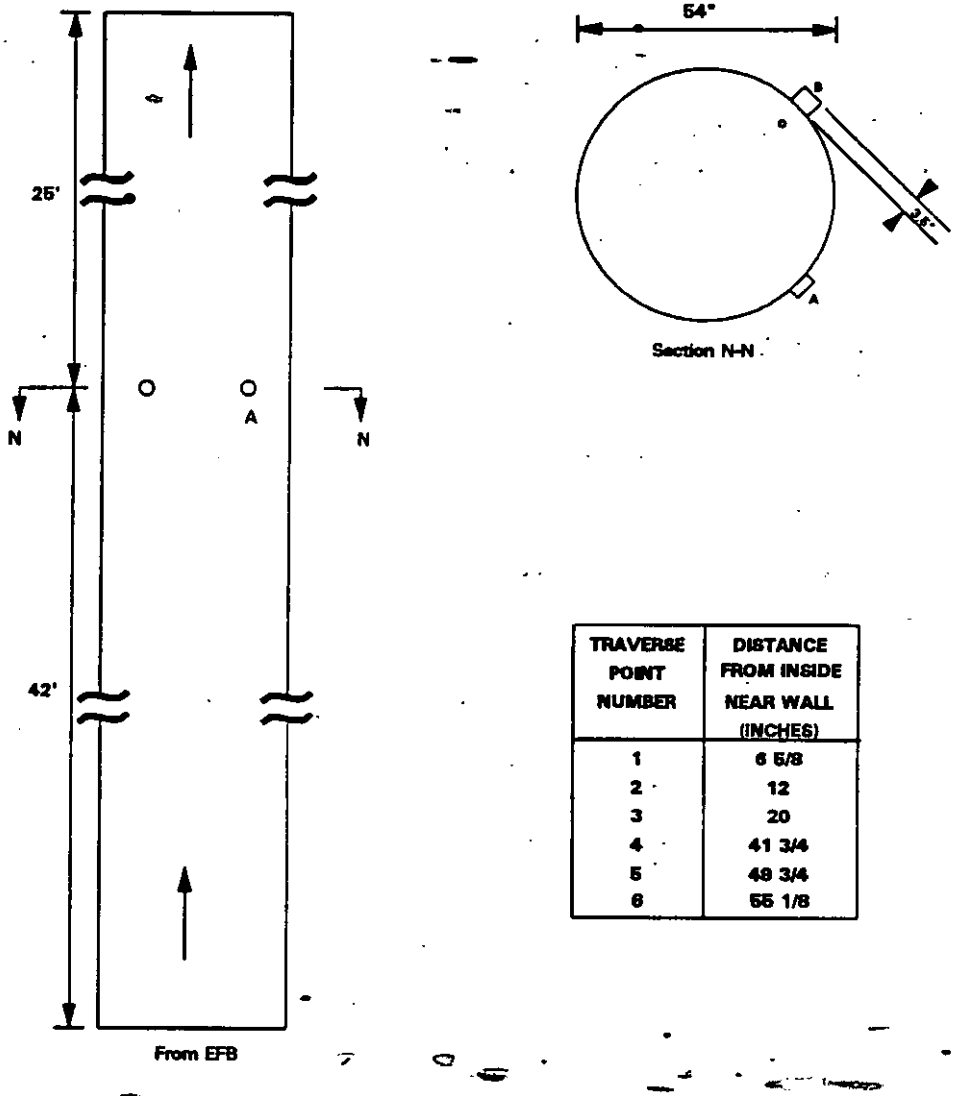
TRAVERSE POINT NUMBER	DISTANCE FROM INSIDE NEAR WALL (INCHES)
1	1
2	3 3/8
3	6 5/8
4	8 7/8
5	12 1/2
6	17 3/4
7	32 1/4
8	37 1/2
9	41 1/8
10	44 1/8
11	46 5/8
12	49



Drawing Not to Scale

Figure 4-8
EFB Inlet Sampling Location

figur4-8.wey



TRAVERSE POINT NUMBER	DISTANCE FROM INSIDE NEAR WALL (INCHES)
1	6 5/8
2	12
3	20
4	41 3/4
5	49 3/4
6	55 1/8

Note: Core EFB outlet test location is identical to surface EFB outlet.

Drawing Not to Scale

Figure 4-9
EFB Outlet Sampling Location (1510 or 1520)

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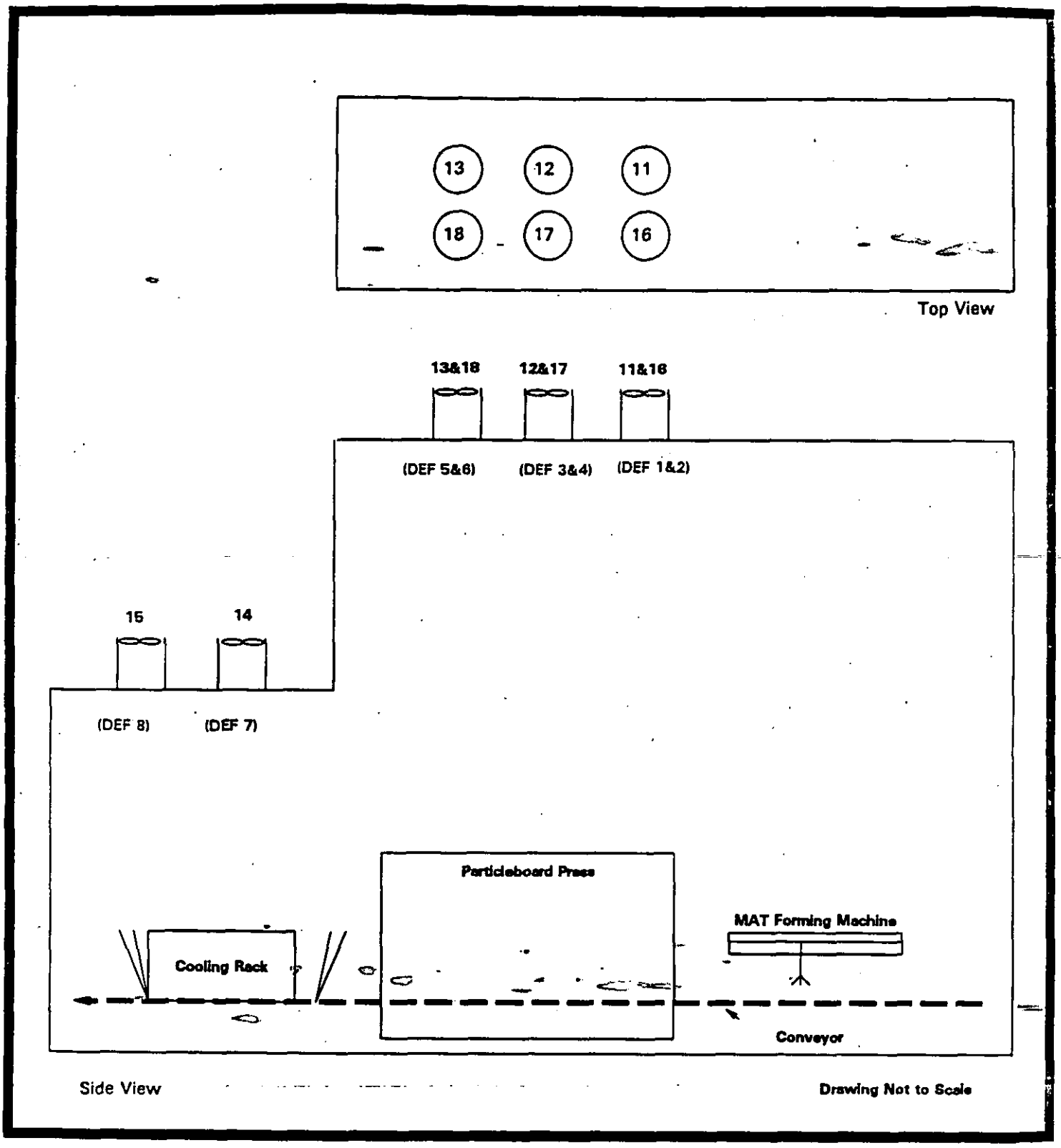

Figure 4-10
Microboard Press Building

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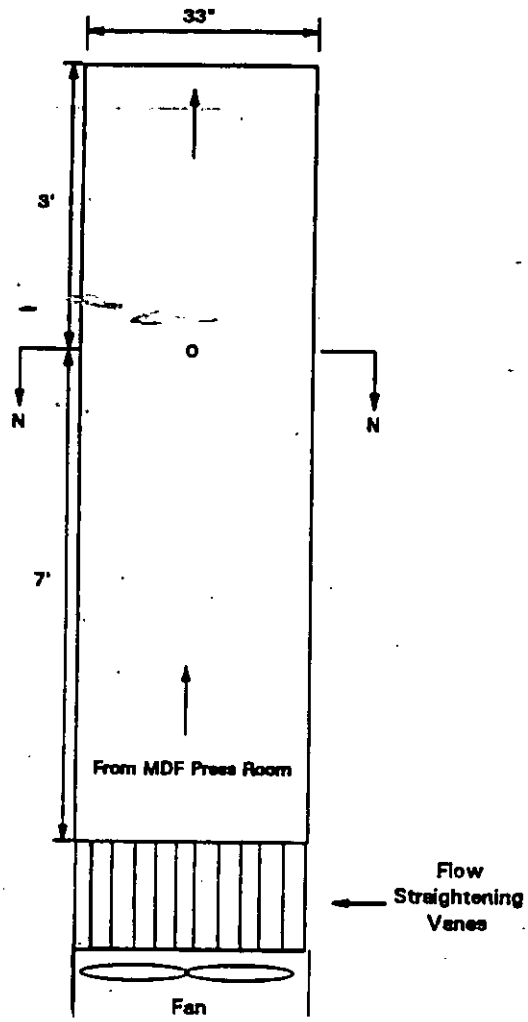

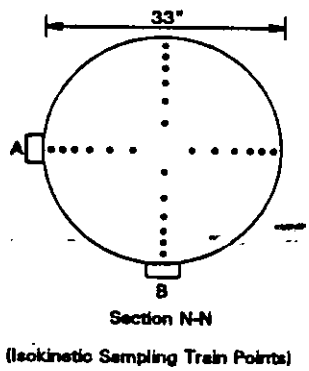

ISOKENETIC SAMPLING TRAIN	
TRAVERSE POINT NUMBER	DISTANCE FROM INSIDE NEAR WALL (INCHES)
1	1
2	2 1/4
3	3 3/8
4	5 3/4
5	8 1/4
6	11 3/4
7	21 3/4
8	24 3/4
9	27 1/4
10	29 1/8
11	30 3/4
12	32

PM 10 SAMPLING TRAIN	
TRAVERSE POINT NUMBER	DISTANCE FROM INSIDE NEAR WALL (INCHES)
1	1 1/2
2	4 7/8
3	5 3/4
4	23 1/4
5	28 1/8
6	31 1/2

Microboard Press & Cooling Room Stacks Are Identical

Drawing Not to Scale

Figure 4-11
Microboard Press and Cooling Room Stack Sampling Location (DEF)

FIGUR411.WEY

SECTION 5
SAMPLING AND ANALYTICAL PROCEDURES

5.1 OVERVIEW OF FLUE GAS SAMPLING AND ANALYSIS PROCEDURES

Aldehyde/ketones, condensible particulate, PM_{10}, particulate, semivolatile organic, and volatile organic samples were recovered on-site at the field laboratory. Carbon monoxide, total hydrocarbon, and nitrogen oxide samples were monitored continuously during each test repetition using WESTON's on-site CEMS instrumentation trailer. Appendix C contains the reference methods and a complete description of equipment and procedures (extracted from 40 CFR 60).

5.2 SAMPLING POINTS

EPA Method 1 criteria was used to determine the number and location of the sampling points.

5.3 VOLUMETRIC FLOW RATES

5.3.1 Flue Gas Velocity

EPA Method 2 was utilized to obtain the velocity measurements during the traverses of the stack (duct) cross sections. For the MDF cyclone outlet, cyclonic flow was present. The flow yaw angle at each sample point was measured with an angle finder and the pitot tubes were aligned parallel to the flow. The flow at each point was measured and weighted by the cosine of the yaw angle. The resultant flows for each point were used to calculate the gas velocity.

5.3.2 Flue Gas Composition

The flue gas molecular weight was determined by EPA Method 3 at the core EFB and surface EFB inlets and outlets. At all other sampling locations, the flue gas composition was assumed to be that of ambient air, as confirmed with Fyrite analyzers.

5.3.3 Flue Gas Moisture Content

Moisture content was determined by analyzing the sampling train impinger contents according to the procedures outlined in the respective EPA Methods.

5.4 POLLUTANT EMISSIONS DETERMINATIONS

5.4.1 Aldehyde/Ketones

The aldehyde and ketone emissions from all sampling locations were determined by EPA Method 0011. The sampling train, as shown in Figure 5-1, consisted of the following components connected in series:

- A calibrated borosilicate nozzle attached to a borosilicate probe.
- A rigid borosilicate connector to join the outlet of the sample probe to the inlet of the impinger train.
- An impinger train consisting of four impingers. The first three impingers contained 100 ml of cleaned 2,4-dinitrophenylhydrazine (DNPH) solution. The fourth impinger contained 300 grams of the dry preweighed silica gel. The second impinger was a Greenburg-Smith type; all other impingers were of a modified design. All impingers were maintained in a crushed ice bath.
- A vacuum line (umbilical cord) with adapter to connect the outlet of the impinger train to a control module.
- A control module containing a 3-cfm carbon vane vacuum pump (sample gas mover), a calibrated dry gas meter (sample gas volume measurement device), a calibrated orifice (sample gas flow rate monitor) and inclined manometers (orifice and gas stream pressure indicators).
- A switchable calibrated digital pyrometer to monitor flue and sample gas temperatures.

The preparation, sampling, and recovery procedures used for determination of formaldehyde, aldehydes, and ketones are shown in Figure 5-2, 5-3 and 5-4, respectively. Each test was 60 to 90 minutes in duration and at least 45 dry standard cubic feet of sample volume was collected. All runs were isokinetic ± 10 percent.

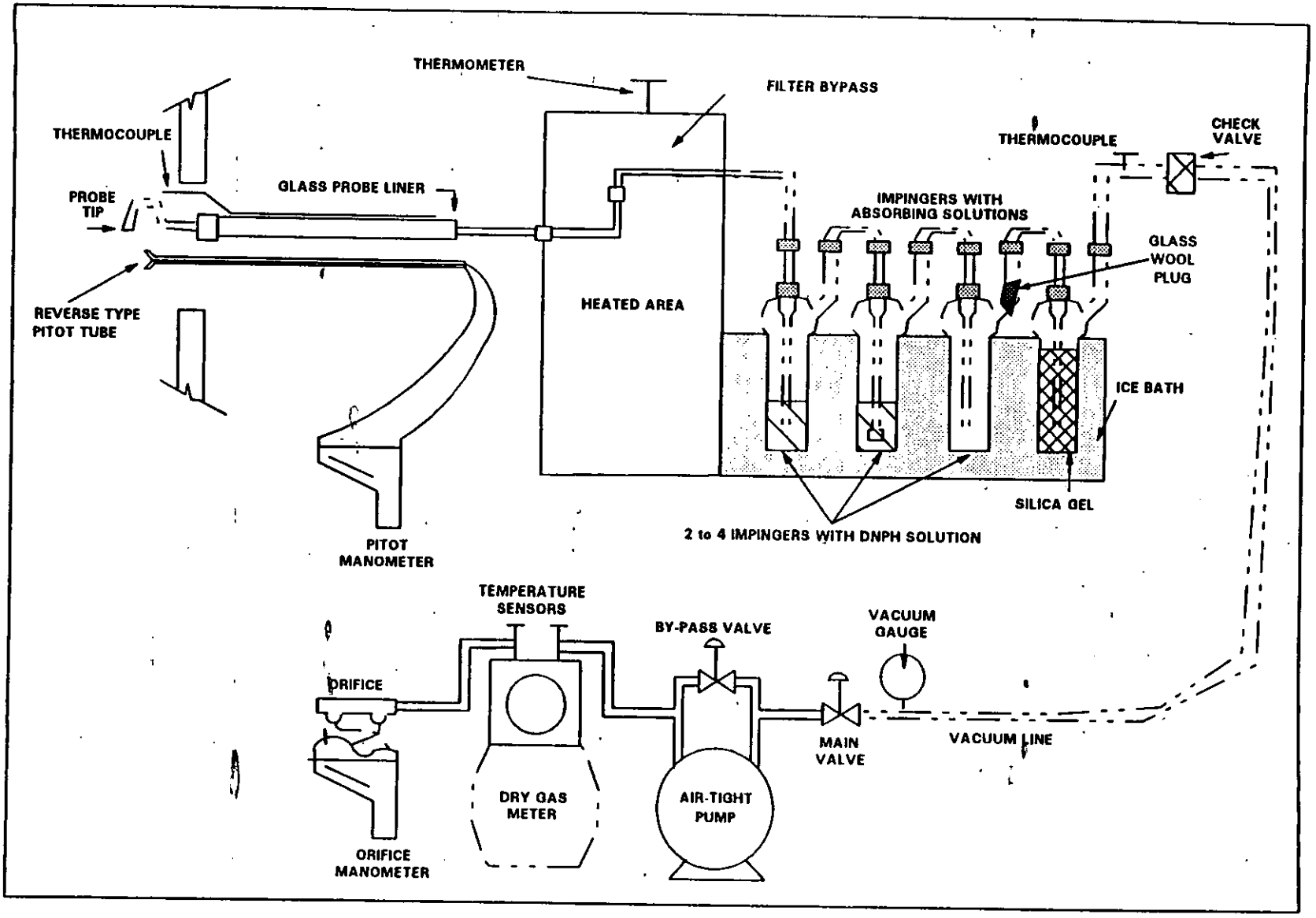

FIGURE 5-1
EPA METHOD 0011
ALDEHYDE/KETONE SAMPLING TRAIN

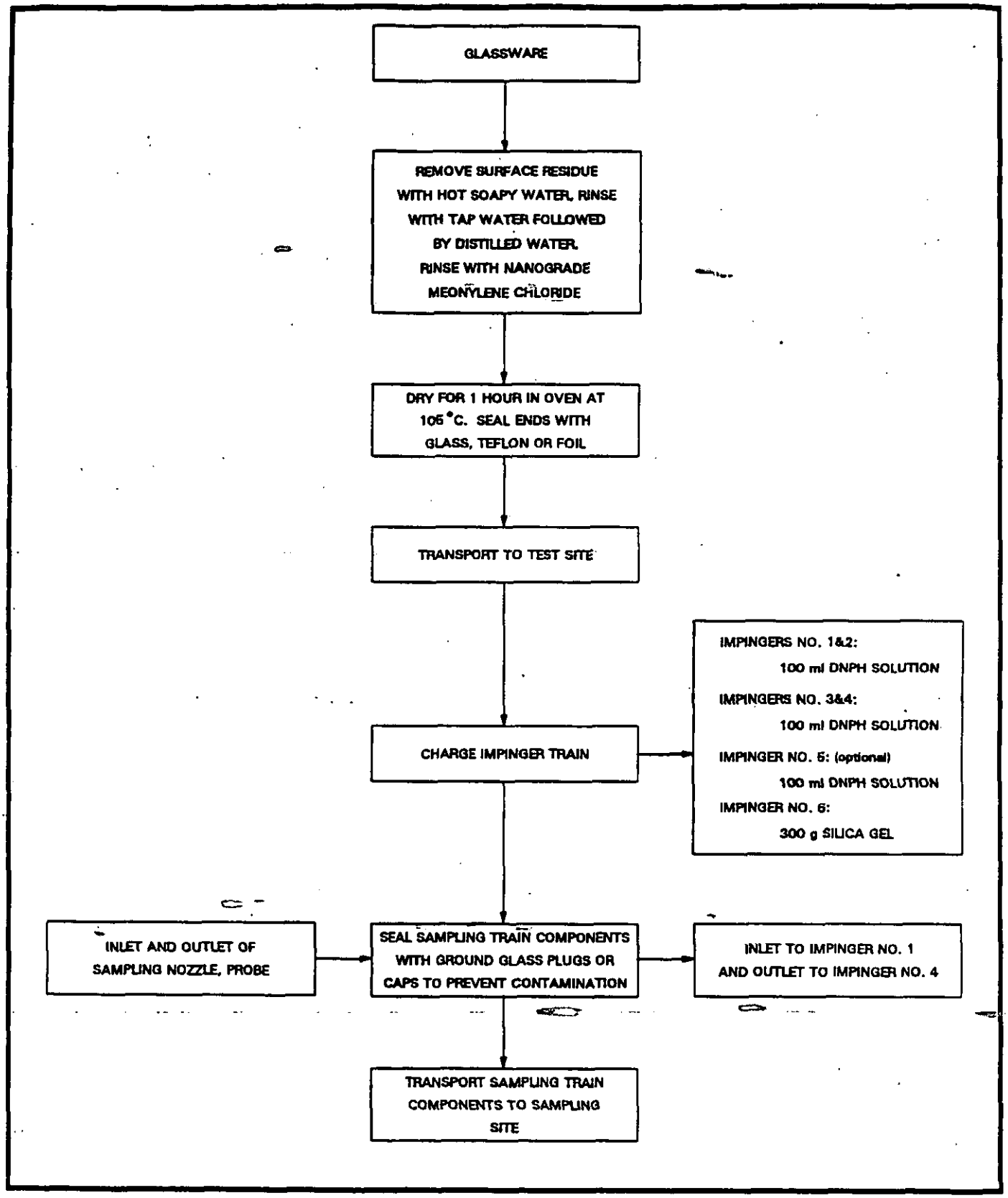

FIGURE 5-2
PREPARATION PROCEDURES FOR ALDEHYDE/KETONE SAMPLING TRAINS

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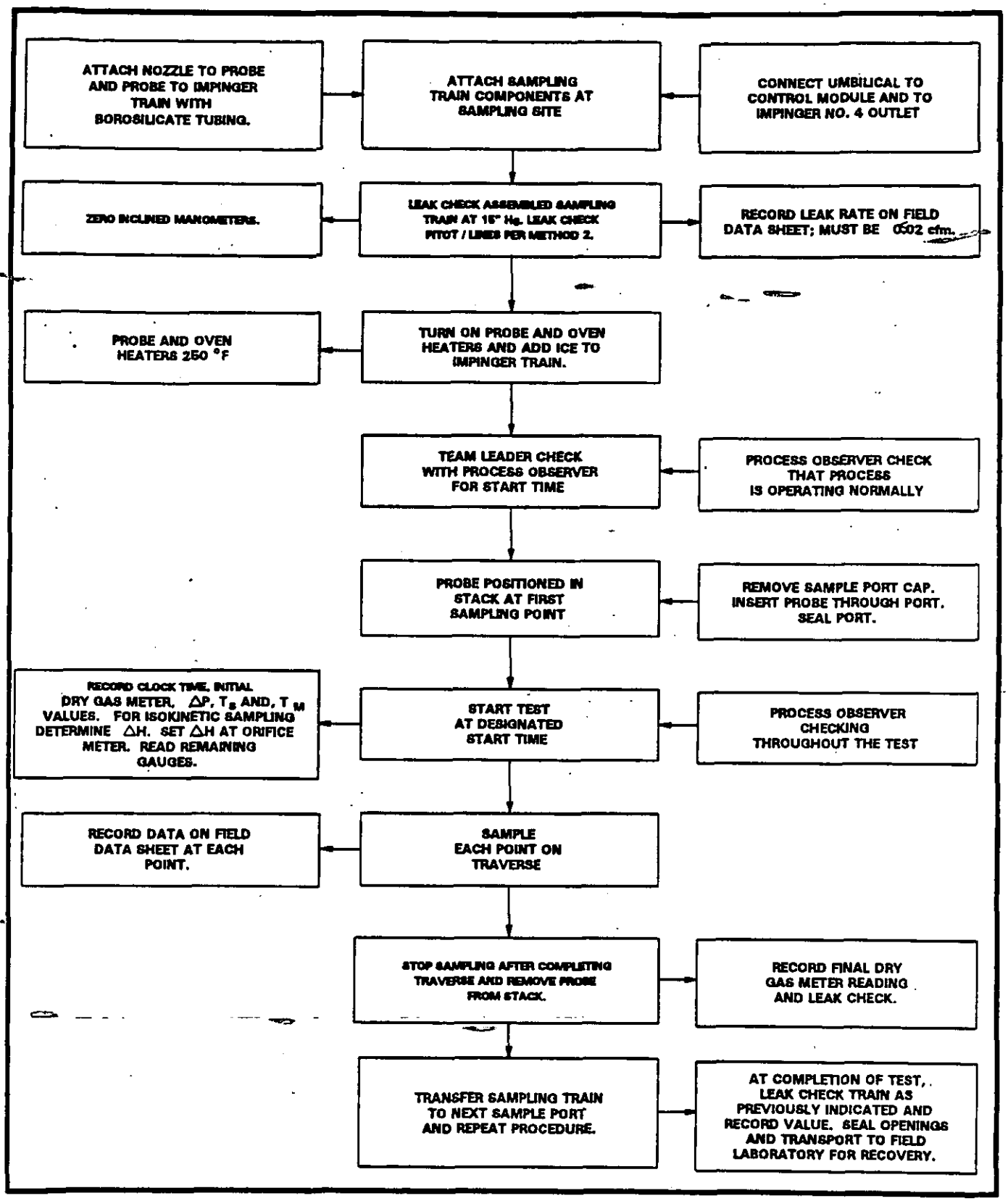


FIGURE 5-3
SAMPLING PROCEDURES FOR ALDEHYDES/KETONES

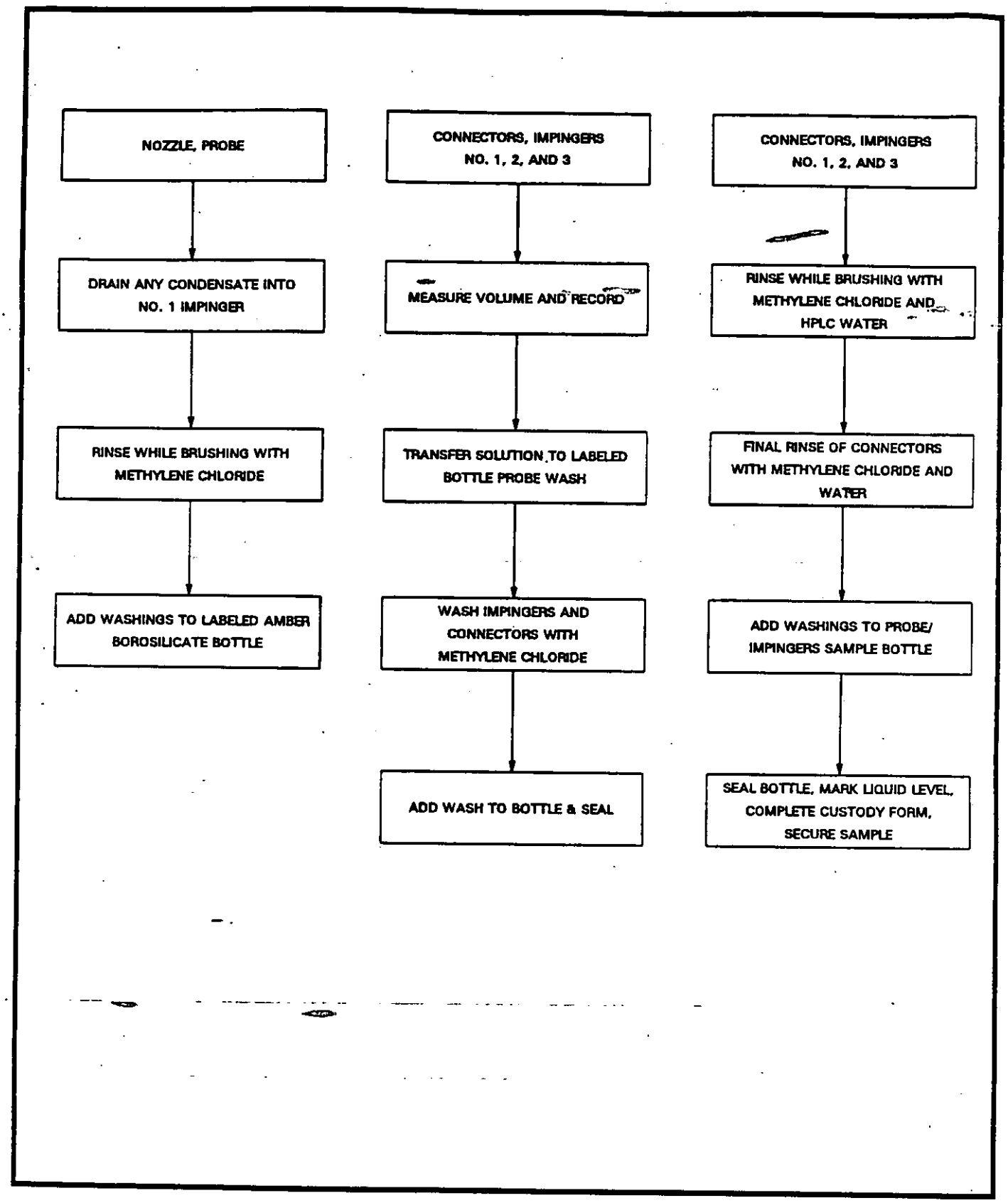


FIGURE 5-4
SAMPLE RECOVERY PROCEDURES FOR ALDEHYDE/KETONE SAMPLING TRAINS

drawings\recovery\m0011rec.wwy

The analytical procedures for the quantification of aldehydes and ketones were performed as specified in EPA Methods 0011 and 0011A utilizing high-performance liquid chromatography (HPLC). The Method 0011A analysis steps for the determination of aldehydes and ketones are summarized in Figure 5-5.

5.4.2 Carbon Monoxide, Nitrogen Oxides, and Total Hydrocarbons

The WESTON portable CEM system was used to continuously monitor the concentrations of carbon monoxide, nitrogen oxides and total hydrocarbons at the core EFB and the surface EFB outlets. The total hydrocarbon emissions were measured at the MDF press stacks, microboard press stacks, core EFB and surface EFB inlets and the MDF cyclone outlet.

The portable CEM system contained an instrument rack, a data acquisition system, and a microcomputer. The instrument rack contained continuous emission analyzers, sample conditioning units, recorders, and a data acquisition system. The following parameters were determined in accordance with U.S. EPA methodology:

- Carbon monoxide (EPA Method 10).
- Nitrogen oxides (EPA Method 7E).
- Total hydrocarbons (EPA Method 25A).

Stack samples were collected through a heated stainless steel probe and heated Teflon line and sent to the portable CEM. The total hydrocarbon sample was drawn directly from this heated line; refer to Section 3.2.6 for a discussion of sampling strategy. Heated sample line pressure is monitored and the sampling rate is controlled by a needle valve on the pump outlet in order to maintain excess conditioned sample flow. The excess sample is released to the atmosphere to maintain a constant sample pressure.

The data from the CEM train was processed through a Molytek Model 2702 chart recorder. This unit has the capacity to handle up to 32 channels of data from instruments, thermocouples, and other process instrumentation. All active channels can be displayed on a single strip chart. The Model 2702 also scales and converts the analog input signals to

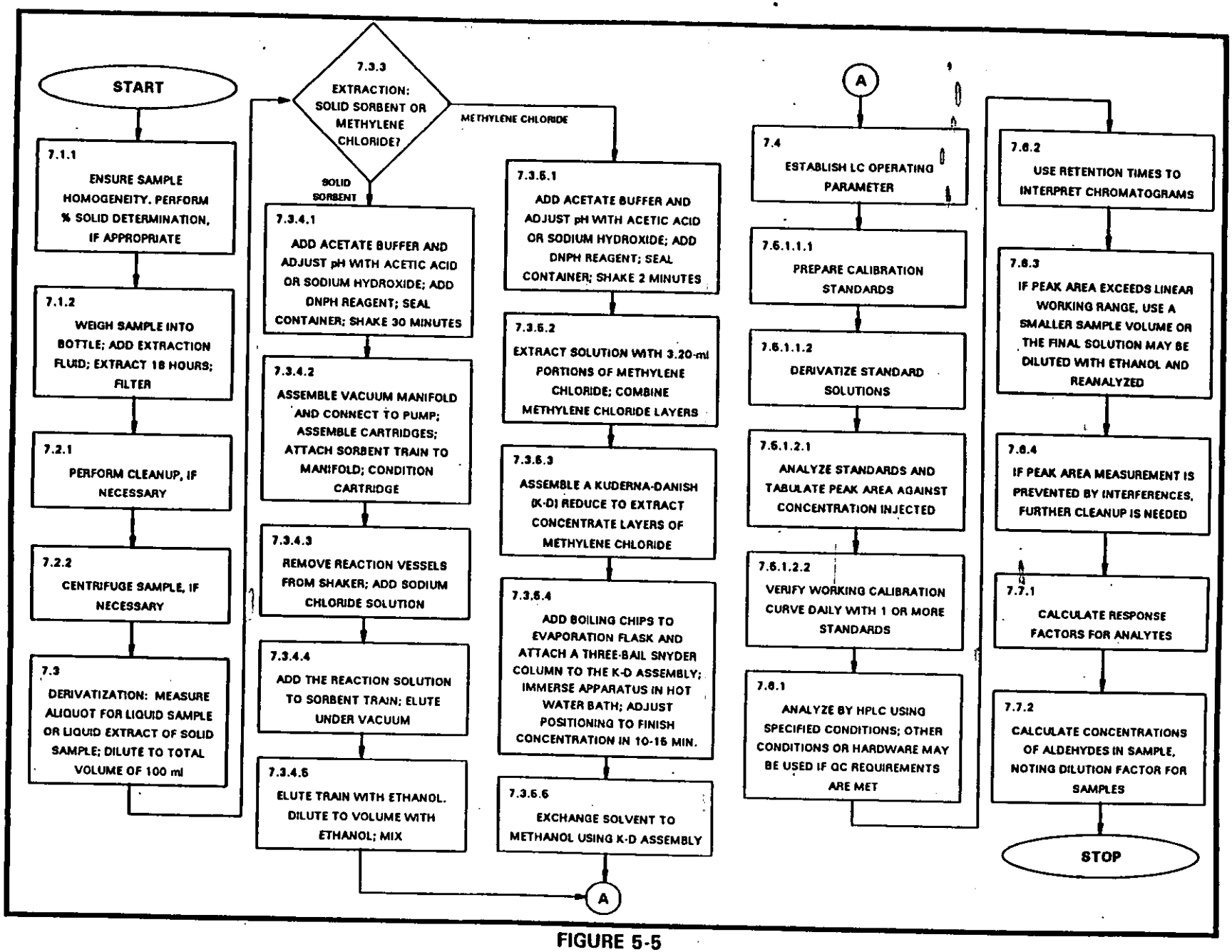


FIGURE 5-5
ANALYTICAL SCHEME FOR ALDEHYDES/KETONES

digital (ASCII) format, and transmits the data to a computer for data logging. The WESTON data logging program reads the digital output from the Molytek 2702 approximately once per second. The speed varies depending upon the number of active channels, microprocessor speed, and the baud rate for transmission. The data logger calculates a 1-minute average from the instantaneous readings and stores this average on a hard disk. The data logger displays the instantaneous channel values in real-time, with updates every 5 seconds. The 1-minute average and a rolling 60-minute average values are also displayed.

At the close of each test period, the CEM data was stored on the hard disk drive and downloaded to a Lotus 1-2-3 spreadsheet to calculate discreet time periods and to correct for calibration drift.

The analyzers used for this evaluation of the emissions were:

Parameter	Manufacturer and Model	Detection Method
CO	Thermo Electron Model 48	NDIR
NO_x	Thermo Electron Model 10A	Chemiluminescent Detector
THC	J.U.M. Model VE-7	FID (heated)

The analyzers were calibrated at the start and end of each test day and/or test series. Analyses of calibration gases from NIST traceable cylinders were performed along with zero checks. Three-point calibrations (low, mid, and high range) were performed directly for each analyzer. Bias checks were performed by introducing the calibration standard that is closest to the observed concentration in the sample gas at a three-way valve on the probe. Bias checks performed at the intervals between each test repetition were averaged to correct for instrument drift. The bias calibration gases are sent to the probe valve through a separate Teflon line and back through the heated sample line and sample conditioning system to the instrument to determine the entire sampling system calibration bias. Bias calibration gas flow is regulated to maintain sample line pressure. All calibrations, zero and calibration drift tests, and QA procedures followed the specific requirements in the EPA

reference methods. The calibration drift correction described in EPA Method 6C was used for all analyzers.

5.4.3 Particulate and Condensible Particulate

Particulate and condensible particulate emissions were withdrawn isokinetically from the MDF cyclone outlet gas streams using an EPA Method 5/202 sampling train. A schematic of the sampling train is shown in Figure 5-6. This sampling train consisted of the following components:

- A stainless steel or glass nozzle with an inside diameter sized to sample isokinetically.
- A heated, (248 ± 25 °F) borosilicate-lined probe, approximately 5 ft long, equipped with a calibrated thermocouple to measure flue gas temperature and a calibrated S-type pitot tube to measure flue gas velocity pressure.
- A heated oven containing a section of borosilicate tubing followed by a borosilicate filter holder with a preweighed 9-cm quartz fiber filter.
- Borosilicate tubing to connect the outlet of the filter holder to the first impinger.
- An impinger train containing four impingers (No. 1 - 100 ml DI H_2O; No. 2 - 100 ml DI H_2O; No. 3 - dry; No. 4 - 300 gm silica gel).
- A vacuum hose with adapter to connect the outlet of the impinger train to a control module.
- A control module containing a 3-cfm carbon vane vacuum pump (sample gas mover), a calibrated dry gas meter (sample gas volume measurement device), a calibrated orifice (sample gas flow rate monitor), and inclined manometers (orifice and gas stream pressure indicators).
- A switchable calibrated digital pyrometer to monitor flue and sample gas temperatures.

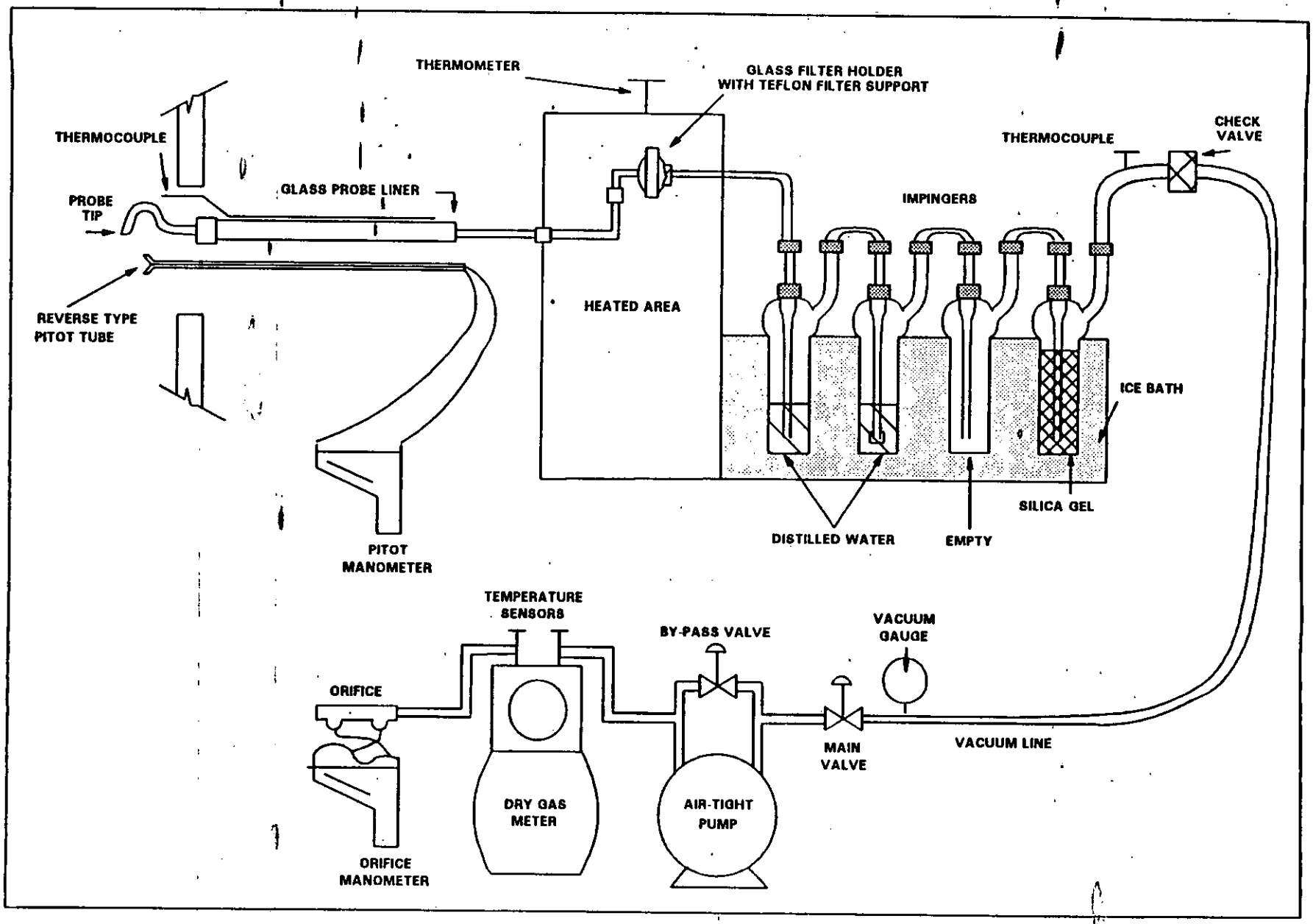


FIGURE 5.6

EPA METHOD 5/202

PARTICULATE & CONDENSIBLE PARTICULATE SAMPLING TRAIN

Preparation, testing, and sample recovery techniques, as shown in Figures 5-7, 5-8, and 5-9, respectively, conformed to those specified in Section 4 of EPA Method 5 and section 3.2 of EPA Method 202. Each test was 60 minutes in length and at least 30 dry standard cubic feet of flue gas was sampled. All runs were isokinetic ±10 percent.

Analytical procedures and calculations for particulate determination were performed as specified in Sections 4 and 6 of Method 5, and Section 5 of Method 202. The analysis procedure is described below:

- The filter and any loose fragments were desiccated for 24 hours and weighed on a calibrated analytical balance to the nearest 0.1 mg to a constant weight. "Constant weight" means a difference of no more than 0.5 mg or 1% of total weight less tare weight, whichever is greater, between 2 consecutive weighings, with no less than six hours of desiccation time between weighings.

- The front-half acetone wash samples and corresponding blank were evaporated at ambient temperature and pressure in tared beakers, and then desiccated to constant weight to the nearest 0.1 mg.

- The back-half methylene chloride rinse was evaporated at ambient temperature and pressure in tared breakers and then desiccated to a constant weight to the nearest 0.1 mg.

The material collected in the nozzle, probe, flask or connector, front-half of the filter holder, and on the quartz fiber filter represents the EPA Method 5 particulate catch. Water vapor and the condensible particulate were collected in the impinger portion. The total weight measured in the back half wash fraction represents the EPA Method 202 condensible particulate catch for each run. Acetone and methylene chloride blank corrections were made on all wash sample weights.

A figure presenting the particulate analysis scheme is shown in Figure 5-10.

5.4.4 PM 10 and Condensible Particulate

PM_{10} and condensible particulate emissions from the MDF press stacks, microboard press stacks, and core and surface EFB outlet gas streams were collected using an EPA Method 201A/202 sampling train. The PM_{10} emissions at the MDF cyclone outlet were determined

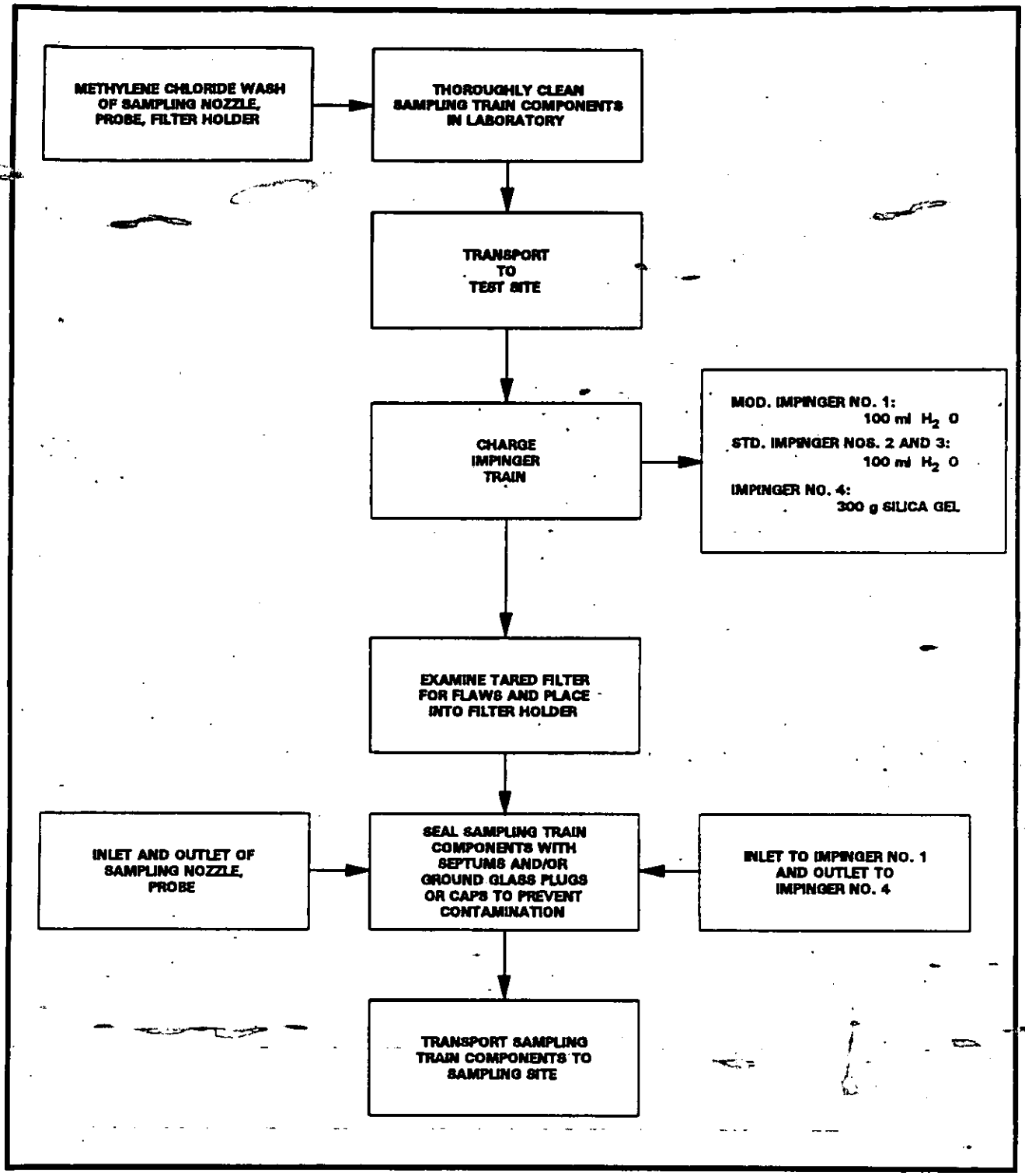


FIGURE 5-7
PREPARATION PROCEDURES FOR
PARTICULATE AND CONDENSIBLE PARTICULATE SAMPLING TRAIN

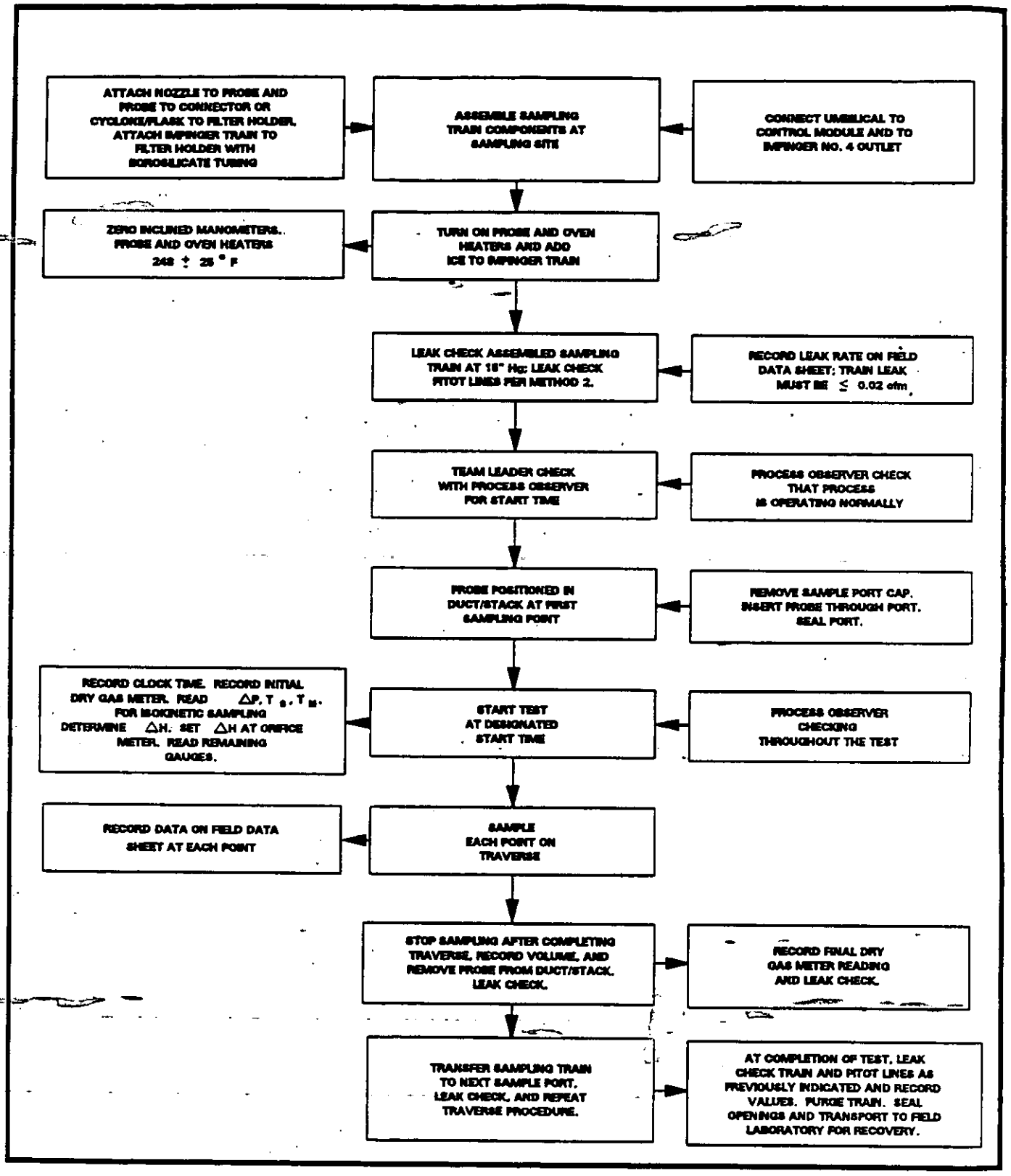


FIGURE 5-8
TEST PROCEDURES FOR
PARTICULATE AND CONDENSIBLE PARTICULATE SAMPLING TRAIN

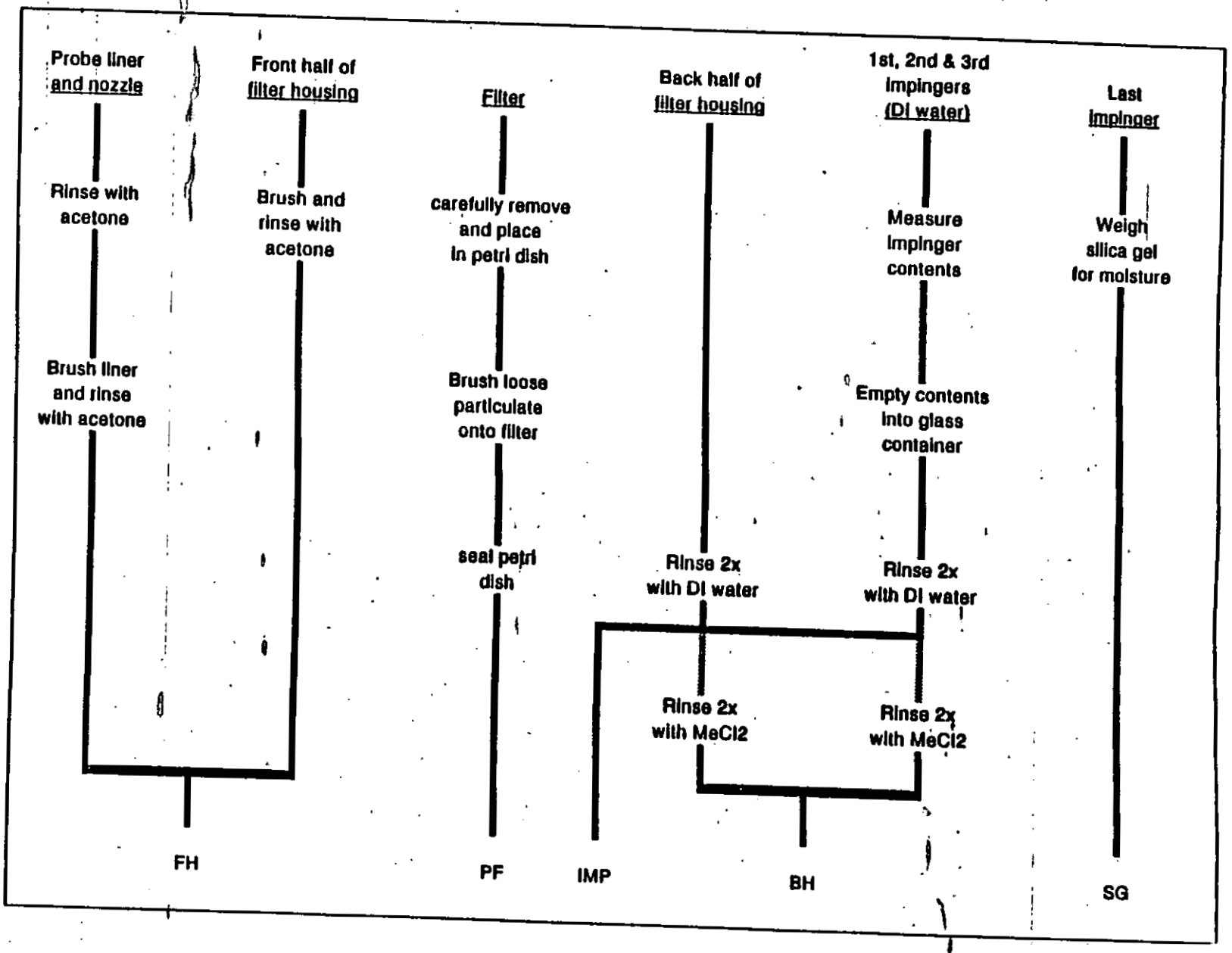


FIGURE 5-9. SAMPLE RECOVERY PROCEDURES FOR PARTICULATE/CONDENSIBLES TRAIN.

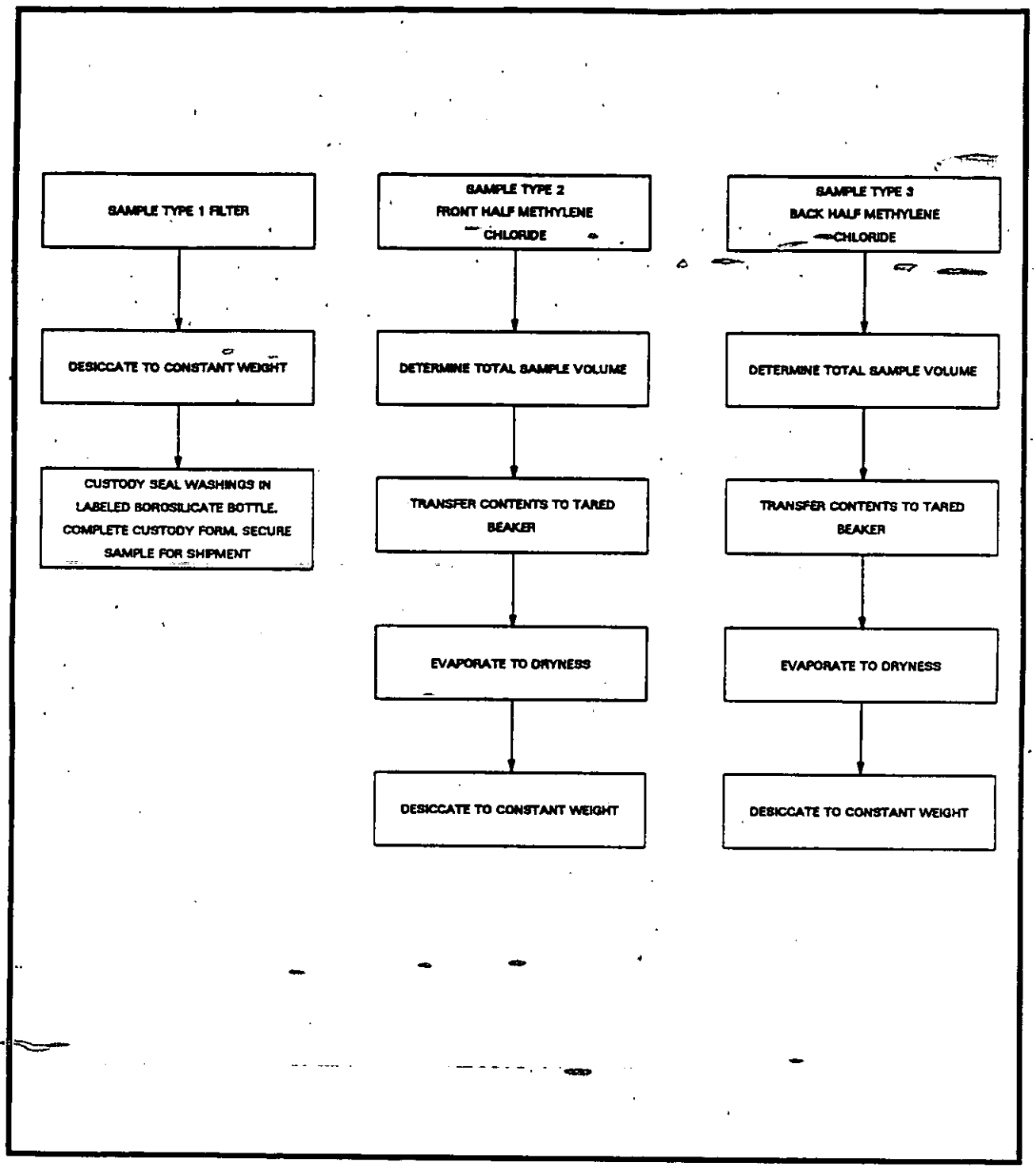


FIGURE 5-10
ANALYSIS PROCEDURES FOR PARTICULATE SAMPLES

using a Method 201A sampling train. A minimum of 30 dscf was collected per run. A sampling train schematic is shown in Figure 5-11. The sampling train consisted of the following components:

- A PM_{10} stainless steel nozzle with an inside diameter sized to sample isokinetically.
- PM_{10} sizing cyclone designed to aerodynamically fractionate particulate at a 10 micron cut point.
- A heated stainless steel probe equipped with a calibrated thermocouple to measure flue gas temperature and a calibrated S-type Pitot tube to measure flue gas velocity pressure.
- A section of borosilicate tubing to connect the outlet of the sampling probe to the first impinger.
- An impinger train consisting of four impingers. The first two impingers contained 100 ml of H_2O. The third impinger was dry and the fourth contained 300 grams of dry preweighed silica gel.
- A vacuum hose with adapter to connect the outlet of the impinger train to a control module.
- A control module containing a 3-cfm carbon vane vacuum pump (sample gas mover), a calibrated dry gas meter (sample gas volume measurement device), a calibrated orifice (sample gas flow rate monitor), and inclined manometers (orifice and gas stream pressure indicators).
- A switchable calibrated digital pyrometer to monitor flue and sample gas temperatures.

