United States
Environmental Protection
Agency

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

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December 1979

Air

EPA

Metallic Minerals

Emission Test Report
Exxon
Casper, Wyoming

EXXON MINERALS COMPANY, U.S.A.
CONVERSE COUNTY, WYOMING

PROCESS ORE SAMPLES - ANALYTICAL RESULTS

Sample Description	Percent Moisture	Percent Solids
Conveyor from Fine Ore Bins	4.99	95.01
Conveyor Leading to the Crusher	5.13	94.87
Conveyor Leaving the Crusher	5.62	94.38
Conveyor Leaving the Screening	5.73	94.27
Set #2 Conveyor from Screen to Fine Ore Bin	5.57	94.43
Set #2 Conveyor Leading from the Fine Ore Bin	6.07	93.93
Set #2 Conveyor Leaving Primary Crusher	5.66	94.34
Set #2 Conveyor Leading to the Crusher	5.90	94.10

Source Emissions Test Report
Exxon Minerals Company, U.S.A.
Converse County, Wyoming

Primary Crusher, Fine Ore Bins and Dryer Scrubbers

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Work Assignment No. 10

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SUMMARY

The Emission Measurement Branch of the U.S. Environmental Protection Agency contracted Roy F. Weston, Inc. to conduct a source testing and analysis program at Exxon Minerals Company, U.S.A.'s Converse County, Wyoming Uranium Processing Facility.

The primary objective of the testing program was to quantify the particulate emissions to the atmosphere from three scrubber-controlled sources at the plant (Primary Crusher, Fine Ore Bins and Dryer). This objective was achieved by performing a series of three particulate tests utilizing EPA Method 5[1] procedures at each scrubber exhaust stack location. In addition, visual determinations of plume opacities were made simultaneously with each particulate test at the three source discharge points according to EPA Method 9[2] protocol. A singular Anderson[R] cascade impactor test was conducted at each of the three exhaust stack locations. Also, three EPA Method 5 particulate and three Anderson cascade impactor tests were executed at each corresponding scrubber inlet site. In addition, visual determination of opacities (by EPA Method 9) and the frequency of fugitive emissions (by EPA Method 22[3]) was monitored at several points in the processing operation.

The particulate matter emission results are summarized below.

CRUSHER TRANSFER POINT EXHAUST DUCT

Test Number	Date	Particulate Concentration Grains/DSCF	Particulate Emission Rate Pounds/Hour
1	9-27-79	0.002	0.021
2	9-27-79	0.003	0.029
3	9-27-79	0.013	0.107
Series Average		-	0.052

CRUSHER SCRUBBER INLET DUCT

Test Number	Date	Particulate Concentration Grains/DSCF	Particulate Emission Rate Pounds/Hour
1	9-27-79	0.012	0.742
2	9-27-79	0.009	0.562
3	9-27-79	0.006	0.341
Series Average		-	0.548

[1] Code of Federal Regulations, Title 40, Part 60, Appendix A, "Standards of Performance for New Stationary Sources", August 18, 1977.

[2] Federal Register, Vol. 39, No. 219, November 12, 1974.

[3] Draft Method Revised 28 July 1978.

CRUSHER-GRIZZLEY EXHAUST DUCT

Test Number	Date	Particulate Concentration Grains/DSCF	Particulate Emission Rate Pounds/Hour
1	9-27-79	0.008	0.169
2	9-27-79	0.010	0.229
3	9-27-79	0.013	0.298
Series Average		-	0.232

CRUSHER SCRUBBER OUTLET DUCT

Test Number	Date	Particulate Concentration Grains/DSCF	Particulate Emission Rate Pounds/Hour
1	9-27-79	0.002	0.146
2	9-27-79	0.005	0.314
3	9-27-79	0.004	0.223
Series Average		-	0.228

FINE ORE BINS SCRUBBER OUTLET DUCT

Test Number	Date	Particulate Concentration Grains/DSCF	Particulate Emission Rate Pounds/Hour
1	9-28-79	0.003	0.042
2	9-28-79	0.002	0.041
3	9-28-79	0.002	0.039
Series Average		-	0.041

FINE ORE BINS SCRUBBER INLET DUCT

Test Number	Date	Particulate Concentration Grains/DSCF	Particulate Emission Rate Pounds/Hour
1	9-28-79	0.006	0.089
2	9-28-79	0.003	0.057
3	9-28-79	0.004	0.065
Series Average		-	0.070

FINE ORE BINS HOPPER EXHAUST DUCT

Test Number	Date	Particulate Concentration Grains/DSCF	Particulate Emission Rate Pounds/Hour
1	9-28-79	0.003	0.010
2	9-28-79	0.003	0.008
3	9-28-79	0.003	0.008
Series Average		-	0.009

DRYER SCRUBBER INLET DUCT

Test Number	Date	Particulate Concentration Grains/DSCF	Particulate Emission Rate Pounds/Hour
1	10-1-79	2.527	12.53
2	10-1-79	3.335	15.75
3	10-1-79	0.900	4.35
Series Average		-	10.88

DRYER SCRUBBER OUTLET DUCT

Test Number	Date	Particulate Concentration Grains/DSCF	Particulate Emission Rate Pounds/Hour
1	10-1-79	0.125	2.81
2	10-1-79	0.051	1.02
3	10-1-79	0.027	0.61
Series Average		-	1.48

PACKAGING AREA EXHAUST DUCT

Test Number	Date	Particulate Concentration Grains/DSCF	Particulate Emission Rate Pounds/Hour
1	10-1-79	0.007	0.050
2	10-1-79	0.003	0.025
3	10-1-79	0.003	0.023
Series Average		-	0.033

The measured particulate removal efficiency of the Crusher Area Scrubber was 53.0%, that of the Fine Ore Bins Scrubber was 40.3%, the Dryer Scrubber was 85.7%.

INTRODUCTION

The Emission Measurement Branch of the U. S. Environmental Protection Agency contracted Roy F. Weston, Inc. to conduct a source testing and analysis program at the Exxon Minerals Company, U.S.A.'s Converse County, Wyoming Uranium Processing Facility. The objective of the testing program was to measure various emission parameters relating to milling, drying and packaging operations at the plant.

The locations tested, plus the number and types of tests performed at each site are listed below:

1. Crusher Transfer Point Exhaust Duct
   a. Three particulate tests by EPA Method 5.
   b. Three particle size distribution tests by cascade impaction (Anderson^R).
2. Crusher Scrubber Inlet Duct
   a. Three particulate tests by EPA Method 5.
   b. Three particle size distribution tests by cascade impaction (Anderson^R).
3. Crusher-Grizzley Exhaust Duct
   a. Three particulate tests by EPA Method 5.
   b. Three particle size distribution tests by cascade impaction (Anderson^R).
4. Crusher Scrubber Outlet Duct
   a. Three particulate tests by EPA Method 5.
   b. One particle size distribution test by cascade impaction (Anderson^R).
   c. One opacity test by EPA Method 9 simultaneous with Run One particulate test.
5. Crusher-Grizzley Hood Area
   a. Three opacity tests by EPA Method 9 and three fugitive tests by Method 22. Visual determination of plume opacity and frequency performed concurrently with particulate tests.

6. Conveyor Transfer Point Area

   a. Three opacity tests by EPA Method 9 and three fugitive tests by Method 22 performed in conjunction with particulate tests.

7. Crusher Transfer Point Area

   a. Three EPA Method 9 and Method 22 tests performed in conjunction with the particulate tests.

8. Fine Ore Bins Scrubber Outlet Duct

   a. Three particulate tests by EPA Method 5.

   b. One particle size distribution test by cascade impaction (Anderson^R).

   c. One opacity test by EPA Method 9 simultaneous with Run One particulate test.

9. Fine Ore Bins Scrubber Inlet Duct

   a. Three particulate tests by EPA Method 5.

   b. Three particle size distribution tests by cascade impaction (Anderson^R).

10. Fine Ore Bins Hopper Exhaust Duct

   a. Three particulate tests by EPA Method 5.

   b. Three particle size distribution tests by cascade impaction (Anderson^R).

11. Fine Ore Storage Bins Entrance Area

   a. Three EPA Method 9 and Method 22 tests performed in conjunction with particulate tests.

12. Fine Ore Bins Hopper Area

   a. Three EPA Method 9 and Method 22 tests performed in conjunction with particulate tests.

13. Dryer Scrubber Inlet Duct

   a. Three particulate tests by EPA Method 5.

   b. Three particle size distribution tests by cascade impaction (Anderson^R).

14. Dryer Scrubber Outlet Duct

    a. Three particulate tests by EPA Method 5.

    b. One particle size distribution test by cascade impaction (Anderson[R]).

    c. Three opacity tests by EPA Method 9 simultaneous with each particulate test.

15. Packaging Area Exhaust Duct

    a. Three particulate tests by EPA Method 5.

    b. Three particle size distribution tests by cascade impaction (Anderson[R]).

16. Barreling Enclosure Area

    a. Three EPA Method 9 and Method 22 tests performed simultaneously with particulate tests at the packaging area.

All tests were conducted during the period from September 27 through October 1, 1979 by Weston personnel and were observed by Mr. Dennis P. Holzschuh, EPA Technical Manager.

Test data and test result summaries are presented in Tables 1 through 20 of this report. Particle size distribution results are shown in Tables 21 through 44. Also included is a description of the facility processes, test locations, test equipment, test procedures, sample recovery, analytical methods used during the test program and trace elements analysis results. Raw test data, laboratory reports, sample calculations, equipment calibration data, and a list of project participants are provided in Appendices A through E, respectively.

DESCRIPTION OF TEST LOCATIONS

Crusher Transfer Point Exhaust Duct

Two 4" I.D. test ports, 90° apart, were installed on a straight section of the 32" I.D. metal stack at a location greater than 8 diameters (50') downstream and greater than 2 diameters (20') upstream from the nearest flow disturbances. EPA Method 1 criteria for this test location required a minimum of 8 traverse points. See Figure 2 for port and sampling point locations.

Crusher Scrubber Inlet Duct

Two 4" I.D. test ports at 100° were placed on the 28" I.D. metal stack 1.3 diameters downstream and 1.1 diameters upstream from the nearest flow disturbances. Obstructions near the duct necessitated installing the ports $>$ 90° apart. Forty-eight sampling points (24 per axis) were required for testing. See Figure 3 for port and sampling point locations.

Crusher-Grizzley Exhaust Duct

Two 4" I.D. test ports were placed at right angles on a straight section of the 16" I.D. ductwork leading to the inlet of the scrubber at a location of 12" (.75 diameter) downstream, and 36" (2.3 diameters) upstream from the nearest gas stream flow disturbances. The stack geometry required the use of the maximum number of traverse points specified by EPA Method 1 (48, 24 points per axis). Figure 4 illustrates port and sampling point locations.

Crusher Scrubber Outlet Duct

Two 4" I.D. test ports, 90° apart, were installed in a straight section of the 41" I.D. metal duct at a location which was $<$ 1 duct diameters downstream and $<$ 1 diameter upstream from flow disturbances. A total of 48 points were selected for this test location (24 per axis). Figure 5 illustrates port and traverse point locations.

Fine Ore Bins Hopper Exhaust Duct

Two 4" I.D. test ports, 90° apart, were installed on a straight section of the 6" I.D. metal duct at a location greater than 8 stack diameters downstream and greater than 2 stack diameters upstream from the nearest flow disturbances. Due to the smaller duct diameter (6") a one point traverse was used during the sampling program. See Figure 6 for port and sampling point locations.

Fine Ore Bins Scrubber Inlet Duct

Two 4" I.D. test ports, 90° apart, were installed on a straight section of the 10" I.D. metal duct leading to the inlet of the scrubber. The test ports were located 1 diameter downstream and 2 diameters upstream from the nearest gas stream flow disturbances. A total of 20 traverse points (10 per axis) were sampled for 3 minutes per point resulting in a total test time of 60 minutes. See Figure 7 for port and sampling point locations.

Fine Ore Bins Scrubber Outlet Duct

Two 4" I.D. test ports, 90° apart, were located on a straight section of the 12" I.D. metal stack at a location ~3 stack diameters downstream and less than 1 diameter upstream from the nearest flow disturbance. A total of 32 traverse points (16 per axis) were sampled for 2 minutes per point for a total test time of 64 minutes. See Figure 8 for port and sampling point locations.

Packaging Area Exhaust Duct

Two 4" I.D. test ports, 90° apart, were placed on the 7" I.D. duct leading from the packaging area. The ports were located greater than 8 stack diameters downstream and greater than 2 stack diameters upstream from the nearest flow disturbances. The smaller duct diameter resulted in utilizing a one-point traverse during the sampling. Figure 9 shows the port and sampling point location.

Dryer Scrubber Outlet Duct

Two 4" I.D. test ports, 90° apart, were located on the 13-3/4" I.D. duct. The ports were installed on a straight section of the metal duct 5 diameters downstream and 2 diameters upstream from the nearest gas stream flow disturbances. Sixteen sampling points (8 per axis) were selected for testing. See Figure 10 for port and sampling point locations.

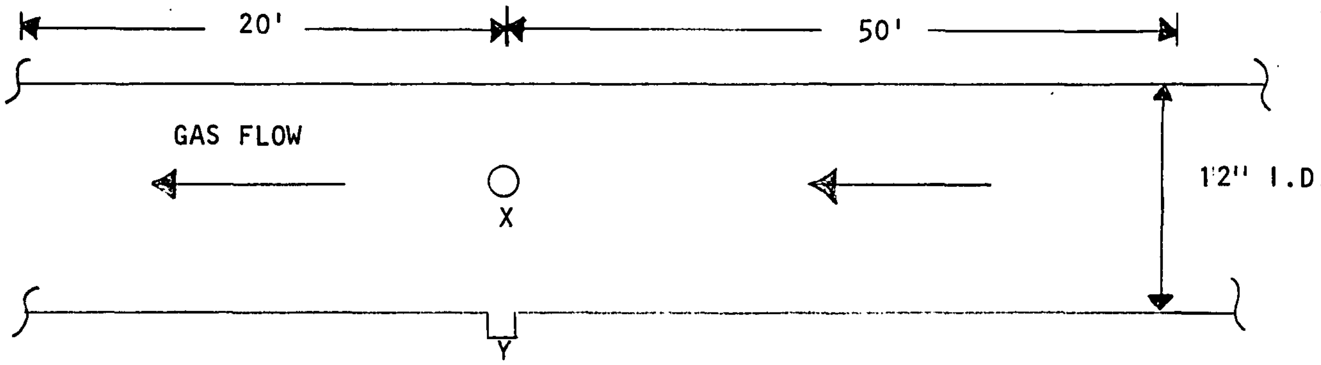
Dryer Scrubber Inlet Duct

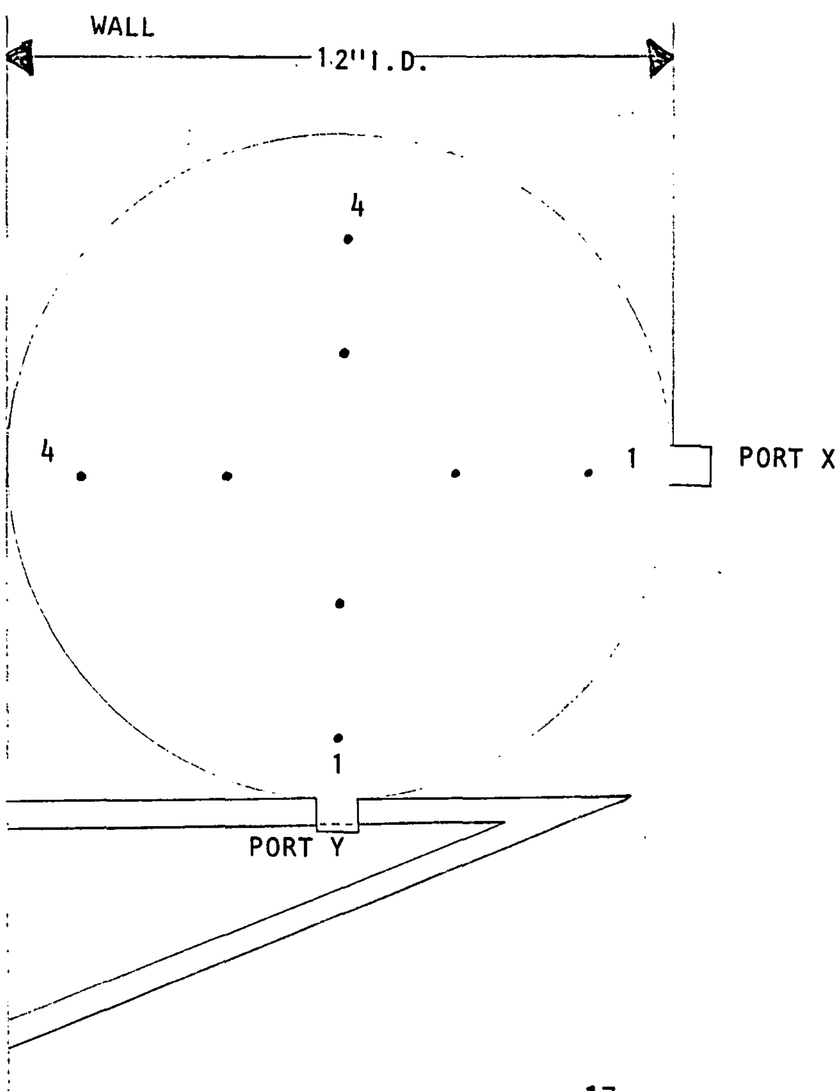
Two 4" I.D. sampling ports were installed on a straight section of the 13-3/4" I.D. duct. The ports were positioned 3 duct diameters downstream and 5 duct diameters upstream from the nearest gas stream flow disturbances. Sixteen traverse points across the X axis were traversed during sampling. Port Y diameter could not be traversed because the port was ~ 2' above, and in line with, the platform which precluded the insertion of the sampling probe. Figure 11 illustrates the port and sampling point locations.

EXXON MINERALS COMPANY, U.S.A.

Converse County, Wyoming
FIGURE 2

CRUSHER TRANSFER POINT EXHAUST DUCT
PORT AND SAMPLING POINT LOCATIONS

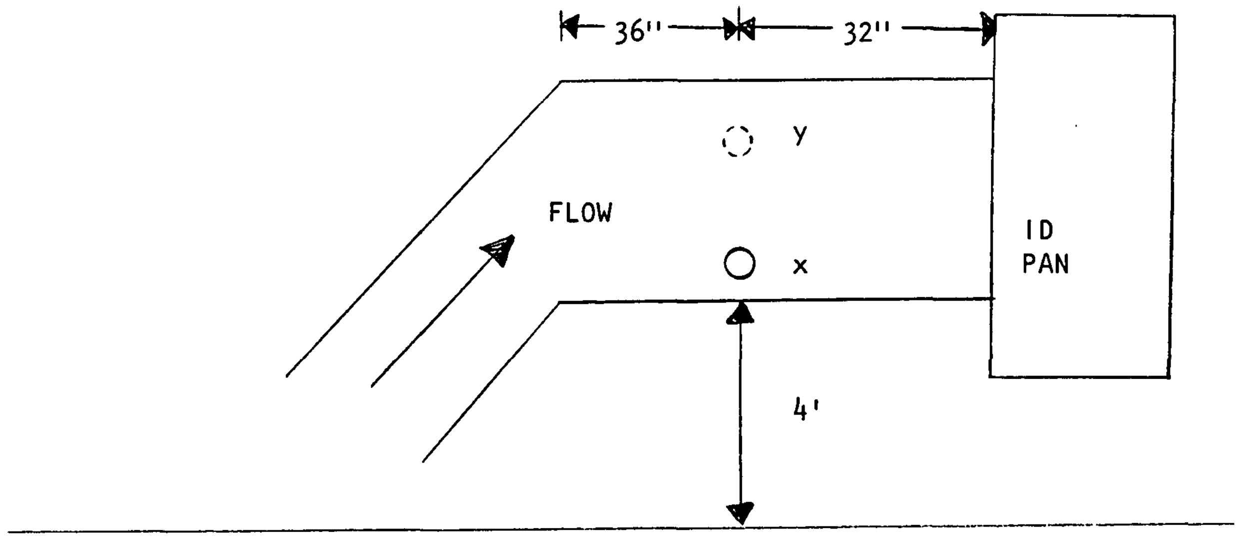


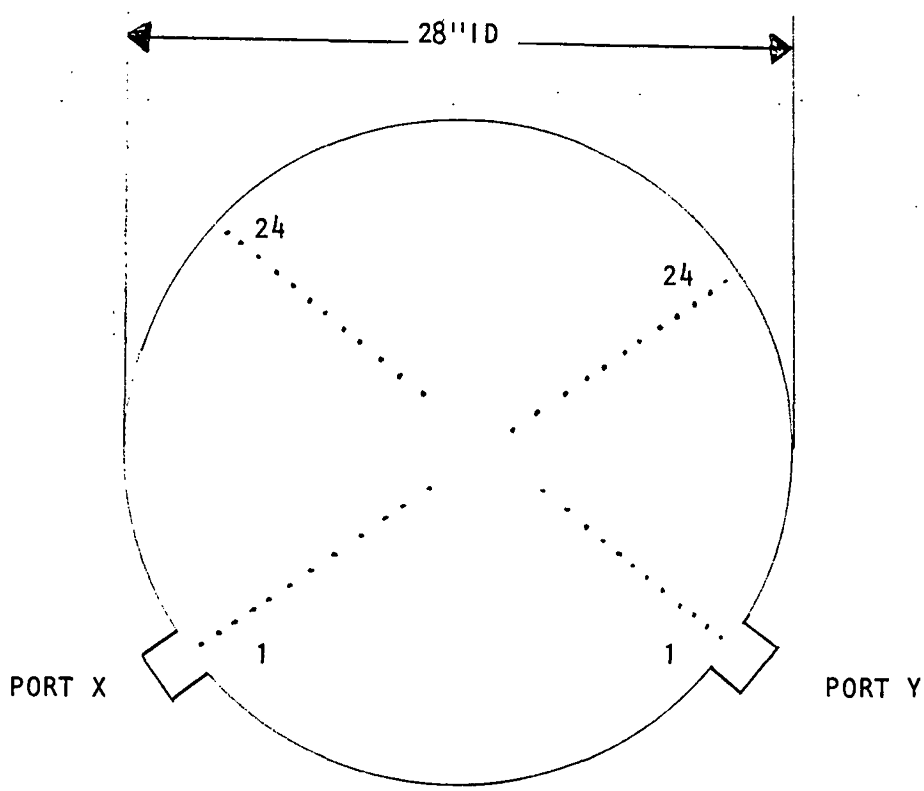


TRAVERSE POINT NUMBER	DISTANCE FROM INSIDE NEAR WALL, inches
1	3/4
2	3
3	9
4	11¼

EXXON MINERALS COMPANY, U.S.A.

Converse County, Wyoming
FIGURE 3
CRUSHER SCRUBBER INLET DUCT
PORT AND SAMPLING POINT LOCATIONS





100° SEPARATION DUE TO
GRATING OBSTRUCTIONS

FLOOR

TRAVERSE POINT NUMBER	DISTANCE FROM INSIDE NEAR WALL, inches
1	¼
2	7/8
3	1½
4	2¼
5	2 7/8
6	3 5/8
7	4½
8	5 3/8
9	6
10	7 5/8
11	9
12	11 1/8
13	16 3/4
14	18 7/8
15	20¼
16	21½
17	22
18	23 3/8
19	24¼
20	25
21	25 5/8
22	26 3/8
23	27
24	27 5/8

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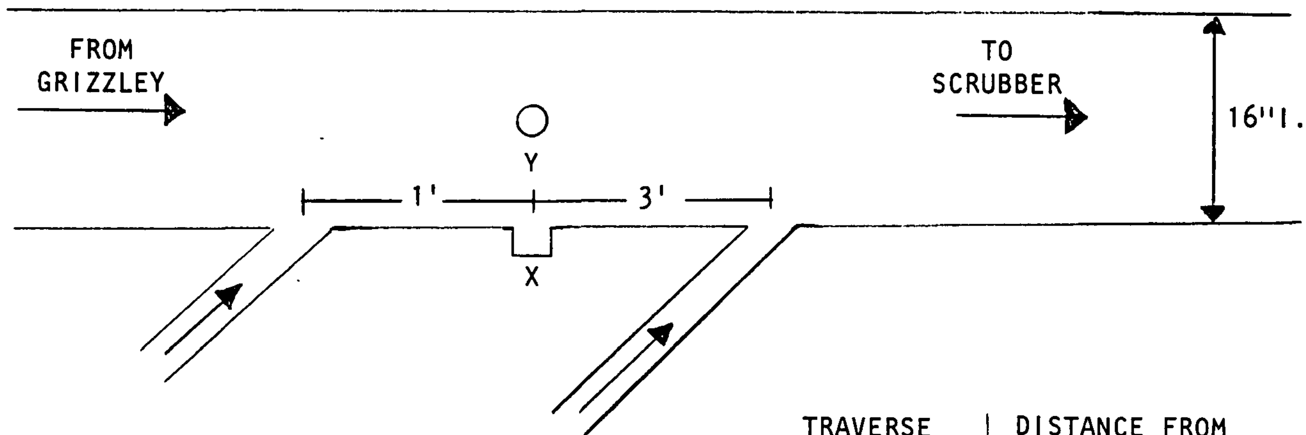
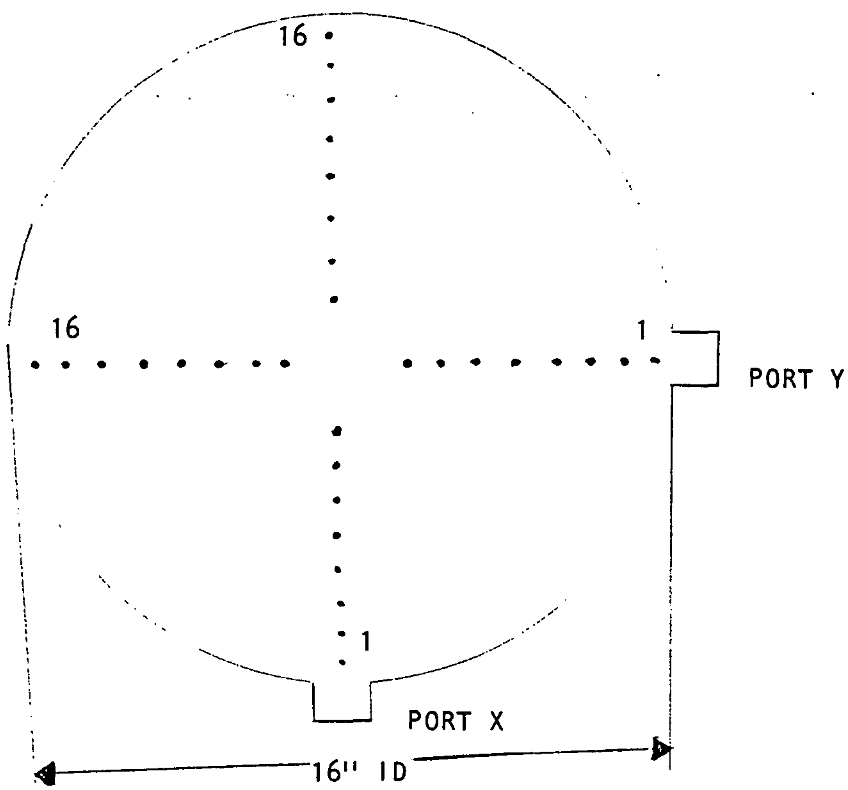
Converse County, Wyoming

FIGURE 4

CRUSHER-GRIZZLEY EXHAUST DUCT
PORT AND SAMPLING POINT LOCATIONS





TRAVERSE POINT NUMBER	DISTANCE FROM INSIDE NEAR WALL, inches
1	¼
2	3/4
3	1 3/8
4	2
5	2 3/4
6	3½
7	4½
8	6
9	10
10	11½
11	12½
12	13¼
13	14
14	14 5/8
15	15¼
16	15 3/4

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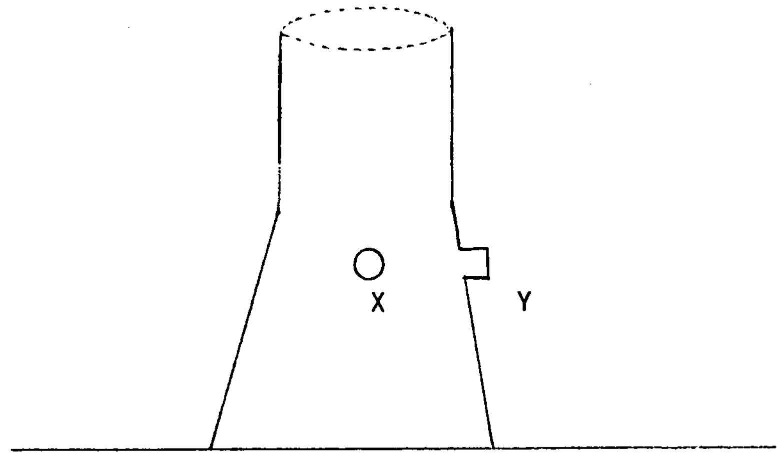
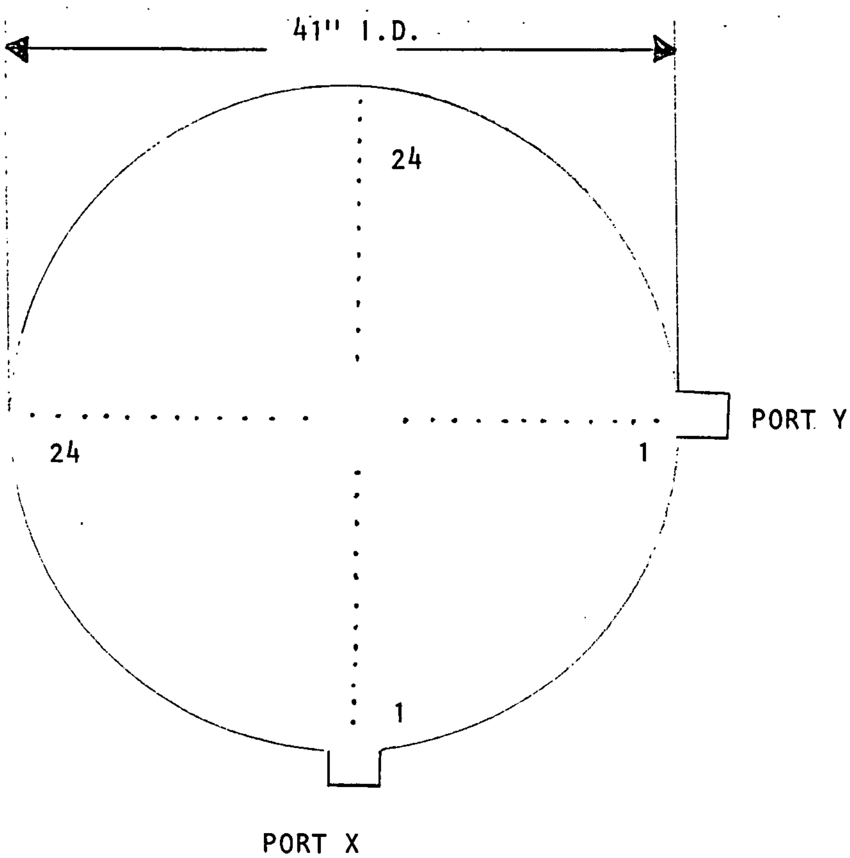
Converse County, Wyoming
FIGURE 5

CRUSHER SCRUBBER OUTLET DUCT
PORT AND SAMPLING POINT LOCATIONS





TRAVERSE POINT NUMBER	DISTANCE FROM INSIDE NEAR WALL, inches
1	½
2	1½
3	2¼
4	3¼
5	4½
6	5 3/8
7	6 5/8
8	8
9	9½
10	11 1/8
11	13¼
12	16 3/8
13	24 3/4
14	27 3/4
15	29 7/8
16	31½
17	33 1/8
18	34 3/8
19	35½
20	36 3/4
21	37
22	38
23	39
24	40½

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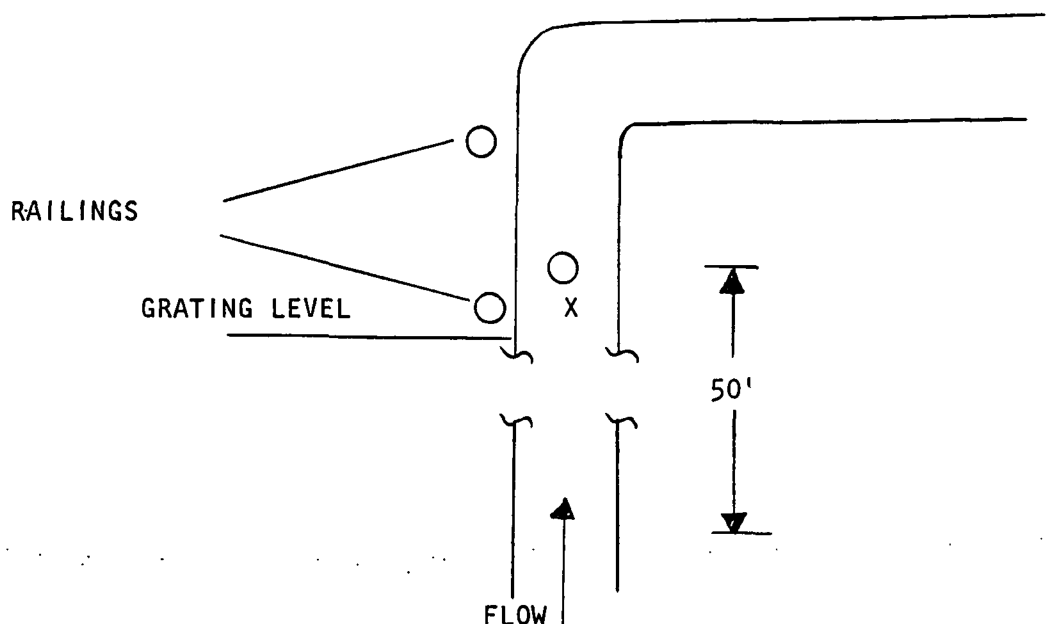
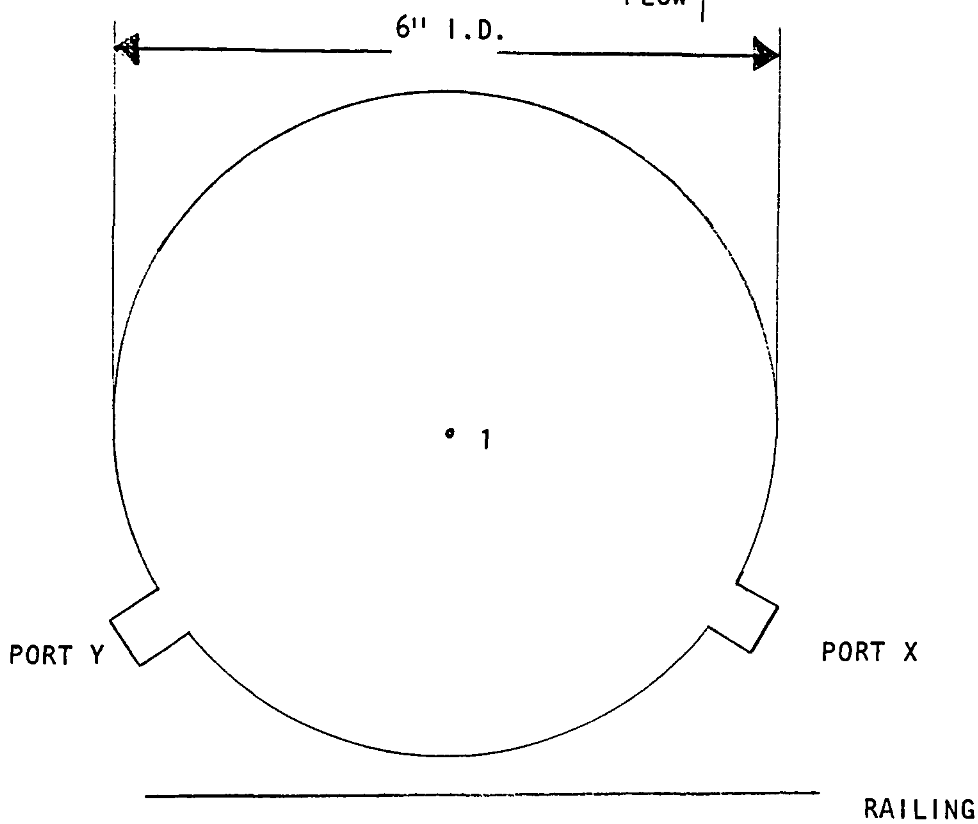
Converse County, Wyoming