The preparation, sampling, and recovery procedures that were used to determine PM_{10} at all locations during the program are included in Figures 5-12, 5-13 and 5-14, respectively. For the Method 202 procedure used in conjunction with Method 201A, refer to Section 5.4-3. The PM10 analysis procedure is the same as Method 5; refer to Figure 5-5 for a schematic of the sampling analysis.

5.4.5 Semivolatiles

The semivolatile organic emissions at the core and surface EFB outlets and the MDF cyclone outlet were determined using Method 0010. The sampling train as shown in

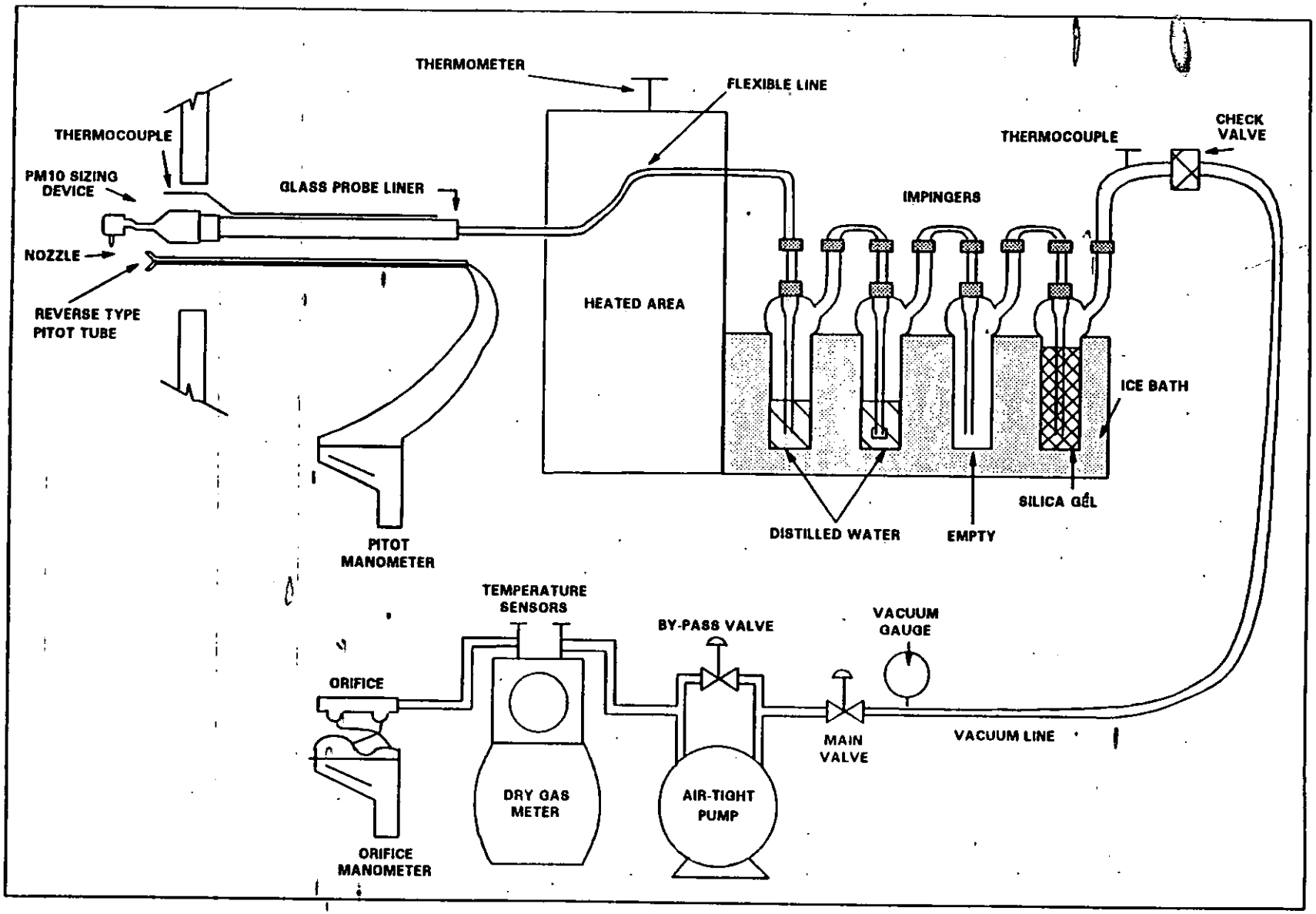


FIGURE 5-11
EPA METHOD 201A
PM10 SAMPLING TRAIN

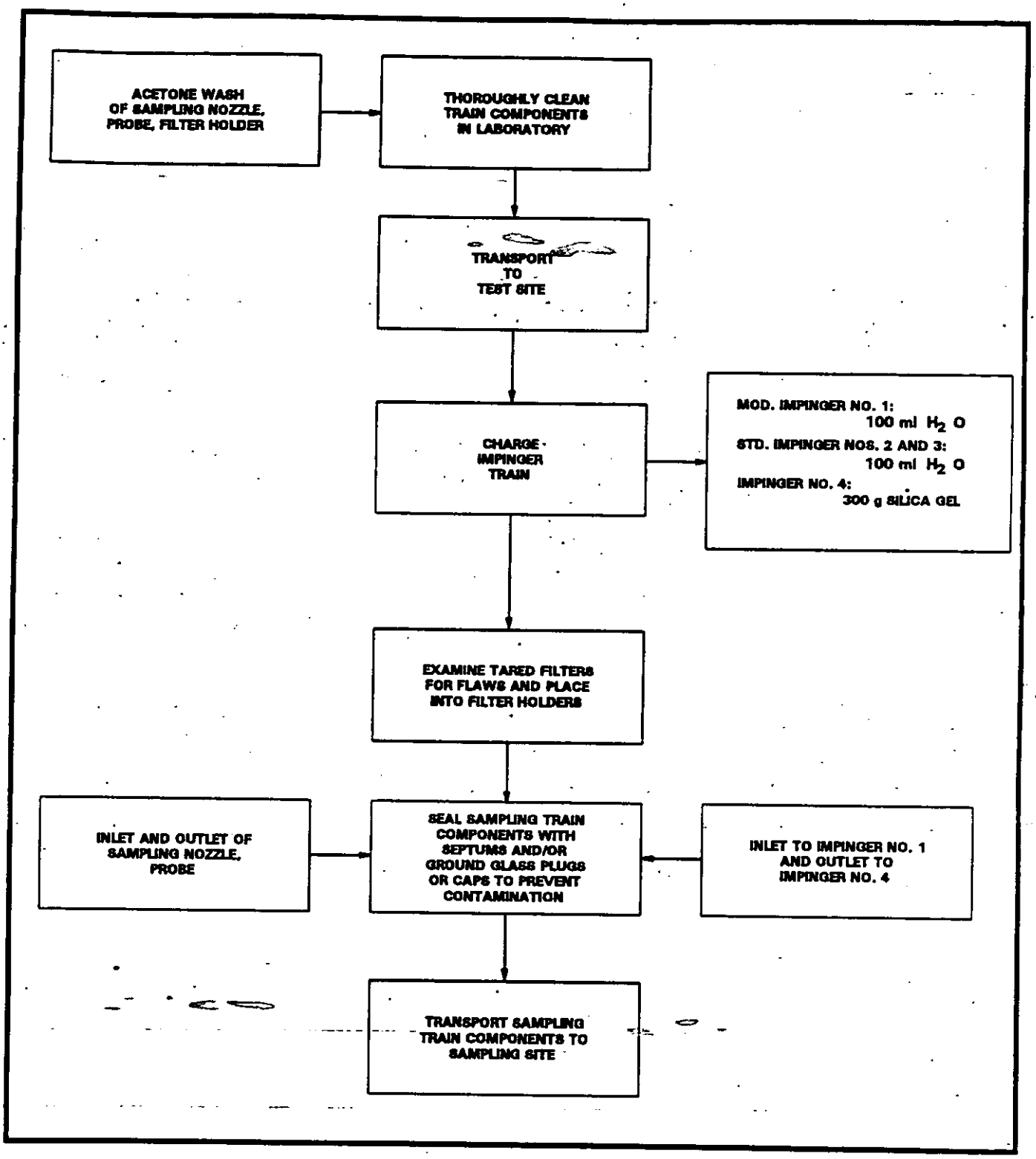


FIGURE 5-12
PREPARATION PROCEDURES FOR
PM10 SAMPLING TRAIN

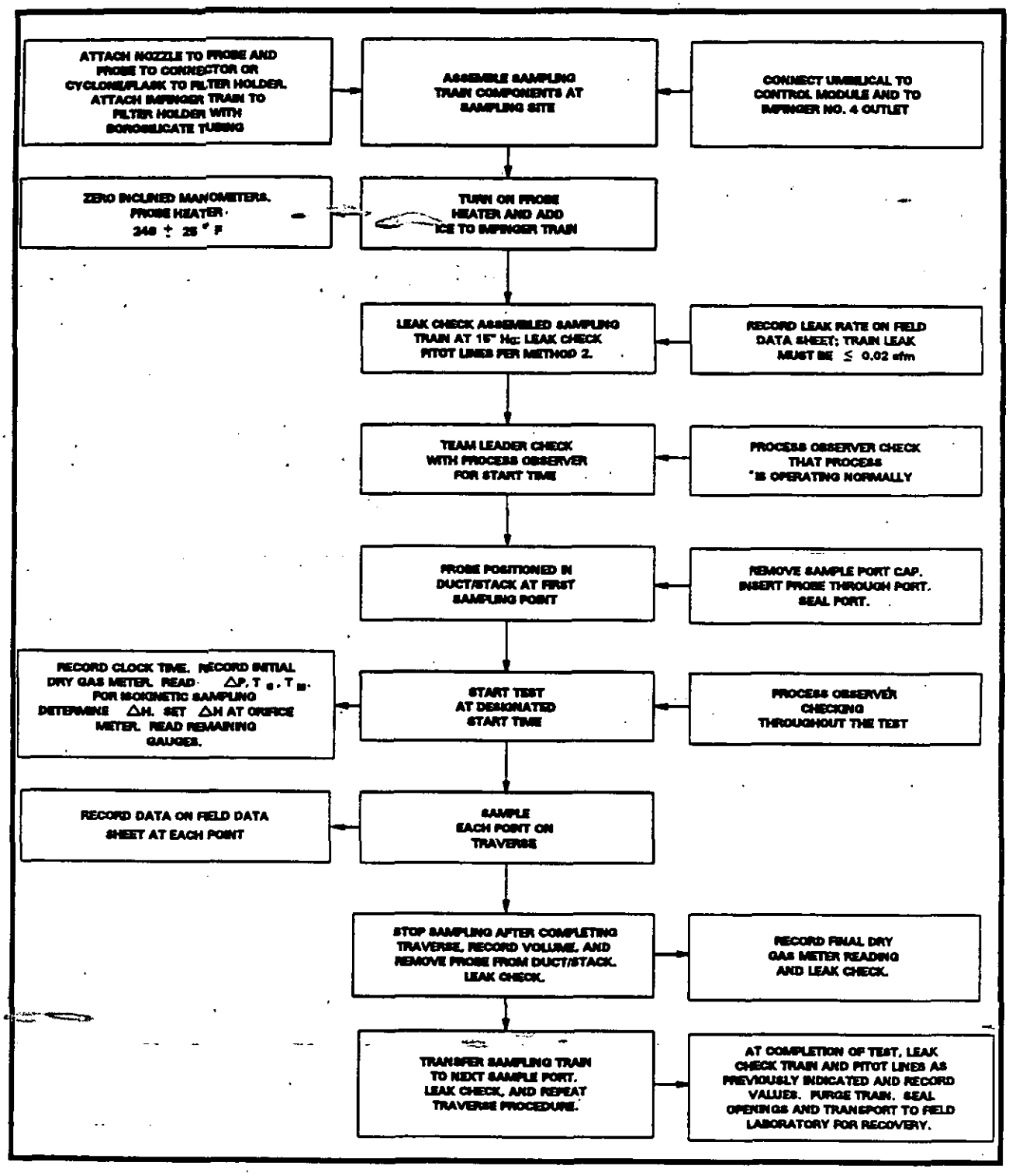


FIGURE 5-13
TEST PROCEDURES FOR PM10 SAMPLING TRAIN

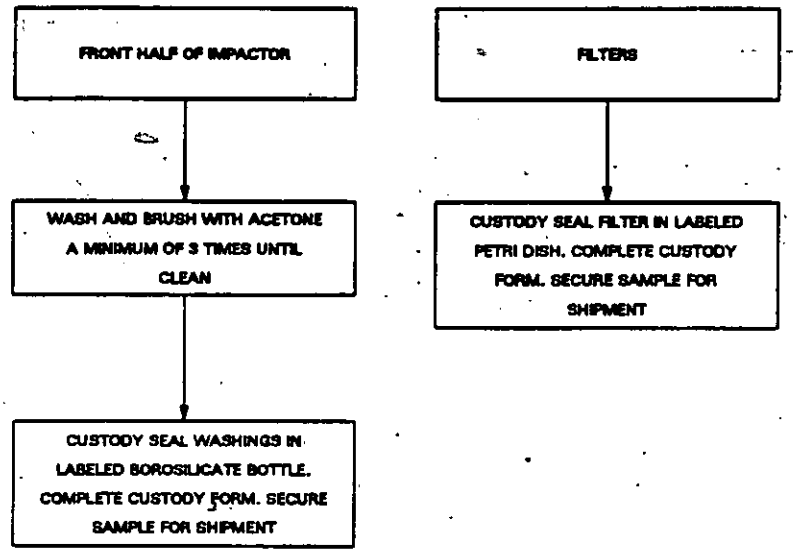


FIGURE 5-14
SAMPLE RECOVERY PROCEDURES FOR
PM-10 SAMPLING TRAIN

Figure 5-15 consisted of the following components:

- A stainless steel or glass nozzle with an inside diameter sized to sample isokinetically.
- A heated (248 ± 25°F), 5-ft borosilicate-lined probe equipped with a calibrated thermocouple to measure flue gas temperature and a calibrated S-type pitot tube to measure the flue gas velocity pressure.
- A heated oven containing a borosilicate connector, cyclone/flask and filter, holder with a Soxhlet-extracted glass fiber filter.
- A borosilicate connector to join the outlet of the filter holder to the inlet of the impinger train.
- An impinger train consisting of a Graham (spiral) type ice-water cooled condenser, a temperature sensor (thermocouple), an ice-water jacketed solvent module containing 40 grams of 30/60 mesh Amberlite™ XAD-2 (pre-extracted), a 1-liter condensate trap, one standard and one modified Greenburg-Smith impinger each containing 100 ml high purity (HPLC) water, an empty standard Greenburg-Smith impinger, and a final impinger containing 300 grams of dry preweighed silica gel plus a thermocouple to detect sample gas exit temperature.
- A vacuum line (umbilical cord) with adapter to connect the outlet of the impinger train to a control module.
- A control module containing a 3-cfm carbon vane vacuum pump (sample gas mover), a calibrated dry gas meter (sample gas volume measurement device), a calibrated orifice (sample gas flow rate monitor), and inclined manometers (orifice and gas stream pressure indicators).
- A switchable calibrated digital pyrometer to monitor flue and sample gas temperatures.

The material collected in the nozzle, probe, connector or cyclone/flask, front-half filter holder, and on the glass fiber filter were combined with the rinses/extract of the connectors, condenser, and XAD sorbent for the determination of the semivolatiles. A minimum of 3 cubic meters of gas was collected per sample.

The preparation, sampling and recovery procedures used for the semivolatile sampling train are included in Figures 5-16, 5-17, and 5-18 respectively. The sampling rate during each test was isokinetic ± 10% and never exceeded the maximum rate of 0.75 cfm specified by the test

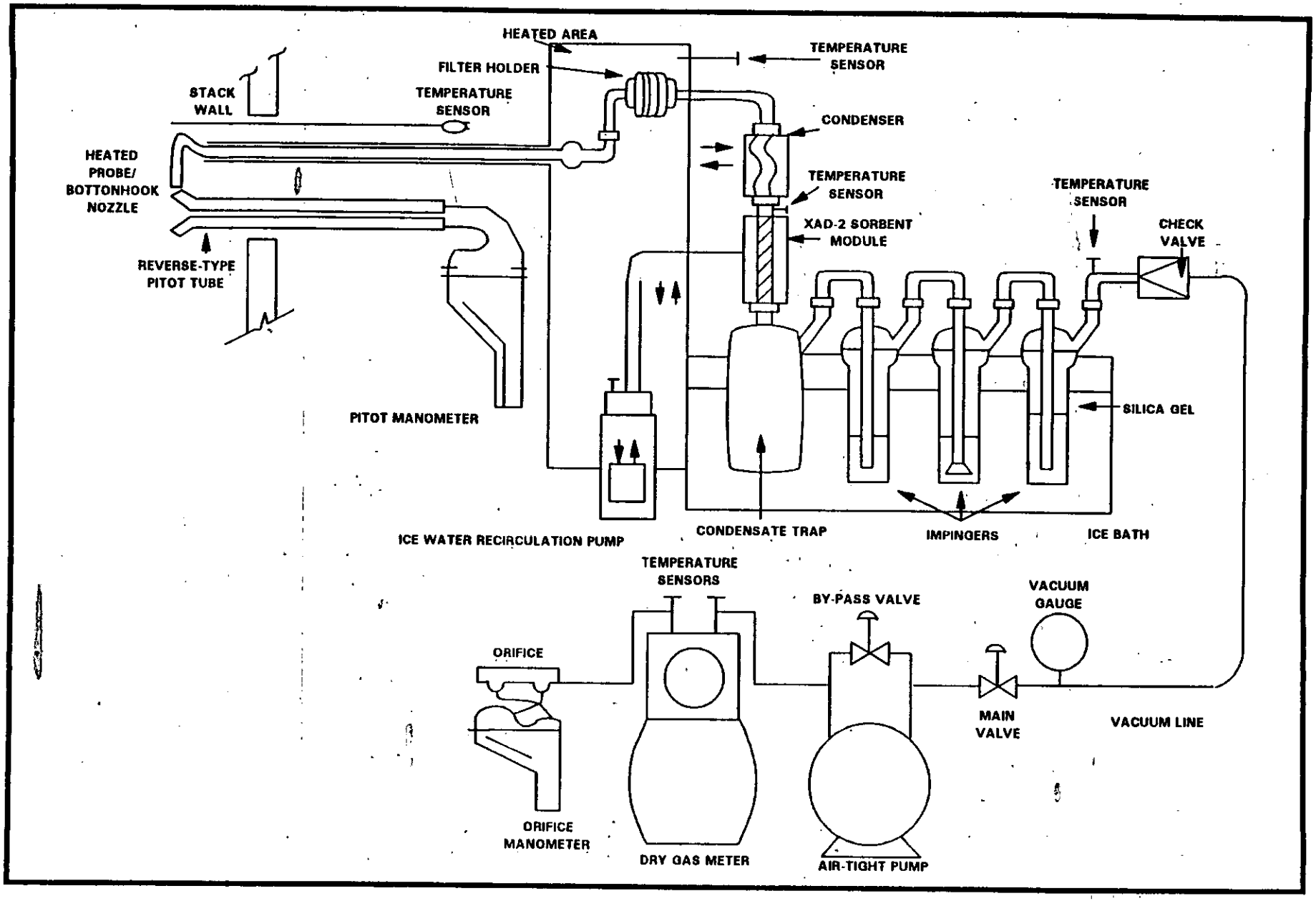


FIGURE 5-15
EPA METHOD 0010
SEMI VOLATILE ORGANIC HAPs SAMPLING TRAIN

SCH-MM5

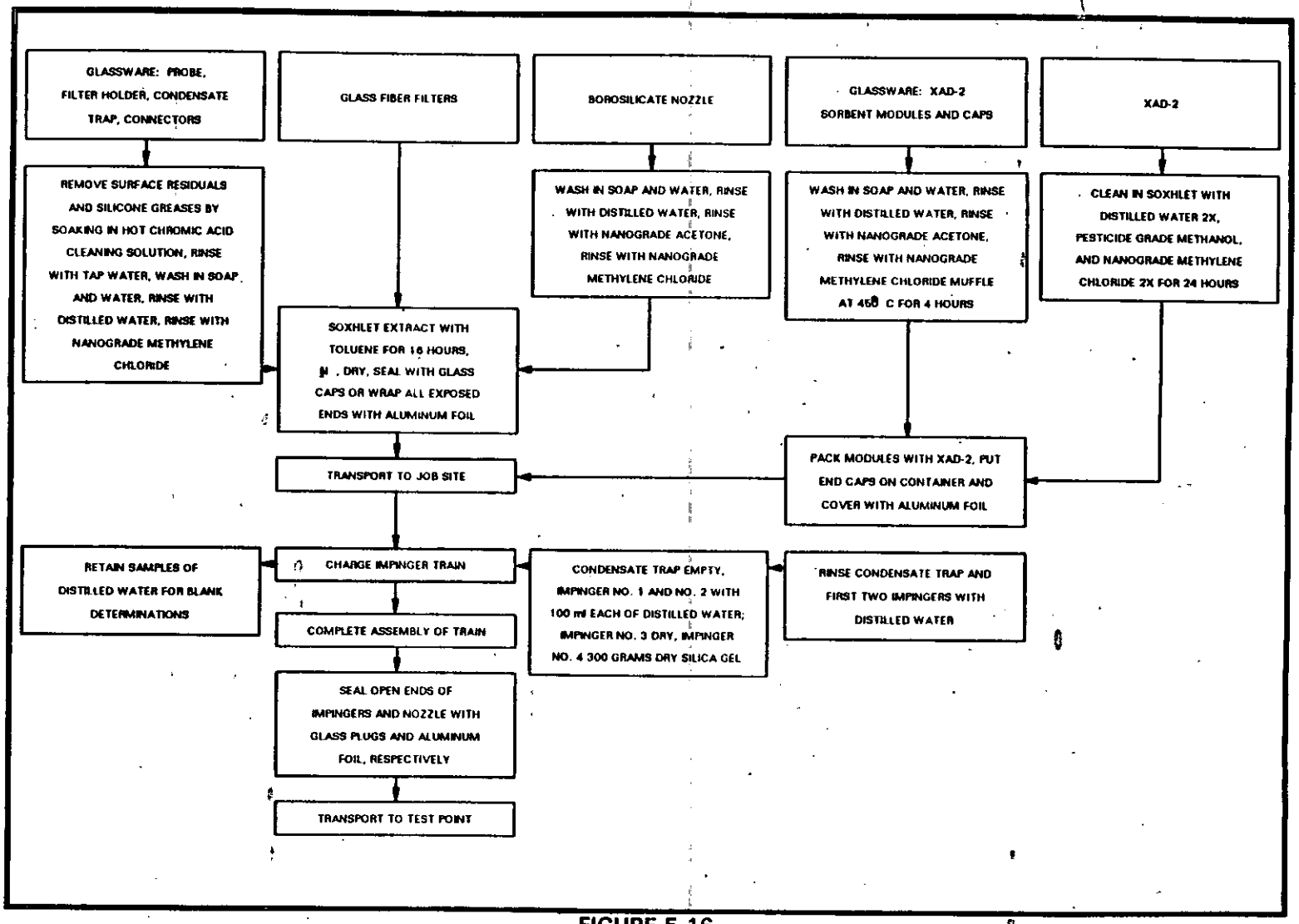


FIGURE 5-16
PREPARATION PROCEDURES FOR SEMIVOLATILE HAPs SAMPLING TRAIN

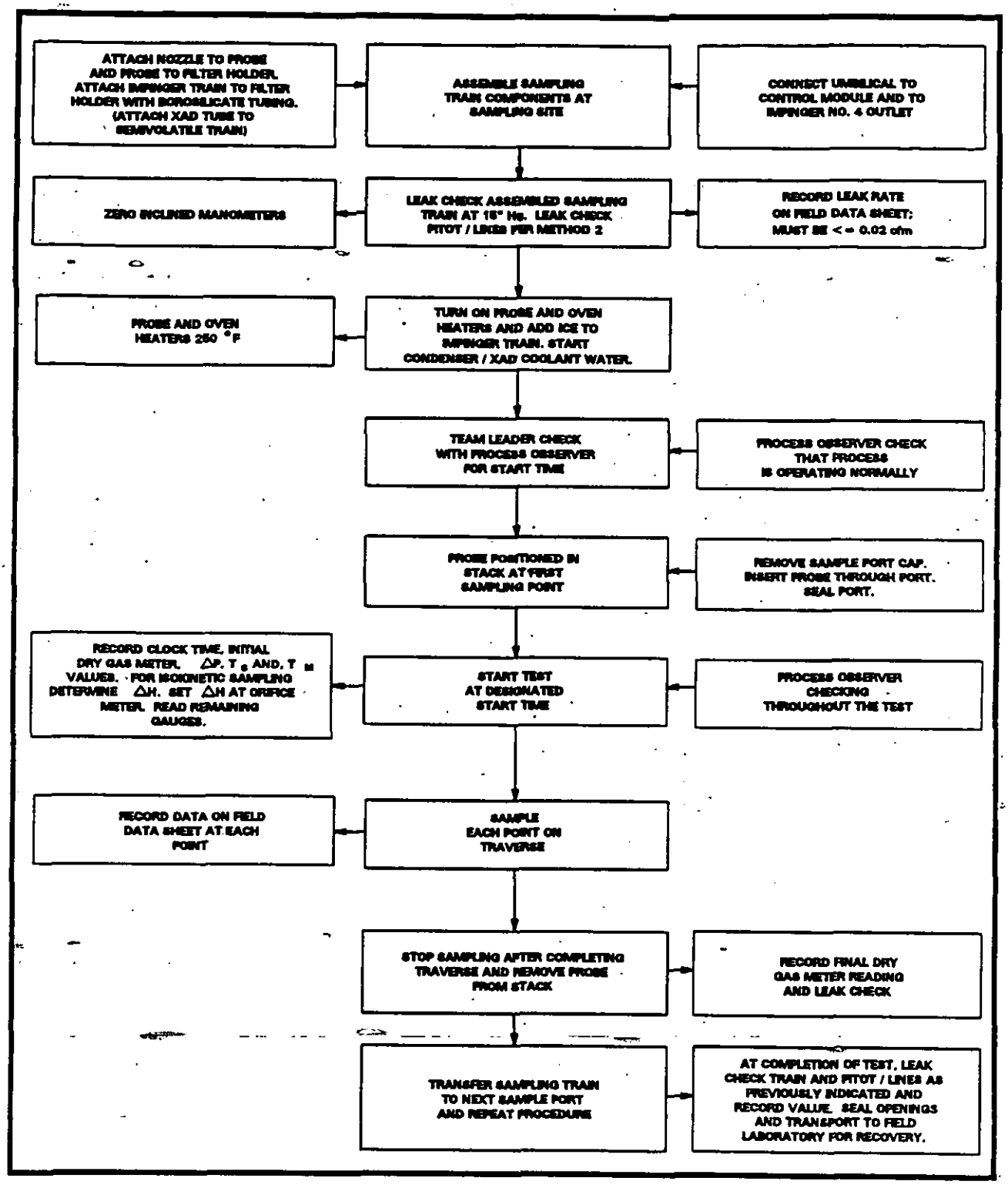


FIGURE 5-17
SAMPLING PROCEDURES FOR SEMIVOLATILE HAPS

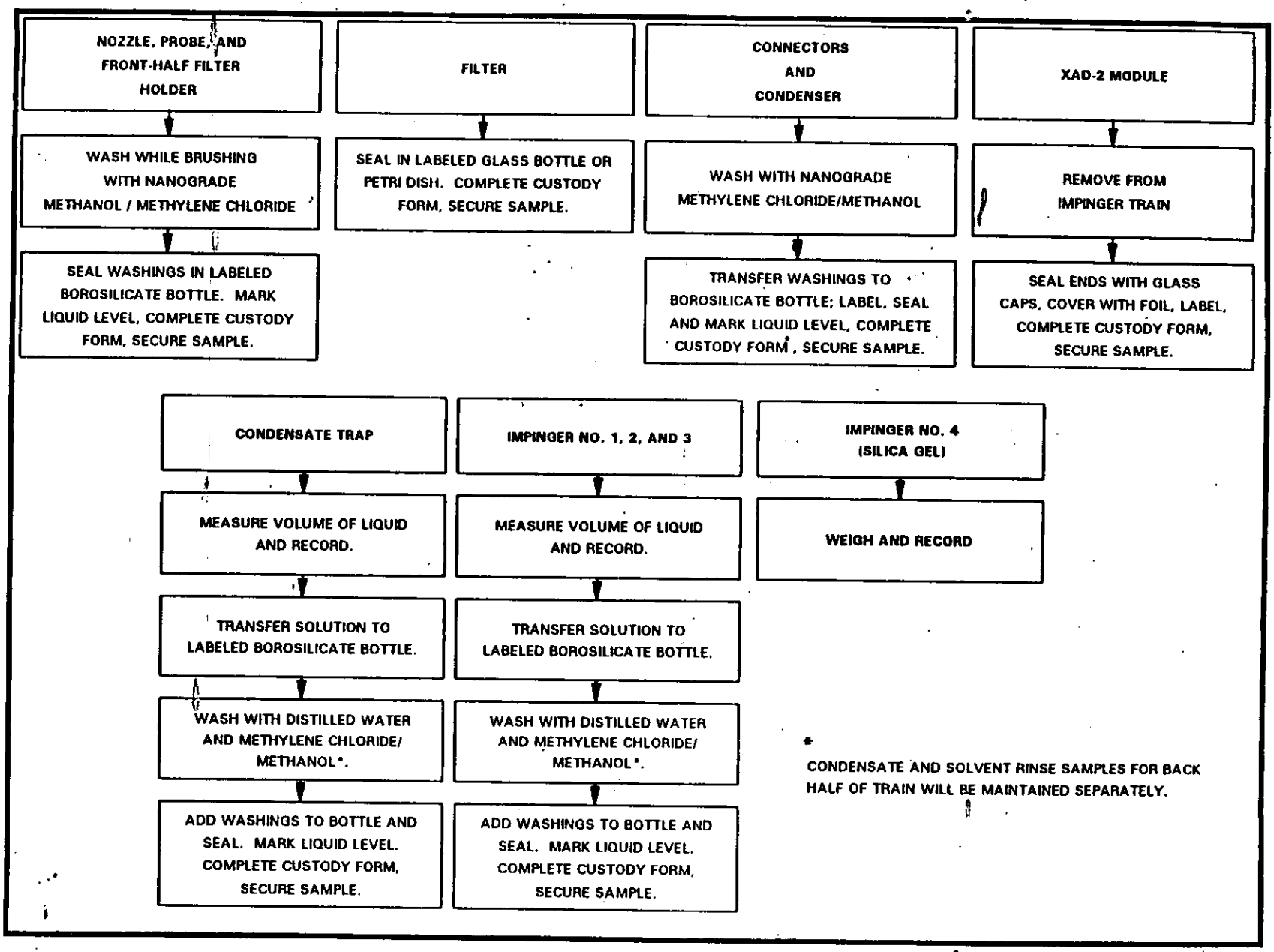


FIGURE 5-18
SAMPLE RECOVERY PROCEDURES FOR SEMIVOLATILE HAPS

ws27rept\drawings\recovery\m0010rec.wey

method. A blank train was set up, leak checked, and sealed for the duration of one of the tests performed at the EFB outlet and the MDF cyclone outlet. The purpose of this train blank was to determine whether contamination occurred during preparation, setup, recovery, or analysis steps. These and other QC checks are discussed in further detail in Section 6.

The analysis procedure for the semivolatile organics is summarized below. See EPA Methods 8270 for detailed specification of the analysis procedures.

- Concentrate each front-half wash sample to 1-5 ml using a rotary evaporator apparatus. Rinse sample container three times with methylene chloride, add to concentrated solution, and concentrate further to near dryness.

- Add above concentrate to the filter and XAD-2 resin in a soxhlet apparatus that contains a precleaned glass extraction thimble and silica gel. Add semivolatile internal standard. Cover with a plug of precleaned glass wool. Reflux sample with toluene or methylene chloride for 16 hours. Transfer extract using three 10 ml rinses of toluene to a rotary evaporator and concentrate to approximately 8 ml. Reduce to 1 ml under nitrogen stream. Split sample in half. One split is analyzed, and the second is stored.

- The back-half impinger solvent rinse is concentrated to 2 ml using a rotary evaporator, then added to the impinger water/condensate sample. Following solvent addition the sample is spiked with the appropriate semivolatile internal standards. A liquid extraction is conducted using methylene chloride. The extract is combined with the front-half extract for cleanup and analysis.

- The remaining extract is analyzed for the semivolatile compounds utilizing EPA Method 8270 procedures for high-resolution GC with low-resolution mass spectrometry.

The analytical scheme for the EPA 8270 procedures is shown in Figure 5-19.

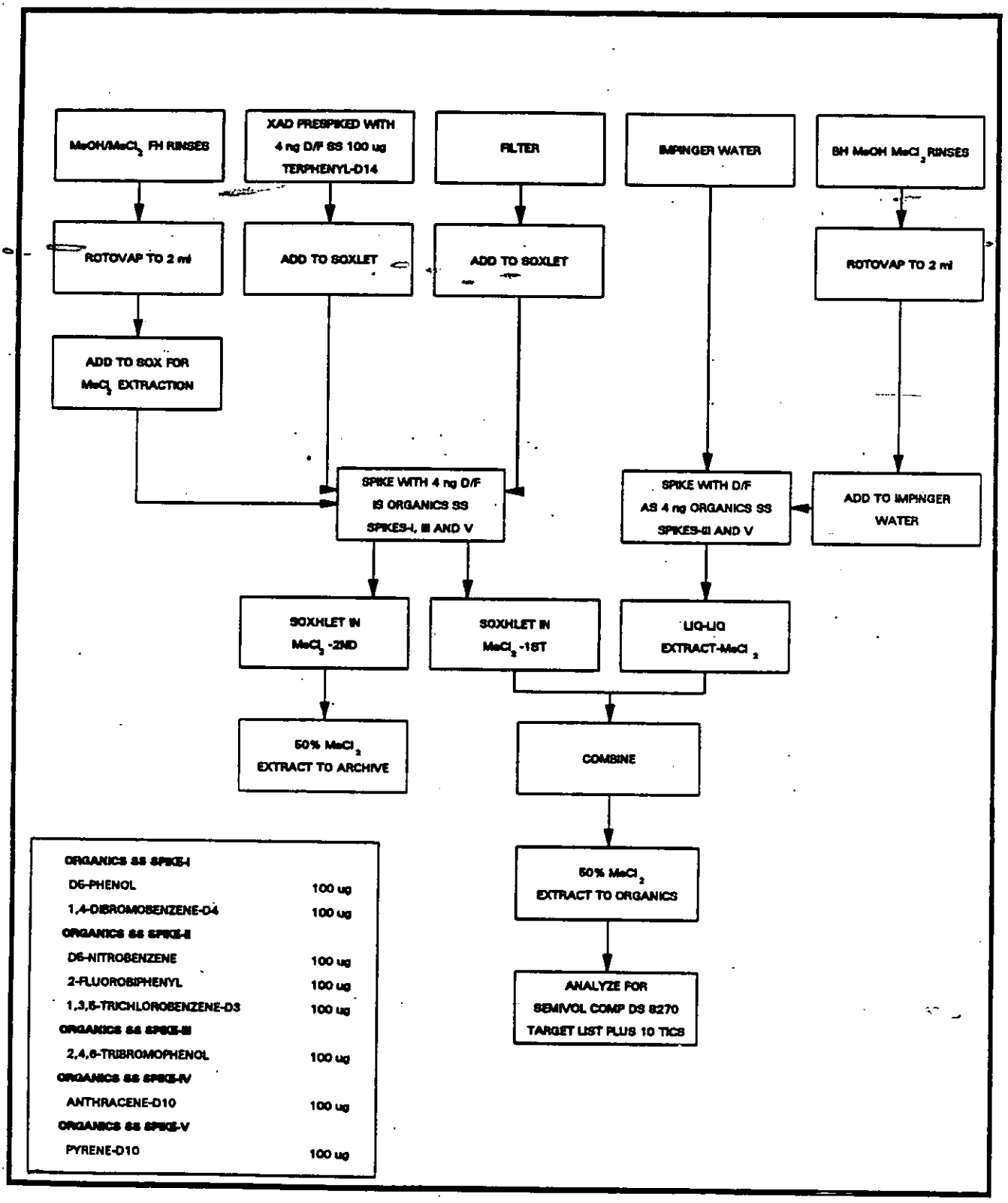


FIGURE 5-19
SEMIVOLATILE HAPs ANALYSIS SCHEME

5.4.6 Volatile Organics

The volatile organic emissions for the core EFB and surface EFB outlets and the MDF cyclone outlet were determined by Method 0030. A schematic of the sampling train is shown in Figure 5-20. This sampling train consisted of the following components connected in series:

- A heated glass probe, 5 ft in length, containing a glass wool particulate filter.
- The probe is connected to an ice water-cooled condenser followed by a temperature sensor, an adsorption cartridge containing 1.6 grams of Tenax-GC, and a condensate trap.
- A section of Teflon tubing is used to connect the outlet of the condensate trap to a second condenser which is followed by a back-up sorbent trap containing 1 gram of Tenax-GC and 1 gram of activated charcoal, a second condensate collector, and a tube containing an unweighed amount of dry silica gel.
- The tube of silica gel is connected, via an umbilical cable, to a control console containing flow controllers, a calibrated 1-liter-per-minute dry gas meter, a sample pump, a temperature indicator, and other components.

The preparation, sampling, recovery, and analytical procedures that were used to determine the volatile organics are included in Figures 5-21, 5-22, 5-23, and 5-24. The volatile organics were determined by analyzing three of the pairs of traps per test run by EPA Method 5040 purge-trap-desorb GC/MS. EPA Method 8240 was used to analyze for volatiles in the condensate samples.

Each sorbent tube sample that was analyzed was spiked with internal standards, then thermally desorbed in a tube oven onto the Tenax analytical adsorbent trap. This procedure is described in Section 7 of the reference method. Each sample was then desorbed from the analytical adsorbent trap into the GC/MS system per EPA Method 5040. Analysis of the condensate samples was conducted as specified in EPA Method 624, P-T-D GC/MS. Laboratory results are reported as total micrograms of each volatile organic in the samples.

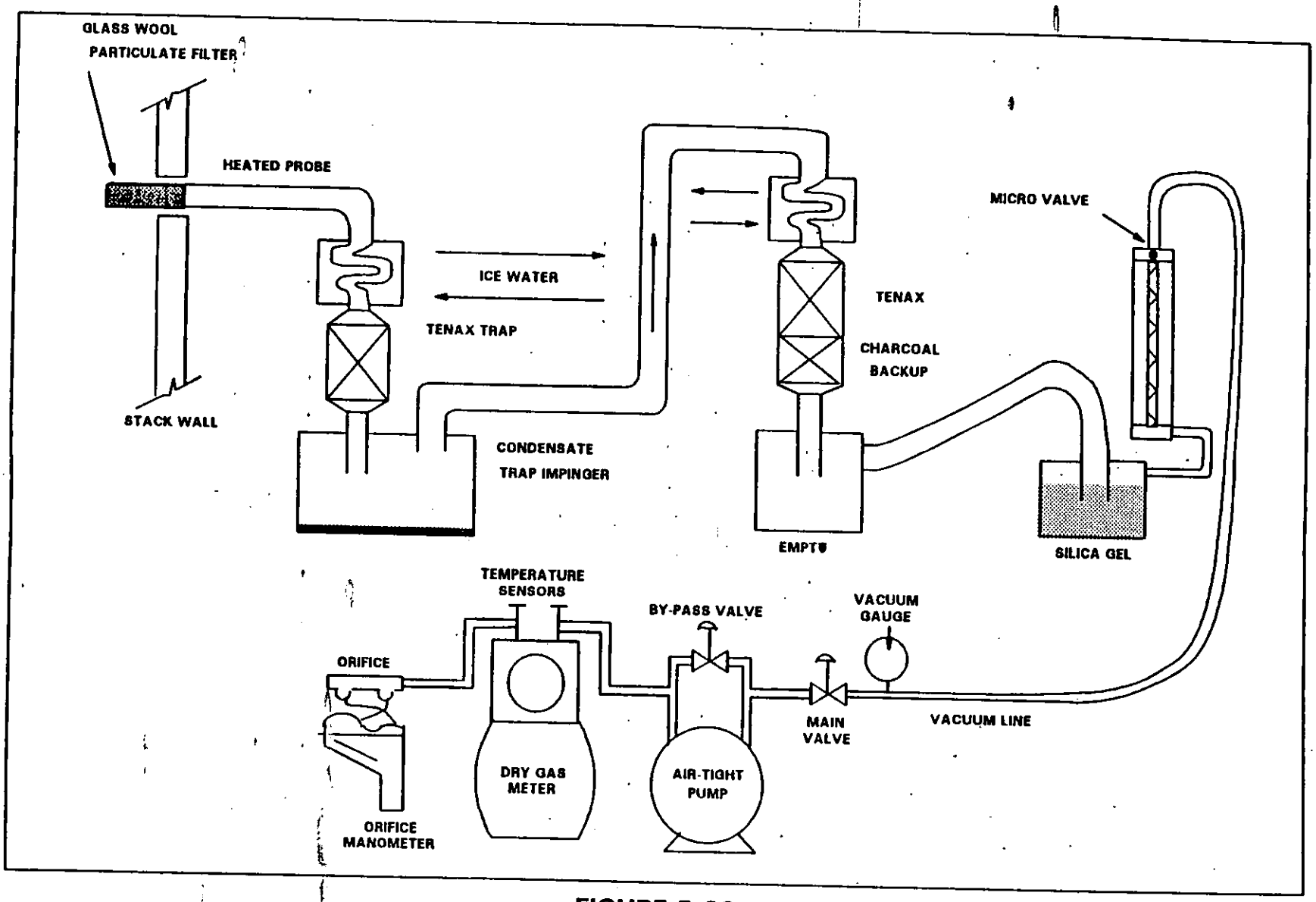


FIGURE 5-20
EPA METHOD 0030
VOLATILE ORGANIC SAMPLING TRAIN (VOST)

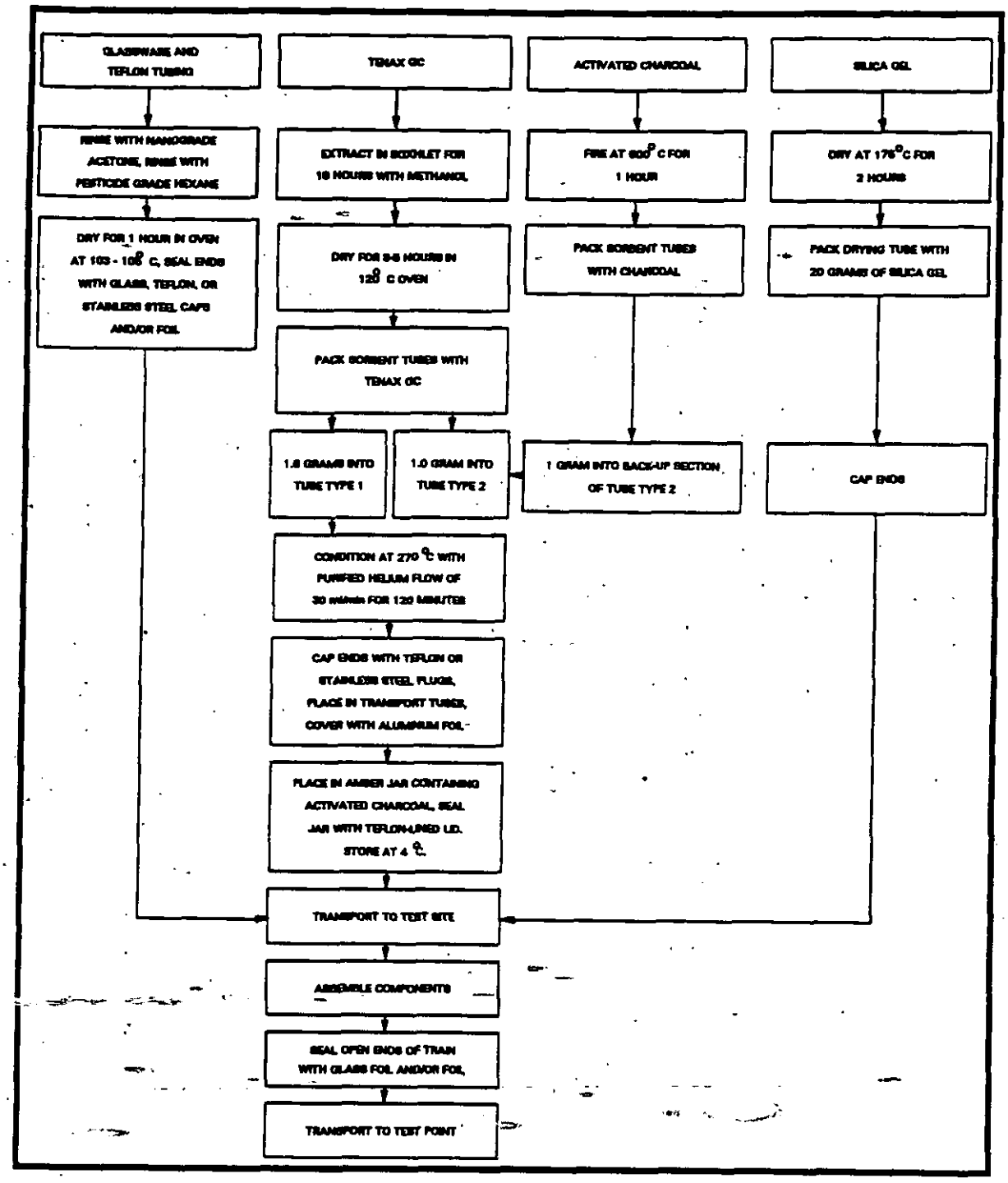


FIGURE 5-21
PREPARATION PROCEDURES FOR
VOLATILE ORGANIC SAMPLING TRAIN

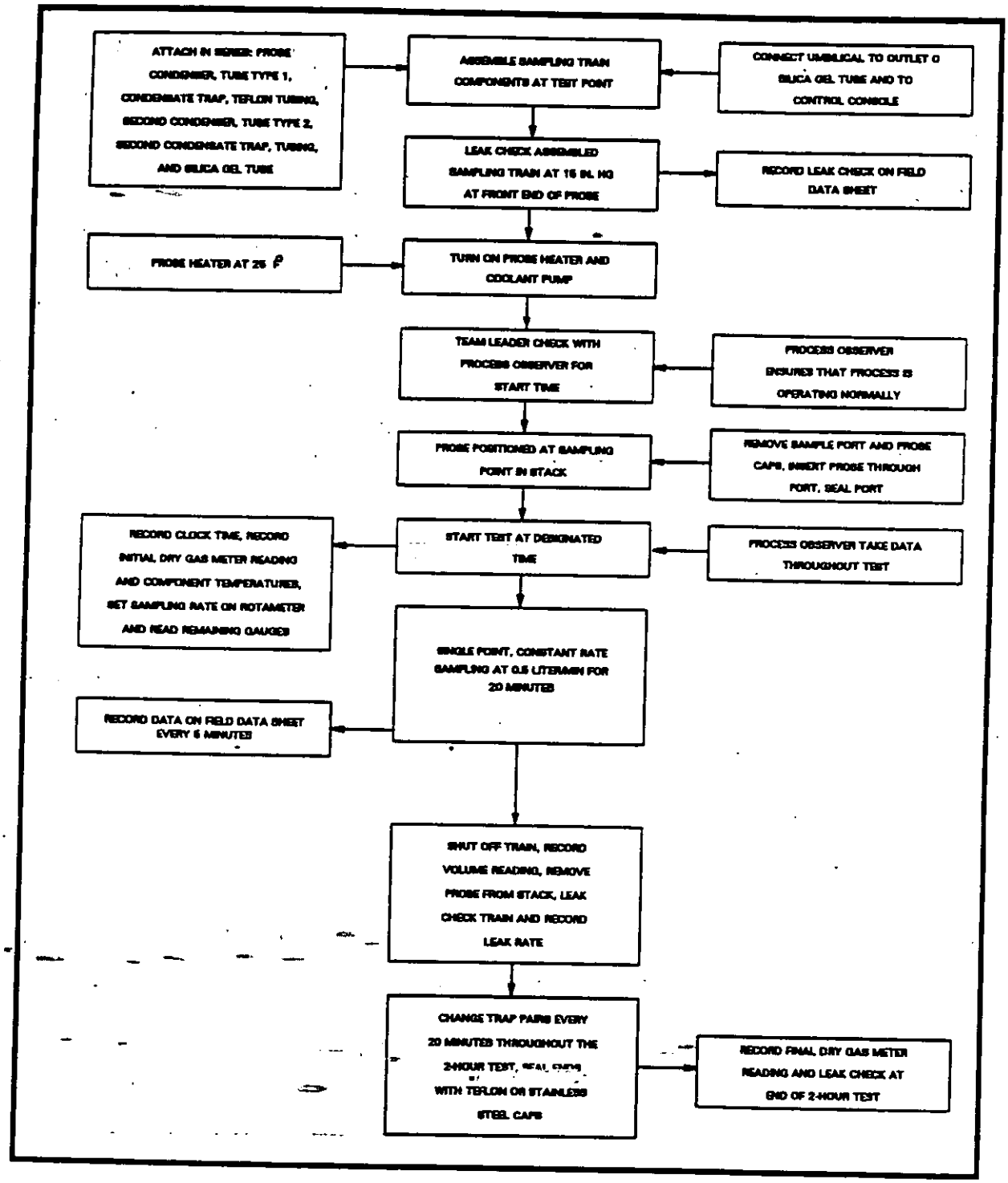


FIGURE 5-22
SAMPLING PROCEDURES FOR VOLATILE ORGANICS

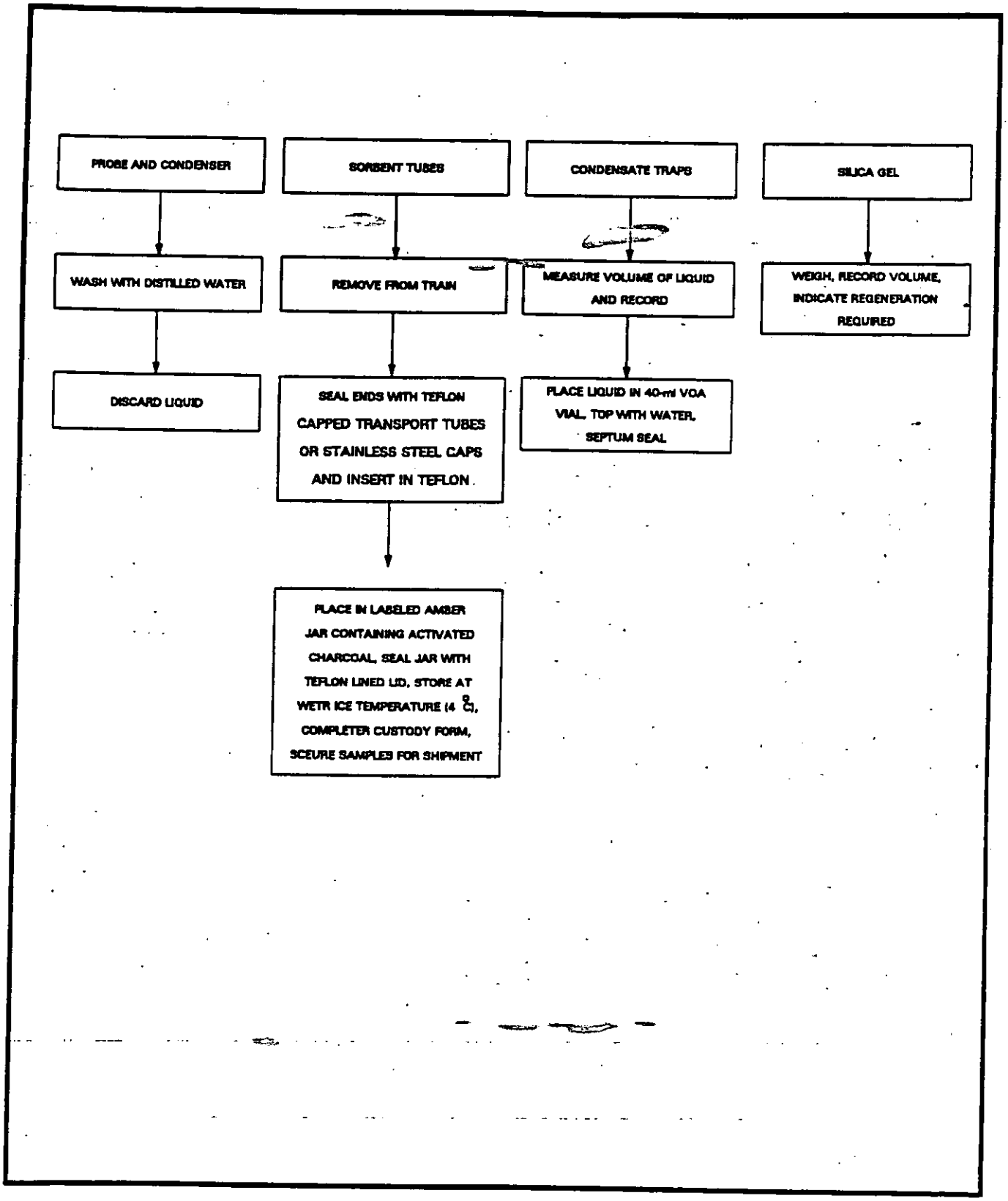
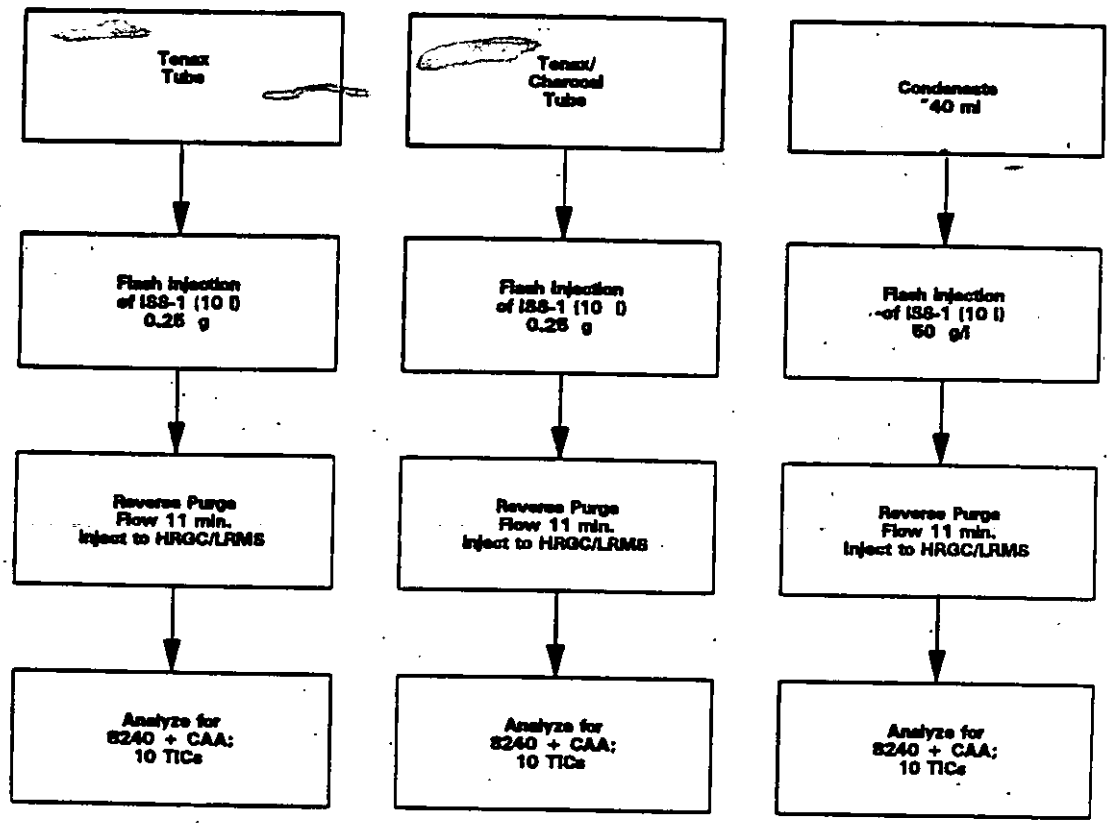


FIGURE 5-23
RECOVERY PROCEDURES FOR
VOLATILE ORGANICS



ISS-1 Conc. 25 icrograms/ml each

Internal Standard /Surrogate Solution

Bromochloromethane	ISTD
1,2-Dichloroethane-d4	SURR
1,4-Difluorobenzene	ISTD
Chlorobenzene-d5	ISTD
Toluene-d8	SURR
Benzene-d6	SURR
Xylene-d10	SURR

FIGURE 5-24
ANALYTICAL PROCEDURES FOR VOLATILE ORGANICS

BROY01-D15

SECTION 6

QUALITY ASSURANCE/QUALITY CONTROL ACTIVITIES

6.1 PRESENTATION

This section summarizes the quality assurance and quality control (QA/QC) activities that were implemented to assure WESTON successfully met the goals and objectives of this assignment. These procedures were an integral part of the testing program activities. Section 6.2 addresses the data quality objectives. Section 6.3 covers method-specific QC results for the flue gas sampling. Laboratory QC checks are discussed in Section 6.4. QC checks for data reporting are covered in Section 6.5, and audits and corrective actions are discussed in the subsections 6.6 and 6.7. The appendices present all necessary backup data.

6.2 DATA QUALITY OBJECTIVES

The overall objective of the sampling and analysis effort was to provide data that are precise, accurate, comparable, representative and complete for characterizing the sources to be evaluated under this assignment. The data quality objectives for this testing program were deemed complete if all planned data are obtained within the QA/QC criteria noted in the Test Plan and established by the applicable methods.

Data quality objectives are measured in terms of precision, accuracy and completeness. The WESTON QA objective of having 95% of the laboratory data usable without qualification was achieved. The overall QA objective of obtaining at least 80% usable data without qualification was obtained.

The comparability of the data is a qualitative, not quantitative, review of the measurement data. This QA objective determines the confidence with which data sets can be compared. The comparability has been ensured by WESTON's use of standardized test methods, QA plans, sample container preparation, sample handling procedures, analytical procedures,

calculation procedures, and report preparation. In addition, these activities were performed by properly trained, experienced personnel. The data from this survey can be compared to those obtained from other planned or previous programs that meet the data quality objectives.

6.3 QC FOR SAMPLE COLLECTION

The following subsections provide a list of method-specific QC procedures employed during the field sampling effort. The procedures specified for the particulate/condensibles will also apply to the other isokinetic sample trains (PM_{10}, aldehyde/ketone, MM5). General QC checks that applied to all methods include the following:

- leak checks;
- use of standardized forms, labels and checklists;
- maintenance of sample traceability;
- collection of appropriate blanks;
- use of calibrated instrumentation;
- use of Protocol 1 and/or NIST traceable calibration gases;
- review of data sheets in the field to verify completeness; and
- use of validated spreadsheets for calculating results.

While each team member shares in the responsibility to follow the stated Test Plan, the Field Manager was ultimately responsible for assuring each of these QC checks were fully and properly implemented.

6.3.1 Method 0011 Aldehyde/Ketones

QC procedures used to determine the accuracy of M0011 sampling runs are outlined in Draft SW-846 Method 0011, Sampling for Aldehyde and Ketone Emissions from Stationary Sources, Sections 3.5.11 and 3.5.12. These checks include:

- Use of reagents that meets method criteria. A supply of the DNPH reagent was prepared within 5 days of scheduled use. Two aliquots from each lot of DNPH were reserved for blank analysis as per Method 0011A.
- Collection of two field spike samples.
- Collection of three field blanks.

To further assure valid; representative sample collection for this system, the impingers were analyzed separately. The laboratory reports included in Appendix B-17 discusses the effectiveness of the collection efficiency. In general, the sample strategy used was effective in the capture of aldehyde/ketone emissions. Refer to Section 3.2.1 of this report for a discussion of the results.

The preparation and recovery of the EPA Method 0011 test train was performed in an area isolated from the preparation and recovery activities for the other test trains. This was to minimize the potential for contamination of the Method 0011 samples from acetone. Blank trains (identical to the EPA Method 0011 sample train) were charged, leak checked, and recovered. A blank train was setup for the MDF press stack, the microboard press stacks and the core EFB and surface EFB outlets. The blank trains were analyzed as a QC check to determine whether or not contamination occurred during preparation, setup, recovery or analysis. Variability in the acetone and acetaldehyde results (discussed in Section 3.2.1) introduced a degree of uncertainty. As such, these values should only be used for general estimates.

6.3.2 Continuous Emissions Monitoring

The QC procedures were performed on-site according to EPA Methods 10, 7E, and 25A for carbon monoxide, nitrogen oxides, and total hydrocarbon emissions, respectively. Additionally, the analyzers used were calibrated prior to leaving the home office and upon return from the job.

Specific QC checks include:

- Use of protocol 1 gases (verify ± 10% of known concentration)
- Performance of zero and calibration drift tests (± 10% of span)
- Performance of system bias check (± 5% of span).

6.3.3 Methods 5/202 Particulate/Condensibles

EPA Method 5 served as the QC guideline for precise sampling criteria. Special attention was given to the following quality control (QC) checks:

- Prior to and following each run and port change, the sampling train was leak checked. All trains met the required method criteria for leak checks.
- The outlet of the silica gel impinger was maintained at less than 68°F during sampling.
- Isokinetic sampling was maintained at 100 percent ± 10 percent and readings were recorded at 5-minute or less intervals.
- Use of organic rinsed glassware and sample containers.

6.3.4 Method 201A PM_{10}

Quality control procedures outlined for EPA Method 5 sampling were followed for this system. A pretest leak check was performed through the entire system. Mid-point and post-test leak checks were not conducted through the PM_{10} cyclone to avoid disturbing the fractionated particulate collected in the PM_{10} sizing device. A leak check was done through the impingers at the completion of the test run. The runs performed at the MDF and Microboard press stack were approximately four hours in duration. This was done to maximize that the sample catch in order to insure proper gravimetric analysis.

6.3.5 Method 0010 Semivolatiles

QC guidelines for Modified Method 5 were followed as stated in SW-846 Method 0010, "Modified Method 5 Sampling Train" Section 11. Additional quality control considerations are outlined in Method 8270. Sampling criteria are given in EPA Method 5. QC measures

employed for this procedure include:

- Use of organic rinsed glassware and sample containers.
- Collection of field bias blanks.
- Use of teflon tape instead of silicone grease.
- Collection of field bias blanks.

6.3.6 Methods 1-4 Velocity/Volumetric Flow Rate QC Procedures

The QC procedures for velocity/volumetric flow rate determinations followed guidelines set forth by EPA Method 2. Incorporated into this method are sample point determinations by EPA Method 1, flue gas oxygen (O_2) and carbon dioxide (CO_2) concentration determinations by EPA Method 3, and gas moisture determination by EPA Method 4. Volumetric flow rates were determined using measurement methods and procedures outlined in Reference Method 2. Checks were performed at all sample locations to verify the presence or absence of cyclonic flow. Oxygen (O_2) and carbon dioxide (CO_2) concentrations at the cyclone outlet and the press stacks were determined using Fyrite analyzers. This was deemed acceptable since none of the sources were considered combustion sources and none of the reported emissions data was corrected for dilution effects. The oxygen and carbon dioxide concentrations at the core and surface sampling locations were determined using orsat analyzers.

6.3.7 Method 0030 VOST

The major QC item associated with the VOST sampling was the completion of the VOST audit. This is a useful check for determining method precision and accuracy for both the field and laboratory components. Other QC measures included maintaining VOST tubes samples at or below 4°C, collection of condensate samples in VOA vials, and special precleaning of all glassware and containers. A field bias blank was collected at the surface EFB outlet. Measured total hydrocarbon concentrations were used as a guideline to select the desired VOST sample volume in an effort to minimize trap saturation.

6.4 QC PROCEDURES FOR ANALYSES

The following subsections outline the basic quality control components associated with the analytical procedures to be utilized. Several different types of samples were analyzed as part of the ongoing quality control program for this assignment. Blank samples were analyzed in order to assess possible contamination from the field and/or laboratory, so that corrective measures of future programs can be taken if necessary. The types of QC samples analyzed during this assignment include:

- *Field Blanks* - These blank samples were exposed to field and sampling conditions, and analyzed in order to assess possible contamination from the field (one for each lot of samples analyzed).

- *Reagent and Solvent Blanks* - These blanks were prepared in the laboratory and analyzed in order to determine the background of each of the reagents (or solvent in the case of particulate samples) used in each type of analysis (one for each new lot number of solvent used).

- *Duplicates* - multiple analysis of specific samples were completed by the analyst to check on the validity of certain analogous samples.

- *Matrix Spike* - A known quantity of standard was added to the sample during the preparation stage. The amount detected after analysis was reported as a percent recovery and used to assess accuracy in consideration of possible matrix interference. On a selected number of samples, a *matrix spike duplicate* was prepared to assess precision and accuracy.

- *Calibration Standards* - A calibration standard was analyzed as required by the applicable method.

6.4.1 Methods 5/202 Particulate/Condensibles

EPA Method 5 served as the QC guideline for precise sampling criteria. Special attention was given to the following quality control (QC) checks:

- All samples were desiccated a minimum of 24 hours prior to the first weighing. Constant weigh is achieved when consecutive reading agree within 0.5 mg. These reading must be at least 6 hours apart.

- Gravimetric measurements were checked with a set of Class S weights. Measurements were made in the approximate range of the actual field samples.

6.4.2 Method 201A PM_{10}

Quality control procedures outlined for EPA Method 5 analyses were followed for Method 201A. Some of the reported results were at-or very near the minimum detection limit for the gravimetric analysis. This aspect of the PM_{10} data must be considered in reviewing any of the reported results.

6.4.3 Method 0011A Aldehyde/Ketones Analysis

The analyte calibration linearity curves all had r^2 values exceeding 0.999. Four continuing calibration checks were required for this study. None of the compounds deviated from the initial calibration by more than 15% except n-butyraldehyde which exceeded the initial calibration by 20 to 40 %. This high value results from a confluence with a peak in the MEK standard.

Two matrix spike/matrix spike duplicates were performed for formaldehyde, acetone and methyl ethyl ketone. The results are summarized on Table 6-1. Results for the field bias blank are provided on Table 6-2.

High-performance liquid chromatographs were calibrated prior to each day of use. Calibration standard mixtures were prepared from appropriate reference materials and contained analytes appropriate for the method of analysis.

6.4.4 Method 0010 Semivolatiles

Stack samples collected using Method 0010 were analyzed in accordance with the guidelines of Method 8270. The samples were analyzed as a combined front half (methanol/methylene chloride probe rinse and filter), back half (XAD and back half rinse) and impinger (aqueous) sample extract. Quality control measures included: pre-spiking the XAD resin

TABLE 6-1

M0011a Matrix Spike Duplicates- Percent Recovery

Analyte	MS1	MSD1	MS2	MSD2
Formaldehyde	99.1	91.6	89.6	91.4
MethylEthylKetone	54.1	59.5	59.8	71.1
Benzaldehyde	101.0	97.2	95.0	96.4

TABLE 6-2

M0011a Field Bias Blank and Reported MDLs

Compound	Method DetectionLimit µg/mL	FieldBias Blank, µg		
		MDF Press	Surface EFB Outlet	Microboard Press
Formaldehyde	0.0079	399	36	30
Acetaldehyde	0.0046	19	16	9
Acrolein	0.0131	20	15	10
Acetone	0.0052	20	62	22
Propionaldehyde	0.0075	<1*	<2*	1*
Crotonaldehyde	0.0295	23	30	16
n-Butyraldehyde	0.0386	32	42	25
Methylethylketone	0.0225	<4*	<5*	<4**
Benzaldehyde	0.0062	8	12	<1*
Isovaleraldehyde	0.0197	23	29	<2*
Valeraldehyde	0.0330	36	67	17
o-Tolualdehyde	0.0092	12	<2*	<1*
m/p-Tolualdehyde	0.0052	12	8	<5**
Hexaldehyde	0.0317	43	19	11
2,5-Dimethylbanzaldehyde	0.0046	20	4	<1*

* analyte not detected ** analyte present but less than detection limit

with surrogate compounds, initial calibrations, continuing (daily) calibrations, field and laboratory blanks and the analysis of two XAD traps pre-spiked with α- and ß- pinenes. The MM5 analyses were completed in two separate batches. The MDF cyclone outlet and pre-spiked XAD traps were analyzed as part of one batch. The second batch included samples from the microboard surface and core layer outlet locations. Both batches included analysis of field and laboratory blanks.

The calibration solutions are prepared with mixtures of analytes in solutions ranging from 20 to 160 mg/ml with the internal standards injected at a concentration of 40 mg/ml. Individual response factors (RF) are determined at concentrations of 20, 50, 80, 120 and 160 mg/ml and are used to calculate an average RF. If the relative standard deviation (RSD) of the five RFs is less than 30%, the calibration is considered acceptable. The RFs for all target analytes were within the 30% limit except 2,4-dinitrophenol and 4,6-dinitro-2-methylphenol. These analytes were not detected in any of the samples and therefore had no effect on the quality of the data. The continuing (daily) calibrations also met method criteria acceptance limits for all compounds except benzidine and 3,5-dichlorophenol. Once again, these analytes were not present in the samples and therefore are considered to have no effect on the data quality.

All XAD traps were pre-spiked with 100 μg terphenyl-d_{14} prior to field use. Prior to extraction, all samples were fortified with 100 μg each of eight additional surrogate spike compounds. All recoveries of the surrogate compounds were within the method criteria of 50 to 150% for the MDFCO and all blanks. Samples from the MBCLO and MBSLO required dilution to quantify the pinene compounds. Therefore, the surrogate compounds from these samples were diluted out of the detectable range. However, recoveries for the analyses of the blanks which were extracted at the same time were within acceptable limits. Three of the surrogate compounds were below the method advisory guidelines of 50% for both of the spike samples.

Several compounds were detected in the field samples that were also detected in the field and laboratory blanks. Amounts of these compounds that were found in the samples that were not greater than five times the amount found in the laboratory blank should not be considered native to that source.

Two XAD traps were pre-spiked with 100 μg each of α- and ß-pinene. The recoveries for these spikes ranged from approximately 35 to 45%. These values indicated a moderate recovery efficiency. The volatility of these compounds may have resulted in some loss during the nitrogen concentration procedure.

6.4.5 Method 0030 VOST

The VOST analysis is based on the guidelines of Method 5040 and 8240. Quality control measures included performance of initial calibrations (using internal standards, analytes of interest and surrogate standards), continuing calibrations (daily), analysis of blanks and analysis of audit samples.

The range of calibration for low level VOST analysis extends from 0.10 to 1.0 μg. The analytes for the calibration standard are prepared at amounts of 0.1, 0.25, 0.5, 0.75 and 1.0 μg. Internal standards are injected at a constant amount of 0.25 μg. For the high level VOST analysis, the calibrations are performed with standards that range from 10 to 100 μg with 12.5 μg of internal standard added to the VOST tube. Although the QC criteria for high level analyses have not been established, correlation of the guidelines and criteria of Method 8240 have been generally very good. Five individual response factors are averaged to calculate a mean RF. If the relative standard deviation (RSD) of these RFs is less than 50%, the calibration is considered acceptable. The calibration check compounds (CCC) must have a percent difference (%D) of less than 30%.

The initial calibrations had a % RSD for the response factors ranging from 1 to 31% (below 50% is acceptable). The RF %D values from the continuing calibrations were generally below 30% with acrylonitrile and certain ketone compounds occasionally outside the desired

range. Each reported recovery for the surrogate compounds were within the suggested method criteria of 50 to 100% with the exception of one of the audit samples (possibly due to a large tetrachloroethene peak) and the tenax tube from MBSLO 1A (artificially inflated due to low internal standard recovery).

Analysis of field blanks and laboratory blanks revealed low levels of the compounds of interest. There were reported contamination of the tubes for several compounds including methylene chloride and carbon disulfide. Table 6-3 summarizes the compounds and levels reported in all VOST tube blanks.

Results of the analysis of the VOST tubes collected from the two EPA audit cylinders are reported in Table 6-4.

The VOST sampling and analyses were performed with some required variation from standard protocol. These variations were attributed to the high concentrations of α and ß pinene. The majority of the pinene data is considered estimated due to exceeding calibration range of the use of the non-standard high level analysis procedure.

6.4.6 Method 7E Nitrogen Oxides, Method 10 Carbon Monoxide and Method 25A Total Hydrocarbons Monitoring

All analyses for these parameters were completed on-site during the field effort. The field bias check and calibration on run MDFP3-M25A-2 was not within the Method requirements. An additional run was performed to replace this run. All analyses for this parameter were completed on-site during the field effort. All bias checks and system calibrations were within Method requirements.

6.5 QA/QC CHECKS FOR DATA REDUCTION, VALIDATION, AND REPORTING

Data quality audits were conducted using data quality indicators which require the detailed review of: (1) the recording and transfer of raw data; (2) data calculations; (3) the documentation of procedures; and (4) the selection of appropriate data quality indicators.

TABLE 6-3

Field Laboratory Blank VOST Tube Results Expressed in Micrograms (ug)

Compound	Field	Laboratory					
	MBCLO HJ147	09/23/92 HJ146	09/23/92 BC598***	09/25/92 BC625**	09/28/92 BC640**	09/29/92 BC658**	10/12/92 BC837**
Carbon Disulfide	0.0	0.0	--	--	--	--	--
Chloroform	0.0	0.0	0.4	0.2	--	--	--
Cumene (isopropylbenzene)	--	--	--	0.3	--	--	--
n-Hexane	0.1	0.0	--	--	--	--	--
1,1,1-Trichloroethane	0.0	--	--	--	--	--	--
Iodomethane	--	--	--	--	--	--	5.3
Methylene Chloride	0.1	0.0	1.4	--	0.3	--	--
Toluene	0.1	--	--	0.2	0.3	--	--
Isooctane	0.1	--	--	--	--	--	--
m-/p-Xylene	0.0	0.0	--	--	--	--	--
1,3 Dichlorobenzene	--	0.0	--	0.4	--	--	--
1,4 Dichlorobenzene	--	--	--	0.5	--	--	--
1,2 Dichlorobenzene	--	0.0	--	0.7	--	--	0.5
Trichlorofluoromethane	0.4	--	--	--	--	--	--
P-Cymene	--	--	--	0.5	0.2	0.3	0.6

TABLE 6-4

VOST AUDIT SAMPLES

	Audit 527				Audit 528			
	A	B	C	Average	A	B	C	Average
Date	9/21/92	9/21/92	9/21/92	--	9/21/92	9/21/92	9/21/92	--
Start Time	1028	1057	1127	--	1232	1057	1127	--
Stop Time	1048	1117	1147	--	1252	1117	1147	--
Sampling Parameters:								
Volume Sampled	9.491	10.302	9.954	--	10.081	10.902	10.326	--
Meter Temperature, C	20	20	20	--	20	20	20	--
Barometric, mm Hg	758	758	758	--	758	758	758	--
Meter Delta H, in H2O	0.4	0.4	0.4	--	0.4	0.4	0.4	--
DGM Gamma	1.001	1.001	1.001	--	1.001	1.001	1.001	--
Volume Sampled, DSL	9.483	10.293	9.945	--	10.072	10.892	10.317	--
Concentration, ppb								
Acrylonitrile	--	--	--	0.0	1.1	1.5	1.3	1.3
Benzene	45.7	42.1	27.6	38.4	--	--	--	0.0
1,3-butadiene	--	--	--	0.0	3.4	3.2	3.2	3.3
Carbon Disulfide	16.8	15.4	10.9	14.4	--	--	--	0.0
Carbon Tetrachloride	7.8	7.2	8.4	7.8	0.0	0.0	0.0	0.0
Chloroform	2.8	2.6	1.2	2.2	1.7	19.0	1.2	7.3
Chloromethane	1.1	1.0	--	0.7	--	--	--	0.0
1,1,1-Trichloroethane	0.2	0.2	--	0.1	0.1	0.1	0.1	0.1
Methylene Chloride	11.0	10.1	4.1	8.4	29.9	31.7	29.4	30.3
Tetrachloroethene	117.8	108.5	168.2	131.5	0.3	0.1	0.1	0.2
Toluene	0.6	0.6	0.7	0.7	0.3	0.6	0.3	0.4
Isooctane	2.4	2.2	1.6	2.0	1.9	11.5	0.8	4.7
Vinyl Chloride	16.2	14.9	13.9	15.0	--	--	--	0.0
m-/p-Xylene	0.1	0.1	0.1	0.1	0.3	0.3	0.3	0.3
o-Xylene	--	--	--	0.0	39.0	35.3	38.5	37.6
Acetone	--	--	--	0.0	0.2	0.6	0.2	0.3
Trichlorofluoromethane	3.1	2.8	0.8	2.2	1.6	20.9	1.6	8.1
A-Pinene	0.6	0.6	0.1	0.4	0.1	0.1	0.1	0.1
B-Pinene	0.1	0.1	--	0.1	--	--	--	0.0

Some of the data quality indicators to used for data validation are:

1. Comparison of the relative concentrations of the emissions at the different sampling locations;

2. Comparison of the results to previous field test results (i.e., are there any similarities);

3. Comparison of the results for a particular parameter with those from each condition (i.e., are the concentrations similar and do they show the same relationship for a material balance).

4. The inlet and outlet volumetric flow rates were compared. Agreement within these two trains were ±10 percent.

All data and/or calculations for flow rates, moisture content, and isokinetic rates made using a computer software program were validated by an independent check. All calculations were spot checked for accuracy and completeness.

In general, all measurement data was validated based on the following criteria:

- Process conditions during sampling or testing;
- Acceptable sample collection procedures;
- Consistency with expected other results; and
- Adherence to prescribed QC procedures.

Any suspect data is flagged and identified according to the specific deviation from prescribed criteria and its potential effect on the data quality. Upon completion of testing, the field coordinator was responsible for preparation of a data summary including calculation results and raw data sheets.

6.6 CORRECTIVE ACTIONS

No corrective action measures were implemented during this assignment. However, WESTON has received notification of a possible field contamination problem associated with the VOST condensate samples. WESTON has initiated corrective measures to address

this concern. All HPLC squeeze bottles and HPLC water sources will be investigated prior to the initiation of any future Work Assignments associated with the wood products industry.

6.7 QA AUDITS

A VOST audit was the only audit conducted during this assignment. Results are discussed in subsection 6.4.5. This audit involves the use of a multi-gas audit cylinder of known concentration. A measured amount is drawn into the VOST sample system and analyzed with other project samples. This audit can provide an estimate of method precision and accuracy. EPA does not assign a pass or fail value for this audit. Typically agreement is better than 50% relative difference for all audit tubes analyzed.

SECTION 7
SUMMARY OF EMISSION FACTORS

This section summarizes the emission factors that were developed from the test data. The emission factors are presented in five tables. Table 7-1 summarizes the emission factors developed for uncontrolled emissions from the particle dryer. The emission factors in Table 7-1 are presented in units of kilograms of pollutant emitted per megagram (kg/Mg) of wood particles fed to the dryer on a dry basis (pounds per ton [lb/ton]).

Table 7-2 summarizes the uncontrolled emission factors developed for the MDF press based on the combined emissions from all five vents. It should be noted that, for the aldehyde-ketone test, emission data were not available for Vent 2, Run 3 and for Vent 4, Run 1. For these runs, the emission rates for each aldehyde or ketone were estimated using the average concentrations of the same pollutant for the other two runs and the volumetric flow rate through the vent for the run for which emission data were not available. The emission factors in Table 7-2 are presented in units of kg of pollutant emitted per thousand square meters (lb per thousand square feet) of board produced.

Table 7-3 summarizes the emission factors developed for uncontrolled and controlled emissions from the microboard surface dryer. The emission factors in Table 7-3 are presented in units of kg/Mg (lb/ton) of material dried.

Table 7-4 summarizes the emission factors developed for uncontrolled and controlled emissions from the microboard core dryer. The emission factors in Table 7-4 are presented in units of kg/Mg (lb/ton) of material dried.

Table 7-5 summarizes the uncontrolled emission factors for emissions from the microboard press. As explained previously, the microboard press has a total of eight vents. Vents 1, 3, 5, 7, and 8 were tested, and Vents 2, 4, and 6 were not tested. Vents

1, 3, and 5 are paired with Vents 2, 4, and 6, respectively. Emissions from Vents 2, 4, and 6 are assumed to be comparable to emissions from Vents 1, 3, and 5. Therefore, the emission rates for the entire microboard press were estimated by summing the emissions rates measured in Vents 7, and 8, and doubling the emission rates in Vents 1, 3, and 5 to account for the fact that emissions from Vents 2, 4, and 6 were not quantified. The emission factors in Table 7-5 are presented in units of kg of pollutant emitted per thousand square meters (lb per thousand square feet) of board produced.

TABLE 7-1. SUMMARY OF EMISSION FACTORS FOR PARTICLE DRYER

Type of control	Pollutant	No. of runs	Emission factors, kg/Mg			Emission factors, lb/ton		
			Minimum	Maximum	Average	Minimum	Maximum	Average
none	filt. PM	3	0.51	0.66	0.59	1.0	1.3	1.2
	condens. inorg. PM	3	0.074	0.40	0.24	0.15	0.80	0.49
	condens. org. PM	3	0.041	0.10	0.074	0.082	0.19	0.15
	PM-10	3	0.047	0.22	0.11	0.094	0.44	0.21
	CEM Results							
	total hydrocarbons	3	0.30	0.35	0.33	0.60	0.70	0.66
	Aldehyde-ketone results							
	formaldehyde	3	0.51	0.58	0.55	1.0	1.2	1.1
	acetaldehyde	3	0.0025	0.0074	0.0051	0.0050	0.015	0.010
	acrolein	3	6.8E-04	0.0012	8.6E-04	0.0014	0.0023	0.0017
	acetone	3	9.1E-04	0.0022	0.0015	0.0018	0.0044	0.0031
	propanaldehyde	3	3.8E-04	4.5E-04	4.2E-04	7.6E-04	9.0E-04	8.4E-04
	crotonaldehyde	3	7.0E-04	7.7E-04	7.4E-04	0.0014	0.0015	0.0015
	n-butyraldehyde	3	9.2E-04	0.0013	0.0011	0.0018	0.0026	0.0022
	methyl ethyl ketone	3	0.0022	0.0030	0.0025	0.0044	0.0060	0.0049
	benzaldehyde	3	7.8E-04	0.0013	0.0010	0.0016	0.0025	0.0020
	isoveraldehyde	3	6.0E-04	0.0010	7.3E-04	0.0012	0.0019	0.0015
	valeraldehyde	3	6.8E-04	0.0011	8.2E-04	0.0014	0.0021	0.0016
	o-tolualdehyde	3	1.9E-04	3.7E-04	2.9E-04	3.7E-04	7.3E-04	5.8E-04
	m/p-tolualdehyde	3	3.8E-04	0.0022	1.4E-03	0.00077	0.0043	0.0028
	hexaldehyde	3	7.7E-04	0.0014	1.0E-03	0.0015	0.0029	0.0020
	2,5-dimethylbenzaldehyde	3	1.2E-04	1.8E-04	1.5E-04	0.00024	0.00036	0.00030
	Semi-VOST results							
	p-cymene	3						
	a-pinene	3	0.0019	0.0030	0.0024	0.0038	0.0060	0.0048
	b-pinene	3	0.0021	0.0030	0.0026	0.0042	0.0060	0.0051
	a-terpineol	3	7.3E-04	0.0010	8.7E-04	0.0015	0.0020	0.0017
	VOST results							
	a-pinene	3	0.0019	0.0030	0.0024	0.0038	0.0060	0.0048
	b-pinene	3	0.0021	0.0029	0.0024	0.0042	0.0058	0.0049
	methylene chloride	3	2.4E-04	0.0019	0.0011	4.8E-04	0.0038	0.0022
	trichlorofluoromethane	3	1.0E-04	0.0014	7.3E-04	2.0E-04	0.0029	0.0015
	chloromethane	3	3.1E-04	7.4E-04	0.0011	6.1E-04	0.0015	0.0022
	n-hexane	3	8.8E-05	0.0011	5.4E-04	1.8E-04	0.0022	0.0011
	acetone	3	3.5E-04	5.2E-04	4.4E-04	7.0E-04	0.0010	8.8E-04
	isooctane	3	4.1E-05	4.8E-04	2.4E-04	8.1E-05	9.7E-04	4.8E-04
	p-cymene	3	5.5E-05	7.8E-05	6.7E-05	1.1E-04	1.6E-04	1.3E-04
	toluene	3	3.8E-05	1.0E-04	6.2E-05	7.5E-05	2.0E-04	1.2E-04
	2-butanone	3	2.7E-05	7.0E-05	4.4E-05	5.4E-05	1.4E-04	8.8E-05
	1,1,1-trichloroethane	3	2.7E-05	4.7E-05	3.5E-05	5.5E-05	9.4E-05	6.9E-05
	chloroform	3	4.2E-06	7.5E-05	2.8E-05	8.3E-06	1.5E-04	5.6E-05
	styrene	3	1.4E-05	2.3E-05	1.8E-05	2.8E-05	4.6E-05	3.6E-05
	m-/p-xylene	3	1.4E-05	2.3E-05	1.8E-05	2.8E-05	4.6E-05	3.6E-05
	bromomethane	3	3.6E-06	2.9E-05	1.8E-05	7.2E-06	5.8E-05	3.5E-05
	cumene	3	1.0E-05	2.3E-05	1.5E-05	2.1E-05	4.6E-05	3.1E-05
	carbon disulfide	3	4.2E-06	6.5E-06	5.5E-06	8.3E-06	1.3E-05	1.1E-05

TABLE 7-2. SUMMARY OF EMISSION FACTORS FOR MDF PRESS

Type of control	Pollutant	No. of runs	Emission factors, kg/thousand sq.m.			Emission factors, lb/thousand sq.ft		
			Minimum	Maximum	Average	Minimum	Maximum	Average
none	filt. PM	1	0.70	1.3	0.94	0.14	0.26	0.19
	condens. inorg. PM	2	0.48	1.8	1.1	0.10	0.37	0.22
	condens. org. PM	1	0.11	0.24	0.20	0.023	0.049	0.040
	PM-10	1	0.34	0.47	0.38	0.069	0.10	0.079
	CEM Results							
	total hydrocarbons	1	2.7	2.9	2.8	0.56	0.60	0.58
	Aldehyde-ketone results							
	formaldehyde	1	3.2	3.7	3.5	0.66	0.76	0.72
	acetaldehyde	1	0.029	0.035	0.032	0.0060	0.0071	0.0065
	acrolein	1	0.0068	0.0074	0.0071	0.0014	0.0015	0.0015
	acetone	1	0.022	0.062	0.039	0.0045	0.013	0.0080
	propanaldehyde	1	0.0022	0.0024	0.0023	4.5E-04	5.0E-04	4.7E-04
	crotonaldehyde	1	0.0049	0.0092	0.0077	0.0010	0.0019	0.0016
	n-butyraldehyde	1	0.016	0.025	0.020	0.0033	0.0051	0.0040
	methyl ethyl ketone	1	0.0025	0.0048	0.0036	5.1E-04	0.0010	7.5E-04
	benzaldehyde	1	0.0031	0.0046	0.0038	6.4E-04	9.4E-04	7.8E-04
	isoveraldehyde	1	0.0070	0.0098	0.0087	0.0014	0.0020	0.0018
	valeraldehyde	1	0.013	0.016	0.015	0.0027	0.0032	0.0030
	o-tolualdehyde	1	0.0021	0.0039	0.0032	4.3E-04	8.0E-04	6.6E-04
	m/p-tolualdehyde	1	0.0050	0.0069	0.0061	0.0010	0.0014	0.0013
	hexaldehyde	1	0.017	0.038	0.025	0.0035	0.0077	0.0050
	2,5-dimethylbenzaldehyde	1	0.0075	0.011	0.0087	0.0015	0.0022	0.0018

TABLE 7-3. SUMMARY OF EMISSION FACTORS FOR MICROBOARD SURFACE DRYER

Type of control	Pollutant	No. of runs	Emission factors, kg/Mg			Emission factors, lb/ton		
			Minimum	Maximum	Average	Minimum	Maximum	Average
none	filt. PM	3	0.86	1.2	1.0	1.7	2.3	2.0
	condens. inorg. PM	3	0.079	0.10	0.09	0.16	0.19	0.18
	condens. org. PM	3	0.14	0.42	0.25	0.28	0.83	0.49
	CO2	13	290	420	351	580	840	702
	CEM Results							
	total hydrocarbons	3	0.50	1.0	0.75	1.0	2.0	1.5
EFB	filt. PM	2	0.13	0.14	0.14	0.27	0.29	0.28
	condens. inorg. PM	2	0.082	0.14	0.11	0.16	0.27	0.22
	condens. org. PM	2	0.035	0.036	0.036	0.071	0.073	0.072
	PM-10	3	0.032	0.14	0.082	0.063	0.28	0.16
	CEM Results							
	CO	3	0.57	1.9	1.2	1.1	3.8	2.3
	NOx	3	0.66	0.73	0.69	1.3	1.5	1.4
	total hydrocarbons	3	0.46	0.75	0.64	0.92	1.5	1.3
	Aldehyde-ketone results							
	formaldehyde	3	0.0056	0.016	0.0094	0.011	0.032	0.019
	acetaldehyde	3	0.0017	0.0043	0.0026	0.0034	0.0086	0.0052
	acrolein	3	1.9E-04	5.5E-04	4.1E-04	3.7E-04	0.0011	8.1E-04
	acetone	3	0.0053	0.0078	0.0066	0.011	0.016	0.013
	propanaldehyde	3	1.0E-04	3.3E-04	1.9E-04	2.0E-04	6.7E-04	3.9E-04
	crotonaldehyde	3	2.9E-04	5.2E-04	4.1E-04	5.8E-04	0.0010	8.2E-04
	n-butyraldehyde	3	8.3E-04	0.0011	0.0010	0.0017	0.0021	0.0019
	methyl ethyl ketone	3	4.7E-05	2.9E-04	1.7E-04	9.4E-05	5.9E-04	3.4E-04
	benzaldehyde	3	2.8E-03	0.0066	0.0041	0.0056	0.013	0.0082
	isovaraldehyde	3	3.9E-04	7.5E-04	5.5E-04	7.8E-04	0.0015	0.0011
	valeraldehyde	3	0.0015	0.0026	0.0020	0.0030	0.0051	0.0040
	o-tolualdehyde	3	2.1E-04	4.8E-04	3.3E-04	4.2E-04	0.0010	6.6E-04
	m/p-tolualdehyde	3	0.0013	0.0038	0.0023	0.0026	0.0075	0.0046
	hexaldehyde	3	0.0022	0.0037	0.0031	0.0045	0.0074	0.0062
	2,5-dimethylbenzaldehyde	3	4.8E-04	8.9E-04	7.4E-04	0.0010	0.0018	0.0015
	Semi-VOST results							
	p-cymene	3	4.4E-04	5.4E-04	4.9E-04	8.9E-04	0.0011	0.0010
	a-pinene	3	0.17	0.20	0.18	0.33	0.39	0.36
	b-pinene	3	0.057	0.064	0.060	0.11	0.13	0.12
	a-terpineol	3	0.023	0.030	0.026	0.046	0.061	0.052
	VOST results							
	a-pinene	3	0.21	0.34	0.28	0.43	0.68	0.57
	b-pinene	3	0.090	0.13	0.11	0.18	0.26	0.21
	methylene chloride	3	6.0E-04	0.0023	0.0016	0.0012	0.0046	0.0032
	trichlorofluoromethane	3	1.6E-06	3.4E-06	2.8E-06	3.2E-06	6.9E-06	5.6E-06
	chloromethane	3	1.6E-06	0.020	0.0065	3.2E-06	0.039	0.013
	n-hexane	3	1.6E-06	3.4E-06	2.8E-06	3.2E-06	6.9E-06	5.6E-06
	acetone	3	0.015	0.017	0.016	0.029	0.034	0.032
	isooctane	3	1.6E-06	3.4E-06	2.8E-06	3.2E-06	6.9E-06	5.6E-06
	p-cymene	3	7.1E-04	0.0019	0.0011	0.0014	0.0037	0.0022
	toluene	3	3.9E-04	8.7E-04	6.3E-04	7.8E-04	0.0017	0.0013
	m-/p-xylene	3	3.5E-06	2.0E-04	1.0E-04	6.9E-06	4.0E-04	2.0E-04

TABLE 7-4. SUMMARY OF EMISSION FACTORS FOR MICROBOARD CORE DRYER

Type of control	Pollutant	No. of runs	Emission factors, kg/Mg			Emission factors, lb/ton		
			Minimum	Maximum	Average	Minimum	Maximum	Average
none	filt. PM	3	0.98	1.7	1.3	2.0	3.4	2.5
	condens. inorg. PM	3	0.36	0.43	0.40	0.72	0.86	0.81
	condens. org. PM	3	0.42	0.55	0.48	0.84	1.1	0.96
	CO2	13	260	450	360	520	900	720
	CEM Results							
	total hydrocarbons	3	3.7	5.4	4.5	7.5	11	9.1
EFB	filt. PM	2	0.14	1.4	0.75	0.28	2.7	1.5
	condens. inorg. PM	2	0.48	0.49	0.48	0.95	0.98	0.97
	condens. org. PM	2	0.23	0.26	0.24	0.46	0.51	0.48
	PM-10	2	0.21	0.40	0.32	0.43	0.81	0.64
	CEM Results							
	CO	3	1.5	1.6	1.5	2.9	3.2	3.1
	NOx	3	0.58	0.72	0.66	1.2	1.4	1.3
	total hydrocarbons	3	3.1	5.0	3.9	6.2	10.0	7.8
	Aldehyde-ketone results							
	formaldehyde	3	0.070	0.095	0.084	0.14	0.19	0.17
	acetaldehyde	1	0.036	0.038	0.037	0.071	0.077	0.074
	acrolein	1	0.0059	0.017	0.012	0.012	0.035	0.024
	acetone	1	0.023	0.072	0.048	0.045	0.14	0.096
	propanaldehyde	1	0.0019	0.0094	0.0054	0.0037	0.019	0.011
	crotonaldehyde	1	0.0026	0.010	0.0051	0.0052	0.020	0.010
	n-butyraldehyde	1	0.0055	0.027	0.015	0.011	0.053	0.030
	methyl ethyl ketone	1	0.0044	0.0049	0.0046	0.0089	0.0099	0.0092
	benzaldehyde	1	0.054	0.069	0.060	0.11	0.14	0.12
	isoveraldehyde	1	0.009	0.010	0.009	0.017	0.019	0.018
	valeraldehyde	1	0.0040	0.010	0.0070	0.0080	0.019	0.014
	o-tolualdehyde	1	0.0044	0.0057	0.0053	0.0088	0.011	0.011
	m/p-tolualdehyde	1	0.005	0.018	0.013	0.010	0.037	0.026
	hexaldehyde	1	0.010	0.013	0.011	0.020	0.026	0.022
	2,5-dimethylbenzaldehyde	3	0.0008	0.0062	0.0026	0.0017	0.0123	0.0053
	Semi-VOST results							
	p-cymene	1	9.8E-07	0.0033	0.0022	1.95E-06	0.0067	0.0044
	a-pinene	1	1.0	1.4	1.2	2.0	2.7	2.3
	b-pinene	1	0.38	0.42	0.40	0.75	0.83	0.79
	a-terpineol	1	0.070	0.094	0.083	0.14	0.19	0.17
	VOST results							
	a-pinene	1	0.16	1.1	0.79	0.32	2.2	1.6
	b-pinene	1	0.11	0.59	0.42	0.22	1.2	0.85
	methylene chloride	2	1.3E-04	0.0019	0.0011	2.5E-04	0.0037	0.0022
	chloromethane	1	3.9E-06	3.2E-04	1.1E-04	7.8E-06	6.3E-04	2.2E-04
	acetone	1	0.031	0.24	0.14	0.062	0.48	0.29
	isooctane	1	3.9E-06	5.7E-05	2.2E-05	7.8E-06	1.1E-04	4.3E-05
	p-cymene	1	0.0029	0.010	0.0075	0.0058	0.020	0.015
	toluene	1	0.0052	0.015	0.011	0.010	0.031	0.021
	m-/p-xylene	1	0.0022	0.0069	0.0038	0.0043	0.014	0.0076
	2-butanone		3.9E-06	6.3E-04	2.2E-04	7.8E-06	0.0013	4.3E-04
	chloroform		3.9E-06	9.0E-05	3.6E-05	7.8E-06	1.8E-04	7.2E-05
	styrene		4.1E-06	2.3E-04	1.2E-04	8.2E-06	4.6E-04	2.4E-04
	cumene		6.7E-04	0.0017	0.0010	0.0013	0.0034	0.0020
	benzene		3.9E-06	0.0023	7.8E-04	7.8E-06	0.0047	0.0016
	iodomethane		3.9E-06	3.1E-04	1.1E-04	7.8E-06	6.1E-04	2.1E-04
	o-xylene		4.1E-06	2.8E-04	1.5E-04	8.2E-06	5.6E-04	3.0E-04

TABLE 7-5. SUMMARY OF EMISSION FACTORS FOR MICROBOARD PRESS

Type of control	Pollutant	No. of runs	Emission factors, kg/thousand sq.m.			Emission factors, lb/thousand sq.ft		
			Minimum	Maximum	Average	Minimum	Maximum	Average
none	filt. PM	3	0.16	0.30	0.22	0.032	0.062	0.044
	condens. inorg. PM	3	0.15	0.29	0.24	0.030	0.059	0.049
	condens. org. PM	3	0.057	0.11	0.086	0.012	0.022	0.018
	PM-10	3	0.058	0.12	0.091	0.012	0.024	0.019
	CEM Results							
	total hydrocarbons	3	4.3	6.3	5.2	0.87	1.3	1.1
	Aldehyde-ketone results							
	formaldehyde	3	1.8	2.3	2.0	0.36	0.48	0.42
	acetaldehyde	3	0.025	0.030	0.028	0.0051	0.0062	0.0058
	acrolein	3	0.0061	0.0089	0.0073	0.0012	0.0018	0.0015
	acetone	3	0.036	0.068	0.049	0.0074	0.014	0.0099
	propanaldehyde	3	9.1E-05	7.9E-04	5.3E-04	1.9E-05	1.6E-04	1.1E-04
	crotonaldehyde	3	0.031	0.040	0.035	0.0063	0.0082	0.0072
	n-butyraldehyde	3	0.0082	0.011	0.009	0.0017	0.0022	0.0019
	methyl ethyl ketone	3	6.2E-04	0.0023	0.0016	1.3E-04	4.7E-04	3.3E-04
	benzaldehyde	3	0.0064	0.010	0.0085	0.0013	0.0020	0.0017
	isoveraldehyde	3	0.0059	0.0091	0.0078	0.0012	0.0019	0.0016
	valeraldehyde	3	0.0077	0.018	0.012	0.0016	0.0036	0.0025
	o-tolualdehyde	3	4.0E-04	6.2E-04	5.3E-04	8.1E-05	1.3E-04	1.1E-04
	m/p-tolualdehyde	3	0.0033	0.0053	0.0043	6.8E-04	0.0011	8.8E-04
	hexaldehyde	3	0.016	0.042	0.028	0.0033	0.0086	0.0057
	2,5-dimethylbenzaldehyde	3	0.0015	0.0023	0.0018	3.1E-04	4.8E-04	3.7E-04

APPENDIX A

TEST RESULTS

APPENDIX A-1

MDF CYCLONE OUTLET (DB)

ALDEHDEHDES/KETONES TEST RESULTS

PLANT: Weyerhaeuser Company, Moncure, NC

SAMPLING LOCATION: MDF Particle Dryer B Cyclone Outlet (DB)

		MDFCO-M0011-1	MDFCO-M0011-2	MDFCO-M0011-3
	Test Date	9-25-92	9-25-92	9-25-92
	Run Start & Finish Times	1326-1500	1626-1741	1843-2018
	Net Traversing Points	24	24	24
Theta	Net Run Time, Minutes	72	72	72
Dia	Nozzle Diameter, Inches	0.244	0.244	0.244
Cp	Pitot Tube Coefficient	0.84	0.84	0.84
Y	Dry Gas Meter Calibration Factor	0.995	0.995	0.995
Pbar	Barometric Pressure, Inches Hg	30.000	30.000	30.000
Delta H	Avg. Pressure Differential of Orifice Meter, Inches H2O	1.513	1.647	1.710
Vm	Volume of Metered Gas Sample, Dry ACF	46.063	47.325	48.616
tm	Dry Gas Meter Temperature, Degrees F	65	69	69
Vm(std)	Volume of Metered Gas Sample, Dry SCF*	46.373	47.326	48.553
Vlc	Total Volume of Liquid Collected in Impingers & Silica Gel, mL	112.7	96.5	109.3
Vw	Volume of Water Vapor, SCF*	5.305	4.542	5.145
%H20	Moisture Content, Percent by Volume	10.3	8.8	9.6
Mfd	Dry Mole Fraction	0.897	0.912	0.904
%CO2	Carbon Dioxide, Percent by Volume, Dry	0.0	0.0	0.0
%O2	Oxygen, Percent by Volume, Dry	20.9	20.9	20.9
%CO+N2	CO + N2, Percent by Volume, Dry	79.1	79.1	79.1
Md	Gas Molecular Weight, Lb/Lb-Mole, Dry	28.84	28.84	28.84
Ms	Gas Molecular Weight, Lb/Lb-Mole, Wet	27.72	27.89	27.80
Pg	Flue Gas Static Pressure, Inches H2O	-0.3	-0.3	-0.3
Ps	Absolute Flue Gas Pressure, Inches Hg	29.98	29.98	29.98
ts	Flue Gas Temperature, Degrees F	158	155	152
Delta-P	Average Velocity Head, Inches H2O	0.4408	0.5088	0.5263
vs	Flue Gas Velocity, Feet per Second	41.13	43.94	44.64
A	Stack/Duct Area, Square Inches	6,611	6,611	6,611
Qsd	Volumetric Air Flow Rate, Dry SCFM*	86,955	94,900	96,124
Qaw	Volumetric Air Flow Rate, Wet ACFM	113,304	121,045	122,973
%I	Isokinetic Sampling Rate, Percent	104.7	97.9	99.2

* 68 Deg. F (20 C) -- 29.92 In. Mercury

(continued next page)

ALDEHYDES/KETONES TEST RESULTS

		MDPCO-M0011-1	MDPCO-M0011-2	MDPCO-M0011-3
	EMISSION RESULTS:			
	FORMALDEHYDE			
Fwt	Formula Weight, lb/lb-mole	30	30	30
µg	Catch Weight, micrograms	46,732	51,981	47,961
µg/dscm	µg per dry std. cubic meter*	35,584	38,784	34,880
ppmvd	ppm by volume, Dry	28.534	31.100	27.969
kg/hr	kilograms per hour	5.258	6.254	5.69712
lb/hr	pounds per hour	11.5913	13.7879	12.5601
	ACETALDEHYDE			
	Formula Weight, lb/lb-mole	44.1	44.1	44.1
	Catch Weight, micrograms	493	224	640
	µg per dry std. cubic meter*	375	167	465
	ppm by volume, Dry	0.2048	0.0912	0.2539
	kilograms per hour	0.05547	0.02695	0.07602
	pounds per hour	0.12228	0.05942	0.16760
	ACROLEIN			
	Formula Weight, lb/lb-mole	56.1	56.1	56.1
	Catch Weight, micrograms	68	61	100
	µg per dry std. cubic meter*	51.8	45.5	72.7
	ppm by volume, Dry	0.0222	0.0195	0.0312
	kilograms per hour	0.00765	0.00734	0.01188
	pounds per hour	0.01687	0.01618	0.02619
	ACETONE			
	Formula Weight, lb/lb-mole	58	58	58
	Catch Weight, micrograms	204	82	132
	µg per dry std. cubic meter*	155	61.2	96.0
	ppm by volume, Dry	0.0644	0.0254	0.0398
	kilograms per hour	0.02295	0.00987	0.01568
	pounds per hour	0.05060	0.02175	0.03457
	PROPIONALDEHYDE			
	Formula Weight, lb/lb-mole	58.1	58.1	58.1
	Catch Weight, micrograms	38	34	39
	µg per dry std. cubic meter*	28.9	25.4	28.4
	ppm by volume, Dry	0.0120	0.0105	0.0117
	kilograms per hour	0.00428	0.00409	0.00463
	pounds per hour	0.00943	0.00902	0.01021
	CROTONALDEHYDE			
	Formula Weight, lb/lb-mole	70	70	70
	Catch Weight, micrograms	65	68	66
	µg per dry std. cubic meter*	49.5	50.7	48.0
	ppm by volume, Dry	0.0170	0.0174	0.0165
	kilograms per hour	0.00731	0.00818	0.00784
	pounds per hour	0.01612	0.01804	0.01728
	n-BUTYRALDEHYDE			
	Formula Weight, lb/lb-mole	72.1	72.1	72.1
	Catch Weight, micrograms	100	83	112
	µg per dry std. cubic meter*	76.1	61.9	81.5
	ppm by volume, Dry	0.0254	0.0207	0.0272
	kilograms per hour	0.01125	0.00999	0.01330
	pounds per hour	0.02480	0.02202	0.02933
	METHYL ETHYL KETONE			
	Formula Weight, lb/lb-mole	72.1	72.1	72.1
	Catch Weight, micrograms	203	202	257
	µg per dry std. cubic meter*	155	151	187
	ppm by volume, Dry	0.0516	0.0503	0.0624
	kilograms per hour	0.02284	0.02430	0.03053
	pounds per hour	0.05035	0.05358	0.06730

Estimated catch weight

* 68 Deg. F (20 C) - - 29.92 In. Mercury

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ALDEHYDES/KETONES TEST RESULTS

EMISSION RESULTS:	MDFCO-M0011-1	MDFCO-M0011-2	MDFCO-M0011-3
BENZALDEHYDE			
Formula Weight, lb/lb-mole	106.1	106.1	106.1
Catch Weight, micrograms	72	114	85
µg per dry std. cubic meter*	54.8	85.1	61.8
ppm by volume, Dry	0.01243	0.01929	0.01402
kilograms per hour	0.00810	0.01372	0.01010
pounds per hour	0.01786	0.03024	0.02226
ISOVALERALDEHYDE			
Formula Weight, lb/lb-mole	86.1	86.1	86.1
Catch Weight, micrograms	59	54	83
µg per dry std. cubic meter*	44.9	40.3	60.4
ppm by volume, Dry	0.01255	0.01126	0.01687
kilograms per hour	0.00664	0.00650	0.00986
pounds per hour	0.01463	0.01432	0.02174
VALERALDEHYDE			
Formula Weight, lb/lb-mole	86.1	86.1	86.1
Catch Weight, micrograms	66	61	92
µg per dry std. cubic meter*	50.3	45.5	66.9
ppm by volume, Dry	0.01404	0.01272	0.01869
kilograms per hour	0.00743	0.00734	0.01093
pounds per hour	0.01637	0.01618	0.02409
o-TOLUALDEHYDE			
Formula Weight, lb/lb-mole	120.2	120.2	120.2
Catch Weight, micrograms	34	28	16
µg per dry std. cubic meter*	25.9	20.9	11.6
ppm by volume, Dry	0.00518	0.00418	0.00233
kilograms per hour	0.00383	0.00337	0.00190
pounds per hour	0.00843	0.00743	0.00419
m/p-TOLUALDEHYDE			
Formula Weight, lb/lb-mole	120.2	120.2	120.2
Catch Weight, micrograms	161	194	33
µg per dry std. cubic meter*	123	145	24.0
ppm by volume, Dry	0.02454	0.02897	0.00480
kilograms per hour	0.01811	0.02334	0.00392
pounds per hour	0.03993	0.05146	0.00864
HEXALDEHYDE			
Formula Weight, lb/lb-mole	100.16	100.16	100.16
Catch Weight, micrograms	79	69	125
µg per dry std. cubic meter*	60.2	51.5	90.9
ppm by volume, Dry	0.01445	0.01236	0.02183
kilograms per hour	0.00889	0.00830	0.01485
pounds per hour	0.01959	0.01830	0.03274
2,5-DIMETHYL BENZALDEHYDE			
Formula Weight, lb/lb-mole	134	134	134
Catch Weight, micrograms	11	16	13
µg per dry std. cubic meter*	8.38	11.9	9.45
ppm by volume, Dry	0.00150	0.00214	0.00170
kilograms per hour	0.00124	0.00193	0.00154
pounds per hour	0.00273	0.00424	0.00340

Estimated catch weight

* 68 Deg. F (20 C) - - 29.92 In. Mercury

PARTICULATE & CONDENSIBLE PARTICULATE TEST RESULTS

PLANT: Weyerhaeuser Company, Moncure, NC

SAMPLING LOCATION: MDF Cyclone Outlet (WEYCO I.D. DB)

		MDFCO-M5/202-1	MDFCO-M5/202-2	MDFCO-M5/202-3
	Test Date	9-25-92	9-25-92	9-25-92
	Run Start & Finish Times	1327-1457	1626-1745	1843-2021
	Net Traversing Points	24	24	24
Theta	Net Run Time, Minutes	72	72	72
Dia	Nozzle Diameter, Inches	0.275	0.245	0.245
Cp	Pitot Tube Coefficient	0.84	0.84	0.84
Y	Dry Gas Meter Calibration Factor	0.994	0.994	0.994
Pbar	Barometric Pressure, Inches Hg	30.000	30.000	30.000
Delta H	Avg. Pressure Differential of Orifice Meter, Inches H2O	2.491	2.494	2.494
Vm	Volume of Metered Gas Sample, Dry ACF	58.627	52.807	54.732
tm	Dry Gas Meter Temperature, Degrees F	71	74	75
Vm(std)	Volume of Metered Gas Sample, Dry SCF*	58.466	52.337	54.193
Vlc	Total Volume of Liquid Collected in Impingers & Silica Gel, mL	142.0	116.0	138.0
Vw	Volume of Water Vapor, SCF*	6.684	5.460	6.496
%H20	Moisture Content, Percent by Volume	10.3	9.4	10.7
Mfd	Dry Mole Fraction	0.897	0.906	0.893
%CO2	Carbon Dioxide, Percent by Volume, Dry	0.0	0.0	0.0
%O2	Oxygen, Percent by Volume, Dry	20.9	20.9	20.9
%CO+N2	CO + N2, Percent by Volume, Dry	79.1	79.1	79.1
Md	Gas Molecular Weight, Lb/Lb-Mole, Dry	28.84	28.84	28.84
Ms	Gas Molecular Weight, Lb/Lb-Mole, Wet	27.72	27.82	27.68
Pg	Flue Gas Static Pressure, Inches H2O	-0.2	-0.2	-0.2
Ps	Absolute Flue Gas Pressure, Inches Hg	29.99	29.99	29.99
ts	Flue Gas Temperature, Degrees F	160	158	156
Delta-P	Average Velocity Head, Inches H2O	0.4408	0.5088	0.5263
vs	Flue Gas Velocity, Feet per Second	41.17	44.08	44.87
A	Stack/Duct Area, Square Inches	6,611	6,611	6,611
Qsd	Volumetric Air Flow Rate, Dry SCFM*	86,866	94,243	94,885
Qaw	Volumetric Air Flow Rate, Wet ACFM	113,414	121,431	123,607
%I	Isokinetic Sampling Rate, Percent	104.1	108.2	111.2

* 68 Deg. F (20 C) -- 29.92 In. Mercury

(continued next page)

PARTICULATE & CONDENSIBLE PARTICULATE TEST RESULTS

		MDFCO-M5/202-1	MDFCO-M5/202-2	MDFCO-M5/202-3
	PARTICULATE RESULTS:			
	Filterable			
mg	Catch Weight, milligrams	59.7	59.1	63.7
mg/DSCM	Milligrams/Dry Std. Cubic Meter*	36.1	39.9	41.5
gr/DSCF	Grains per Dry Std. Cubic Foot*	0.0158	0.0174	0.0181
kg/hr	Kilograms per hour	5.32	6.39	6.69
lb/hr	Pounds per hour	11.7	14.1	14.8
	Condensable – Extractable			
	Catch Weight, milligrams	4.1	6.9	9.2
	Milligrams/Dry Std. Cubic Meter*	2.48	4.66	5.99
	Grains per Dry Std. Cubic Foot*	0.00108	0.00203	0.00262
	Kilograms per hour	0.365	0.745	0.966
	Pounds per hour	0.806	1.64	2.13
	Condensable – Non-Extractable			
	Catch Weight, milligrams	40.0	5.9	24.4
	Milligrams/Dry Std. Cubic Meter*	24.2	3.98	15.9
	Grains per Dry Std. Cubic Foot*	0.0106	0.00174	0.00695
	Kilograms per hour	3.57	0.637	2.56
	Pounds per hour	7.86	1.41	5.65
	Total Particulate			
	Catch Weight, milligrams	103.8	71.9	97.3
	Milligrams/Dry Std. Cubic Meter*	62.7	48.5	63.4
	Grains per Dry Std. Cubic Foot*	0.0274	0.0212	0.0277
	Kilograms per hour	9.25	7.77	10.2
	Pounds per hour	20.4	17.1	22.5

PM10 TEST RESULTS

PLANT: Weyerhaeuser Company, Moncure, NC

SAMPLING LOCATION: MDF Cyclone Outlet (WEYCO I.D. DB)

		MDFCO-M201A-1	MDFCO-M201A-2	MDFCO-M201A-3
	Test Date	9/26/92	9/26/92	9/27/92
	Run Start & Finish Times	1116-1457	1707-1937	945-1248
	Net Traversing Points	24	24	24
Theta	Net Run Time, Minutes	116.25	123.25	130.5
Dia	Nozzle Diameter, Inches	0.170	0.169	0.170
Cp	Pitot Tube Coefficient	0.84	0.84	0.84
Y	Dry Gas Meter Calibration Factor	0.9938	0.9938	0.9938
Pbar	Barometric Pressure, Inches Hg	30	30	29.9
Delta H	Avg. Pressure Differential of Orifice Meter, Inches H2O	0.54	0.54	0.54
Vm	Volume of Metered Gas Sample, Dry ACF	45.906	49.141	51.808
tm	Dry Gas Meter Temperature, Degrees F	87	86	87
Vm(std)	Volume of Metered Gas Sample, Dry SCF*	44.173	47.411	49.711
Vlc	Total Volume of Liquid Collected in Impingers & Silica Gel, mL	114	110	125
Vw	Volume of Water Vapor, SCF*	5.366	5.178	5.884
%H20	Moisture Content, Percent by Volume	10.8	9.8	10.6
Mfd	Dry Mole Fraction	0.892	0.902	0.894
%CO2	Carbon Dioxide, Percent by Volume, Dry	0.0	0.0	0.0
%O2	Oxygen, Percent by Volume, Dry	20.9	20.9	20.9
%CO+N2	CO + N2, Percent by Volume, Dry	79.1	79.1	79.1
Md	Gas Molecular Weight, Lb/Lb-Mole, Dry	28.84	28.84	28.84
Ms	Gas Molecular Weight, Lb/Lb-Mole, Wet	27.67	27.78	27.69
Pg	Flue Gas Static Pressure, Inches H2O	0.30	0.30	0.30
Ps	Absolute Flue Gas Pressure, Inches Hg	30.02	30.02	29.92
ts	Flue Gas Temperature, Degrees F	154	148	151
Delta-P	Average Velocity Head, Inches H2O	0.5962	0.5696	0.5451
vs	Flue Gas Velocity, Feet per Second	47.68	46.29	45.53
A	Stack/Duct Area, Square Inches	6611	6611	6611
Qsd	Volumetric Air Flow Rate, Dry SCFM*	101,060	100,152	96,897
Qaw	Volumetric Air Flow Rate, Wet ACFM	131,339	127,510	125,417
%I	Isokinetic Sampling Rate, Percent	110.1	112.9	115.1