FIGURE 6

FINE ORE BINS HOPPER EXHAUST DUCT
PORT AND SAMPLING POINT LOCATIONS





TOP VIEW

TRAVERSE POINT NUMBER	DISTANCE FROM INSIDE NEAR WALL, inches
CENTER POINT	3

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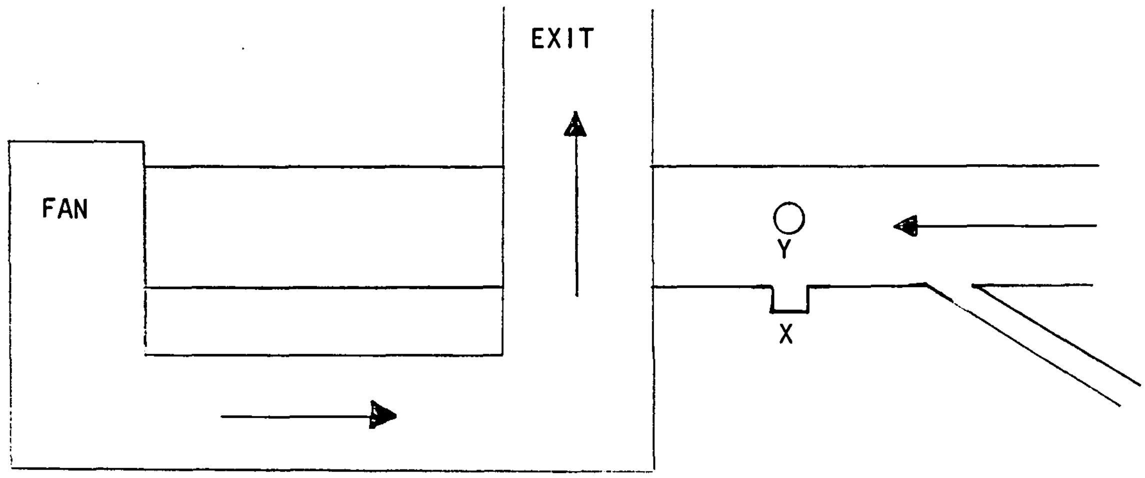
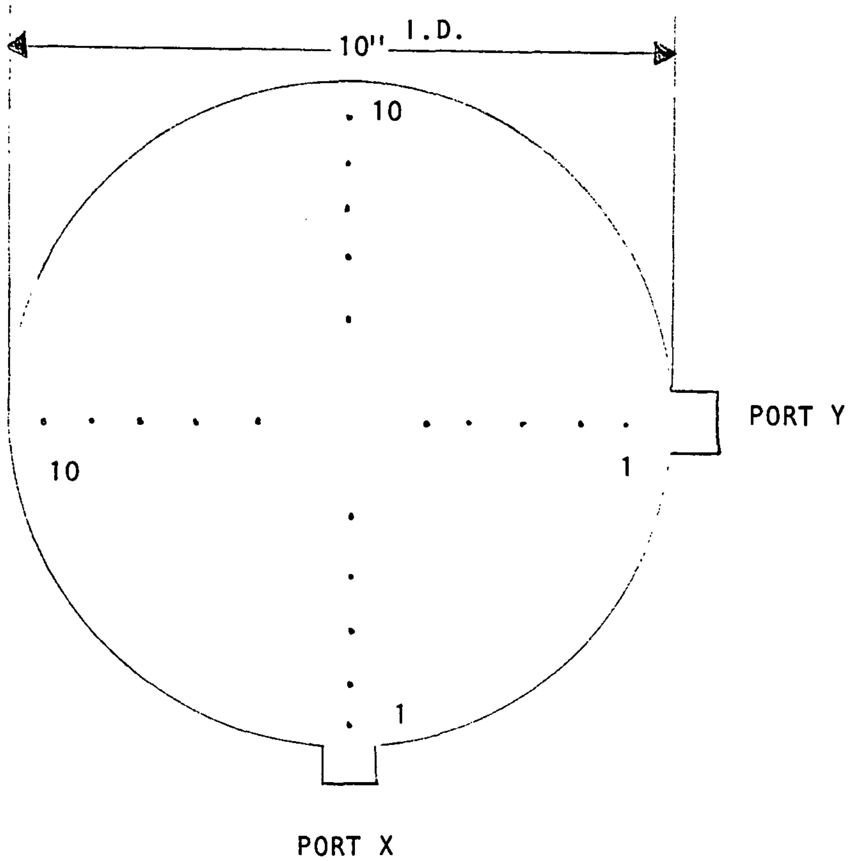
Converse County, Wyoming

FIGURE 7

FINE ORE BINS SCRUBBER INLET DUCT
PORT AND SAMPLING POINT LOCATIONS



TRAVERSE POINT NUMBER	DISTANCE FROM INSIDE NEAR WALL, inches
1	¼
2	7/8
3	1½
4	2¼
5	3 3/8
6	6
7	7 3/4
8	8½
9	9 1/8
10	9 3/4

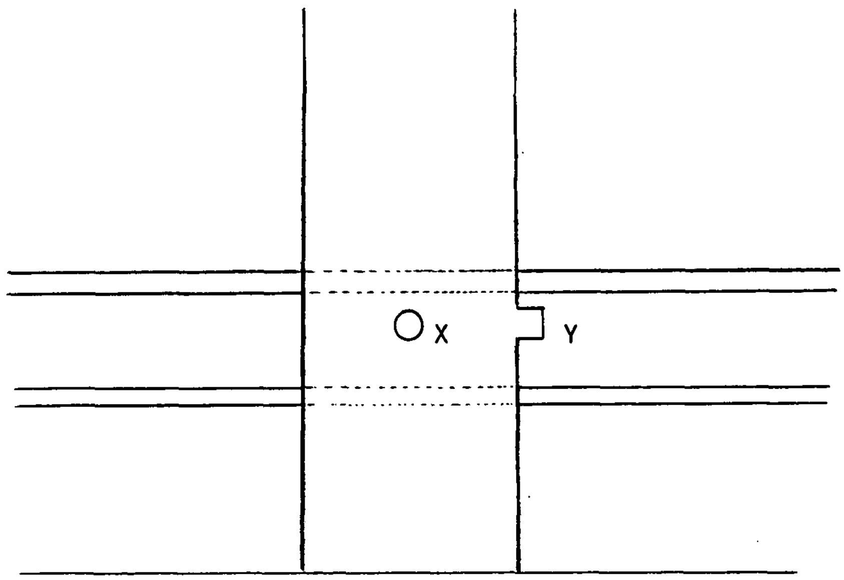


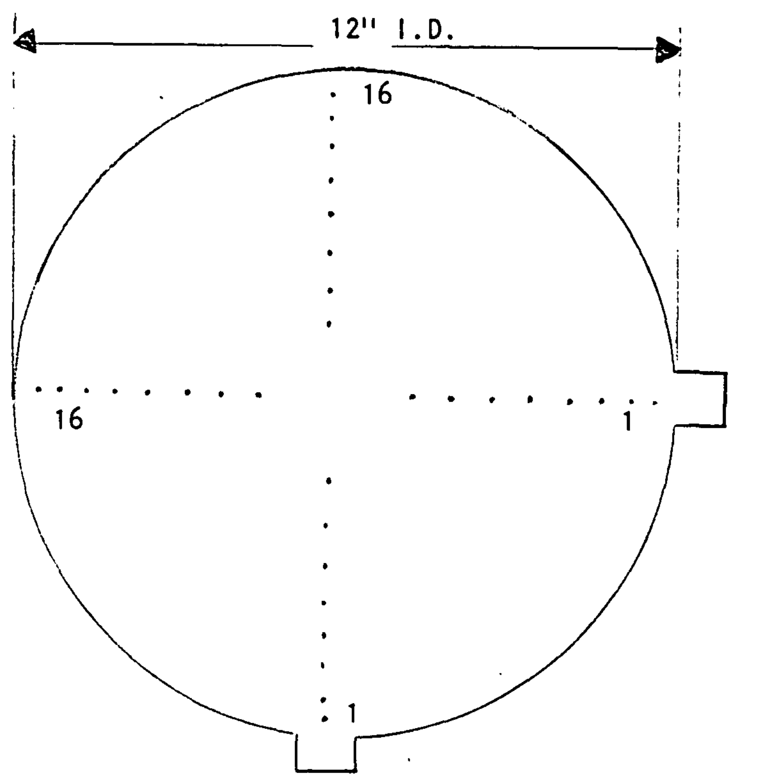
EXXON MINERALS COMPANY, U.S.A.

Converse County, Wyoming

FIGURE 8

FINE ORES BIN SCRUBBER OUTLET DUCT PORT AND SAMPLING POINT LOCATIONS





TRAVERSE POINT NUMBER	DISTANCE FROM INSIDE NEAR WALL, inches
1	¼
2	5/8
3	1
4	1½
5	2¼
6	2 5/8
7	3 3/8
8	4½
9	7½
10	8 5/8
11	9 3/8
12	10
13	10½
14	11
15	11½
16	11 3/4

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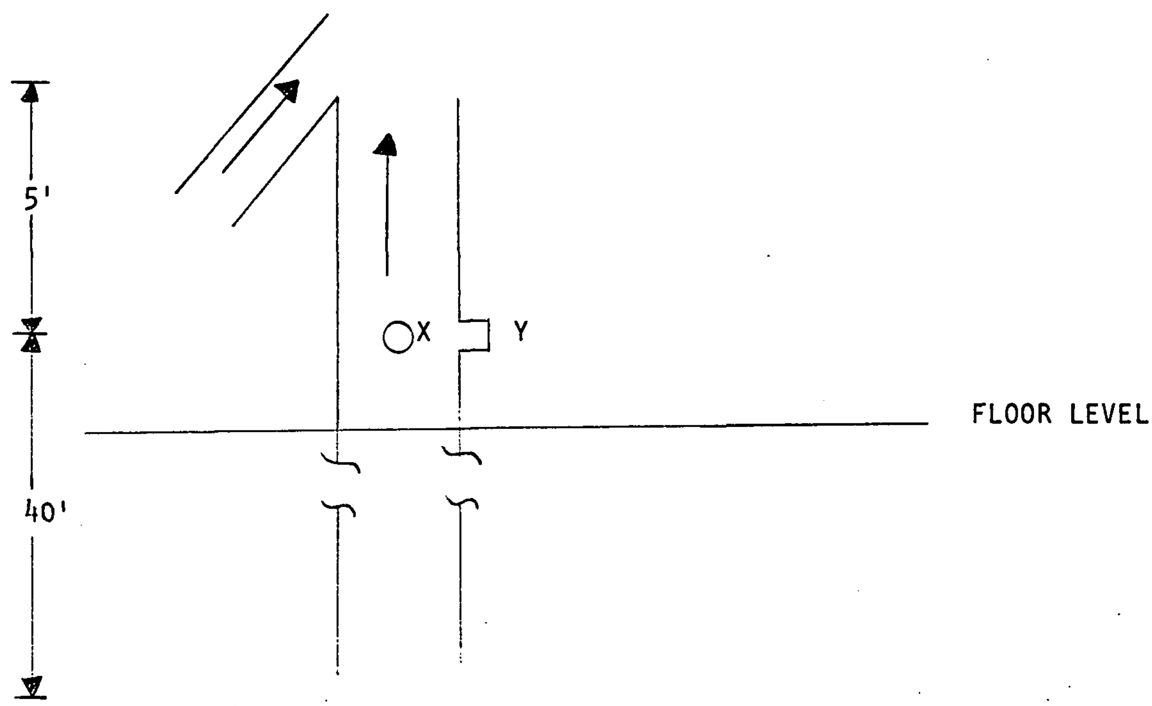
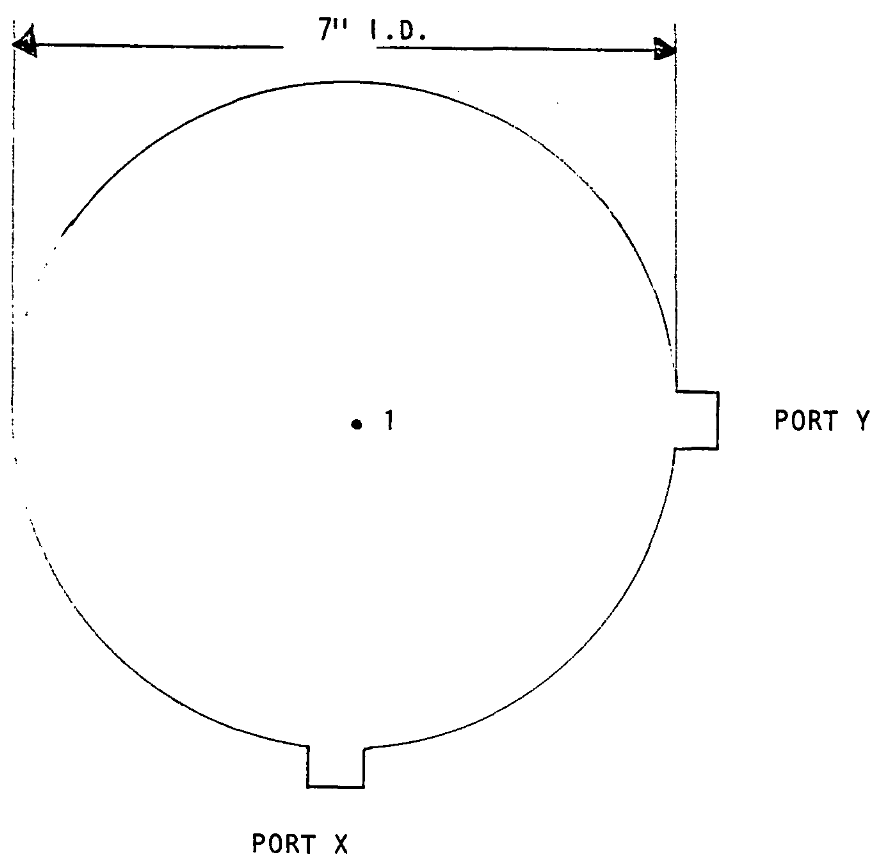
Converse County, Wyoming

FIGURE 9

PACKAGING AREA EXHAUST DUCT
PORT AND SAMPLING POINT LOCATIONS





TRAVERSE POINT NUMBER	DISTANCE FROM INSIDE NEAR WALL, inches
CENTER POINT	3½

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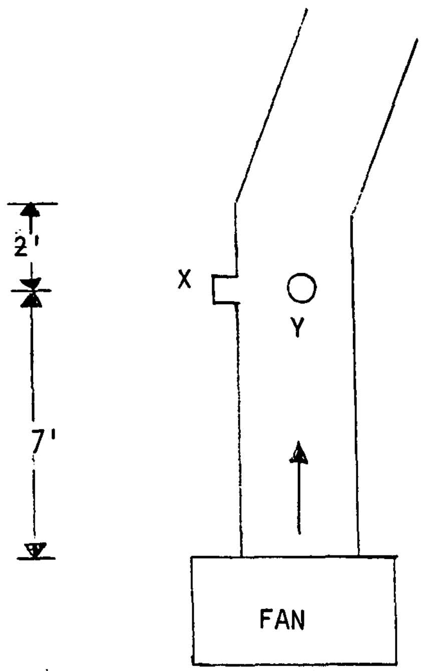
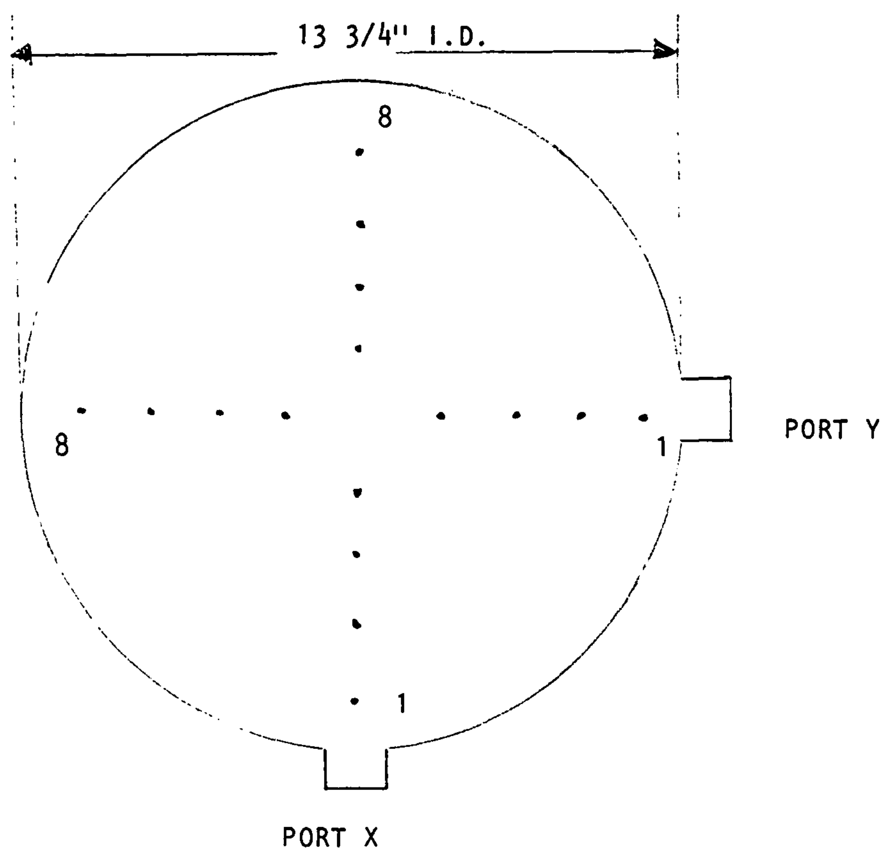
Converse County, Wyoming

FIGURE 10

DRYER SCRUBBER OUTLET DUCT

PORT AND SAMPLING POINT LOCATIONS





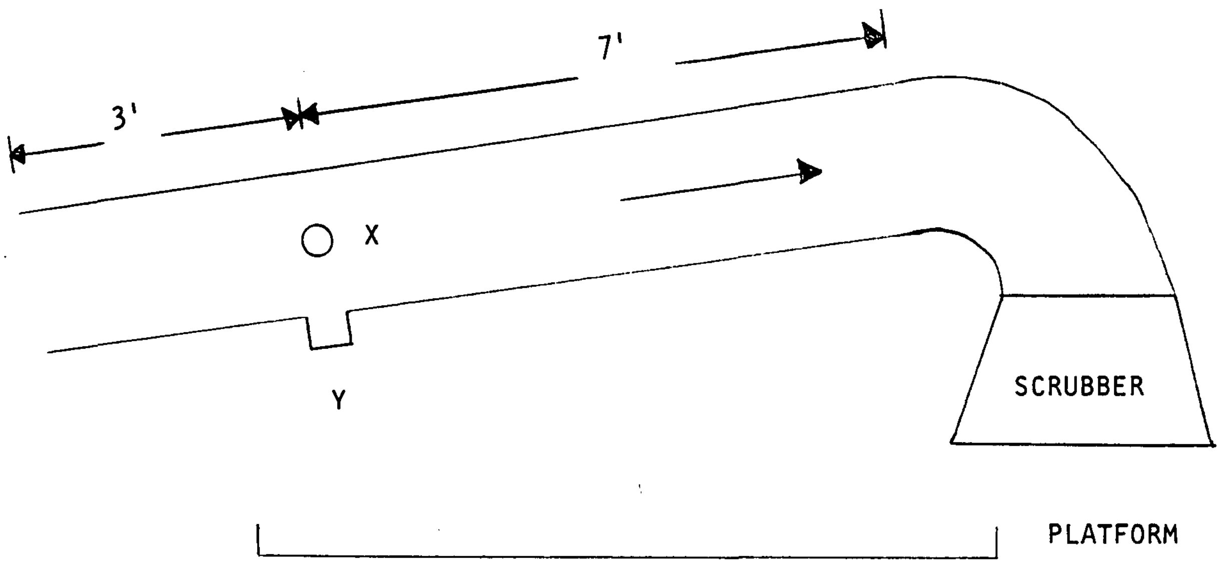
TRAVERSE POINT NUMBER	DISTANCE FROM INSIDE NEAR WALL, inches
1	½
2	1 3/8
3	2 5/8
4	4 3/8
5	9¼
6	10 7/8
7	12
8	13

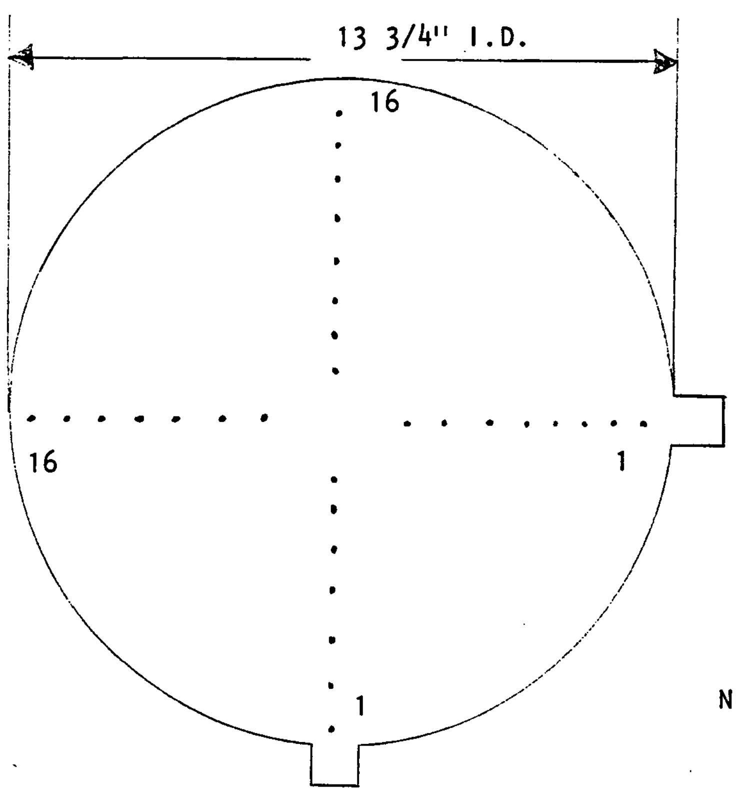
EXXON MINERALS COMPANY, U.S.A.

Converse County, Wyoming

FIGURE 11

DRYER SCRUBBER INLET DUCT
PORT AND SAMPLING POINT LOCATIONS





TRAVERSE POINT NUMBER	DISTANCE FROM INSIDE NEAR WALL, inches
1	¼
2	5/8
3	1 1/8
4	1 3/4
5	2 3/8
6	3
7	3 7/8
8	5¼
9	8 5/8
10	9 7/8
11	10 3/4
12	11½
13	12
14	12 5/8
15	13
16	13½

NOTE: Port Y not traversed due to port access blockage by platform.

DESCRIPTION OF SAMPLING TRAINS

Particulate Sampling Trains

The test train utilized for particulate sampling at all test locations was the standard EPA Method 5 train (see Figure 12).

A stainless steel nozzle was attached to a heated (~250°F) borosilicate glass probe which was connected directly to a borosilicate filter holder containing a 9-cm Reeve Angel 900 AF glass fiber filter. The filter holder was maintained at approximately 250°F in a heated chamber, and was connected by Tygon® vacuum tubing to the first of four Greenburg-Smith impingers which were included in the train to condense the moisture in the gas stream. Each of the first two impingers contained 100 ml of distilled water, the third was dry and the final impinger contained 200 grams of dry per-weighted silica gel. The first, third, and fourth impingers were modified Greenburg-Smith type; the second was a standard Greenburg-Smith impinger. All impingers were maintained in a crushed ice bath. A RAC control console with vacuum pump, dry gas meter, a calibrated orifice, and inclined manometers completed the sampling train.

Flue gas temperature was measured by means of a Type K thermocouple which was connected to a direct readout pyrometer. The thermocouple sensor was positioned adjacent to the sampling nozzle.

Gas velocity was measured using a calibrated "S" type pitot tube provided with extensions and fastened alongside the sampling probe. Gas stream composition (carbon dioxide, oxygen, and carbon monoxide content) was determined utilizing Orsat apparatus to analyze stack gas samples. Gas stream composition proved to be ambient air with the exception of the dryer inlet and outlet test sites which contained products of combustion.

Figure 13 shows the EPA Method 5 train utilized at the Fine Ore Bins Hopper Duct and the Packaging Area Duct. The test train shown is identical to the one described above, except a rigid glass connection is used between the back half of the filter holder and the first impinger, rather than the flexible vacuum tubing.

Particle Size Distribution Sampling Apparatus

A stainless steel nozzle was connected directly to an 8-stage Anderson® cascade impaction device which separated the particles according to their effective aerodynamic particle diameters. A glass fiber filter was used to capture any particles that passed through the impactor substrates to permit the measurement of total particulate. The filter holder was maintained at stack temperature and was connected by Tygon®

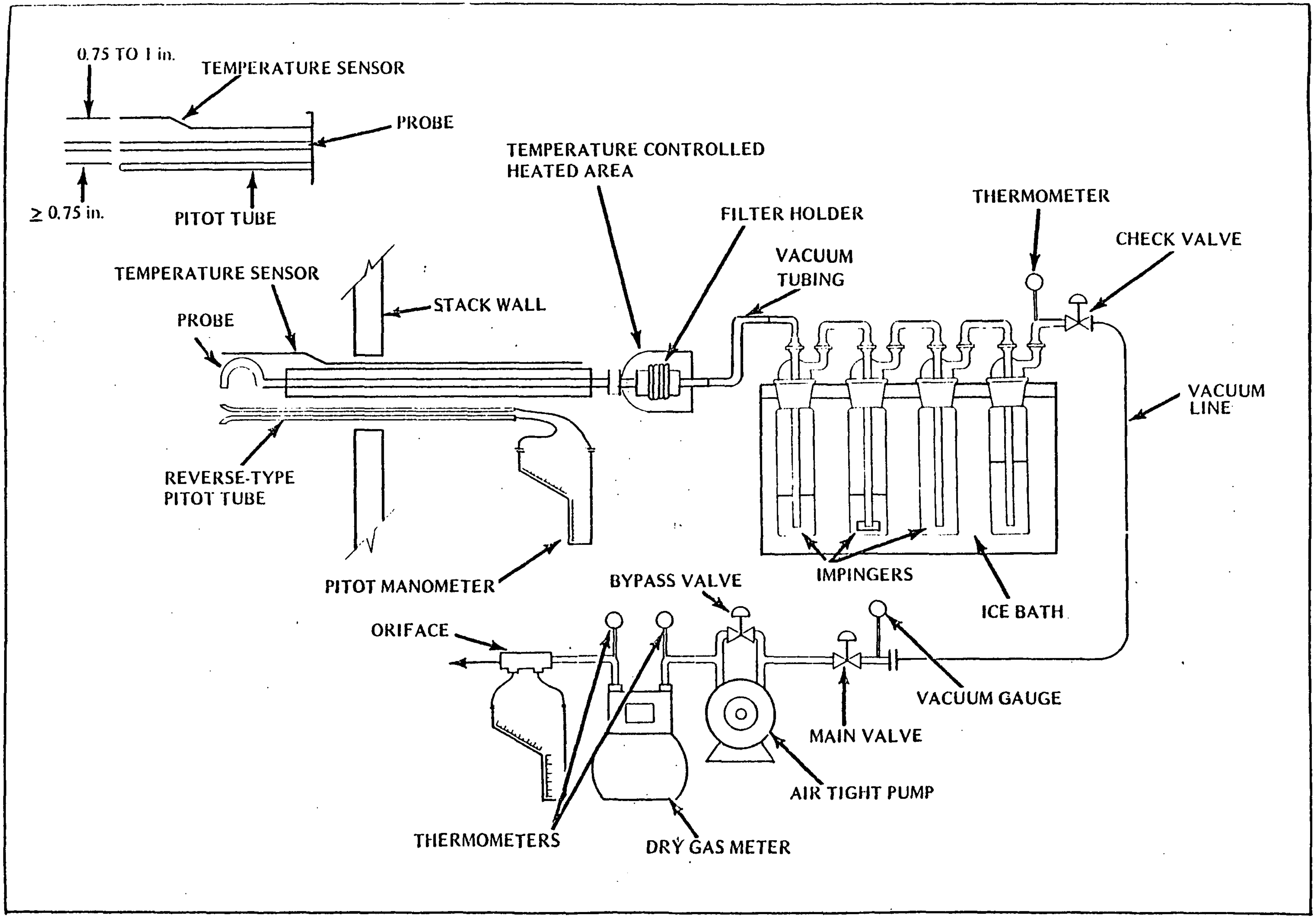


FIGURE **12** PARTICULATE SAMPLING TRAIN
EPA METHOD 5

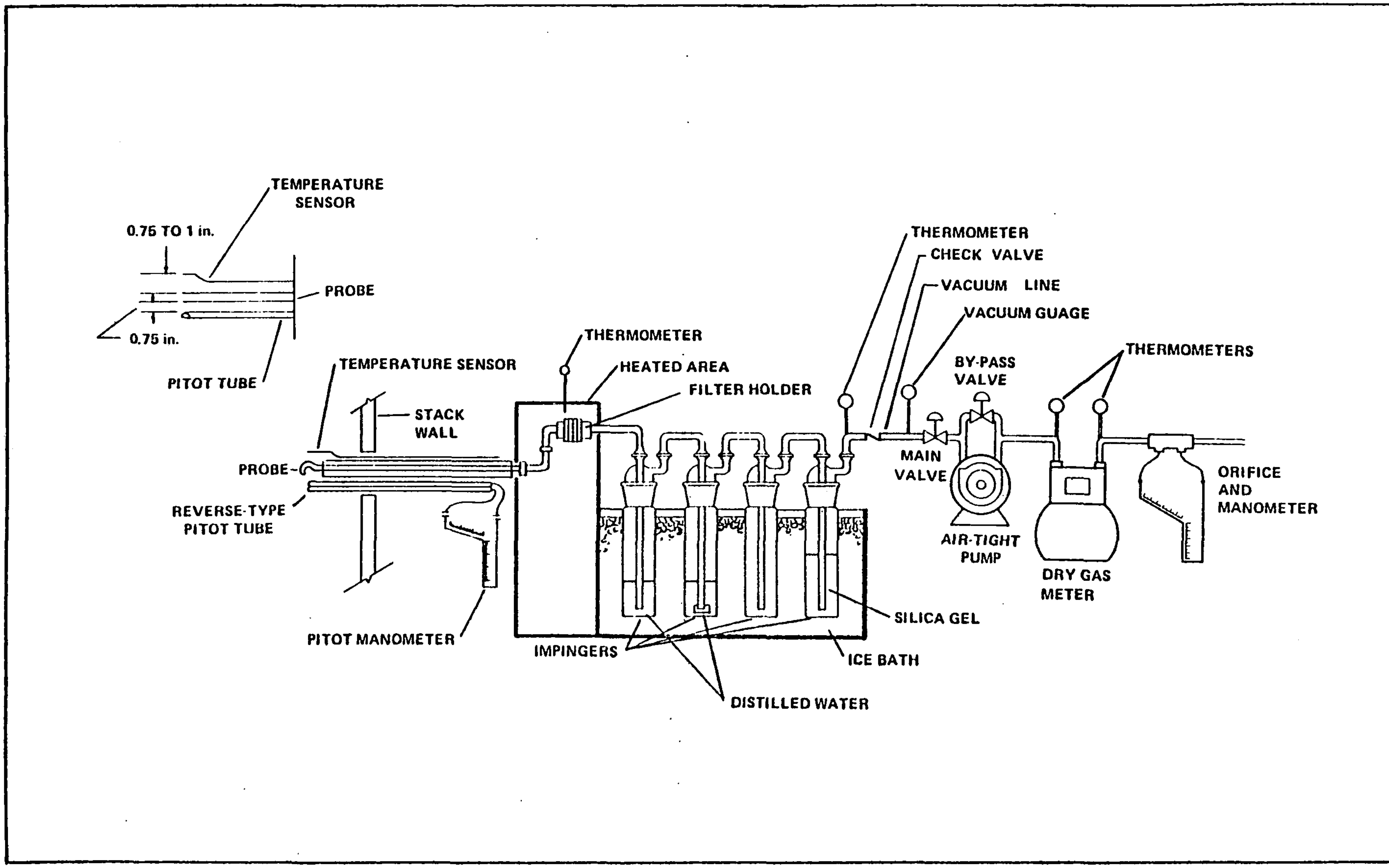


FIGURE 13 PARTICULATE SAMPLING TRAIN—EPA METHOD 5

vacuum tubing to the first of four Greenburg-Smith impingers which were included in the train to condense the moisture in the gas stream. All impingers were maintained in a crushed ice bath. A RAC control console with vacuum pump, dry gas meter, a calibrated orifice, and inclined manometers completed the sampling train (see Figures 14 and 15).