* 68 Degrees F -- 29.92 Inches of Mercury (Hg). (Continued Next Page)

PM10 TEST RESULTS

		MDFCO-M201A-1	MDFCO-M201A-2	MDFCO-M201A-3
	PM10 RESULTS:			
ucyc	Stack Gas Viscosity	193.5	192.8	192.9
Qs	PM10 Flow, at Cyclone Conditions, ACFM	0.494	0.490	0.493
D50	Dia. of Particles in Cyclone, Microns	9.5	9.5	9.5
	Particulate Catch,			
mg	< PM10, grams	0.0033	0.0032	0.0190
	> PM10, grams	0.0730	0.0607	0.0968
	PM10 Emissions:			
gr/DSCF	Concentration, grains/DSCF*	0.00115	0.00104	0.00590
kg/hr	Emission Rate, kilograms/hour	0.453	0.405	2.22
lb/hr	Emission Rate, pounds/hour	0.998	0.893	4.90
	Total Particulate Emissions (Includes PM10):			
	Concentration, grains/DSCF*	0.0267	0.0208	0.0359
	Emission Rate, kilograms/hour	10.5	8.09	7.44
	Emission Rate, pounds/hour	23.1	17.8	16.4
	Particulate Fractionation:			
%>PM10	> PM10, %	95.7	95.0	83.6
%<PM10	< PM10, %	4.3	5.0	16.4

SEMIVOLATILE ORGANICS TEST RESULTS

PLANT: Weyerhaeuser Company, Moncure, NC

SAMPLING LOCATION: MDF Particle Dryer B Cyclone Outlet (WEYCO I.D. DB)

		MDFCO-M0010-1	MDFCO-M0010-2	MDFCO-M0010-3
	Test Date	9-26-92	9-26-92	9-27-92
	Run Start & Finish Times	1109-1502	1706-1945	941-1257
	Net Traversing Points	24	24	24
Theta	Net Run Time, Minutes	168	168	168
Dia	Nozzle Diameter, Inches	0.245	0.245	0.245
Cp	Pitot Tube Coefficient	0.84	0.84	0.84
Y	Dry Gas Meter Calibration Factor	0.995	0.995	0.995
Pbar	Barometric Pressure, Inches Hg	29.950	29.950	29.900
Delta H	Avg. Pressure Differential of Orifice Meter, Inches H2O	1.733	1.628	1.540
Vm	Volume of Metered Gas Sample, Dry ACF	113.073	109.107	108.459
tm	Dry Gas Meter Temperature, Degrees F	83	84	89
Vm(std)	Volume of Metered Gas Sample, Dry SCF*	109.856	105.877	103.978
Vlc	Total Volume of Liquid Collected in Impingers & Silica Gel, mL	249.0	252.0	266.0
Vw	Volume of Water Vapor, SCF*	11.720	11.862	12.521
%H20	Moisture Content, Percent by Volume	9.6	10.1	10.7
Mfd	Dry Mole Fraction	0.904	0.899	0.893
%CO2	Carbon Dioxide, Percent by Volume, Dry	0.0	0.0	0.0
%O2	Oxygen, Percent by Volume, Dry	20.9	20.9	20.9
%CO+N2	CO + N2, Percent by Volume, Dry	79.1	79.1	79.1
Md	Gas Molecular Weight, Lb/Lb-Mole, Dry	28.84	28.84	28.84
Ms	Gas Molecular Weight, Lb/Lb-Mole, Wet	27.80	27.75	27.68
Pg	Flue Gas Static Pressure, Inches H2O	0	0	0
Ps	Absolute Flue Gas Pressure, Inches Hg	29.95	29.95	29.90
ts	Flue Gas Temperature, Degrees F	154	147	150
Delta-P	Average Velocity Head, Inches H2O	0.4908	0.4449	0.4231
vs	Flue Gas Velocity, Feet per Second	43.21	40.92	40.09
A	Stack/Duct Area, Square Inches	6,611	6,611	6,611
Qsd	Volumetric Air Flow Rate, Dry SCFM*	92,617	88,305	85,351
Qaw	Volumetric Air Flow Rate, Wet ACFM	119,034	112,726	110,439
%I	Isokinetic Sampling Rate, Percent	99.0	100.1	101.7

* 68 Deg. F (20 C) -- 29.92 In. Mercury

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SEMIVOLATILE ORGANICS TEST RESULTS

	EMISSION RESULTS:	MDFCO-M0010-1	MDFCO-M0010-2	MDFCO-M0010-3
	ACETOPHENONE			
Fwt	Formula Weight, lb/lb-mole	120.1	120.1	120.1
µg	Catch Weight, micrograms	15.9	18.2	16.7
µg/dscm	µg per dry std. cubic meter*	5	6	6
ppmvd	ppm by volume, Dry	0.001	0.001	0.001
kg/hr	kilograms per hour	0.001	0.00091	0.00082
lb/hr	pounds per hour	0.0018	0.0020	0.0018
	BIS(2-ETHYLHEXYL)PHTHALATE			
	Formula Weight, lb/lb-mole	390.5	390.5	390.5
	Catch Weight, micrograms	17.9	23.1	15.0
	µg per dry std. cubic meter*	6	8	5
	ppm by volume, Dry	0.0004	0.0005	0.0003
	kilograms per hour	0.00091	0.00116	0.00074
	pounds per hour	0.00200	0.00255	0.00163
	DI-N-BUTYLPHTHALATE			
	Formula Weight, lb/lb-mole	278.3	278.3	278.3
	Catch Weight, micrograms	18.2	6.3	14.6
	µg per dry std. cubic meter*	6	2	5
	ppm by volume, Dry	0.0005	0.0002	0.0004
	kilograms per hour	0.00092	0.00032	0.00072
	pounds per hour	0.00203	0.00070	0.00159
	NAPHTHALENE			
	Formula Weight, lb/lb-mole	128.2	128.2	128.2
	Catch Weight, micrograms	42.9	47.3	--
	µg per dry std. cubic meter*	14	16	
	ppm by volume, Dry	0.0026	0.0030	
	kilograms per hour	0.00217	0.00237	
	pounds per hour	0.00478	0.00522	
	PHENOL			
	Formula Weight, lb/lb-mole	94.1	94.1	94.1
	Catch Weight, micrograms	14.6	---	13.2
	µg per dry std. cubic meter*	5		4
	ppm by volume, Dry	0.0012		0.0011
	kilograms per hour	0.00074		0.00065
	pounds per hour	0.00163		0.00143
	BUTYLBENZYLPHTHALATE			
	Formula Weight, lb/lb-mole	312	312	312
	Catch Weight, micrograms	---	7.7	---
	µg per dry std. cubic meter*		3	
	ppm by volume, Dry		0.0002	
	kilograms per hour		0.00039	
	pounds per hour		0.00085	

* 68 Deg. F (20 C) -- 29.92 In. Mercury

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SEMIVOLATILE ORGANICS TEST RESULTS

	MDFCO-M0010-1	MDFCO-M0010-2	MDFCO-M0010-3
P-CYMENE			
Formula Weight, lb/lb-mole	134.2	134.2	134.2
Catch Weight, micrograms	10.6	15.9	11.2
µg per dry std. cubic meter*	3	5	4
ppm by volume, Dry	0.0006	0.0010	0.0007
kilograms per hour	0.00054	0.00080	0.00055
pounds per hour	0.00118	0.00175	0.00122
A-PINENE			
Formula Weight, lb/lb-mole	136.2	136.2	136.2
Catch Weight, micrograms	402.1	516.5	388.2
µg per dry std. cubic meter*	129	172	132
ppm by volume, Dry	0.02283	0.03042	0.02328
kilograms per hour	0.02034	0.02585	0.01912
pounds per hour	0.04484	0.05698	0.04215
B-PINENE			
Formula Weight, lb/lb-mole	136.2	136.2	136.2
Catch Weight, micrograms	453.9	515.4	433.4
µg per dry std. cubic meter*	146	172	147
ppm by volume, Dry	0.02577	0.03036	0.02600
kilograms per hour	0.02296	0.02579	0.02135
pounds per hour	0.05062	0.05686	0.04706
A-TERPINEOL			
Formula Weight, lb/lb-mole	154.3	154.3	154.3
Catch Weight, micrograms	152.4	176.6	148.2
µg per dry std. cubic meter*	49	59	50
ppm by volume, Dry	0.00764	0.00918	0.00785
kilograms per hour	0.00771	0.00884	0.00730
pounds per hour	0.01700	0.01948	0.01609

* 68 Deg. F (20 C) -- 29.92 In. Mercury

VOLATILE ORGANIC TEST RESULTS

PLANT: Weyerhaeuser Company, Moncure, NC

SAMPLING LOCATION: MDF Cyclone Outlet (WEYCO I.D. DB)

		MDFCO-M0030-1a	MDFCO-M0030-1b	MDFCO-M0030-1c	
	Test Date	9/26/92	9/26/92	9/26/92	
	Run Start Time	1135	1218	1355	
	Run Finish Time	1155	1238	1415	
Theta	Net Run Time, Minutes	20	20	20	
Y	Dry Gas Meter Calibration Factor	0.9963	0.9963	0.9963	
Pbar	Barometric Pressure, mm Hg	761	761	761	
Vm	Volume of Metered Gas Sample, DAL	9.835	6.64	7.95	
tm	Dry Gas Meter Temperature, Degrees C	24.8	27.8	32.5	
Vm(std)	Volume of Metered Gas Sample, Dry SL*	9.659	6.456	7.610	
Qsd	Volumetric Air Flow Rate, Dry SCFM*	92,617	92,617	92,617	
	EMISSION RESULTS:				Average
	B-Pinene				
Pwt	Formula Weight, lb/lb-mole	136.24	136.24	136.24	N/A
µg	Catch Weight, micrograms	1.11	1.01	0.91	N/A
µg/dscm	µg per dry std. cubic meter*	115	156	120	130
ppbvd	parts per billion by volume, Dry	20.3	27.6	21.1	23.0
kg/hr	kilograms per hour	0.0181	0.0246	0.0188	0.0205
lb/hr	pounds per hour	0.0399	0.0543	0.0415	0.0452
	A-Pinene				
	Formula Weight, lb/lb-mole	136.24	136.24	136.24	N/A
	Catch Weight, micrograms	1.18	1.09	0.80	N/A
	µg per dry std. cubic meter*	122	169	105	132
	parts per billion by volume, Dry	21.6	29.8	18.6	23.3
	kilograms per hour	0.0192	0.0266	0.0165	0.0208
	pounds per hour	0.0424	0.0586	0.0365	0.0458
	Methylene Chloride				
	Formula Weight, lb/lb-mole	84.93	84.93	84.93	N/A
	Catch Weight, micrograms	1.00	0.33	0.37	N/A
	µg per dry std. cubic meter*	103.5	51.1	48.6	67.8
	parts per billion by volume, Dry	29.3	14.5	13.8	19.2
	kilograms per hour	0.0163	0.00804	0.00765	0.0107
	pounds per hour	0.0359	0.0177	0.0169	0.0235
	Trichlorofluoromethane				
	Formula Weight, lb/lb-mole	137.37	137.37	137.37	N/A
	Catch Weight, micrograms	0.13	1.41	0.11	N/A
	µg per dry std. cubic meter*	13.5	218	14.5	82.1
	parts per billion by volume, Dry	2.36	38.2	2.53	14.4
	kilograms per hour	0.00212	0.0344	0.00227	0.0129
	pounds per hour	0.00467	0.0758	0.00501	0.0285
	Chloromethane				
	Formula Weight, lb/lb-mole	50.49	50.49	50.49	N/A
	Catch Weight, micrograms	0.26	0.27	0.43	N/A
	µg per dry std. cubic meter*	26.9	41.8	56.5	41.7
	parts per billion by volume, Dry	12.8	19.9	26.9	19.9
	kilograms per hour	0.00424	0.00658	0.00889	0.00657
	pounds per hour	0.00934	0.0145	0.0196	0.0145
	n-Hexane				
	Formula Weight, lb/lb-mole	86.17	86.17	86.17	N/A
	Catch Weight, micrograms	0.06	1.09	0.09	N/A
	µg per dry std. cubic meter*	6.2	169	11.8	62.3
	parts per billion by volume, Dry	1.73	47.1	3.30	17.4
	kilograms per hour	0.000978	0.0266	0.00186	0.00980
	pounds per hour	0.00216	0.0586	0.00410	0.0216

* 68 Deg. F (20 C) -- 29.92 In. Mercury

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VOLATILE ORGANIC TEST RESULTS

	MDPCO-M0030-1a	MDPCO-M0030-1b	MDPCO-M0030-1c	Average
Acetone				
Formula Weight, lb/lb-mole	58.08	58.08	58.08	N/A
Catch Weight, micrograms	0.18	0.29	0.19	N/A
µg per dry std. cubic meter*	18.6	44.9	25.0	29.5
parts per billion by volume, Dry	7.72	18.6	10.3	12.2
kilograms per hour	0.00293	0.00707	0.00393	0.00464
pounds per hour	0.00647	0.0156	0.00866	0.0102
Isooctane				
Formula Weight, lb/lb-mole	114.23	114.23	114.23	N/A
Catch Weight, micrograms	0.04	0.47	0.04	N/A
µg per dry std. cubic meter*	4.14	72.8	5.26	27.4
parts per billion by volume, Dry	0.872	15.3	1.11	5.77
kilograms per hour	0.000652	0.0115	0.000827	0.00431
pounds per hour	0.00144	0.0253	0.00182	0.00951
P-Cymene				
Formula Weight, lb/lb-mole	134.22	134.22	134.22	N/A
Catch Weight, micrograms	0.03	0.03	0.03	N/A
µg per dry std. cubic meter*	3.11	4.65	3.94	3.90
parts per billion by volume, Dry	0.557	0.833	0.707	0.699
kilograms per hour	0.000489	0.000731	0.000620	0.000613
pounds per hour	0.00108	0.00161	0.00137	0.00135
Toluene				
Formula Weight, lb/lb-mole	92.15	92.15	92.15	N/A
Catch Weight, micrograms	0.05	0.06	0.02	N/A
µg per dry std. cubic meter*	5.18	9.29	2.63	5.70
parts per billion by volume, Dry	1.35	2.43	0.686	1.49
kilograms per hour	0.000815	0.001462	0.000414	0.000897
pounds per hour	0.00180	0.00322	0.000912	0.00198
2-Butanone				
Formula Weight, lb/lb-mole	72.1	72.1	72.1	N/A
Catch Weight, micrograms	0.03	0.04	0.02	N/A
µg per dry std. cubic meter*	3.11	6.20	2.63	3.98
parts per billion by volume, Dry	1.04	2.07	0.877	1.33
kilograms per hour	0.000489	0.000975	0.000414	0.000626
pounds per hour	0.00108	0.00215	0.000912	0.00138
1,1,1-Trichloroethane				
Formula Weight, lb/lb-mole	133.41	133.41	133.41	N/A
Catch Weight, micrograms	0.02	0.03	0.01	N/A
µg per dry std. cubic meter*	2.07	4.65	1.31	2.68
parts per billion by volume, Dry	0.373	0.838	0.237	0.483
kilograms per hour	0.000326	0.000731	0.000207	0.000421
pounds per hour	0.000718	0.001612	0.000456	0.000929
Chloroform				
Formula Weight, lb/lb-mole	119.38	119.38	119.38	N/A
Catch Weight, micrograms	0.0025	0.0025	0.0025	N/A
µg per dry std. cubic meter*	0.259	0.387	0.329	0.325
parts per billion by volume, Dry	0.0522	0.0780	0.0662	0.0655
kilograms per hour	0.0000407	0.0000609	0.0000517	0.0000511
pounds per hour	0.0000898	0.000134	0.000114	0.000113
Styrene				
Formula Weight, lb/lb-mole	104.15	104.15	104.15	N/A
Catch Weight, micrograms	0.01	0.01	0.01	N/A
µg per dry std. cubic meter*	1.04	1.55	1.31	1.30
parts per billion by volume, Dry	0.239	0.358	0.304	0.300
kilograms per hour	0.000163	0.000244	0.000207	0.000204
pounds per hour	0.000359	0.000537	0.000456	0.000451
m-/p-Xylene				
Formula Weight, lb/lb-mole	106.16	106.16	106.16	N/A
Catch Weight, micrograms	0.01	0.01	0.01	N/A
µg per dry std. cubic meter*	1.04	1.55	1.31	1.30
parts per billion by volume, Dry	0.235	0.351	0.298	0.294
kilograms per hour	0.000163	0.000244	0.000207	0.000204
pounds per hour	0.000359	0.000537	0.000456	0.000451

* 68 Deg. F (20 C) -- 29.92 In. Mercury

Estimated results or not detectable (underlined)

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VOLATILE ORGANIC TEST RESULTS

	MDPCO-M0030-1a	MDPCO-M0030-1b	MDPCO-M0030-1c	Average
Bromomethane				
Formula Weight, lb/lb-mole	94.95	94.95	94.95	N/A
Catch Weight, micrograms	0.02	0.01	0.01	N/A
µg per dry std. cubic meter*	2.07	1.55	1.31	1.64
parts per billion by volume, Dry	0.525	0.392	0.333	0.417
kilograms per hour	0.000326	0.000244	0.000207	0.000259
pounds per hour	0.000718	0.000537	0.000456	0.000571
Cumene (isopropylbenzene)				
Formula Weight, lb/lb-mole	120.21	120.21	120.21	N/A
Catch Weight, micrograms	0.01	0.01	0.01	N/A
µg per dry std. cubic meter*	1.04	1.55	1.31	1.30
parts per billion by volume, Dry	0.207	0.310	0.263	0.260
kilograms per hour	0.000163	0.000244	0.000207	0.000204
pounds per hour	0.000359	0.000537	0.000456	0.000451
Carbon Disulfide				
Formula Weight, lb/lb-mole	76.14	76.14	76.14	N/A
Catch Weight, micrograms	0.0025	0.0025	0.0025	N/A
µg per dry std. cubic meter*	0.259	0.387	0.329	0.325
parts per billion by volume, Dry	0.0818	0.122	0.104	0.103
kilograms per hour	0.0000407	0.0000609	0.0000517	0.0000511
pounds per hour	0.0000898	0.000134	0.000114	0.000113
Ethylbenzene				
Formula Weight, lb/lb-mole	106.17	106.17	106.17	N/A
Catch Weight, micrograms	0.0025	0.0025	0.0025	N/A
µg per dry std. cubic meter*	0.259	0.387	0.329	0.325
parts per billion by volume, Dry	0.0586	0.0877	0.0744	0.0736
kilograms per hour	0.0000407	0.0000609	0.0000517	0.0000511
pounds per hour	0.0000898	0.000134	0.000114	0.000113
Bromodichloromethane				
Formula Weight, lb/lb-mole	163.8	163.8	163.8	N/A
Catch Weight, micrograms	0.0025	0.0025	0.0025	N/A
µg per dry std. cubic meter*	0.259	0.387	0.329	0.325
parts per billion by volume, Dry	0.0380	0.0569	0.0482	0.0477
kilograms per hour	0.0000407	0.0000609	0.0000517	0.0000511
pounds per hour	0.0000898	0.000134	0.000114	0.000113
Tetrachloroethene				
Formula Weight, lb/lb-mole	165.83	165.83	165.83	N/A
Catch Weight, micrograms	0.0025	0.0025	0.0025	N/A
µg per dry std. cubic meter*	0.259	0.387	0.329	0.325
parts per billion by volume, Dry	0.0375	0.0562	0.0477	0.0471
kilograms per hour	0.0000407	0.0000609	0.0000517	0.0000511
pounds per hour	0.0000898	0.000134	0.000114	0.000113
o-Xylene				
Formula Weight, lb/lb-mole	106.16	106.16	106.16	N/A
Catch Weight, micrograms	0.0025	0.0025	0.0025	N/A
µg per dry std. cubic meter*	0.259	0.387	0.329	0.325
parts per billion by volume, Dry	0.0586	0.0877	0.0744	0.0736
kilograms per hour	0.0000407	0.0000609	0.0000517	0.0000511
pounds per hour	0.0000898	0.0001343	0.0001140	0.000113

* 68 Deg. F (20 C) -- 29.92 In. Mercury

Estimated results or not detectable (underlined)

VOLATILE ORGANIC TEST RESULTS

PLANT: Weyerhaeuser Company, Moncure, NC

SAMPLING LOCATION: MDF Cyclone Outlet (WEYCO I.D. DB)

		MDFCO-M0030-2b	MDFCO-M0030-2c	MDFCO-M0030-2d	
	Test Date	9/26/92	9/26/92	9/26/92	
	Run Start Time	1625	1725	1752	
	Run Finish Time	1645	1745	1812	
Theta	Net Run Time, Minutes	20	20	20	
Y	Dry Gas Meter Calibration Factor	0.9963	0.9969	0.9963	
Pbar	Barometric Pressure, mm Hg	761	761	761	
Vm	Volume of Metered Gas Sample, DAL	9.97	10.31	10.71	
tm	Dry Gas Meter Temperature, Degrees C	32.0	29.8	27.5	
Vm(std)	Volume of Metered Gas Sample, Dry SL*	9.559	9.959	10.422	
Qsd	Volumetric Air Flow Rate, Dry SCFM*	88,305	88,305	88,305	
	EMISSION RESULTS:				
					Average
	B-Pinene				
Fwt	Formula Weight, lb/lb-mole	136.24	136.24	136.24	N/A
µg	Catch Weight, micrograms	1.40	1.83	1.75	N/A
µg/dacm	µg per dry std. cubic meter*	146	184	168	166.0
ppbvd	ppb by volume, Dry	25.9	32.4	29.6	29.3
kg/hr	kilograms per hour	0.0220	0.0276	0.0252	0.0249
lb/hr	pounds per hour	0.048445	0.060785	0.055541	0.0549
	A-Pinene				
	Formula Weight, lb/lb-mole	136.24	136.24	136.24	N/A
	Catch Weight, micrograms	1.45	1.73	2.00	N/A
	µg per dry std. cubic meter*	151.7	173.7	191.9	172.4
	ppb by volume, Dry	26.8	30.7	33.9	30.4
	kilograms per hour	0.0228	0.0261	0.0288	0.0259
	pounds per hour	0.050175	0.057463	0.063475	0.0570
	Methylene Chloride				
	Formula Weight, lb/lb-mole	84.93	84.93	84.93	N/A
	Catch Weight, micrograms	0.15	0.17	0.09	N/A
	µg per dry std. cubic meter*	15.7	17.1	8.63	13.8
	ppb by volume, Dry	4.44	4.83	2.45	3.91
	kilograms per hour	0.00235	0.00256	0.00130	0.00207
	pounds per hour	0.00519	0.00565	0.00286	0.00456
	Trichlorofluoromethane				
	Formula Weight, lb/lb-mole	137.37	137.37	137.37	N/A
	Catch Weight, micrograms	0.03	0.12	0.02	N/A
	µg per dry std. cubic meter*	3.14	12.0	2.09	5.76
	ppb by volume, Dry	0.550	2.11	0.366	1.01
	kilograms per hour	0.000471	0.00181	0.000314	0.000864
	pounds per hour	0.001038	0.003986	0.000692	0.00191
	Chloromethane				
	Formula Weight, lb/lb-mole	50.49	50.49	50.49	N/A
	Catch Weight, micrograms	0.37	0.54	0.32	N/A
	µg per dry std. cubic meter*	38.7	54.2	30.7	41.2
	ppb by volume, Dry	18.4	25.8	14.6	19.6
	kilograms per hour	0.00581	0.00814	0.00461	0.00618
	pounds per hour	0.0128	0.0179	0.0102	0.0136
	n-Hexane				
	Formula Weight, lb/lb-mole	86.17	86.17	86.17	N/A
	Catch Weight, micrograms	0.02	0.12	0.01	N/A
	µg per dry std. cubic meter*	2.09	12.0	0.96	5.03
	ppb by volume, Dry	0.584	3.36	0.268	1.41
	kilograms per hour	0.000314	0.00181	0.000144	0.000755
	pounds per hour	0.000692	0.003986	0.000317	0.00167

* 68 Deg. F (20 C) -- 29.92 In. Mercury

Estimated results or not detectable (underlined)

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VOLATILE ORGANIC TEST RESULTS

	MDFCO-M0030-2b	MDFCO-M0030-2c	MDFCO-M0030-2d	Average
Acetone				
Formula Weight, lb/lb-mole	58.08	58.08	58.08	N/A
Catch Weight, micrograms	0.27	0.25	0.25	N/A
µg per dry std. cubic meter*	28.2	25.1	24.0	25.8
ppb by volume, Dry	11.7	10.4	9.93	10.7
kilograms per hour	0.00424	0.00377	0.00360	0.00387
pounds per hour	0.00934	0.00830	0.00793	0.00853
Isooctane				
Formula Weight, lb/lb-mole	114.23	114.23	114.23	N/A
Catch Weight, micrograms	0.01	0.05	0.01	N/A
µg per dry std. cubic meter*	1.05	5.02	0.96	2.34
ppb by volume, Dry	0.220	1.06	0.202	0.493
kilograms per hour	0.000157	0.000753	0.000144	0.000351
pounds per hour	0.000346	0.001661	0.000317	0.000775
P-Cymene				
Formula Weight, lb/lb-mole	134.22	134.22	134.22	N/A
Catch Weight, micrograms	0.04	0.05	0.04	N/A
µg per dry std. cubic meter*	4.18	5.02	4.18	4.46
ppb by volume, Dry	0.750	0.900	0.750	0.800
kilograms per hour	0.000628	0.000753	0.000628	0.000670
pounds per hour	0.001384	0.001661	0.001384	0.00148
Toluene				
Formula Weight, lb/lb-mole	92.15	92.15	92.15	N/A
Catch Weight, micrograms	0.03	0.03	0.02	N/A
µg per dry std. cubic meter*	3.14	3.01	1.92	2.69
ppb by volume, Dry	0.819	0.786	0.501	0.702
kilograms per hour	0.000471	0.000452	0.000288	0.000404
pounds per hour	0.001038	0.000996	0.000635	0.000890
2-Butanone				
Formula Weight, lb/lb-mole	72.1	72.1	72.1	N/A
Catch Weight, micrograms	0.02	0.02	0.02	N/A
µg per dry std. cubic meter*	2.09	2.01	1.92	2.01
ppb by volume, Dry	0.698	0.670	0.640	0.669
kilograms per hour	0.000314	0.000301	0.000288	0.000301
pounds per hour	0.000692	0.000664	0.000635	0.000664
1,1,1-Trichloroethane				
Formula Weight, lb/lb-mole	133.41	133.41	133.41	N/A
Catch Weight, micrograms	0.02	0.02	0.01	N/A
µg per dry std. cubic meter*	2.09	2.01	0.96	1.69
ppb by volume, Dry	0.377	0.362	0.173	0.304
kilograms per hour	0.000314	0.000301	0.000144	0.000253
pounds per hour	0.000692	0.000664	0.000317	0.000558
Chloroform				
Formula Weight, lb/lb-mole	119.38	119.38	119.38	N/A
Catch Weight, micrograms	0.0025	0.0025	0.0025	N/A
µg per dry std. cubic meter*	0.240	0.240	0.240	0.240
ppb by volume, Dry	0.0483	0.0483	0.0483	0.0483
kilograms per hour	0.0000360	0.0000360	0.0000360	0.0000360
pounds per hour	0.0000793	0.0000793	0.0000793	0.0000793
Styrene				
Formula Weight, lb/lb-mole	104.15	104.15	104.15	N/A
Catch Weight, micrograms	0.01	0.01	0.01	N/A
µg per dry std. cubic meter*	1.05	1.00	0.959	1.00
ppb by volume, Dry	0.242	0.232	0.222	0.232
kilograms per hour	0.000157	0.000151	0.000144	0.000151
pounds per hour	0.000346	0.000332	0.000317	0.000332
m-/p-Xylene				
Formula Weight, lb/lb-mole	106.16	106.16	106.16	N/A
Catch Weight, micrograms	0.01	0.01	0.01	N/A
µg per dry std. cubic meter*	1.05	1.00	0.959	1.00
ppb by volume, Dry	0.237	0.228	0.217	0.227
kilograms per hour	0.000157	0.000151	0.000144	0.000151
pounds per hour	0.000346	0.000332	0.000317	0.000332

* 68 Deg. F (20 C) -- 29.92 In. Mercury

Estimated results or not detectable (undertined)

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VOLATILE ORGANIC TEST RESULTS

	MDPCO-M0030-2b	MDPCO-M0030-2c	MDPCO-M0030-2d	Average
Bromomethane				
Formula Weight, lb/lb-mole	94.95	94.95	94.95	N/A
Catch Weight, micrograms	0.02	0.01	0.0025	N/A
µg per dry std. cubic meter*	2.09	1.00	0.240	1.11
ppb by volume, Dry	0.530	0.254	0.061	0.282
kilograms per hour	0.000314	0.000151	0.0000360	0.000167
pounds per hour	0.000692	0.0003[illegible]	0.0000793	0.000368
Cumene (isopropylbenzene)				
Formula Weight, lb/lb-mole	120.21	120.21	120.21	N/A
Catch Weight, micrograms	0.01	0.01	0.0025	N/A
µg per dry std. cubic meter*	1.05	1.00	0.240	1.03
ppb by volume, Dry	0.209	0.201	0.048	0.205
kilograms per hour	0.000157	0.000151	0.0000360	0.000115
pounds per hour	0.000346	0.000332	0.0000793	0.000253

* 68 Deg. F (20 C) -- 29.92 In. Mercury

Estimated results or <u>not detectable</u> (underlined)

VOLATILE ORGANIC TEST RESULTS

PLANT: Weyerhaeuser Company, Moncure, NC

SAMPLING LOCATION: MDF Cyclone Outlet (WEYCO I.D. DB)

		MDPCO-M0030-3a	MDPCO-M0030-3b	MDPCO-M0030-3c	
	Test Date	9/27/92	9/27/92	9/27/92	
	Run Start Time	955	1030	1105	
	Run Finish Time	1015	1050	1125	
Theta	Net Run Time, Minutes	20	20	20	
Y	Dry Gas Meter Calibration Factor	0.9963	0.9963	0.9963	
Pbar	Barometric Pressure, mm Hg	759	759	759	
Vm	Volume of Metered Gas Sample, DAL	11.79	10.23	10.44	
tm	Dry Gas Meter Temperature, Degrees C	30.0	31.5	32.8	
Vm(std)	Volume of Metered Gas Sample, Dry SL*	11.360	9.808	9.969	
Qsd	Volumetric Air Flow Rate, Dry SCFM*	85,351	85,351	85,351	
	EMISSION RESULTS:				
					Average
	B-Pinene				
Fwt	Formula Weight, lb/lb-mole	136.24	136.24	136.24	N/A
µg	Catch Weight, micrograms	2.14	1.63	0.84	N/A
µg/dscm	µg per dry std. cubic meter*	188	166	84.3	146
ppbvd	ppb by volume, Dry	33.3	29.3	14.9	25.8
kg/hr	kilograms per hour	0.0273	0.0241	0.0122	0.0212
lb/hr	pounds per hour	0.0602	0.0531	0.0269	0.0468
	A-Pinene				
	Formula Weight, lb/lb-mole	136.24	136.24	136.24	N/A
	Catch Weight, micrograms	2.19	1.21	0.82	N/A
	µg per dry std. cubic meter*	193	123	82.3	133
	ppb by volume, Dry	34.0	21.8	14.5	23.4
	kilograms per hour	0.0280	0.0179	0.0119	0.0193
	pounds per hour	0.0616	0.0394	0.0263	0.0425
	Methylene Chloride				
	Formula Weight, lb/lb-mole	84.93	84.93	84.93	N/A
	Catch Weight, micrograms	4.03	0.25	0.14	N/A
	µg per dry std. cubic meter*	354.7	25.5	14.0	131
	ppb by volume, Dry	100.5	7.22	3.98	37.2
	kilograms per hour	0.0514	0.00370	0.00204	0.0191
	pounds per hour	0.113	0.00815	0.00449	0.0420
	Trichlorofluoromethane				
	Formula Weight, lb/lb-mole	137.37	137.37	137.37	N/A
	Catch Weight, micrograms	0.07	1.16	0.10	N/A
	µg per dry std. cubic meter*	6.16	118.3	10.0	44.8
	ppb by volume, Dry	1.08	20.7	1.76	7.85
	kilograms per hour	0.000894	0.0172	0.00145	0.00650
	pounds per hour	0.00197	0.0378	0.00321	0.0143
	Chloromethane				
	Formula Weight, lb/lb-mole	50.49	50.49	50.49	N/A
	Catch Weight, micrograms	0.08	0.24	0.32	N/A
	µg per dry std. cubic meter*	7.04	24.5	32.1	21.2
	ppb by volume, Dry	3.36	11.7	15.3	10.1
	kilograms per hour	0.00102	0.00355	0.00466	0.00308
	pounds per hour	0.00225	0.00782	0.0103	0.00678
	n-Hexane				
	Formula Weight, lb/lb-mole	86.17	86.17	86.17	N/A
	Catch Weight, micrograms	0.07	0.75	0.07	N/A
	µg per dry std. cubic meter*	6.16	76.5	7.02	29.9
	ppb by volume, Dry	1.72	21.3	1.96	8.34
	kilograms per hour	0.000894	0.0111	0.00102	0.00433
	pounds per hour	0.001970	0.024448	0.002245	0.00955

* 68 Deg. F (20 C) -- 29.92 In. Mercury

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VOLATILE ORGANIC TEST RESULTS

	MDPCO-M0030-3a	MDPCO-M0030-3b	MDPCO-M0030-3c	Average
Acetone				
Formula Weight, lb/lb-mole	58.08	58.08	58.08	N/A
Catch Weight, micrograms	0.32	0.21	0.23	N/A
µg per dry std. cubic meter*	28.2	21.4	23.1	24.2
ppb by volume, Dry	11.7	8.87	9.56	10.0
kilograms per hour	0.00409	0.00311	0.00335	0.00351
pounds per hour	0.00901	0.00685	0.00738	0.00774
Isooctane				
Formula Weight, lb/lb-mole	114.23	114.23	114.23	N/A
Catch Weight, micrograms	0.04	0.33	0.04	N/A
µg per dry std. cubic meter*	3.52	33.6	4.01	13.7
ppb by volume, Dry	0.742	7.09	0.845	2.89
kilograms per hour	0.000511	0.00488	0.000582	0.00199
pounds per hour	0.001126	0.010757	0.001283	0.00439
P-Cymene				
Formula Weight, lb/lb-mole	134.22	134.22	134.22	N/A
Catch Weight, micrograms	0.05	0.04	0.03	N/A
µg per dry std. cubic meter*	4.40	4.08	3.01	3.83
ppb by volume, Dry	0.789	0.731	0.539	0.686
kilograms per hour	0.000638	0.000591	0.000436	0.000555
pounds per hour	0.001407	0.001304	0.000962	0.00122
Toluene				
Formula Weight, lb/lb-mole	92.15	92.15	92.15	N/A
Catch Weight, micrograms	0.02	0.03	0.03	N/A
µg per dry std. cubic meter*	1.76	3.06	3.01	2.61
ppb by volume, Dry	0.460	0.798	0.786	0.681
kilograms per hour	0.000255	0.000444	0.000436	0.000378
pounds per hour	0.000563	0.000978	0.000962	0.000834
2-Butanone				
Formula Weight, lb/lb-mole	72.1	72.1	72.1	N/A
Catch Weight, micrograms	0.03	0.01	0.02	N/A
µg per dry std. cubic meter*	2.64	1.02	2.01	1.89
ppb by volume, Dry	0.881	0.340	0.669	0.630
kilograms per hour	0.000383	0.000148	0.000291	0.000274
pounds per hour	0.000844	0.000326	0.000641	0.000604
1,1,1-Trichloroethane				
Formula Weight, lb/lb-mole	133.41	133.41	133.41	N/A
Catch Weight, micrograms	0.03	0.02	0.01	N/A
µg per dry std. cubic meter*	2.64	2.04	1.00	1.89
ppb by volume, Dry	0.476	0.368	0.181	0.342
kilograms per hour	0.000383	0.000296	0.000145	0.000275
pounds per hour	0.000844	0.000652	0.000321	0.000606
Chloroform				
Formula Weight, lb/lb-mole	119.38	119.38	119.38	N/A
Catch Weight, micrograms	0.17	0.0025	0.0025	N/A
µg per dry std. cubic meter*	15.0	0.255	0.251	5.16
ppb by volume, Dry	3.02	0.0514	0.0505	1.04
kilograms per hour	0.00217	0.0000370	0.0000364	0.000748
pounds per hour	0.00478	0.0000815	0.0000802	0.00165
Styrene				
Formula Weight, lb/lb-mole	104.15	104.15	104.15	N/A
Catch Weight, micrograms	0.01	0.01	0.01	N/A
µg per dry std. cubic meter*	0.88	1.02	1.00	0.968
ppb by volume, Dry	0.203	0.235	0.232	0.223
kilograms per hour	0.000128	0.000148	0.000145	0.000140
pounds per hour	0.000281	0.000326	0.000321	0.000309
m-/p-Xylene				
Formula Weight, lb/lb-mole	106.16	106.16	106.16	N/A
Catch Weight, micrograms	0.01	0.01	0.01	N/A
µg per dry std. cubic meter*	0.880	1.02	1.00	0.968
ppb by volume, Dry	0.199	0.231	0.227	0.219
kilograms per hour	0.000128	0.000148	0.000145	0.000140
pounds per hour	0.000281	0.000326	0.000321	0.000309

* 68 Deg. F (20 C) -- 29.92 In. Mercury

Estimated results or not detectable (underlined)

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VOLATILE ORGANIC TEST RESULTS

	MDPCO-M0030-3a	MDPCO-M0030-3b	MDPCO-M0030-3c	Average
Cumene (isopropylbenzene)				
Formula Weight, lb/lb-mole	120.21	120.21	120.21	N/A
Catch Weight, micrograms	0.01	0.0025	0.01	N/A
µg per dry std. cubic meter*	0.880	0.255	1.00	0.713
ppb by volume, Dry	0.176	0.0510	0.201	0.143
kilograms per hour	0.000128	0.0000370	0.000145	0.000103
pounds per hour	0.000281	0.0000815	0.000321	0.000228
Carbon Disulfide				
Formula Weight, lb/lb-mole	76.14	76.14	76.14	N/A
Catch Weight, micrograms	0.01	0.0025	0.0025	N/A
µg per dry std. cubic meter*	0.880	0.255	0.251	0.462
ppb by volume, Dry	0.278	0.0805	0.0792	0.146
kilograms per hour	0.0001277	0.0000370	0.0000364	0.0000670
pounds per hour	0.000281	0.0000815	0.0000802	0.000148
Bromodichloromethane				
Formula Weight, lb/lb-mole	163.8	163.8	163.8	N/A
Catch Weight, micrograms	0.01	0.0025	0.0025	N/A
µg per dry std. cubic meter*	0.880	0.255	0.255	0.463
ppb by volume, Dry	0.129	0.0374	0.0374	0.0680
kilograms per hour	0.000128	0.0000370	0.0000370	0.0000672
pounds per hour	0.000281	0.0000815	0.0000815	0.000148

* 68 Deg. F (20 C) -- 29.92 In. Mercury
Estimated results or not detectable (underlined)

APPENDIX A-2

MDF PRESS STACK 2 (WIW-2)

ALDEHYDES/KETONES TEST RESULTS

PLANT: Weyerhaeuser Company, Moncure, NC

SAMPLING LOCATION: MDF Press Stack 2 (WIW-2)

023

		MDFP2-M0011-1	MDFP2-M0011-2	MDFP2-M0011-3
	Test Date	9-11-92	9-12-92	9-12-92
	Run Start & Finish Times	1928-2050	848-1021	1211-1427
	Net Traversing Points	24	24	24
Theta	Net Run Time, Minutes	72	84	84
Dia	Nozzle Diameter, Inches	0.200	0.200	0.200
Cp	Pitot Tube Coefficient	0.84	0.84	0.84
Y	Dry Gas Meter Calibration Factor	1.005	1.005	1.005
Pbar	Barometric Pressure, Inches Hg	30.020	30.060	30.060
Delta H	Avg. Pressure Differential of Orifice Meter, Inches H2O	1.100	1.057	1.129
Vm	Volume of Metered Gas Sample, Dry ACF	40.968	45.997	48.005
tm	Dry Gas Meter Temperature, Degrees F	99	82	97
Vm(std)	Volume of Metered Gas Sample, Dry SCF*	39.080	45.344	46.027
Vlc	Total Volume of Liquid Collected in Impingers & Silica Gel, mL	38.9	21.8	19.9
Vw	Volume of Water Vapor, SCF*	1.831	1.026	0.937
%H20	Moisture Content, Percent by Volume	4.5	2.2	2.0
Mfd	Dry Mole Fraction	0.955	0.978	0.980
%CO2	Carbon Dioxide, Percent by Volume, Dry	0.0	0.0	0.0
%O2	Oxygen, Percent by Volume, Dry	20.9	20.9	20.9
%CO+N2	CO + N2, Percent by Volume, Dry	79.1	79.1	79.1
Md	Gas Molecular Weight, Lb/Lb-Mole, Dry	28.84	28.84	28.84
Ms	Gas Molecular Weight, Lb/Lb-Mole, Wet	28.35	28.60	28.62
Pg	Flue Gas Static Pressure, Inches H2O	0.45	0.45	0.45
Ps	Absolute Flue Gas Pressure, Inches Hg	30.05	30.09	30.09
ts	Flue Gas Temperature, Degrees F	118	111	115
Delta-P	Average Velocity Head, Inches H2O	0.6172	0.6109	0.6301
vs	Flue Gas Velocity, Feet per Second	46.46	45.73	46.56
A	Stack/Duct Area, Square Inches	661	661	661
Qsd	Volumetric Air Flow Rate, Dry SCFM*	11,207	11,444	11,604
Qaw	Volumetric Air Flow Rate, Wet ACFM	12,787	12,586	12,814
%I	Isokinetic Sampling Rate, Percent	101.8	99.2	99.3

* 68 Deg. F (20 C) -- 29.92 In. Mercury

(continued next page)

	EMISSION RESULTS:	MDFP2-M0011-1	MDFP2-M0011-2	MDFP2-M0011-3
	FORMALDEHYDE			
Fwt	Formula Weight, lb/lb-mole	30	30	
µg	Catch Weight, micrograms	61,419	60,520	
µg/dscm	µg per dry std. cubic meter*	55,495	47,129	
ppmvd	ppm by volume, Dry	44.5	37.8	
kg/hr	kilograms per hour	1.057	0.916	
lb/hr	pounds per hour	2.330	2.020	
	ACETALDEHYDE			
	Formula Weight, lb/lb-mole	44.1	44.1	
	Catch Weight, micrograms	785	483	
	µg per dry std. cubic meter*	709	[illegible]	
	ppm by volume, Dry	0.3869	0.2052	
	kilograms per hour	0.0135	0.00731	
	pounds per hour	0.0298	0.0161	
	ACROLEIN			
	Formula Weight, lb/lb-mole	56.1	56.1	
	Catch Weight, micrograms	88	46	
	µg per dry std. cubic meter*	79.5	35.8	
	ppm by volume, Dry	0.03410	0.01536	
	kilograms per hour	0.00151	0.00070	
	pounds per hour	0.00334	0.00154	
	ACETONE			
	Formula Weight, lb/lb-mole	58	58	
	Catch Weight, micrograms	232	336	
	µg per dry std. cubic meter*	210	262	
	ppm by volume, Dry	0.08694	0.10852	
	kilograms per hour	0.00399	0.00509	
	pounds per hour	0.00880	0.01122	
	PROPIONALDEHYDE			
	Formula Weight, lb/lb-mole	58.1	58.1	
	Catch Weight, micrograms	56	2	
	µg per dry std. cubic meter*	50.6	1.557	
	ppm by volume, Dry	0.02095	0.000645	
	kilograms per hour	0.000964	0.0000303	
	pounds per hour	0.00212	0.0000668	
	CROTONALDEHYDE			
	Formula Weight, lb/lb-mole	70	70	
	Catch Weight, micrograms	61	161	
	µg per dry std. cubic meter*	55.1	125	
	ppm by volume, Dry	0.01894	0.04309	
	kilograms per hour	0.001050	0.00244	
	pounds per hour	0.00231	0.00537	
	n-BUTYRALDEHYDE			
	Formula Weight, lb/lb-mole	72.1	72.1	
	Catch Weight, micrograms	157	267	
	µg per dry std. cubic meter*	142	208	
	ppm by volume, Dry	0.04733	0.06937	
	kilograms per hour	0.00270	0.00404	
	pounds per hour	0.00596	0.00891	
	METHYL ETHYL KETONE			
	Formula Weight, lb/lb-mole	72.1	72.1	
	Catch Weight, micrograms	103	31	
	µg per dry std. cubic meter*	93.1	24.1	
	ppm by volume, Dry	0.03105	0.00805	
	kilograms per hour	0.00177	0.000469	
	pounds per hour	0.00391	0.00103	

Estimated catch weight.

All catch weights are less than the minimum detection limit (MDL). Value presented calculated using 1/2 MDL for each catch weight.

* 68 Deg. F (20 C) -- 29.92 in. Mercury

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EMISSION RESULTS:	MDFP2-M0011-1	MDFP2-M0011-2	MDFP2-M0011-3
BENZALDEHYDE			
Formula Weight, lb/lb-mole	106.1	106.1	
Catch Weight, micrograms	34	38	
µg per dry std. cubic meter*	30.7	29.6	
ppm by volume, Dry	0.00697	0.00671	
kilograms per hour	0.000585	0.000575	
pounds per hour	0.00129	0.00127	
ISOVALERALDEHYDE			
Formula Weight, lb/lb-mole	86.1	86.1	
Catch Weight, micrograms	81	167	
µg per dry std. cubic meter*	73.2	130	
ppm by volume, Dry	0.02045	0.03634	
kilograms per hour	0.00139	0.00253	
pounds per hour	0.00307	0.00558	
VALERALDEHYDE			
Formula Weight, lb/lb-mole	86.1	86.1	
Catch Weight, micrograms	91	212	
µg per dry std. cubic meter*	82.2	165	
ppm by volume, Dry	0.02297	0.04613	
kilograms per hour	0.00157	0.00321	
pounds per hour	0.00345	0.00708	
o-TOLUALDEHYDE			
Formula Weight, lb/lb-mole	120.2	120.2	
Catch Weight, micrograms	33	18	
µg per dry std. cubic meter*	29.8	14.0	
ppm by volume, Dry	0.00597	0.00281	
kilograms per hour	0.000568	0.000273	
pounds per hour	0.00125	0.000601	
m/p-TOLUALDEHYDE			
Formula Weight, lb/lb-mole	120.2	120.2	
Catch Weight, micrograms	63	236	
µg per dry std. cubic meter*	56.9	184	
ppm by volume, Dry	0.01139	0.03678	
kilograms per hour	0.00108	0.00357	
pounds per hour	0.00239	0.00788	
HEXALDEHYDE			
Formula Weight, lb/lb-mole	100.16	100.16	
Catch Weight, micrograms	142	131	
µg per dry std. cubic meter*	128	102	
ppm by volume, Dry	0.03082	0.02450	
kilograms per hour	0.00244	0.00198	
pounds per hour	0.00539	0.00437	
2,5-DIMETHYL BENZALDEHYDE			
Formula Weight, lb/lb-mole	134	134	
Catch Weight, micrograms	42	264	
µg per dry std. cubic meter*	37.9	206	
ppm by volume, Dry	0.00681	0.03691	
kilograms per hour	0.000723	0.00400	
pounds per hour	0.00159	0.00881	

Estimated catch weight.

All catch weights are less than the minimum detection limit (MDL). Value presented calculated using 1/2 MDL for each catch weight.

* 68 Deg. F (20 C) -- 29.92 In. Mercury

PM10 & CONDENSIBLE PARTICULATE TEST RESULTS

PLANT: Weyerhaeuser Company, Moncure, NC

SAMPLING LOCATION: MDF Press Stack 2 (WEYCO I.D. W.I.W.2)

		MDFP2-M201A/202-1	MDFP2-M201A/202-2	MDFP2-M201A/202-3
	Test Date	9/10/92	9/11/92	9/11/92
	Run Start & Finish Times	1148-1739	740-1145	1253-1821
	Net Traversing Points	12	12	12
Theta	Net Run Time, Minutes	261.75	232.00	253.00
Dia	Nozzle Diameter, Inches	0.175	0.175	0.175
Cp	Pitot Tube Coefficient	0.84	0.84	0.84
Y	Dry Gas Meter Calibration Factor	1.005	1.005	1.005
Pbar	Barometric Pressure, Inches Hg	30.09	30.02	30.02
Delta H	Avg. Pressure Differential of Orifice Meter, Inches H2O	0.7	0.67	0.67
Vm	Volume of Metered Gas Sample, Dry ACF	123.71	105.39	116.332
tm	Dry Gas Meter Temperature, Degrees F	108	93	108
Vm(std)	Volume of Metered Gas Sample, Dry SCF*	116.411	101.570	109.198
Vlc	Total Volume of Liquid Collected in Impingers & Silica Gel, mL	87	73	73
Vw	Volume of Water Vapor, SCF*	4.095	3.436	3.436
%H20	Moisture Content, Percent by Volume	3.4	3.3	3.1
Mfd	Dry Mole Fraction	0.966	0.967	0.969
%CO2	Carbon Dioxide, Percent by Volume, Dry	0.0	0.0	0.0
%O2	Oxygen, Percent by Volume, Dry	20.9	20.9	20.9
%CO+N2	CO + N2, Percent by Volume, Dry	79.1	79.1	79.1
Md	Gas Molecular Weight, Lb/Lb-Mole, Dry	28.84	28.84	28.84
Ms	Gas Molecular Weight, Lb/Lb-Mole, Wet	28.47	28.48	28.50
Pg	Flue Gas Static Pressure, Inches H2O	0.42	0.42	0.42
Ps	Absolute Flue Gas Pressure, Inches Hg	30.12	30.05	30.05
ts	Flue Gas Temperature, Degrees F	123	114	121
Delta-P	Average Velocity Head, Inches H2O	0.6513	0.5992	0.6632
vs	Flue Gas Velocity, Feet per Second	47.77	45.51	48.19
A	Stack/Duct Area, Square Inches	661	661	661
Qsd	Volumetric Air Flow Rate, Dry SCFM*	11,586	11,203	11,729
Qaw	Volumetric Air Flow Rate, Wet ACFM	13,147	12,533	13,272
%I	Isokinetic Sampling Rate, Percent	105.4	107.4	101.1

* 68 Degrees F -- 29.92 Inches of Mercury (Hg). (Continued Next Page)

PM10 & CONDENSIBLE PARTICULATE TEST RESULTS

		MDFP2-M201A/202-1	MDFP2-M201A/202-2	MDFP2-M201A/202-3
	PM10 RESULTS:			
ucyc	Stack Gas Viscosity	189.4	190.6	189.1
Qs	PM10 Flow, at Cyclone Conditions, ACFM	0.505	0.490	0.488
D50	Dia. of Particles in Cyclone, Microns	9.6	9.9	9.8
	Particulate Catch,			
mg	< PM10, Grams	0.0274	0.0267	0.0266
	> PM10, Grams	0.0663	0.0500	0.0400
	Non-extractable Condensibles, Grams	0.0522	0.0165	0.0131
	Extractable Condensibles, Grams	0.0103	0.0014	0.0033
	PM10 Emissions:			
	Including extractable/non-extractable condensibles			
gr/DSCF	Concentration, grains/DSCF*	0.0119	0.00678	0.00608
kg/hr	Emission Rate, kilograms/hour	0.537	0.295	0.277
lb/hr	Emission Rate, pounds/hour	1.18	0.650	0.611
	Including only non-extractable condensibles			
	Concentration, grains/DSCF*	0.0106	0.00656	0.00561
	Emission Rate, kilograms/hour	0.475	0.286	0.256
	Emission Rate, pounds/hour	1.05	0.630	0.564
	Without condensibles			
	Concentration, grains/DSCF*	0.00363	0.00406	0.00376
	Emission Rate, kilograms/hour	0.164	0.177	0.171
	Emission Rate, pounds/hour	0.361	0.389	0.378
	Total Particulate Emissions (Includes PM10):			
	Concentration, grains/DSCF*	0.0207	0.0144	0.0117
	Emission Rate, kilograms/hour	0.93	0.63	0.53
	Emission Rate, pounds/hour	2.06	1.38	1.18
	Particulate Fractionation:			
%>PM10	> PM10, %	42.4	52.9	48.2
%<PM10	< PM10, %	57.6	47.1	51.8

APPENDIX A-3

MDF PRESS STACK 3 (WIW-1)

ALDEHYDES/KETONES TEST RESULTS

PLANT: Weyerhaeuser Company, Moncure, NC

SAMPLING LOCATION: MDF Press Stack 3 (WIW-1)

		MDFP3-M0011-1	MDFP3-M0011-2	MDFP3-M0011-3
	Test Date	9-11-92	9-12-92	9-12-92
	Run Start & Finish Times	1928-2050	0848-1009	1211-1410
	Net Traversing Points	24	24	24
Theta	Net Run Time, Minutes	72	72	72
Dia	Nozzle Diameter, Inches	0.201	0.201	0.201
Cp	Pitot Tube Coefficient	0.84	0.84	0.84
Y	Dry Gas Meter Calibration Factor	1.006	1.006	1.006
Pbar	Barometric Pressure, Inches Hg	30.020	30.060	30.060
Delta H	Avg. Pressure Differential of Orifice Meter, Inches H2O	1.457	1.355	1.487
Vm	Volume of Metered Gas Sample, Dry ACF	45.987	44.915	46.308
tm	Dry Gas Meter Temperature, Degrees F	95	82	96
Vm(std)	Volume of Metered Gas Sample, Dry SCF*	44.324	44.366	44.571
Vlc	Total Volume of Liquid Collected in Impingers & Silica Gel, mL	32.1	29.1	27.6
Vw	Volume of Water Vapor, SCF*	1.511	1.370	1.299
%H20	Moisture Content, Percent by Volume	3.3	3.0	2.8
Mfd	Dry Mole Fraction	0.967	0.970	0.972
%CO2	Carbon Dioxide, Percent by Volume, Dry	0.0	0.0	0.0
%O2	Oxygen, Percent by Volume, Dry	20.9	20.9	20.9
%CO+N2	CO + N2, Percent by Volume, Dry	79.1	79.1	79.1
Md	Gas Molecular Weight, Lb/Lb-Mole, Dry	28.84	28.84	28.84
Ms	Gas Molecular Weight, Lb/Lb-Mole, Wet	28.48	28.51	28.54
Pg	Flue Gas Static Pressure, Inches H2O	0.2	0.2	0.2
Ps	Absolute Flue Gas Pressure, Inches Hg	30.03	30.07	30.07
ts	Flue Gas Temperature, Degrees F	120	114	119
Delta-P	Average Velocity Head, Inches H2O	0.7423	0.6966	0.7561
vs	Flue Gas Velocity, Feet per Second	50.96	49.04	51.27
A	Stack/Duct Area, Square Inches	661	661	661
Qsd	Volumetric Air Flow Rate, Dry SCFM*	12,386	12,106	12,579
Qaw	Volumetric Air Flow Rate, Wet ACFM	14,025	13,497	14,111
%I	Isokinetic Sampling Rate, Percent	103.5	106.0	102.4

* 68 Deg. F (20 C) -- 29.92 In. Mercury

(continued next page)

ALDEHYDES/KETONES TEST RESULTS

	EMISSION RESULTS:	MDFP3-M0011-1	MDFP3-M0011-2	MDFP3-M0011-3
	FORMALDEHYDE			
Fwt	Formula Weight, lb/lb-mole	30	30	30
µg	Catch Weight, micrograms	80,176	90,935	77,086
µg/dscm	µg per dry std. cubic meter*	63,872	72,375	61,070
ppmvd	ppm by volume, Dry	51.217	58.035	48.971
kg/hr	kilograms per hour	1.344	1.489	1.305
lb/hr	pounds per hour	2.96363	3.28223	2.87778
	ACETALDEHYDE			
	Formula Weight, lb/lb-mole	44.1	44.1	44.1
	Catch Weight, micrograms	529	625	713
	µg per dry std. cubic meter*	421	497	565
	ppm by volume, Dry	0.230	0.271	0.308
	kilograms per hour	0.00887	0.01023	0.01207
	pounds per hour	0.01955	0.02256	0.02662
	ACROLEIN			
	Formula Weight, lb/lb-mole	56.1	56.1	56.1
	Catch Weight, micrograms	204	177	105
	µg per dry std. cubic meter*	163	141	83.2
	ppm by volume, Dry	0.06969	0.06041	0.03567
	kilograms per hour	0.00342	0.00290	0.00178
	pounds per hour	0.00754	0.00639	0.00392
	ACETONE			
	Formula Weight, lb/lb-mole	58	58	58
	Catch Weight, micrograms	138	351	111
	µg per dry std. cubic meter*	110	279	87.9
	ppm by volume, Dry	0.04560	0.11587	0.03647
	kilograms per hour	0.00231	0.00575	0.00188
	pounds per hour	0.00510	0.01267	0.00414
	PROPIONALDEHYDE			
	Formula Weight, lb/lb-mole	58.1	58.1	58.1
	Catch Weight, micrograms	23	107	42
	µg per dry std. cubic meter*	18.3	85.2	33.3
	ppm by volume, Dry	0.00759	0.03526	0.01378
	kilograms per hour	0.000386	0.00175	0.000711
	pounds per hour	0.000850	0.00386	0.00157
	CROTONALDEHYDE			
	Formula Weight, lb/lb-mole	70	70	70
	Catch Weight, micrograms	55	49	59
	µg per dry std. cubic meter*	43.8	39.0	46.7
	ppm by volume, Dry	0.01506	0.01340	0.01606
	kilograms per hour	0.000922	0.000802	0.00100
	pounds per hour	0.00203	0.00177	0.00220
	n-BUTYRALDEHYDE			
	Formula Weight, lb/lb-mole	72.1	72.1	72.1
	Catch Weight, micrograms	161	101	133
	µg per dry std. cubic meter*	128	80.4	105
	ppm by volume, Dry	0.04279	0.02682	0.03516
	kilograms per hour	0.00270	0.00165	0.00225
	pounds per hour	0.00595	0.00365	0.00497
	METHYL ETHYL KETONE			
	Formula Weight, lb/lb-mole	72.1	72.1	72.1
	Catch Weight, micrograms	183	59	50
	µg per dry std. cubic meter*	146	47.0	39.6
	ppm by volume, Dry	0.04864	0.01567	0.01322
	kilograms per hour	0.00307	0.000966	0.000847
	pounds per hour	0.00676	0.00213	0.00187