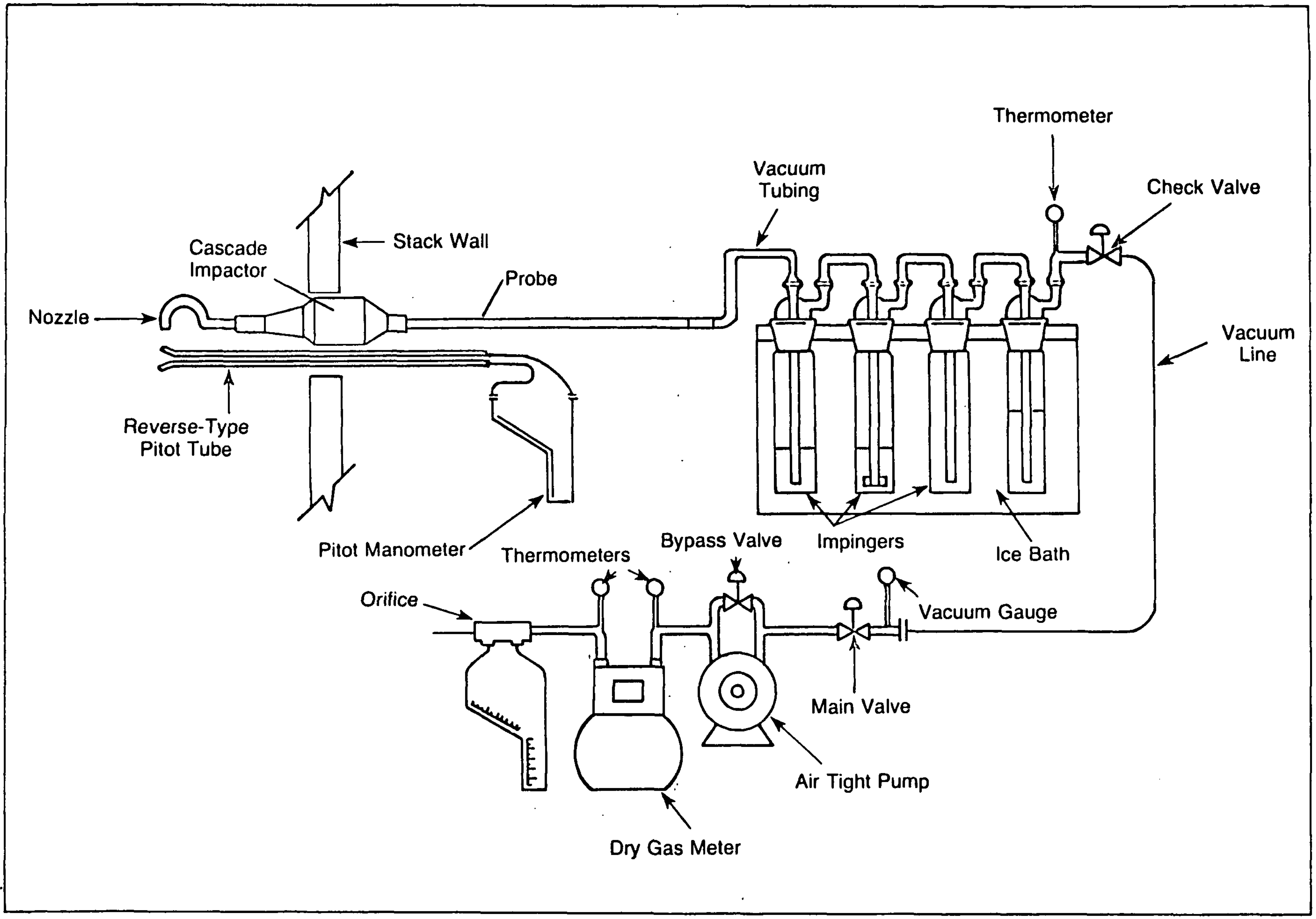


FIGURE 14 PARTICLE SIZE DISTRIBUTION SAMPLING APPARATUS - ANDERSEN 2000, INC.

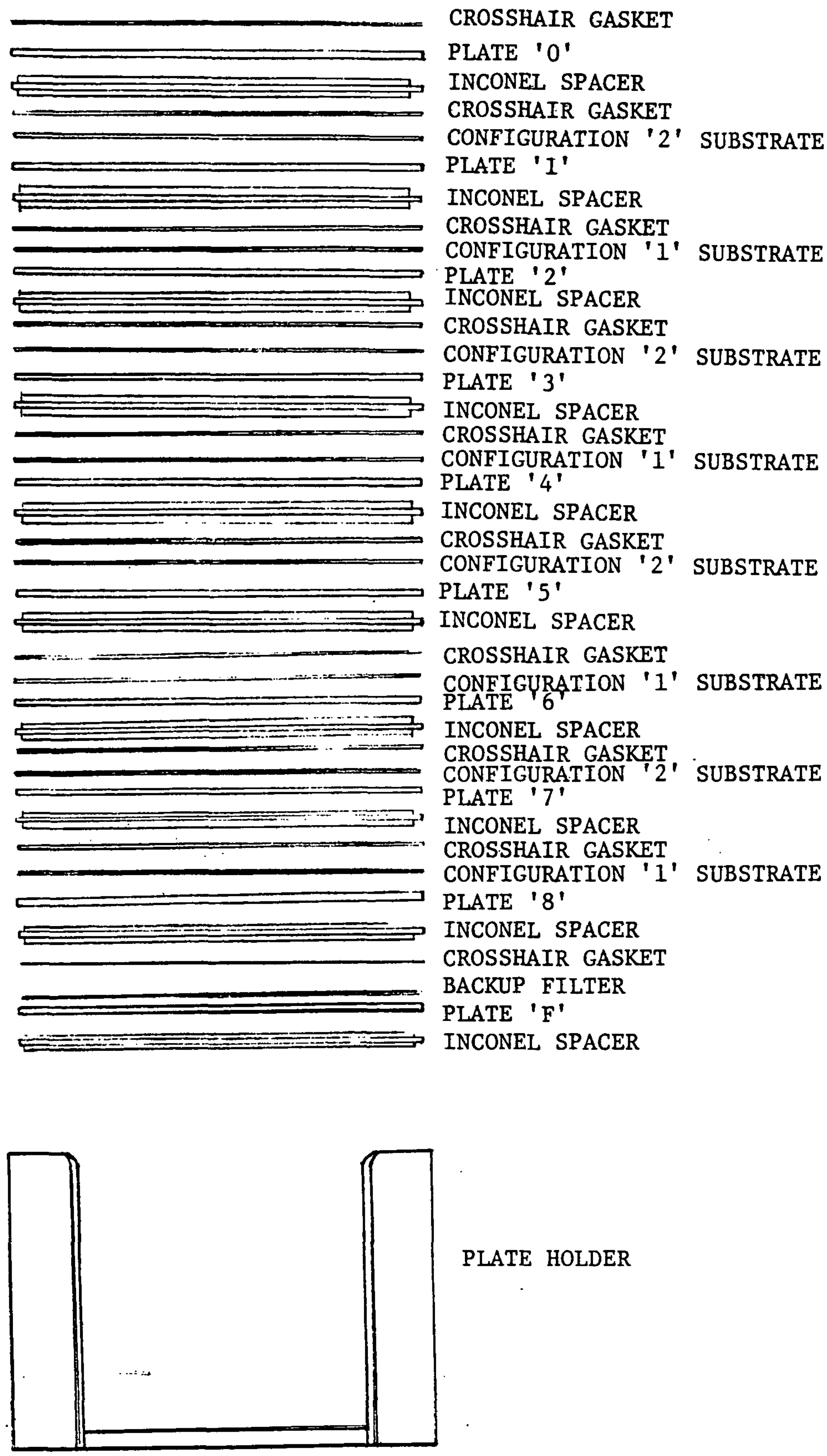


FIGURE 15

ANDERSEN SAMPLER HEAD
PLATE ASSEMBLY

TEST PROCEDURES

Preliminary Tests

Preliminary test data was obtained at each sampling location. Stack geometry measurements were recorded and sampling point distances calculated. A preliminary velocity traverse was performed at each test location utilizing a calibrated "S"-type pitot tube and a Dwyer inclined manometer to determine velocity profiles. A check for the presence or absence of cyclonic flow was conducted at each test location prior to formal testing. Stack gas temperatures were observed with a direct read-out pyrometer equipped with a chromel-alumel thermocouple.

Preliminary test data was used for nozzle sizing and nomagraph set-up for isokinetic sampling procedures.

Calibration of the probe nozzles, pitot tubes, metering systems, probe heaters, temperature gauges and barometer were performed as specified in Section 5 of EPA Method 5 test procedures (see Appendix D for calibration data).

Crusher Transfer Point Exhaust Duct

A series of three tests were conducted at the Crusher Transfer Point Exhaust Stack to measure the concentration and mass rate of particulate matter emissions. Eight traverse points (4 per port axis) were sampled for 12 minutes each, resulting in a total test time of 96 minutes.

During particulate sampling, gas stream velocities were measured by inserting a calibrated "S"-type pitot tube into the stream adjacent to the sampling nozzle. The velocity pressure differential was observed immediately after positioning the nozzle at each point, and sampling rates were adjusted to maintain isokinetic sampling. Stack gas temperatures were also monitored at each point with the pyrometer and thermocouple. Additional temperature measurements were made at the final impinger and at the inlet and outlet of the dry gas meter.

Test data were recorded at each traverse point during all test periods. Leak checks were performed according to EPA Method 5 instructions prior to and after each run and/or component change. Table 1 presents a summary of test data for each of the three runs. Test result summarization appears on Table 11.

One sampling point located at a site of average velocity was selected from particulate traverse data for particle size distribution testing. The gas stream was sampled isokinetically at that point for 75 minutes, which permitted collection of sufficient samples for analysis without overloading the filter substrates. Sample volume, temperature, and pressure data were recorded every 5 minutes during sampling. See Tables 21 through 23 for distribution plots.

Crusher Scrubber Inlet Duct

Three 96-minute Method 5 test runs were performed at the scrubber inlet. A total of 48 points were sampled for 2 minutes each per test.

Procedures for isokinetic sampling were identical to those described in Crusher Transfer Point Exhaust Duct section.

See Tables 2 and 12 for test data and test result summaries, respectively.

Three particle size distribution tests were conducted at a point of average velocity. Each particle size distribution test was one hour in length. Sample volume, temperature, and pressure data were recorded every 5 minutes. See Tables 24 through 26 for distribution plots.

Crusher-Grizzley Exhaust Duct

Three Method 5 tests were performed at the Crusher-Grizzley Exhaust Duct. 32 points were traversed (16 per axis) for 3 minutes each, yielding a test period of 96 minutes.

Isokinetic sampling procedures were identical to those previously described. Table 3 shows test data summarization and Table 13 presents test results.

Three particle size distribution tests were conducted at an average point of velocity. Each sample set was 75 minutes in length. Readings were recorded every 5 minutes during each test. See Tables 28 through 30 for distribution plots.

Crusher Scrubber Outlet Duct

Three Method 5 test runs were conducted on the Crusher Scrubber Outlet Duct. Forty-eight sampling points (24 per axis) were sampled for two minutes each, resulting in a total test time of 96 minutes.

Sampling procedures were identical to those previously described. See Tables 4 and 14 for test data and test result summaries, respectively.

One particle size distribution test was completed at an average point of velocity. Total test time was 160 minutes, with readings taken every 5 minutes. See Table 27 for particle distribution plot.

Fine Ore Bins Scrubber Outlet Duct

Three Method 5 tests were performed at the scrubber outlet site. Thirty-two traverse points (16 per axis) were sampled for 2 minutes at each point, yielding a 64-minute test period.

Sampling procedures were identical to those previously described. Table 5 shows test data summarization and Table 15 presents test results.

One particle size distribution sample was collected isokinetically at a point of average velocity over a 90-minute period. Sample volume, temperature, and pressure data were recorded every 5 minutes during sampling. See Table 31 for distribution results.

Visual determinations of plume opacity were performed by a certified observer according to Method 9 procedures during test Run One. A summary of results is presented in Table 50.

Fine Ore Bins Scrubber Inlet Duct

Three test runs were conducted by EPA Method 5 procedures at the inlet to the Fine Ore Bins Scrubber. A total of twenty traverse points (10 per axis) were sampled for 3 minutes each, resulting in a total test time of 60 minutes. Tables 6 and 16 show test data and test results, respectively.

Three particle size distribution tests were performed at a point of average velocity over a 90-minute period. Readings were taken every 5 minutes during sampling. Tables 32 through 34 show the particle size distribution.

Fine Ore Bins Hopper Exhaust Duct

Three 64-minute Method 5 test runs were performed at the Hopper Exhaust. A one point traverse was sampled for 64 minutes per test.

Procedures for isokinetic sampling were identical to those described for the other locations. Table 7 shows test data summarization and Table 17 presents test results.

Three particle size distribution tests were conducted at a point of average velocity over an 85-minute period. Tables 35 through 37 show the particle size distribution.

Dryer Scrubber Inlet Duct

Three Method 5 tests were performed at the inlet simultaneous with particulate tests at the outlet. Sixteen points were traversed for 4 minutes each, yeilding a test period of 64 minutes.

Isokinetic sampling procedures were identical to those previously described except that test data were recorded every 4 minutes. Table 8 shows test data summarization and Table 18 presents test results.

Three particle size distribution samples were collected isokinetically at a point of average velocity over a 2 minute period. Sample volume, temperature, and pressure data was recorded before and after the test. See Tables 39 through 41 for distribution results.

Dryer Scrubber Outlet Duct

Three EPA Method 5 tests were performed at the outlet simultaneous with particulate test runs at the inlet. Sixteen points were traversed (8 per port axis) for 4 minutes each, yeilding a test period 64 minutes in length.

Procedures for isokinetic sampling were identical to those described for the first location, except that test data were recorded every 4 minutes. Test data and test result summaries are provided in Tables 9 and 19, respectively.

One sampling point located at a site of average velocity was selected from particulate traverse data for particle size distribution testing. The gas stream was sampled isokinetically at that point for 4 minutes which permitted collection of sufficient samples for analysis without overloading the filter substrates. Sample volume, temperature, and pressure data were recorded before and after the test. See Table 38 for a distribution plot.

Visual determinations of plume opacity were performed by a certified observer according to Method 9 procedures. A summary of results is presented in Table 51.

Packaging Area Exhaust Duct

A one point traverse in the center of the small diameter duct was sampled for 64 minutes during each of the three EPA Method 5 tests. Readings were taken every 4 minutes during the test period.

Isokinetic sampling procedures were identical to those previously described except that all test data were taken at a single point. Table 10 shows test data summarization and Table 20 presents test results.

Three particle size distribution samples were taken at midpoint in the duct. Total sample time for each run was 55 minutes. Tables 42 through 44 present particle distribution plots.

ANALYTICAL PROCEDURES

Particulate Sample Recovery

At the conclusion of each test, the sampling trains were dismantled, openings sealed, and the components transported to the field laboratory. Sample integrity was assured by maintaining chain-of-custody records, which will be supplied upon request.

A consistent procedure was employed for sample recovery.

The glass fiber filter(s) was removed from its holder with tweezers and placed in its original container (petri dish), along with any loose particulate and filter fragments (Sample 1).

The probe (EPA 5) and nozzle were separated, and the internal particulate rinsed with acetone into a borosilicate container while brushing a minimum of three times until no visible particles remained. Particulate adhering to the brush was rinsed with acetone into the same container. The front half of the filter holder was rinsed with acetone while brushing a minimum of three times. The rinses were combined (Sample 2) and the container sealed with a Teflon-lined closure.

The total liquid in impingers one, two and three was measured, the value recorded, and the liquid discarded.

The silica gel was removed from the last impinger and immediately weighted.

An acetone sample was retained for blank analysis.

Particulate Analyses

The filters (Sample 1) and any loose fragments were desiccated for 24 hours and weighed to the nearest 0.1 milligram to a constant weight.

The acetone wash samples (Sample 2) were evaporated at ambient temperature and pressure in tared beakers, and desiccated to constant weight. All sample residue weights were adjusted by the acetone blank value.

The weight of the material collected on the glass fiber filter(s) plus the weight of the residue of the acetone nozzle/probe/front-half filter holder washes represents the "total" EPA Method 5 catch. Complete laboratory results are presented in Appendix B of this report.

Particle Size Sample Recovery and Analyses

The cascade impactor substrates and any loose fragments were carefully removed from their support plates with tweezers and placed in individual containers (petri dishes) for shipment to Weston's laboratory.

Each cascade impactor filter was fired at 525°C and pre-weighed to the nearest 0.1 milligram to constant weight at Weston's laboratory prior to on-site application. Subsequent to emissions exposure, the cascade impactor substrates, back-up filters and any loose fragments (Sample 4) were desiccated for 24 hours in the laboratory, and weighed to the nearest 0.1 milligram to constant weight.

York Services Corporation
• Energy and Environmental Systems Engineering
• Atmospheric Sciences Services
• Emission Measurement Services

One Research Drive
Stamford, Connecticut 06906
Telephone: (203) 325-1371
TWX: 710-474-3947

December 9, 1980

Mr. David Ralston
Roy F. Weston, Inc.
Weston Way
West Chester, PA 19380

Reference: TRACE ELEMENT ANALYSIS OF PARTICULATE SAMPLES

Dear Mr. Ralston:

The results of the trace element analyses of your particulate samples are enclosed. The samples are identified with the numbers listed below and correspond to your sample descriptions as follows:

#37700 - Exxon - Dryer Scrubber, Run 3, 10/1/79 WESTON #25455

Please contact Mr. Robert Bradley, if you have any questions.

Sincerely,

Maria Denaro

Maria Denaro
Project Scientist

MD/mdf
cc: Dennis Holzschuh
Roger Kniskern
Robert Bradley

Ledoux & Company
EST. 1880

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TELEX 134340

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REPORT OF ANALYSIS

No. 1014215

October 31, 1980

Our analysis of the sample of DUST SAMPLES

From York Research Corporation

Marked: Samples as below P.O. #3-5830

and submitted to us, shows:

PARTS PER MILLION

	37700
URANIUM -------------------	M
THORIUM -------------------	<1.
BISMUTH -------------------	<1.
LEAD ----------------------	<1.
THALLIUM ------------------	<1.
MERCURY -------------------	<2.
GOLD ----------------------	<1.
PLATINUM ------------------	<2.
IRIDIUM -------------------	<1.
OSMIUM --------------------	<2.
RHENIUM -------------------	10.
TUNGSTEN ------------------	<2.
TANTALUM ------------------	<1.
HAFNIUM -------------------	<2.
LUTETIUM ------------------	<0.2
YTTERBIUM -----------------	<1.
THULIUM -------------------	<0.2
ERBIUM --------------------	<1.
HOLMIUM -------------------	<0.2
DYSPROSIUM ----------------	<1.
TERBIUM -------------------	<0.2
GADOLINIUM ----------------	<1.
EUROPIUM ------------------	<1.
SAMARIUM ------------------	<1.
NEODYMIUM -----------------	10.
PRASEODYMIUM --------------	2.

* * *

To York Research Corporation

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October 31, 1980

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From York Research Corporation

Marked: Samples as below P.O. #3-5830

and submitted to us, shows:

	PARTS PER MILLION
	37700
CERIUM	5.
LANTHANUM	10.
BARIUM	10.
CESIUM	<1.
IODINE	<1.
TELLURIUM	<1.
ANTIMONY	<1.
TIN	<1.
INDIUM	<2.
CADMIUM	<2.
SILVER	<1.
PALLADIUM	<2.
RHODIUM	<1.
RUTHENIUM	<2.
MOLYBDENUM	20.
NIOBIUM	<2.
ZIRCONIUM	50.
YTTRIUM	20.
STRONTIUM	100.
RUBIDIUM	<0.5
BROMINE	<1.
SELENIUM	100.
ARSENIC	5.
GERMANIUM	<2.
GALLIUM	<1.
ZINC	2.

* * *

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BS

REPORT OF ANALYSIS

No. 1014215

October 31, 1980

Our analysis of the sample of DUST SAMPLES

From York Research Corporation

Marked: Samples as below P.O. #3-5830

and submitted to us, shows:

PARTS PER MILLION

	37700
COPPER	10.
NICKEL	20.
COBALT	5.
IRON	M
MANGANESE	100.
CHROMIUM	10.
VANADIUM	200
TITANIUM	100.
SCANDIUM	5.
CALCIUM	1000.
POTASSIUM	M
CHLORINE	50.
SULFUR	200.
PHOSPHORUS	20.
SILICON	M
ALUMINUM	M
MAGNESIUM	A
SODIUM	M
FLUORINE	1
CARBON	--
BORON	20.
BERYLLIUM	A
LITHIUM	2.

* * *

A. Matrix Interference

M. Signifies Major Constituent of Sample

To York Research Corporation

PAGE 12 of 12 PAGES

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DISCUSSION OF TEST RESULTS

Particulate test data and test result summaries are presented in Tables 1 through 20 of this report. Tables 21 through 44 list the particle size distribution of the particulate matter for all locations.

No unusual sampling difficulties or process operating problems were encountered during any of the test periods.

The amount of particulate matter discharged to the atmosphere from the Crusher Scrubber and the Fine Ore Bins Scrubber was low ($\leq$0.005 grains/dscf and $\leq$ 0.31 pounds/hour). The certified observer verified the particulate test findings at the Crusher and Fine Ore Bins Scrubbers, since no visible emissions were recorded emanating from either stack during the simultaneous observation periods.

The particulate matter discharged from the Dryer Scrubber for the three test runs averaged 0.068 grains/dscf and 1.5 pounds/hour. Opacity readings observed during the first test run on the Dryer Scrubber Exhaust were $\leq$ 5 percent. Readings of 15 percent or less were recorded during run two. A few 5 percent readings were observed during test three; the balance of the readings were zero's.

Uranium was the major solid constituent entering the yellowcake scrubber (~65 percent by weight). The uranium content of the yellowcake scrubber discharge was ~31 percent by weight. See Appendix B, Laboratory Reports, page B-50 for the results of a detailed radionuclide analysis performed on Run 1 yellowcake scrubber inlet and outlet test filters by Eberline-Albuquerque Laboratory.

The particulate removal efficiency of the Dryer Scrubber averaged 85.7 percent for the three test sets; efficiency of the Fine Ore Bins Scrubber averaged 40.3 percent; efficiency of the Crusher Scrubber averaged 53 percent.

During the preliminary velocity traverse at the Crusher Scrubber Outlet and the Fine Ore Bin Scrubber Outlet, it was determined that a high cyclonic flow condition existed. The yaw rotation angle at the null point ranged from 48° to 68°. Alternative methodology, as approved by the Administrator, was used at the outlet site to perform accurate sample and velocity traverses. The probe/nozzle/pitot tube assembly was rotated during sampling so that the planes of the openings of the nozzle and pitot tube were perpendicular to the oncoming gas stream at each traverse point based on information obtained during the preliminary traverse.

Due to high cyclonic flows, data obtained at the Crusher Scrubber Outlet and the Fine Ore Bin Scrubber Outlet was recalculated based on their respective inlet flows.

Fugitive emission tests were performed at the following locations, where the illumination was <10 foot candles (the level which is considered necessary for proper application of the method):

1. Fine Ore Bins Transfer Point (3 f.c.).
2. Barreling Enclosure Area (9 f.c.).

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Converse County, Wyoming

TABLE 1

Crusher Transfer Point Exhaust Duct

SUMMARY OF TEST DATA

Test Data			
Test Run Number	1	2	3
Test Date	9-27-79	9-27-79	9-27-79
Test Period	1735-1940	2058-2245	2355-0138
Sampling Data			
Sampling Duration, minutes	96.0	96.0	96.0
Nozzle Diameter, inches	0.242	0.242	0.242
Barometric Pressure, inches mercury	24.77	24.77	24.77
Average Orifice Pressure Differential, inches water	0.77	0.72	0.71
Average Dry Gas Temperature at Meter, °F	95.	88.	81.
Total Water Collected by Train, ml	9.5	10.0	14.7
Standard Volume of Water Vapor Collected, cubic feet	0.45	0.47	0.69
Dry Gas Meter Calibration Factor, dimensionless	0.995	0.995	0.995
Sample Volume at Meter Conditions, cubic feet	52.20	50.65	47.42
Sample Volume at Standard Conditions, cubic feet[1]	41.02	40.27	38.22
Gas Stream Composition			
CO_2, percent by volume	0.0	0.0	0.0
O_2, percent by volume	20.9	20.9	20.9
CO, percent by volume	0.0	0.0	0.0
N_2, percent by volume	79.1	79.1	79.1
Moisture in Gas Stream, percent by volume	1.1	1.2	1.8
Mole Fraction of Dry Gas	0.989	0.988	0.982
Molecular Weight of Dry Gas	28.97	28.97	28.97
Molecular Weight of Wet Gas	28.85	28.84	28.77
Gas Stream Velocity and Volumetric Flow			
Static Pressure, inches water	-0.13	-0.05	-0.05
Absolute Pressure, inches mercury	24.76	24.77	24.77
Average Temperature, °F	76.0	71.	67.
Pitot Tube Calibration Coefficient, dimensionless	0.855	0.855	0.855
Total Number of Traverse Points	8.0	8.0	8.0
Velocity at Actual Conditions, feet/second	27.6	26.4	25.4
Stack/duct Cross-Sectional Area, square feet	0.79	0.79	0.79
Volumetric Flow at Actual Conditions, cubic feet/minute	1300.	1240.	1200.
Volumetric Flow at Standard Conditions, cubic feet/minute[2]	1050.	1010.	970.
Percent Isokinetic	99.9	102.1	100.4

Unit/Process Operations Data — MONITORED BY GCA CORPORATION PERSONNEL

[1] Standard Conditions = 68°F (20°C) and 29.92 inches (760 mm) mercury, dry basis.

[2] Ibid.

EXXON MINERALS COMPANY, U.S.A.

Converse County, Wyoming

TABLE 2

Crusher Scrubber Inlet Duct

SUMMARY OF TEST DATA

Test Data			
Test Run Number	1	2	3
Test Date	9-27-79	9-27-79	9-27-79
Test Period	1750-1917	2120-2308	2400-0149
Sampling Data			
Sampling Duration, minutes	96.0	96.0	96.0
Nozzle Diameter, inches	0.250	0.250	0.250
Barometric Pressure, inches mercury	24.77	24.77	24.77
Average Orifice Pressure Differential, inches water	1.37	1.52	1.30
Average Dry Gas Temperature at Meter, °F	110.	100.	99.
Total Water Collected by Train, ml	14.4	19.0	9.0
Standard Volume of Water Vapor Collected, cubic feet	0.68	0.90	0.42
Dry Gas Meter Calibration Factor, dimensionless	0.995	0.995	0.995
Sample Volume at Meter Conditions, cubic feet	65.06	71.03	62.19
Sample Volume at Standard Conditions, cubic feet[1]	49.80	55.39	48.54
Gas Stream Composition			
CO_2, percent by volume	0.0	0.0	0.0
O_2, percent by volume	20.9	20.9	20.9
CO, percent by volume	0.0	0.0	0.0
N_2, percent by volume	79.1	79.1	79.1
Moisture in Gas Stream, percent by volume	1.3	1.6	0.9
Mole Fraction of Dry Gas	0.987	0.984	0.991
Molecular Weight of Dry Gas	28.97	28.97	28.97
Molecular Weight of Wet Gas	28.82	28.80	28.88
Gas Stream Velocity and Volumetric Flow			
Static Pressure, inches water	-1.9	-1.8	-1.7
Absolute Pressure, inches mercury	24.63	24.64	24.65
Average Temperature, °F	77.	71.	71.
Pitot Tube Calibration Coefficient, dimensionless	0.853	0.853	0.853
Total Number of Traverse Points	48.0	48.0	48.0
Velocity at Actual Conditions, feet/second	34.7	36.3	33.0
Stack/duct Cross-Sectional Area, square feet	4.28	4.28	4.28
Volumetric Flow at Actual Conditions, cubic feet/minute	8890.	9320.	8470.
Volumetric Flow at Standard Conditions, cubic feet/minute[2]	7100.	7510.	6870.
Percent Isokinetic	91.6	96.3	92.3

Unit/Process Operations Data — MONITORED BY GCA CORPORATION PERSONNEL

[1]Standard Conditions = 68°F (20°C) and 29.92 inches (760 mm) mercury, dry basis.

[2]Ibid.

EXXON MINERALS COMPANY, U.S.A.

Converse County, Wyoming

TABLE 3

Crusher - Grizzley Exhaust Duct

SUMMARY OF TEST DATA

Test Data			
Test Run Number	1	2	3
Test Date	9-27-79	9-27-79	9-27-79
Test Period	1751-1945	2112-2258	0001-0139
Sampling Data			
Sampling Duration, minutes	86.0	96.0	96.0
Nozzle Diameter, inches	0.241	0.241	0.241
Barometric Pressure, inches mercury	24.77	24.77	24.77
Average Orifice Pressure Differential, inches water	1.21	1.42	1.41
Average Dry Gas Temperature at Meter, °F	110.	122.	116.
Total Water Collected by Train, ml	11.6	8.4	8.7
Standard Volume of Water Vapor Collected, cubic feet	0.55	0.40	0.41
Dry Gas Meter Calibration Factor, dimensionless	0.994	0.994	0.994
Sample Volume at Meter Conditions, cubic feet	59.97	70.89	70.18
Sample Volume at Standard Conditions, cubic feet[1]	45.86	53.17	53.13
Gas Stream Composition			
CO_2, percent by volume	0.0	0.0	0.0
O_2, percent by volume	20.9	20.9	20.9
CO, percent by volume	0.0	0.0	0.0
N_2, percent by volume	79.1	79.1	79.1
Moisture in Gas Stream, percent by volume	1.2	0.7	0.8
Mole Fraction of Dry Gas	0.988	0.992	0.992
Molecular Weight of Dry Gas	28.97	28.97	28.97
Molecular Weight of Wet Gas	28.84	28.89	28.89
Gas Stream Velocity and Volumetric Flow			
Static Pressure, inches water	-1.1	-1.1	-1.1
Absolute Pressure, inches mercury	24.69	24.69	24.69
Average Temperature, °F	78.	75.	72.
Pitot Tube Calibration Coefficient, dimensionless	0.856	0.856	0.856
Total Number of Traverse Points	32.0	32.0	32.0
Velocity at Actual Conditions, feet/second	35.4	38.2	38.0
Stack/duct Cross-Sectional Area, square feet	1.40	1.40	1.40
Volumetric Flow at Actual Conditions, cubic feet/minute	2960.	3200.	3180.
Volumetric Flow at Standard Conditions, cubic feet/minute[2]	2370.	2580.	2590.
Percent Isokinetic	99.2	94.5	94.3

Unit/Process Operations Data — MONITORED BY GCA CORPORATION PERSONNEL

[1]Standard Conditions = 68°F (20°C) and 29.92 inches (760 mm) mercury, dry basis.
[2]Ibid.

EXXON MINERALS COMPANY, U.S.A.

Converse County, Wyoming

TABLE 4

Crusher Scrubber Outlet Duct

SUMMARY OF TEST DATA

Test Data			
Test Run Number	1	2	3
Test Date	9-27-79	9-27-79	9-27-79
Test Period	1800-1940	2119-2259	0005-0145
Sampling Data			
Sampling Duration, minutes	96.0	96.0	96.0
Nozzle Diameter, inches	0.250	0.250	0.250
Barometric Pressure, inches mercury	24.74	24.74	24.74
Average Orifice Pressure Differential, inches water	1.08	1.04	1.01
Average Dry Gas Temperature at Meter, °F	101.	102.	98.
Total Water Collected by Train, ml	15.0	14.0	10.5
Standard Volume of Water Vapor Collected, cubic feet	0.71	0.66	0.50
Dry Gas Meter Calibration Factor, dimensionless	0.986	0.986	0.986
Sample Volume at Meter Conditions, cubic feet	61.08	61.09	60.18
Sample Volume at Standard Conditions, cubic feet[1]	47.02	46.92	46.57
Gas Stream Composition			
CO_2, percent by volume	0.0	0.0	0.0
O_2, percent by volume	20.9	20.9	20.9
CO, percent by volume	0.0	0.0	0.0
N_2, percent by volume	79.1	79.1	79.1
Moisture in Gas Stream, percent by volume	1.5	1.4	1.1
Mole Fraction of Dry Gas	0.985	0.986	0.989
Molecular Weight of Dry Gas	28.97	28.97	28.97
Molecular Weight of Wet Gas	28.81	28.82	28.85
Gas Stream Velocity and Volumetric Flow			
Static Pressure, inches water	0.19	0.19	0.19
Absolute Pressure, inches mercury	24.75	24.75	24.75
Average Temperature, °F	74.	72.	71.
Pitot Tube Calibration Coefficient, dimensionless	0.855	0.855	0.855
Total Number of Traverse Points	48.0	48.0	48.0
Velocity at Actual Conditions, feet/second	31.9	31.4	30.8
Stack/duct Cross-Sectional Area, square feet	9.17	9.17	9.17
Volumetric Flow at Actual Conditions, cubic feet/minute	17,500.	17,300.	16,900.
Volumetric Flow at Standard Conditions, cubic feet/minute[2]	14,100.	14,000.	13,800.
Percent Isokinetic	93.2	94.0	94.8

Unit/Process Operations Data — MONITORED BY GCA CORPORATION PERSONNEL

[1] Standard Conditions = 68°F (20°C) and 29.92 inches (760 mm) mercury, dry basis.
[2] Ibid.

EXXON MINERALS COMPANY, U.S.A.

Converse County, Wyoming

TABLE 5

Fine Ore Bins Scrubber Outlet Duct

SUMMARY OF TEST DATA

Test Data			
Test Run Number	1	2	3
Test Date	9-28-79	9-28-79	9-28-79
Test Period	1855-2005	2122-2236	2331-0040
Sampling Data			
Sampling Duration, minutes	64.0	64.0	64.0
Nozzle Diameter, inches	0.183	0.183	0.183
Barometric Pressure, inches mercury	24.77	24.77	24.77
Average Orifice Pressure Differential, inches water	1.53	1.61	1.39
Average Dry Gas Temperature at Meter, °F	79.	72.	70.
Total Water Collected by Train, ml	11.1	10.0	8.6
Standard Volume of Water Vapor Collected, cubic feet	0.52	0.47	0.41
Dry Gas Meter Calibration Factor, dimensionless	0.995	0.995	0.995
Sample Volume at Meter Conditions, cubic feet	48.07	47.54	44.23
Sample Volume at Standard Conditions, cubic feet[1]	38.98	39.07	36.47
Gas Stream Composition			
CO_2, percent by volume	0.0	0.0	0.0
O_2, percent by volume	20.9	20.9	20.9
CO, percent by volume	0.0	0.0	0.0
N_2, percent by volume	79.1	79.1	79.1
Moisture in Gas Stream, percent by volume	1.3	1.2	1.1
Mole Fraction of Dry Gas	0.987	0.988	0.989
Molecular Weight of Dry Gas	28.97	28.97	28.97
Molecular Weight of Wet Gas	28.82	28.85	28.85
Gas Stream Velocity and Volumetric Flow			
Static Pressure, inches water	1.1	1.1	1.1
Absolute Pressure, inches mercury	24.85	24.85	24.85
Average Temperature, °F	69.	64.	63.
Pitot Tube Calibration Coefficient, dimensionless	0.850	0.850	0.850
Total Number of Traverse Points	32.0	32.0	32.0
Velocity at Actual Conditions, feet/second	63.5	65.0	58.9
Stack/duct Cross-Sectional Area, square feet	0.79	0.79	0.79
Volumetric Flow at Actual Conditions, cubic feet/minute	2990.	3060.	2770.
Volumetric Flow at Standard Conditions, cubic feet/minute[2]	2450.	2530.	2300.
Percent Isokinetic	107.0	103.6	106.4

Unit/Process Operations Data — MONITORED BY GCA CORPORATION PERSONNEL

[1] Standard Conditions = 68°F (20°C) and 29.92 inches (760 mm) mercury, dry basis.