* 68 Deg. F (20 C) -- 29.92 In. Mercury

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ALDEHYDES/KETONES TEST RESULTS

EMISSION RESULTS:	MDFP3-M0011-1	MDFP3-M0011-2	MDFP3-M0011-3
BENZALDEHYDE			
Formula Weight, lb/lb-mole	106.1	106.1	106.1
Catch Weight, micrograms	28	35	32
µg per dry std. cubic meter*	22.3	27.9	25.4
ppm by volume, Dry	0.00506	0.00632	0.00575
kilograms per hour	0.000469	0.000573	0.000542
pounds per hour	0.00103	0.00126	0.00119
ISOVALERALDEHYDE			
Formula Weight, lb/lb-mole	86.1	86.1	86.1
Catch Weight, micrograms	70	63	76
µg per dry std. cubic meter*	55.8	50.1	60.2
ppm by volume, Dry	0.01558	0.01401	0.01682
kilograms per hour	0.00117	0.00103	0.00129
pounds per hour	0.00259	0.00227	0.00284
VALERALDEHYDE			
Formula Weight, lb/lb-mole	86.1	86.1	86.1
Catch Weight, micrograms	222	78	102
µg per dry std. cubic meter*	177	62.1	80.8
ppm by volume, Dry	0.04941	0.01735	0.02258
kilograms per hour	0.00372	0.00128	0.00173
pounds per hour	0.00821	0.00282	0.00381
o-TOLUALDEHYDE			
Formula Weight, lb/lb-mole	120.2	120.2	120.2
Catch Weight, micrograms	138	22	36
µg per dry std. cubic meter*	110	17.5	28.5
ppm by volume, Dry	0.02200	0.00350	0.00571
kilograms per hour	0.00231	0.000360	0.000610
pounds per hour	0.00510	0.000794	0.00134
m/p-TOLUALDEHYDE			
Formula Weight, lb/lb-mole	120.2	120.2	120.2
Catch Weight, micrograms	112	50	75
µg per dry std. cubic meter*	89.2	39.8	59.4
ppm by volume, Dry	0.01786	0.00796	0.01189
kilograms per hour	0.00188	0.000819	0.00127
pounds per hour	0.00414	0.00180	0.00280
HEXALDEHYDE			
Formula Weight, lb/lb-mole	100.16	100.16	100.16
Catch Weight, micrograms	153	116	134
µg per dry std. cubic meter*	122	92.3	106
ppm by volume, Dry	0.02927	0.02217	0.02550
kilograms per hour	0.00257	0.00190	0.00227
pounds per hour	0.00566	0.00419	0.00500
2,5-DIMETHYL BENZALDEHYDE			
Formula Weight, lb/lb-mole	134	134	134
Catch Weight, micrograms	245	29	48
µg per dry std. cubic meter*	195	23.1	38.0
ppm by volume, Dry	0.03504	0.00414	0.00683
kilograms per hour	0.00411	0.000475	0.000813
pounds per hour	0.00906	0.00105	0.00179

* 68 Deg. F (20 C) -- 29.92 In. Mercury

PM10 & CONDENSIBLE PARTICULATE TEST RESULTS

PLANT: Weyerhaeuser Company, Moncure, NC

SAMPLING LOCATION: MDF Press Stack 3 (WEYCO I.D. WIW-1)

		MDFP3-M201A/202-1	MDFP3-M201A/202-2	MDFP3-M201A/202-3
	Test Date	9/10/92	9/11/92	9/11/92
	Run Start & Finish Times	1148-1742	739-1158	1352-1803
	Meter Traversing Points	12	12	12
Theta	Net Run Time, Minutes	259.75	249	238.5
Dia	Nozzle Diameter, Inches	0.181	0.181	0.181
Cp	Pitot Tube Coefficient	0.84	0.84	0.84
Y	Dry Gas Meter Calibration Factor	1.006	1.006	1.006
Pbar	Barometric Pressure, Inches Hg	30.09	30.02	30.02
Delta H	Avg. Pressure Differential of Orifice Meter, Inches H2O	0.75	0.73	0.76
Vm	Volume of Metered Gas Sample, Dry ACF	123.248	115.284	111.522
tm	Dry Gas Meter Temperature, Degrees F	109	96	97
Vm(std)	Volume of Metered Gas Sample, Dry SCF*	115.788	110.621	106.810
Vlc	Total Volume of Liquid Collected in Impingers & Silica Gel, mL	101	112	76
Vw	Volume of Water Vapor, SCF*	4.754	5.272	3.577
%H20	Moisture Content, Percent by Volume	3.9	4.5	3.2
Mfd	Dry Mole Fraction	0.961	0.955	0.968
%CO2	Carbon Dioxide, Percent by Volume, Dry	0.0	0.0	0.0
%O2	Oxygen; Percent by Volume, Dry	20.9	20.9	20.9
%CO+N2	CO + N2, Percent by Volume, Dry	79.1	79.1	79.1
Md	Gas Molecular Weight, Lb/Lb-Mole, Dry	28.84	28.84	28.84
Ms	Gas Molecular Weight, Lb/Lb-Mole, Wet	28.42	28.35	28.49
Pg	Flue Gas Static Pressure, Inches H2O	0.45	0.45	0.45
Ps	Absolute Flue Gas Pressure, Inches Hg	30.12	30.05	30.05
ts	Flue Gas Temperature, Degrees F	125	119	123
Delta-P	Average Velocity Head, Inches H2O	0.6986	0.7512	0.7611
vs	Flue Gas Velocity, Feet per Second	49.6	51.3	51.71
A	Stack/Duct Area, Square Inches	661	661	661
Qsd	Volumetric Air Flow Rate, Dry SCFM*	11,935	12,362	12,532
Qaw	Volumetric Air Flow Rate, Wet ACFM	13,661	14,128	14,241
%I	Isokinetic Sampling Rate, Percent	96.0	92.3	91.8

* 68 Degrees F -- 29.92 Inches of Mercury (Hg). (Continued Next Page)

PM10 & CONDENSIBLE PARTICULATE TEST RESULTS

		MDFP3-M201A/202-1	MDFP3-M201A/202-2	MDFP3-M201A/202-3
	PM10 RESULTS:			
ucyc	Stack Gas Viscosity	192.4	190.8	191.0
Qs	PM10 Flow, at Cyclone Conditions, ACFM	0.511	0.508	0.509
D50	Dia. of Particles in Cyclone, Microns	9.7	9.6	9.6
	Particulate Catch,			
mg	< PM10, Grams	0.0341	0.0282	0.0252
	> PM10, Grams	0.0754	0.0483	0.0572
	Non-extractable Condensibles, Grams	0.0372	0.0136	0.3021
	Extractable Condensibles, Grams	0.0100	0.0124	0.0000
	PM10 Emissions:			
	Including extractable/non-extractable condensibles			
gr/DSCF	Concentration, grains/DSCF*	0.0108	0.00756	0.0473
kg/hr	Emission Rate, kilograms/hour	0.502	0.363	2.30
lb/hr	Emission Rate, pounds/hour	1.11	0.800	5.07
	Including only non-extractable condensibles			
	Concentration, grains/DSCF*	0.00950	0.00583	0.0473
	Emission Rate, kilograms/hour	0.440	0.280	2.30
	Emission Rate, pounds/hour	0.971	0.617	5.07
	Without condensibles			
	Concentration, grains/DSCF*	0.00454	0.00393	0.00364
	Emission Rate, kilograms/hour	0.211	0.189	0.177
	Emission Rate, pounds/hour	0.464	0.416	0.391
	Total Particulate Emissions (Includes PM10):			
	Concentration, grains/DSCF*	0.0209	0.0143	0.0555
	Emission Rate, kilograms/hour	0.968	0.687	2.70
	Emission Rate, pounds/hour	2.13	1.51	5.96
	Particulate Fractionation:			
%>PM10	> PM10, %	48.1	47.1	14.9
%<PM10	< PM10, %	51.9	52.9	85.1

APPENDIX A-4

MDF PRESS STACK 4 (WIW-5)

ALDEHYDES/KETONES TEST RESULTS

PLANT: Weyerhaeuser Company, Moncure, NC

SAMPLING LOCATION: MDF Press Stack 4 (WIW-5)

		MDFP4-M0011-1	MDFP4-M0011-2	MDFP4-M0011-3
	Test Date	9-12-92	9-13-92	9-13-92
	Run Start & Finish Times	1802-1936	0938-1132	1248-1420
	Net Traversing Points	12	12	12
Theta	Net Run Time, Minutes	84	84	84
Dia	Nozzle Diameter, Inches	0.201	0.201	0.201
Cp	Pitot Tube Coefficient	0.84	0.84	0.84
Y	Dry Gas Meter Calibration Factor	0.995	0.995	0.995
Pbar	Barometric Pressure, Inches Hg	30.080	30.080	30.080
Delta H	Avg. Pressure Differential of Orifice Meter, Inches H2O	0.758	1.108	1.065
Vm	Volume of Metered Gas Sample, Dry ACF	45.22	53.617	52.688
tm	Dry Gas Meter Temperature, Degrees F	79	79	84
Vm(std)	Volume of Metered Gas Sample, Dry SCF*	44.335	52.700	51.242
Vlc	Total Volume of Liquid Collected in Impingers & Silica Gel, mL	17.0	19.0	21.0
Vw	Volume of Water Vapor, SCF*	0.800	0.894	0.988
%H20	Moisture Content, Percent by Volume	1.8	1.7	1.9
Mfd	Dry Mole Fraction	0.982	0.983	0.981
%CO2	Carbon Dioxide, Percent by Volume, Dry	0.0	0.0	0.0
%O2	Oxygen, Percent by Volume, Dry	20.9	20.9	20.9
%CO+N2	CO + N2, Percent by Volume, Dry	79.1	79.1	79.1
Md	Gas Molecular Weight, Lb/Lb-Mole, Dry	28.84	28.84	28.84
Ms	Gas Molecular Weight, Lb/Lb-Mole, Wet	28.64	28.66	28.63
Pg	Flue Gas Static Pressure, Inches H2O	-0.07	-0.15	-0.15
Ps	Absolute Flue Gas Pressure, Inches Hg	30.07	30.07	30.07
ts	Flue Gas Temperature, Degrees F	96	89	97
Delta-P	Average Velocity Head, Inches H2O	0.5174	0.7351	0.6934
vs	Flue Gas Velocity, Feet per Second	41.49	49.12	48.08
A	Stack/Duct Area, Square Inches	1,075	1,075	1,075
Qsd	Volumetric Air Flow Rate, Dry SCFM*	17,434	20,929	20,150
Qaw	Volumetric Air Flow Rate, Wet ACFM	18,588	22,007	21,541
%I	Isokinetic Sampling Rate, Percent	102.6	101.6	102.6

* 68 Deg. F (20 C) -- 29.92 In. Mercury

(continued next page)

ALDEHYDES/KETONES TEST RESULTS

03

		MDFP4-M0011-1	MDFP4-M0011-2	MDFP4-M0011-3
	EMISSION RESULTS:			
	FORMALDEHYDE			
Fwt	Formula Weight, lb/lb-mole	30	30	30
µg	Catch Weight, micrograms	11,138	10,794	11,574
µg/dscm	µg per dry std. cubic meter*	8,871	7,232	7,976
ppmvd	ppm by volume, Dry	7.113	5.799	6.395
kg/hr	kilograms per hour	0.263	0.257	0.273
lb/hr	pounds per hour	0.57936	0.56703	0.60203
	ACETALDEHYDE			
	Formula Weight, lb/lb-mole	44.1	44.1	44.1
	Catch Weight, micrograms	114	88	113
	µg per dry std. cubic meter*	90.8	59.0	77.9
	ppm by volume, Dry	0.04953	0.03216	0.04248
	kilograms per hour	0.00269	0.00210	0.00267
	pounds per hour	0.00593	0.00462	0.00588
	ACROLEIN			
	Formula Weight, lb/lb-mole	56.1	56.1	56.1
	Catch Weight, micrograms	34	36	30
	µg per dry std. cubic meter*	27.1	24.1	20.7
	ppm by volume, Dry	0.01161	0.01034	0.00886
	kilograms per hour	0.000802	0.000858	0.000708
	pounds per hour	0.00177	0.00189	0.00156
	ACETONE			
	Formula Weight, lb/lb-mole	58	58	58
	Catch Weight, micrograms	132	84	103
	µg per dry std. cubic meter*	105	56	71
	ppm by volume, Dry	0.04360	0.02334	0.02944
	kilograms per hour	0.00311	0.00200	0.00243
	pounds per hour	0.00687	0.00441	0.00536
	PROPIONALDEHYDE			
	Formula Weight, lb/lb-mole	58.1	58.1	58.1
	Catch Weight, micrograms	16	24	2
	µg per dry std. cubic meter*	12.7	16.1	1.38
	ppm by volume, Dry	0.00528	0.00666	0.000571
	kilograms per hour	0.000378	0.000572	0.0000472
	pounds per hour	0.000832	0.00126	0.0001040
	CROTONALDEHYDE			
	Formula Weight, lb/lb-mole	70	70	70
	Catch Weight, micrograms	39	59	61
	µg per dry std. cubic meter*	31.1	39.5	42.0
	ppm by volume, Dry	0.01067	0.01359	0.01445
	kilograms per hour	0.000920	0.00141	0.00144
	pounds per hour	0.00203	0.00310	0.00317
	n-BUTYRALDEHYDE			
	Formula Weight, lb/lb-mole	72.1	72.1	72.1
	Catch Weight, micrograms	87	93	98
	µg per dry std. cubic meter*	69.3	62.3	67.5
	ppm by volume, Dry	0.02312	0.02079	0.02253
	kilograms per hour	0.00205	0.00222	0.00231
	pounds per hour	0.00453	0.00489	0.00510
	METHYL ETHYL KETONE			
	Formula Weight, lb/lb-mole	72.1	72.1	72.1
	Catch Weight, micrograms	4	5	5
	µg per dry std. cubic meter*	3.19	3.35	3.45
	ppm by volume, Dry	0.001063	0.001118	0.001150
	kilograms per hour	0.0000944	0.000119	0.000118
	pounds per hour	0.000208	0.000263	0.000260

Estimated catch weight.

____ All catch weights are less than the minimum detection limit (MDL). Value presented calculated using 1/2 MDL for each catch weight.

* 68 Deg. F (20 C) -- 29.92 In. Mercury

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ALDEHYDES/KETONES TEST RESULTS

03

EMISSION RESULTS:	MDFP4-M0011-1	MDFP4-M0011-2	MDFP4-M0011-3
BENZALDEHYDE			
Formula Weight, lb/lb-mole	106.1	106.1	106.1
Catch Weight, micrograms	22	19	25
µg per dry std. cubic meter*	17.5	12.7	17.2
ppm by volume, Dry	0.00397	0.00289	0.00391
kilograms per hour	0.000519	0.000453	0.000590
pounds per hour	0.00114	0.00100	0.00130
ISOVALERALDEHYDE			
Formula Weight, lb/lb-mole	86.1	86.1	86.1
Catch Weight, micrograms	49	53	62
µg per dry std. cubic meter*	39.0	35.5	42.7
ppm by volume, Dry	0.01090	0.00992	0.01194
kilograms per hour	0.00116	0.00126	0.00146
pounds per hour	0.00255	0.00278	0.00322
VALERALDEHYDE			
Formula Weight, lb/lb-mole	86.1	86.1	86.1
Catch Weight, micrograms	83	87	94
µg per dry std. cubic meter*	66.1	58.3	64.8
ppm by volume, Dry	0.01847	0.01629	0.01810
kilograms per hour	0.00196	0.00207	0.00222
pounds per hour	0.00432	0.00457	0.00489
o-TOLUALDEHYDE			
Formula Weight, lb/lb-mole	120.2	120.2	120.2
Catch Weight, micrograms	8	12	22
µg per dry std. cubic meter*	6.37	8.04	15.2
ppm by volume, Dry	0.00128	0.00161	0.00303
kilograms per hour	0.000189	0.000286	0.000519
pounds per hour	0.000416	0.000630	0.00114
m/p-TOLUALDEHYDE			
Formula Weight, lb/lb-mole	120.2	120.2	120.2
Catch Weight, micrograms	19	13	17
µg per dry std. cubic meter*	15.1	8.71	11.7
ppm by volume, Dry	0.00303	0.00174	0.00234
kilograms per hour	0.000448	0.000310	0.000401
pounds per hour	0.000988	0.000683	0.000884
HEXALDEHYDE			
Formula Weight, lb/lb-mole	100.16	100.16	100.16
Catch Weight, micrograms	147	119	149
µg per dry std. cubic meter*	117	79.7	102.7
ppm by volume, Dry	0.02812	0.01915	0.02466
kilograms per hour	0.00347	0.00284	0.00352
pounds per hour	0.00765	0.00625	0.00775
2,5-DIMETHYL BENZALDEHYDE			
Formula Weight, lb/lb-mole	134	134	134
Catch Weight, micrograms	37	44	42
µg per dry std. cubic meter*	29.5	29.5	28.9
ppm by volume, Dry	0.00529	0.00529	0.00520
kilograms per hour	0.000873	0.00105	0.000991
pounds per hour	0.00192	0.00231	0.00218

Estimated catch weight.

All catch weights are less than the minimum detection limit (MDL). Value presented calculated using 1/2 MDL for each catch weight.

* 68 Deg. F (20 C) -- 29.92 In. Mercury

(continued next page)

PM10 & CONDENSIBLE PARTICULATE TEST RESULTS

PLANT: Weyerhaeuser Company, Moncure, NC

SAMPLING LOCATION: MDF Press Stack 4 (WEYCO I.D. WIW-5)

		MDFP4-M201A/202-1	MDFP4-M201A/202-2	MDFP4-M201A/202-3
	Test Date	9/12/92	9/13/92	9/13/92
	Run Start & Finish Times	1625-2059	840-1253	1408-1812
	Net Traversing Points	12	12	12
Theta	Net Run Time, Minutes	244.75	248	213.25
Dia	Nozzle Diameter, Inches	0.175	0.175	0.175
Cp	Pitot Tube Coefficient	0.84	0.84	0.84
Y	Dry Gas Meter Calibration Factor	1.005	1.005	1.005
Pbar	Barometric Pressure, Inches Hg	30.06	30.08	30.08
Delta H	Avg. Pressure Differential of Orifice Meter, Inches H2O	0.68	0.68	0.70
Vm	Volume of Metered Gas Sample, Dry ACF	111.459	111.949	99.072
tm	Dry Gas Meter Temperature, Degrees F	96	86	102
Vm(std)	Volume of Metered Gas Sample, Dry SCF*	106.970	109.521	94.097
Vlc	Total Volume of Liquid Collected in Impingers & Silica Gel, mL	50	36	18
Vw	Volume of Water Vapor, SCF*	2.354	1.695	0.847
%H20	Moisture Content, Percent by Volume	2.2	1.5	0.9
Mfd	Dry Mole Fraction	0.978	0.985	0.991
%CO2	Carbon Dioxide, Percent by Volume, Dry	0.0	0.0	0.0
%O2	Oxygen, Percent by Volume, Dry	20.9	20.9	20.9
%CO+N2	CO + N2, Percent by Volume, Dry	79.1	79.1	79.1
Md	Gas Molecular Weight, Lb/Lb-Mole, Dry	28.84	28.84	28.84
Ms	Gas Molecular Weight, Lb/Lb-Mole, Wet	28.60	28.68	28.74
Pg	Flue Gas Static Pressure, Inches H2O	-0.14	-0.14	-0.12
Ps	Absolute Flue Gas Pressure, Inches Hg	30.05	30.07	30.07
ts	Flue Gas Temperature, Degrees F	96	89	97
Delta-P	Average Velocity Head, Inches H2O	0.6465	0.7260	0.6132
vs	Flue Gas Velocity, Feet per Second	46.43	48.8	45.14
A	Stack/Duct Area, Square Inches	1075	1076	1076
Qsd	Volumetric Air Flow Rate, Dry SCFM*	19,411	20,843	19,104
Qaw	Volumetric Air Flow Rate, Wet ACFM	20,802	21,872	20,232
%I	Isokinetic Sampling Rate, Percent	100.7	94.8	103.3

* 68 Degrees F -- 29.92 Inches of Mercury (Hg). (Continued Next Page)

PM10 & CONDENSIBLE PARTICULATE TEST RESULTS

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		MDFP4-M201A/202-1	MDFP4-M201A/202-2	MDFP4-M201A/202-3
	PM10 RESULTS:			
ucyc	Stack Viscosity	184.8	185.4	185.4
	PM10 Flow, at Cyclone Conditions, ACFM	0.468	0.464	0.467
D50	Dia. of Particles in Cyclone, Microns	9.9	10.0	9.9
	Particulate Catch,			
mg	< PM10, Grams	0.0035	0.0019	0.0088
	> PM10, Grams	0.0055	0.0075	0.0005
	Non-extractable Condensibles, Grams	0.0082	0.0030	0.0058
	Extractable Condensibles, Grams	0.0000	0.0102	0.0020
	PM10 Emissions:			
	Including extractable/non-extractable condensibles			
gr/DSCF	Concentration, grains/DSCF*	0.00169	0.00213	0.00272
kg/hr	Emission Rate, kilograms/hour	0.127	0.172	0.202
lb/hr	Emission Rate, pounds/hour	0.281	0.380	0.446
	Including only non-extractable condensibles			
	Concentration, grains/DSCF*	0.00169	0.000690	0.00239
	Emission Rate, kilograms/hour	0.127	0.0559	0.178
	Emission Rate, pounds/hour	0.281	0.123	0.392
	Without condensibles			
	Concentration, grains/DSCF*	0.000505	0.000268	0.00144
	Emission Rate, kilograms/hour	0.0381	0.0217	0.107
	Emission Rate, pounds/hour	0.0840	0.0478	0.236
	Total Particulate Emissions (Includes PM10):			
	Concentration, grains/DSCF*	0.00248	0.00318	0.00280
	Emission Rate, kilograms/hour	0.187	0.258	0.208
	Emission Rate, pounds/hour	0.413	0.568	0.459
	Particulate Fractionation:			
%>PM10	> PM10, %	32.0	33.2	2.9
%<PM10	< PM10, %	68.0	66.8	97.1

* 68 Degrees F -- 29.92 Inches of Mercury (Hg).

APPENDIX A-5

MDF PRESS STACK 5 (WIW-3)

ALDEHYDES/KETONES TEST RESULTS

PLANT: Weyerhaeuser Company, Moncure, NC

SAMPLING LOCATION: MDF Press Stack 5

		MDFP5-M0011-1	MDFP5-M0011-2	MDFP5-M0011-3
	Test Date	9-12-92	9-13-92	9-13-92
	Run Start & Finish Times	1757-1904	0935-1111	1246-1420
	Net Traversing Points	12	12	12
Theta	Net Run Time, Minutes	84	84	84
Dia	Nozzle Diameter, Inches	0.201	0.200	0.200
Cp	Pitot Tube Coefficient	0.84	0.84	0.84
Y	Dry Gas Meter Calibration Factor	0.995	0.995	0.995
Pbar	Barometric Pressure, Inches Hg	30.060	30.080	30.080
Delta H	Avg. Pressure Differential of Orifice Meter, Inches H2O	1.113	1.120	1.084
Vm	Volume of Metered Gas Sample, Dry ACF	52.501	50.937	50.194
tm	Dry Gas Meter Temperature, Degrees F	93	88	100
Vm(std)	Volume of Metered Gas Sample, Dry SCF*	50.183	49.171	47.463
Vlc	Total Volume of Liquid Collected in Impingers & Silica Gel, mL	17.5	26.7	14.0
Vw	Volume of Water Vapor, SCF*	0.824	1.257	0.659
%H20	Moisture Content, Percent by Volume	1.6	2.5	1.4
Mfd	Dry Mole Fraction	0.984	0.975	0.986
%CO2	Carbon Dioxide, Percent by Volume, Dry	0.0	0.0	0.0
%O2	Oxygen, Percent by Volume, Dry	20.9	20.9	20.9
%CO+N2	CO + N2, Percent by Volume, Dry	79.1	79.1	79.1
Md	Gas Molecular Weight, Lb/Lb-Mole, Dry	28.84	28.84	28.84
Ms	Gas Molecular Weight, Lb/Lb-Mole, Wet	28.67	28.57	28.69
Pg	Flue Gas Static Pressure, Inches H2O	-0.2	-0.07	-0.07
Ps	Absolute Flue Gas Pressure, Inches Hg	30.05	30.07	30.07
ts	Flue Gas Temperature, Degrees F	95	87	95
Delta-P	Average Velocity Head, Inches H2O	0.6899	0.6326	0.6088
vs	Flue Gas Velocity, Feet per Second	47.85	45.58	44.93
A	Stack/Duct Area, Square Inches	3,019	3,019	3,019
Qsd	Volumetric Air Flow Rate, Dry SCFM*	56,640	54,233	53,300
Qaw	Volumetric Air Flow Rate, Wet ACFM	60,193	57,338	56,520
%I	Isokinetic Sampling Rate, Percent	100.4	103.7	101.9

* 68 Deg. F (20 C) -- 29.92 In. Mercury

(continued next page)

ALDEHYDES/KETONES TEST RESULTS

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		MDFP5-M0011-1	MDFP5-M0011-2	MDFP5-M0011-3
	EMISSION RESULTS:			
	FORMALDEHYDE			
Fwt	Formula Weight, lb/lb-mole	30	30	30
µg	Catch Weight, micrograms	10,051	8,101	9,198
µg/dscm	µg per dry std. cubic meter*	7,072	5,817	6,843
lb/dscf	ppm by volume, Dry	5.671	4.665	5.487
ppmvd	kilograms per hour	0.681	0.536	0.620
lb/hr	pounds per hour	1.501	1.182	1.366
	ACETALDEHYDE			
	Formula Weight, lb/lb-mole	44.1	44.1	44.1
	Catch Weight, micrograms	108	83	88
	µg per dry std. cubic meter*	76.0	59.6	65.5
	ppm by volume, Dry	0.04145	0.03251	0.03571
	kilograms per hour	0.00731	0.00549	0.00593
	pounds per hour	0.01612	0.01211	0.01307
	ACROLEIN			
	Formula Weight, lb/lb-mole	56.1	56.1	56.1
	Catch Weight, micrograms	29	23	40
	µg per dry std. cubic meter*	20.4	16.5	29.8
	ppm by volume, Dry	0.00875	0.00708	0.01276
	kilograms per hour	0.00196	0.00152	0.00270
	pounds per hour	0.00433	0.00336	0.00594
	ACETONE			
	Formula Weight, lb/lb-mole	58	58	58
	Catch Weight, micrograms	105	89	102
	µg per dry std. cubic meter*	73.9	63.9	75.9
	ppm by volume, Dry	0.03064	0.02651	0.03147
	kilograms per hour	0.00711	0.00589	0.00687
	pounds per hour	0.01568	0.01298	0.01515
	PROPIONALDEHYDE			
	Formula Weight, lb/lb-mole	58.1	58.1	58.1
	Catch Weight, micrograms	13	2	16
	µg per dry std. cubic meter*	9.15	1.436	11.9
	ppm by volume, Dry	0.00379	0.000595	0.00493
	kilograms per hour	0.000880	0.0001324	0.00108
	pounds per hour	0.00194	0.000292	0.00238
	CROTONALDEHYDE			
	Formula Weight, lb/lb-mole	70	70	70
	Catch Weight, micrograms	22	50	63
	µg per dry std. cubic meter*	15.5	35.9	46.9
	ppm by volume, Dry	0.00532	0.01234	0.01611
	kilograms per hour	0.00149	0.00331	0.00424
	pounds per hour	0.00328	0.00729	0.00936
	n-BUTYRALDEHYDE			
	Formula Weight, lb/lb-mole	72.1	72.1	72.1
	Catch Weight, micrograms	85	82	99
	µg per dry std. cubic meter*	59.8	58.9	73.7
	ppm by volume, Dry	0.01996	0.01965	0.02457
	kilograms per hour	0.00576	0.00543	0.00667
	pounds per hour	0.01269	0.01196	0.01471
	METHYL ETHYL KETONE			
	Formula Weight, lb/lb-mole	72.1	72.1	72.1
	Catch Weight, micrograms	5	5	6
	µg per dry std. cubic meter*	3.52	3.59	4.46
	ppm by volume, Dry	0.001174	0.001198	0.001489
	kilograms per hour	0.000339	0.000331	0.000404
	pounds per hour	0.000746	0.000729	0.000891

Estimated catch weight.

All catch weights are less than the minimum detection limit (MDL). Value presented calculated using 1/2 MDL for each catch weight.

* 68 Deg. F (20 C) -- 29.92 In. Mercury

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ALDEHYDES/KETONES TEST RESULTS

EMISSION RESULTS:	MDFP5-M0011-1	MDFP5-M0011-2	MDFP5-M0011-3
BENZALDEHYDE			
Formula Weight, lb/lb-mole	106.1	106.1	106.1
Catch Weight, micrograms	31	15	40
µg per dry std. cubic meter*	21.8	10.8	29.8
ppm by volume, Dry	0.00495	0.00244	0.00675
kilograms per hour	0.00210	0.000993	0.00270
pounds per hour	0.00463	0.00219	0.00594
ISOVALERALDEHYDE			
Formula Weight, lb/lb-mole	86.1	86.1	86.1
Catch Weight, micrograms	47	55	58
µg per dry std. cubic meter*	33.1	39.5	43.1
ppm by volume, Dry	0.00924	0.01104	0.01206
kilograms per hour	0.00318	0.00364	0.00391
pounds per hour	0.00702	0.00802	0.00862
VALERALDEHYDE			
Formula Weight, lb/lb-mole	86.1	86.1	86.1
Catch Weight, micrograms	86	107	102
µg per dry std. cubic meter*	60.5	76.8	75.9
ppm by volume, Dry	0.01691	0.02147	0.02120
kilograms per hour	0.00582	0.00708	0.00687
pounds per hour	0.01284	0.01561	0.01515
o-TOLUALDEHYDE			
Formula Weight, lb/lb-mole	120.2	120.2	120.2
Catch Weight, micrograms	20	16	26
µg per dry std. cubic meter*	14.1	11.5	19.3
ppm by volume, Dry	0.00282	0.00230	0.00387
kilograms per hour	0.00135	0.00106	0.00175
pounds per hour	0.00299	0.00233	0.00386
m/p-TOLUALDEHYDE			
Formula Weight, lb/lb-mole	120.2	120.2	120.2
Catch Weight, micrograms	26	24	27
µg per dry std. cubic meter*	18.3	17.2	20.1
ppm by volume, Dry	0.00366	0.00345	0.00402
kilograms per hour	0.00176	0.00159	0.00182
pounds per hour	0.00388	0.00350	0.00401
HEXALDEHYDE			
Formula Weight, lb/lb-mole	100.16	100.16	100.16
Catch Weight, micrograms	145	119	158
µg per dry std. cubic meter*	102	85	118
ppm by volume, Dry	0.02450	0.02052	0.02823
kilograms per hour	0.00982	0.00788	0.01065
pounds per hour	0.02165	0.01736	0.02347
2,5-DIMETHYL BENZALDEHYDE			
Formula Weight, lb/lb-mole	134	134	134
Catch Weight, micrograms	36	65	42
µg per dry std. cubic meter*	25.3	46.7	31.2
ppm by volume, Dry	0.00455	0.00838	0.00561
kilograms per hour	0.00244	0.00430	0.00283
pounds per hour	0.00537	0.00948	0.00624

Estimated catch weight.

All catch weights are less than the minimum detection limit (MDL). Value presented calculated using 1/2 MDL for each catch weight.

* 68 Deg. F (20 C) -- 29.92 In. Mercury

PM10 & CONDENSIBLE PARTICULATE TEST RESULTS

PLANT: Weyerhaeuser Company, Moncure, NC

SAMPLING LOCATION: MDF Press Stack 5 (WEYCO I.D. WIW-3)

		MDFP5-M201A/202-1	MDFP5-M201A/202-2	MDFP5-M201A/202-3
	Test Date	9/12/92	9/13/92	9/13/92
	Run Start & Finish Times	1625-2122	840-1226	1348-1842
	Net Traversing Points	12	12	12
Theta	Net Run Time, Minutes	263.25	210.25	261
Dia	Nozzle Diameter, Inches	0.181	0.179	0.179
Cp	Pitot Tube Coefficient	0.84	0.84	0.84
Y	Dry Gas Meter Calibration Factor	1.006	1.006	1.006
Pbar	Barometric Pressure, Inches Hg	30.06	30.08	30.08
Delta H	Avg. Pressure Differential of Orifice Meter, Inches H2O	0.74	0.74	0.75
Vm	Volume of Metered Gas Sample, Dry ACF	122.993	96.388	122.142
tm	Dry Gas Meter Temperature, Degrees F	94	83	95
Vm(std)	Volume of Metered Gas Sample, Dry SCF*	118.616	94.875	117.675
Vlc	Total Volume of Liquid Collected in Impingers & Silica Gel, mL	48	28	35
Vw	Volume of Water Vapor, SCF*	2.259	1.318	1.647
%H20	Moisture Content, Percent by Volume	1.9	-1.4	1.4
Mfd	Dry Mole Fraction	0.981	0.986	0.986
%CO2	Carbon Dioxide, Percent by Volume, Dry	0.0	0.0	0.0
%O2	Oxygen, Percent by Volume, Dry	20.9	20.9	20.9
%CO+N2	CO + N2, Percent by Volume, Dry	79.1	79.1	79.1
Md	Gas Molecular Weight, Lb/Lb-Mole, Dry	28.84	28.84	28.84
Ms	Gas Molecular Weight, Lb/Lb-Mole, Wet	28.63	28.69	28.69
Pg	Flue Gas Static Pressure, Inches H2O	0.13	0.13	-0.07
Ps	Absolute Flue Gas Pressure, Inches Hg	30.07	30.09	30.07
ts	Flue Gas Temperature, Degrees F	96	88	97
Delta-P	Average Velocity Head, Inches H2O	0.7334	0.5850	0.7615
vs	Flue Gas Velocity, Feet per Second	49.42	43.78	50.35
A	Stack/Duct Area, Square Inches	3019	3019	3019
Qsd	Volumetric Air Flow Rate, Dry SCFM*	58,216	52,583	59,511
Qaw	Volumetric Air Flow Rate, Wet ACFM	62,168	55,073	63,338
%I	Isokinetic Sampling Rate, Percent	90.8	103.0	90.9

* 68 Degrees F -- 29.92 Inches of Mercury (Hg). (Continued Next Page)

PM10 & CONDENSIBLE PARTICULATE TEST RESULTS

		MDFP5-M201A/202-1	MDFP5-M201A/202-2	MDFP5-M201A/202-3
	PM10 RESULTS:			
ucyc	Stack Gas Viscosity	185.7	185.6	185.6
Qs	PM10 Flow, at Cyclone Conditions, ACFM	0.481	0.473	0.480
D50	Dia. of Particles in Cyclone, Microns	9.7	9.9	9.8
	Particulate Catch,			
mg	< PM10, Grams	0.0019	0.0006	0.0001
	> PM10, Grams	0.0069	0.0050	0.0037
	Non-extractable Condensibles, Grams	0.0073	0.0053	0.0029
	Extractable Condensibles, Grams	0.0004	0.0009	0.0000
	PM10 Emissions:			
	Including extractable/non-extractable condensibles			
gr/DSCF	Concentration, grains/DSCF*	0.00125	0.00111	0.000393
kg/hr	Emission Rate, kilograms/hour	0.283	0.226	0.0910
lb/hr	Emission Rate, pounds/hour	0.623	0.498	0.201
	Including only non-extractable condensibles			
	Concentration, grains/DSCF*	0.00120	0.000960	0.000393
	Emission Rate, kilograms/hour	0.271	0.196	0.0910
	Emission Rate, pounds/hour	0.597	0.432	0.201
	Without condensibles			
	Concentration, grains/DSCF*	0.000247	0.0000976	0.0000131
	Emission Rate, kilograms/hour	0.0559	0.0199	0.00303
	Emission Rate, pounds/hour	0.123	0.0440	0.00669
	Total Particulate Emissions (Includes PM10):			
	Concentration, grains/DSCF*	0.00215	0.00192	0.000879
	Emission Rate, kilograms/hour	0.486	0.392	0.203
	Emission Rate, pounds/hour	1.07	0.865	0.448
	Particulate Fractionation:			
%>PM10	> PM10, %	41.8	42.4	55.2
%<PM10	< PM10, %	58.2	57.6	44.8

* 68 Degrees F -- 29.92 Inches of Mercury (Hg).

APPENDIX A-6

MDF PRESS STACK 6 (WIW-4)

ALDEHYDES/KETONES TEST RESULTS

PLANT: Weyerhaeuser Company, Moncure, NC

SAMPLING LOCATION: MDF Press Stack 6

		MDFP6-M0011-1	MDFP6-M0011-2	MDFP6-M0011-3
	Test Date	9-11-92	9-12-92	9-12-92
	Run Start & Finish Times	1928-2056	848-1019	1212-1418
	Net Traversing Points	12	12	12
Theta	Net Run Time, Minutes	75	75	75
Dia	Nozzle Diameter, Inches	0.292	0.297	0.297
Cp	Pitot Tube Coefficient	0.84	0.84	0.84
Y	Dry Gas Meter Calibration Factor	0.995	0.995	0.995
Pbar	Barometric Pressure, Inches Hg	30.020	30.060	30.060
Delta H	Avg. Pressure Differential of Orifice Meter, Inches H2O	1.371	1.549	1.264
Vm	Volume of Metered Gas Sample, Dry ACF	50.358	53.172	49.333
tm	Dry Gas Meter Temperature, Degrees F	93	82	98
Vm(std)	Volume of Metered Gas Sample, Dry SCF*	48.156	51.990	46.808
Vlc	Total Volume of Liquid Collected in Impingers & Silica Gel, mL	27.8	26.5	15.1
Vw	Volume of Water Vapor, SCF*	1.309	1.247	0.711
%H20	Moisture Content, Percent by Volume	2.6	2.3	1.5
Mfd	Dry Mole Fraction	0.974	0.977	0.985
%CO2	Carbon Dioxide, Percent by Volume, Dry	0.0	0.0	0.0
%O2	Oxygen, Percent by Volume, Dry	20.9	20.9	20.9
%CO+N2	CO + N2, Percent by Volume, Dry	79.1	79.1	79.1
Md	Gas Molecular Weight, Lb/Lb-Mole, Dry	28.84	28.84	28.84
Ms	Gas Molecular Weight, Lb/Lb-Mole, Wet	28.56	28.59	28.68
Pg	Flue Gas Static Pressure, Inches H2O	0.2	0.2	0.2
Ps	Absolute Flue Gas Pressure, Inches Hg	30.03	30.07	30.07
ts	Flue Gas Temperature, Degrees F	95	88	95
Delta-P	Average Velocity Head, Inches H2O	0.1679	0.1716	0.1410
vs	Flue Gas Velocity, Feet per Second	23.67	23.75	21.64
A	Stack/Duct Area, Square Inches	3,136	3,136	3,136
Qsd	Volumetric Air Flow Rate, Dry SCFM*	28,771	29,366	26,624
Qaw	Volumetric Air Flow Rate, Wet ACFM	30,929	31,033	28,277
%I	Isokinetic Sampling Rate, Percent	104.5	106.9	106.1

* 68 Deg. F (20 C) -- 29.92 In. Mercury

(continued next page)

ALDEHYDES/KETONES TEST RESULTS.

	EMISSION RESULTS:	MDFP6-M0011-1	MDFP6-M0011-2	MDFP6-M0011-3
	FORMALDEHYDE			
Fwt	Formula Weight, lb/lb-mole		30	30
µg	Catch Weight, micrograms		17,523	18,654
µg/dscm	µg per dry std. cubic meter*		11,901	14,072
ppmvd	ppm by volume, Dry		9.543	11.284
kg/hr	kilograms per hour		0.594	0.63661
lb/hr	pounds per hour		1.3092	1.4035
	ACETALDEHYDE			
	Formula Weight, lb/lb-mole		44.1	44.1
	Catch Weight, micrograms		141	167
	µg per dry std. cubic meter*		95.8	126
	ppm by volume, Dry		0.0522	0.0687
	kilograms per hour		0.00478	0.00570
	pounds per hour		0.01053	0.01256
	ACROLEIN			
	Formula Weight, lb/lb-mole		56.1	56.1
	Catch Weight, micrograms		31	38
	µg per dry std. cubic meter*		21.1	28.7
	ppm by volume, Dry		0.00903	0.0123
	kilograms per hour		0.00105	0.00130
	pounds per hour		0.00232	0.00286
	ACETONE			
	Formula Weight, lb/lb-mole		58	58
	Catch Weight, micrograms		446	231
	µg per dry std. cubic meter*		303	174
	ppm by volume, Dry		0.1256	0.0723
	kilograms per hour		0.01512	0.00788
	pounds per hour		0.03332	0.01738
	PROPIONALDEHYDE			
	Formula Weight, lb/lb-mole		58.1	58.1
	Catch Weight, micrograms		1	1
	µg per dry std. cubic meter*		0.340	0.377
	ppm by volume, Dry		0.000141	0.000156
	kilograms per hour		0.0000169	0.0000171
	pounds per hour		0.0000374	0.0000376
	CROTONALDEHYDE			
	Formula Weight, lb/lb-mole		70	70
	Catch Weight, micrograms		44	35
	µg per dry std. cubic meter*		29.9	26.4
	ppm by volume, Dry		0.0103	0.00907
	kilograms per hour		0.00149	0.00119
	pounds per hour		0.00329	0.00263
	n-BUTYRALDEHYDE			
	Formula Weight, lb/lb-mole		72.1	72.1
	Catch Weight, micrograms		361	76
	µg per dry std. cubic meter*		245	57.3
	ppm by volume, Dry		0.0818	0.0191
	kilograms per hour		0.01223	0.00259
	pounds per hour		0.02697	0.00572
	METHYL ETHYL KETONE			
	Formula Weight, lb/lb-mole		72.1	72.1
	Catch Weight, micrograms		20	14
	µg per dry std. cubic meter*		13.6	10.6
	ppm by volume, Dry		0.00453	0.00352
	kilograms per hour		0.000678	0.000478
	pounds per hour		0.00149	0.00105

Estimated catch weight.

All catch weights are less than the minimum detection limit (MDL). Value presented calculated using 1/2 MDL for each catch weight.

* 68 Deg. F (20 C) -- 29.92 In. Mercury

(continued next page)

ALDEHYDES/KETONES TEST RESULTS

EMISSION RESULTS:	MDFP6-M0011-1	MDFP6-M0011-2	MDFP6-M0011-3
BENZALDEHYDE			
Formula Weight, lb/lb-mole		106.1	106.1
Catch Weight, micrograms		18	13
µg per dry std. cubic meter*		12.2	9.8
ppm by volume, Dry		0.00277	0.00222
kilograms per hour		0.000610	0.000444
pounds per hour		0.00134	0.000978
ISOVALERALDEHYDE			
Formula Weight, lb/lb-mole		86.1	86.1
Catch Weight, micrograms		39	40
µg per dry std. cubic meter*		26.5	30.2
ppm by volume, Dry		0.00740	0.00843
kilograms per hour		0.00132	0.00137
pounds per hour		0.00291	0.00301
VALERALDEHYDE			
Formula Weight, lb/lb-mole		86.1	86.1
Catch Weight, micrograms		64	83
µg per dry std. cubic meter*		43.5	62.6
ppm by volume, Dry		0.01214	0.01749
kilograms per hour		0.00217	0.00283
pounds per hour		0.00478	0.00624
o-TOLUALDEHYDE			
Formula Weight, lb/lb-mole		120.2	120.2
Catch Weight, micrograms		5	>15
µg per dry std. cubic meter*		3.40	11.3
ppm by volume, Dry		0.000680	0.00226
kilograms per hour		0.000169	0.000512
pounds per hour		0.000374	0.00113
m/p-TOLUALDEHYDE			
Formula Weight, lb/lb-mole		120.2	120.2
Catch Weight, micrograms		24	28
µg per dry std. cubic meter*		16.3	21.1
ppm by volume, Dry		0.00326	0.00423
kilograms per hour		0.000813	0.000956
pounds per hour		0.00179	0.00211
HEXALDEHYDE			
Formula Weight, lb/lb-mole		100.16	100.16
Catch Weight, micrograms		93	106
µg per dry std. cubic meter*		63.2	80.0
ppm by volume, Dry		0.01517	0.01921
kilograms per hour		0.00315	0.00362
pounds per hour		0.00695	0.00798
2,5-DIMETHYL BENZALDEHYDE			
Formula Weight, lb/lb-mole		134	134
Catch Weight, micrograms		28	29
µg per dry std. cubic meter*		19.0	21.9
ppm by volume, Dry		0.00341	0.00393
kilograms per hour		0.000949	0.000990
pounds per hour		0.00209	0.00218

Estimated catch weight.

All catch weights are less than the minimum detection limit (MDL). Value presented calculated using 1/2 MDL for each catch weight.

* 68 Deg. F (20 C) -- 29.92 In. Mercury

PM10 & CONDENSIBLE PARTICULATE TEST RESULTS

PLANT: Weyerhaeuser Company, Moncure, NC

SAMPLING LOCATION: MDF Press Stack 6 (WEYCO I.D. WIW-4)

		MDFP6-M201A/202-1	MDFP6-M201A/202-2	MDFP6-M201A/202-3
	Test Date	9/10/92	9/11/92	9/11/92
	Run Start & Finish Times	925-1458	735-1159	1353-1756
	Net Traversing Points	0	0	12
Theta	Net Run Time, Minutes	249.5	247.5	234.75
Dia	Nozzle Diameter, Inches	0.23	0.23	0.23
Cp	Pitot Tube Coefficient	0.84	0.84	0.84
Y	Dry Gas Meter Calibration Factor	0.995	0.995	0.995
Pbar	Barometric Pressure, Inches Hg	30.09	30.02	30.02
Delta H	Avg. Pressure Differential of Orifice Meter, Inches H2O	0.65	0.63	0.64
Vm	Volume of Metered Gas Sample, Dry ACF	117.084	113.953	110.8
tm	Dry Gas Meter Temperature, Degrees F	95	90	95
Vm(std)	Volume of Metered Gas Sample, Dry SCF*	111.539	109.311	105.314
Vlc	Total Volume of Liquid Collected in Impingers & Silica Gel, mL	61	52	68
Vw	Volume of Water Vapor, SCF*	2.871	2.448	3.201
%H20	Moisture Content, Percent by Volume	2.5	2.2	2.9
Mfd	Dry Mole Fraction	0.975	0.978	0.971
%CO2	Carbon Dioxide, Percent by Volume, Dry	0.0	0.0	0.0
%O2	Oxygen, Percent by Volume, Dry	20.9	20.9	20.9
%CO+N2	CO + N2, Percent by Volume, Dry	79.1	79.1	79.1
Md	Gas Molecular Weight, Lb/Lb-Mole, Dry	28.84	28.84	28.84
Ms	Gas Molecular Weight, Lb/Lb-Mole, Wet	28.57	28.60	28.53
Pg	Flue Gas Static Pressure, Inches H2O	0.10	0.20	0.10
Ps	Absolute Flue Gas Pressure, Inches Hg	30.10	30.03	30.03
ts	Flue Gas Temperature, Degrees F	100	96	98
Delta-P	Average Velocity Head, Inches H2O	0.1900	0.2012	0.1907
vs	Flue Gas Velocity, Feet per Second	25.27	25.91	25.32
A	Stack/Duct Area, Square Inches	3136	3136	3136
Qsd	Volumetric Air Flow Rate, Dry SCFM*	30,522	31,578	30,487
Qaw	Volumetric Air Flow Rate, Wet ACFM	33,019	33,856	33,085
%I	Isokinetic Sampling Rate, Percent	110.6	105.6	111.1

* 68 Degrees F -- 29.92 Inches of Mercury (Hg). (Continued Next Page)

PM10 & CONDENSIBLE PARTICULATE TEST RESULTS

		MDFP6-M201A/202-1	MDFP6-M201A/202-2	MDFP6-M201A/202-3
	PM10 RESULTS:			
ucyc	Stack Gas Viscosity	186.8	186.4	186.4
Qs	PM10 Flow, at Cyclone Conditions, ACFM	0.484	0.474	0.487
D50	Dia. of Particles in Cyclone, Microns	9.7	9.9	9.7
	Particulate Catch,			
mg	< PM10, Grams	0.0015	0.0014	0.0004
	> PM10, Grams	0.0109	0.0118	0.0098
	Non-extractable Condensibles, Grams	0.0120	0.0096	0.0064
	Extractable Condensibles, Grams	0.0070	0.0037	0.0062
	PM10 Emissions:			
	Including extractable/non-extractable condensibles			
gr/DSCF	Concentration, grains/DSCF*	0.00284	0.00207	0.00190
kg/hr	Emission Rate, kilograms/hour	0.336	0.255	0.226
lb/hr-	Emission Rate, pounds/hour	0.741	0.561	0.497
	Including only non-extractable condensibles			
	Concentration, grains/DSCF*	0.00187	0.00155	0.00100
	Emission Rate, kilograms/hour	0.221	0.191	0.118
	Emission Rate, pounds/hour	0.488	0.420	0.260
	Without condensibles			
	Concentration, grains/DSCF*	0.000208	0.000198	0.0000586
	Emission Rate, kilograms/hour	0.0246	0.0243	0.00694
	Emission Rate, pounds/hour	0.0543	0.0535	0.0153
	Total Particulate Emissions (Includes PM10):			
	Concentration, grains/DSCF*	0.00434	0.00374	0.00334
	Emission Rate, kilograms/hour	0.515	0.459	0.396
	Emission Rate, pounds/hour	1.14	1.01	0.872
	Particulate Fractionation:			
%>PM10	> PM10, %	34.7	44.5	43.0
%<PM10	< PM10, %	65.3	55.5	57.0

* 68 Degrees F -- 29.92 Inches of Mercury (Hg).