[2] Ibid.

EXXON MINERALS COMPANY, U.S.A.

Converse County, Wyoming

TABLE 6

Fine Ore Bins Scrubber Inlet Duct

SUMMARY OF TEST DATA

Test Data			
Test Run Number	1	2	3
Test Date	9-28-79	9-28-79	9-28-79
Test Period	1848-2002	2125-2238	2328-0038
Sampling Data			
Sampling Duration, minutes	60.0	60.0	60.0
Nozzle Diameter, inches	0.188	0.188	0.188
Barometric Pressure, inches mercury	24.77	24.77	24.77
Average Orifice Pressure Differential, inches water	1.82	1.93	1.86
Average Dry Gas Temperature at Meter, °F	89.	84.	83.
Total Water Collected by Train, ml	8.0	8.0	8.0
Standard Volume of Water Vapor Collected, cubic feet	0.38	0.38	0.38
Dry Gas Meter Calibration Factor, dimensionless	0.998	0.998	0.998
Sample Volume at Meter Conditions, cubic feet	48.38	49.43	48.17
Sample Volume at Standard Conditions, cubic feet[1]	38.69	39.88	38.89
Gas Stream Composition			
CO_2, percent by volume	0.0	0.0	0.0
O_2, percent by volume	20.9	20.9	20.9
CO, percent by volume	0.0	0.0	0.0
N_2, percent by volume	79.1	79.1	79.1
Moisture in Gas Stream, percent by volume	1.0	0.9	1.0
Mole Fraction of Dry Gas	0.990	0.991	0.990
Molecular Weight of Dry Gas	28.97	28.97	28.97
Molecular Weight of Wet Gas	28.86	28.87	28.86
Gas Stream Velocity and Volumetric Flow			
Static Pressure, inches water	-7.2	-7.5	-7.1
Absolute Pressure, inches mercury	24.24	24.22	24.25
Average Temperature, °F	72.	64.	61.
Pitot Tube Calibration Coefficient, dimensionless	0.849	0.849	0.849
Total Number of Traverse Points	20.0	20.0	20.0
Velocity at Actual Conditions, feet/second	71.0	72.1	70.8
Stack/duct Cross-Sectional Area, square feet	0.55	0.55	0.55
Volumetric Flow at Actual Conditions, cubic feet/minute	2320.	2360.	2320.
Volumetric Flow at Standard Conditions, cubic feet/minute[2]	1850.	1910.	1880.
Percent Isokinetic	98.6	98.6	97.3

Unit/Process Operations Data — MONITORED BY GCA CORPORATION PERSONNEL

[1] Standard Conditions = 68°F (20°C) and 29.92 inches (760 mm) mercury, dry basis.
[2] Ibid.

EXXON MINERALS COMPANY, U.S.A.

Converse County, Wyoming

TABLE 7

Fine Ore Bins Hopper Exhaust Duct

SUMMARY OF TEST DATA

Test Data			
Test Run Number	1	2	3
Test Date	9-28-79	9-28-79	9-28-79
Test Period	1845-2000	2120-2222	2325-0031
Sampling Data			
Sampling Duration, minutes	64.0	64.0	64.0
Nozzle Diameter, inches	0.250	0.250	0.250
Barometric Pressure, inches mercury	24.76	24.77	24.77
Average Orifice Pressure Differential, inches water	1.53	1.55	1.33
Average Dry Gas Temperature at Meter, °F	101.	90.	85.
Total Water Collected by Train, ml	13.5	8.3	7.4
Standard Volume of Water Vapor Collected, cubic feet	0.64	0.39	0.35
Dry Gas Meter Calibration Factor, dimensionless	0.986	0.986	0.986
Sample Volume at Meter Conditions, cubic feet	48.07	45.09	46.37
Sample Volume at Standard Conditions, cubic feet[1]	37.11	35.47	36.84
Gas Stream Composition			
CO_2, percent by volume	0.0	0.0	0.0
O_2, percent by volume	20.9	20.9	20.9
CO, percent by volume	0.0	0.0	0.0
N_2, percent by volume	79.1	79.1	79.1
Moisture in Gas Stream, percent by volume	1.7	1.1	0.9
Mole Fraction of Dry Gas	0.983	0.989	0.991
Molecular Weight of Dry Gas	28.97	28.97	28.97
Molecular Weight of Wet Gas	28.79	28.85	28.87
Gas Stream Velocity and Volumetric Flow			
Static Pressure, inches water	-4.7	-4.2	-5.4
Absolute Pressure, inches mercury	24.41	24.46	24.37
Average Temperature, °F	70.	66.	64.
Pitot Tube Calibration Coefficient, dimensionless	0.855	0.855	0.855
Total Number of Traverse Points	16.0	16.0	16.0
Velocity at Actual Conditions, feet/second	37.2	36.9	34.3
Stack/duct Cross-Sectional Area, square feet	0.20	0.20	0.20
Volumetric Flow at Actual Conditions, cubic feet/minute	440.	430.	400.
Volumetric Flow at Standard Conditions, cubic feet/minute[2]	350.	350.	330.
Percent Isokinetic	95.4	99.0	100.9

Unit/Process Operations Data — MONITORED BY GCA CORPORATION PERSONNEL

[1] Standard Conditions = 68°F (20°C) and 29.92 inches (760 mm) mercury, dry basis.
[2] Ibid.

EXXON MINERALS COMPANY, U.S.A.

Converse County, Wyoming

TABLE 8

Dryer Scrubber Inlet Duct

SUMMARY OF TEST DATA

Test Data			
Test Run Number	1	2	3
Test Date	10-1-79	10-1-79	10-1-79
Test Period	0935-1045	1230-1325	1430-1545
Sampling Data			
Sampling Duration, minutes	64.0	64.0	64.0
Nozzle Diameter, inches	0.492	0.356	0.356
Barometric Pressure, inches mercury	23.98	23.98	23.98
Average Orifice Pressure Differential, inches water	3.30	0.82	0.59
Average Dry Gas Temperature at Meter, °F	132.	136.	139.
Total Water Collected by Train, ml	327.0	262.0	109.0
Standard Volume of Water Vapor Collected, cubic feet	15.39	12.33	5.13
Dry Gas Meter Calibration Factor, dimensionless	0.998	0.998	0.998
Sample Volume at Meter Conditions, cubic feet	67.13	35.87	31.58
Sample Volume at Standard Conditions, cubic feet[1]	48.33	25.46	22.28
Gas Stream Composition			
CO_2, percent by volume	1.7	1.7	1.7
O_2, percent by volume	4.6	4.5	4.6
CO, percent by volume	0.0	0.0	0.0
N_2, percent by volume	81.8	81.9	81.9
Moisture in Gas Stream, percent by volume	24.2	32.6	18.7
Mole Fraction of Dry Gas	0.758	0.674	0.813
Molecular Weight of Dry Gas	29.19	29.19	29.18
Molecular Weight of Wet Gas	26.49	25.54	27.09
Gas Stream Velocity and Volumetric Flow			
Static Pressure, inches water	-0.36	-0.34	-0.46
Absolute Pressure, inches mercury	23.95	23.96	23.95
Average Temperature, °F	595.	595.	595.
Pitot Tube Calibration Coefficient, dimensionless	0.849	0.849	0.849
Total Number of Traverse Points	16.0	16.0	16.0
Velocity at Actual Conditions, feet/second	30.4	33.0	28.0
Stack/duct Cross-Sectional Area, square feet	1.03	1.03	1.03
Volumetric Flow at Actual Conditions, cubic feet/minute	1880.	2040	1730.
Volumetric Flow at Standard Conditions, cubic feet/minute[2]	570.	550.	560.
Percent Isokinetic	103.1	107.7	92.1

Unit/Process Operations Data — MONITORED BY GCA CORPORATION PERSONNEL

[1] Standard Conditions = 68°F (20°C) and 29.92 inches (760 mm) mercury, dry basis.
[2] Ibid.

EXXON MINERALS COMPANY, U.S.A.

Converse County, Wyoming

TABLE 9

Dryer Scrubber Outlet Duct

SUMMARY OF TEST DATA

Test Data			
Test Run Number	1	2	3
Test Date	10-1-79	10-1-79	10-1-79
Test Period	0939-1052	1226-1339	1439-1550
Sampling Data			
Sampling Duration, minutes	64.0	64.0	64.0
Nozzle Diameter, inches	0.235	0.235	0.235
Barometric Pressure, inches mercury	23.98	23.98	23.98
Average Orifice Pressure Differential, inches water	2.85	2.50	2.81
Average Dry Gas Temperature at Meter, °F	107.	119.	119.
Total Water Collected by Train, ml	144.5	170.5	118.5
Standard Volume of Water Vapor Collected, cubic feet	6.80	8.03	5.58
Dry Gas Meter Calibration Factor, dimensionless	0.998	0.998	0.998
Sample Volume at Meter Conditions, cubic feet	65.58	62.70	66.38
Sample Volume at Standard Conditions, cubic feet[1]	49.38	46.05	48.79
Gas Stream Composition			
CO_2, percent by volume	0.7	0.7	0.7
O_2, percent by volume	5.7	5.7	5.7
CO, percent by volume	0.0	0.0	0.0
N_2, percent by volume	80.5	80.5	80.5
Moisture in Gas Stream, percent by volume	12.1	14.8	10.3
Mole Fraction of Dry Gas	0.879	0.852	0.897
Molecular Weight of Dry Gas	28.97	28.99	28.98
Molecular Weight of Wet Gas	27.64	27.36	27.85
Gas Stream Velocity and Volumetric Flow			
Static Pressure, inches water	0.9	1.03	1.00
Absolute Pressure, inches mercury	24.05	24.06	24.05
Average Temperature, °F	131.	137.	125.
Pitot Tube Calibration Coefficient, dimensionless	0.855	0.855	0.855
Total Number of Traverse Points	16.0	16.0	16.0
Velocity at Actual Conditions, feet/second	69.5	64.9	68.0
Stack/duct Cross-Sectional Area, square feet	0.99	0.99	0.99
Volumetric Flow at Actual Conditions, cubic feet/minute	4140.	3870.	4060.
Volumetric Flow at Standard Conditions, cubic feet/minute[2]	2620.	2340.	2640.
Percent Isokinetic	97.3	101.3	95.3
Unit/Process Operations Data	MONITORED BY GCA CORPORATION PERSONNEL		

[1]Standard Conditions = 68°F (20°C) and 29.92 inches (760 mm) mercury, dry basis.

[2]Ibid.

EXXON MINERALS COMPANY, U.S.A.

Converse County, Wyoming

TABLE 10

Packaging Area Exhaust Duct

SUMMARY OF TEST DATA

Test Data			
Test Run Number	1	2	3
Test Date	10-1-79	10-1-79	10-1-79
Test Period	0915-1045	1430-1540	1435-1545
Sampling Data			
Sampling Duration, minutes	64.0	64.0	64.0
Nozzle Diameter, inches	0.183	0.183	0.183
Barometric Pressure, inches mercury	23.98	23.98	23.98
Average Orifice Pressure Differential, inches water	2.70	2.38	2.49
Average Dry Gas Temperature at Meter, °F	106.	115.	120.
Total Water Collected by Train, ml	17.0	20.2	15.4
Standard Volume of Water Vapor Collected, cubic feet	0.80	0.95	0.73
Dry Gas Meter Calibration Factor, dimensionless	1.006	1.006	1.006
Sample Volume at Meter Conditions, cubic feet	63.86	61.15	63.01
Sample Volume at Standard Conditions, cubic feet[1]	48.44	45.64	46.60
Gas Stream Composition			
CO_2, percent by volume	0.0	0.0	0.0
O_2, percent by volume	20.9	20.9	20.9
CO, percent by volume	0.0	0.0	0.0
N_2, percent by volume	79.1	79.1	79.1
Moisture in Gas Stream, percent by volume	1.6	2.0	1.5
Mole Fraction of Dry Gas	0.984	0.979	0.985
Molecular Weight of Dry Gas	28.97	28.97	28.97
Molecular Weight of Wet Gas	28.79	28.75	28.80
Gas Stream Velocity and Volumetric Flow			
Static Pressure, inches water	2.4	2.5	2.3
Absolute Pressure, inches mercury	24.16	24.16	24.15
Average Temperature, °F	98.	105.	120.
Pitot Tube Calibration Coefficient, dimensionless	0.855	0.855	0.855
Total Number of Traverse Points	16.0	16.0	16.0
Velocity at Actual Conditions, feet/second	92.6	88.0	91.1
Stack/duct Cross-Sectional Area, square feet	0.21	0.21	0.21
Volumetric Flow at Actual Conditions, cubic feet/minute	1180.	1120.	1160.
Volumetric Flow at Standard Conditions, cubic feet/minute[2]	890.	830.	860.
Percent Isokinetic	99.3	100.1	99.2

Unit/Process Operations Data — MONITORED BY GCA CORPORATION PERSONNEL

[1]Standard Conditions = 68°F (20°C) and 29.92 inches (760 mm) mercury, dry basis.
[2]Ibid.

EXXON MINERALS COMPANY, U.S.A.

Converse County, Wyoming

Table 11

Crusher Transfer Point Exhaust Duct

Summary of Test Results

Test Data			
Test Number	1	2	3
Test Date	9/27/79	9/27/79	9/27/79
Test Time	1735-1940	2058-2245	2355-0138
Gas Flow			
Standard Cubic Feet/minute, dry	1,050.	1,010.	970.
Acutal Cubic Feet/minute, wet	1,300.	1,240.	1,200.
Particulates			
Nozzle and Front Half Filter Holder Catch Fraction, g	0.0044	0.0060	0.0306
Filter Catch Fraction, g	0.0019	0.0026	0.0010
Total Particulates, g	0.0063	0.0086	0.0316
Particulate Emissions[1]			
Grains/dry standard cubic foot[2]	0.002	0.003	0.013
Pounds/hour	0.021	0.029	0.107
Visible Emissions[3]			
5 percent opacity, minutes observed	0	0	0
0 percent opacity, minutes observed	118	102	98
Unobserved readings, minutes observed	0	0	0

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[1] Based on Total Particulates captured by train.

[2] Standard Conditions = 68°F and 29.92 inches mercury.

[3] Opacity results listed are in minutes of the observed reading during the test period.

EXXON MINERALS COMPANY, U.S.A.

Converse County, Wyoming

Table 12

Crusher Scrubber Inlet Duct

Summary of Test Results

Test Data			
Test Number	1	2	3
Test Date	9/27/79	9/27/79	9/27/79
Test Time	1750-1917	2120-2308	2400-0149
Gas Flow			
Standard Cubic Feet/minute, dry	7,100.	7,510.	6,870.
Actual Cubic Feet/minute, wet	8,890.	9,320.	8,470.
Particulates			
Nozzle and Front Half Filter Holder Catch Fraction, g	0.0256	0.0157	0.0111
Filter Catch Fraction, g	0.0137	0.0156	0.0071
Total Particulates, g	0.0393	0.0313	0.0182
Particulate Emissions[1]			
Grains/dry standard cubic foot[2]	0.012	0.009	0.006
Pounds/hour	0.742	0.562	0.341

[1]Based on Total Particulates captured by train.

[2]Standard Conditions = 68^{o}F and 29.92 inches mercury.

EXXON MINERALS COMPANY, U.S.A.

Converse County, Wyoming

Table 13

Crusher-Grizzley Exhaust Duct

Summary of Test Results

Test Data			
Test Number	1	2	3
Test Date	9/27/79	9/27/79	9/27/79
Test Time	1751-1945	2112-2258	0001-0139
Gas Flow			
Standard Cubic Feet/minute, dry	2,370.	2,580.	2,590.
Actual Cubic Feet/minute, wet	2,960.	3,200.	3,180.
Particulates			
Nozzle and Front Half Filter Holder Catch Fraction, g	0.0144	0.0265	0.0403
Filter Catch Fraction, g	0.0102	0.0091	0.0059
Total Particulates, g	0.0246	0.0356	0.0462
Particulate Emissions[1]			
Grains/dry standard cubic foot[2]	0.008	0.010	0.013
Pounds/hour	0.168	0.229	0.298
Visible Emissions[3]			
5 percent opacity, minutes observed	0	0	0
0 percent opacity, minutes observed	76	102	96
Unobserved readings, minutes observed	0	0	0

[1] Based on Total Particulates captured by train.

[2] Standard Conditions = 68°F and 29.92 inches mercury.

[3] Opacity results listed are in minutes of the observed reading during the test period.

EXXON MINERALS COMPANY, U.S.A.

Converse County, Wyoming

Table 14

Crusher Scrubber Outlet Duct

Summary of Test Results

Test Data			
Test Number	1	2	3
Test Date	9/27/79	9/27/79	9/27/79
Test Time	1800-1940	2119-2259	0005-0145
Gas Flow			
Standard Cubic Feet/minute, dry	14,100.	14,000.	13,800.
Actual Cubic Feet/minute, wet	17,500.	17,300.	16,900.
Particulates			
Nozzle and Front Half Filter Holder Catch Fraction, g	0.0060	0.0138	0.0101
Filter Catch Fraction, g	0.0013	0.0010	0.0013
Total Particulages, g	0.0073	0.0148	0.0114
Particulate Emissions[1]			
Grains/dry standard cubic foot[2]	0.002	0.005	0.004
Pounds/hour[3]	0.146	0.314	0.223
Scrubber Particulate Removal Efficiency, percent	80.3	44.1	34.6
Visible Emissions[4]			
5 percent opacity, minutes observed	0	---	---
0 percent opacity, minutes observed	69	---	---
Unobserved readings, minutes observed	0	---	---

[1] Based on Total Particulates captured by train.

[2] Standard Conditions = 68°F and 29.92 inches mercury.

[3] Due to high cyclonic flows at the outlet, emissions were calculated using inlet flows.

[4] Opacity results listed are in minutes of the observed reading during the test period.

EXXON MINERALS COMPANY, U.S.A.

Converse County, Wyoming

Table 15

Fine Ore Bins Scrubber Outlet Duct

Summary of Test Results

Test Data			
Test Number	1	2	3
Test Date	9/28/79	9/28/79	9/28/79
Test Time	1855-2005	2122-2236	2331-0040
Gas Flow			
Standard Cubic Feet/minute, dry	2,450.	2,530.	2,300.
Actual Cubic Feet/minute, wet	2,990.	3,060.	2,770.
Particulates			
Nozzle and Front Half Filter Holder Catch Fraction, g	0.0056	0.0049	0.0042
Filter Catch Fraction, g	0.0011	0.0014	0.0015
Total Particulates, g	0.0067	0.0063	0.0057
Particulate Emissions[1]			
Grains/dry standard cubic foot[2]	0.003	0.002	0.002
Pounds/hour[3]	0.042	0.041	0.039
Scrubber Particulate Removal Efficiency, percent	52.8	28.1	40.0
Visible Emissions[4]			
5 percent opacity, minutes observed	0	---	---
0 percent opacity, minutes observed	60	---	---
Unobserved readings, minutes observed	0	---	---

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[1]Based on Total Particulates captured by train.

[2]Standard Conditions = 68°F and 29.92 inches mercury.

[3]Due to high cyclonic flows at the outlet, emissions were calculated using inlet flows.

[4]Opacity results listed are in minutes of the observed reading during the test period.

EXXON MINERALS COMPANY, U.S.A.

Converse County, Wyoming

Table 16

Fine Ore Bins Scrubber Inlet Duct

Summary of Test Results

Test Data			
Test Number	1	2	3
Test Date	9/28/79	9/28/79	9/28/79
Test Time	1848-2002	2125-2238	2328-0038
Gas Flow			
Standard Cubic Feet/minute, dry	1,850.	1,910.	1,880.
Actual Cubic Feet/minute, wet	2,320.	2,360.	2,320.
Particulates			
Nozzle and Front Half Filter Holder Catch Fraction, g	0.0103	0.0067	0.0086
Filter Catch Fraction, g	0.0039	0.0023	0.0016
Total Particulates, g	0.0142	0.0090	0.0102
Particulate Emissions[1]			
Grains/dry standard cubic foot[2]	0.006	0.003	0.004
Pounds/hour	0.089	0.057	0.065
Visible Emissions[3]			
5 percent opacity, minutes observed	0	0	0
0 percent opacity, minutes observed	75	75	67
Unobserved readings, minutes observed	0	0	0

[1]Based on Total Particulates captured by train.

[2]Standard Conditions = 68°F and 29.92 inches mercury.

[3]Opacity results listed are in minutes of the observed reading during the test period.

EXXON MINERALS COMPANY, U.S.A.

Converse County, Wyoming

Table 17

Fine Ore Bins Hopper Exhaust Duct

Summary of Test Results

Test Data			
Test Number	1	2	3
Test Date	9/28/79	9/28/79	9/28/79
Test Time	1845-2000	2120-2222	2325-0031
Gas Flow			
Standard Cubic Feet/minute, dry	350.	350.	330.
Actual Cubic Feet/minute, wet	440.	430.	400.
Particulates			
Nozzle and Front Half Filter Holder Catch Fraction, g	0.0065	0.0052	0.0057
Filter Catch Fraction, g	0.0012	0.0009	0.0014
Total Particulates, g	0.0077	0.0061	0.0071
Particulate Emissions[1]			
Grains/dry standard cubic foot[2]	0.003	0.003	0.003
Pounds/hour	0.010	0.008	0.008
Visible Emissions[3]			
5 percent opacity, minutes observed	0	0	0
0 percent opacity, minutes observed	82	40	65
Unobserved readings, minutes observed	0	0	0

[1] Based on Total Particulates captured by train.

[2] Standard Conditions = 68°F and 29.92 inches mercury.

[3] Opacity results listed are in minutes of the observed reading during the test period.

EXXON MINERALS COMPANY, U.S.A.

Converse County, Wyoming

Table 18

Dryer Scrubber Inlet Duct

Summary of Test Results

Test Data			
Test Number	1	2	3
Test Date	10/1/79	10/1/79	10/1/79
Test Time	0935-1045	1230-1325	1430-1545
Gas Flow			
Standard Cubic Feet/minute, dry	570.	550.	560.
Actual Cubic Feet/minute, wet	1880.	2,040.	1,730.
Particulates			
Nozzle and Front Half Filter Holder Catch Fraction, g	1.2438	0.7097	0.4629
Filter Catch Fraction, g	6.6719	4.7913	0.8368
Total Particulates, g	7.9157	5.5010	1.2997
Particulate Emissions[1]			
Grains/dry standard cubic foot[2]	2.527	3.335	0.900
Pounds/hour	12.40	15.75	4.35

[1] Based on Total Particulates captured by train.

[2] Standard Conditions = 68°F and 29.92 inches mercury.

EXXON MINERALS COMPANY, U.S.A.

Converse County, Wyoming

Table 19

Dryer Scrubber Outlet Duct

Summary of Test Results

Test Data			
Test Number	1	2	3
Test Date	10/1/79	10/1/79	10/1/79
Test Time	0939-1052	1226-1339	1439-1550
Gas Flow			
Standard Cubic Feet/minute, dry	2,620.	2,340.	2,640.
Actual Cubic Feet/minute, wet	4,140.	3,870.	4,060.
Particulates			
Nozzle and Front Half Filter Holder Catch Fraction, g	0.2875	0.0952	0.0219
Filter Catch Fraction, g	0.1135	0.0563	0.0628
Total Particulates, g	0.4010	0.1515	0.0847
Particulate Emissions[1]			
Grains/dry standard cubic foot[2]	0.125	0.051	0.027
Pounds/hour	2.81	1.02	0.61
Scrubber Particulate Removal Efficiency, percent	77.6	93.5	86.0
Visible Emissions[3]			
15 percent opacity, minutes observed	0	3/4	0
10 percent opacity, minutes observed	0	7-3/4	0
5 percent opacity, minutes observed	8-1/2	36-3/4	3/4
0 percent opacity, minutes observed	55-1/2	25-1/2	64-1/4
Unobserved readings, minutes observed	0	0	0

[1] Based on Total Particulates captured by train.

[2] Standard Conditions = 68°F and 29.92 inches mercury.

[3] Opacity results listed are in minutes of the observed reading during the test period.

EXXON MINERALS COMPANY, U.S.A.

Converse County, Wyoming

Table 20

Packaging Area Exhaust Duct

Summary of Test Results

Test Data			
Test Number	1	2	3
Test Date	10/1/79	10/1/79	10/1/79
Test Time	0915-1045	1430-1540	1435-1545
Gas Flow			
Standard Cubic Feet/minute, dry	890.	830.	860.
Actual Cubic Feet/minute, wet	1,180.	1,120.	1,160.
Particulates			
Nozzle and Front Half Filter Holder Catch Fraction, g	0.0113	0.0071	0.0087
Filter Catch Fraction, g	0.0093	0.0031	0.0010
Total Particulates, g	0.0206	0.0102	0.0097
Particulate Emissions[1]			
Grains/dry standard cubic foot[2]	0.007	0.003	0.003
Pounds/hour	0.050	0.025	0.023
Visible Emissions[3]			
5 percent opacity, minutes observed	0	0	0
0 percent opacity, minutes observed	64	63	70
Unobserved readings, minutes observed	0	0	0

---

[1] Based on Total Particulates captured by train.

[2] Standard Conditions = 68°F and 29.92 inches mercury.

[3] Opacity results listed are in minutes of the observed reading during the test period.

EXXON MINERALS COMPANY, U.S.A.

Converse County, Wyoming

TABLE 21

PARTICLE SIZE DISTRIBUTION

Run: 1

Date: September 28, 1979

Location: Exxon Minerals Company, U.S.A.

Sampling Location: Crusher Transfer Point Exhaust Duct

Traverse Point No. Sampled: X-3

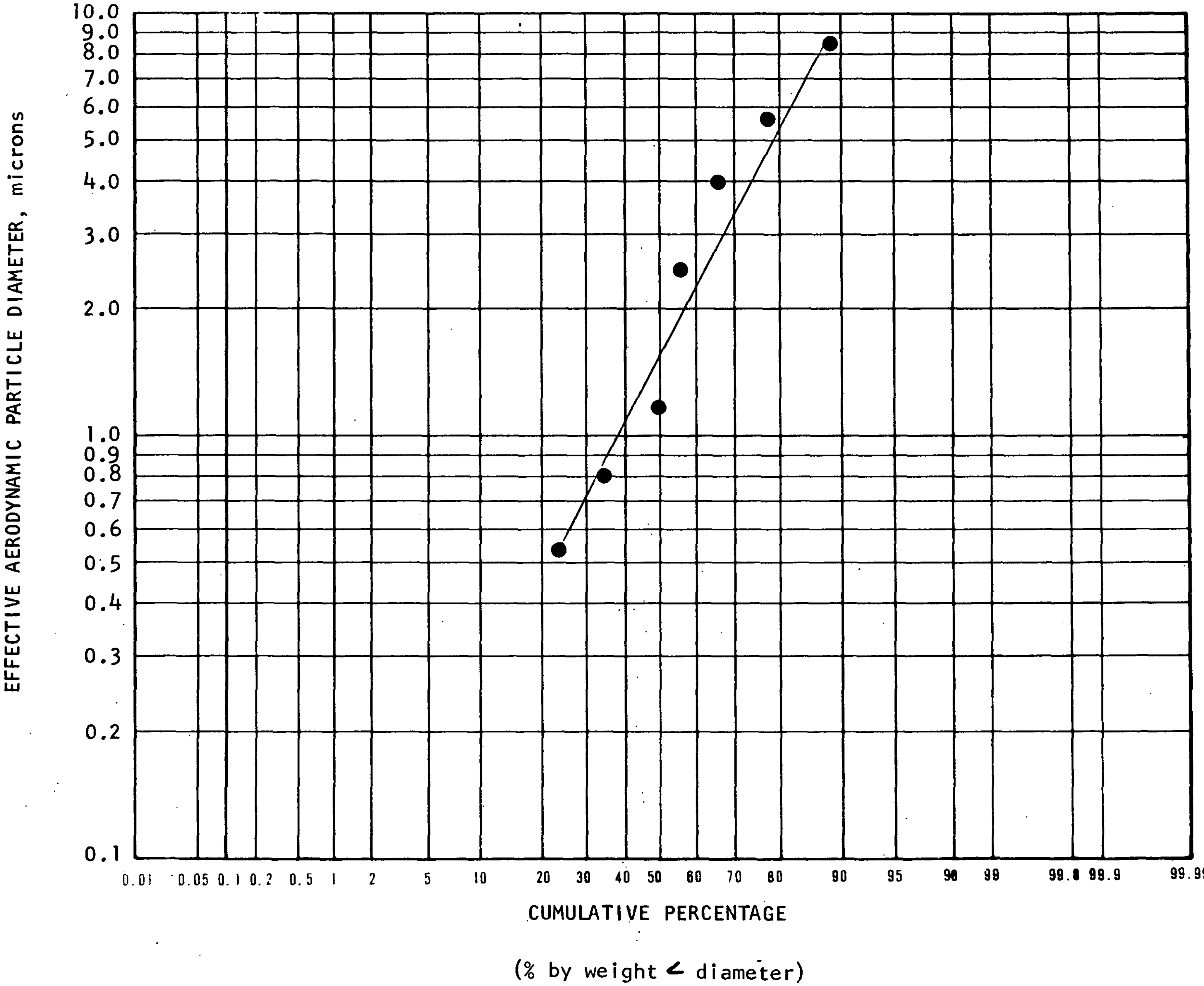
P_{bar} (in. Hg.)	24.77
Stack Temp (^{o}F)	72.
Sample Time (min)	75.
Sample Volume (cf)	43.65
Moisture (% H_2O)	1.1
Meter Tem0 (^{o}F)	83.
Flow Setting, ΔH (in. H_2O)	0.97
Nozzle Diameter (in.)	0.242

Sample Flow Rate (at stack conditions): 0.62 cfm

Plate No.	Net Wt. (mg)	%	Cumulative %	EAD (Microns)
1	0.5	11.9	100.0	13.5
2	0.4	9.5	88.1	8.55
3	0.5	11.9	78.6	5.65
4	0.4	9.5	66.7	4.0
5	0.3	7.1	57.2	2.5
6	0.6	14.3	50.1	1.3
7	0.5	11.9	35.8	0.80
8	0.4	9.5	23.9	0.54
Backup Filter	0.6	14.3	14.3	-----
TOTAL	4.2			

Crusher Transfer Point Exhaust Duct

Run 1



EXXON MINERALS COMPANY, U.S.A.

Converse County, Wyoming

TABLE 22

PARTICLE SIZE DISTRIBUTION

Run: 2

Date: September 28, 1979

Location: Exxon Minerals Company, U.S.A.

Sampling Location: Crusher Transfer Point Exhaust Duct

Traverse Point No. Sampled: X-4

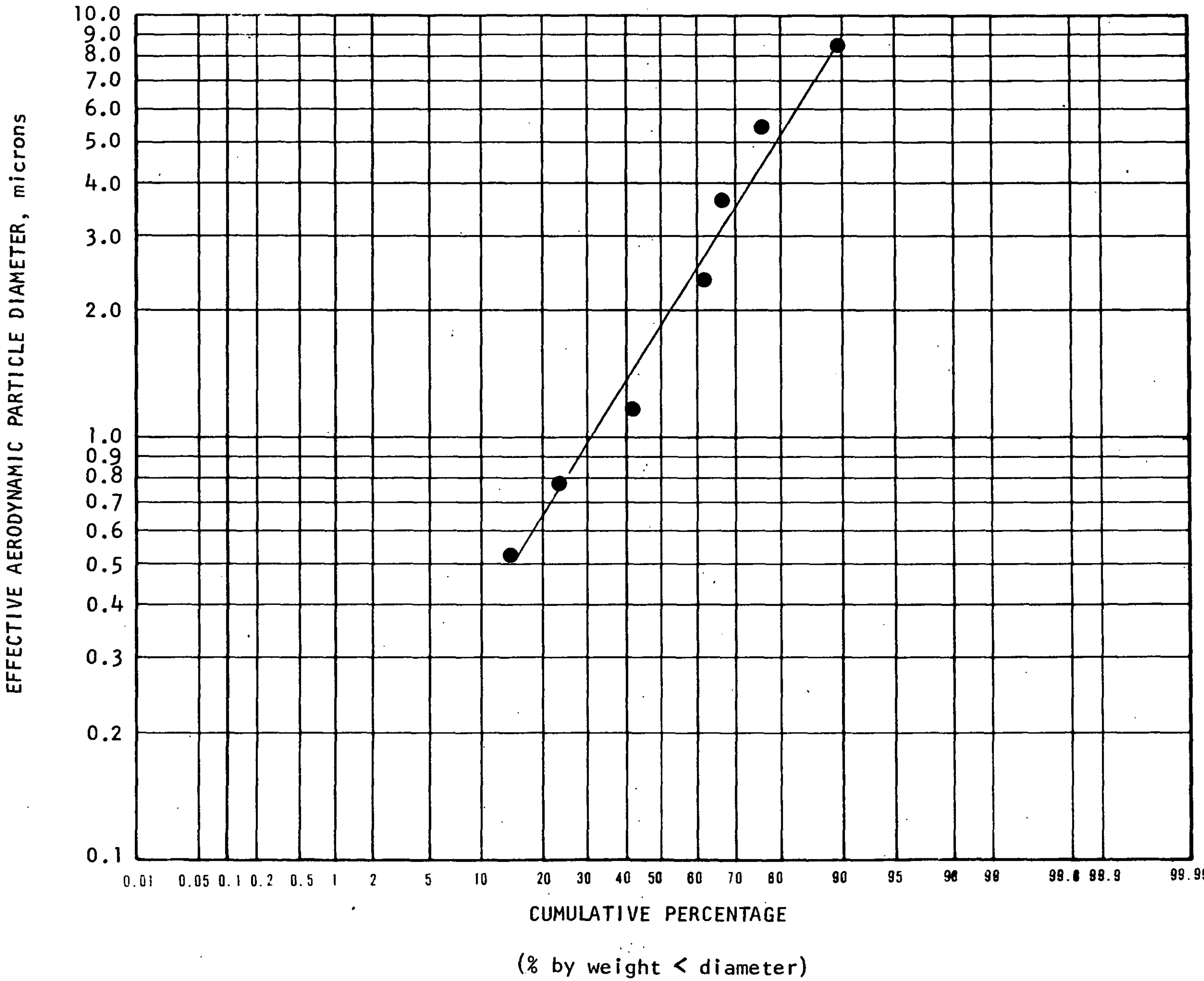
P_{bar} (in. Hg.)	24.76
Stack Temp (°F)	72.
Sample Time (min)	90.
Sample Volume (cf)	57.87
Moisture (% H_2O)	1.2
Meter Tem0 (°F)	91.
Flow Setting, ΔH (in. H_2O)	1.05
Nozzle Diameter (in.)	0.242

Sample Flow Rate (at stack conditions): 0.63 cfm

Plate No.	Net Wt. (mg)	%	Cumulative %	EAD (Microns)
1	0.6	10.3	100.0	13.2
2	0.8	13.8	89.7	8.4
3	0.5	8.6	75.9	5.5
4	0.3	5.2	67.3	3.8
5	1.2	20.7	62.1	2.5
6	1.0	17.2	41.4	1.25
7	0.5	8.6	24.2	0.78
8	0.6	10.3	15.6	0.52
Backup Filter	0.3	5.2	5.2	------
TOTAL	5.8			

Crusher Transfer Point Exhaust Duct

Run 2



EXXON MINERALS COMPANY, U.S.A.