APPENDIX A-7

MICROBOARD CORE EFB INLET

PARTICULATE & CONDENSIBLE PARTICULATE TEST RESULTS

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PLANT: Weyerhaeuser Company, Moncure, NC

SAMPLING LOCATION: Core EFB Inlet

		MBCLI-M5/202-1	MBCLI-M5/202-2	MBCLI-M5/202-3
	Test Date	9-14-92	9-15-92	9-15-92
	Run Start & Finish Times	1619-1910	1010-1411	1547-1729
	Net Traversing Points	24	24	24
Theta	Net Run Time, Minutes	120	60	60
Dia	Nozzle Diameter, Inches	0.184	0.191	0.191
Cp	Pitot Tube Coefficient	0.84	0.84	0.84
Y	Dry Gas Meter Calibration Factor	1.000	1.000	1.000
Pbar	Barometric Pressure, Inches Hg	30.090	30.150	30.150
Delta H	Avg. Pressure Differential of Orifice Meter, Inches H2O	0.889	0.987	1.017
Vm	Volume of Metered Gas Sample, Dry ACF	59.505	31.973	32.079
tm	Dry Gas Meter Temperature, Degrees F	87	95	96
Vm(std)	Volume of Metered Gas Sample, Dry SCF*	57.816	30.695	30.781
Vlc	Total Volume of Liquid Collected in Impingers & Silica Gel, mL	329.0	210.0	199.0
Vw	Volume of Water Vapor, SCF*	15.486	9.885	9.367
%H20	Moisture Content, Percent by Volume	21.1	24.4	23.3
Mfd	Dry Mole Fraction	0.789	0.756	0.767
%CO2	Carbon Dioxide, Percent by Volume, Dry	3.0	3.7	3.0
%O2	Oxygen, Percent by Volume, Dry	18.0	16.9	18.0
%CO+N2	CO + N2, Percent by Volume, Dry	79.0	79.4	79.0
Md	Gas Molecular Weight, Lb/Lb-Mole, Dry	29.20	29.27	29.20
Ms	Gas Molecular Weight, Lb/Lb-Mole, Wet	26.84	26.52	26.59
Pg	Flue Gas Static Pressure, Inches H2O	-0.65	-0.6	-0.6
Ps	Absolute Flue Gas Pressure, Inches Hg	30.04	30.11	30.11
ts	Flue Gas Temperature, Degrees F	260	261	262
Delta-P	Average Velocity Head, Inches H2O	1.1279	1.1338	1.0902
vs	Flue Gas Velocity, Feet per Second	72.07	72.64	71.22
A	Stack/Duct Area, Square Inches	1,905	1,905	1,905
Qsd	Volumetric Air Flow Rate, Dry SCFM*	33,233	32,142	31,891
Qaw	Volumetric Air Flow Rate, Wet ACFM	57,205	57,657	56,530
%I	Isokinetic Sampling Rate, Percent	103.9	105.8	107.0

* 68 Deg. F (20 C) -- 29.92 In. Mercury

(continued next page)

PARTICULATE & CONDENSIBLE PARTICULATE TEST RESULTS

		MBCLI-M5/202-1	MBCLI-M5/202-2	MBCLI-M5/202-3
	PARTICULATE RESULTS:			
	Filterable			
mg	Catch Weight, milligrams	336.4	213.0	178.2
mg/DSCM	Milligrams/Dry Std. Cubic Meter*	205	245	204
gr/DSCF	Grains per Dry Std. Cubic Foot*	0.0898	0.107	0.0893
kg/hr	Kilograms per hour	11.6	13.4	11.1
lb/hr	Pounds per hour	25.6	29.5	24.4
	Condensable – Extractable			
	Catch Weight, milligrams	156.5	90.0	99.1
	Milligrams/Dry Std. Cubic Meter*	95.6	104	114
	Grains per Dry Std. Cubic Foot*	0.0418	0.0452	0.0497
	Kilograms per hour	5.40	5.65	6.16
	Pounds per hour	11.9	12.5	13.6
	Condensable – Non-Extractable			
	Catch Weight, milligrams	138.2	68.3	76.5
	Milligrams/Dry Std. Cubic Meter*	84.4	78.6	87.8
	Grains per Dry Std. Cubic Foot*	0.0369	0.0343	0.0384
	Kilograms per hour	4.77	4.29	4.76
	Pounds per hour	10.5	9.46	10.5
	Total Particulate			
	Catch Weight, milligrams	631.1	371.3	353.8
	Milligrams/Dry Std. Cubic Meter*	385	427	406
	Grains per Dry Std. Cubic Foot*	0.168	0.187	0.177
	Kilograms per hour	21.8	23.3	22.0
	Pounds per hour	48.0	51.4	48.5

* 68 Deg. F (20 C) -- 29.92 In. Mercury

PARTICULATE & CONDENSIBLE PARTICULATE TEST RESULTS

PLANT: Weyerhaeuser Company, Moncure, NC

SAMPLING LOCATION: Core EFB Inlet

		MBCLI-M5/202-4
	Test Date	9-15-92
	Start & Finish Times	1619-1910
	Net Traversing Points	24
Theta	Net Run Time, Minutes	60
Dia	Nozzle Diameter, Inches	0.191
Cp	Pitot Tube Coefficient	0.84
Y	Dry Gas Meter Calibration Factor	1.000
Pbar	Barometric Pressure, Inches Hg	30.150
Delta H	Avg. Pressure Differential of Orifice Meter, Inches H2O	0.979
Vm	Volume of Metered Gas Sample, Dry ACF	31.458
tm	Dry Gas Meter Temperature, Degrees F	87
Vm(std)	Volume of Metered Gas Sample, Dry SCF*	30.654
Vlc	Total Volume of Liquid Collected in Impingers & Silica Gel, mL	218.0
Vw	Volume of Water Vapor, SCF*	10.261
%H20	Moisture Content, Percent by Volume	25.1
Mfd	Dry Mole Fraction	0.749
%CO2	Carbon Dioxide, Percent by Volume, Dry	3.8
%O2	Oxygen, Percent by Volume, Dry	17.0
%CO+N2	CO + N2, Percent by Volume, Dry	79.2
Md	Gas Molecular Weight, Lb/Lb-Mole, Dry	29.29
Ms	Gas Molecular Weight, Lb/Lb-Mole, Wet	26.46
Pg	Flue Gas Static Pressure, Inches H2O	-0.7
Ps	Absolute Flue Gas Pressure, Inches Hg	30.10
ts	Flue Gas Temperature, Degrees F	262
Delta-P	Average Velocity Head, Inches H2O	1.1031
vs	Flue Gas Velocity, Feet per Second	71.83
A	Stack/Duct Area, Square Inches	1,905
Qsd	Volumetric Air Flow Rate, Dry SCFM*	31,401
Qaw	Volumetric Air Flow Rate, Wet ACFM	57,014
%I	Isokinetic Sampling Rate, Percent	108.2

* 68 Deg. F (20 C) -- 29.92 In. Mercury

PARTICULATE & CONDENSIBLE PARTICULATE TEST RESULTS

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MBCLI-M5/202-4

PARTICULATE RESULTS:

	Filterable	
mg	Catch Weight, milligrams	296.1
mg/DSCM	Milligrams/Dry Std. Cubic Meter*	341
gr/DSCF	Grains per Dry Std. Cubic Foot*	0.149
kg/hr	Kilograms per hour	18.2
lb/hr	Pounds per hour	40.1
	Condensable – Extractable	
	Catch Weight, milligrams	73.5
	Milligrams/Dry Std. Cubic Meter*	84.7
	Grains per Dry Std. Cubic Foot*	0.0370
	Kilograms per hour	4.52
	Pounds per hour	9.96
	Condensable – Non-Extractable	
	Catch Weight, milligrams	74.8
	Milligrams/Dry Std. Cubic Meter*	86.2
	Grains per Dry Std. Cubic Foot*	0.0377
	Kilograms per hour	4.60
	Pounds per hour	10.1
	Total Particulate	
	Catch Weight, milligrams	444.4
	Milligrams/Dry Std. Cubic Meter*	512
	Grains per Dry Std. Cubic Foot*	0.224
	Kilograms per hour	27.3
	Pounds per hour	60.2

* 68 Deg. F (20 C) -- 29.92 In. Mercury

APPENDIX A-8

MICROBOARD CORE EFB OUTLET (1520)

ALDEHYDES/KETONES TEST RESULTS

PLANT: Weyerhaeuser Company, Moncure, NC

SAMPLING LOCATION: Microboard Core Layer EFB Outlet

		MBCLO-M0011-1	MBCLO-M0011-2	MBCLO-M001-3
	Test Date	9-14-92	9-15-92	9-15-92
	Run Start & Finish Times	1711-1816	1304-1409	1633-1738
	Net Traversing Points	12	12	12
Theta	Net Run Time, Minutes	60	60	60
Dia	Nozzle Diameter, Inches	0.241	0.241	0.241
Cp	Pitot Tube Coefficient	0.84	0.84	0.84
Y	Dry Gas Meter Calibration Factor	1.000	1.000	1.000
Pbar	Barometric Pressure, Inches Hg	30.1	30.2	30.2
Delta H	Avg. Pressure Differential of Orifice Meter, Inches H2O	1.875	1.908	1.942
Vm	Volume of Metered Gas Sample, Dry ACF	50.23	49.556	50.731
tm	Dry Gas Meter Temperature, Degrees F	94	93	101
Vm(std)	Volume of Metered Gas Sample, Dry SCF*	48.372	47.868	48.275
Vlc	Total Volume of Liquid Collected in Impingers & Silica Gel, mL	280.6	275.2	273.4
Vw	Volume of Water Vapor, SCF*	13.208	12.954	12.869
%H20	Moisture Content, Percent by Volume	21.4	21.3	21.0
Mfd	Dry Mole Fraction	0.786	0.787	0.790
%CO2	Carbon Dioxide, Percent by Volume, Dry	3.6	3.5	3.6
%O2	Oxygen, Percent by Volume, Dry	17.0	17.0	17.0
%CO+N2	CO + N2, Percent by Volume, Dry	79.4	79.5	79.4
Md	Gas Molecular Weight, Lb/Lb-Mole, Dry	29.26	29.24	29.26
Ms	Gas Molecular Weight, Lb/Lb-Mole, Wet	26.85	26.85	26.90
Pg	Flue Gas Static Pressure, Inches H2O	0.58	0.58	0.58
Ps	Absolute Flue Gas Pressure, Inches Hg	30.13	30.19	30.19
ts	Flue Gas Temperature, Degrees F	248	250	252
Delta-P	Average Velocity Head, Inches H2O	1.0340	1.0894	1.1465
vs	Flue Gas Velocity, Feet per Second	68.3	70.16	72
A	Stack/Duct Area, Square Inches	2,227	2,227	2,227
Qsd	Volumetric Air Flow Rate, Dry SCFM*	37,421	38,439	39,491
Qaw	Volumetric Air Flow Rate, Wet ACFM	63,380	65,106	66,813
%I	Isokinetic Sampling Rate, Percent	105.2	101.3	99.5

* 68 Deg. F (20 C) -- 29.92 In. Mercury

(continued next page)

ALDEHYDES/KETONES TEST RESULTS

	EMISSION RESULTS:	MBCLO-M0011-1	MBCLO-M0011-2	MBCLO-M001-3
	FORMALDEHYDE			
Fwt	Formula Weight, lb/lb-mole	30	30	30
µg	Catch Weight, micrograms	14,630	22,031	20,006
µg/dscm	µg per dry std. cubic meter*	10,680	16,252	14,633
ppmvd	ppm by volume, Dry	8.564	13.032	11.734
kg/hr	kilograms per hour	0.679	1.061	0.982
lb/hr	pounds per hour	1.49711	2.34018	2.16483
	ACETALDEHYDE			
	Formula Weight, lb/lb-mole	44.1	44.1	44.1
	Catch Weight, micrograms	8,328	8,413	8,037
	µg per dry std. cubic meter*	6,079	6,206	5,879
	ppm by volume, Dry	3.316	3.385	3.207
	kilograms per hour	0.387	0.405	0.394
	pounds per hour	0.852	0.894	0.870
	ACROLEIN			
	Formula Weight, lb/lb-mole	56.1	56.1	56.1
	Catch Weight, micrograms	3783	2910	1329
	µg per dry std. cubic meter*	2,762	2,147	972
	ppm by volume, Dry	1.184	0.920	0.417
	kilograms per hour	0.176	0.140	0.065
	pounds per hour	0.387	0.309	0.144
	ACETONE			
	Formula Weight, lb/lb-mole	58	58	58
	Catch Weight, micrograms	10,860	5,219	16,187
	µg per dry std. cubic meter*	7,928	3,850	11,840
	ppm by volume, Dry	3.288	1.597	4.911
	kilograms per hour	0.504	0.251	0.794
	pounds per hour	1.111	0.554	1.752
	PROPIONALDEHYDE			
	Formula Weight, lb/lb-mole	58.1	58.1	58.1
	Catch Weight, micrograms	1,063	433	2,116
	µg per dry std. cubic meter*	776	319	1,548
	ppm by volume, Dry	0.321	0.132	0.641
	kilograms per hour	0.0493	0.0209	0.104
	pounds per hour	0.109	0.0460	0.229
	CROTONALDEHYDE			
	Formula Weight, lb/lb-mole	70	70	70
	Catch Weight, micrograms	566	651	2,224
	µg per dry std. cubic meter*	413	480	1,627
	ppm by volume, Dry	0.142	0.165	0.559
	kilograms per hour	0.0263	0.0314	0.109
	pounds per hour	0.0579	0.0692	0.241
	n-BUTYRALDEHYDE			
	Formula Weight, lb/lb-mole	72.1	72.1	72.1
	Catch Weight, micrograms	2,727	1,277	6,024
	µg per dry std. cubic meter*	1,991	942	4,406
	ppm by volume, Dry	0.664	0.314	1.470
	kilograms per hour	0.127	0.0615	0.296
	pounds per hour	0.279	0.136	0.652
	METHYL ETHYL KETONE			
	Formula Weight, lb/lb-mole	72.1	72.1	72.1
	Catch Weight, micrograms	962	1,034	1,117
	µg per dry std. cubic meter*	702	763	817
	ppm by volume, Dry	0.234	0.254	0.273
	kilograms per hour	0.0447	0.0498	0.0548
	pounds per hour	0.0984	0.110	0.121

* 68 Deg. F (20 C) = 29.92 In. Mercury

(continued next page)

ALDEHYDES/KETONES TEST RESULTS

EMISSION RESULTS:	MBCLO-M0011-1	MBCLO-M0011-2	MBCLO-M001-3
BENZALDEHYDE			
Formula Weight, lb/lb-mole	106.1	106.1	106.1
Catch Weight, micrograms	11,893	15,974	12,223
µg per dry std. cubic meter*	8,682	11,784	8,941
ppm by volume, Dry	1.968	2.672	2.027
kilograms per hour	0.552	0.770	0.600
pounds per hour	1.217	1.697	1.323
ISOVALERALDEHYDE			
Formula Weight, lb/lb-mole	86.1	86.1	86.1
Catch Weight, micrograms	1,861	2,103	2,151
µg per dry std. cubic meter*	1,358	1,551	1,573
ppm by volume, Dry	0.3796	0.4334	0.4396
kilograms per hour	0.0864	0.1013	0.1056
pounds per hour	0.1904	0.2234	0.2328
VALERALDEHYDE			
Formula Weight, lb/lb-mole	86.1	86.1	86.1
Catch Weight, micrograms	868	2,232	1,632
µg per dry std. cubic meter*	634	1,646	1,194
ppm by volume, Dry	0.177	0.460	0.334
kilograms per hour	0.0403	0.1075	0.0801
pounds per hour	0.0888	0.2371	0.1766
o-TOLUALDEHYDE			
Formula Weight, lb/lb-mole	120.2	120.2	120.2
Catch Weight, micrograms	956	1,311	1,292
µg per dry std. cubic meter*	698	967	945
ppm by volume, Dry	0.140	0.194	0.189
kilograms per hour	0.0444	0.0632	0.0634
pounds per hour	0.0978	0.1393	0.1398
m/p-TOLUALDEHYDE			
Formula Weight, lb/lb-mole	120.2	120.2	120.2
Catch Weight, micrograms	3,490	4,238	1,149
µg per dry std. cubic meter*	2,548	3,126	840
ppm by volume, Dry	0.510	0.626	0.168
kilograms per hour	0.162	0.204	0.056
pounds per hour	0.357	0.450	0.124
HEXALDEHYDE			
Formula Weight, lb/lb-mole	100.16	100.16	100.16
Catch Weight, micrograms	2,127	2,423	2,978
µg per dry std. cubic meter*	1,553	1,787	2,178
ppm by volume, Dry	0.373	0.429	0.523
kilograms per hour	0.0987	0.117	0.146
pounds per hour	0.218	0.257	0.322
2,5-DIMETHYL BENZALDEHYDE			
Formula Weight, lb/lb-mole	134	134	134
Catch Weight, micrograms	181	220	1,386
µg per dry std. cubic meter*	132	162	1,014
ppm by volume, Dry	0.0237	0.0291	0.1820
kilograms per hour	0.0084	0.0106	0.0680
pounds per hour	0.0185	0.0234	0.1500

* 68 Deg. F (20 C) -- 29.92 In. Mercury

PM10 & CONDENSIBLE PARTICULATE TEST RESULTS

PLANT: Weyerhaeuser Company, Moncure, NC

SAMPLING LOCATION: Microboard Core Layer Dryer EFB Outlet (WEYCO I.D. 1520)

		MBCLO-M201A/202-2	MBCLO-M201A/202-3	MBCLO-M201A/202-4
	Test Date	9/15/92	9/15/92	9/15/92
	Run Start & Finish Times	1204-1411	1546-1736	1857-2029
	Net Traversing Points	12	12	12
Theta	Net Run Time, Minutes	91	95.5	87.5
Dia	Nozzle Diameter, Inches	0.165	0.165	0.165
Cp	Pitot Tube Coefficient	0.84	0.84	0.84
Y	Dry Gas Meter Calibration Factor	0.995	0.995	0.995
Pbar	Barometric Pressure, Inches Hg	30.15	30.15	30.15
Delta H	Avg. Pressure Differential of Orifice Meter, Inches H2O	0.41	0.41	0.41
Vm	Volume of Metered Gas Sample, Dry ACF	34.035	36.755	32.538
tm	Dry Gas Meter Temperature, Degrees F	92	94	87
Vm(std)	Volume of Metered Gas Sample, Dry SCF*	32.642	35.152	31.520
Vlc	Total Volume of Liquid Collected in Impingers & Silica Gel, mL	221	199	203
Vw	Volume of Water Vapor, SCF*	10.402	9.367	9.555
%H20	Moisture Content, Percent by Volume	24.2	21.0	23.3
Mfd	Dry Mole Fraction	0.758	0.790	0.767
%CO2	Carbon Dioxide, Percent by Volume, Dry	3.0	3.0	3.5
%O2	Oxygen, Percent by Volume, Dry	17.9	17.9	17.4
%CO+N2	CO + N2, Percent by Volume, Dry	79.1	79.1	79.1
Md	Gas Molecular Weight, Lb/Lb-Mole, Dry	29.20	29.20	29.26
Ms	Gas Molecular Weight, Lb/Lb-Mole, Wet	26.49	26.85	26.64
Pg	Flue Gas Static Pressure, Inches H2O	0.58	0.58	0.58
Ps	Absolute Flue Gas Pressure, Inches Hg	30.19	30.19	30.19
ts	Flue Gas Temperature, Degrees F	251	252	252
Delta-P	Average Velocity Head, Inches H2O	1.1369	1.1883	1.1570
vs	Flue Gas Velocity, Feet per Second	72.17	73.39	72.67
A	Stack/Duct Area, Square Inches	2227	2227	2227
Qsd	Volumetric Air Flow Rate, Dry SCFM*	38,063	40,233	38,705
Qaw	Volumetric Air Flow Rate, Wet ACFM	66,969	68,101	67,433
%I	Isokinetic Sampling Rate, Percent	98.2	95.3	96.9

* 68 Degrees F -- 29.92 Inches of Mercury (Hg). (Continued Next Page)

PM10 & CONDENSIBLE PARTICULATE TEST RESULTS

		MBCLO-M201A/202-2	MBCLO-M201A/202-3	MBCLO-M201A/202-4
	PM10 RESULTS:			
ucyc	Stack Gas Viscosity	209.2	209.2	209.2
Qs	PM10 Flow, at Cyclone Conditions, ACFM	0.631	0.624	0.628
D50	Dia. of Particles in Cyclone, Microns	9.3	9.4	9.3
	Particulate Catch,			
mg	< PM10, Grams	0.0588	0.0350	0.0590
	> PM10, Grams	0.0240	0.2246	0.0076
	Non-extractable Condensibles, Grams	0.0840	0.0787	N/A
	Extractable Condensibles, Grams	0.0436	0.0376	N/A
	PM10 Emissions:			
	Including extractable/non-extractable condensibles			
gr/DSCF	Concentration, grains/DSCF*	0.0881	0.0664	Sample
kg/hr	Emission Rate, kilograms/hour	13.0	10.4	Jar
lb/hr	Emission Rate, pounds/hour	28.7	22.9	Broken
	Including only non-extractable condensibles			
	Concentration, grains/DSCF*	0.0675	0.0499	Sample
	Emission Rate, kilograms/hour	9.99	7.80	Jar
	Emission Rate, pounds/hour	22.0	17.2	Broken
	Without condensibles			
	Concentration, grains/DSCF*	0.0278	0.0154	0.0289
	Emission Rate, kilograms/hour	4.11	2.40	4.35
	Emission Rate, pounds/hour	9.07	5.29	9.58
	Total Particulate Emissions (Includes PM10):			
	Concentration, grains/DSCF*	0.0995	0.165	not
	Emission Rate, kilograms/hour	14.7	25.8	calculated
	Emission Rate, pounds/hour	32.4	56.8	
	Particulate Fractionation:			
%>PM10	> PM10, %	11.4	59.7	not
%<PM10	< PM10, %	88.6	40.3	calculated

* 68 Degrees F -- 29.92 Inches of Mercury (Hg).

N/A -- Sample jar broken

SEMIVOLATILE ORGANICS TEST RESULTS

PLANT: Weyerhaeuser Company, Moncure, NC

SAMPLING LOCATION: Microboard Core Layer Dryer EFB Outlet (WEYCO I.D. 1520)

		MBCLO-M0010-1	MBCLO-M0010-2	MBCLO-M0010-3
	Test Date	9-17-92	9-17-92	9-18-92
	Run Start & Finish Times	1204-1533	1801-2035	12[illegible]
	Net Traversing Points	12	12	12
Theta	Net Run Time, Minutes	180	144	144
Dia	Nozzle Diameter, Inches	0.229	0.229	0.229
Cp	Pitot Tube Coefficient	0.84	0.84	0.84
Y	Dry Gas Meter Calibration Factor	0.995	1.000	1.000
Pbar	Barometric Pressure, Inches Hg	30.000	30.000	30.000
Delta H	Avg. Pressure Differential of Orifice Meter, Inches H2O	1.845	2.240	2.590
Vm	Volume of Metered Gas Sample, Dry ACF	137.448	113.976	104.504
tm	Dry Gas Meter Temperature, Degrees F	106	85	96
Vm(std)	Volume of Metered Gas Sample, Dry SCF*	128.497	111.279	100.098
Vlc	Total Volume of Liquid Collected in Impingers & Silica Gel, mL	831.0	585.0	685.0
Vw	Volume of Water Vapor, SCF*	39.115	27.536	32.243
%H20	Moisture Content, Percent by Volume	23.3	19.8	24.4
Mfd	Dry Mole Fraction	0.767	0.802	0.756
%CO2	Carbon Dioxide, Percent by Volume, Dry	4.0	4.0	4.0
%O2	Oxygen, Percent by Volume, Dry	17.0	17.0	17.0
%CO+N2	CO + N2, Percent by Volume, Dry	79.0	79.0	79.0
Md	Gas Molecular Weight, Lb/Lb-Mole, Dry	29.32	29.32	29.32
Ms	Gas Molecular Weight, Lb/Lb-Mole, Wet	26.68	27.08	26.56
Pg	Flue Gas Static Pressure, Inches H2O	0	0	0
Ps	Absolute Flue Gas Pressure, Inches Hg	30.00	30.00	30.00
ts	Flue Gas Temperature, Degrees F	254	252	253
Delta-P	Average Velocity Head, Inches H2O	1.1461	1.1830	1.0638
vs	Flue Gas Velocity, Feet per Second	72.63	73.12	70.07
A	Stack/Duct Area, Square Inches	2,227	2,227	2,227
Qsd	Volumetric Air Flow Rate, Dry SCFM*	38,306	40,463	36,500
Qaw	Volumetric Air Flow Rate, Wet ACFM	67,398	67,852	65,022
%I	Isokinetic Sampling Rate, Percent	100.8	103.3	103.0

* 68 Deg. F (20 C) -- 29.92 In. Mercury

(continued next page)

SEMIVOLATILE ORGANICS TEST RESULTS

		MBCLO-M0010-1	MBCLO-M0010-2	MBCLO-M0010-3
	EMISSION RESULTS:			
	P-CYMENE			
Fwt	Formula Weight, lb/lb-mole	134.2	134.2	134.2
µg	Catch Weight, micrograms	[illegible]	1	1698
µg/dscm	µg per dry std. cubic meter*	561	0.159	599
ppmvd	ppm by volume, Dry	0.1006	0.0000284	0.1074
kg/hr	kilograms per hour	0.03654	0.0000109	0.03715
lb/hr	pounds per hour	0.08056	0.0000240	0.08190
	A-PINENE			
	Formula Weight, lb/lb-mole	136.2	136.2	136.2
	Catch Weight, micrograms	634214	698375	542372
	µg per dry std. cubic meter*	174,281	221,606	191,328
	ppm by volume, Dry	30.78218	39.14101	33.79313
	kilograms per hour	11.34386	15.23649	11.86632
	pounds per hour	25.00906	33.59088	26.16089
	B-PINENE			
	Formula Weight, lb/lb-mole	136.2	136.2	136.2
	Catch Weight, micrograms	259058	192381	203170
	µg per dry std. cubic meter*	71,189	61,046	71,671
	ppm by volume, Dry	12.57363	10.78215	12.65875
	kilograms per hour	4.63364	4.19719	4.44507
	pounds per hour	10.21548	9.25326	9.79975
	A-TERPINEOL			
	Formula Weight, lb/lb-mole	154.3	154.3	154.3
	Catch Weight, micrograms	58613	35724	43801
	µg per dry std. cubic meter*	16,107	11,336	15,451
	ppm by volume, Dry	2.511.13	1.76732	2.40894
	kilograms per hour	1.04838	0.77939	0.95830
	pounds per hour	2.31130	1.71828	2.11271

Estimated catch weight.

_____ Catch weight less than minimum detection limt (MDL). Value presented calculated using 1/2 MDL

* 68 Deg. F (20 C) -- 29.92 In. Mercury

VOLATILE ORGANIC TEST RESULTS

PLANT: Weyerhaeuser Company, Moncure, NC

SAMPLING LOCATION: Core EPB Outlet (WEYCO I.D. 1520)

		MBCLO-M0030-1a	MBCLO-M0030-1b	MBCLO-M0030-1d	
	Test Date	9/17/92	9/17/92	9/17/92	
	Run Start Time	1219	1301	1426	
	Run Finish Time	1239	1321	1446	
Theta	Net Run Time, Minutes	20	20	20	
Y	Dry Gas Meter Calibration Factor	0.9963	0.9963	0.9963	
Pbar	Barometric Pressure, mm Hg	762	762	762	
Vm	Volume of Metered Gas Sample, DAL	18.17	18.38	18.72	
tm	Dry Gas Meter Temperature, Degrees C	36.0	36.5	36.0	
Vm(std)	Volume of Metered Gas Sample, Dry SL*	17.225	17.396	17.746	
Qsd	Volumetric Air Flow Rate, Dry SCFM*	48,645	48,645	48,645	
	EMISSION RESULTS:				
					Average
	A-Pinene				
Pwt	Formula Weight, lb/lb-mole	136.24	136.24	136.24	N/A
µg	Catch Weight, micrograms	373.7	353.3	410.7	N/A
µg/dscm	µg per dry std. cubic meter*	21,700	20,300	23,200	21,700
ppmvd	ppb by volume, Dry	3830	3590	4090	3,840
kg/hr	kilograms per hour	1.79	1.68	1.91	1.80
lb/hr	pounds per hour	3.95	3.71	4.22	3.96
	B-Pinene				
	Formula Weight, lb/lb-mole	136.24	136.24	136.24	N/A
	Catch Weight, micrograms	246.2	235.1	303.2	N/A
	µg per dry std. cubic meter*	14,300	13,500	17,100	15,000
	ppb by volume, Dry	2520	2390	3020	2,640
	kilograms per hour	1.18	1.12	1.41	1.24
	pounds per hour	2.60	2.47	3.12	2.73
	Acetone				
	Formula Weight, lb/lb-mole	58.08	58.08	58.08	N/A
	Catch Weight, micrograms	83.8	78.7	58.0	N/A
	µg per dry std. cubic meter*	4,850	4,510	3,260	4,210
	ppb by volume, Dry	2010	1870	1350	1,740
	kilograms per hour	0.401	0.373	0.269	0.348
	pounds per hour	0.884	0.823	0.594	0.767
	Toluene				
	Formula Weight, lb/lb-mole	92.15	92.15	92.15	N/A
	Catch Weight, micrograms	12.9	9.1	14.6	N/A
	µg per dry std. cubic meter*	749	523	823	698
	ppb by volume, Dry	196	137	215	182
	kilograms per hour	0.0619	0.0432	0.0680	0.0577
	pounds per hour	0.136	0.0953	0.150	0.127
	P-Cymene				
	Formula Weight, lb/lb-mole	134.22	134.22	134.22	N/A
	Catch Weight, micrograms	7.3	5.1	8.1	N/A
	µg per dry std. cubic meter*	424	293	456	391
	ppb by volume, Dry	76.0	52.5	81.8	70.1
	kilograms per hour	0.0350	0.0242	0.0377	0.0323
	pounds per hour	0.0772	0.0534	0.0832	0.0713
	m-/p-Xylene				
	Formula Weight, lb/lb-mole	106.16	106.16	106.16	N/A
	Catch Weight, micrograms	6.6	3.8	6.3	N/A
	µg per dry std. cubic meter*	383	218	355	319
	ppb by volume, Dry	86.8	49.5	80.4	72.3
	kilograms per hour	0.0317	0.0181	0.0293	0.0264
	pounds per hour	0.0698	0.0398	0.0647	0.0581
	Benzene				
	Formula Weight, lb/lb-mole	78.12	78.12	78.12	N/A
	Catch Weight, micrograms	5.6	2.2	8.7	N/A
	µg per dry std. cubic meter*	325	126	490	314
	ppb by volume, Dry	100	38.9	151	96.7
	kilograms per hour	0.0269	0.0105	0.0405	0.0259
	pounds per hour	0.0592	0.0230	0.0893	0.0572

* 68 Deg. F (20 C) -- 29.92 In. Mercury

Estimated results or not detectable (underlined)

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VOLATILE ORGANIC TEST RESULTS

	MBCLO-M0030-1a	MBCLO-M0030-1b	MBCLO-M0030-1d	Average
Cumene (isopropylbenzene)				
Formula Weight, lb/lb-mole	120.2	120.2	120.2	N/A
Catch Weight, micrograms	1.8	1.3	1.6	N/A
µg per dry std. cubic meter*	104	74.7	90.2	89.8
ppb by volume, Dry	20.9	15.0	18.0	18.0
kilograms per hour	0.00864	0.00618	0.00745	0.00742
pounds per hour	0.0190	0.0136	0.0164	0.0164
Methylene Chloride				
Formula Weight, lb/lb-mole	84.93	84.93	84.93	N/A
Catch Weight, micrograms	0.2	0.1	0.6	N/A
µg per dry std. cubic meter*	11.6	5.75	33.8	17.1
ppb by volume, Dry	3.29	1.63	9.58	4.83
kilograms per hour	0.000960	0.000475	0.00279	0.00141
pounds per hour	0.00212	0.00105	0.00616	0.00311
2-Butanone				
Formula Weight, lb/lb-mole	72.11	72.11	72.11	N/A
Catch Weight, micrograms	4.4	0.0025	0.0025	N/A
µg per dry std. cubic meter*	255	0.144	0.141	85.2
ppb by volume, Dry	85.2	0.0479	0.0470	28.4
kilograms per hour	0.0211	0.0000119	0.0000116	0.00705
pounds per hour	0.0465	0.0000262	0.0000257	0.0155
Chloromethane				
Formula Weight, lb/lb-mole	50.49	50.49	50.49	N/A
Catch Weight, micrograms	2.2	0.0025	0.0025	N/A
µg per dry std. cubic meter*	128	0.144	0.141	42.7
ppb by volume, Dry	60.9	0.0685	0.0671	20.3
kilograms per hour	0.0106	0.0000119	0.0000116	0.00353
pounds per hour	0.0233	0.0000262	0.0000257	0.00778
Iodomethane				
Formula Weight, lb/lb-mole	141.94	141.94	141.94	N/A
Catch Weight, micrograms	0.0025	0.0025	2.2	N/A
µg per dry std. cubic meter*	0.145	0.144	124	41.4
ppb by volume, Dry	0.0246	0.0244	21.0	7.02
kilograms per hour	0.0000120	0.0000119	0.0102	0.00342
pounds per hour	0.0000264	0.0000262	0.0226	0.00755
o-Xylene				
Formula Weight, lb/lb-mole	106.16	106.16	106.16	N/A
Catch Weight, micrograms	0.6	0.3	0.3	N/A
µg per dry std. cubic meter*	34.8	17.2	16.9	23.0
ppb by volume, Dry	7.89	3.91	3.83	5.21
kilograms per hour	0.00288	0.00143	0.00140	0.00190
pounds per hour	0.00635	0.00314	0.00308	0.00419
Styrene				
Formula Weight, lb/lb-mole	104.15	104.15	104.15	N/A
Catch Weight, micrograms	0.9	0.0025	0.0025	N/A
µg per dry std. cubic meter*	52.2	0.144	0.141	17.5
ppb by volume, Dry	12.1	0.0332	0.0325	4.04
kilograms per hour	0.00432	0.0000119	0.0000116	0.00145
pounds per hour	0.00952	0.0000262	0.0000257	0.00319
Isooctane				
Formula Weight, lb/lb-mole	114.23	114.23	114.23	N/A
Catch Weight, micrograms	0.0025	0.0025	0.4	N/A
µg per dry std. cubic meter*	0.145	0.144	22.5	7.61
ppb by volume, Dry	0.0306	0.0303	4.75	1.60
kilograms per hour	0.0000120	0.0000119	0.00186	0.000629
pounds per hour	0.0000264	0.0000262	0.00411	0.00139
Chloroform				
Formula Weight, lb/lb-mole	119.38	119.38	119.38	N/A
Catch Weight, micrograms	0.0025	0.1	0.0025	N/A
µg per dry std. cubic meter*	0.145	5.75	0.145	2.01
ppb by volume, Dry	0.0292	1.16	0.0292	0.41
kilograms per hour	0.0000120	0.000475	0.0000120	0.000166
pounds per hour	0.0000264	0.00105	0.0000264	0.000367

* 68 Deg. F (20 C) -- 29.92 In. Mercury

Estimated results or not detectable (underlined)

VOLATILE ORGANIC TEST RESULTS

PLANT: Weyerhaeuser Company, Moncure, NC

SAMPLING LOCATION: Core EPB Outlet (WEYCO I.D. 1520)

		MBCLO-M0030-2a	MBCLO-M0030-2b	MBCLO-M0030-2c	
	Test Date	9/17/92	9/17/92	9/17/92	
	Run Start Time	1804	1838	1928	
	Run Finish Time	1824	1858	1948	
Theta	Net Run Time, Minutes	20	20	20	
Y	Dry Gas Meter Calibration Factor	0.9963	0.9963	0.9963	
Pbar	Barometric Pressure, mm Hg	762	762	762	
Vm	Volume of Metered Gas Sample, DAL	[illegible]	5.04	4.9	
tm	Dry Gas Meter Temperature, Degrees C	36.3	34.0	29.5	
Vm(std)	Volume of Metered Gas Sample, Dry SL*	6.043	4.809	4.745	
Qsd	Volumetric Air Flow Rate, Dry SCFM*	51,850	51,850	51,850	
	EMISSION RESULTS:				
					Average
	A-Pinene				
Pwt	Formula Weight, lb/lb-mole	136.24	136.24	136.24	N/A
µg	Catch Weight, micrograms	331.6	1262.7	497.8	N/A
µg/dscm	µg per dry std. cubic meter*	54,900	263,000	105,000	141,000
ppmvd	ppb by volume, Dry	9690	46400	18500	24,900
kg/hr	kilograms per hour	4.84	23.2	9.23	12.4
lb/hr	pounds per hour	10.7	51.0	20.4	27.4
	B-Pinene				
	Formula Weight, lb/lb-mole	136.24	136.24	136.24	N/A
	Catch Weight, micrograms	184.7	664.9	255.2	N/A
	µg per dry std. cubic meter*	30,600	138,000	53,800	74,100
	ppb by volume, Dry	5400	24400	9500	13,100
	kilograms per hour	2.69	12.2	4.74	6.54
	pounds per hour	5.94	26.8	10.5	14.4
	Acetone				
	Formula Weight, lb/lb-mole	58.08	58.08	58.08	N/A
	Catch Weight, micrograms	47.2	175.8	78.1	N/A
	µg per dry std. cubic meter*	7,800	36,500	16,500	20,300
	ppb by volume, Dry	3230	15100	6820	8,380
	kilograms per hour	0.687	3.21	1.45	1.78
	pounds per hour	1.51	7.08	3.20	3.93
	Toluene				
	Formula Weight, lb/lb-mole	92.15	92.15	92.15	N/A
	Catch Weight, micrograms	5.5	11.5	4.8	N/A
	µg per dry std. cubic meter*	910	2,390	1,010	1,440
	ppb by volume, Dry	238	624	264	375
	kilograms per hour	0.0802	0.211	0.0891	0.127
	pounds per hour	0.177	0.464	0.196	0.279
	P-Cymene				
	Formula Weight, lb/lb-mole	134.22	134.22	134.22	N/A
	Catch Weight, micrograms	6.5	8.9	3.6	N/A
	µg per dry std. cubic meter*	1,080	1,850	759	1,230
	ppb by volume, Dry	193	332	136	220
	kilograms per hour	0.0948	0.163	0.0668	0.108
	pounds per hour	0.209	0.359	0.147	0.239
	m-/p-Xylene				
	Formula Weight, lb/lb-mole	106.16	106.16	106.16	N/A
	Catch Weight, micrograms	1.1	2.2	0.8	N/A
	µg per dry std. cubic meter*	182	457	169	269
	ppb by volume, Dry	41.2	103.7	38.2	61.0
	kilograms per hour	0.0160	0.0403	0.0149	0.0237
	pounds per hour	0.0354	0.0889	0.0327	0.0523
	Benzene				
	Formula Weight, lb/lb-mole	78.12	78.12	78.12	N/A
	Catch Weight, micrograms	0.0025	0.0025	0.0025	N/A
	µg per dry std. cubic meter*	0.520	0.520	0.520	0.520
	ppb by volume, Dry	0.160	0.160	0.160	0.160
	kilograms per hour	0.0000458	0.0000458	0.0000458	0.0000458
	pounds per hour	0.000101	0.000101	0.000101	0.000101

* 68 Deg. F (20 C) -- 29.92 in. Mercury

(continued next page)

VOLATILE ORGANIC TEST RESULTS

	MBCLO-M0030-2a	MBCLO-M0030-2b	MBCLO-M0030-2c	Average
Cumene (isopropylbenzene)				
Formula Weight, lb/lb-mole	120.2	120.2	120.2	N/A
Catch Weight, micrograms	1.0	0.0025	0.5	N/A
µg per dry std. cubic meter*	145	0.520	105	90.5
ppb by volume, Dry	33.1	0.104	21.1	18.1
kilograms per hour	0.0146	0.0000458	0.00928	0.00797
pounds per hour	0.0321	0.000101	0.0205	0.0176
Methylene Chloride				
Formula Weight, lb/lb-mole	84.93	84.93	84.93	N/A
Catch Weight, micrograms	0.9	0.6	1.0	N/A
µg per dry std. cubic meter*	149	125	211	161
ppb by volume, Dry	42.2	35.3	59.7	45.7
kilograms per hour	0.0131	0.0110	0.0186	0.0142
pounds per hour	0.0289	0.0242	0.0409	0.0314
2-Butanone				
Formula Weight, lb/lb-mole	72.11	72.11	72.11	N/A
Catch Weight, micrograms	0.0025	0.0025	0.0025	N/A
µg per dry std. cubic meter*	0.520	0.520	0.520	0.520
ppb by volume, Dry	0.173	0.173	0.173	0.173
kilograms per hour	0.0000458	0.0000458	0.0000458	0.0000458
pounds per hour	0.000101	0.000101	0.000101	0.000101
Chloromethane				
Formula Weight, lb/lb-mole	50.49	50.49	50.49	N/A
Catch Weight, micrograms	0.0025	0.0025	0.0025	N/A
µg per dry std. cubic meter*	0.520	0.520	0.520	0.520
ppb by volume, Dry	0.248	0.248	0.248	0.248
kilograms per hour	0.0000458	0.0000458	0.0000458	0.0000458
pounds per hour	0.000101	0.000101	0.000101	0.000101
Iodomethane				
Formula Weight, lb/lb-mole	141.94	141.94	141.94	N/A
Catch Weight, micrograms	0.0025	0.0025	0.0025	N/A
µg per dry std. cubic meter*	0.520	0.520	0.520	0.520
ppb by volume, Dry	0.088	0.088	0.088	0.0881
kilograms per hour	0.0000458	0.0000458	0.0000458	0.0000458
pounds per hour	0.000101	0.000101	0.000101	0.000101
o-Xylene				
Formula Weight, lb/lb-mole	106.16	106.16	106.16	N/A
Catch Weight, micrograms	0.0025	0.0025	0.0025	N/A
µg per dry std. cubic meter*	0.520	0.520	0.520	0.520
ppb by volume, Dry	0.118	0.118	0.118	0.118
kilograms per hour	0.0000458	0.0000458	0.0000458	0.0000458
pounds per hour	0.000101	0.000101	0.000101	0.000101
Styrene				
Formula Weight, lb/lb-mole	104.15	104.15	104.15	N/A
Catch Weight, micrograms	0.0025	0.0025	0.0025	N/A
µg per dry std. cubic meter*	0.520	0.520	0.520	0.520
ppb by volume, Dry	0.120	0.120	0.120	0.120
kilograms per hour	0.0000458	0.0000458	0.0000458	0.0000458
pounds per hour	0.000101	0.000101	0.000101	0.000101
Isooctane				
Formula Weight, lb/lb-mole	114.23	114.23	114.23	N/A
Catch Weight, micrograms	0.0025	0.0025	0.0025	N/A
µg per dry std. cubic meter*	0.520	0.520	0.520	0.520
ppb by volume, Dry	0.109	0.109	0.109	0.109
kilograms per hour	0.0000458	0.0000458	0.0000458	0.0000458
pounds per hour	0.000101	0.000101	0.000101	0.000101
Chloroform				
Formula Weight, lb/lb-mole	119.38	119.38	119.38	N/A
Catch Weight, micrograms	0.2	0.0025	0.0025	N/A
µg per dry std. cubic meter*	33.1	0.520	0.527	11.4
ppb by volume, Dry	6.67	0.105	0.106	2.29
kilograms per hour	0.00292	0.0000458	0.0000464	0.00100
pounds per hour	0.00643	0.000101	0.000102	0.00221

* 68 Deg. F (20 C) -- 29.92 In. Mercury

Estimated results or not detectable (underlined)

VOLATILE ORGANIC TEST RESULTS

PLANT: Weyerhaeuser Company, Moncure, NC

SAMPLING LOCATION: Core EFB Outlet (WEYCO I.D. 1520)

		MBCLO-M0030-3a	MBCLO-M0030-3b	MBCLO-M0030-3c	
	Test Date	9/18/92	9/18/92	9/18/92	
	Run Start Time	1255	1333	1435	
	Run Stop Time	1315	1353	1455	
	Net Run Time, Minutes	20	20	20	
Y	Dry Gas Meter Calibration Factor	0.9963	0.9963	0.9963	
Pbar	Barometric Pressure, mm Hg	764	764	764	
Vm	Volume of Metered Gas Sample, DAL	5.48	5.14	5.03	
Tm	Dry Gas Meter Temperature, Degrees C	36.8	37.0	37.0	
Vm(std)	Volume of Metered Gas Sample, Dry SL*	5.194	4.868	4.764	
Qsd	Volumetric Air Flow Rate, Dry SCFM*	52,961	52,961	52,961	
	EMISSION RESULTS:				
					Average
	A-Pinene				
Pwt	Formula Weight, lb/lb-mole	136.24	136.24	136.24	N/A
µg	Catch Weight, micrograms	895.6	590.2	528.1	N/A
µg/dscm	µg per dry std. cubic meter*	172,000	121,000	111,000	135,000
ppmvd	ppb by volume, Dry	30400	21400	19600	23,800
kg/hr	kilograms per hour	15.5	10.9	9.99	12.1
lb/hr	pounds per hour	34.2	24.0	22.0	26.7
	B-Pinene				
	Formula Weight, lb/lb-mole	136.24	136.24	136.24	N/A
	Catch Weight, micrograms	377.9	382.4	294.2	N/A
	µg per dry std. cubic meter*	72,500	78,700	61,700	71,000
	ppb by volume, Dry	12800	13900	10900	12,500
	kilograms per hour	6.52	7.08	5.56	6.39
	pounds per hour	14.4	15.6	12.2	14.1
	Acetone				
	Formula Weight, lb/lb-mole	58.08	58.08	58.08	N/A
	Catch Weight, micrograms	120.8	142.6	175.5	N/A
	µg per dry std. cubic meter*	23,300	29,200	36,900	29,800
	ppb by volume, Dry	9630	12100	15300	12,300
	kilograms per hour	2.09	2.63	3.32	2.68
	pounds per hour	4.61	5.80	7.33	5.91
	Toluene				
	Formula Weight, lb/lb-mole	92.15	92.15	92.15	N/A
	Catch Weight, micrograms	9.4	8.9	9.9	N/A
	µg per dry std. cubic meter*	1,810	1,830	2,080	1,910
	ppb by volume, Dry	472	477	542	497
	kilograms per hour	0.163	0.165	0.187	0.171
	pounds per hour	0.359	0.363	0.412	0.378
	P-Cymene				
	Formula Weight, lb/lb-mole	134.22	134.22	134.22	N/A
	Catch Weight, micrograms	5.2	7.1	5.6	N/A
	µg per dry std. cubic meter*	1,001	1,460	1,180	1,210
	ppb by volume, Dry	179	261	211	217
	kilograms per hour	0.0901	0.131	0.106	0.109
	pounds per hour	0.199	0.289	0.233	0.240
	m-/p-Xylene				
	Formula Weight, lb/lb-mole	106.16	106.16	106.16	N/A
	Catch Weight, micrograms	4.2	3.8	4.6	N/A
	µg per dry std. cubic meter*	809	781	966	852
	ppb by volume, Dry	183	177	219	193
	kilograms per hour	0.0728	0.0702	0.0869	0.0766
	pounds per hour	0.160	0.155	0.192	0.169
	Benzene				
	Formula Weight, lb/lb-mole	78.12	78.12	78.12	N/A
	Catch Weight, micrograms	0.0025	0.0025	0.0025	N/A
	µg per dry std. cubic meter*	0.481	0.481	0.481	0.481
	ppb by volume, Dry	0.148	0.148	0.148	0.148
	kilograms per hour	0.0000433	0.0000433	0.0000433	0.0000433
	pounds per hour	0.0000955	0.0000955	0.0000955	0.0000955

* 68 Deg. F (20 C) -- 29.92 In. Mercury

Estimated results

(continued next page)

VOLATILE ORGANIC TEST RESULTS

	MBCLO-M0030-3a	MBCLO-M0030-3b	MBCLO-M0030-3c	Average
Cumene (isopropylbenzene)				
Formula Weight, lb/lb-mole	120.2	120.2	120.2	N/A
Catch Weight, micrograms	1.1	0.9	1.1	N/A
µg per dry std. cubic meter*	212	185	231	209
ppb by volume, Dry	42.4	37.0	46.2	41.9
kilograms per hour	0.0191	0.0166	0.0208	0.0188
pounds per hour	0.0420	0.0367	0.0458	0.0415
Methylene Chloride				
Formula Weight, lb/lb-mole	84.93	84.93	84.93	N/A
Catch Weight, micrograms	[illegible]	0.6	0.7	N/A
µg per dry std. cubic meter*	424	123	147	231
ppb by volume, Dry	120	34.9	41.6	65.5
kilograms per hour	0.0381	0.0111	0.0132	0.0208
pounds per hour	0.0840	0.0245	0.0291	0.0459
2-Butanone				
Formula Weight, lb/lb-mole	72.11	72.11	72.11	N/A
Catch Weight, micrograms	0.0025	0.0025	0.0025	N/A
µg per dry std. cubic meter*	0.481	0.481	0.481	0.481
ppb by volume, Dry	0.161	0.161	0.161	0.161
kilograms per hour	0.0000433	0.0000433	0.0000433	0.0000433
pounds per hour	0.0000955	0.0000955	0.0000955	0.0000955
Chloromethane				
Formula Weight, lb/lb-mole	50.49	50.49	50.49	N/A
Catch Weight, micrograms	0.0025	0.0025	0.0025	N/A
µg per dry std. cubic meter*	0.481	0.481	0.481	0.481
ppb by volume, Dry	0.229	0.229	0.229	0.229
kilograms per hour	0.0000433	0.0000433	0.0000433	0.0000433
pounds per hour	0.0000955	0.0000955	0.0000955	0.0000955
Iodomethane				
Formula Weight, lb/lb-mole	141.94	141.94	141.94	N/A
Catch Weight, micrograms	0.0025	0.0025	0.0025	N/A
µg per dry std. cubic meter*	0.481	0.481	0.481	0.481
ppb by volume, Dry	0.082	0.082	0.082	0.0816
kilograms per hour	0.0000433	0.0000433	0.0000433	0.0000433
pounds per hour	0.0000955	0.0000955	0.0000955	0.0000955
o-Xylene				
Formula Weight, lb/lb-mole	106.16	106.16	106.16	N/A
Catch Weight, micrograms	0.0025	0.2	0.3	N/A
µg per dry std. cubic meter*	0.481	41.1	63.0	34.8
ppb by volume, Dry	0.109	9.31	14.3	7.90
kilograms per hour	0.0000433	0.00370	0.00567	0.00314
pounds per hour	0.0000955	0.00815	0.0125	0.00691
Styrene				
Formula Weight, lb/lb-mole	104.15	104.15	104.15	N/A
Catch Weight, micrograms	0.0025	0.0025	0.4	N/A
µg per dry std. cubic meter*	0.481	0.514	84.0	28.3
ppb by volume, Dry	0.111	0.119	19.4	6.54
kilograms per hour	0.0000433	0.0000462	0.00756	0.00255
pounds per hour	0.0000955	0.0001019	0.0167	0.00562
Isooctane				
Formula Weight, lb/lb-mole	114.23	114.23	114.23	N/A
Catch Weight, micrograms	0.0025	0.0025	0.0025	N/A
µg per dry std. cubic meter*	0.481	0.481	0.481	0.481
ppb by volume, Dry	0.101	0.101	0.101	0.101
kilograms per hour	0.0000433	0.0000433	0.0000433	0.0000433
pounds per hour	0.0000955	0.0000955	0.0000955	0.0000955
Chloroform				
Formula Weight, lb/lb-mole	119.38	119.38	119.38	N/A
Catch Weight, micrograms	0.0025	0.0025	0.0025	N/A
µg per dry std. cubic meter*	0.481	0.481	0.481	0.481
ppb by volume, Dry	0.097	0.097	0.097	0.0970
kilograms per hour	0.0000433	0.0000433	0.0000433	0.0000433
pounds per hour	0.0000955	0.0000955	0.0000955	0.0000955

* 68 Deg. F (20 C) -- 29.92 In. Mercury

Estimated results or not detectable (underlined)

APPENDIX A-9

MICROBOARD SURFACE EFB INLET

PARTICULATE & CONDENSIBLE PARTICULATE TEST RESULTS

PLANT: Weyerhaeuser Company, Moncure, NC

SAMPLING LOCATION: Surface EFB Inlet

		MBSLI-M5/202-1	MBSLI-M5/202-2	MBSLI-M5/202-3
	Test Date	9/16/92	9/16/92	9/17/92
	Run Start & Finish Times	1221-1354	1539-1659	839-955
	Net Traversing Points	24	24	24
Theta	Net Run Time, Minutes	60	60	60
Dia	Nozzle Diameter, Inches	0.193	0.191	0.191
Cp	Pitot Tube Coefficient	0.84	0.84	0.84
Y	Dry Gas Meter Calibration Factor	1.000	1.000	1.000
Pbar	Barometric Pressure, Inches Hg	30.100	30.100	30.100
Delta H	Avg. Pressure Differential of Orifice Meter, Inches H2O	1.444	1.998	1.870
Vm	Volume of Metered Gas Sample, Dry ACF	37.505	44.056	42.422
tm	Dry Gas Meter Temperature, Degrees F	92	95	83
Vm(std)	Volume of Metered Gas Sample, Dry SCF*	36.175	42.322	41.684
Vlc	Total Volume of Liquid Collected in Impingers & Silica Gel, mL	131.0	152.0	140.0
Vw	Volume of Water Vapor, SCF*	6.166	7.155	6.590
%H20	Moisture Content, Percent by Volume	14.6	14.5	13.7
Mfd	Dry Mole Fraction	0.854	0.855	0.863
%CO2	Carbon Dioxide, Percent by Volume, Dry	2.0	2.0	2.0
%O2	Oxygen, Percent by Volume, Dry	18.6	18.8	18.9
%CO+N2	CO + N2, Percent by Volume, Dry	79.4	79.2	79.1
Md	Gas Molecular Weight, Lb/Lb-Mole, Dry	29.06	29.07	29.08
Ms	Gas Molecular Weight, Lb/Lb-Mole, Wet	27.45	27.46	27.56
Pg	Flue Gas Static Pressure, Inches H2O	-1.6	-1.7	-1.5
Ps	Absolute Flue Gas Pressure, Inches Hg	29.98	29.98	29.99
ts	Flue Gas Temperature, Degrees F	227	224	218
Delta-P	Average Velocity Head, Inches H2O	1.4223	1.9098	1.7591
vs	Flue Gas Velocity, Feet per Second	78.27	90.46	86.27
A	Stack/Duct Area, Square Inches	1,914	1,914	1,914
Qsd	Volumetric Air Flow Rate, Dry SCFM*	41,039	47,717	46,349
Qaw	Volumetric Air Flow Rate, Wet ACFM	62,431	72,155	68,812
%I	Isokinetic Sampling Rate, Percent	96.1	98.8	100.1

* 68 Deg. F (20 C) -- 29.92 In. Mercury

(continued next page)

PARTICULATE & CONDENSIBLE PARTICULATE TEST RESULTS

		MBSLI-M5/202-1	MBSLI-M5/202-2	MBSLI-M5/202-3
	PARTICULATE RESULTS:			
	Filterable			
mg	Catch Weight, milligrams	128.6	134.8	112.2
mg/DSCM	Milligrams/Dry Std. Cubic Feet*	125.5	112.5	95.0
gr/DSCF	Grains per Dry Std. Cubic Foot*	0.0549	0.0492	0.0415
kg/hr	Kilograms per hour	8.75347	9.11902	7.48540
lb/hr	Pounds per hour	19.29821	20.10410	16.50257
	Condensable – Extractable			
	Catch Weight, milligrams	broken	18.3	24.3
	Milligrams/Dry Std. Cubic Feet*		15.27	20.58
	Grains per Dry Std. Cubic Foot*		0.0067	0.0090
	Kilograms per hour		1.23797	1.62117
	Pounds per hour		2.72927	3.57409
	Condensable – Non-Extractable			
	Catch Weight, milligrams	broken	12.2	10.3
	Milligrams/Dry Std. Cubic Feet*		10.2	8.7
	Grains per Dry Std. Cubic Foot*		0.0044	0.0038
	Kilograms per hour		0.82531	0.68716
	Pounds per hour		1.81951	1.51494
	Total Particulate			
	Catch Weight, milligrams	N/A	165.3	146.8
	Milligrams/Dry Std. Cubic Feet*	N/A	137.9	124.4
	Grains per Dry Std. Cubic Foot*	N/A	0.0603	0.0543
	Kilograms per hour	N/A	11.18230	9.79373
	Pounds per hour	N/A	24.65288	21.59160

* 68 Deg. F (20 C) -- 29.92 In. Mercury

PARTICULATE & CONDENSIBLE PARTICULATE TEST RESULTS

PLANT: Weyerhaeuser Company, Moncure, NC

SAMPLING LOCATION: Surface EFB Inlet

		MBSLI-M5/202-4
	Test Date	9-[illegible]-92
	Run Start & Finish Times	925-1052
	Net Traversing Points	12
Theta	Net Run Time, Minutes	60
Dia	Nozzle Diameter, Inches	0.193
Cp	Pitot Tube Coefficient	0.84
Y	Dry Gas Meter Calibration Factor	1.000
Pbar	Barometric Pressure, Inches Hg	30.070
Delta H-	Avg. Pressure Differential of Orifice Meter, Inches H2O	2.064
Vm	Volume of Metered Gas Sample, Dry ACF	43.968
tm	Dry Gas Meter Temperature, Degrees F	83
Vm(std)	Volume of Metered Gas Sample, Dry SCF*	43.169
Vlc	Total Volume of Liquid Collected in Impingers & Silica Gel, mL	165.0
Vw	Volume of Water Vapor, SCF*	7.767
%H20	Moisture Content, Percent by Volume	15.2
Mfd	Dry Mole Fraction	0.848
%CO2	Carbon Dioxide, Percent by Volume, Dry	1.9
%O2	Oxygen, Percent by Volume, Dry	19.0
%CO+N2	CO + N2, Percent by Volume, Dry	79.1
Md	Gas Molecular Weight, Lb/Lb-Mole, Dry	29.06
Ms	Gas Molecular Weight, Lb/Lb-Mole, Wet	27.3[illegible]
Pg	Flue Gas Static Pressure, Inches H2O	-1.6
Ps	Absolute Flue Gas Pressure, Inches Hg	29.95
ts	Flue Gas Temperature, Degrees F	223
Delta-P	Average Velocity Head, Inches H2O	1.8489
vs	Flue Gas Velocity, Feet per Second	89.1
A	Stack/Duct Area, Square Inches	1,914
Qsd	Volumetric Air Flow Rate, Dry SCFM*	46,648
Qaw	Volumetric Air Flow Rate, Wet ACFM	71,070
%I	Isokinetic Sampling Rate, Percent	100.9

* 68 Deg. F (20 C) -- 29.92 In. Mercury

PARTICULATE & CONDENSIBLE PARTICULATE TEST RESULTS

MBSLI-M5/202-4

PARTICULATE RESULTS:

	Filterable	
mg	Catch Weight, milligrams	136.2
mg/DSCM	Milligrams/Dry Std. Cubic Feet*	111.4
gr/DSCF	Grains per Dry Std. Cubic Foot*	0.0487
kg/hr	Kilograms per hour	8.831
lb/hr	Pounds per hour	19.468
	Condensable – Extractable	
	Catch Weight, milligrams	48.8
	Milligrams/Dry Std. Cubic Feet*	39.92
	Grains per Dry Std. Cubic Foot*	0.0174
	Kilograms per hour	3.164
	Pounds per hour	6.975
	Condensable – Non-Extractable	
	Catch Weight, milligrams	11.0
	Milligrams/Dry Std. Cubic Feet*	9.00
	Grains per Dry Std. Cubic Foot*	0.00393
	Kilograms per hour	0.713
	Pounds per hour	1.572
	Total Particulate	
	Catch Weight, milligrams	196.0
	Milligrams/Dry Std. Cubic Feet*	160.3
	Grains per Dry Std. Cubic Foot*	0.0701
	Kilograms per hour	12.71
	Pounds per hour	28.02

* 68 Deg. F (20 C) -- 29.92 In. Mercury

APPENDIX A-10

MICROBOARD SURFACE EFB OUTLET (1510)

ALDEHYDES/KETONES TEST RESULTS

PLANT: Weyerhaeuser Company, Moncure, NC

SAMPLING LOCATION: Microboard Surface Layer EFB Outlet (1510)

		MBSLO-M0011-1	MBSLO-M0011-2	MBSLO-M0011-3
	Test Date	9-16-92	9-16-92	9-17-92
	Run Start & Finish Times	1143-1307	1505-1620	859-1016
	Net Traversing Points	12	12	12
Theta	Net Run Time, Minutes	72	72	72
Dia	Nozzle Diameter, Inches	0.200	0.200	0.200
Cp	Pitot Tube Coefficient	0.84	0.84	0.84
Y	Dry Gas Meter Calibration Factor	1.000	1.000	1.000
Pbar	Barometric Pressure, Inches Hg	30.100	30.100	29.000
Delta H	Avg. Pressure Differential of Orifice Meter, Inches H2O	1.450	1.350	1.432
Vm	Volume of Metered Gas Sample, Dry ACF	52.531	51.079	51.691
tm	Dry Gas Meter Temperature, Degrees F	91	96	90
Vm(std)	Volume of Metered Gas Sample, Dry SCF*	50.825	48.925	48.255
Vlc	Total Volume of Liquid Collected in Impingers & Silica Gel, mL	162.8	173.0	144.5
Vw	Volume of Water Vapor, SCF*	7.663	8.143	6.802
%H20	Moisture Content, Percent by Volume	13.1	14.3	12.4
Mfd	Dry Mole Fraction	0.869	0.857	0.876
%CO2	Carbon Dioxide, Percent by Volume, Dry	2.1	2.0	1.9
%O2	Oxygen, Percent by Volume, Dry	18.8	18.9	19.0
%CO+N2	CO + N2, Percent by Volume, Dry	79.1	79.1	79.1
Md	Gas Molecular Weight, Lb/Lb-Mole, Dry	29.09	29.08	29.06
Ms	Gas Molecular Weight, Lb/Lb-Mole, Wet	27.64	27.50	27.69
Pg	Flue Gas Static Pressure, Inches H2O	0.59	0.58	0.58
Ps	Absolute Flue Gas Pressure, Inches Hg	30.14	30.14	29.04
ts	Flue Gas Temperature, Degrees F	226	221	215
Delta-P	Average Velocity Head, Inches H2O	1.4971	1.4412	1.4799
vs	Flue Gas Velocity, Feet per Second	79.73	78.14	80.05
A	Stack/Duct Area, Square Inches	2,227	2,227	2,227
Qsd	Volumetric Air Flow Rate, Dry SCFM*	49,858	48,543	49,389
Qaw	Volumetric Air Flow Rate, Wet ACFM	73,986	72,511	74,283
%I	Isokinetic Sampling Rate, Percent	100.4	99.2	96.2

* 68 Deg. F (20 C) -- 29.92 In. Mercury

(continued next page)

ALDEHYDES/KETONES TEST RESULTS

		MBSLO-M0011-1	MBSLO-M0011-2	MBSLO-M0011-3
	EMISSION RESULTS:			
	FORMALDEHYDE			
Fwt	Formula Weight, lb/lb-mole	30	30	30
µg	Catch Weight, micrograms	975	2,350	717
µg/dscm	µg per dry std. cubic meter*	677	1,696	525
ppmvd	ppm by volume, Dry	0.543	1.360	0.421
kg/hr	kilograms per hour	0.0574	0.1399	0.0440
lb/hr	pounds per hour	0.1265	0.3084	0.0971
	ACETALDEHYDE			
	Formula Weight, lb/lb-mole	44.1	44.1	44.1
	Catch Weight, micrograms	260	632	217
	µg per dry std. cubic meter*	181	456	159
	ppm by volume, Dry	0.0985	0.2488	0.0866
	kilograms per hour	0.0153	0.0376	0.0133
	pounds per hour	0.0337	0.0829	0.0294
	ACROLEIN			
	Formula Weight, lb/lb-mole	56.1	56.1	56.1
	Catch Weight, micrograms	72	81	24
	µg per dry std. cubic meter*	50.0	58.5	17.6
	ppm by volume, Dry	0.02145	0.02507	0.00753
	kilograms per hour	0.00424	0.00482	0.00147
	pounds per hour	0.00934	0.01063	0.00325
	ACETONE			
	Formula Weight, lb/lb-mole	58	58	58
	Catch Weight, micrograms	788	980	1,000
	µg per dry std. cubic meter*	547	707	732
	ppm by volume, Dry	0.227	0.293	0.304
	kilograms per hour	0.0464	0.0583	0.0614
	pounds per hour	0.102	0.129	0.135
	PROPIONALDEHYDE			
	Formula Weight, lb/lb-mole	58.1	58.1	58.1
	Catch Weight, micrograms	22	49	13
	µg per dry std. cubic meter*	15.3	35.4	9.5
	ppm by volume, Dry	0.00633	0.01464	0.00394
	kilograms per hour	0.00129	0.00292	0.00080
	pounds per hour	0.00285	0.00643	0.00176
	CROTONALDEHYDE			
	Formula Weight, lb/lb-mole	70	70	70
	Catch Weight, micrograms	64	76	37
	µg per dry std. cubic meter*	44.5	54.9	27.1
	ppm by volume, Dry	0.01528	0.01885	0.00930
	kilograms per hour	0.00377	0.00452	0.00227
	pounds per hour	0.00830	0.00997	0.00501
	n-BUTYRALDEHYDE			
	Formula Weight, lb/lb-mole	72.1	72.1	72.1
	Catch Weight, micrograms	145	155	106
	µg per dry std. cubic meter*	101	112	77.6
	ppm by volume, Dry	0.03361	0.03732	0.02588
	kilograms per hour	0.00853	0.00923	0.00651
	pounds per hour	0.01882	0.02034	0.01435
	METHYL ETHYL KETONE			
	Formula Weight, lb/lb-mole	72.1	72.1	72.1
	Catch Weight, micrograms	7	43	21
	µg per dry std. cubic meter*	4.86	31.0	15.4
	ppm by volume, Dry	0.001623	0.01035	0.00513
	kilograms per hour	0.000412	0.00256	0.00129
	pounds per hour	0.000908	0.00564	0.00284

Estimated Catch Weight.