Converse County, Wyoming

TABLE 23

PARTICLE SIZE DISTRIBUTION

Run: 3

Date: September 28, 1979

Location: Exxon Minerals Company, U.S.A.

Sampling Location: Crusher Transfer Point Exhaust Duct

Traverse Point No. Sampled: X-4

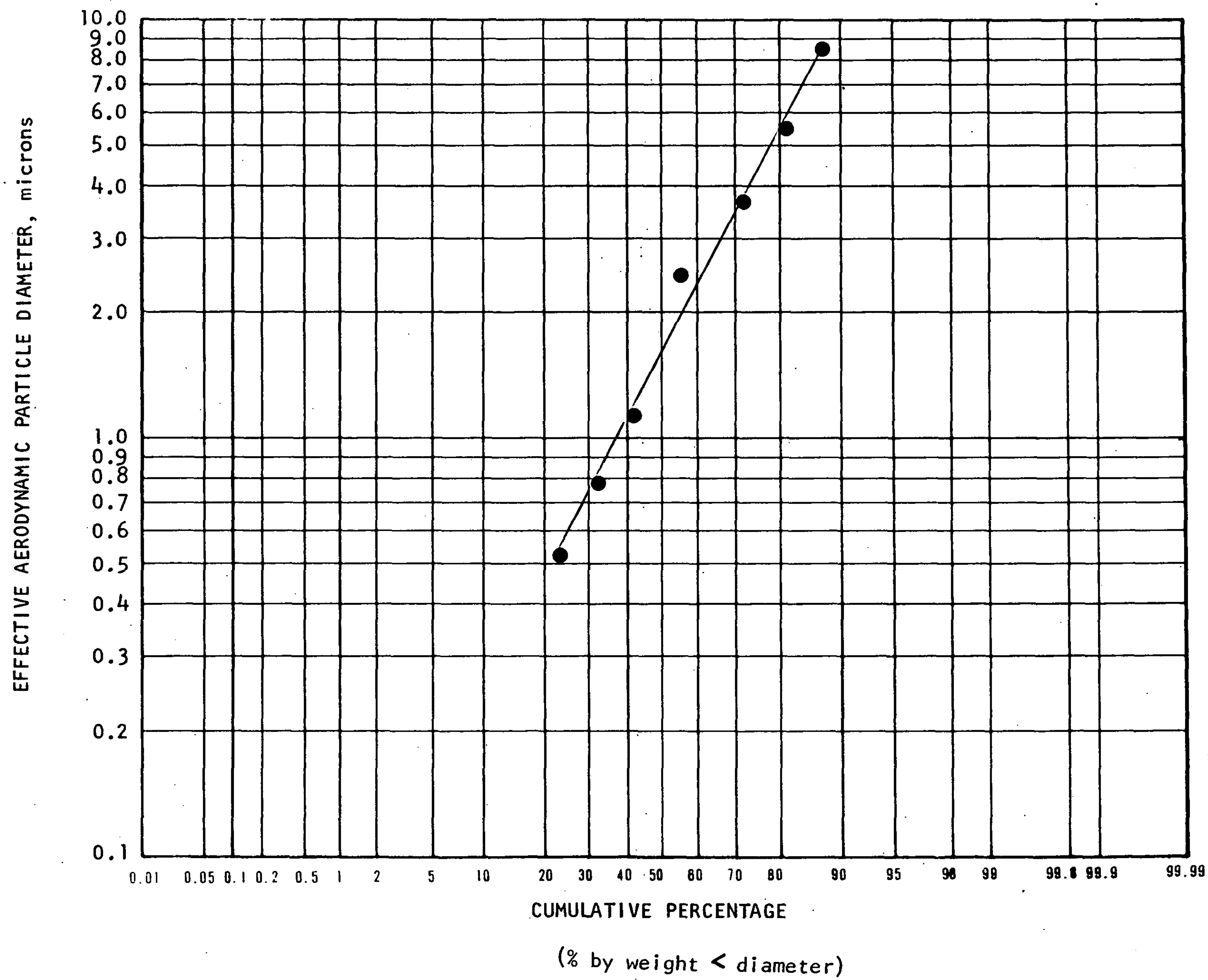
P_{bar} (in. Hg.)	24.76
Stack Temp (^oF)	72.
Sample Time (min)	90.
Sample Volume (cf)	56.83
Moisture (% H_2O)	1.8
Meter TemO (^oF)	88.
Flow Setting, ΔH (in. H_2O)	1.05
Nozzle Diameter (in.)	0.242

Sample Flow Rate (at stack conditions): 0.63 cfm

Plate No.	Net Wt. (mg)	%	Cumulative %	EAD (Microns)
1	0.7	12.7	100.0	13.2
2	0.3	5.5	87.3	8.4
3	0.5	9.1	81.8	5.5
4	0.7	12.7	72.7	3.8
5	1.0	18.2	60.0	2.5
6	0.5	9.1	41.8	1.25
7	0.5	9.1	32.7	0.78
8	0.7	12.7	23.6	0.52
Backup Filter	0.6	10.9	10.9	------
TOTAL	5.5			

Crusher Transfer Point Exhaust Duct

Run 3



EXXON MINERALS COMPANY, U.S.A.

Converse County, Wyoming

Table 24

PARTICLE SIZE DISTRIBUTION

Run: 1

Date: September 27, 1979

Location: Exxon Mineral Company

Sampling Location: Crusher Scrubber Inlet Duct

Traverse Point No. Sampled: X-16

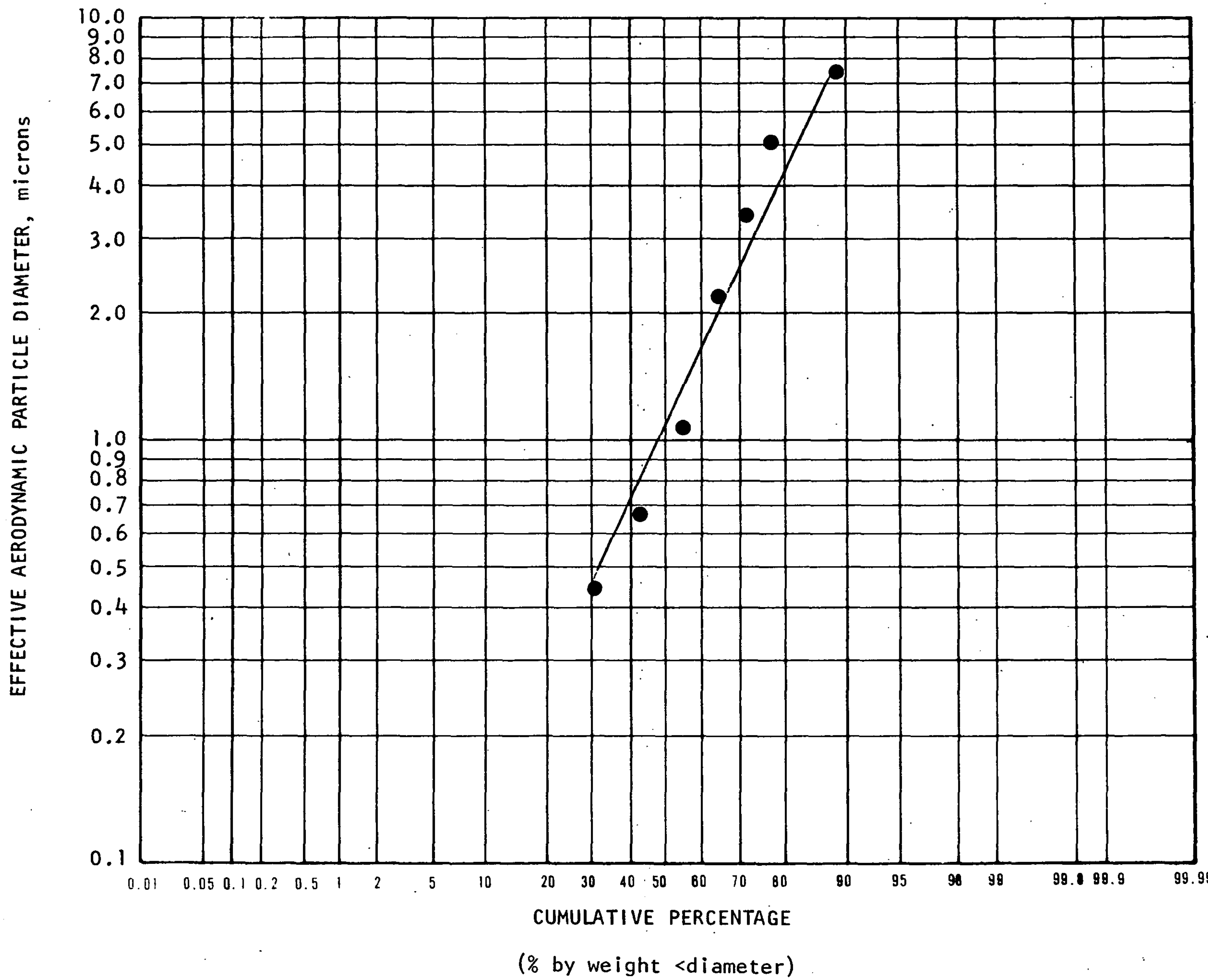
P_{bar} (in. Hg.)	24.75
Stack Temp (°F)	73.
Sample Time (min)	60.
Sample Volume (cf)	49.17
Moisture (% H_2O)	1.3
Meter Temp (°F)	94.
Flow Setting, ΔH (in. H_2O)	1.8
Nozzle Diameter (in.)	0.250

Sample Flow Rate (at stack conditions): 0.81 cfm

Plate No.	Net Wt. (mg)	%	Cumulative %	EAD (Microns)
1	1.0	12.0	100.0	11.7
2	0.8	9.6	88.0	7.5
3	0.6	7.2	78.3	5.0
4	0.5	6.0	71.1	3.5
5	0.8	9.6	65.1	2.2
6	1.0	12.1	55.5	1.1
7	1.0	12.1	43.4	0.67
8	1.3	15.7	31.3	0.45
Backup Filter	1.3	15.7	15.7	
TOTAL	8.3			

CRUSHER SCRUBBER INLET DUCT

Run 1



EXXON MINERALS COMPANY, U.S.A.

Converse County, Wyoming

Table 25

PARTICLE SIZE DISTRIBUTION

Run: 2

Date: September 28, 1979

Location: Exxon Minerals Company, U.S.A.

Sampling Location: Crusher Scrubber Inlet Duct

Traverse Point No. Sampled: X-16

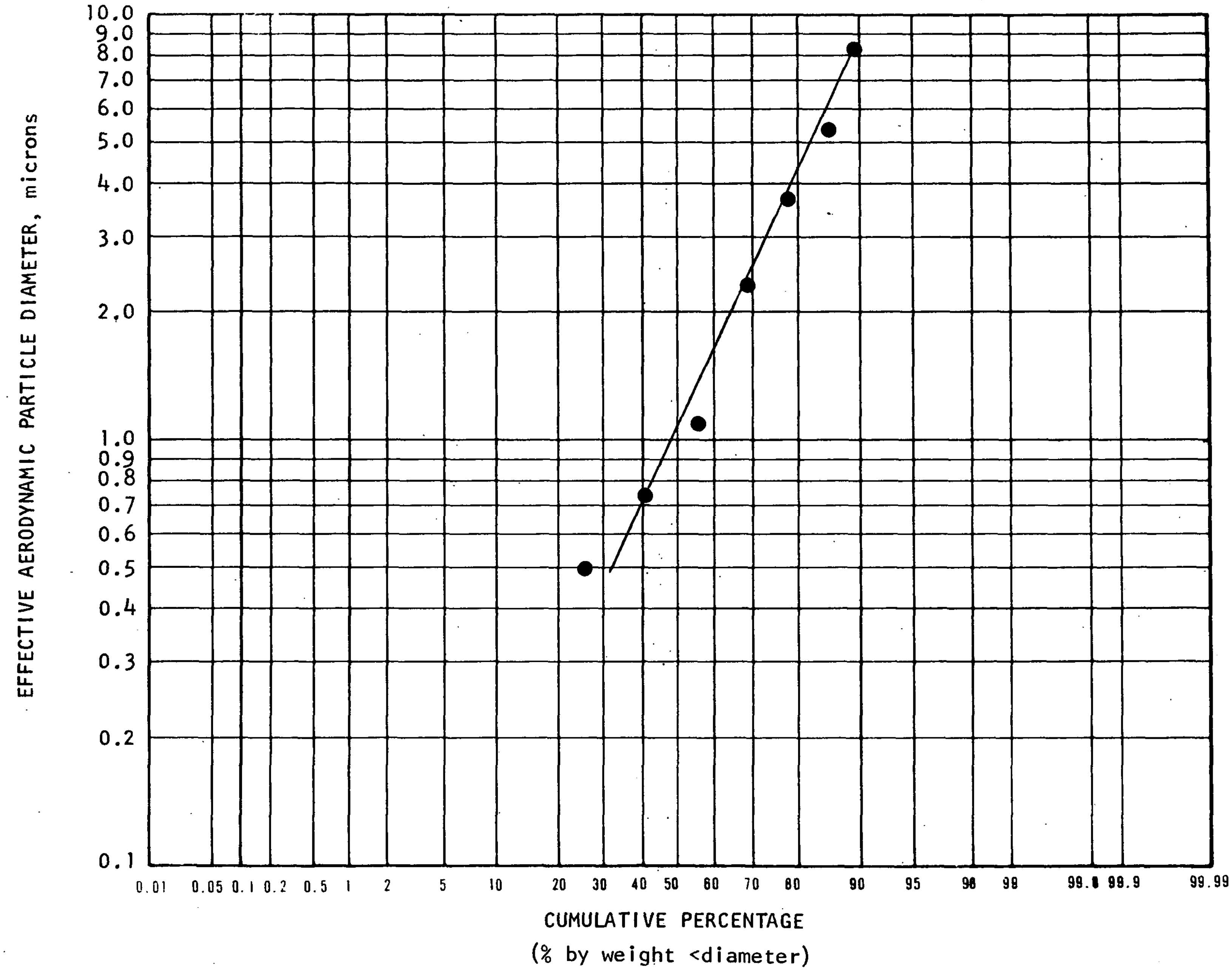
P_{bar} (in. Hg.)	24.75
Stack Temp (°F)	73.
Sample Time (min)	70.
Sample Volume (cf)	47.84
Moisture (% H_2O)	1.6
Meter Temp (°F)	80.
Flow Setting, ΔH (in. H_2O)	1.8
Nozzle Diameter (in.)	0.250

Sample Flow Rate (at stack conditions): 0.69 cfm

Plate No.	Net Wt. (mg)	%	Cumulative %	EAD (Microns)
1	0.9	10.9	100.0	12.7
2	0.3	3.6	89.2	8.05
3	0.6	7.2	85.6	5.3
4	0.8	9.6	78.4	3.75
5	1.1	13.3	68.8	2.35
6	1.2	14.5	55.5	1.2
7	1.2	14.5	41.0	0.74
8	0.8	9.6	26.5	0.50
Backup Filter	1.4	16.9	16.9	---
TOTAL	8.3			

CRUSHER SCRUBBER INLET DUCT

Run 2



EXXON MINERALS COMPANY, U.S.A.

Converse County, Wyoming

Table 26

PARTICLE SIZE DISTRIBUTION

Run: 3

Date: September 28, 1979

Location: Exxon Minerals Company, U.S.A.

Sampling Location: Crusher Scrubber Inlet Duct

Traverse Point No. Sampled: X-16

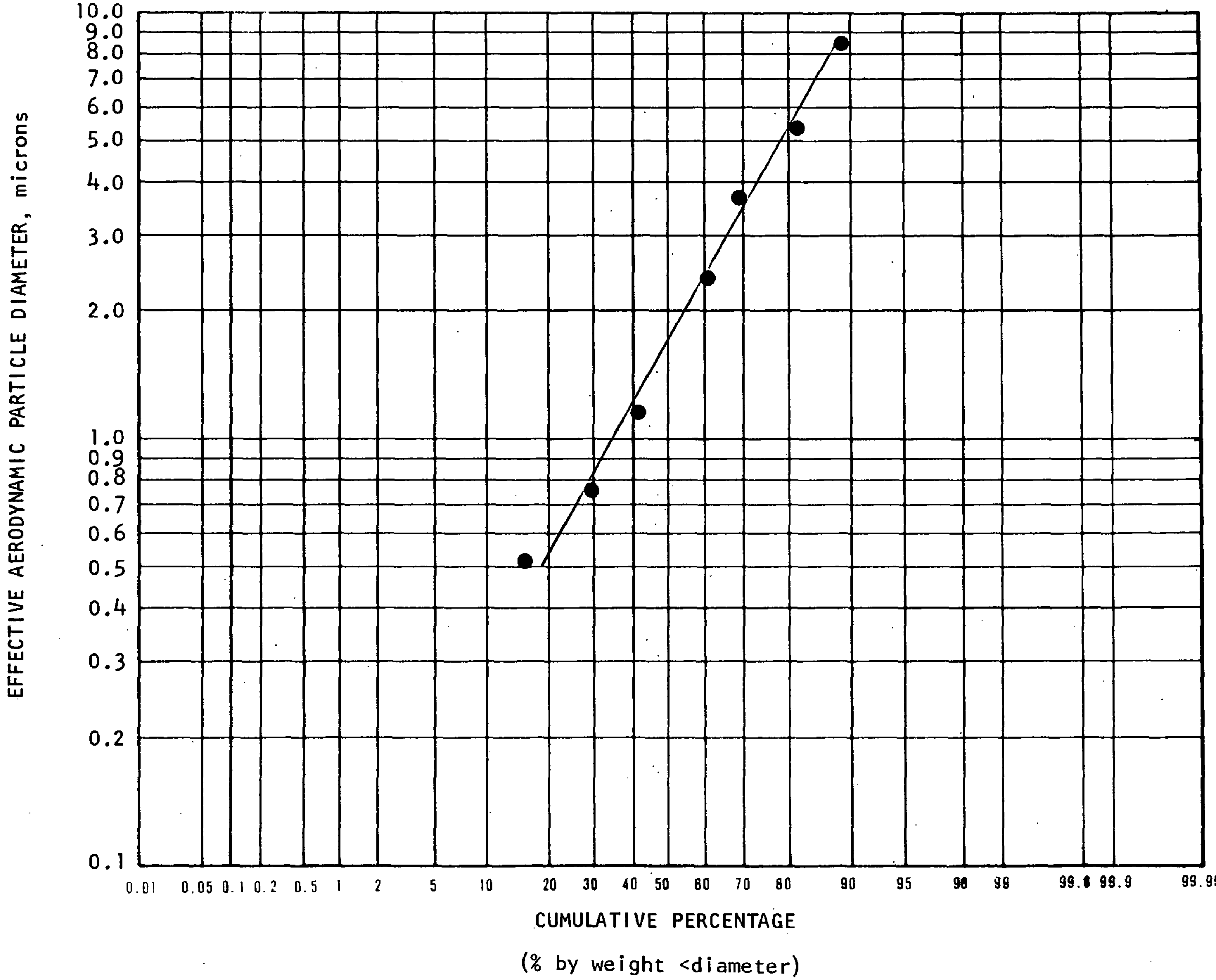
P_{bar} (in. Hg.)	24.78
Stack Temp (^{o}F)	73.
Sample Time (min)	70.
Sample Volume (cf)	46.49
Moisture (% H_2O)	0.9
Meter Temp (^{o}F)	83.
Flow Setting, ΔH (in. H_2O)	1.8
Nozzle Diameter (in.)	0.250

Sample Flow Rate (at stack conditions): 0.67 cfm

Plate No.	Net Wt. (mg)	%	Cumulative %	EAD (Microns)
1	0.9	11.4	100.0	12.6
2	0.5	6.3	88.6	8.4
3	1.0	12.7	82.3	5.45
4	0.7	8.9	69.7	3.75
5	1.6	20.3	60.8	2.4
6	0.9	11.4	40.6	1.2
7	1.0	12.7	29.2	0.76
8	0.6	7.6	16.5	0.52
Backup Filter	0.7	8.9	8.9	---
TOTAL	7.9			

CRUSHER SCRUBBER INLET DUCT

Run 3



EXXON MINERALS COMPANY, U.S.A.

Converse County, Wyoming

Table 27

PARTICLE SIZE DISTRIBUTION

Run: 1

Date: September 27, 1979

Location: Exxon Minerals Company, U.S.A.

Sampling Location: Crusher Scrubber Outlet Duct

Traverse Point No. Sampled: X-11

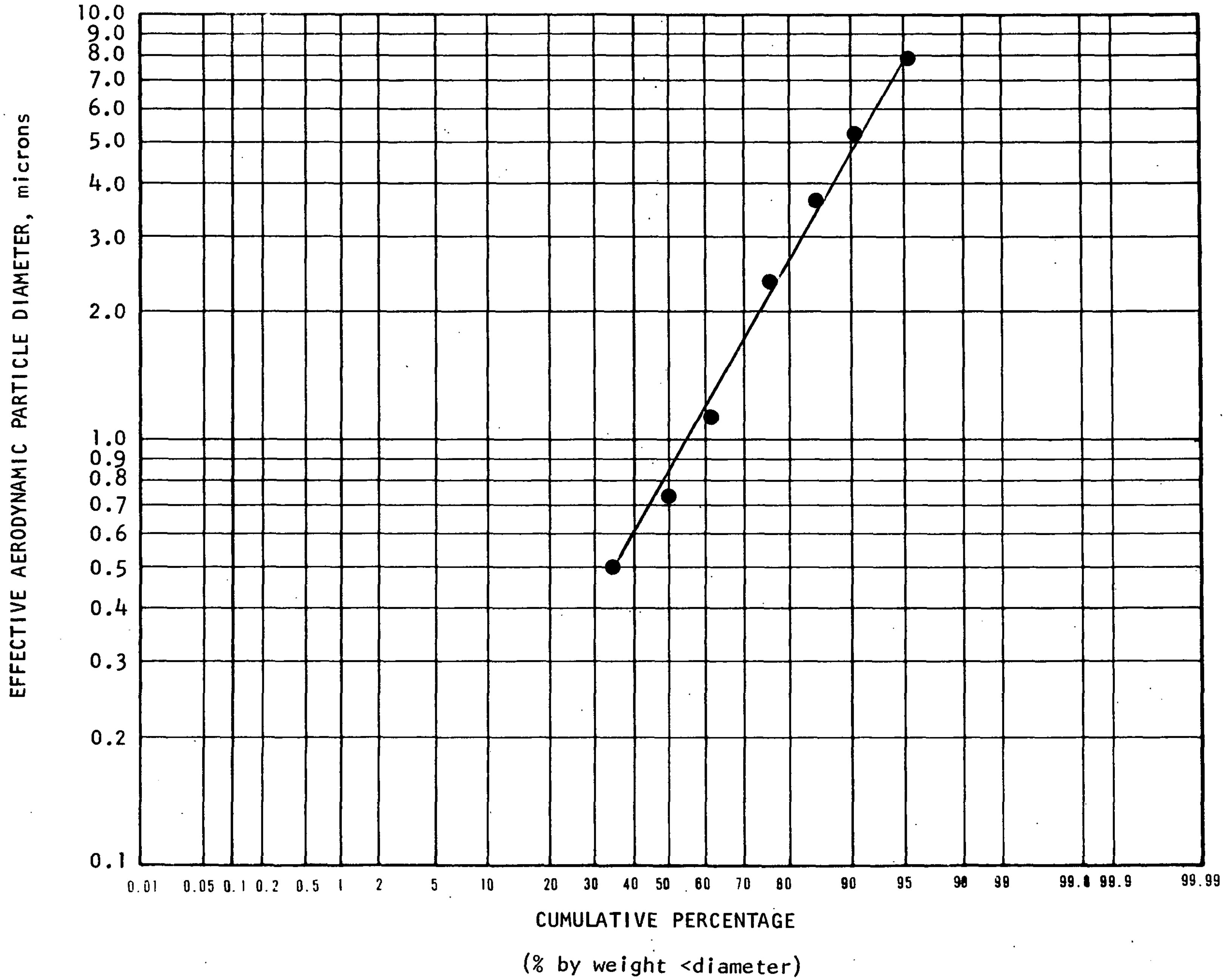
P_{bar} (in. Hg.)	24.74
Stack Temp (^{o}F)	65.
Sample Time (min)	160.
Sample Volume (cf)	110.48
Moisture (% H2O)	1.4
Meter Temp (^{o}F)	82.
Flow Setting, Δ H (in. H_2O)	1.1
Nozzle Diameter (in.)	0.250

Sample Flow Rate (at stack conditions): 0.68 cfm

Plate No.	Net Wt. (mg)	%	Cumulative %	EAD (Microns)
1	0.2	4.2	100.0	12.4
2	0.2	4.2	95.8	8.0
3	0.3	6.25	91.6	5.35
4	0.4	8.3	85.4	3.7
5	0.7	14.6	77.1	2.4
6	0.6	12.5	62.5	1.2
7	0.7	14.6	50.0	0.73
8	1.0	20.8	35.4	0.50
Backup Filter	0.7	14.6	14.6	---
TOTAL	4.8			

CRUSHER SCRUBBER OUTLET DUCT

Run 1



EXXON MINERALS COMPANY, U.S.A.

Converse County, Wyoming

Table 28

PARTICLE SIZE DISTRIBUTION

Run: 1

Date: September 28, 1979

Location: Exxon Minerals Company, U.S.A.

Sampling Location: Crusher-Grizzley Exhaust Duct

Traverse Point No. Sampled: X-10

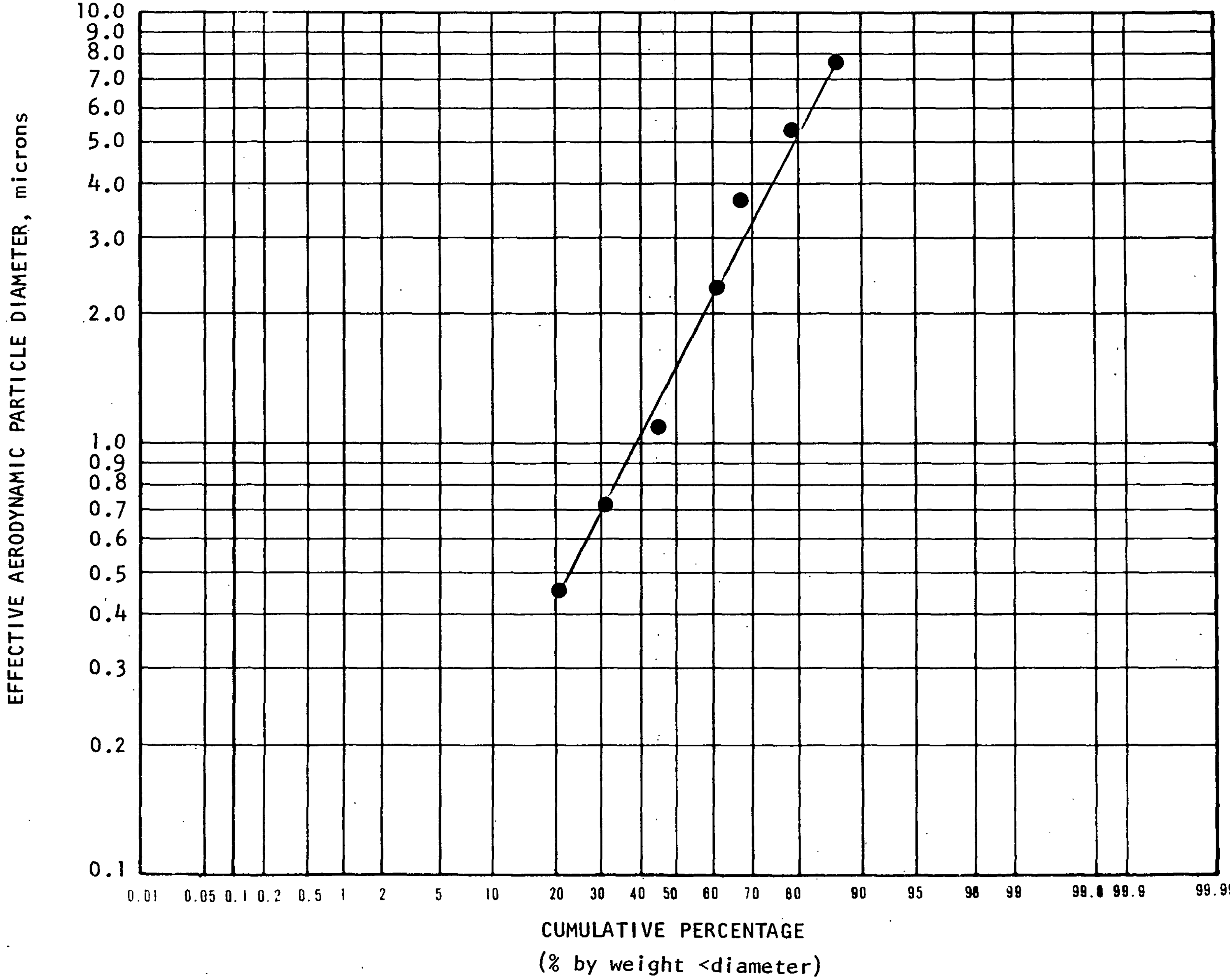
P_{bar} (in. Hg.)	24.79
Stack Temp (^oF)	75.
Sample Time (min)	75.
Sample Volume (cf)	62.22
Moisture (% H_2O)	1.2
Meter Temp (^oF)	117.
Flow Setting, ΔH (in. H_2O)	1.7
Nozzle Diameter (in.)	0.241

Sample Flow Rate (at stack conditions): 0.77 cfm

Plate No.	Net Wt. (mg)	%	Cumulative %	EAD (Microns)
1	1.1	13.8	100.0	12.2
2	0.6	7.5	86.3	7.7
3	0.9	11.3	78.8	5.3
4	0.5	6.3	67.5	3.7
5	1.3	16.3	61.2	2.3
6	1.0	12.5	45.0	1.2
7	0.9	11.3	32.5	0.72
8	0.7	8.8	21.3	0.47
Backup Filter	1.0	12.5	12.5	----
TOTAL	8.0			

CRUSHER-GRIZZLEY EXHAUST DUCT

Run 1



EXXON MINERALS COMPANY, U.S.A.

Converse County, Wyoming

Table 29

PARTICLE SIZE DISTRIBUTION

Run: 2

Date: September 28, 1979

Location: Exxon Minerals Company, U.S.A.

Sampling Location: Crusher-Grizzley Exhaust Duct

Traverse Point No. Sampled: X-10

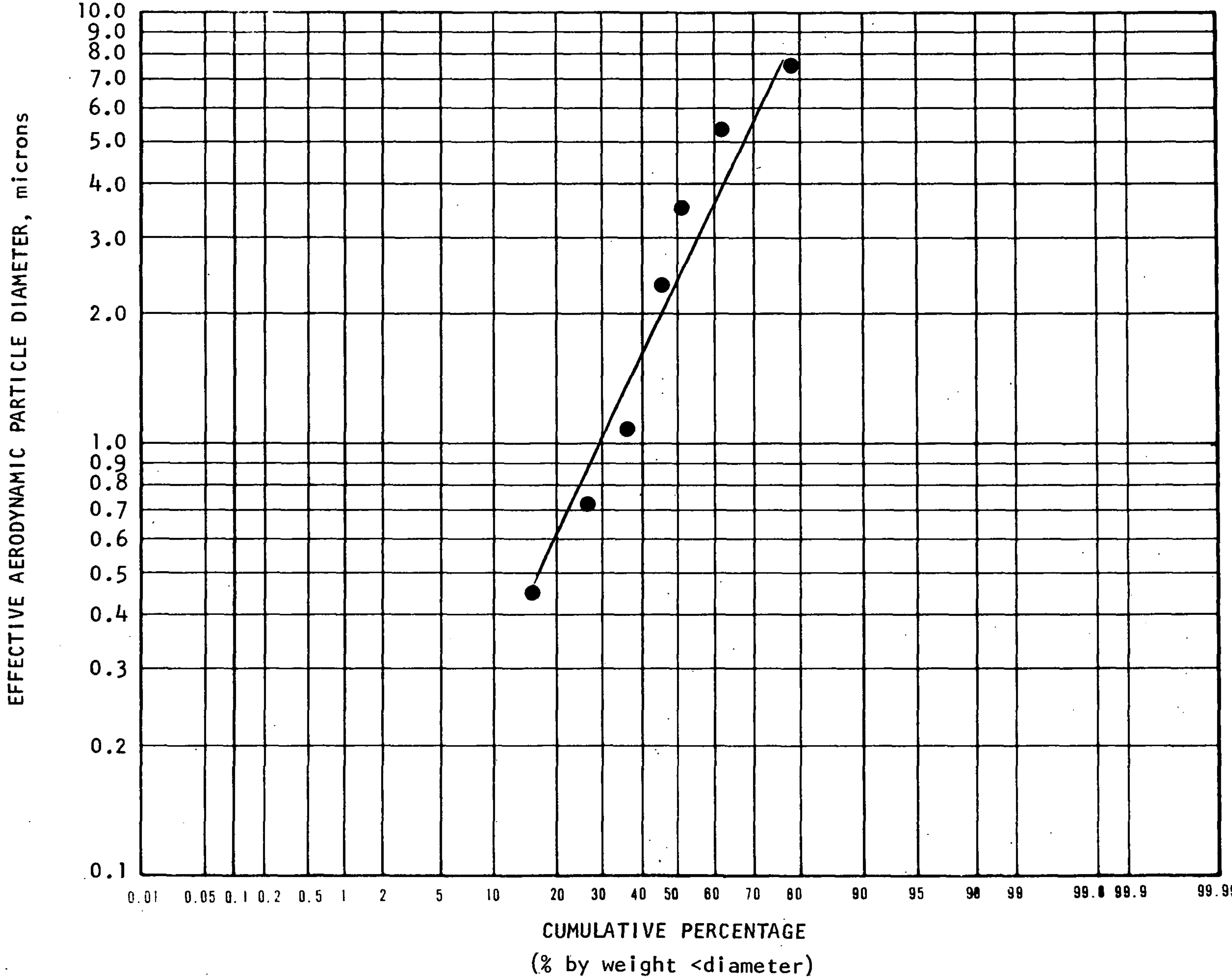
P_{bar} (in. Hg.)	24.76
Stack Temp (°F)	75.
Sample Time (min)	75.
Sample Volume (cf)	58.14
Moisture (% H2O)	0.7
Meter Temp (°F)	87.
Flow Setting, ΔH (in. H_2O)	1.7
Nozzle Diameter (in.)	0.241

Sample Flow Rate (at stack conditions): 0.77 cfm

Plate No.	Net Wt. (mg)	%	Cumulative %	EAD (Microns)
1	1.7	22.1	100.0	12.2
2	1.2	15.6	77.9	7.7
3	0.8	10.4	62.3	5.3
4	0.4	5.2	51.9	3.7
5	0.7	9.1	46.7	2.3
6	0.8	10.4	37.6	1.2
7	0.8	10.4	27.2	0.72
8	0.6	7.8	16.8	0.47
Backup Filter	0.7	9.1	9.1	---
TOTAL	7.7			

CRUSHER-GRIZZLEY EXHAUST DUCT

Run 2



EXXON MINERALS COMPANY, U.S.A.
Converse County, Wyoming

Table 30

PARTICLE SIZE DISTRIBUTION

Run: 3
Date: September 28, 1979
Location: Exxon Minerals Company, U.S.A.
Sampling Location: Crusher-Grizzley Exhaust Duct
Traverse Point No. Sampled: X-10

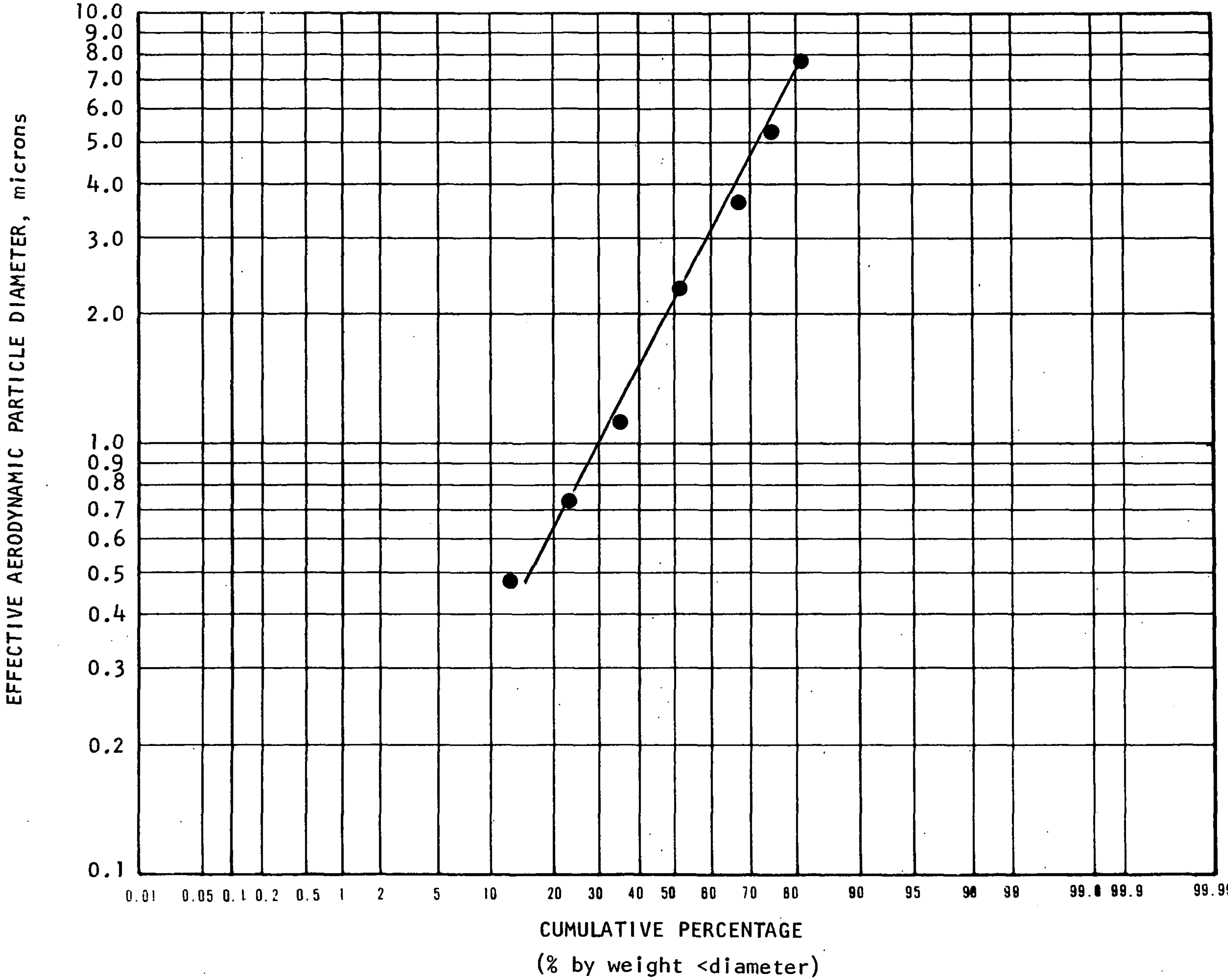
P_{bar} (in. Hg.)	24.76
Stack Temp (°F)	75.
Sample Time (min)	75.
Sample Volume (cf)	57.41
Moisture (% H2O)	0.8
Meter Temp (°F)	88.
Flow Setting, ΔH (in. H_2O)	1.7
Nozzle Diameter (in.)	0.241

Sample Flow Rate (at stack conditions): 0.76 cfm

Plate No.	Net Wt. (mg)	%	Cumulative %	EAD (Microns)
1	1.0	13.2	100.0	12.4
2	0.5	6.6	86.9	7.9
3	0.4	5.3	80.3	5.3
4	0.5	6.6	75.0	3.7
5	1.2	15.8	68.4	2.4
6	1.3	17.1	52.6	1.2
7	0.9	11.8	35.5	0.73
8	0.8	10.5	23.7	0.48
Backup Filter	1.0	13.2	13.2	---
TOTAL	7.6			

CRUSHER-GRIZZLEY EXHAUST DUCT

Run 3



EXXON MINERALS COMPANY, U.S.A.

Converse County, Wyoming

Table 31

PARTICLE SIZE DISTRIBUTION

Run: 1

Date: September 28, 1979

Location: Exxon Minerals Company, U.S.A.

Sampling Location: Fine Ore Bins Scrubber Outlet Duct

Traverse Point No. Sampled: Y-5

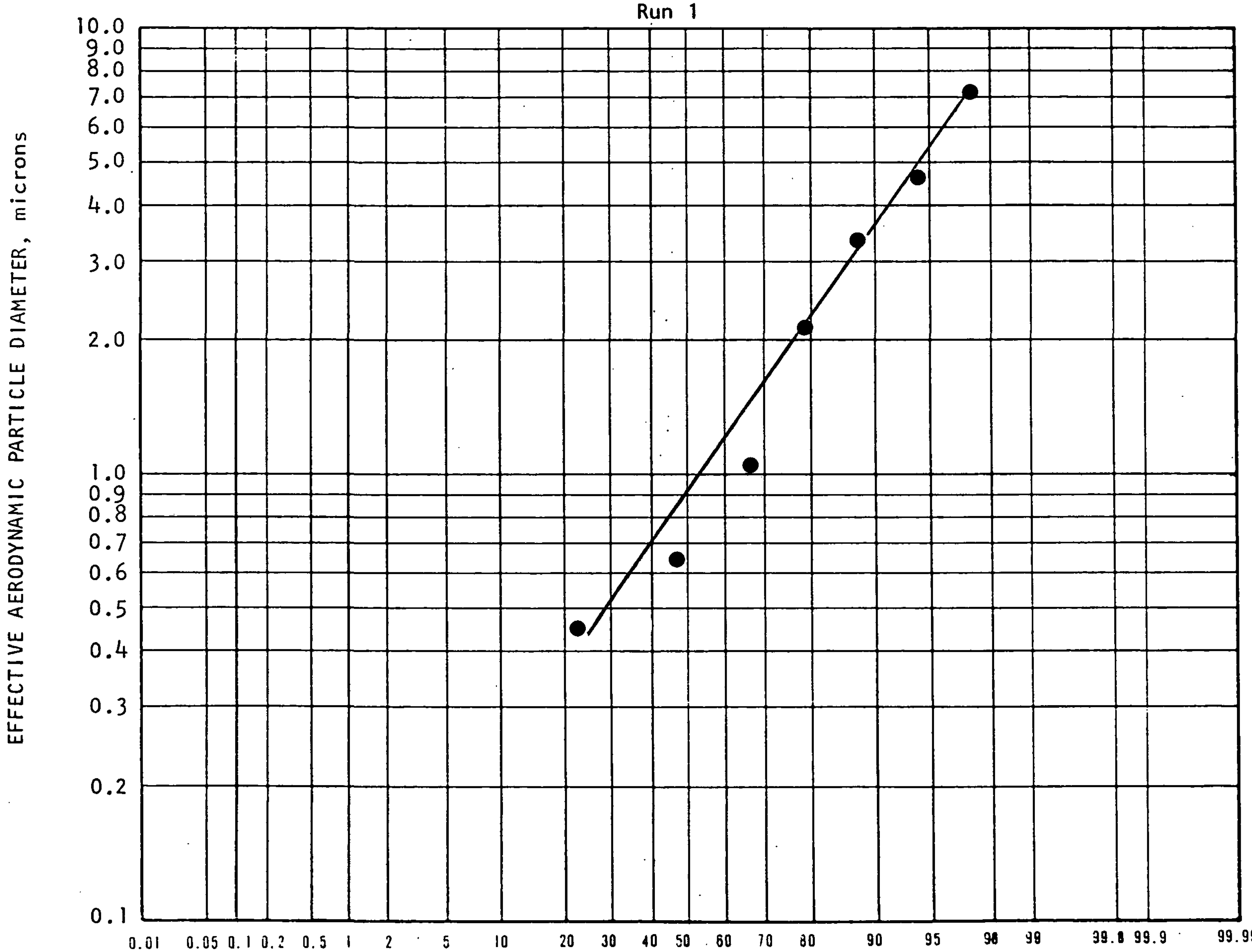
P_{bar} (in. Hg.)	23.98
Stack Temp (^{O}F)	65.
Sample Time (min)	90.
Sample Volume (cf)	79.80
Moisture (% H_2O)	1.2
Meter Temp (^{O}F)	85.
Flow Setting, Δ H (in. H_2O)	2.2
Nozzle Diameter (in.)	0.185

Sample Flow Rate (at stack conditions): 0.83 cfm

Plate No.	Net Wt. (mg)	%	Cumulative %	EAD (Microns)
1	0.1	2.9	100.0	11.4
2	0.1	2.9	97.1	7.1
3	0.2	5.9	94.1	4.8
4	0.3	8.8	88.2	3.4
5	0.4	11.8	79.4	2.1
6	0.7	20.6	67.6	1.1
7	0.8	23.5	47.1	0.65
8	0.5	14.7	23.5	0.45
Backup Filter	0.3	8.8	8.8	---
TOTAL	3.4			

FINE ORE BINS SCRUBBER OUTLET DUCT

Run 1



CUMULATIVE PERCENTAGE
(% by weight <diameter)

EXXON MINERALS COMPANY, U.S.A.

Converse County, Wyoming

Table 32

PARTICLE SIZE DISTRIBUTION

Run: 1

Date: September 28, 1979

Location: Exxon Minerals Company, U.S.A.

Sampling Location: Fine Ore Bins Scrubber Inlet Duct

Traverse Point No. Sampled: X-7

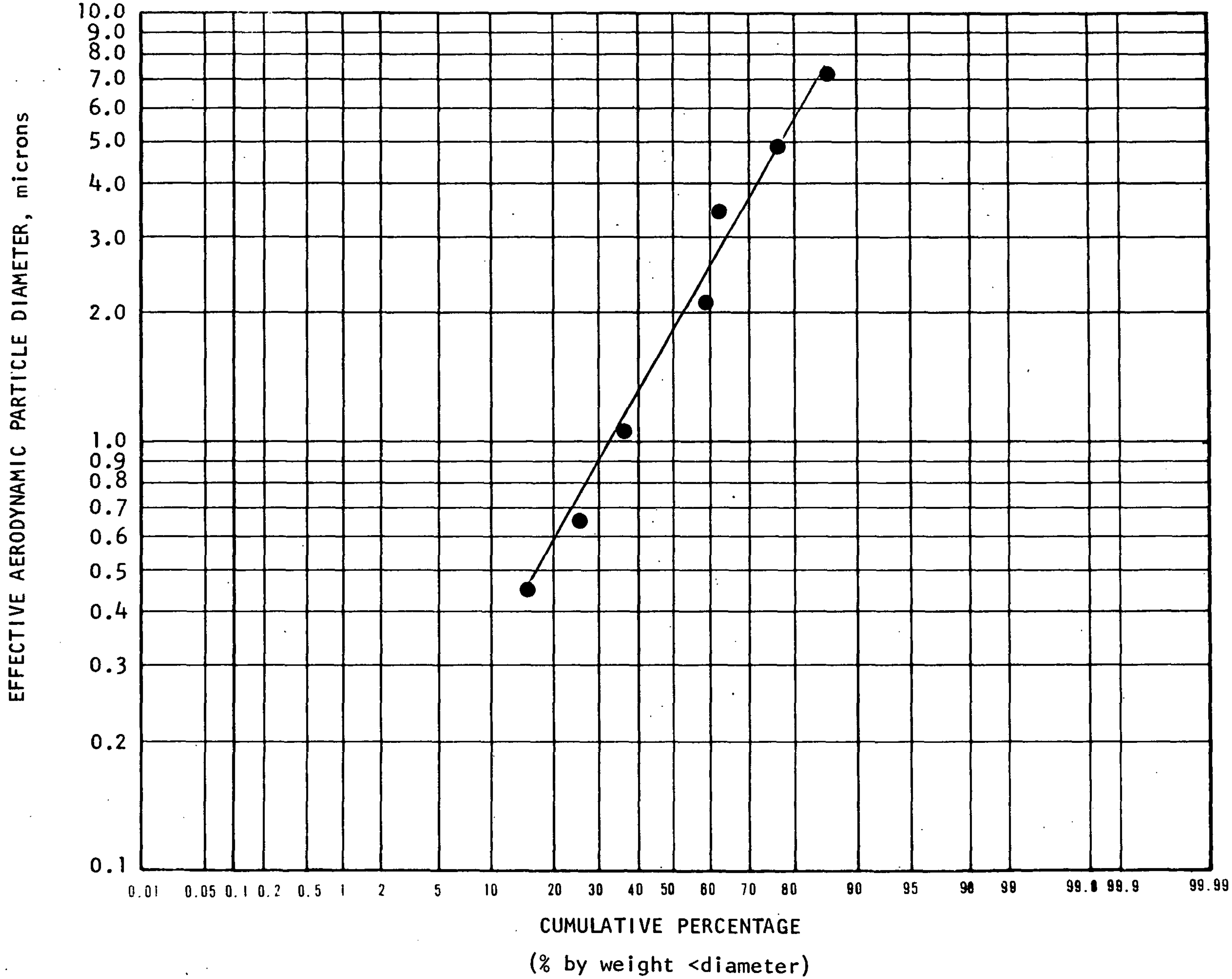
P_{bar} (in. Hg.)	24.76
Stack Temp (°F)	66.
Sample Time (min)	90.
Sample Volume (cf)	71.78
Moisture (% H2O)	1.0
Meter Temp (°F)	83.
Flow Setting, Δ H (in. H_2O)	1.85
Nozzle Diameter (in.)	0.188

Sample Flow Rate (at stack conditions): 0.80 cfm

Plate No.	Net Wt. (mg)	%	Cumulative %	EAD (Microns)
1	0.6	4.4	100.0	11.8
2	2.0	14.7	95.6	7.4
3	3.5	25.7	80.9	4.9
4	1.1	8.1	55.1	3.5
5	1.7	12.5	47.1	2.2
6	2.0	14.7	34.6	1.1
7	1.1	8.1	19.9	0.67
8	0.9	6.6	11.8	0.46
Backup Filter	0.7	5.1	5.1	---
TOTAL	13.6			

FINE ORE BINS SCRUBBER INLET DUCT

Run 1



EXXON MINERALS COMPANY, U.S.A.

Converse County, Wyoming

Table 33

PARTICLE SIZE DISTRIBUTION

Run: 2

Date: September 30, 1979

Location: Exxon Minerals Company, U.S.A.

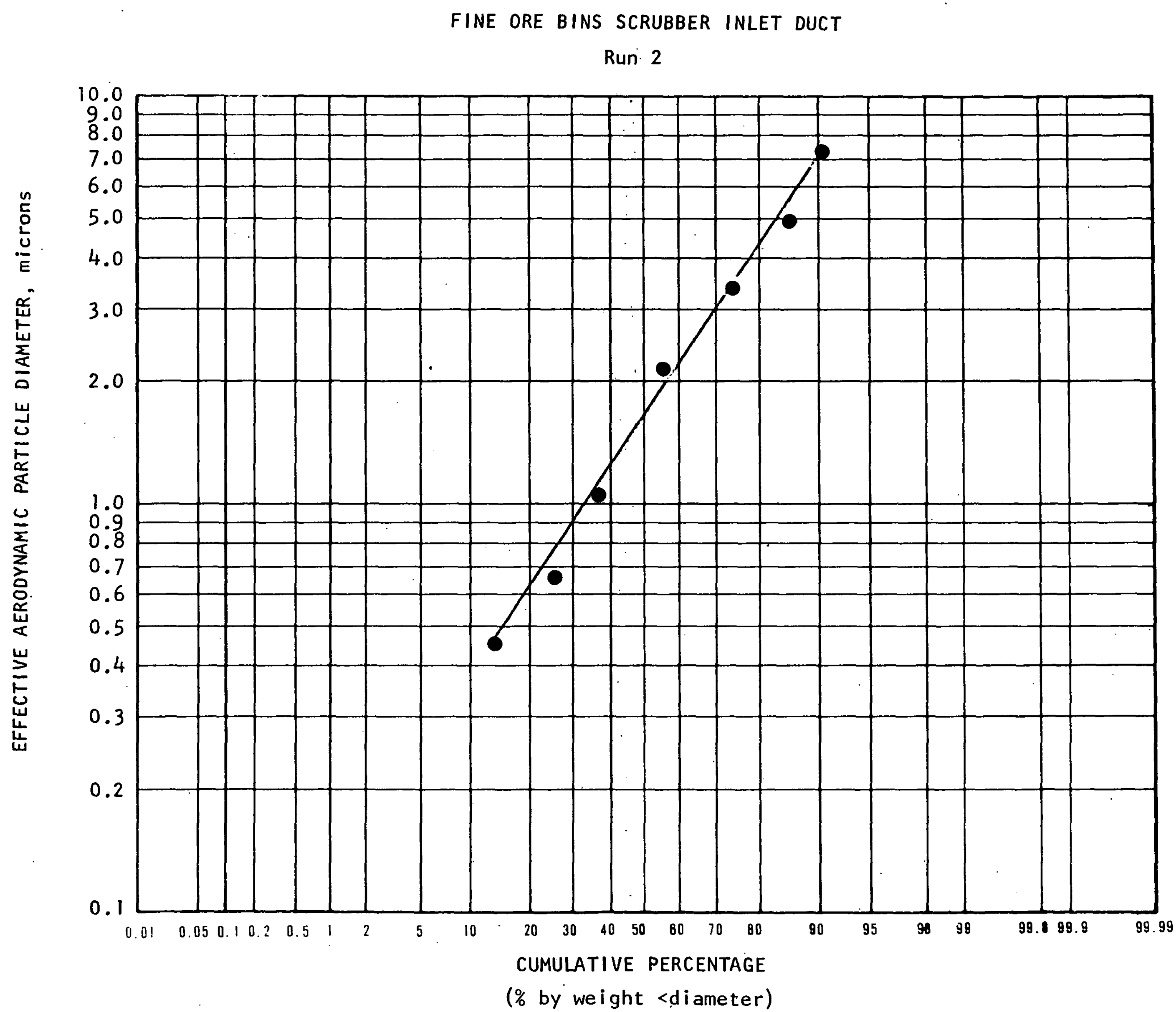
Sampling Location: Fine Ore Bins Scrubber Inlet Duct

Traverse Point No. Sampled: X-7

P_{bar} (in. Hg.)	24.76
Stack Temp (°F)	66.
Sample Time (min)	90.
Sample Volume (cf)	72.82
Moisture (% H_2O)	0.9
Meter Temp (°F)	92.
Flow Setting, ΔH (in. H_2O)	1.85
Nozzle Diameter (in.)	0.188

Sample Flow Rate (at stack conditions): 0.80 cfm

Plate No.	Net Wt. (mg)	%	Cumulative %	EAD (Microns)
1	0.4	9.5	100.0	11.8
2	0.2	4.8	90.5	7.4
3	0.5	11.9	85.7	4.9
4	0.7	16.7	73.8	3.5
5	0.8	19.0	57.1	2.2
6	0.5	11.9	38.1	1.1
7	0.5	11.9	26.2	0.67
8	0.4	9.5	14.3	0.46
Backup Filter	0.2	4.8	4.8	---
TOTAL	4.2			



FINE ORE BINS SCRUBBER INLET DUCT
Run 2
EFFECTIVE AERODYNAMIC PARTICLE DIAMETER, microns
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.01 0.05 0.1 0.2 0.5 1 2 5 10 20 30 40 50 60 70 80 90 95 98 99 99.8 99.9 99.99
CUMULATIVE PERCENTAGE
(% by weight <diameter)

EXXON MINERALS COMPANY, U.S.A.

Converse County, Wyoming

Table 34

PARTICLE SIZE DISTRIBUTION

Run: 3

Date: September 30, 1979

Location: Exxon Minerals Company, U.S.A.

Sampling Location: Fine Ore Bins Scrubber Inlet Duct

Traverse Point No. Sampled X-7

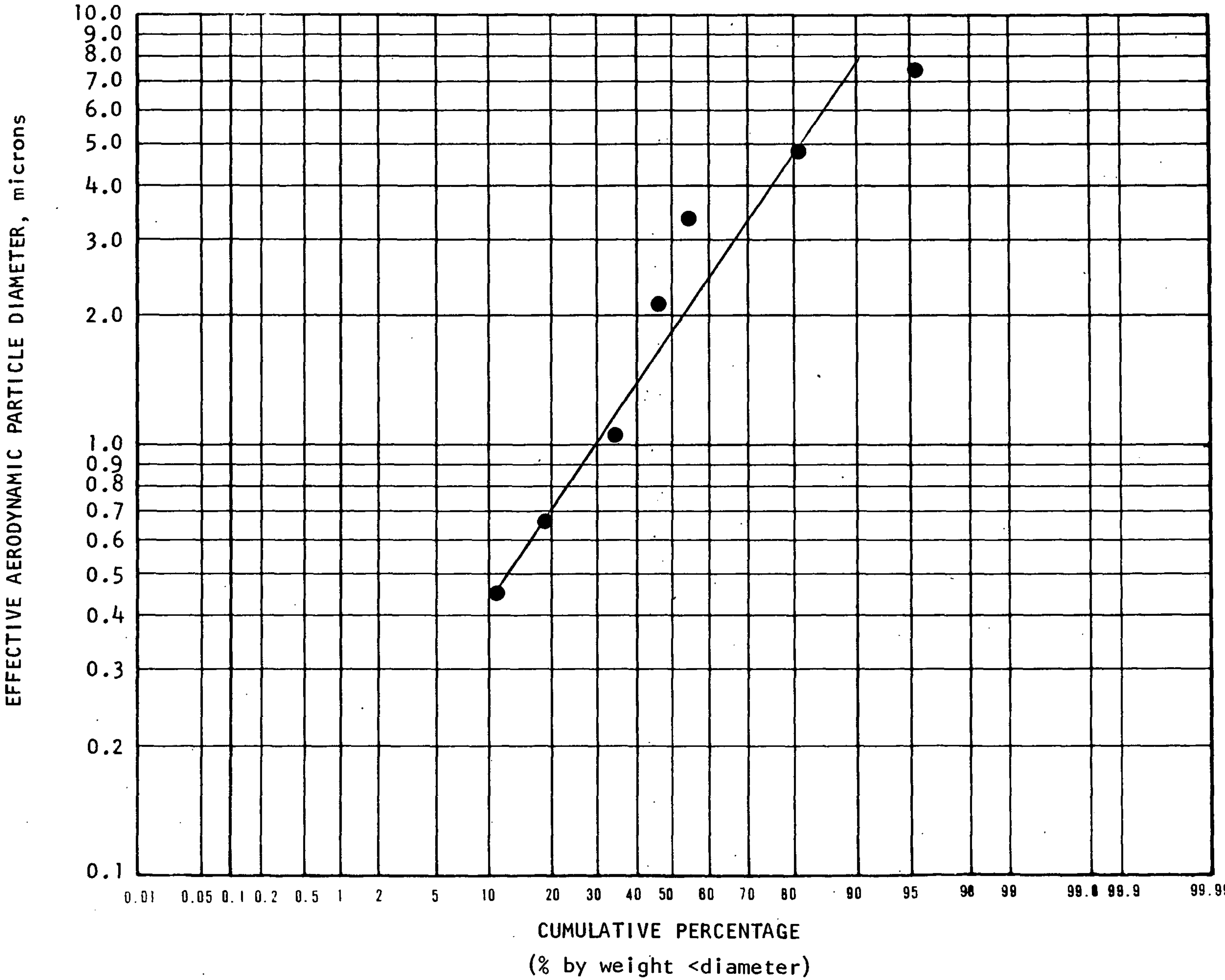
P_{bar} (in. Hg.)	24.76
Stack Temp (°F)	66.
Sample Time (min)	85.
Sample Volume (cf)	68.54
Moisture (% H2O)	1.0
Meter Temp (°F)	81.
Flow Setting, Δ H (in. H_2O)	1.85
Nozzle Diameter (in.)	0.188

Sample Flow Rate (at stack conditions): 0.81 cfm

Plate No.	Net Wt. (mg)	%	Cumulative %	EAD (Microns)
1	0.9	13.2	100.0	11.8
2	0.6	8.8	86.8	7.4
3	1.0	14.7	77.9	4.9
4	0.3	4.4	63.2	3.5
5	1.5	22.1	58.8	2.2
6	0.7	10.3	36.8	1.1
7	0.7	10.3	26.5	0.67
8	0.6	8.8	16.2	0.46
Backup Filter	0.5	7.4	7.4	---
TOTAL	6.8			

FINE ORE BINS SCRUBBER INLET DUCT

Run 3



EXXON MINERALS COMPANY, U.S.A.

Converse County, Wyoming

Table 35

PARTICLE SIZE DISTRIBUTION

Run: 1

Date: September 29, 1979

Location: Exxon Minerals Company, U.S.A.

Sampling Location: Fine Ore Bins Hopper Exhaust Duct

Traverse Point No. Sampled Center Point

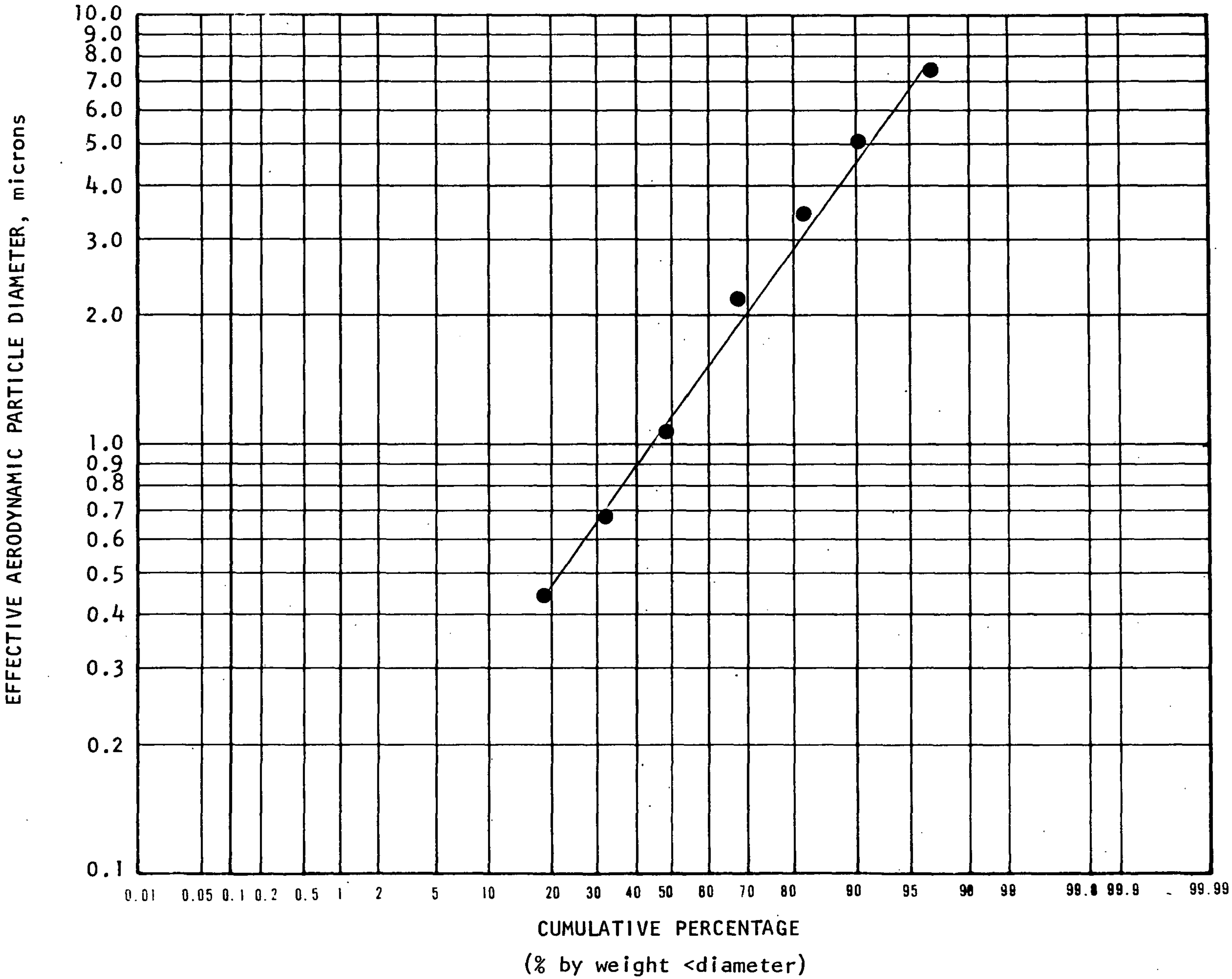
P_{bar} (in. Hg.)	24.76
Stack Temp (^oF)	66.
Sample Time (min)	75.
Sample Volume (cf)	59.88
Moisture (% H_2O)	1.7
Meter Temp (^oF)	84.
Flow Setting, ΔH (in. H_2O)	1.7
Nozzle Diameter--(in.)	0.250

Sample Flow Rate (at stack conditions): 0.77 cfm

Plate No.	Net Wt. (mg)	%	Cumulative %	EAD (Microns)
1	0.2	3.9	100.0	12.0 and larger
2	0.3	5.9	96.1	7.5
3	0.4	7.8	90.2	5.0
4	0.7	13.7	82.4	3.6
5	1.0	19.6	68.6	2.2
6	0.8	15.7	49.0	1.1
7	0.7	13.7	33.3	0.7
8	0.5	9.8	19.6	0.45
Backup Filter	0.5	9.8	9.8	---
TOTAL	5.1			

FINE ORE BINS HOPPER EXHAUST DUCT

Run 1



EXXON MINERALS COMPANY, U.S.A.

Converse County, Wyoming

Table 36

PARTICLE SIZE DISTRIBUTION

Run: 2

Date: October 1, 1979

Location: Exxon Minerals Company, U.S.A.

Sampling Location: Fine Ore Bins Hopper Exhaust Duct

Traverse Point No. Sampled: Center Point

P_{bar} (in. Hg.)	24.76
Stack Temp (^oF)	66.
Sample Time (min)	75.
Sample Volume (cf)	59.78
Moisture (% H_2O)	1.1
Meter Temp (^oF)	96.
Flow Setting, ΔH (in. H_2O)	1.7
Nozzle Diameter (in.)	0.250

Sample Flow Rate (at stack conditions): 0.75 cfm

Plate No.	Net Wt. (mg)	%	Cumulative %	EAD (Microns)
1	0.2	5.7	100.0	12.1 and larger
2	0.1	2.9	94.3	7.6
3	0.3	8.6	91.4	5.1
4	0.4	11.4	82.8	3.6
5	0.4	11.4	71.4	2.3
6	0.7	20.0	60.0	1.2
7	0.6	17.1	40.0	0.7
8	0.5	14.3	22.9	0.45
Backup Filter	0.3	8.6	8.6	---
TOTAL	3.5			

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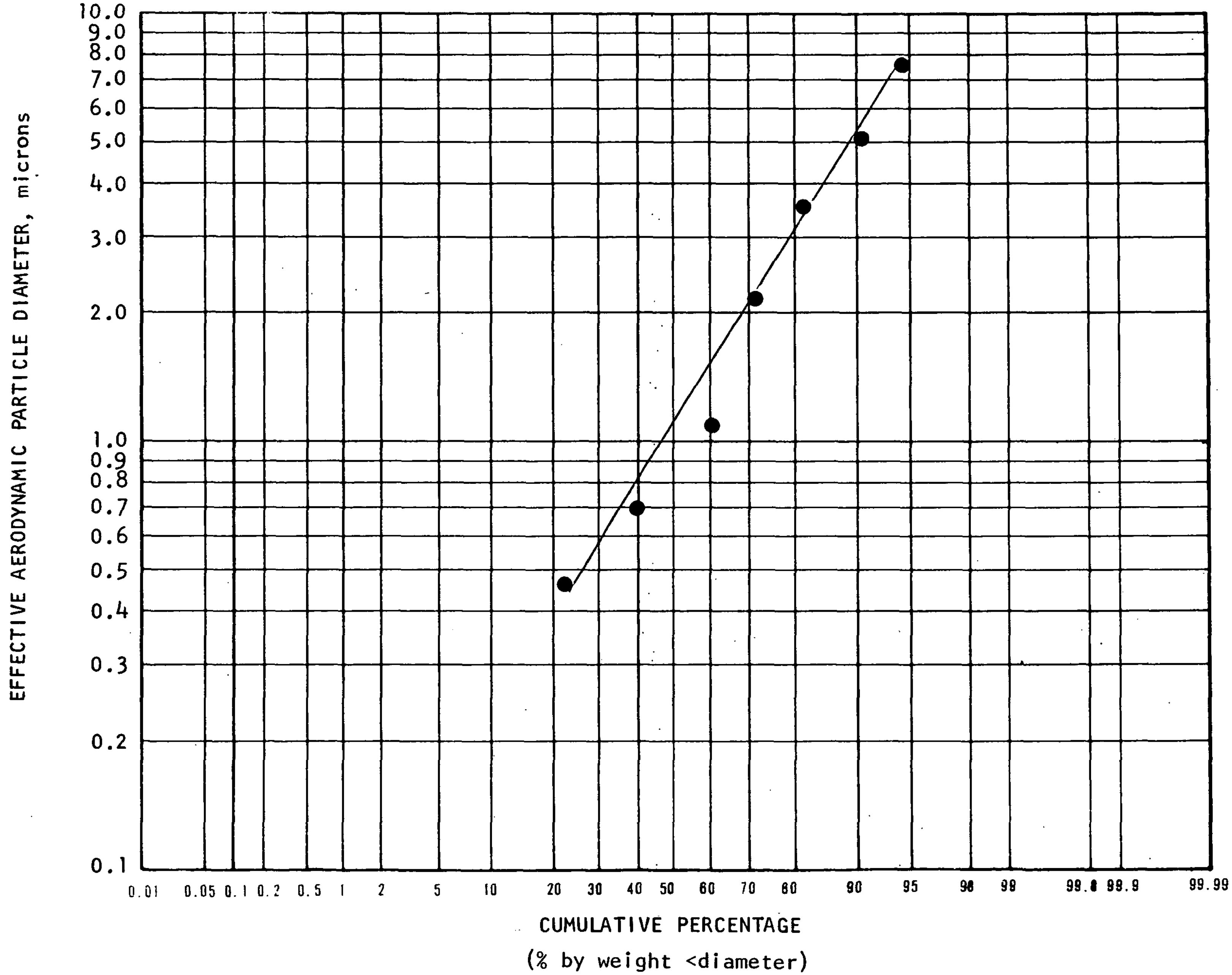
FINE ORE BINS HOPPER EXHAUST DUCT

Run 2



EXXON MINERALS COMPANY, U.S.A.