____ All catch weights are less than the minimum detection limit. Value presented calculated using 1/2 MDL for each catch.

* 68 Deg. F (20 C) -- 29.92 In. Mercury

(continued next page)

ALDEHYDES/KETONES TEST RESULTS

EMISSION RESULTS:	MBSLO-M0011-1	MBSLO-M0011-2	MBSLO-M0011-3
BENZALDEHYDE			
Formula Weight, lb/lb-mole	106.1	106.1	106.1
Catch Weight, micrograms	439	969	357
µg per dry std. cubic meter*	305	699	261
ppm by volume, Dry	0.0692	0.1586	0.0592
kilograms per hour	0.0258	0.0577	0.0219
pounds per hour	0.0570	0.1272	0.0483
ISOVALERALDEHYDE			
Formula Weight, lb/lb-mole	86.1	86.1	86.1
Catch Weight, micrograms	74	110	50
µg per dry std. cubic meter*	51.4	79.4	36.6
ppm by volume, Dry	0.0144	0.02218	0.01022
kilograms per hour	0.00436	0.00655	0.00307
pounds per hour	0.00960	0.01444	0.00677
VALERALDEHYDE			
Formula Weight, lb/lb-mole	86.1	86.1	86.1
Catch Weight, micrograms	226	291	329
µg per dry std. cubic meter*	157	210	241
ppm by volume, Dry	0.0439	0.0587	0.0673
kilograms per hour	0.0133	0.0173	0.0202
pounds per hour	0.0293	0.0382	0.0445
o-TOLUALDEHYDE			
Formula Weight, lb/lb-mole	120.2	120.2	120.2
Catch Weight, micrograms	31	71	39
µg per dry std. cubic meter*	21.5	51.2	28.5
ppm by volume, Dry	0.00431	0.01026	0.00571
kilograms per hour	0.00182	0.00423	0.00239
pounds per hour	0.00402	0.00932	0.00528
m/p-TOLUALDEHYDE			
Formula Weight, lb/lb-mole	120.2	120.2	120.2
Catch Weight, micrograms	266	554	169
µg per dry std. cubic meter*	185	400	124
ppm by volume, Dry	0.0370	0.0800	0.0247
kilograms per hour	0.0157	0.0330	0.0104
pounds per hour	0.0345	0.0727	0.0229
HEXALDEHYDE			
Formula Weight, lb/lb-mole	100.16	100.16	100.16
Catch Weight, micrograms	334	501	476
µg per dry std. cubic meter*	232	362	348
ppm by volume, Dry	0.0557	0.0868	0.0837
kilograms per hour	0.0197	0.0298	0.0292
pounds per hour	0.0433	0.0658	0.0644
2,5-DIMETHYL BENZALDEHYDE			
Formula Weight, lb/lb-mole	134	134	134
Catch Weight, micrograms	71	131	110
µg per dry std. cubic meter*	49.3	94.5	80.5
ppm by volume, Dry	0.00886	0.01697	0.01445
kilograms per hour	0.00418	0.00780	0.00676
pounds per hour	0.00921	0.01719	0.01489

Estimated Catch Weight.

All catch weights are less than the minimum detection limit. Value presented calculated using 1/2 MDL for each catch.

* 68 Deg. F (20 C) -- 29.92 In. Mercury

PM10 & CONDENSIBLE PARTICULATE TEST RESULTS

PLANT: Weyerhaeuser Company, Moncure, NC

SAMPLING LOCATION: Surface EFB Outlet (WEYCO I.D. 1510)

		MBSLO-M201A/202-2	MBSLO-M201A/202-3	MBSLO-M201A/202-4
	Test Date	9/16/92	9/17/92	9/18/92
	Run Start & Finish Times	1225-1357	1550-1719	839-1027
	Net Traversing Points	12	12	12
Theta	Net Run Time, Minutes	83.5	93.5	82.5
Dia	Nozzle Diameter, Inches	0.150	0.150	0.150
Cp	Pitot Tube Coefficient	0.84	0.84	0.84
Y	Dry Gas Meter Calibration Factor	0.995	0.995	1.006
Pbar	Barometric Pressure, Inches Hg	30.10	30.00	30.07
Delta H	Avg. Pressure Differential of Orifice Meter, Inches H2O	0.50	0.48	0.48
Vm	Volume of Metered Gas Sample, Dry ACF	34.950	38.120	33.538
tm	Dry Gas Meter Temperature, Degrees F	99	88	94
Vm(std)	Volume of Metered Gas Sample, Dry SCF*	33.099	36.657	32.361
Vlc	Total Volume of Liquid Collected in Impingers & Silica Gel, mL	113.0	104.0	118.0
Vw	Volume of Water Vapor, SCF*	5.319	4.895	5.554
%H20	Moisture Content, Percent by Volume	13.8	11.8	14.6
Mfd	Dry Mole Fraction	0.862	0.882	0.854
%CO2	Carbon Dioxide, Percent by Volume, Dry	2.0	1.9	1.7
%O2	Oxygen, Percent by Volume, Dry	18.9	19.0	19.2
%CO+N2	CO + N2, Percent by Volume, Dry	79.1	79.1	79.1
Md	Gas Molecular Weight, Lb/Lb-Mole, Dry	29.08	29.06	29.04
Ms	Gas Molecular Weight, Lb/Lb-Mole, Wet	27.55	27.75	27.43
Pg	Flue Gas Static Pressure, Inches H2O	0.59	0.59	0.59
Ps	Absolute Flue Gas Pressure, Inches Hg	30.14	30.04	30.11
ts	Flue Gas Temperature, Degrees F	219	217	221
Delta-P	Average Velocity Head, Inches H2O	1.3732	1.4473	1.3359
vs	Flue Gas Velocity, Feet per Second	76.1	77.85	75.39
A	Stack/Duct Area, Square Inches	2227	2227	2227
Qsd	Volumetric Air Flow Rate, Dry SCFM*	47,683	49,903	46,585
Qaw	Volumetric Air Flow Rate, Wet ACFM	70,616	72,240	69,957
%I	Isokinetic Sampling Rate, Percent	104.8	99.0	106.1

* 68 Degrees F -- 29.92 Inches of Mercury (Hg). (Continued Next Page)

PM10 & CONDENSIBLE PARTICULATE TEST RESULTS

		MBSLO-M201A/202-2	MBSLO-M201A/202-3	MBSLO-M201A/202-4
	PM10 RESULTS:			
ucyc	Stack Gas Viscosity	208.0	206.2	206.2
Qs	PM10 Flow, at Cyclone Conditions, ACFM	0.588	0.568	0.590
D50	Dia. of Particles in Cyclone, Microns	9.6	9.8	9.5
	Particulate Catch,			
mg	< PM10, Grams	0.0032	0.0149	0.0064
	> PM10, Grams	0.0138	0.0143	0.0121
	Non-extractable Condensibles, Grams	NA	0.0146	0.00720
	Extractable Condensibles, Grams	NA	0.00380	0.00320
	PM10 Emissions:			
	Including extractable/non-extractable condensibles			
gr/DSCF	Concentration, grains/DSCF*	Sample	0.0140	0.00801
kg/hr	Emission Rate, kilograms/hour	Bottle	2.72	1.45
lb/hr	Emission Rate, pounds/hour	Broken	5.99	3.20
	Including only non-extractable condensibles			
	Concentration, grains/DSCF*	Sample	0.0124	0.00648
	Emission Rate, kilograms/hour	Bottle	2.41	1.17
	Emission Rate, pounds/hour	Broken	5.31	2.59
	Without condensibles			
	Concentration, grains/DSCF*	0.00149	0.00627	0.00305
	Emission Rate, kilograms/hour	0.276	1.22	0.552
	Emission Rate, pounds/hour	0.609	2.68	1.22
	Total Particulate Emissions (Includes PM10):			
	Concentration, grains/DSCF*	Not	0.0200	0.0138
	Emission Rate, kilograms/hour	Calculated	3.89	2.49
	Emission Rate, pounds/hour		8.57	5.50
	Particulate Fractionation:			
%>PM10	> PM10, %	Not	30.0	41.9
%<PM10	< PM10, %	Calculated	70.0	58.1

* 68 Degrees F -- 29.92 Inches of Mercury (Hg).
NA -- Sample Jar Broken

SEMIVOLATILE ORGANICS TEST RESULTS

PLANT: Weyerhaeuser Company, Moncure, NC

SAMPLING LOCATION: Surface Dryer EFB Outlet (WEYCO I.D. 1510)

		MBSLO-M0010-1	MBSLO-M0010-2	MBSLO-M0010-3
	Test Date	9-17-92	9-17-92	9-18-92
	Run Start & Finish Times	1227-1509	1801-2035	1225-1508
	Net Traversing Points	12	12	12
Theta	Net Run Time, Minutes	144	144	144
Dia	Nozzle Diameter, Inches	0.200	0.200	0.200
Cp	Pitot Tube Coefficient	0.84	0.84	0.84
Y	Dry Gas Meter Calibration Factor	1.000	1.000	1.000
Pbar	Barometric Pressure, Inches Hg	30.000	30.000	30.000
Delta H	Avg. Pressure Differential of Orifice Meter, Inches H2O	1.462	1.600	1.600
Vm	Volume of Metered Gas Sample, Dry ACF	105.953	110.025	110.82
tm	Dry Gas Meter Temperature, Degrees F	106	101	106
Vm(std)	Volume of Metered Gas Sample, Dry SCF*	99.395	104.195	104.021
Vlc	Total Volume of Liquid Collected in Impingers & Silica Gel, mL	371.0	323.0	271.0
Vw	Volume of Water Vapor, SCF*	17.463	15.204	12.756
%H20	Moisture Content, Percent by Volume	14.9	12.7	10.9
Mfd	Dry Mole Fraction	0.851	0.873	0.891
%CO2	Carbon Dioxide, Percent by Volume, Dry	1.9	2.0	2.0
%O2	Oxygen, Percent by Volume, Dry	19.0	18.9	18.9
%CO+N2	CO + N2, Percent by Volume, Dry	79.1	79.1	79.1
Md	Gas Molecular Weight, Lb/Lb-Mole, Dry	29.06	29.08	29.08
Ms	Gas Molecular Weight, Lb/Lb-Mole, Wet	27.41	27.67	27.87
Pg	Flue Gas Static Pressure, Inches H2O	0.58	0.58	0.58
Ps	Absolute Flue Gas Pressure, Inches Hg	30.04	30.04	30.04
ts	Flue Gas Temperature, Degrees F	219	221	215
Delta-P	Average Velocity Head, Inches H2O	1.4639	1.6000	1.6000
vs	Flue Gas Velocity, Feet per Second	78.9	82.22	81.56
A	Stack/Duct Area, Square Inches	2,227	2,227	2,227
Qsd	Volumetric Air Flow Rate, Dry SCFM*	48,645	51,850	52,961
Qaw	Volumetric Air Flow Rate, Wet ACFM	73,216	76,297	75,684
%I	Isokinetic Sampling Rate, Percent	100.6	98.9	96.7

* 68 Deg. F (20 C) -- 29.92 In. Mercury

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SEMIVOLATILE ORGANICS TEST RESULTS

		MBSLO-M0010-1	MBSLO-M0010-2	MBSLO-M0010-3
	EMISSION RESULTS:			
	P-CYMENE			
Fwt	Formula Weight, lb/lb-mole	134.2	134.2	134.2
µg	Catch Weight, micrograms	132	143	138
µg/dscm	µg per dry std. cubic meter*	47	48	47
ppmvd	ppm by volume, Dry	0.0084	0.0087	0.0084
kg/hr	kilograms per hour	0.00388	0.00427	0.00422
lb/hr	pounds per hour	0.00855	0.00941	0.00929
	A-PINENE			
	Formula Weight, lb/lb-mole	136.2	136.2	136.2
	Catch Weight, micrograms	58,714	48,264	46,279
	µg per dry std. cubic meter*	20,859	16,356	15,710
	ppm by volume, Dry	3.68412	2.88890	2.77472
	kilograms per hour	1.72412	1.44104	1.41374
	pounds per hour	3.80105	3.17697	3.11679
	B-PINENE			
	Formula Weight, lb/lb-mole	136.2	136.2	136.2
	Catch Weight, micrograms	19,109	17,021	14,395
	µg per dry std. cubic meter*	6,789	5,768	4,886
	ppm by volume, Dry	1.19903	1.01881	0.86307
	kilograms per hour	0.56113	0.50820	0.43974
	pounds per hour	1.23708	1.12040	0.96947
	A-TERPINEOL			
	Formula Weight, lb/lb-mole	154.3	154.3	154.3
	Catch Weight, micrograms	6793	7078	7784
	µg per dry std. cubic meter*	2,413	2,399	2,642
	ppm by volume, Dry	0.37624	0.37397	0.41195
	kilograms per hour	0.19947	0.21133	0.23779
	pounds per hour	0.43977	0.46591	0.52423

* 68 Deg. F (20 C) -- 29.92 In. Mercury

VOLATILE ORGANIC TEST RESULTS

PLANT: Weyerhaeuser Company, Moncure, NC

SAMPLING LOCATION: Surface EFB Outlet (WEYCO I.D. 1510)

		MBSLO-M0030-1a	MBSLO-M0030-1b	MBSLO-M0030-1c	
	Test Date	9/17/92	9/17/92	9/17/92	
	Run Start Time	1229	1258	1328	
	Run Finish Time	1249	1318	1348	
Theta	Net Run Time, Minutes	20	20	20	
Y	Dry Gas Meter Calibration Factor	1.001	1.001	1.001	
Pbar	Barometric Pressure, mm Hg	762	762	762	
Vm	Volume of Metered Gas Sample, DAL	15.06	15.59	14.62	
tm	Dry Gas Meter Temperature, Degrees C	36.0	40.8	44.8	
Vm(std)	Volume of Metered Gas Sample, Dry SL*	14.343	14.623	13.540	
Qsd	Volumetric Air Flow Rate, Dry SCFM*	47,900	47,900	47,900	
	EMISSION RESULTS:				Average
	A-Pinene				
Fwt	Formula Weight, lb/lb-mole	136.24	136.24	136.24	N/A
µg	Catch Weight, micrograms	**	322.4	326.1	N/A
µg/dscm	µg per dry std. cubic meter*	**	22,000	24,100	23,100
ppbvd	ppb by volume, Dry	**	3890	4250	4,070
kg/hr	kilograms per hour	**	1.79	1.96	1.88
lb/hr	pounds per hour	**	3.95	4.32	4.14
	B-Pinene				
	Formula Weight, lb/lb-mole	136.24	136.24	136.24	N/A
	Catch Weight, micrograms	**	142.9	145.2	N/A
	µg per dry std. cubic meter*	**	9,800	10,700	10,300
	ppb by volume, Dry	**	1730	1890	1,810
	kilograms per hour	**	0.797	0.871	0.834
	pounds per hour	**	1.76	1.92	1.84
	Acetone				
	Formula Weight, lb/lb-mole	58.08	58.08	58.08	N/A
	Catch Weight, micrograms	**	24.5	20.1	N/A
	µg per dry std. cubic meter*	**	1,680	1,480	1580
	ppb by volume, Dry	**	694	615	654
	kilograms per hour	**	0.136	0.121	0.129
	pounds per hour	**	0.301	0.266	0.283
	Toluene				
	Formula Weight, lb/lb-mole	92.15	92.15	92.15	N/A
	Catch Weight, micrograms	**	0.9	1.7	N/A
	µg per dry std. cubic meter*	**	61.5	126	93.5
	ppb by volume, Dry	**	16.1	32.8	24.4
	kilograms per hour	**	0.00501	0.0102	0.00761
	pounds per hour	**	0.0110	0.0225	0.0168
	Chloromethane				
	Formula Weight, lb/lb-mole	50.49	50.49	50.49	N/A
	Catch Weight, micrograms	**	0.0025	0.0025	N/A
	µg per dry std. cubic meter*	**	0.171	0.171	0.171
	ppb by volume, Dry	**	0.0815	0.0815	0.0815
	kilograms per hour	**	0.0000139	0.0000139	0.0000139
	pounds per hour	**	0.0000307	0.0000307	0.0000307

* 68 Deg. F (20 C) -- 29.92 In. Mercury

-- Estimated results or not detectable (underlined)

(continued next Page)

VOLATILE ORGANIC TEST RESULTS

	MBSLO-M0030-1a	MBSLO-M0030-1b	MBSLO-M0030-1c	Average
m-/p-Xylene				
Formula Weight, lb/lb-mole	106.16	106.16	106.16	N/A
Catch Weight, micrograms	**	0.3	0.0025	N/A
µg per dry std. cubic meter*	**	20.5	0.171	10.3
ppb by volume, Dry	**	4.65	0.0387	2.34
kilograms per hour	**	0.00167	0.0000139	0.000842
pounds per hour	**	0.00368	0.0000307	0.00186
Methylene Chloride				
Formula Weight, lb/lb-mole	84.93	84.93	84.93	N/A
Catch Weight, micrograms	**	0.9	0.9	N/A
µg per dry std. cubic meter*	**	61.5	66.5	64.0
ppb by volume, Dry	**	17.4	18.8	18.1
kilograms per hour	**	0.00501	0.00541	0.00521
pounds per hour	**	0.0110	0.0119	0.0115
P-Cymene				
Formula Weight, lb/lb-mole	134.22	134.22	134.22	N/A
Catch Weight, micrograms	**	0.0025	2.1	N/A
µg per dry std. cubic meter*	**	0.171	155	77.6
ppb by volume, Dry	**	0.0306	27.8	13.9
kilograms per hour	**	0.0000139	0.0126	0.00632
pounds per hour	**	0.0000307	0.0278	0.0139
Trichlorofluoromethane				
Formula Weight, lb/lb-mole	137.37	137.37	137.37	N/A
Catch Weight, micrograms	**	0.0025	0.0025	N/A
µg per dry std. cubic meter*	**	0.171	0.171	0.171
ppb by volume, Dry	**	0.0299	0.0299	0.0299
kilograms per hour	**	0.0000139	0.0000139	0.0000139
pounds per hour	**	0.0000307	0.0000307	0.0000307
n-Hexane				
Formula Weight, lb/lb-mole	86.17	86.17	86.17	N/A
Catch Weight, micrograms	**	0.0025	0.0025	N/A
µg per dry std. cubic meter*	**	0.171	0.171	0.171
ppb by volume, Dry	**	0.0477	0.0477	0.0477
kilograms per hour	**	0.0000139	0.0000139	0.0000139
pounds per hour	**	0.0000307	0.0000307	0.0000307
Isooctane				
Formula Weight, lb/lb-mole	114.23	114.23	114.23	N/A
Catch Weight, micrograms	**	0.0025	0.0025	N/A
µg per dry std. cubic meter*	**	0.171	0.171	0.171
ppb by volume, Dry	**	0.0360	0.0360	0.0360
kilograms per hour	**	0.0000139	0.0000139	0.0000139
pounds per hour	**	0.0000307	0.0000307	0.0000307

* 68 Deg. F (20 C) -- 29.92 In. Mercury

** Run 1A invalid due to tube saturation and high level analysis

Estimated results or not detectable (underlined)

VOLATILE ORGANIC TEST RESULTS

PLANT: Weyerhaeuser Company, Moncure, NC

SAMPLING LOCATION: Surface EFB Outet (WEYCO I.D. 1510)

		MBSLO-M0030-2a	MBSLO-M0030-2b	MBSLO-M0030-2c	
	Test Date	9/17/92	9/17/92	9/17/92	
	Run Start Time	1717	1744	1812	
	Run Finish Time	1737	1804	1832	
Theta	Net Run Time, Minutes	20	20	20	
Y	Dry Gas Meter Calibration Factor	1.001	1.001	1.001	
Pbar	Barometric Pressure, mm Hg	762	762	762	
Vm	Volume of Metered Gas Sample, DAL	9.03	8.01	8.21	
tm	Dry Gas Meter Temperature, Degrees C	41.0	40.0	40.0	
Vm(std)	Volume of Metered Gas Sample, Dry SL*	8.463	7.531	7.719	
Qsd	Volumetric Air Flow Rate, Dry SCFM*	51,900	51,900	51,900	
	EMISSION RESULTS:				
					Average
	A-Pinene				
Fwt	Formula Weight, lb/lb-mole	136.24	136.24	136.24	N/A
µg	Catch Weight, micrograms	252.5	254.6	289.5	N/A
µg/dscm	µg per dry std. cubic meter*	29,800	33,800	37,500	33,700
ppmvd	ppb by volume, Dry	5270	5970	6620	5,950
kg/hr	kilograms per hour	2.63	2.98	3.31	2.97
lb/hr	pounds per hour	5.80	6.57	7.29	6.56
	B-Pinene				
	Formula Weight, lb/lb-mole	136.24	136.24	136.24	N/A
	Catch Weight, micrograms	98.0	95.4	110.8	N/A
	µg per dry std. cubic meter*	11,600	12,700	14,300	12,900
	ppb by volume, Dry	2040	2240	2530	2,270
	kilograms per hour	1.02	1.12	1.26	1.13
	pounds per hour	2.25	2.47	2.79	2.50
	Acetone				
	Formula Weight, lb/lb-mole	58.08	58.08	58.08	N/A
	Catch Weight, micrograms	11.5	9.8	18.1	N/A
	µg per dry std. cubic meter*	1,360	1,300	2,340	1,670
	ppb by volume, Dry	563	539	971	691
	kilograms per hour	0.120	0.115	0.207	0.147
	pounds per hour	0.264	0.253	0.456	0.324
	Toluene				
	Formula Weight, lb/lb-mole	92.15	92.15	92.15	N/A
	Catch Weight, micrograms	0.0025	0.0025	1.4	N/A
	µg per dry std. cubic meter*	0.295	0.332	181	60.7
	ppb by volume, Dry	0.0771	0.0867	47.3	15.8
	kilograms per hour	0.0000261	0.0000293	0.0160	0.00535
	pounds per hour	0.0000574	0.0000645	0.0353	0.0118
	Chloromethane				
	Formula Weight, lb/lb-mole	50.49	50.49	50.49	N/A
	Catch Weight, micrograms	49.0	0.0025	0.0025	N/A
	µg per dry std. cubic meter*	5,790	0.332	0.324	1,930
	ppb by volume, Dry	2760	0.158	0.154	920
	kilograms per hour	0.511	0.0000293	0.0000286	0.170
	pounds per hour	1.13	0.0000645	0.0000630	0.375

* 68 Deg. F (20 C) -- 29.92 In. Mercury

(continued next Page)

VOLATILE ORGANIC TEST RESULTS

	MBSLO-M0030-2a	MBSLO-M0030-2b	MBSLO-M0030-2c	Average
m-/p-Xylene				
Formula Weight, lb/lb-mole	106.16	106.16	106.16	N/A
Catch Weight, micrograms	0.5	0.00250	0.00250	N/A
µg per dry std. cubic meter*	59.1	0.332	0.324	19.9
ppb by volume, Dry	13.4	[illegible]	0.0734	4.51
kilograms per hour	0.00521	0.0000293	0.0000286	0.00176
pounds per hour	0.0115	0.0000645	0.0000630	0.00387
Methylene Chloride				
Formula Weight, lb/lb-mole	84.93	84.93	84.93	N/A
Catch Weight, micrograms	2.9	0.8	1.0	N/A
µg per dry std. cubic meter*	343	106	130	193
ppb by volume, Dry	97.1	30.1	36.7	54.6
kilograms per hour	0.0302	0.00937	0.0114	0.0170
pounds per hour	0.0666	0.0207	0.0252	0.0375
P-Cymene				
Formula Weight, lb/lb-mole	134.22	134.22	134.22	N/A
Catch Weight, micrograms	0.00250	1.60	0.00250	N/A
µg per dry std. cubic meter*	0.332	212	0.332	71.0
ppb by volume, Dry	0.0595	38.1	0.0595	12.7
kilograms per hour	0.0000293	0.0187	0.0000293	0.00626
pounds per hour	0.0000645	0.0413	0.0000645	0.0138
Chloroform				
Formula Weight, lb/lb-mole	119.38	119.38	119.38	N/A
Catch Weight, micrograms	0.00250	0.00250	0.00250	N/A
µg per dry std. cubic meter*	0.332	0.332	0.332	0.332
ppb by volume, Dry	0.0669	0.0669	0.0669	0.0669
kilograms per hour	0.0000293	0.0000293	0.0000293	0.0000293
pounds per hour	0.0000645	0.0000645	0.0000645	0.0000645
Trichlorofluoromethane				
Formula Weight, lb/lb-mole	137.37	137.37	137.37	N/A
Catch Weight, micrograms	0.00250	0.00250	0.00250	N/A
µg per dry std. cubic meter*	0.332	0.332	0.332	0.332
ppb by volume, Dry	0.0581	0.0581	0.0581	0.0581
kilograms per hour	0.0000293	0.0000293	0.0000293	0.0000293
pounds per hour	0.0000645	0.0000645	0.0000645	0.0000645
n-Hexane				
Formula Weight, lb/lb-mole	86.17	86.17	86.17	N/A
Catch Weight, micrograms	0.00250	0.00250	0.00250	N/A
µg per dry std. cubic meter*	0.332	0.332	0.332	0.332
ppb by volume, Dry	0.0927	0.0927	0.0927	0.0927
kilograms per hour	0.0000293	0.0000293	0.0000293	0.0000293
pounds per hour	0.0000645	0.0000645	0.0000645	0.0000645
Isooctane				
Formula Weight, lb/lb-mole	114.23	114.23	114.23	N/A
Catch Weight, micrograms	0.00250	0.00250	0.00250	N/A
µg per dry std. cubic meter*	0.332	0.332	0.332	0.332
ppb by volume, Dry	0.0699	0.0699	0.0699	0.0699
kilograms per hour	0.0000293	0.0000293	0.0000293	0.0000293
pounds per hour	0.0000645	0.0000645	0.0000645	0.0000645
1,1,1-Trichloroethane				
Formula Weight, lb/lb-mole	133.41	133.41	133.41	N/A
Catch Weight, micrograms	0.00250	0.00250	0.00250	N/A
µg per dry std. cubic meter*	0.332	0.332	0.332	0.332
ppb by volume, Dry	0.0599	0.0599	0.0599	0.0599
kilograms per hour	0.0000293	0.0000293	0.0000293	0.0000293
pounds per hour	0.0000645	0.0000645	0.0000645	0.0000645

* 68 Deg. F (20 C) -- 29.92 In. Mercury

Estimated results or not detectable (underlined)

VOLATILE ORGANIC TEST RESULTS

PLANT: Weyerhaeuser Company, Moncure, NC

SAMPLING LOCATION: Surface EFB Outet (WEYCO I.D. 1510)

		MBSLO-M0030-3a	MBSLO-M0030-3b	MBSLO-M0030-3c	
	Test Date	9/17/92	9/17/92	9/17/92	
	Run Start Time	1225	1250	1316	
	Run Finish Time	1245	1310	1336	
Theta	Net Run Time, Minutes	20	20	20	
Y	Dry Gas Meter Calibration Factor	1.001	1.001	1.001	
Pbar	Barometric Pressure, mm Hg	763.8	763.8	763.8	
Vm	Volume of Metered Gas Sample, DAL	8.04	8.4	8.76	
tm	Dry Gas Meter Temperature, Degrees C	35.8	36.0	38.0	
Vm(std)	Volume of Metered Gas Sample, Dry SL*	7.681	8.019	8.309	
Qsd	Volumetric Air Flow Rate, Dry SCFM*	52,900	52,900	52,900	
	EMISSION RESULTS:				Average
	A-Pinene				
Fwt	Formula Weight, lb/lb-mole	136.24	136.24	136.24	N/A
µg	Catch Weight, micrograms	226.6	189.8	207.9	N/A
µg/dscm	µg per dry std. cubic meter*	29,500	23,700	25,000	26,100
ppmvd	ppb by volume, Dry	5210	4180	4420	4,600
kg/hr	kilograms per hour	2.65	2.13	2.25	2.34
lb/hr	pounds per hour	5.85	4.69	4.96	5.17
	B-Pinene				
	Formula Weight, lb/lb-mole	136.24	136.24	136.24	N/A
	Catch Weight, micrograms	72.2	55.4	60.7	N/A
	µg per dry std. cubic meter*	9,400	6,910	7,310	7,870
	ppb by volume, Dry	1660	1220	1290	1,390
	kilograms per hour	0.845	0.621	0.657	0.708
	pounds per hour	1.86	1.37	1.45	1.56
	Acetone				
	Formula Weight, lb/lb-mole	58.08	58.08	58.08	N/A
	Catch Weight, micrograms	12.6	12.2	9.4	N/A
	µg per dry std. cubic meter*	1,640	1,520	1,130	1,430
	ppb by volume, Dry	679	630	469	593
	kilograms per hour	0.147	0.137	0.102	0.129
	pounds per hour	0.325	0.301	0.224	0.284
	Toluene				
	Formula Weight, lb/lb-mole	92.15	92.15	92.15	N/A
	Catch Weight, micrograms	0.5	0.3	0.0025	N/A
	µg per dry std. cubic meter*	65.1	37.4	0.301	34.3
	ppb by volume, Dry	17.0	9.77	0.0785	8.95
	kilograms per hour	0.00585	0.00336	0.0000270	0.00308
	pounds per hour	0.0129	0.00741	0.0000596	0.00679
	Chloromethane				
	Formula Weight, lb/lb-mole	50.49	50.49	50.49	N/A
	Catch Weight, micrograms	0.0025	0.0025	0.0025	N/A
	µg per dry std. cubic meter*	0.301	0.301	0.301	0.301
	ppb by volume, Dry	0.1434	0.1434	0.1434	0.143
	kilograms per hour	0.0000270	0.0000270	0.0000270	0.0000270
	pounds per hour	0.0000596	0.0000596	0.0000596	0.0000596

* 68 Deg. F (20 C) -- 29.92 In. Mercury

Estimated results or not detectable (underlined)

(continued next Page)

VOLATILE ORGANIC TEST RESULTS

	MBSLO-M0030-3a	MBSLO-M0030-3b	MBSLO-M0030-3c	Average
m-/p-Xylene				
Formula Weight, lb/lb-mole	106.16	106.16	106.16	N/A
Catch Weight, micrograms	0.0025	0.0025	0.0025	N/A
µg per dry std. cubic meter*	0.301	0.301	0.301	0.301
ppb by volume, Dry	0.0682	0.0682	0.0682	0.0682
kilograms per hour	0.0000270	0.0000270	0.0000270	0.0000270
pounds per hour	0.0000596	0.0000596	0.0000596	0.0000596
Methylene Chloride				
Formula Weight, lb/lb-mole	84.93	84.93	84.93	N/A
Catch Weight, micrograms	4.1	0.3	0.3	N/A
µg per dry std. cubic meter*	534	37.4	36.1	202
ppb by volume, Dry	151	10.6	10.2	57.3
kilograms per hour	0.0480	0.00336	0.00325	0.0182
pounds per hour	0.106	0.00741	0.00715	0.0401
P-Cymene				
Formula Weight, lb/lb-mole	134.22	134.22	134.22	N/A
Catch Weight, micrograms	1.8	0.9	1.2	N/A
µg per dry std. cubic meter*	234	112	144	164
ppb by volume, Dry	42.0	20.1	25.9	29.3
kilograms per hour	0.0211	0.0101	0.0130	0.0147
pounds per hour	0.0464	0.0222	0.0286	0.0324
Chloroform				
Formula Weight, lb/lb-mole	119.38	119.38	119.38	N/A
Catch Weight, micrograms	0.0025	0.0025	0.5	N/A
µg per dry std. cubic meter*	0.325	0.312	60.2	20.3
ppb by volume, Dry	0.0656	0.0628	12.1	4.08
kilograms per hour	0.0000293	0.0000280	0.00541	0.00182
pounds per hour	0.0000645	0.0000618	0.0119	0.00402
Trichlorofluoromethane				
Formula Weight, lb/lb-mole	137.37	137.37	137.37	N/A
Catch Weight, micrograms	0.0025	0.0025	0.0025	N/A
µg per dry std. cubic meter*	0.301	0.301	0.301	0.301
ppb by volume, Dry	0.0527	0.0527	0.0527	0.0527
kilograms per hour	0.0000270	0.0000270	0.0000270	0.0000270
pounds per hour	0.0000596	0.0000596	0.0000596	0.0000596
n-Hexane				
Formula Weight, lb/lb-mole	86.17	86.17	86.17	N/A
Catch Weight, micrograms	0.0025	0.0025	0.0025	N/A
µg per dry std. cubic meter*	0.301	0.301	0.301	0.301
ppb by volume, Dry	0.0840	0.0840	0.0840	0.0840
kilograms per hour	0.0000270	0.0000270	0.0000270	0.0000270
pounds per hour	0.0000596	0.0000596	0.0000596	0.0000596
Isooctane				
Formula Weight, lb/lb-mole	114.23	114.23	114.23	N/A
Catch Weight, micrograms	0.0025	0.0025	0.0025	N/A
µg per dry std. cubic meter*	0.301	0.301	0.301	0.301
ppb by volume, Dry	0.0634	0.0634	0.0634	0.0634
kilograms per hour	0.0000270	0.0000270	0.0000270	0.0000270
pounds per hour	0.0000596	0.0000596	0.0000596	0.0000596
1,1,1-Trichloroethane				
Formula Weight, lb/lb-mole	133.41	133.41	133.41	N/A
Catch Weight, micrograms	0.0025	0.0025	0.0025	N/A
µg per dry std. cubic meter*	0.301	0.301	0.301	0.301
ppb by volume, Dry	0.0543	0.0543	0.0543	0.0543
kilograms per hour	0.0000270	0.0000270	0.0000270	0.0000270
pounds per hour	0.0000596	0.0000596	0.0000596	0.0000596

* 68 Deg. F (20 C) -- 29.92 In. Mercury

Estimated results or not detectable (underlined)

APPENDIX A-11

MICROBOARD PRESS STACK 11 (DEF-1)

ALDEHYDES/KETONES TEST RESULTS

PLANT: Weyerhaeuser Company, Moncure, NC

SAMPLING LOCATION: Microboard Press Stack 11 (WEYCO I.D. DEF-1)

		MBP11-M0011-1	MBP11-M0011-2	MBP11-M0011-3
	Test Date	9-19-92	9-21-92	9-22-92
	Run Start & Finish Times	1635-1753	1810-1927	1421-1539
	Net Traversing Points	24	24	24
Theta	Net Run Time, Minutes	72	72	72
Dia	Nozzle Diameter, Inches	0.282	0.282	0.282
Cp	Pitot Tube Coefficient	0.84	0.84	0.84
Y	Dry Gas Meter Calibration Factor	1.006	1.006	1.006
Pbar	Barometric Pressure, Inches Hg	30.070	29.850	29.900
Delta H	Avg. Pressure Differential of Orifice Meter, Inches H2O	1.536	1.162	1.221
Vm	Volume of Metered Gas Sample, Dry ACF	43.685	39.359	40.844
tm	Dry Gas Meter Temperature, Degrees F	95	91	97
Vm(std)	Volume of Metered Gas Sample, Dry SCF*	42.196	37.935	39.050
Vlc	Total Volume of Liquid Collected in Impingers & Silica Gel, mL	34.1	33.5	20.1
Vw	Volume of Water Vapor, SCF*	1.605	1.577	0.946
%H20	Moisture Content, Percent by Volume	3.7	4.0	2.4
Mfd	Dry Mole Fraction	0.963	0.960	0.976
%CO2	Carbon Dioxide, Percent by Volume, Dry	0.0	0.0	0.0
%O2	Oxygen, Percent by Volume, Dry	20.9	20.9	20.9
%CO+N2	CO + N2, Percent by Volume, Dry	79.1	79.1	79.1
Md	Gas Molecular Weight, Lb/Lb-Mole, Dry	28.84	28.84	28.84
Ms	Gas Molecular Weight, Lb/Lb-Mole, Wet.	28.44	28.41	28.58
Pg	Flue Gas Static Pressure, Inches H2O	-0.2	-0.11	-0.11
Ps	Absolute Flue Gas Pressure, Inches Hg	30.06	29.84	29.89
ts	Flue Gas Temperature, Degrees F	111	111	115
Delta-P	Average Velocity Head, Inches H2O	0.1842	0.1379	0.1557
vs	Flue Gas Velocity, Feet per Second	25.19	21.88	23.25
A	Stack/Duct Area, Square Inches	855	855	855
Qsd	Volumetric Air Flow Rate, Dry SCFM*	8,028	6,906	7,420
Qaw	Volumetric Air Flow Rate, Wet ACFM	8,978	7,798	8,286
%I	Isokinetic Sampling Rate, Percent	100.0	104.5	100.1

* 68 Deg. F (20 C) -- 29.92 In. Mercury

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ALDEHYDES/KETONES TEST RESULTS

	EMISSION RESULTS:	MBP11-M0011-1	MBP11-M0011-2	MBP11-M0011-3
	FORMALDEHYDE			
Fwt	Formula Weight, lb/lb-mole	30	30	30
µg	Catch Weight, micrograms	39,743	25,207	37,662
µg/dscm	µg per dry std. cubic meter*	33,258	23,463	34,056
ppmvd	ppm by volume, Dry	26.669	18.815	27.308
kg/hr	kilograms per hour	0.454	0.27533	0.42938
lb/hr	pounds per hour	1.0002	0.6070	0.9466
	ACETALDEHYDE			
	Formula Weight, lb/lb-mole	44.1	44.1	44.1
	Catch Weight, micrograms	402	395	467
	µg per dry std. cubic meter*	336	368	422
	ppm by volume, Dry	0.1835	0.2006	0.2304
	kilograms per hour	0.00459	0.00431	0.00532
	pounds per hour	0.01012	0.00951	0.01174
	ACROLEIN			
	Formula Weight, lb/lb-mole	56.1	56.1	56.1
	Catch Weight, micrograms	264	88	80
	µg per dry std. cubic meter*	221	81.9	72.3
	ppm by volume, Dry	0.0947	0.0351	0.0310
	kilograms per hour	0.00301	0.00096	0.00091
	pounds per hour	0.00664	0.00212	0.00201
	ACETONE			
	Formula Weight, lb/lb-mole	58	58	58
	Catch Weight, micrograms	619	1,123	803
	µg per dry std. cubic meter*	518	1,045	726
	ppm by volume, Dry	0.2148	0.4336	0.3012
	kilograms per hour	0.00707	0.01227	0.00915
	pounds per hour	0.01558	0.02704	0.02018
	PROPIONALDEHYDE			
	Formula Weight, lb/lb-mole	58.1	58.1	58.1
	Catch Weight, micrograms	25	1	1
	µg per dry std. cubic meter*	20.9	0.93	0.90
	ppm by volume, Dry	0.00866	0.000385	0.000374
	kilograms per hour	0.000285	0.0000109	0.0000114
	pounds per hour	0.000629	0.0000241	0.0000251
	CROTONALDEHYDE			
	Formula Weight, lb/lb-mole	70	70	70
	Catch Weight, micrograms	77	46	45
	µg per dry std. cubic meter*	64.4	42.8	40.7
	ppm by volume, Dry	0.0221	0.0147	0.0140
	kilograms per hour	0.000879	0.000502	0.000513
	pounds per hour	0.00194	0.00111	0.00113
	n-BUTYRALDEHYDE			
	Formula Weight, lb/lb-mole	72.1	72.1	72.1
	Catch Weight, micrograms	153	139	129
	µg per dry std. cubic meter*	128	129	117
	ppm by volume, Dry	0.0427	0.0432	0.0389
	kilograms per hour	0.00175	0.00152	0.00147
	pounds per hour	0.00385	0.00335	0.00324
	METHYL ETHYL KETONE			
	Formula Weight, lb/lb-mole	72.1	72.1	72.1
	Catch Weight, micrograms	5	28	27
	µg per dry std. cubic meter*	4.18	26.1	24.4
	ppm by volume, Dry	0.00140	0.00870	0.00815
	kilograms per hour	0.0000571	0.000306	0.000308
	pounds per hour	0.0001258	0.000674	0.000679

Estimated catch weight.

All catch weights are less than the minimum detection limit (MDL). Value presented calculated using 1/2 MDL for each catch weight.

* 68 Deg. F (20 C) -- 29.92 In. Mercury

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ALDEHYDES/KETONES TEST RESULTS

EMISSION RESULTS:	MBP11-M0011-1	MBP11-M0011-2	MBP11-M0011-3
BENZALDEHYDE			
Formula Weight, lb/lb-mole	106.1	106.1	106.1
Catch Weight, micrograms	105	116	[illegible]
µg per dry std. cubic meter*	87.9	108	137
ppm by volume, Dry	0.01992	0.02448	0.03096
kilograms per hour	0.00120	0.00127	[illegible]
pounds per hour	0.00264	0.00279	0.00380
ISOVALERALDEHYDE			
Formula Weight, lb/lb-mole	86.1	86.1	86.1
Catch Weight, micrograms	106	127	136
µg per dry std. cubic meter*	88.7	118	123
ppm by volume, Dry	0.02478	0.03303	0.03436
kilograms per hour	0.00121	0.00139	0.00155
pounds per hour	0.00267	0.00306	0.00342
VALERALDEHYDE			
Formula Weight, lb/lb-mole	86.1	86.1	86.1
Catch Weight, micrograms	150	233	199
µg per dry std. cubic meter*	126	217	180
ppm by volume, Dry	0.03507	0.06060	0.05028
kilograms per hour	0.00171	0.00255	0.00227
pounds per hour	0.00377	0.00561	0.00500
o-TOLUALDEHYDE			
Formula Weight, lb/lb-mole	120.2	120.2	120.2
Catch Weight, micrograms	14	7	16
µg per dry std. cubic meter*	11.7	6.52	14.5
ppm by volume, Dry	0.00234	0.00130	0.00290
kilograms per hour	0.000160	0.0000765	0.000182
pounds per hour	0.000352	0.000169	0.000402
m/p-TOLUALDEHYDE			
Formula Weight, lb/lb-mole	120.2	120.2	120.2
Catch Weight, micrograms	73	54	81
µg per dry std. cubic meter*	61.1	50.3	73.2
ppm by volume, Dry	0.01223	0.01006	0.01466
kilograms per hour	0.000833	0.000590	0.000923
pounds per hour	0.00184	0.00130	0.00204
HEXALDEHYDE			
Formula Weight, lb/lb-mole	100.16	100.16	100.16
Catch Weight, micrograms	277	632	418
µg per dry std. cubic meter*	232	588	378
ppm by volume, Dry	0.05567	0.14129	0.09078
kilograms per hour	0.00316	0.00690	0.00477
pounds per hour	0.00697	0.01522	0.01051
2,5-DIMETHYL BENZALDEHYDE			
Formula Weight, lb/lb-mole	134	134	134
Catch Weight, micrograms	41	15	8
µg per dry std. cubic meter*	34.3	14.0	7.23
ppm by volume, Dry	0.00616	0.00251	0.00130
kilograms per hour	0.00047	0.000164	0.0000912
pounds per hour	0.00103	0.000361	0.000201

Estimated catch weight.

All catch weights are less than the minimum detection limit (MDL). Value presented calculated using 1/2 MDL for each catch weight.

* 68 Deg. F (20 C) — 29.92 In. Mercury

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PM10 & CONDENSIBLE PARTICULATE TEST RESULTS

PLANT: Weyerhaeuser Company, Moncure, NC

SAMPLING LOCATION: Microboard Press Stack 11 (WEYCO I.D. DEF-1)

		MBP11-M201A/202-1	MBP11-M201A/202-2	MBP11-M201A/202-3
	Test Date	9/19/92	9/21/92	9/22/92
	Run Start & Finish Times	1044-1513	902-1240	906-1309
	Net Traversing Points	12	12	12
Theta	Net Run Time, Minutes	221.5	205	234.25
Dia	Nozzle Diameter, Inches	0.23	0.23	0.23
Cp	Pitot Tube Coefficient	0.84	0.84	0.84
Y	Dry Gas Meter Calibration Factor	1.006	1.006	1.006
Pbar	Barometric Pressure, Inches Hg	30.07	29.85	29.9
Delta H	Avg. Pressure Differential of Orifice Meter, Inches H2O	0.74	0.74	0.74
Vm	Volume of Metered Gas Sample, Dry ACF	103.223	94.777	108.722
tm	Dry Gas Meter Temperature, Degrees F	98	88	87
Vm(std)	Volume of Metered Gas Sample, Dry SCF*	98.927	91.735	105.564
Vlc	Total Volume of Liquid Collected in Impingers & Silica Gel, mL	67	52	66
Vw	Volume of Water Vapor, SCF*	3.154	2.448	3.107
%H20	Moisture Content, Percent by Volume	3.1	2.6	2.9
Mfd	Dry Mole Fraction	0.969	0.974	0.971
%CO2	Carbon Dioxide, Percent by Volume, Dry	0.0	0.0	0.0
%O2	Oxygen, Percent by Volume, Dry	20.9	20.9	20.9
%CO+N2	CO + N2, Percent by Volume, Dry	79.1	79.1	79.1
Md	Gas Molecular Weight, Lb/Lb-Mole, Dry	28.84	28.84	28.84
Ms	Gas Molecular Weight, Lb/Lb-Mole, Wet	28.50	28.56	28.53
Pg	Flue Gas Static Pressure, Inches H2O	-0.11	-0.11	-0.11
Ps	Absolute Flue Gas Pressure, Inches Hg	30.06	29.84	29.89
ts	Flue Gas Temperature, Degrees F	113	108	110
Delta P	Average Velocity Head, Inches H2O	0.2152	0.1898	0.1910
vs	Flue Gas Velocity, Feet per Second	27.24	25.54	25.65
A	Stack/Duct Area, Square Inches	855	855	855
Qsd	Volumetric Air Flow Rate, Dry SCFM*	8,713	8,223	8,217
Qaw	Volumetric Air Flow Rate, Wet ACFM	9,708	9,102	9,142
%I	Isokinetic Sampling Rate, Percent	105.5	112.0	112.9

* 68 Degrees F -- 29.92 Inches of Mercury (Hg). (Continued Next Page)

PM10 & CONDENSIBLE PARTICULATE TEST RESULTS

		MBP11-M201A/202-1	MBP11-M201A/202-2	MBP11-M201A/202-3
	PM10 RESULTS:			
ucyc	Stack Gas Viscosity	187.8	189.2	188.5
Qs	PM10 Flow, at Cyclone Conditions, ACFM	0.498	0.496	0.501
D50	Dia. of Particles in Cyclone, Microns	9.6	9.7	9.6
	Particulate Catch,			
mg	< PM10, Grams	0.0018	0.0073	0.0020
	> PM10, Grams	0.0058	0.0050	0.0038
	Non-extractable Condensibles, Grams	0.0119	0.0089	0.0055
	Extractable Condensibles, Grams	0.0032	0.0009	0.0127
	PM10 Emissions:			
	Including extractable/non-extractable condensibles			
Gr/DSCF	Concentration, Grains/DSCF*	0.00264	0.00288	0.00295
Kg/Hr	Emission Rate, Kiligrams/Hour	0.0892	0.0919	0.0943
Lb/Hr	Emission Rate, Pounds/Hour	0.197	0.203	0.208
	Including only non-extractable condensibles			
	Concentration, Grains/DSCF*	0.00214	0.00272	0.00110
	Emission Rate, Kiligrams/Hour	0.0723	0.0715	0.0350
	Emission Rate, Pounds/Hour	0.159	0.192	0.0772
	Without condensibles			
	Concentration, Grains/DSCF*	0.000281	0.00123	0.000292
	Emission Rate, Kiligrams/Hour	0.00951	0.0392	0.00934
	Emission Rate, Pounds/Hour	0.0210	0.0865	0.0206
	Total Particulate Emissions (Includes PM10):			
	Concentration, Grains/DSCF*	0.00354	0.00372	0.00351
	Emission Rate, Kiligrams/Hour	0.120	0.119	0.112
	Emission Rate, Pounds/Hour	0.264	0.262	0.247
	Particulate Fractionation:			
%>PM10	> PM10, %	25.6	22.6	15.8
%<PM10	< PM10, %	74.4	77.4	84.2

* 68 Degrees F -- 29.92 Inches of Mercury (Hg).

APPENDIX A-12

MICROBOARD PRESS STACK 12 (DEF-3)

ALDEHYDES/KETONES TEST RESULTS

PLANT: Weyerhaeuser Company, Moncure, NC

SAMPLING LOCATION: Microboard Press Stack 12 (WEYCO I.D. DEF-3)

		MBP12-M0011-1	MBP12-M0011-2	MBP12-M0011-3
	Test Date	9-19-92	9-21-92	9-22-92
	Run Start & Finish Times	1635-1754	1810-1927	1421-1539
	Net Traversing Points	24	24	24
Theta	Net Run Time, Minutes	72	72	72
Dia	Nozzle Diameter, Inches	0.270	0.270	0.270
Cp	Pitot Tube Coefficient	0.84	0.84	0.84
Y	Dry Gas Meter Calibration Factor	1.000	1.000	1.000
Pbar	Barometric Pressure, Inches Hg	30.070	29.850	29.900
Delta H	Avg. Pressure Differential of Orifice Meter, Inches H2O	2.198	2.152	2.256
Vm	Volume of Metered Gas Sample, Dry ACF	56.358	53.898	52.293
tm	Dry Gas Meter Temperature, Degrees F	97	95	95
Vm(std)	Volume of Metered Gas Sample, Dry SCF*	53.973	51.416	49.987
Vlc	Total Volume of Liquid Collected in Impingers & Silica Gel, mL	36.9	37.0	30.7
Vw	Volume of Water Vapor, SCF*	1.737	1.742	1.445
%H20	Moisture Content, Percent by Volume	3.1	3.3	2.8
Mfd	Dry Mole Fraction	0.969	0.967	0.972
%CO2	Carbon Dioxide, Percent by Volume, Dry	0.0	0.0	0.0
%O2	Oxygen, Percent by Volume, Dry	20.9	20.9	20.9
%CO+N2	CO + N2, Percent by Volume, Dry	79.1	79.1	79.1
Md	Gas Molecular Weight, Lb/Lb-Mole, Dry	28.84	28.84	28.84
Ms	Gas Molecular Weight, Lb/Lb-Mole, Wet	28.50	28.48	28.54
Pg	Flue Gas Static Pressure, Inches H2O	-0.25	-0.2	-0.2
Ps	Absolute Flue Gas Pressure, Inches Hg	30.05	29.84	29.89
ts	Flue Gas Temperature, Degrees F	112	112	116
Delta-P	Average Velocity Head, Inches H2O	0.3521	0.3440	0.3591
vs	Flue Gas Velocity, Feet per Second	34.84	34.54	35.37
A	Stack/Duct Area, Square Inches	855	855	855
Qsd	Volumetric Air Flow Rate, Dry SCFM*	11,147	10,968	11,214
Qaw	Volumetric Air Flow Rate, Wet ACFM	12,417	12,310	12,606
%I	Isokinetic Sampling Rate, Percent	100.5	97.3	92.5

* 68 Deg. F (20 C) -- 29.92 In. Mercury

(continued next page)

ALDEHYDES/KETONES TEST RESULTS

		MBP12-M0011-1	MBP12-M0011-2	MBP12-M0011-3
	EMISSION RESULTS:			
	FORMALDEHYDE			
Fwt	Formula Weight, lb/lb-mole	30	30	30
µg	Catch Weight, micrograms	47,711	35,245	48,344
µg/dscm	µg per dry std. cubic meter*	31,214	24,205	34,150
ppmvd	ppm by volume, Dry	25.030	19.409	27.384
kg/hr	kilograms per hour	0.5[illegible]	0.45111	0.65072
lb/hr	pounds per hour	1.3034	0.9945	1.4346
	ACETALDEHYDE			
	Formula Weight, lb/lb-mole	44.1	44.1	44.1
	Catch Weight, micrograms	517	549	600
	µg per dry std. cubic meter*	338	377	424
	ppm by volume, Dry	0.1845	0.2057	0.2312
	kilograms per hour	0.00641	0.00703	0.00808
	pounds per hour	0.01412	0.01549	0.01781
	ACROLEIN			
	Formula Weight, lb/lb-mole	56.1	56.1	56.1
	Catch Weight, micrograms	136	125	129
	µg per dry std. cubic meter*	89.0	85.8	91.1
	ppm by volume, Dry	0.0382	0.0368	0.0391
	kilograms per hour	0.00169	0.00160	0.00174
	pounds per hour	0.00372	0.00353	0.00383
	ACETONE			
	Formula Weight, lb/lb-mole	58	58	58
	Catch Weight, micrograms	713	1,407	876
	µg per dry std. cubic meter*	466	966	619
	ppm by volume, Dry	0.1935	0.4008	0.2567
	kilograms per hour	0.00884	0.01801	0.01179
	pounds per hour	0.01948	0.03970	0.02600
	PROPIONALDEHYDE			
	Formula Weight, lb/lb-mole	58.1	58.1	58.1
	Catch Weight, micrograms	16	1	4
	µg per dry std. cubic meter*	10.5	0.687	2.83
	ppm by volume, Dry	0.00433	0.000284	0.00117
	kilograms per hour	0.000198	0.0000128	0.0000538
	pounds per hour	0.000437	0.0000282	0.000119
	CROTONALDEHYDE			
	Formula Weight, lb/lb-mole	70	70	70
	Catch Weight, micrograms	41	52	34
	µg per dry std. cubic meter*	26.8	35.7	24.0
	ppm by volume, Dry	0.00922	0.0123	0.00825
	kilograms per hour	0.000508	0.000666	0.000458
	pounds per hour	0.00112	0.00147	0.00101
	n-BUTYRALDEHYDE			
	Formula Weight, lb/lb-mole	72.1	72.1	72.1
	Catch Weight, micrograms	124	182	128
	µg per dry std. cubic meter*	81.1	125	90.4
	ppm by volume, Dry	0.0271	0.0417	0.0302
	kilograms per hour	0.00154	0.00233	0.00172
	pounds per hour	0.00339	0.00514	0.00380
	METHYL ETHYL KETONE			
	Formula Weight, lb/lb-mole	72.1	72.1	72.1
	Catch Weight, micrograms	6	36	35
	µg per dry std. cubic meter*	3.93	24.7	24.7
	ppm by volume, Dry	0.00131	0.00825	0.00825
	kilograms per hour	0.0000744	0.000461	0.000471
	pounds per hour	0.000164	0.00102	0.00104

Estimated catch weight.

All catch weights are less than the minimum detection limit (MDL). Value presented calculated using 1/2 MDL for each catch weight

* 68 Deg. F (20 C) -- 29.92 In. Mercury

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ALDEHYDES/KETONES TEST RESULTS

EMISSION RESULTS:	MBP12-M0011-1	MBP12-M0011-2	MBP12-M0011-3
BENZALDEHYDE			
Formula Weight, lb/lb-mole	106.1	106.1	106.1
Catch Weight, micrograms	118	15[illegible]	183
µg per dry std. cubic meter*	77.2	10[illegible]	129
ppm by volume, Dry	0.01750	0.02398	0.02931
kilograms per hour	0.00146	0.00197	0.00246
pounds per hour	0.00322	0.00435	0.00543
ISOVALERALDEHYDE			
Formula Weight, lb/lb-mole	86.1	86.1	86.1
Catch Weight, micrograms	103	168	153
µg per dry std. cubic meter*	67.4	115	108
ppm by volume, Dry	[illegible]	0.0322	0.0302
kilograms per hour	0.00128	0.00215	0.00206
pounds per hour	0.00281	0.00474	0.00454
VALERALDEHYDE			
Formula Weight, lb/lb-mole	86.1	86.1	86.1
Catch Weight, micrograms	135	334	213
µg per dry std. cubic meter*	88	229	150
ppm by volume, Dry	0.02468	0.06409	0.04204
kilograms per hour	0.00167	0.00427	0.00287
pounds per hour	0.00369	0.00942	0.00632
o-TOLUALDEHYDE			
Formula Weight, lb/lb-mole	120.2	120.2	120.2
Catch Weight, micrograms	13	7	3
µg per dry std. cubic meter*	8.50	4.81	2.12
ppm by volume, Dry	0.00170	0.000962	0.000424
kilograms per hour	0.000161	0.0000896	0.0000404
pounds per hour	0.000355	0.000198	0.0000890
m/p-TOLUALDEHYDE			
Formula Weight, lb/lb-mole	120.2	120.2	120.2
Catch Weight, micrograms	83	71	100
µg per dry std. cubic meter*	54.3	48.8	70.6
ppm by volume, Dry	0.01087	0.00976	0.01414
kilograms per hour	0.00103	0.000909	0.00135
pounds per hour	0.00227	0.00200	0.00297
HEXALDEHYDE			
Formula Weight, lb/lb-mole	100.16	100.16	100.16
Catch Weight, micrograms	316	892	495
µg per dry std. cubic meter*	207	613	350
ppm by volume, Dry	0.04965	0.14713	0.08398
kilograms per hour	0.00392	0.01142	0.00666
pounds per hour	0.00863	0.02517	0.01469
2,5-DIMETHYL BENZALDEHYDE			
Formula Weight, lb/lb-mole	134	134	134
Catch Weight, micrograms	39	24	4
µg per dry std. cubic meter*	25.5	16.5	2.83
ppm by volume, Dry	0.00458	0.00296	0.000507
kilograms per hour	0.000483	0.000307	0.0000538
pounds per hour	0.00107	0.00068	0.000119

Estimated catch weight.

All catch weights are less than the minimum detection limit (MDL). Value presented calculated using 1/2 MDL for each catch weight.