Converse County, Wyoming

Table 37

PARTICLE SIZE DISTRIBUTION

Run: 3

Date: October 1, 1979

Location: Exxon Minerals Company, U.S.A.

Sampling Location: Fine Ore Bins Hopper Exhaust Duct

Traverse Point No. Sampled: Center Point

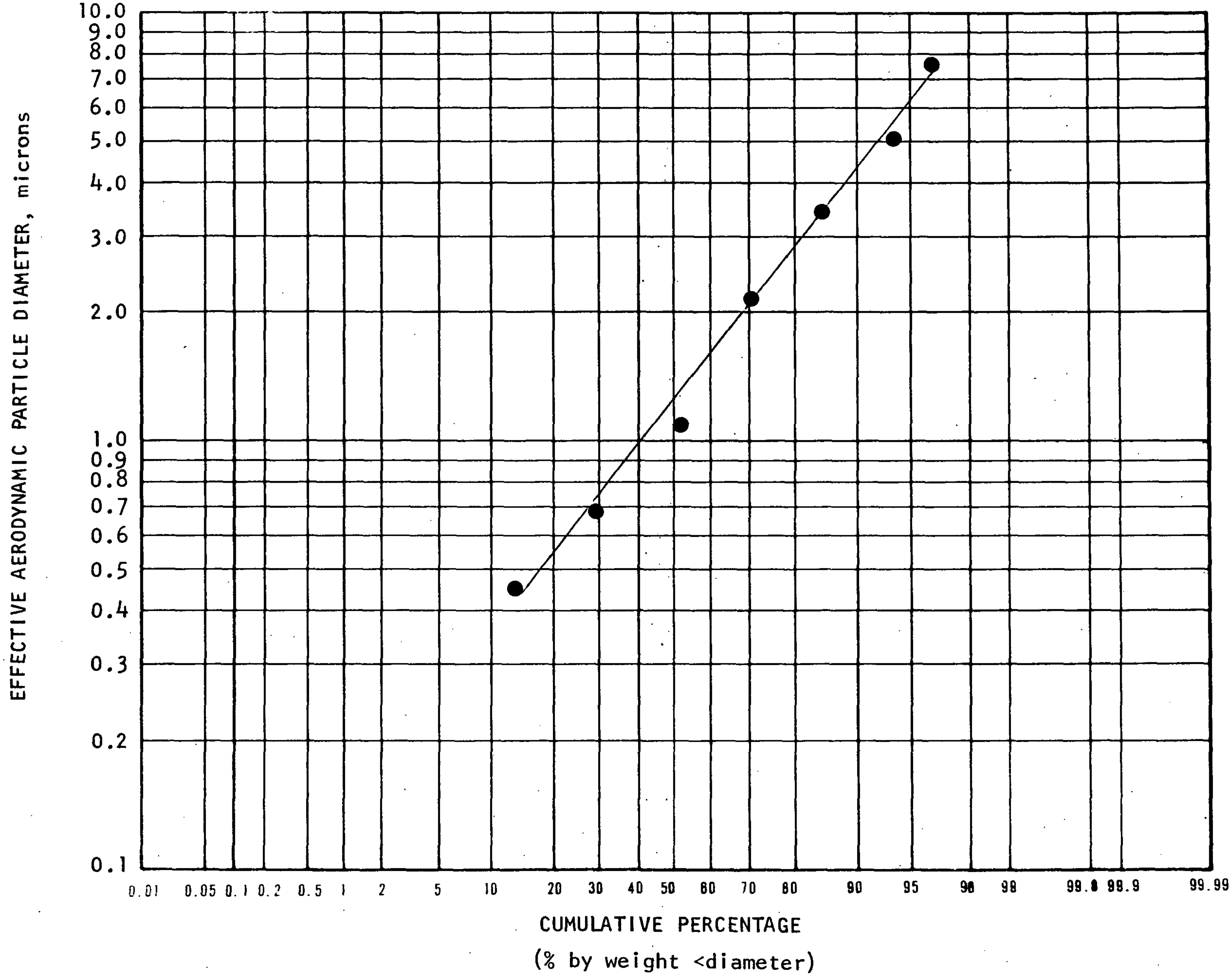
P_{bar} (in. Hg.)	24.76
Stack Temp (^{o}F)	66.
Sample Time (min)	85.
Sample Volume (cf)	66.55
Moisture (% H_2O)	0.9
Meter Temp (^{o}F)	81.
Flow Setting, Δ H (in. H_2O)	1.7
Nozzle Diameter (in.)	0.250

Sample Flow Rate (at stack conditions): 0.76 cfm

Plate No.	Net Wt. (mg)	%	Cumulative %	EAD (Microns)
1	0.2	4.2	100.0	12.0
2	0.1	2.8	95.8	7.5
3	0.4	8.3	93.8	5.0
4	0.7	14.6	85.4	3.6
5	0.9	18.8	70.8	2.2
6	1.1	22.9	52.1	1.1
7	0.7	14.6	29.2	0.7
8	0.5	10.4	14.6	0.45
Backup Filter	0.2	4.2	4.2	---
TOTAL	4.8			

FINE ORE BINS HOPPER EXHAUST DUCT

Run 3



EXXON MINERALS COMPANY, U.S.A.

Converse County, Wyoming

Table 38

PARTICLE SIZE DISTRIBUTION

Run: 1

Date: October 1, 1979

Location: Exxon Minerals Company, U.S.A.

Sampling Location: Dryer Scrubber Outlet Duct

Traverse Point No. Sampled: X-3

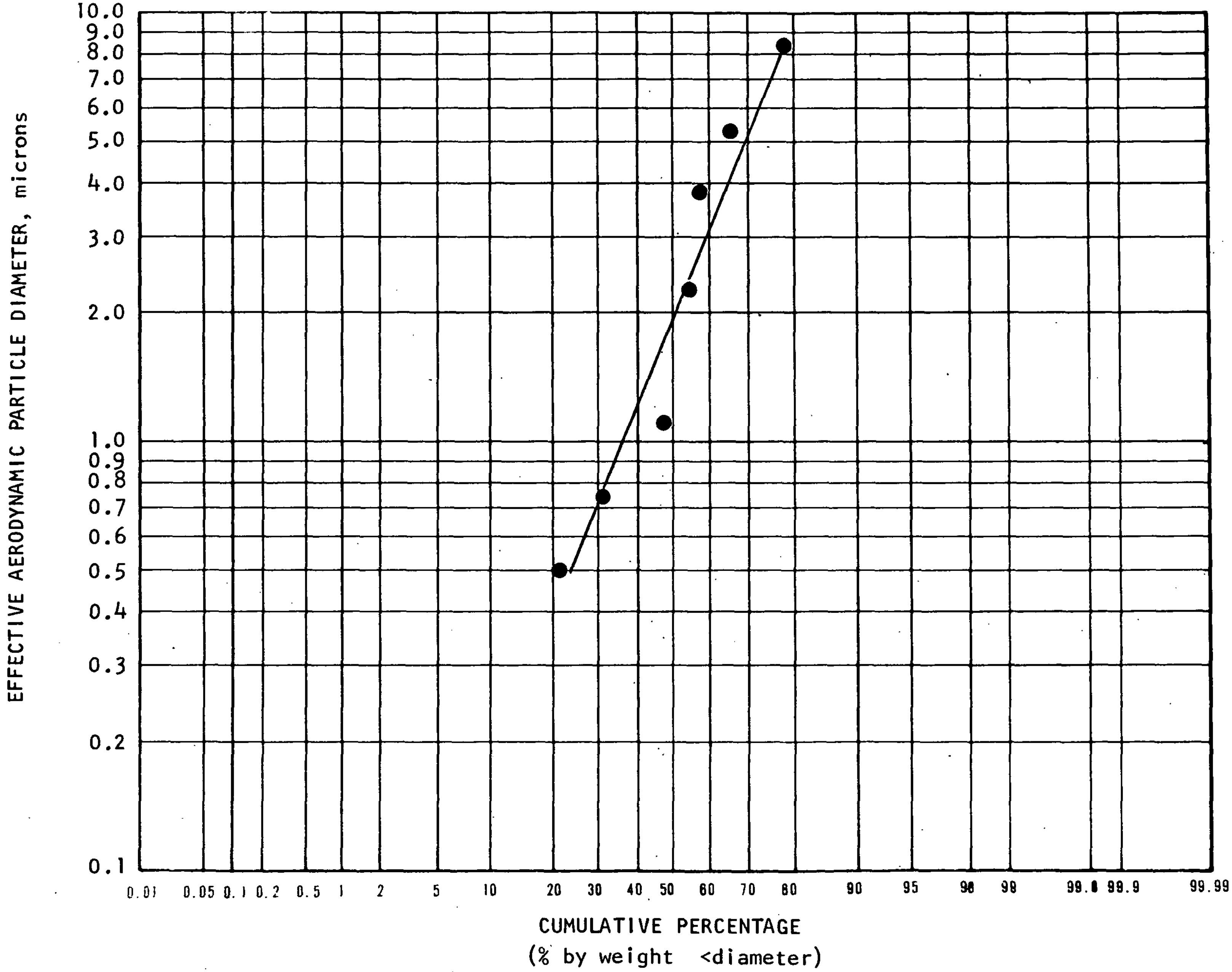
P_{bar} (in. Hg.)	23.98
Stack Temp (°F)	130.
Sample Time (min)	4.
Sample Volume (wscf)	2.42
Moisture (% H_2O)	12.1
Meter Temp (°F)	108.
Flow Setting, ΔH (in. H_2O)	1.2
Nozzle Diameter (in.)	0.188

Sample Flow Rate (at stack conditions): 0.81 cfm

Plate No.	Net Wt. (mg)	%	Cumulative %	EAD (Microns)
1	1.1	21.6	100.0	12.8
2	0.7	13.7	78.4	8.2
3	0.3	5.9	64.7	5.4
4	0.2	3.9	58.8	3.9
5	0.4	7.8	54.9	2.3
6	0.8	15.7	47.1	1.2
7	0.5	9.8	31.4	0.74
8	0.3	5.9	21.6	0.50
Backup Filter	0.8	15.7	15.7	---
TOTAL	5.1			

DRYER SCRUBBER OUTLET DUCT

Run 1



EXXON MINERALS COMPANY, U.S.A.

Converse County, Wyoming

Table 39

PARTICLE SIZE DISTRIBUTION

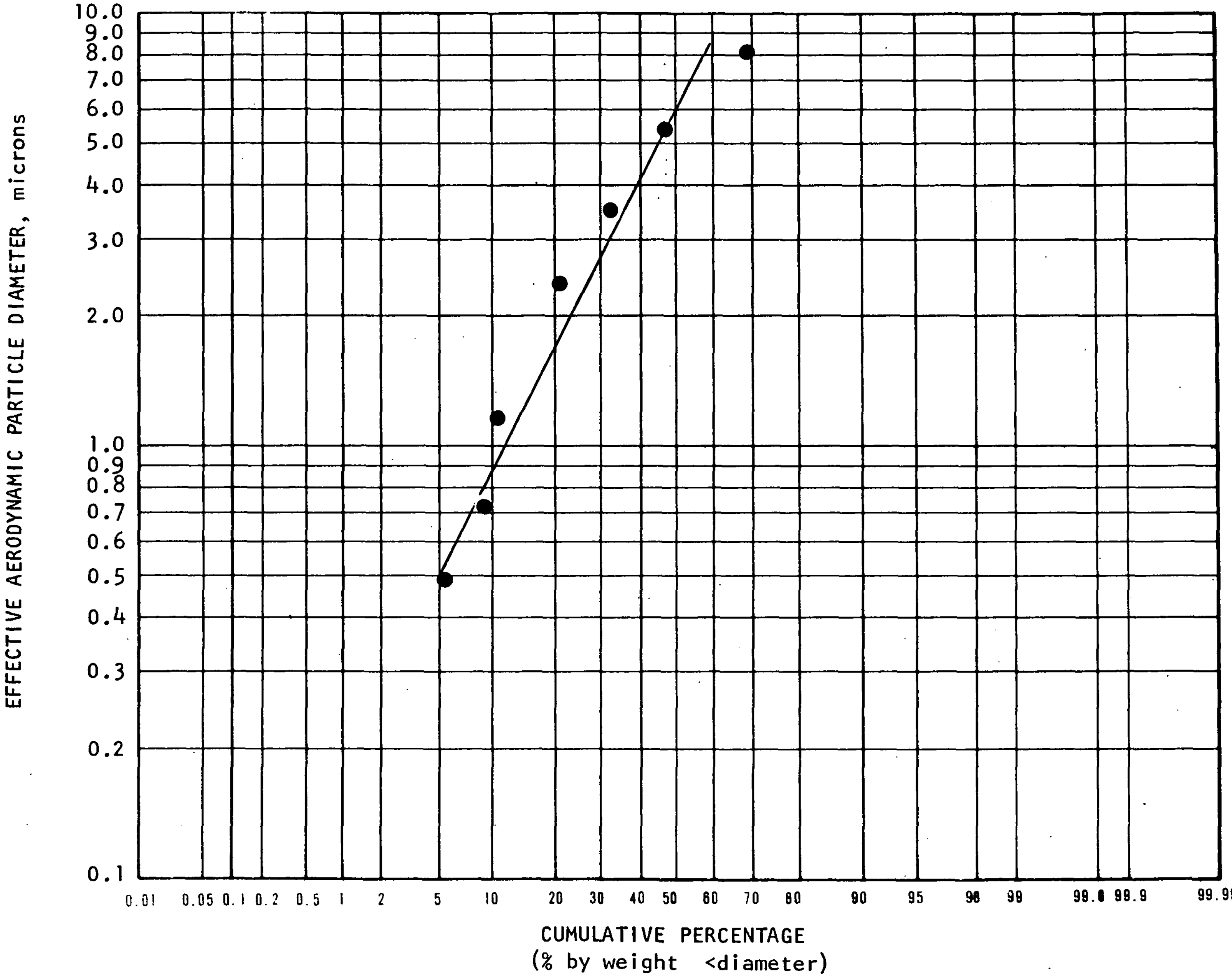
Run:	1	P_{bar} (in. Hg.)	23.98
Date:	October 1, 1979	Stack Temp (°F)	587.
Location:	Exxon Minerals Company, U.S.A.	Sample Time (min)	2.
Sampling Location:	Dryer Scrubber Inlet Duct	Sample Volume (wscf)	1.90
		Moisture (% H_2O)	25.0
Traverse Point No. Sample #	X-10	Meter Temp (°F)	98.
		Flow Setting, Δ H (in. H_2O)	2.8
		Nozzle Diameter (in.)	0.492

Sample Flow Rate (at stack conditions): 2.35 cfm

Plate No.	Net Wt. (mg)	%	Cumulative %	EAD (Microns)
1	30.6	30.5	100.0	12.6
2	22.1	22.1	69.5	8.1
3	14.1	14.1	47.4	5.5
4	12.6	12.6	33.3	3.7
5	9.4	9.4	20.8	2.4
6	2.3	2.3	11.4	1.2
7	3.5	3.5	9.1	0.72
8	2.6	2.6	5.6	0.49
Backup Filter	3.0	3.0	3.0	---
TOTAL	100.2			

DRYER SCRUBBER INLET DUCT

Run 1



EXXON MINERALS COMPANY, U.S.A.

Converse County, Wyoming

Table 40

PARTICLE SIZE DISTRIBUTION

Run: 2

Date: October 1, 1979

Location: Exxon Minerals Company, U.S.A.

Sampling Location: Dryer Scrubber Inlet Duct

Traverse Point No. Sampled: X-10

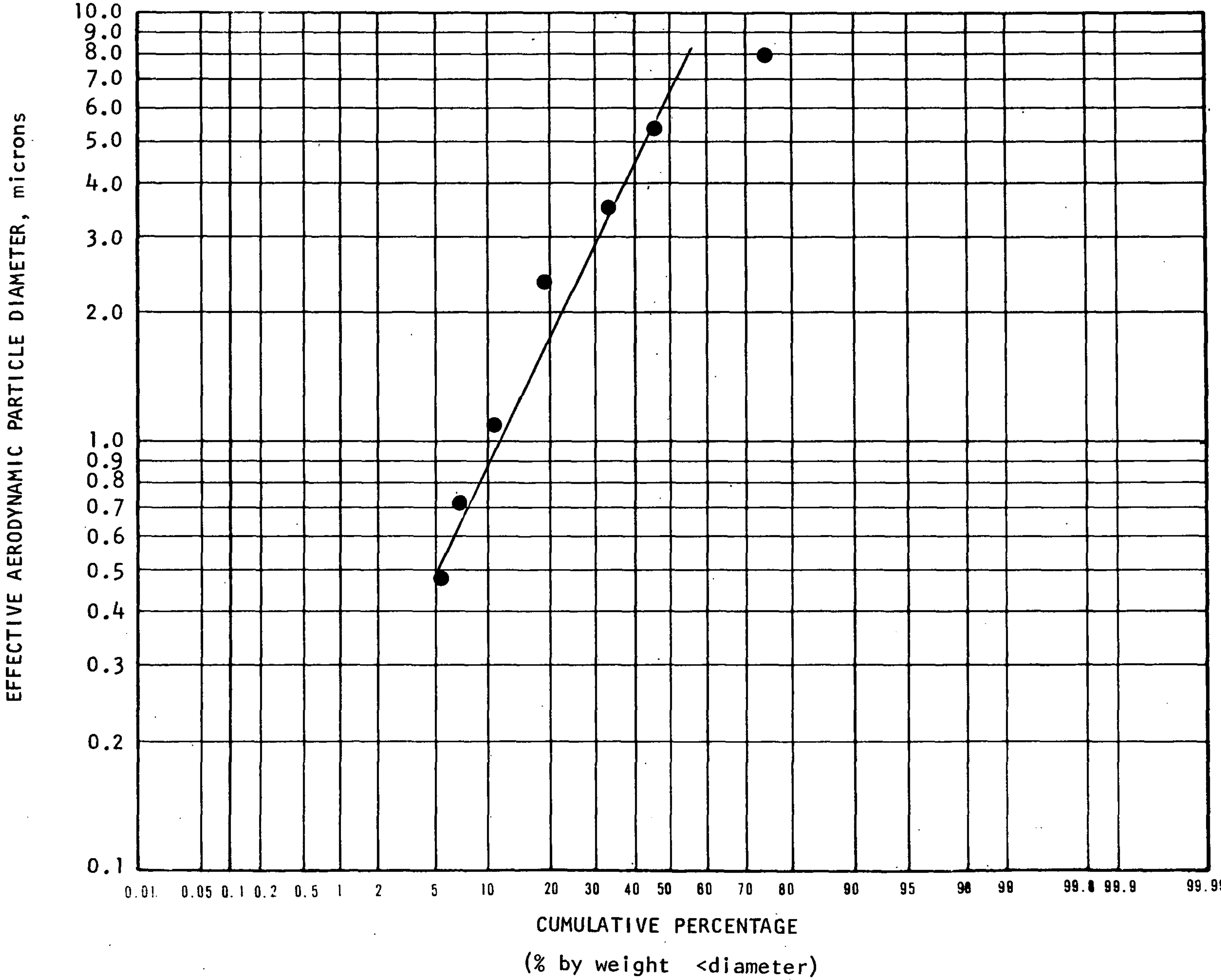
P_{bar} (in. Hg.)	23.98
Stack Temp (^{o}F)	587.
Sample Time (min)	2.
Sample Volume (wscf)	1.97
Moisture (% H_2O)	25.0
Meter Temp (^{o}F)	97.
Flow Setting, Δ H (in. H_2O)	2.8
Nozzle Diameter (in.)	0.492

Sample Flow Rate (at stack conditions) = 2.44 cfm

Plate No.	Net Wt. (mg)	%	Cumulative %	EAD (Microns)
1	24.8	25.9	100.0	12.4
2	26.3	27.5	74.0	8.0
3	13.0	13.6	46.5	5.4
4	12.9	13.5	32.9	3.6
5	7.9	8.3	19.4	2.3
6	3.4	3.7	11.1	1.2
7	2.3	2.4	7.5	0.71
8	2.0	2.1	5.1	0.48
Backup Filter	2.9	3.0	3.0	---
TOTAL	95.5			

DRYER SCRUBBER INLET DUCT

Run 2



EXXON MINERALS COMPANY, U.S.A.

Converse County, Wyoming

Table 41

PARTICLE SIZE DISTRIBUTION

Run: 3

Date: October 1, 1979

Location: Exxon Minerals Company, U.S.A.

Sampling Location: Dryer Scrubber Inlet Duct

Traverse Point No. Sampled: X-10

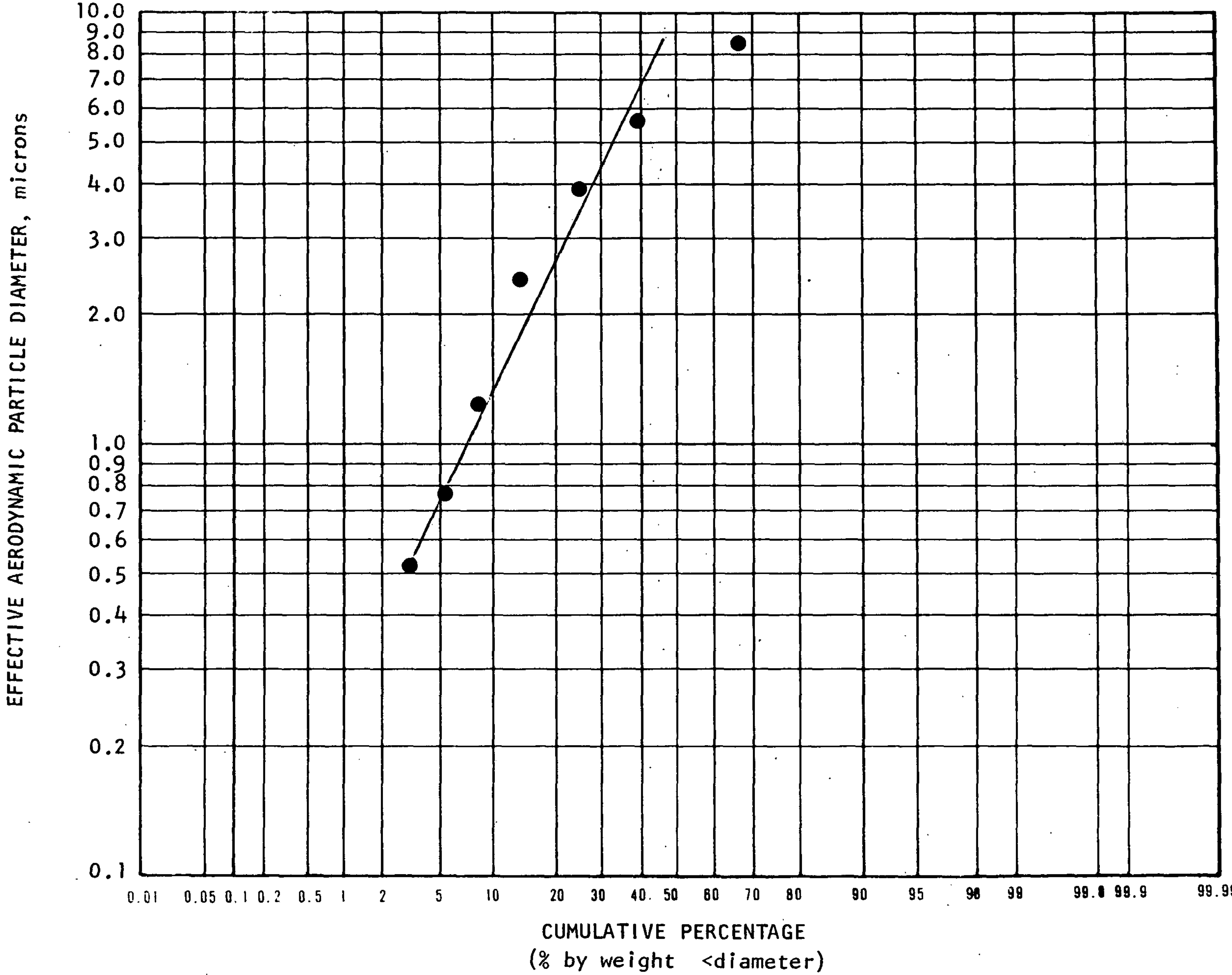
P_{bar} (in. Hg.)	23.98
Stack Temp (^{o}F)	587.
Sample Time (min)	1.5
Sample Volume (wscf)	1.24
Moisture (% H_2O)	25.0
Meter Temp (^{o}F)	100.
Flow Setting, ΔH (in. H_2O)	2.8
Nozzle Diameter (in.)	0.492

Sample Flow Rate (at stack conditions): 2.04 cfm

Plate No.	Net Wt. (mg)	%	Cumulative %	EAD (Microns)
1	29.3	32.7	100.0	13.9
2	24.7	27.6	67.3	8.5
3	13.2	14.7	39.7	5.7
4	9.2	10.3	24.9	3.9
5	5.9	6.6	14.6	2.5
6	2.3	2.6	8.0	1.3
7	1.7	1.9	5.5	0.77
8	1.2	1.3	3.6	0.52
Backup Filter	2.0	2.2	2.2	---
TOTAL	89.5			

DRYER SCRUBBER INLET DUCT

Run 3



EXXON MINERALS COMPANY, U.S.A.

Converse County, Wyoming

Table 42

PARTICLE SIZE DISTRIBUTION

Run: 1

Date: October 1, 1979

Location: Exxon Minerals Company, U.S.A.

Sampling Location: Packaging Area Exhaust Duct

Traverse Point No. Sampled: Center Point

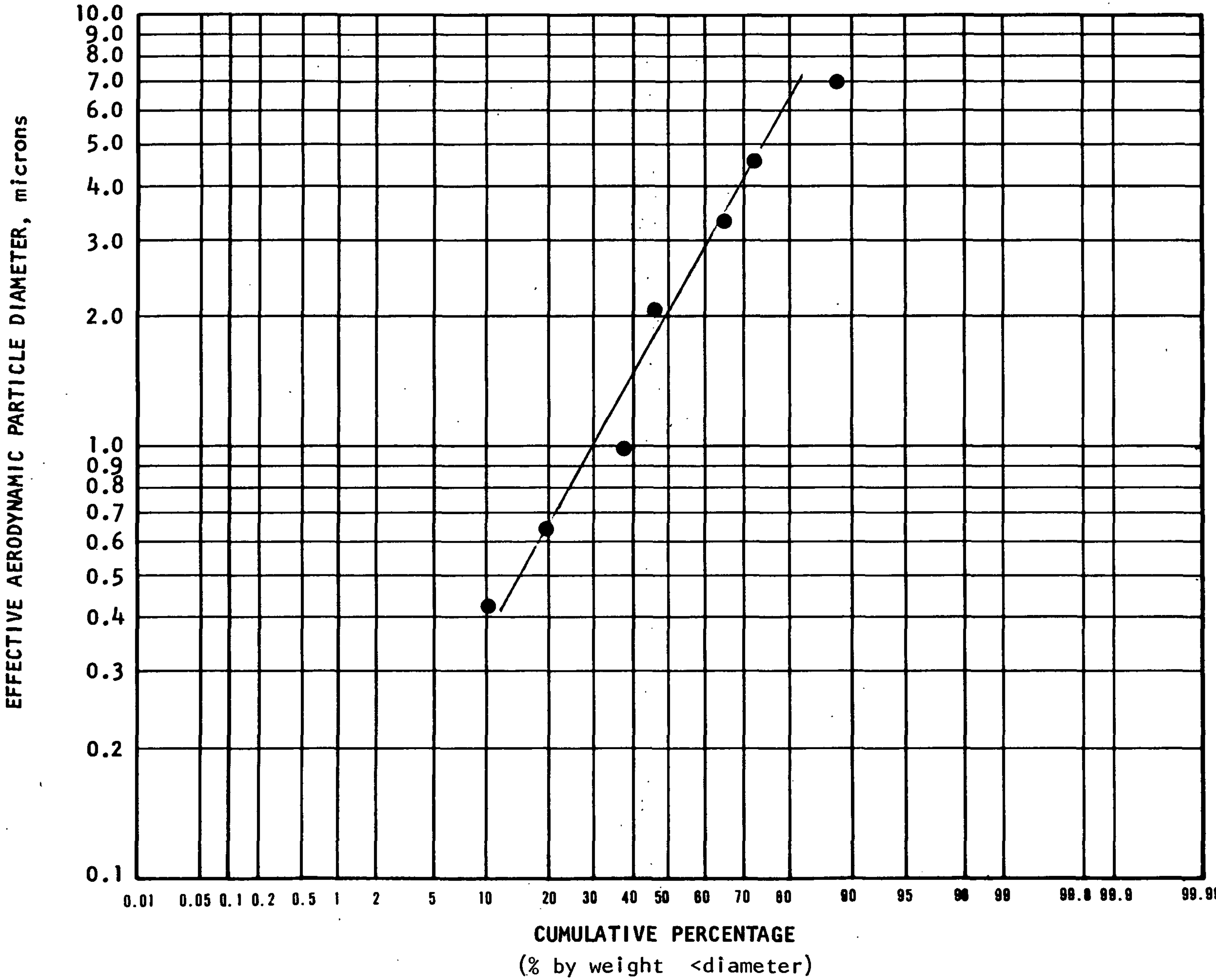
P_{bar} (in. Hg.)	23.98
Stack Temp (°F)	104.
Sample Time (min)	55.
Sample Volume (cf)	54.88
Moisture (% H_2O)	1.6
Meter Temp (°F)	96.
Flow Setting, ΔH (in. H_2O)	2.7
Nozzle Diameter (in.)	0.183

Sample Flow Rate (at stack conditions): 1.01 cfm

Plate No.	Net Wt. (mg)	%	Cumulative %	EAD (Microns)
1	1.3	11.7	100.0	11.4
2	1.6	14.4	88.3	7.0
3	1.0	9.0	73.9	4.7
4	1.0	9.0	64.9	3.3
5	1.9	17.1	55.9	2.0
6	2.1	18.9	38.7	0.99
7	1.0	9.0	19.8	0.65
8	0.9	8.1	10.8	0.44
Backup Filter	0.3	2.7	2.7	---
TOTAL	11.1			

PACKAGING AREA EXHAUST DUCT

Run 1



EXXON MINERALS COMPANY, U.S.A.

Converse County, Wyoming

Table 43

PARTICLE SIZE DISTRIBUTION

Run: 2

Date: October 1, 1979

Location: Exxon Minerals Company, U.S.A.