* 68 Deg. F (20 C) -- 29.92 In. Mercury

PM10 & CONDENSIBLE PARTICULATE TEST RESULTS

PLANT: Weyerhaeuser Company, Moncure, NC

SAMPLING LOCATION: Microboard Press Stack 12 (WEYCO I.D. DEF-3)

		MBP12-M201A/202-1	MBP12-M201A/202-2	MBP12-M201A/202-3
	Test Date	9/19/92	9/21/92	9/22/92
	Run Start & Finish Times	1041-1528	858-1325	906-1305
	Net Traversing Points	12	12	12
Theta	Net Run Time, Minutes	231.00	255.50	230.75
Dia	Nozzle Diameter, Inches	0.200	0.200	0.200
Cp	Pitot Tube Coefficient	0.84	0.84	0.84
Y	Dry Gas Meter Calibration Factor	1.000	1.000	1.000
Pbar	Barometric Pressure, Inches Hg	30.07	29.85	29.9
Delta H	Avg. Pressure Differential of Orifice Meter, Inches H2O	0.69	0.68	0.67
Vm	Volume of Metered Gas Sample, Dry ACF	106.928	115.477	102.575
tm	Dry Gas Meter Temperature, Degrees F	98	95	89
Vm(std)	Volume of Metered Gas Sample, Dry SCF*	101.816	109.724	98.725
Vlc	Total Volume of Liquid Collected in Impingers & Silica Gel, mL	64	66	74
Vw	Volume of Water Vapor, SCF*	3.012	3.107	3.483
%H20	Moisture Content, Percent by Volume	2.9	2.8	3.4
Mfd	Dry Mole Fraction	0.971	0.972	0.966
%CO2	Carbon Dioxide, Percent by Volume, Dry	0.0	0.0	0.0
%O2	Oxygen, Percent by Volume, Dry	20.9	20.9	20.9
%CO+N2	CO + N2, Percent by Volume, Dry	79.1	79.1	79.1
Md	Gas Molecular Weight, Lb/Lb-Mole, Dry	28.84	28.84	28.84
Ms	Gas Molecular Weight, Lb/Lb-Mole, Wet	28.53	28.54	28.47
Pg	Flue Gas Static Pressure, Inches H2O	-0.14	-0.20	-0.20
Ps	Absolute Flue Gas Pressure, Inches Hg	30.06	29.84	29.89
ts	Flue Gas Temperature, Degrees F	114	110	111
Delta-P	Average Velocity Head, Inches H2O	0.4371	0.4035	0.3319
vs	Flue Gas Velocity, Feet per Second	38.83	37.32	33.9
A	Stack/Duct Area, Square Inches	855	855	855
Qsd	Volumetric Air Flow Rate, Dry SCFM*	12,426	11,942	10,778
Qaw	Volumetric Air Flow Rate, Wet ACFM	13,839	13,301	12,082
%I	Isokinetic Sampling Rate, Percent	96.6	97.9	108.1

* 68 Degrees F -- 29.92 Inches of Mercury (Hg). (Continued Next Page)

PM10 & CONDENSIBLE PARTICULATE TEST RESULTS

		MBP12-M201A/202-1	MBP12-M201A/202-2	MBP12-M201A/202-3
	PM10 RESULTS:			
ucyc	Stack Gas Viscosity	189.0	189.0	189.1
Qs	PM10 Flow, at Cyclone Conditions, ACFM	0.491	0.478	0.480
D50	Dia. of Particles in Cyclone; Microns	9.8	10.0	10.0
	Particulate Catch,			
mg	< PM10, Grams	0.0058	0.0068	0.0026
	> PM10, Grams	0.0152	0.0295	0.0112
	Non-extractable Condensibles, Grams	0.0188	0.0147	0.0091
	Extractable Condensibles, Grams	0.0023	0.0038	0.0011
	PM10 Emissions:			
	Including extractable/non-extractable condensibles			
gr/DSCF	Concentration, grains/DSCF*	0.00408	0.00356	0.00200
kg/hr	Emission Rate, kilograms/hour	0.197	0.165	0.0838
lb/hr	Emission Rate, pounds/hour	0.434	0.364	0.185
	Including only non-extractable condensibles			
	Concentration, grains/DSCF*	0.00373	0.00302	0.00183
	Emission Rate, kilograms/hour	0.180	0.140	0.0766
	Emission Rate, pounds/hour	0.397	0.309	0.169
	Without condensibles			
	Concentration, grains/DSCF*	0.000879	0.000956	0.000406
	Emission Rate, kilograms/hour	0.0425	0.0444	0.0170
	Emission Rate, pounds/hour	0.0936	0.0979	0.0375
	Total Particulate Emissions (Includes PM10):			
	Concentration, grains/DSCF*	0.00638	0.00771	0.00375
	Emission Rate, kilograms/hour	0.308	0.358	0.157
	Emission Rate, pounds/hour	0.679	0.789	0.346
	Particulate Fractionation:			
%>PM10	> PM10, %	36.1	53.8	46.7
%<PM10	< PM10, %	63.9	46.2	53.3

* 68 Degrees F -- 29.92 Inches of Mercury (Hg).

APPENDIX A-13

MICROBOARD PRESS STACK 13 (DEF-5)

ALDEHYDES/KETONES TEST RESULTS

PLANT: Weyerhaeuser Company, Moncure, NC

SAMPLING LOCATION: Microboard Press Stack 13 (WEYCO I.D. DEF-5)

		MBP13-M0011-1	MBP13-M0011-2	MBP13-M0011-3
	Test Date	9-19-92	9-21-92	9-22-92
	Run Start & Finish Times	1635-1751	1810-1923	1421-1536
	Net Traversing Points	12	12	12
Theta	Net Run Time, Minutes	72	72	72
Dia	Nozzle Diameter, Inches	0.270	0.270	0.270
Cp	Pitot Tube Coefficient	0.84	0.84	0.84
Y	Dry Gas Meter Calibration Factor	0.996	0.996	0.996
Pbar	Barometric Pressure, Inches Hg	30.070	29.850	29.900
Delta H	Avg. Pressure Differential of Orifice Meter, Inches H2O	1.668	1.614	1.719
Vm	Volume of Metered Gas Sample, Dry ACF	49.31	48.625	51.291
tm	Dry Gas Meter Temperature, Degrees F	94	90	101
Vm(std)	Volume of Metered Gas Sample, Dry SCF*	47.204	46.547	48.200
Vlc	Total Volume of Liquid Collected in Impingers & Silica Gel, mL	43.1	32.7	24.3
Vw	Volume of Water Vapor, SCF*	2.029	1.539	1.144
%H20	Moisture Content, Percent by Volume	4.1	3.2	2.3
Mfd	Dry Mole Fraction	0.959	0.968	0.977
%CO2	Carbon Dioxide, Percent by Volume, Dry	0.0	0.0	0.0
%O2	Oxygen, Percent by Volume, Dry	20.9	20.9	20.9
%CO+N2	CO + N2, Percent by Volume, Dry	79.1	79.1	79.1
Md	Gas Molecular Weight, Lb/Lb-Mole, Dry	28.84	28.84	28.84
Ms	Gas Molecular Weight, Lb/Lb-Mole, Wet	28.40	28.49	28.59
Pg	Flue Gas Static Pressure, Inches H2O	-0.12	-0.13	-0.13
Ps	Absolute Flue Gas Pressure, Inches Hg	30.06	29.84	29.89
ts	Flue Gas Temperature, Degrees F	110	109	118
Delta-P	Average Velocity Head, Inches H2O	0.2645	0.2607	0.2819
vs	Flue Gas Velocity, Feet per Second	30.19	30	31.37
A	Stack/Duct Area, Square Inches	855	855	855
Qsd	Volumetric Air Flow Rate, Dry SCFM*	9,597	9,579	9,960
Qaw	Volumetric Air Flow Rate, Wet ACFM	10,760	10,692	11,180
%I	Isokinetic Sampling Rate, Percent	102.1	100.8	100.4

* 68 Deg. F (20 C) -- 29.92 In. Mercury

(continued next page)

ADLEHYDES/KETONES TEST RESULTS

		MBP13-M0011-1	MBP13-M0011-2	MBP13-M0011-3
	EMISSION RESULTS:			
	FORMALDEHYDE			
Fwt	Formula Weight, lb/lb-mole	30	30	30
µg	Catch Weight, micrograms	40,570	28,569	41,864
µg/dscm	µg per dry std. cubic meter*	30,348	21,673	30,669
ppmvd	ppm by volume, Dry	24.335	17.379	24.503
kg/hr	kilograms per hour	0.495	0.35276	0.51904
lb/hr	pounds per hour	1.0911	0.7777	1.1443
	ACETALDEHYDE			
	Formula Weight, lb/lb-mole	44.1	44.1	44.1
	Catch Weight, micrograms	473	470	395
	µg per dry std. cubic meter*	354	357	289
	ppm by volume, Dry	0.1930	0.1945	0.1579
	kilograms per hour	0.00577	0.00580	0.00490
	pounds per hour	0.01272	0.01279	0.01080
	ACROLEIN			
	Formula Weight, lb/lb-mole	56.1	56.1	56.1
	Catch Weight, micrograms	129	103	72
	µg per dry std. cubic meter*	96.5	38.1	52.7
	ppm by volume, Dry	0.0414	0.0335	0.0226
	kilograms per hour	0.00157	0.00127	0.000893
	pounds per hour	0.00347	0.00280	0.00197
	ACETONE			
	Formula Weight, lb/lb-mole	58	58	58
	Catch Weight, micrograms	569	979	399
	µg per dry std. cubic meter*	426	743	292
	ppm by volume, Dry	0.1765	0.3080	0.1212
	kilograms per hour	0.00694	0.01209	0.00495
	pounds per hour	0.01530	0.02665	0.01091
	PROPIONALDEHYDE			
	Formula Weight, lb/lb-mole	58.1	58.1	58.1
	Catch Weight, micrograms	7	1	26
	µg per dry std. cubic meter*	5.24	0.76	19.0
	ppm by volume, Dry	0.00217	0.000314	0.00789
	kilograms per hour	0.0000854	0.0000123	0.000322
	pounds per hour	0.000188	0.0000272	0.000711
	CROTONALDEHYDE			
	Formula Weight, lb/lb-mole	70	70	70
	Catch Weight, micrograms	65	51	36
	µg per dry std. cubic meter*	48.6	38.7	26.4
	ppm by volume, Dry	0.0167	0.0133	0.00906
	kilograms per hour	0.000793	0.000630	0.000446
	pounds per hour	0.00175	0.00139	0.000984
	n-BUTYRALDEHYDE			
	Formula Weight, lb/lb-mole	72.1	72.1	72.1
	Catch Weight, micrograms	151	146	110
	µg per dry std. cubic meter*	113	111	80.6
	ppm by volume, Dry	0.0377	0.0370	0.0269
	kilograms per hour	[illegible]	0.00180	0.00136
	pounds per hour	0.00406	0.00397	0.00301
	METHYLETHYLKETONE			
	Formula Weight, lb/lb-mole	72.1	72.1	72.1
	Catch Weight, micrograms	5	36	27
	µg per dry std. cubic meter*	3.74	27.3	19.8
	ppm by volume, Dry	0.00125	0.00911	0.00660
	kilograms per hour	0.0000610	0.000445	0.000335
	pounds per hour	0.0001345	0.000980	0.000738

Estimated catch weight.

All catch weights are less than the minimum detection limit (MDL). Value presented calculated using 1/2 MDL for each catch weight.

* 68 Deg. F (20 C) -- 29.92 In. Mercury

(continued next page)

ADLEHYDES/KETONES TEST RESULTS

EMISSION RESULTS:	MBP13-M0011-1	MBP13-M0011-2	MBP13-M0011-3
BENZALDEHYDE			
Formula Weight, lb/lb-mole	106.1	106.1	106.1
Catch Weight, micrograms	107	143	171
µg per dry std. cubic meter*	80.0	108	125
ppm by volume, Dry	0.01815	0.02460	0.02840
kilograms per hour	0.00131	0.00177	0.00212
pounds per hour	0.00288	0.00389	0.00467
ISOVALERALDEHYDE			
Formula Weight, lb/lb-mole	86.1	86.1	86.1
Catch Weight, micrograms	97	129	120
µg per dry std. cubic meter*	72.6	97.9	87.9
ppm by volume, Dry	0.0203	0.0273	0.0246
kilograms per hour	0.00118	0.00159	0.00149
pounds per hour	0.00261	0.00351	0.00328
VALERALDEHYDE			
Formula Weight, lb/lb-mole	86.1	86.1	86.1
Catch Weight, micrograms	116	280	142
µg per dry std. cubic meter*	86.8	212	104
ppm by volume, Dry	0.02424	0.05935	0.02907
kilograms per hour	0.00142	0.00346	0.00176
pounds per hour	0.00312	0.00762	0.00388
o-TOLUALDEHYDE			
Formula Weight, lb/lb-mole	120.2	120.2	120.2
Catch Weight, micrograms	5	3	14
µg per dry std. cubic meter*	3.74	2.28	10.3
ppm by volume, Dry	0.000749	0.000455	0.00205
kilograms per hour	0.0000610	0.0000370	0.000174
pounds per hour	0.000134	0.0000817	0.000383
m/p-TOLUALDEHYDE			
Formula Weight, lb/lb-mole	120.2	120.2	120.2
Catch Weight, micrograms	20	71	96
µg per dry std. cubic meter*	15.0	53.9	70.3
ppm by volume, Dry	0.00299	0.01078	0.01408
kilograms per hour	0.000244	0.000877	0.00119
pounds per hour	0.000538	0.00193	0.00262
HEXALDEHYDE			
Formula Weight, lb/lb-mole	100.16	100.16	100.16
Catch Weight, micrograms	245	666	370
µg per dry std. cubic meter*	183	505	271
ppm by volume, Dry	0.04402	0.12134	0.06510
kilograms per hour	0.00299	0.00822	0.00459
pounds per hour	0.00659	0.01813	0.01011
2,5-DIMETHYL BENZALDEHYDE			
Formula Weight, lb/lb-mole	134	134	134
Catch Weight, micrograms	14	65	63
µg per dry std. cubic meter*	10.5	49.3	46.2
ppm by volume, Dry	0.00188	0.00885	0.00829
kilograms per hour	0.000171	0.000803	0.000781
pounds per hour	0.000377	0.001769	0.001722

Estimated catch weight.

All catch weights are less than the minimum detection limit (MDL). Value presented calculated using 1/2 MDL for each catch weight.

* 68 Deg. F (20 C) -- 29.92 In. Mercury

PM10 & CONDENSIBLE PARTICULATE TEST RESULTS

PLANT: Weyerhaeuser Company, Moncure, NC

SAMPLING LOCATION: Microboard Press Stack 13 (WEYCO I.D. DEF-5)

		MBP13-M201A/202-1	MBP13-M201A/202-2	MBP13-M201A/202-3
	Test Date	9/19/92	9/21/92	9/22/92
	Run Start & Finish Times	1020-1518	858-1301	904-1258
	Net Traversing Points	12	12	12
Theta	Net Run Time, Minutes	248.13	238.00	228.50
Dia	Nozzle Diameter, Inches	0.200	0.200	0.200
Cp	Pitot Tube Coefficient	0.84	0.84	0.84
Y	Dry Gas Meter Calibration Factor	0.9961	0.9961	0.9961
Pbar	Barometric Pressure, Inches Hg	30.07	29.85	29.9
Delta H	Avg. Pressure Differential of Orifice Meter, Inches H2O	0.64	0.65	0.65
Vm	Volume of Metered Gas Sample, Dry ACF	111.118	108.619	104.58
tm	Dry Gas Meter Temperature, Degrees F	94	90	89
Vm(std)	Volume of Metered Gas Sample, Dry SCF*	106.069	103.756	100.185
Vlc	Total Volume of Liquid Collected in Impingers & Silica Gel, mL	71	56	67
Vw	Volume of Water Vapor, SCF*	3.342	2.636	3.154
%H20	Moisture Content, Percent by Volume	3.1	2.5	3.1
Mfd	Dry Mole Fraction	0.969	0.975	0.969
%CO2	Carbon Dioxide, Percent by Volume, Dry	0.0	0.0	0.0
%O2	Oxygen, Percent by Volume, Dry	20.9	20.9	20.9
%CO+N2	CO + N2, Percent by Volume, Dry	79.1	79.1	79.1
Md	Gas Molecular Weight, Lb/Lb-Mole, Dry	28.84	28.84	28.84
Ms	Gas Molecular Weight, Lb/Lb-Mole, Wet	28.50	28.57	28.50
Pg	Flue Gas Static Pressure, Inches H2O	-0.13	-0.13	-0.13
Ps	Absolute Flue Gas Pressure, Inches Hg	30.06	29.84	29.89
ts	Flue Gas Temperature, Degrees F	112	108	112
Delta-P	Average Velocity Head, Inches H2O	0.3017	0.3163	0.2910
vs	Flue Gas Velocity, Feet per Second	32.23	32.95	31.73
A	Stack/Duct Area, Square Inches	855	855	855
Qsd	Volumetric Air Flow Rate, Dry SCFM*	10,322	10,624	10,112
Qaw	Volumetric Air Flow Rate, Wet ACFM	11,487	11,743	11,309
%I	Isokinetic Sampling Rate, Percent	112.8	111.7	118.1

* 68 Degrees F -- 29.92 Inches of Mercury (Hg). (Continued Next Page)

PM10 & CONDENSIBLE PARTICULATE TEST RESULTS

		MBP13-M201A/202-1	MBP13-M201A/202-2	MBP13-M201A/202-3
	PM10 RESULTS:			
ucyc	Stack Gas Viscosity	187.6	188.9	188.9
Qs	PM10 Flow, at Cyclone Conditions, ACFM	0.476	0.482	0.490
D50	Dia. of Particles in Cyclone, Microns	9.9	9.9	9.8
	Particulate Catch,			
mg	< PM10, Grams	0.0012	0.0019	0.0075
	> PM10, Grams	0.0052	0.0081	0.0040
	Non-extractable Condensibles, Grams	0.0135	0.0137	0.0059
	Extractable Condensibles, Grams	0.0071	0.0029	0.0024
	PM10 Emissions:			
	Including extractable/non-extractable condensibles			
gr/DSCF	Concentration, grains/DSCF*	0.00317	0.00275	0.00243
kg/hr	Emission Rate, kilograms/hour	0.127	0.114	0.0957
lb/hr	Emission Rate, pounds/hour	0.281	0.250	0.211
	Including only non-extractable condensibles			
	Concentration, grains/DSCF*	0.00214	0.00232	0.00206
	Emission Rate, kilograms/hour	0.0858	0.0958	0.0811
	Emission Rate, pounds/hour	0.189	0.211	0.179
	Without condensibles			
	Concentration, grains/DSCF*	0.000175	0.00028	0.00116
	Emission Rate, kilograms/hour	0.00700	0.0117	0.0454
	Emission Rate, pounds/hour	0.0154	0.0257	0.100
	Total Particulate Emissions (Includes PM10):			
	Concentration, grains/DSCF*	0.00393	0.00396	0.00305
	Emission Rate, kilograms/hour	0.158	0.163	0.120
	Emission Rate, pounds/hour	0.347	0.360	0.264
	Particulate Fractionation:			
%>PM10	> PM10, %	19.3	30.5	20.2
%<PM10	< PM10, %	80.7	69.5	79.8

* 68 Degrees F -- 29.92 Inches of Mercury (Hg).

APPENDIX A-14

MICROBOARD COOLING ROOM 14 (DEF-7)

ALDEHYDES/KETONES TEST RESULTS

PLANT: Weyerhaeuser Company, Moncure, NC

SAMPLING LOCATION: Microboard Cooling Room Stack 14 (WEYCO I.D. DEF-7)

		MBCR14-M0011-1	MBCR14-M0011-2	MBCR14-M0011-3
	Test Date	9-22-92	9-22-92	9-22-94
	Run Start & Finish Times	1733-1900	1931-2056	753-937
	Net Traversing Points	12	12	12
Theta	Net Run Time, Minutes	84	84	84
Dia	Nozzle Diameter, Inches	0.200	0.212	0.212
Cp	Pitot Tube Coefficient	0.84	0.84	0.84
Y	Dry Gas Meter Calibration Factor	0.996	0.996	0.996
Pbar	Barometric Pressure, Inches Hg	29.900	29.900	30.020
Delta H	Avg. Pressure Differential of Orifice Meter, Inches H2O	1.097	1.390	1.515
Vm	Volume of Metered Gas Sample, Dry ACF	48.177	53.932	56.244
tm	Dry Gas Meter Temperature, Degrees F	101	96	68
Vm(std)	Volume of Metered Gas Sample, Dry SCF*	45.218	51.110	56.350
Vlc	Total Volume of Liquid Collected in Impingers & Silica Gel, mL	32.9	33.8	16.1
Vw	Volume of Water Vapor, SCF*	1.549	1.591	0.758
%H20	Moisture Content, Percent by Volume	3.3	3.0	1.3
Mfd	Dry Mole Fraction	0.967	0.970	0.987
%CO2	Carbon Dioxide, Percent by Volume, Dry	0.0	0.0	0.0
%O2	Oxygen, Percent by Volume, Dry	20.9	20.9	20.9
%CO+N2	CO + N2, Percent by Volume, Dry	79.1	79.1	79.1
Md	Gas Molecular Weight, Lb/Lb-Mole, Dry	28.84	28.84	28.84
Ms	Gas Molecular Weight, Lb/Lb-Mole, Wet	28.48	28.51	28.70
Pg	Flue Gas Static Pressure, Inches H2O	-0.1	-0.1	-0.1
Ps	Absolute Flue Gas Pressure, Inches Hg	29.89	29.89	30.01
ts	Flue Gas Temperature, Degrees F	127	123	103
Delta-P	Average Velocity Head, Inches H2O	0.6119	0.6798	0.7236
vs	Flue Gas Velocity, Feet per Second	46.65	48.96	49.39
A	Stack/Duct Area, Square Inches	855	855	855
Qsd	Volumetric Air Flow Rate, Dry SCFM*	14,442	15,322	16,343
Qaw	Volumetric Air Flow Rate, Wet ACFM	16,626	17,449	17,603
%I	Isokinetic Sampling Rate, Percent	101.5	96.2	99.5

* 68 Deg. F (20 C) -- 29.92 In. Mercury

(continued next page)

ALDEHYDES/KETONES TEST RESULTS

		MBCR14-M0011-1	MBCR14-M0011-2	MBCR14-M0011-3
	EMISSION RESULTS:			
	FORMALDEHYDE			
Fwt	Formula Weight, lb/lb-mole	30	30	30
µg	Catch Weight, micrograms	9,875	9,765	8,119
µg/dscm	µg per dry std. cubic meter*	7,711	6,746	5,088
ppmvd	ppm by volume, Dry	6.184	5.410	4.080
kg/hr	kilograms per hour	0.189	0.17564	0.14128
lb/hr	pounds per hour	0.4172	0.3872	0.3115
	ACETALDEHYDE			
	Formula Weight, lb/lb-mole	44.1	[illegible]	44.1
	Catch Weight, micrograms	209	215	236
	µg per dry std. cubic meter*	163	149	148
	ppm by volume, Dry	0.0890	0.0810	0.0807
	kilograms per hour	0.00401	0.00387	0.00411
	pounds per hour	0.00883	0.00853	0.00905
	ACROLEIN			
	Formula Weight, lb/lb-mole	56.1	56.1	56.1
	Catch Weight, micrograms	54	54	53
	µg per dry std. cubic meter*	42.2	37.3	33.2
	ppm by volume, Dry	0.0181	0.0160	0.0142
	kilograms per hour	0.00103	0.000971	0.000922
	pounds per hour	0.00228	0.00214	0.00203
	ACETONE			
	Formula Weight, lb/lb-mole	58	58	58
	Catch Weight, micrograms	369	308	270
	µg per dry std. cubic meter*	288	213	169
	ppm by volume, Dry	0.1195	0.0883	0.0702
	kilograms per hour	0.00707	0.00554	0.00470
	pounds per hour	0.01559	0.01221	0.01036
	PROPIONALDEHYDE			
	Formula Weight, lb/lb-mole	58.1	58.1	58.1
	Catch Weight, micrograms	1	2	22
	µg per dry std. cubic meter*	0.781	1.382	13.8
	ppm by volume, Dry	0.000323	0.000572	0.00571
	kilograms per hour	0.0000192	0.0000360	0.000383
	pounds per hour	0.0000422	0.0000793	0.000844
	CROTONALDEHYDE			
	Formula Weight, lb/lb-mole	70	70	70
	Catch Weight, micrograms	24	53	44
	µg per dry std. cubic meter*	18.7	36.6	27.6
	ppm by volume, Dry	0.00644	0.0126	0.00948
	kilograms per hour	0.000460	0.000953	0.000766
	pounds per hour	0.00101	0.00210	0.00169
	n-BUTYRALDEHYDE			
	Formula Weight, lb/lb-mole	72.1	72.1	72.1
	Catch Weight, micrograms	63	109	90
	µg per dry std. cubic meter*	49.2	75.3	56.4
	ppm by volume, Dry	0.0164	0.0251	0.0188
	kilograms per hour	0.00121	0.00196	0.00157
	pounds per hour	0.00266	0.00432	0.00345
	METHYL ETHYL KETONE			
	Formula Weight, lb/lb-mole	72.1	72.1	72.1
	Catch Weight, micrograms	13	25	18
	µg per dry std. cubic meter*	10.2	17.3	11.3
	ppm by volume, Dry	0.00339	0.00576	0.00376
	kilograms per hour	0.000249	0.000450	0.000313
	pounds per hour	0.000549	0.000991	0.000691

Estimated catch weight.

All catch weights are less than the minimum detection limit (MDL). Value presented calculated using 1/2 MDL for each catch weight.

* 68 Deg. F (20 C) -- 29.92 In. Mercury

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ALDEHYDES/KETONES TEST RESULTS

EMISSION RESULTS:	MBCR14-M0011-1	MBCR14-M0011-2	MBCR14-M0011-3
BENZALDEHYDE			
Formula Weight, lb/lb-mole	106.1	106.1	106.1
Catch Weight, micrograms	68	78	56
µg per dry std. cubic meter*	53.1	53.9	35.1
ppm by volume, Dry	0.01204	0.01222	0.00796
kilograms per hour	0.00130	0.00140	0.000974
pounds per hour	0.00287	0.00309	0.00215
ISOVALERALDEHYDE			
Formula Weight, lb/lb-mole	86.1	86.1	86.1
Catch Weight, micrograms	51	73	60
µg per dry std. cubic meter*	39.8	50.4	37.6
ppm by volume, Dry	0.01113	0.01409	0.01050
kilograms per hour	0.000977	0.00131	0.00104
pounds per hour	0.00215	0.00289	0.00230
VALERALDEHYDE			
Formula Weight, lb/lb-mole	86.1	86.1	86.1
Catch Weight, micrograms	73	92	85
µg per dry std. cubic meter*	57.0	63.6	53.3
ppm by volume, Dry	0.01593	0.01776	0.01488
kilograms per hour	0.00140	0.00165	0.00148
pounds per hour	0.00308	0.00365	0.00326
o-TOLUALDEHYDE			
Formula Weight, lb/lb-mole	120.2	120.2	120.2
Catch Weight, micrograms	9	4	4
µg per dry std. cubic meter*	7.03	2.76	2.5
ppm by volume, Dry	0.00141	0.000553	0.00050
kilograms per hour	0.000172	0.0000719	0.000070
pounds per hour	0.000380	0.000159	0.000153
m/p-TOLUALDEHYDE			
Formula Weight, lb/lb-mole	120.2	120.2	120.2
Catch Weight, micrograms	31	36	29
µg per dry std. cubic meter*	24.2	24.9	18.2
ppm by volume, Dry	0.00484	0.00498	0.00364
kilograms per hour	0.000594	0.000648	0.000505
pounds per hour	0.00131	0.00143	0.00111
HEXALDEHYDE			
Formula Weight, lb/lb-mole	100.16	100.16	100.16
Catch Weight, micrograms	170	174	178
µg per dry std. cubic meter*	133	120	112
ppm by volume, Dry	0.03188	0.02887	0.02679
kilograms per hour	0.00326	0.00313	0.00310
pounds per hour	0.00718	0.00690	0.00683
2,5-DIMETHYL BENZALDEHYDE			
Formula Weight, lb/lb-mole	134	134	134
Catch Weight, micrograms	4	32	11
µg per dry std. cubic meter*	3.12	22.1	6.89
ppm by volume, Dry	0.000561	0.00397	0.00124
kilograms per hour	0.0000767	0.000576	0.000191
pounds per hour	0.000169	0.00127	0.000422

Estimated catch weight.

All catch weights are less than the minimum detection limit (MDL). Value presented calculated using 1/2 MDL for each catch weight.

* 68 Deg. F (20 C) -- 29.92 In. Mercury

PM10 & CONDENSIBLE PARTICULATE TEST RESULTS

PLANT: Weyerhaeuser Company, Moncure, NC

SAMPLING LOCATION: Microboard Cooling Room Stack 14 (WEYCO I.D. DEF-7)

		MBCR14-M2[illegible]
	Test Date	9/23/92
	Run Start & Finish Times	1055-1459
	Net Traversing Points	12
Theta	Net Run Time, Minutes	230.25
Dia	Nozzle Diameter, Inches	0.164
Cp	Pitot Tube Coefficient	0.84
Y	Dry Gas Meter Calibration Factor	0.996
Pbar	Barometric Pressure, Inches Hg	30.02
Delta H	Avg. Pressure Differential of Orifice Meter, Inches H2O	0.63
Vm	Volume of Metered Gas Sample, Dry ACF	102.136
tm	Dry Gas Meter Temperature, Degrees F	79
Vm(std)	Volume of Metered Gas Sample, Dry SCF*	100.138
Vlc	Total Volume of Liquid Collected in Impingers & Silica Gel, mL	32
Vw	Volume of Water Vapor, SCF*	1.506
%H20	Moisture Content, Percent by Volume	1.5
Mfd	Dry Mole Fraction	0.985
%CO2	Carbon Dioxide, Percent by Volume, Dry	0.0
%O2	Oxygen, Percent by Volume, Dry	20.9
%CO+N2	CO + N2, Percent by Volume, Dry	79.1
Md	Gas Molecular Weight, Lb/Lb-Mole, Dry	28.84
Ms	Gas Molecular Weight, Lb/Lb-Mole, Wet	28.68
Pg	Flue Gas Static Pressure, Inches H2O	-0.33
Ps	Absolute Flue Gas Pressure, Inches Hg	30.00
ts	Flue Gas Temperature, Degrees F	107
Delta-P	Average Velocity Head, Inches H2O	0.6668
vs	Flue Gas Velocity, Feet per Second	47.59
A	Stack/Duct Area, Square Inches	855
Qsd	Volumetric Air Flow Rate, Dry SCFM*	15,608
Qaw	Volumetric Air Flow Rate, Wet ACFM	16,961
%I	Isokinetic Sampling Rate, Percent	112.8

* 68 Degrees F -- 29.92 Inches of Mercury (Hg). (Continued Next Page)

PM10 & CONDENSIBLE PARTICULATE TEST RESULTS

		MBCR14-M201A/202-1
	PM10 RESULTS:	
ucyc	Stack Gas Viscosity	188.5
Qs	PM10 Flow, at Cyclone Conditions, ACFM	0.473
D50	Dia. of Particles in Cyclone, Microns	10.0
	Particulate Catch,	
mg	< PM10, Grams	0.0007
	> PM10, Grams	0.0039
	Non-extractable Condensibles, Grams	0.0041
	Extractable Condensibles, Grams	0.0007
	PM10 Emissions:	
	Including extractable/non-extractable condensibles	
gr/DSCF	Concentration, grains/DSCF*	0.000847
kg/hr	Emission Rate, kilograms/hour	0.0514
lb/hr	Emission Rate, pounds/hour	0.113
	Including only non-extractable condensibles	
	Concentration, grains/DSCF*	0.000740
	Emission Rate, kilograms/hour	0.0449
	Emission Rate, pounds/hour	0.0989
	Without condensibles	
	Concentration, grains/DSCF*	0.000108
	Emission Rate, kilograms/hour	0.00654
	Emission Rate, pounds/hour	0.0144
	Total Particulate Emissions (Includes PM10):	
	Concentration, grains/DSCF*	0.00145
	Emission Rate, kilograms/hour	0.0879
	Emission Rate, pounds/hour	0.194
	Particulate Fractionation:	
%>PM10	> PM10, %	41.5
%<PM10	< PM10, %	58.5

* 68 Degrees F -- 29.92 Inches of Mercury (Hg).

APPENDIX A-15

MICROBOARD COOLING ROOM 15 (DEF-8)

ALDEHYDES/KETONES TEST RESULTS

PLANT: Weyerhaeuser Company, Moncure, NC

SAMPLING LOCATION: Microboard Cooling Room Stack 15 (WEYCO I.D. DEF-8)

		MBCR15-M0011-1	MBCR15-M0011-2	MBCR15-M0011-3
	Test Date	9-22-92	9-22-92	9-24-92
	Run Start & Finish Times	1733-1900	1931-2059	753-927
	Net Traversing Points	24	24	24
Theta	Net Run Time, Minutes	84	84	84
Dia	Nozzle Diameter, Inches	0.201	0.200	0.200
Cp	Pitot Tube Coefficient	0.84	0.84	0.84
Y	Dry Gas Meter Calibration Factor	1.000	1.000	1.000
Pbar	Barometric Pressure, Inches Hg	29.900	29.900	30.020
Delta H	Avg. Pressure Differential of Orifice Meter, Inches H2O	1.110	1.310	1.349
Vm	Volume of Metered Gas Sample, Dry ACF	45.875	48.436	50.299
tm	Dry Gas Meter Temperature, Degrees F	100	96	67
Vm(std)	Volume of Metered Gas Sample, Dry SCF*	43.332	46.113	50.717
Vlc	Total Volume of Liquid Collected in Impingers & Silica Gel, mL	27.5	31.6	10.6
Vw	Volume of Water Vapor, SCF*	1.294	1.487	
%H20	Moisture Content, Percent by Volume	2.9	3.1	0.0
Mfd	Dry Mole Fraction	0.971	0.969	1.000
%CO2	Carbon Dioxide, Percent by Volume, Dry	0.0	0.0	0.0
%O2	Oxygen, Percent by Volume, Dry	20.9	20.9	20.9
%CO+N2	CO + N2, Percent by Volume, Dry	79.1	79.1	79.1
Md	Gas Molecular Weight, Lb/Lb-Mole, Dry	28.84	28.84	28.84
Ms	Gas Molecular Weight, Lb/Lb-Mole, Wet	28.53	28.50	28.84
Pg	Flue Gas Static Pressure, Inches H2O	-0.1	-0.1	-0.1
Ps	Absolute Flue Gas Pressure, Inches Hg	29.89	29.89	30.01
ts	Flue Gas Temperature, Degrees F	128	123	104
Delta-P	Average Velocity Head, Inches H2O	0.6293	0.7334	0.7696
vs	Flue Gas Velocity, Feet per Second	47.29	50.89	50.85
A	Stack/Duct Area, Square Inches	855	855	855
Qsd	Volumetric Air Flow Rate, Dry SCFM*	14,692	15,893	17,020
Qaw	Volumetric Air Flow Rate, Wet ACFM	16,854	18,137	18,123
%I	Isokinetic Sampling Rate, Percent	94.6	94.0	96.6

* 68 Deg. F (20 C) -- 29.92 In. Mercury

(continued next page)

ALDEHYDES/KETONES TEST RESULTS

		MBCR15-M0011-1	MBCR15-M0011-2	MBCR15-M0011-3
	EMISSION RESULTS:			
	FORMALDEHYDE			
Fwt	Formula Weight, lb/lb-mole	30	30	30
µg	Catch Weight, micrograms	9,486	8,758	6,863
µg/dscm	µg per dry std. cubic meter*	7,730	6,706	4,778
ppmvd	ppm by volume, Dry	6.199	5.378	3.832
kg/hr	kilograms per hour	0.193	0.18111	0.13819
lb/hr	pounds per hour	0.4254	0.3993	0.3047
	ACETALDEHYDE			
	Formula Weight, lb/lb-mole	44.1	44.1	44.1
	Catch Weight, micrograms	221	189	217
	µg per dry std. cubic meter*	180	145	151
	ppm by volume, Dry	0.0982	0.0789	0.0824
	kilograms per hour	0.00450	0.00391	0.00437
	pounds per hour	0.00991	0.00862	0.00963
	ACROLEIN			
	Formula Weight, lb/lb-mole	56.1	56.1	56.1
	Catch Weight, micrograms	75	53	55
	µg per dry std. cubic meter*	61.1	40.6	38.3
	ppm by volume, Dry	0.0262	0.0174	0.0164
	kilograms per hour	0.00153	0.00110	0.00111
	pounds per hour	0.00336	0.00242	0.00244
	ACETONE			
	Formula Weight, lb/lb-mole	58	58	58
	Catch Weight, micrograms	408	279	291
	µg per dry std. cubic meter*	332	214	203
	ppm by volume, Dry	0.1379	0.0886	0.0840
	kilograms per hour	0.00830	0.00577	0.00586
	pounds per hour	0.01830	0.01272	0.01292
	PROPIONALDEHYDE			
	Formula Weight, lb/lb-mole	58.1	58.1	58.1
	Catch Weight, micrograms	2	1	1
	µg per dry std. cubic meter*	1.63	0.77	0.70
	ppm by volume, Dry	0.000675	0.000317	0.000288
	kilograms per hour	0.0000407	0.0000207	0.0000201
	pounds per hour	0.0000897	0.0000456	0.0000444
	CROTONALDEHYDE			
	Formula Weight, lb/lb-mole	70	70	70
	Catch Weight, micrograms	57	52	51
	µg per dry std. cubic meter*	46.4	39.8	35.5
	ppm by volume, Dry	0.0160	0.0137	0.0122
	kilograms per hour	0.00116	0.00108	0.00103
	pounds per hour	0.00256	0.00237	0.00226
	n-BUTYRALDEHYDE			
	Formula Weight, lb/lb-mole	72.1	72.1	72.1
	Catch Weight, micrograms	114	98	106
	µg per dry std. cubic meter*	92.9	75.0	73.8
	ppm by volume, Dry	0.0310	0.0250	0.0246
	kilograms per hour	0.00232	0.00203	0.00213
	pounds per hour	0.00511	0.00447	0.00471
	METHYL ETHYL KETONE			
	Formula Weight, lb/lb-mole	72.1	72.1	72.1
	Catch Weight, micrograms	20	17	18
	µg per dry std. cubic meter*	16.3	13.0	12.5
	ppm by volume, Dry	0.00544	0.00434	0.00418
	kilograms per hour	0.000407	0.000352	0.000362
	pounds per hour	0.000897	0.000775	0.000799

Estimated catch weight.

All catch weights are less than the minimum detection limit (MDL). Value presented calculated using 1/2 MDL for each catch weight.

* 68 Deg. F (20 C) -- 29.92 In. Mercury

(continued next page)

ALDEHYDES/KETONES TEST RESULTS

EMISSION RESULTS:	MBCR15-M0011-1	MBCR15-M0011-2	MBCR15-M0011-3
BENZALDEHYDE			
Formula Weight, lb/lb-mole	106.1	106.1	106.1
Catch Weight, micrograms	79	70	54
µg per dry std. cubic meter*	64.4	53.6	37.6
ppm by volume, Dry	0.01460	0.01215	0.00852
kilograms per hour	0.00161	0.00145	0.00109
pounds per hour	0.00354	0.00319	0.00240
ISOVALERALDEHYDE			
Formula Weight, lb/lb-mole	86.1	86.1	86.1
Catch Weight, micrograms	78	65	61
µg per dry std. cubic meter*	63.6	49.8	42.5
ppm by volume, Dry	0.01776	0.01391	0.01187
kilograms per hour	0.00159	0.00134	0.00123
pounds per hour	0.00350	0.00296	0.00271
VALERALDEHYDE			
Formula Weight, lb/lb-mole	86.1	86.1	86.1
Catch Weight, micrograms	96	123	86
µg per dry std. cubic meter*	78.2	94.2	59.9
ppm by volume, Dry	0.02186	0.02632	0.01673
kilograms per hour	0.00195	0.00254	0.00173
pounds per hour	0.00431	0.00561	0.00382
o-TOLUALDEHYDE			
Formula Weight, lb/lb-mole	120.2	120.2	120.2
Catch Weight, micrograms	2	4	3
µg per dry std. cubic meter*	1.63	3.06	2.09
ppm by volume, Dry	0.000326	0.000613	0.000418
kilograms per hour	0.0000407	0.0000827	0.0000604
pounds per hour	0.0000897	0.000182	0.000133
m/p-TOLUALDEHYDE			
Formula Weight, lb/lb-mole	120.2	120.2	120.2
Catch Weight, micrograms	38	31	28
µg per dry std. cubic meter*	31.0	23.7	19.5
ppm by volume, Dry	0.00620	0.00475	0.00390
kilograms per hour	0.000773	0.000641	0.000564
pounds per hour	0.00170	0.00141	0.00124
HEXALDEHYDE			
Formula Weight, lb/lb-mole	100.16	100.16	100.16
Catch Weight, micrograms	205	154	164
µg per dry std. cubic meter*	167	118	114
ppm by volume, Dry	0.04012	0.02832	0.02742
kilograms per hour	0.00417	0.00318	0.00330
pounds per hour	0.00919	0.00702	0.00728
2,5-DIMETHYL BENZALDEHYDE			
Formula Weight, lb/lb-mole	134	134	134
Catch Weight, micrograms	15	9	13
µg per dry std. cubic meter*	12.2	6.89	9.05
ppm by volume, Dry	0.00219	0.00124	0.00162
kilograms per hour	0.000305	0.000186	0.000262
pounds per hour	0.000673	0.000410	0.000577

Estimated catch weight.

All catch weights are less than the minimum detection limit (MDL). Value presented calculated using 1/2 MDL for each catch weight.

* 68 Deg. F (20 C) -- 29.92 In. Mercury

(continued next page)

PM10 & CONDENSIBLE PARTICULATE TEST RESULTS

PLANT: Weyerhaeuser Company, Moncure, NC

SAMPLING LOCATION: Microboard Cooling Room Stack 15 (WEYCO I.D. DEF-8)

		MBCR15-M201A/202-1
	Test Date	9/23/92
	Run Start & Finish Times	1055-1502
	Net Traversing Points	12
Theta	Net Run Time, Minutes	232.75
Dia	Nozzle Diameter, Inches	0.165
Cp	Pitot Tube Coefficient	0.84
Y	Dry Gas Meter Calibration Factor	1
Pbar	Barometric Pressure, Inches Hg	30.02
Delta H	Avg. Pressure Differential of Orifice Meter, Inches H2O	0.66
Vm	Volume of Metered Gas Sample, Dry ACF	103.245
tm	Dry Gas Meter Temperature, Degrees F	77
Vm(std)	Volume of Metered Gas Sample, Dry SCF*	101.894
Vlc	Total Volume of Liquid Collected in Impingers & Silica Gel, mL	42
Vw	Volume of Water Vapor, SCF*	1.977
%H20	Moisture Content, Percent by Volume	1.9
Mfd	Dry Mole Fraction	0.981
%CO2	Carbon Dioxide, Percent by Volume, Dry	0.0
%O2	Oxygen, Percent by Volume, Dry	20.9
%CO+N2	CO + N2, Percent by Volume, Dry	79.1
Md	Gas Molecular Weight, Lb/Lb-Mole, Dry	28.84
Ms	Gas Molecular Weight, Lb/Lb-Mole, Wet	28.63
Pg	Flue Gas Static Pressure, Inches H2O	-0.33
Ps	Absolute Flue Gas Pressure, Inches Hg	30.00
ts	Flue Gas Temperature, Degrees F	109
Delta-P	Average Velocity Head, Inches H2O	0.7561
vs	Flue Gas Velocity, Feet per Second	50.82
A	Stack/Duct Area, Square Inches	855
Qsd	Volumetric Air Flow Rate, Dry SCFM*	16,536
Qaw	Volumetric Air Flow Rate, Wet ACFM	18,112
%I	Isokinetic Sampling Rate, Percent	105.9

* 68 Degrees F -- 29.92 Inches of Mercury (Hg). (Continued Next Page)

MBCR15-M201A/202-1

PM10 RESULTS:

μcyc	Stack Gas Viscosity	188.5
Qs	PM10 Flow, at Cyclone Conditions, ACFM	0.480
D50	Dia. of Particles in Cyclone, Microns	9.9
	Particulate Catch,	
mg	< PM10, Grams	0.0014
	> PM10, Grams	0.0049
	Non-extractable Condensibles, Grams	0.0007
	Extractable Condensibles, Grams	0.0004
	PM10 Emissions:	
	Including extractable/non-extractable condensibles	
gr/DSCF	Concentration, grains/DSCF*	0.000379
kg/hr	Emission Rate, kilograms/hour	0.0243
lb/hr	Emission Rate, pounds/hour	0.0536
	Including only non-extractable condensibles	
	Concentration, grains/DSCF*	0.000318
	Emission Rate, kilograms/hour	0.0204
	Emission Rate, pounds/hour	0.0450
	Without condensibles	
	Concentration, grains/DSCF*	0.000212
	Emission Rate, kilograms/hour	0.0136
	Emission Rate, pounds/hour	0.0300
	Total Particulate Emissions (Includes PM10):	
	Concentration, grains/DSCF*	0.00112
	Emission Rate, kilograms/hour	0.0720
	Emission Rate, pounds/hour	0.159
	Particulate Fractionation:	
%>PM10	> PM10, %	66.2
%<PM10	< PM10, %	[illegible]

* 68 Degrees F -- 29.92 Inches of Mercury (Hg).

APPENDIX A-16

CONTINUOUS EMISSIONS MONITORING DATA FOR ALL LOCATIONS

EPA/EMB - WEYERHAEUSER - MONCURE, NC
SUMMARY OF TOTAL HYDROCARBON DATA FROM MDF PRESS VENTS

DATE	TIME	RUN NUMBER	MDF-1 THC (ppm)[1]	MDF-2 THC (ppm)[1]	MDF-3 THC (ppm)[1]	MDF-4 THC (ppm)[1]	MDF-5 THC (ppm)[1]	MDF-6 THC (ppm)[1]
11 SEP 92	1934-2100	ONE		24.6	32.7			5.5
12 SEP 92	0828-1012	TWO		18.1	9.2 [2]			5.5
12 SEP 92	1211-1335	THREE A		17.4	26.3			5.6
12 SEP 92	1231-1253	THREE B [3]		10.1	15.6			3.2
12 SEP 92	1335-1446	THREE C [4]		16.9	25.6			5.8
12 SEP 92	1753-2038	FOUR				4.5	3.1	
13 SEP 92	0830-1022	FIVE				3.5	2.3	
13 SEP 92	1249-1533	SIX				4.7	3.0	
25 SEP 92	1255-1458	ONE	10.4					
25 SEP 92	1540-1742	TWO	11.8					
25 SEP 92	1824-2018	THREE	10.3					

(1) ppm as propane, wet basis.
(2) Test run invalid, condensable material on filter produced high bias.
(3) Data represents the time period when the press was only loaded every other cycle.
(4) Run THREE C run to replace invalid data of run two.

02-Nov-92

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EPA/EMB - WEYERHAEUSER - MONCURE, NC
SUMMARY OF TOTAL HYDROCARBON, OXIDES OF NITROGEN, AND CARBON MONOXIDE DATA FROM THE MICROBOARD CORE PARTICLE DRYER

DATE	TIME	RUN NUMBER	EFB INLET THC (ppm)(1)	EFB OUTLET THC (ppm)(1)	EFB OUTLET NO_x (ppm)(2)	EFB OUTLET CO (ppm)(3)
14 SEP 92	1723-1852	ONE	343.7	212.5	59.6	
15 SEP 92	0930-1130	TWO	352.9	299.6	97.7	
15 SEP 92	1407-1507	THREE	312.7	244.7	61.0	189.5
15 SEP 92	1648-1748	FOUR	323.2	259.5	58.7	231.5
15 SEP 92	1900-2000	FIVE	459.5	351.8	50.9	220.1

(1) ppm as propane, wet basis.
(2) reported as NO_2 on a dry basis.
(2) reported on a dry basis.

EPA/EMB - WEYERHAEUSER - MONCURE, NC
SUMMARY OF TOTAL HYDROCARBON, OXIDES OF NITROGEN, AND CARBON MONOXIDE DATA FROM THE MICROBOARD SURFACE PARTICLE DRYER

DATE	TIME	RUN NUMBER	EFB INLET THC (ppm)(1)	EFB OUTLET THC (ppm)(1)	EFB OUTLET NO_x (ppm)(2)	EFB OUTLET CO (ppm)(3)
16 SEP 92	1145-1330	ONE	43.2	36.4	39.0	92.0
16 SEP 92	1518-1630	TWO	50.5	34.1	36.7	174.2
17 SEP 92	0840-1030	THREE	24.4	20.8	33.8	45.8

(1) ppm as propane, wet basis.
(2) reported as NO_2 on a dry basis.
(2) reported on a dry basis.

EPA/EMB - WEYERHAEUSER - MONCURE, NC
SUMMARY OF TOTAL HYDROCARBON DATA FROM THE MICROBOARD PRESS ROOM EXHAUST

DATE	TIME	RUN NUMBER	MPRE-11A THC (ppm)[1]	MPRE-11B THC (ppm)[1]	MPRE-12A THC (ppm)[1]	MPRE-12B THC (ppm)[1]	MPRE-13A THC (ppm)[1]	MPRE-13B THC (ppm)[1]
19 SEP 92	0900-1000	ONE		32.8		22.3		27.4
19 SEP 92	1022-1129	TWO		34.0		22.8		27.0
19 SEP 92	1224-1450	THREE	39.8		28.5		33.0	
19 SEP 92	1505-1800	FOUR	38.7		28.0		29.6	
21 SEP 92	0900-1200	FIVE		30.6		21.5		33.7
21 SEP 92	1210-1328	SIX A		31.6		20.8		38.3
21 SEP 92	1345-1443	SIX B	32.8		39.3		25.0	
21 SEP 92	1900-2003	SEVEN	45.6		51.9		29.8	
22 SEP 92	0748-1110	EIGHT	32.0		33.8		25.2	
22 SEP 92	1352-1545	NINE	48.4		47.3		39.7	

[1] ppm as propane, wet basis.

EPA/EMB - WEYERHAEUSER - MONCURE, NC
SUMMARY OF TOTAL HYDROCARBON DATA FROM THE MICROBOARD COOLING ROOM EXHAUST

DATE	TIME	RUN NUMBER	MCRE-14 THC (ppm)[1]	MCRE-15 THC (ppm)[1]
22 SEP 92	1733-1900	ONE	14.5	14.6
22 SEP 92	1900-2105	TWO	13.5	10.4

[1] ppm as propane, wet basis.

APPENDIX A-17

EXAMPLE CALCULATIONS

CONSTANTS, DEFINITIONS, NOMENCLATURE, AND UNITS OF MEASURE FOR ISOKINETIC AND DRY GAS METER CONSTANT RATE SAMPLING

A	Stack cross-sectional area, square feet
avg	Average
$\%CO_2$	Percent carbon dioxide by volume (dry basis)
$\%CO + N_2$	Percent carbon monoxide & nitrogen by volume (dry basis)
Cp	Pitot tube coefficient
Delta H	Average pressure differential of orifice meter, inches H_2O
Delta P	Average velocity head, inches of water
D_{50}	Diameter of particles having a 50 percent probability of penetration, micrometers
Fwt	Formula weight for individual compounds g/g-mole (lb/lb-mole)
Gr/DSCF	Concentration, grains per dry standard cubic feet
Hg	Mercury
H_2O	Water
$\%H_2O$	Percent moisture
%I	Isokinetic sampling rate, percent
Lb/Hr	Emission rate, pounds per hour
Kg/Hr	Emission rate, kilograms per hour
Mfd	Dry mole fraction
Md	Average Dry molecular weight of stack gas, g/g-mole (lb/lb-mole)
Ms	Average Wet molecular weight of stack gas, g/g-mole (lb/lb-mole)
mg	Milligrams
mg/DSCM	Milligrams per dry standard cubic meter
$\%O_2$	Percent oxygen by volume (dry basis)
Pbar	Barometric pressure, inches Hg

CONSTANTS, DEFINITIONS, NOMENCLATURE, AND UNITS OF MEASURE

FOR ISOKINETIC AND DRY GAS METER CONSTANT RATE SAMPLING

(continued)

Pg	Stack gas static pressure, inches H_2O
ppmd	Concentration, parts per million dry by volume
ppmw	Concentration, parts per million wet by volume
Ps	Absolute flue gas pressure, inches Hg
Pstd	Standard absolute pressure at 29.92 inches of mercury
Qs	Total cyclone flow rate at wet cyclone conditions, ft^3/min
Qsd	Volumetric air flow rate, dry standard cubic feet per min (SCFM)
Qaw	Volumetric air flow rate, wet actual cubic feet per min (ACFM)
Theta	Net run time, minutes
tm	Dry gas meter temperature, degrees F
ts	Stack gas temperature, degrees F
Tstd	Standard absolute temperature, 528° Rankin
Vlc	Total volume of liquid collected in impingers & silica gel, mL
Vm	Volume of metered gas sample, dry ACF
Vm(std)	Volume of metered gas sample at dry standard conditions, DSCF
vs	Average flue gas velocity, feet per second
Vw	Volume of water vapor, standard cubic feet
Y	Gamma, dry gas meter calibration factor
μ_s	Viscosity of mixed cyclone gas, micropoise
0.02832	Cubic meters per cubic foot
0.18	Molecular weight of water divided by 100
0.28	Molecular weight of nitrogen and/or carbon monoxide divided by 100

CONSTANTS, DEFINITIONS, NOMENCLAUTE, AND UNITS OF MEASURE

FOR ISOKINETIC AND DRY GAS METER CONSTANT RATE SAMPLING

(continued)

0.32	Molecular weight of oxygen divided by 100
0.44	Molecular weight of carbon dioxide divided by 100
0.264	From Equation 3-1 EPA Method 3
0.5	From Equation 3-1 EPA Method 3
13.6	Specific gravity of mercury (1 inch Hg = 13.6 inch H_2O)
17.64	From EPA Method 5, (68 + 460) °R/29.92 in.Hg
20.9	Percent O_2 by volume (dry basis) in ambient air
24.056	Liters per gram-mole at standard conditions
85.49	Pitot tube constant
29.92	Standard pressure, inches mercury
385.3	Molar volume, ft^3/mole @ 68 degrees F & 29.92 in. Hg
60	Minutes per hour or seconds per minute
100	Conversion of percent
144	Square inches per square foot
460	0 degrees Fahrenheit in degrees Rankin
528	Standard temperature, degrees Rankin
7,000	Grains per pound
453,592	Milligrams per pound
453,592,000	Micrograms per pound

Volume of dry gas sampled at standard conditions (68 deg F, 29.92 in. Hg), dscf.

$$Vm(std) = \frac{17.64 * Y * Vm * (Pbar + (Delta\ H / 13.6))}{(tm + 460)}$$

Volume of water vapor in the gas sample corrected to standard conditions, scf.

$$Vw = (0.04707 * Vlc)$$

Moisture content, Percent By Volume, As Measured In Flue Gas

$$\%H2O = 100 * \frac{Vw}{Vw + Vm(std)}$$

Mole Fraction of Dry Gas.

$$Mfd = 1 - (\%H2O/100)$$

Dry molecular weight of gas stream, lb/lb-mole.

$$Md = (0.440 * \% CO_2) + (0.320 * \% O_2) + (0.280 * (\% N_2 + \% CO))$$

Actual Molecular Weight of Gas Stream (wet basis), lb/lb-mole.

$$Ms = (Md * Mfd) + (18 * (1 - Mfd))$$

Absolute Gas Pressure, Inches of Mercury

$$Ps = Pbar + (Pg / 13.6)$$

Average Velocity of Gas Stream at Actual Conditions, ft/sec.

$$vs = 85.49 * Cp * SQRT \left(\frac{Delta\ p * (460 + ts)}{Ps * Ms}\right)$$

Average Gas Stream Volumetric Flowrate at Actual Conditions, acfm.

$$Qaw = 60 / 144 * vs * A$$

Average Gas Stream Dry Volumetric Flowrate at Standard Conditions, dscfm.

$$Qsd = Qaw * Mfd * Tstd/(ts + 460) * Ps/Pstd$$

Isokinetic Sampling Rate, percent.

$$\%I = \frac{Pstd * 100 * (ts + 460) * Vm(std)}{Tstd * 60 * vs * Ps * Mfd * Theta * Area-nozzle, (ft)^2}$$

Particulate Concentration, gr/dscf.

$$Gr/DSCF = \frac{7{,}000 * mg}{453{,}592 * Vm(std)}$$

Mass Emission Rate, lb/hr from Milligrams of Catch.

$$lb/hr = \frac{60 * mg * Qsd}{453{,}592 * Vm(std)}$$

Mass Emission Rate, lb/hr from Parts Per Billion, Dry.

$$lb/hr = \frac{60 * ppbvd * Fwt * Qsd}{385.3 * 10^9}$$

Mass Emission Rate, kg/hr.

$$kg/hr = lb/hr * 453.6 / 1000$$

Parts Per Billion By Volume, Dry (using dry std. cubic feet).

$$ppbvd = \frac{385.3 * 10^6 * \mu g}{453{,}592 * Fwt * Vm(std)}$$

EXAMPLE CALCULATIONS

Concentration, Parts Per Billion By Volume, Dry (using micrograms & dry std.liters).

$$ppbvd = \frac{24.056 * \mu g/10^6}{Vm(std) * Fwt} * 1{,}000{,}000$$

Parts Per Million By Volume, Wet.

$$ppmw = ppmd * Mfd$$

Milligrams Per Dry Standard Cubic Meter

$$mg/DSCM = mg / (Vm(std) * 0.02832)$$

Milligrams Per Dry Standard Cubic Meter from Parts per Million Dry

$$mg/DSCM = ppmd * Fwt / 24.056$$

Stack Gas Viscosity, micropoise

$$\mu_s = 152.418 + 0.2552 * ts + 3.2355*10^{-6} * ts^2 + 0.53147 * \%O2 - 74.143 * \%H2O/100$$

Total cyclone flow rate @ wet conditions, acfm

$$Qs = \frac{((Vm(std) / (1-\%H2O)/100)) * (ts + 460)}{17.64 * Ps * Theta}$$

Diameter of particles having a 50% probability of penetration, μm

$$D_{50} = 0.15625 * \left(\frac{ts + 460}{Ms * Ps}\right)^{0.2091} * (\mu_s/Qs)^{0.7091}$$

Particulate Fractionation, %>PM10

$$\%>PM10 = (>PM10\ Catch / Total\ Particulate\ Catch) * 100$$

Particulate Fractionation, %<PM10

$$\%<PM10 = (<PM10\ Catch / Total\ Particulate\ Catch) * 100$$