Sampling Location: Packaging Area Exhaust Duct

Traverse Point No. Sampled: Center Point

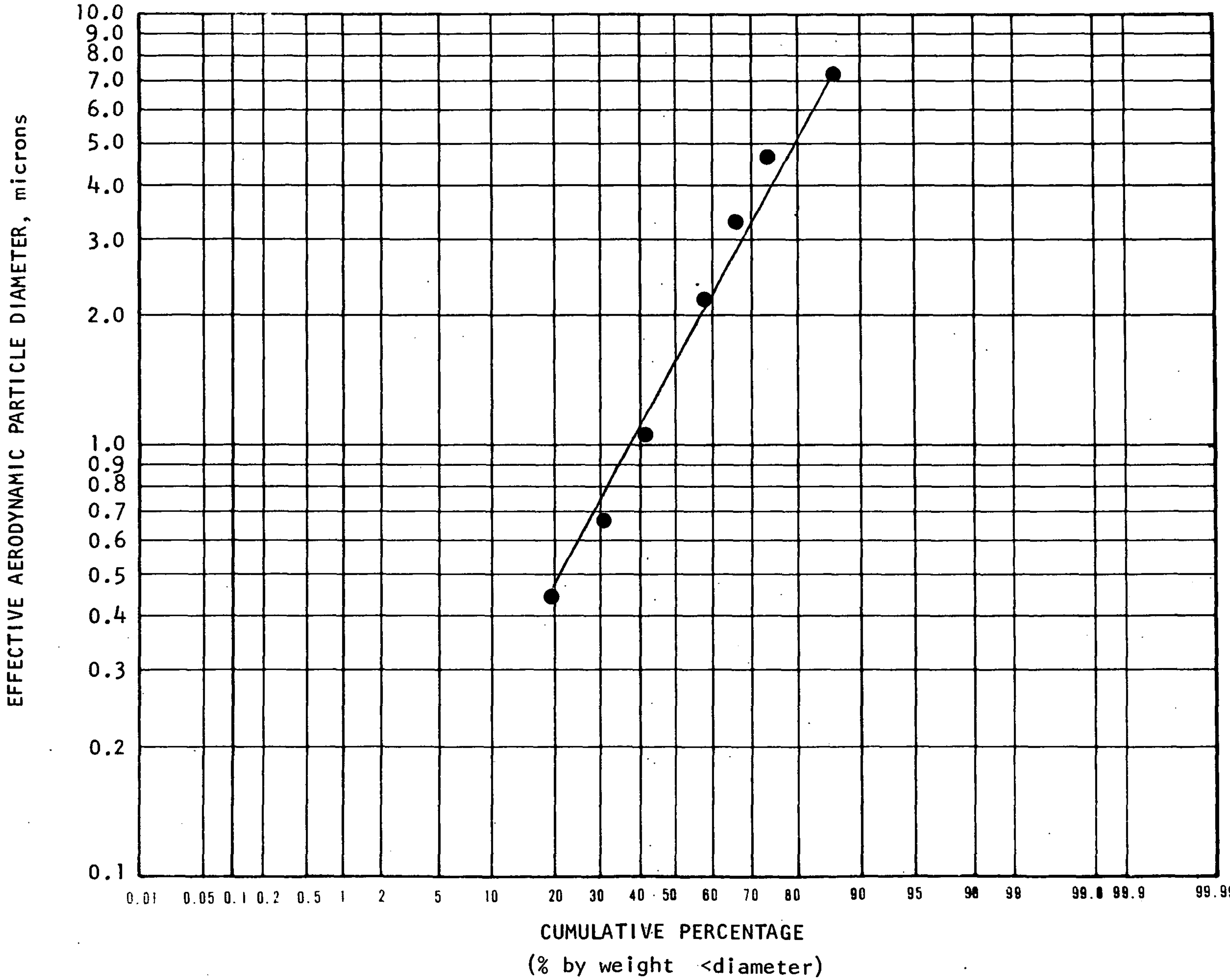
P_{bar} (in. Hg.)	23.98
Stack Temp (^{o}F)	104.
Sample Time (min)	55.
Sample Volume (cf)	50.77
Moisture (% H_2O)	2.0
Meter Temp (^{o}F)	91.
Flow Setting, Δ H (in. H_2O)	2.7
Nozzle Diameter (in.)	0.183

Sample Flow Rate (at stack conditions): 0.96 cfm

Plate No.	Net Wt. (mg)	%	Cumulative %	EAD (Microns)
1	1.6	13.2	100.0	11.5
2	1.6	13.2	86.8	7.2
3	0.8	6.6	73.6	4.8
4	1.0	8.3	66.9	3.4
5	2.0	16.5	58.7	2.2
6	1.4	11.6	42.2	1.1
7	1.4	11.6	30.6	0.67
8	0.8	6.6	19.0	0.45
Backup Filter	1.5	12.4	12.4	---
TOTAL	12.1			

PACKAGING AREA EXHAUST DUCT

Run 2



EXXON MINERALS COMPANY, U.S.A.

Converse County, Wyoming

Table 44

PARTICLE SIZE DISTRIBUTION

Run: 3

Date: October 1, 1979

Location: Exxon Minerals Company, U.S.A.

Sampling Location: Packaging Area Exhaust Duct

Traverse Point No. Sampled: Center Point

P_{bar} (in. Hg.)	23.98
Stack Temp (^{o}F)	104.
Sample Time (min)	55.
Sample Volume (cf)	51.89
Moisture (% H20)	1.5
Meter Temp (^{o}F)	103.
Flow Setting, Δ H (in. H_2O)	2.7
Nozzle Diameter (in.)	0.183

Sample Flow Rate (at stack conditions): 0.96 cfm

Plate No.	Net Wt. (mg)	%	Cumulative %	EAD (Microns)
1	1.0	9.7	100.0	11.5
2	0.8	7.8	90.3	7.2
3	1.0	9.7	82.5	4.8
4	1.3	12.6	72.8	3.4
5	1.6	15.5	60.2	2.2
6	1.3	12.6	44.7	1.1
7	1.2	11.7	32.0	0.67
8	1.0	9.7	20.4	0.45
Backup Filter	1.1	10.7	10.7	---
TOTAL	10.3			

PACKAGING AREA EXHAUST DUCT

Run 3

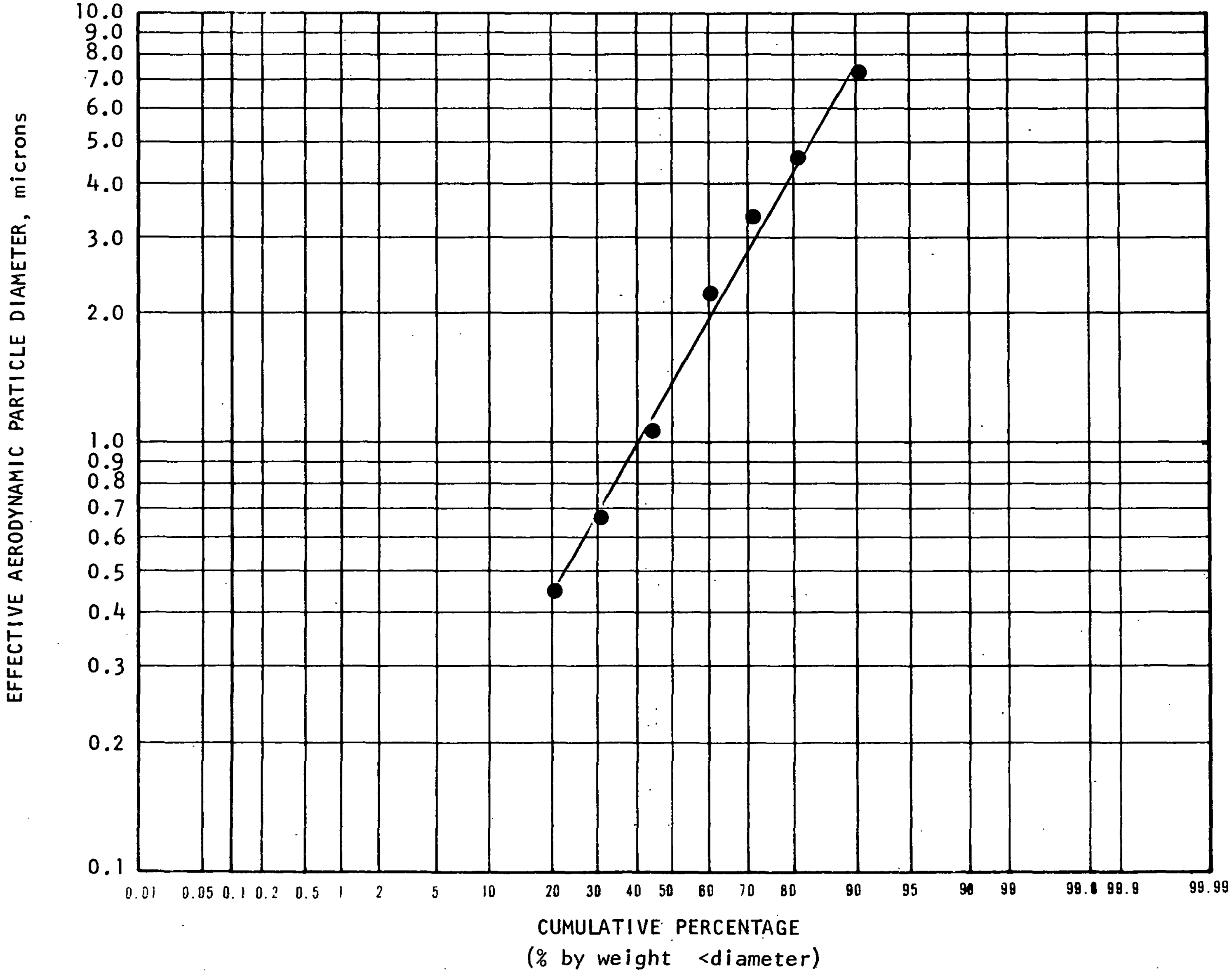


TABLE 45
SUMMARY OF VISIBLE EMISSIONS

Date: September 27, 1979
Type of Plant: Uranium Mine
Type of Discharge: Process Hoods
Location of Discharge: Grizzley Hood & Crusher Ent
Height of Point of Discharge: Approx. 12 ft
Description of Sky: Area (TP9 and TP10)
Wind Direction:
Wind Velocity:
Color of Plume:
Detached Plume:
Observer No.:
Duration of Observation: Approx. 5-3/4 hours
Distance from Observer to Discharge Point: Approx. 25 ft
Direction of Observer from Discharge Point: North
Height of Observation Point: Ground Level
Description of Background: Inside Crusher Building on Ground Level

SUMMARY OF AVERAGE OPACITY

Set Number	Time Start	Time End	Opacity Sum	Opacity Average	Set Number	Time Start	Time End	Opacity Sum	Opacity Average
1	1745	1751	0	0	21	1945	1951	0	0
2	1751	1757	0	0	22	1951	1953	0	0
3	1757	1803	0	0	23	2115	2121	0	0
4	1803	1809	0	0	24	2121	2127	0	0
5	1809	1815	0	0	25	2127	2133	0	0
6	1815	1821	0	0	26	2133	2139	0	0
7	1821	1827	0	0	27	2139	2145	0	0
8	1827	1833	0	0	28	2145	2151	0	0
9	1833	1839	0	0	29	2151	2157	0	0
10	1839	1845	0	0	30	2157	2203	0	0
11	1845	1851	0	0	31	2203	2209	0	0
12	1851	1857	0	0	32	2209	2215	0	0
13	1857	1903	0	0	33	2215	2221	0	0
14	1903	1909	0	0	34	2221	2227	0	0
15	1909	1915	0	0	35	2227	2233	0	0
16	1915	1921	0	0	36	2233	2239	0	0
17	1921	1927	0	0	37	2239	2245	0	0
18	1927	1933	0	0	38	2245	2251	0	0
19	1933	1939	0	0	39	2251	2257	0	0
20	1939	1945	0	0	40	2257	2303	0	0

Sketch Showing How Opacity Varied with Time:

Opacity (%)

0 — 1 hr — 2 hr — 3 hr — 4 hr — 5 hr — 6 hr

0 Time, Hours

TABLE 45

SUMMARY OF VISIBLE EMISSIONS

(continued)

Date: September 27, 1979

Type of Plant: Uranium Mine

Type of Discharge: Process Hoods

Location of Discharge: Grizzley Hood & Crusher Ent. Area (TP9 and TP10)

Height of Point of Discharge: Approx. 12 ft

Description of Sky:

Wind Direction:

Wind Velocity:

Color of Plume:

Detached Plume:

Observer No.:

Duration of Observation: Approx. 5-3/4 hours

Distance from Observer to Discharge Point: Approx. 25 ft

Direction of Observer from Discharge Point: North

Height of Observation Point: Ground Level

Description of Background: Inside Crusher Building on Ground Level

SUMMARY OF AVERAGE OPACITY

Set Number	Time		Opacity		Set Number	Time		Opacity	
	Start	End	Sum	Average		Start	End	Sum	Average
41	2303	2305	0	0					
42	0005	0011	0	0					
43	0011	0017	0	0					
44	0017	0023	0	0					
45	0023	0029	0	0					
46	0029	0035	0	0					
47	0035	0041	0	0					
48	0041	0047	0	0					
49	0047	0053	0	0					
50	0053	0059	0	0					
51	0059	0105	0	0					
52	0105	0111	0	0					
53	0111	0117	0	0					
54	0117	0123	0	0					
55	0123	0129	0	0					
56	0129	0135	0	0					
57	0135	0141	0	0					
58	0141	0147	0	0					
59	0147	0149	0	0					

Sketch Showing How Opacity Varied with Time:

Opacity (%)

0

0 Time, Hours

Date: September 27, 1979
Type of Plant: Uranium Mine
Type of Discharge: Process Hoods
Location of Discharge: Crusher Transfer Point
Height of Point of Discharge: Approx. 50 ft
Description of Sky:
Wind Direction:
Wind Velocity:
Color of Plume:
Detached Plume:
Observer No.:
Duration of Observation: Approx. 5-1/4 hours
Distance from Observer to Discharge Point: Approx. 50 ft
Direction of Observer from Discharge Point:
Height of Observation Point: 5 ft Above on Walkway
Description of Background: Near crusher transfer point

SUMMARY OF AVERAGE OPACITY

Set Number	Time		Opacity		Set Number	Time		Opacity	
	Start	End	Sum	Average		Start	End	Sum	Average
1	1740	1746	0	0	21	2100	2106	0	0
2	1746	1752	0	0	22	2106	2112	0	0
3	1752	1758	0	0	23	2112	2118	0	0
4	1758	1804	0	0	24	2118	2124	0	0
5	1804	1810	0	0	25	2124	2130	0	0
6	1810	1816	0	0	26	2130	2136	0	0
7	1816	1822	0	0	27	2136	2142	0	0
8	1822	1828	0	0	28	2142	2148	0	0
9	1828	1834	0	0	29	2148	2154	0	0
10	1834	1840	0	0	30	2154	2200	0	0
11	1840	1846	0	0	31	2200	2206	0	0
12	1846	1852	0	0	32	2206	2212	0	0
13	1852	1858	0	0	33	2212	2218	0	0
14	1858	1904	0	0	34	2218	2224	0	0
15	1904	1910	0	0	35	2224	2230	0	0
16	1910	1916	0	0	36	2230	2236	0	0
17	1916	1922	0	0	37	2236	2242	0	0
18	1922	1928	0	0	38	0000	0006	0	0
19	1928	1934	0	0	39	0006	0012	0	0
20	1934	1938	0	0	40	0012	0018	0	0

Sketch Showing How Opacity Varied with Time:

Opacity (%)

0

1 hr 2 hr 3 hr 4 hr 5 hr

0 Time, Hours

TABLE 46

SUMMARY OF VISIBLE EMISSIONS
(continued)

Date: September 27, 1979
Type of Plant: Uranium Mine
Type of Discharge: Process Hoods
Location of Discharge: Crusher Transfer Point
Height of Point of Discharge: Approx. 50 ft
Description of Sky:
Wind Direction:
Wind Velocity:
Color of Plume:
Detached Plume:
Observer No.:
Duration of Observation: Approx. 5-1/4 hours
Distance from Observer to Discharge Point: Approx. 50 ft
Direction of Observer from Discharge Point:
Height of Observation Point: 5 ft Above on Walkway
Description of Background: Near crusher transfer point

SUMMARY OF AVERAGE OPACITY

Set Number	Time Start	Time End	Opacity Sum	Opacity Average	Set Number	Time Start	Time End	Opacity Sum	Opacity Average
41	0018	0024	0	0					
42	0024	0030	0	0					
43	0030	0036	0	0					
44	0036	0042	0	0					
45	0042	0048	0	0					
46	0048	0054	0	0					
47	0054	0100	0	0					
48	0100	0106	0	0					
49	0106	0112	0	0					
50	0112	0118	0	0					
51	0118	0124	0	0					
52	0124	0130	0	0					
53	0130	0136	0	0					
54	0136	0138	0	0					

Sketch Showing How Opacity Varied with Time:

Opacity (%)

0

0 Time, Hours

TABLE 47
SUMMARY OF VISIBLE EMISSIONS

Date: September 27, 1979
Type of Plant: Uranium Mine
Type of Discharge: Process Hoods
Location of Discharge: Crusher Grizzley
Height of Point of Discharge:
Description of Sky:
Wind Direction:
Wind Velocity:
Color of Plume:
Detached Plume:
Observer No.:
Duration of Observation: Approx. 4-1/2 hours
Distance from Observer to Discharge Point: Approx. 20 ft
Direction of Observer from Discharge Point:
Height of Observation Point:
Description of Background: Inside crusher building, 20 ft from hood

SUMMARY OF AVERAGE OPACITY

Set Number	Time		Opacity		Set Number	Time		Opacity	
	Start	End	Sum	Average		Start	End	Sum	Average
1	1751	1757	0	0	21	2158	2204	0	0
2	1757	1803	0	0	22	2204	2210	0	0
3	1803	1809	0	0	23	2210	2216	0	0
4	1809	1815	0	0	24	2216	2222	0	0
5	1815	1821	0	0	25	2222	2228	0	0
6	1821	1827	0	0	26	2228	2234	0	0
7	1827	1833	0	0	27	2234	2240	0	0
8	1833	1839	0	0	28	2240	2246	0	0
9	1839	1845	0	0	29	2246	2252	0	0
10	1845	1851	0	0	30	2252	2258	0	0
11	1851	1857	0	0	31	0002	0008	0	0
12	1857	1903	0	0	32	0008	0014	0	0
13	1903	1907	0	0	33	0014	0020	0	0
14	2116	2122	0	0	34	0020	0026	0	0
15	2122	2128	0	0	35	0026	0032	0	0
16	2128	2134	0	0	36	0032	0038	0	0
17	2134	2140	0	0	37	0038	0044	0	0
18	2140	2146	0	0	38	0044	0050	0	0
19	2146	2152	0	0	39	0050	0056	0	0
20	2152	2158	0	0	40	0056	0102	0	0

Sketch Showing How Opacity Varied with Time:

Opacity (%)

0

1 hr 2 hr 3 hr 4 hr

0 Time, Hours

TABLE 47
SUMMARY OF VISIBLE EMISSIONS
(continued)

Date: September 27, 1979
Type of Plant: Uranium Mine
Type of Discharge: Process Hoods
Location of Discharge: Crusher Grizzley
Height of Point of Discharge:
Description of Sky:
Wind Direction:
Wind Velocity:
Color of Plume:
Detached Plume:
Observer No.:
Duration of Observation: Approx. 4-1/2 hours
Distance from Observer to Discharge Point: Approx. 20 ft
Direction of Observer from Discharge Point:
Height of Observation Point:
Description of Background: Inside crusher building, 20 ft from hood

SUMMARY OF AVERAGE OPACITY

Set Number	Time Start	Time End	Opacity Sum	Opacity Average	Set Number	Time Start	Time End	Opacity Sum	Opacity Average
41	0102	0108	0	0					
42	0108	0114	0	0					
43	0114	0120	0	0					
44	0120	0126	0	0					
45	0126	0132	0	0					
46	0132	0138	0	0					

Sketch Showing How Opacity Varied with Time:

Opacity (%)

0

0 Time, Hours

TABLE 48
SUMMARY OF VISIBLE EMISSIONS

Date: September 27, 1979
Type of Plant: Uranium Mine
Type of Discharge: Stack
Location of Discharge: Crusher Scrubber Outlet
Height of Point of Discharge: Approx. 120 ft
Description of Sky: Partly Cloudy
Wind Direction: SW
Wind Velocity: 5 to 15 mph
Color of Plume:
Detached Plume:
Observer No.:
Duration of Observation: 69 minutes
Distance from Observer to Discharge Point: Approx. 7 ft
Direction of Observer from Discharge Point: NW
Height of Observation Point: Approx. 5 ft below lip
Description of Background: Scattered

SUMMARY OF AVERAGE OPACITY

Set Number	Time		Opacity		Set Number	Time		Opacity	
	Start	End	Sum	Average		Start	End	Sum	Average
1	1804	1810	0	0					
2	1810	1816	0	0					
3	1816	1822	0	0					
4	1822	1828	0	0					
5	1828	1834	0	0					
6	1834	1840	0	0					
7	1840	1846	0	0					
8	1846	1852	0	0					
9	1852	1858	0	0					
10	1858	1904	0	0					
11	1904	1910	0	0					
12	1910	1913	0	0					

Sketch Showing How Opacity Varied with Time:

Opacity (%)

0 15 mins. 30 mins. 45 mins. 60 mins. 75 mins.

0 Time, Minutes

TABLE 49
SUMMARY OF VISIBLE EMISSIONS

Date: September 28, 1979
Type of Plant: Uranium Mine
Type of Discharge: Transfer Point
Location of Discharge: Fine Ore Bins Scrubber Inle
Height of Point of Discharge: Approx. 8 ft
Description of Sky:
Wind Direction:
Wind Velocity:
Color of Plume:
Detached Plume:
Observer No.:
Duration of Observation: Approx. 3-1/2 hours
Distance from Observer to Discharge Point: Approx. 25 ft
Direction of Observer from Discharge Point: East
Height of Observation Point:
Description of Background:

SUMMARY OF AVERAGE OPACITY

Set Number	Time Start	Time End	Opacity Sum	Opacity Average	Set Number	Time Start	Time End	Opacity Sum	Opacity Average
1	1850	1856	0	0	21	2207	2213	0	0
2	1856	1902	0	0	22	2213	2219	0	0
3	1902	1908	0	0	23	2219	2225	0	0
4	1908	1914	0	0	24	2225	2231	0	0
5	1914	1920	0	0	25	2231	2237	0	0
6	1920	1926	0	0	26	2237	2240	0	0
7	1926	1932	0	0	27	2330	2336	0	0
8	1932	1938	0	0	28	2336	2342	0	0
9	1938	1944	0	0	29	2342	2348	0	0
10	1944	1950	0	0	30	2348	2354	0	0
11	1950	1956	0	0	31	2354	2400	0	0
12	1956	2002	0	0	32	2400	0006	0	0
13	2002	2005	0	0	33	0006	0012	0	0
14	2125	2131	0	0	34	0012	0018	0	0
15	2131	2137	0	0	35	0018	0024	0	0
16	2137	2143	0	0	36	0024	0030	0	0
17	2143	2149	0	0	37	0030	0036	0	0
18	2149	2155	0	0	38	0036	0037	0	0
19	2155	2201	0	0					
20	2201	2207	0	0					

Sketch Showing How Opacity Varied with Time:

Opacity (%)

0 1 hr 2 hr 3 hr 4 hr

0 Time, Hours

TABLE 50
SUMMARY OF VISIBLE EMISSIONS

Date: September 28, 1979
Type of Plant: Uranium Mine
Type of Discharge: Process Area
Location of Discharge: Fine Ore Bins Hopper Exhaust Duct
Height of Point of Discharge:
Description of Sky:
Wind Direction:
Wind Velocity:
Color of Plume:
Detached Plume:
Observer No.:
Duration of Observation: Approx. 3 hours
Distance from Observer to Discharge Point: Approx. 50 ft
Direction of Observer from Discharge Point:
Height of Observation Point: Eye Level to Source
Description of Background:

SUMMARY OF AVERAGE OPACITY

Set Number	Time		Opacity		Set Number	Time		Opacity	
	Start	End	Sum	Average		Start	End	Sum	Average
1	1848	1854			21	2156	2200		
2	1854	1900			22	2325	2331		
3	1900	1906			23	2331	2337		
4	1906	1912			24	2337	2343		
5	1912	1918			25	2343	2349		
6	1918	1924			26	2349	2355		
7	1924	1930			27	2355	0001		
8	1930	1936			28	0001	0007		
9	1936	1942			29	0007	0013		
10	1942	1948			30	0013	0019		
11	1948	1954			31	0019	0025		
12	1954	2000			32	0025	0030		
13	2000	2006							
14	2006	2010							
15	2120	2126							
16	2126	2132							
17	2132	2138							
18	2138	2144							
19	2144	2150							
20	2150	2156							

Sketch Showing How Opacity Varied with Time:

Opacity (%)

0

1 hr   2 hr   3 hr

0   Time, Hours

TABLE 51
SUMMARY OF VISIBLE EMISSIONS

Date: September 28, 1979
Type of Discharge: Stack
Height of Point of Discharge: Approx. 170 ft
Wind Direction: NW
Color of Plume:
Observer No.:
Type of Plant: Uranium Mine
Location of Discharge: Fine Ore Bins Scrubber Out- let Duc
Description of Sky: Clear
Wind Velocity: 5 to 15 mph
Detached Plume:
Duration of Observation: 1 hour
Distance from Observer to Discharge Point: Approx. 35 ft
Direction of Observer from Discharge Point: West
Height of Observation Point: Approx. 150 ft
Description of Background:

SUMMARY OF AVERAGE OPACITY

Set Number	Time		Opacity		Set Number	Time		Opacity	
	Start	End	Sum	Average		Start	End	Sum	Average
1	1845	1851	0	0					
2	1851	1857	0	0					
3	1857	1903	0	0					
4	1903	1909	0	0					
5	1909	1915	0	0					
6	1915	1921	0	0					
7	1921	1927	0	0					
8	1927	1933	0	0					
9	1933	1939	0	0					
10	1939	1945	0	0					

Sketch Showing How Opacity Varied with Time:

Opacity (%)

0

20 mins. 40 mins. 60 mins.

0 Time, Minutes

TABLE 52
SUMMARY OF VISIBLE EMISSIONS

Date: October 1, 1979
Type of Plant: Uranium Mine
Type of Discharge: Stack
Location of Discharge: Dryer Scrubber Outlet Duct
Height of Point of Discharge: Approx. 80 ft
Description of Sky: Clear
Wind Direction: SW
Wind Velocity: 10 to 15 mph
Color of Plume:
Detached Plume:
Observer No.:
Duration of Observation: Approx. 3-1/4 hours
Distance from Observer to Discharge Point: Approx. 150 ft
Direction of Observer from Discharge Point: South
Height of Observation Point: Approx. 65 ft
Description of Background:

SUMMARY OF AVERAGE OPACITY

Set Number	Time		Opacity		Set Number	Time		Opacity	
	Start	End	Sum	Average		Start	End	Sum	Average
1	0930	0936	70	2.9	21	1324	1330	95	4.0
2	0936	0942	50	2.1	22	1330	1336	65	2.7
3	0942	0948	5	0.2	23	1336	1340	30	1.5
4	0948	0954	0	0.0	24	1430	1436	5	0.2
5	0954	1000	5	0.2	25	1436	1442	0	0
6	1000	1006	0	0	26	1442	1448	0	0
7	1006	1012	0	0	27	1448	1454	0	0
8	1012	1018	0	0	28	1454	1500	0	0
9	1018	1024	0	0	29	1500	1506	0	0
10	1024	1030	0	0	30	1506	1512	0	0
11	1030	1033	0	0	31	1512	1518	5	0.2
12	1230	1236	130	5.4	32	1518	1524	10	0.4
13	1236	1242	85	3.5	33	1524	1530	0	0
14	1242	1248	115	4.8	34	1530	1534	0	0
15	1248	1254	105	4.4					
16	1254	1300	105	4.4					
17	1300	1306	125	5.2					
18	1306	1312	70	2.9					
19	1312	1318	70	2.9					
20	1318	1324	100	4.2					

Sketch Showing How Opacity Varied with Time:

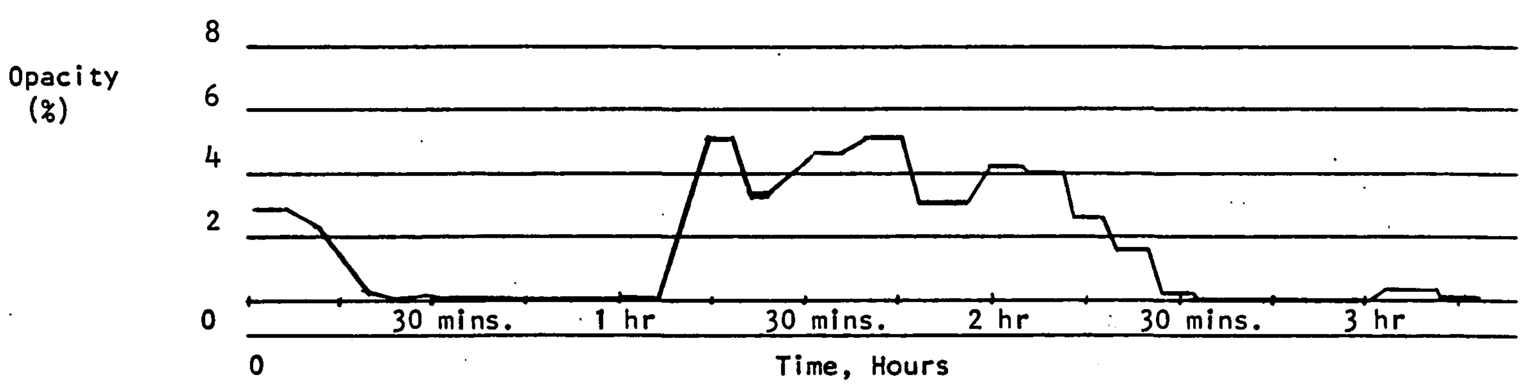


TABLE 53

SUMMARY OF VISIBLE EMISSIONS

Date: October 1, 1979

Type of Plant: Uranium Mine

Type of Discharge: Process Area

Location of Discharge: Barreling Enclosure Area

Height of Point of Discharge:

Description of Sky:

Wind Direction:

Wind Velocity:

Color of Plume:

Detached Plume:

Observer No.:

Duration of Observation: Approx. 3-1/4 hours

Distance from Observer to Discharge Point: Approx. 15 ft at Eye Level

Direction of Observer from Discharge Point: SW

Height of Observation Point:

Description of Background: Indoors

S U M M A R Y   O F   A V E R A G E   O P A C I T Y

Set Number	Time Start	Time End	Opacity Sum	Opacity Average	Set Number	Time Start	Time End	Opacity Sum	Opacity Average
1	0930	0936	0	0	21	1324	1330	0	0
2	0936	0942	0	0	22	1330	1333	0	0
3	0942	0948	0	0	23	1435	1441	0	0
4	0948	0954	0	0	24	1441	1447	0	0
5	0954	1000	0	0	25	1447	1453	0	0
6	1000	1006	0	0	26	1453	1459	0	0
7	1006	1012	0	0	27	1459	1505	0	0
8	1012	1018	0	0	28	1505	1511	0	0
9	1018	1024	0	0	29	1511	1517	0	0
10	1024	1030	0	0	30	1517	1523	0	0
11	1030	1034	0	0	31	1523	1529	0	0
12	1230	1236	0	0	32	1529	1535	0	0
13	1236	1242	0	0	33	1535	1541	0	0
14	1242	1248	0	0	34	1541	1545	0	0
15	1248	1254	0	0					
16	1254	1300	0	0					
17	1300	1306	0	0					
18	1306	1312	0	0					
19	1312	1318	0	0					
20	1318	1324	0	0					

Sketch Showing How Opacity Varied with Time:

Opacity (%)

0

1 hr   2 hr   3 hr

0

Time, Hours

TABLE 54

Mean fugitive emission values (% frequency emission) for three tests at each location are presented. Values are given for each oberserver.

Fine Ore Bins - Scrubber Inlet Duct Area TP-19

	Observer 1	Test Mean
Test 1	0.0	0.0
Test 2	0.0	0.0
Test 3	0.0	0.0
Site Mean	0.0	0.0

Fine Ore Bins - Hopper Exhaust Duct Area TP-18

Test 1	0.0	0.0
Test 2	0.0	0.0
Test 3	0.0	0.0
Site Mean	0.0	0.0

Dryer Scrubber Inlet Area TP-24

Test 1	0.0	0.0
Test 2	0.0	0.0
Test 3	0.0	0.0
Site Mean	0.0	0.0

TABLE 55

Mean fugitive emission values (% frequency emission) for three tests at each location are presented. Values are given for each observer.

Grizzley Hood & Crusher Entrance Area TP-9 and 10.

	Observer 1	Test Mean
Test 1	0.0	0.0
Test 2	0.0	0.0
Test 3	0.0	0.0
Site Mean	0.0	0.0

Crusher Transfer Point Area TP-13

Test 1	0.0	0.0
Test 2	0.0	0.0
Test 3	0.0	0.0
Site Mean	0.0	0.0

Crusher-Grizzley Area TP-12

Test 1	0.0	0.0
Test 2	0.0	0.0
Test 3	0.0	0.0
Site Mean	0.0	0.0

Appendix A

Raw Test Data

TRAVERSE POINT LOCATION FOR CIRCULAR DUCTS

PLANT Exxon Uranium
DATE 9-26-79
SAMPLING LOCATION Crusher Transfer Point exhaust duct
INSIDE OF FAR WALL TO OUTSIDE OF PORT, (DISTANCE A) 18"
INSIDE OF NEAR WALL TO OUTSIDE OF PORT, (DISTANCE B) 6"
STACK I.D., (DISTANCE A - DISTANCE B) 12"
NEAREST UPSTREAM DISTURBANCE 28 Dia.
NEAREST DOWNSTREAM DISTURBANCE 72 Dia.
CALCULATOR Dobroski

SCHEMATIC OF SAMPLING LOCATION

TRAVERSE POINT NUMBER	FRACTION OF STACK I.D.	STACK I.D.	PRODUCT OF COLUMNS 2 AND 3 (TO NEAREST 1/8 INCH)	DISTANCE B	TRAVERSE POINT LOCATION FROM OUTSIDE OF PORT (SUM OF COLUMNS 4 & 5)
1	.067				3/4" + 6"
2	.25				3" "
3	.75				9" "
4	.933				11 1/4" "
					6 3/4
					9
					15
					17 1/4

PRELIMINARY VELOCITY TRAVERSE

PLANT Exxon Mineral
DATE 9-27-79
LOCATION Crusher transfer Pt.
STACK I.D. 12"
BAROMETRIC PRESSURE, in. Hg 24.77
STACK GAUGE PRESSURE, in. H_2O -.13
OPERATORS Newton / Feeley

L.C.I

L.C.F

SCHEMATIC OF TRAVERSE POINT LAYOUT

TRAVERSE POINT NUMBER	VELOCITY HEAD (Δp_s), in. H_2O	STACK TEMPERATURE (T_s), °F
X 1	.32	74
2	.25	72
3	.23	71
4	.22	71
Y 1	.11	72
2	.15	71
3	.20	71
4	.20	71
AVERAGE	.21	72

TRAVERSE POINT NUMBER	VELOCITY HEAD (Δp_s), in. H_2O	STACK TEMPERATURE (T_s), °F
AVERAGE		

NOMOGRAPH DATA

PLANT Exxon Mineral

DATE 9-27-79

SAMPLING LOCATION Crusher Transfer Pt.

CONTROL BOX NO. 1226

CALIBRATED PRESSURE DIFFERENTIAL ACROSS ORIFICE, in. H_2O	$\Delta H_@$	1.92
AVERAGE METER TEMPERATURE (AMBIENT + 20°F), °F	$T_{m\,avg.}$	90
PERCENT MOISTURE IN GAS STREAM BY VOLUME	B_{wo}	5%
BAROMETRIC PRESSURE AT METER, in. Hg	P_m	29.77
STATIC PRESSURE IN STACK, in. Hg ($P_m \pm 0.073$ x STACK GAUGE PRESSURE in in. H_2O)	P_s	29.76
RATIO OF STATIC PRESSURE TO METER PRESSURE	P_s P_m	1.0
AVERAGE STACK TEMPERATURE, °F	$T_{s\,avg.}$	75
AVERAGE VELOCITY HEAD, in. H_2O	$\Delta p_{avg.}$	.21
MAXIMUM VELOCITY HEAD, in. H_2O	$\Delta p_{max.}$	.35
C FACTOR	1.1	
CALCULATED NOZZLE DIAMETER, in.	.30	
ACTUAL NOZZLE DIAMETER, in.	.242	
REFERENCE Δp, in. H_2O	.46	

FIELD DATA

PLANT Exxon Mineral
DATE 9-27-79
SAMPLING LOCATION Crusher Transfer
SAMPLE TYPE Particulate
RUN NUMBER 1
OPERATOR Newton
AMBIENT TEMPERATURE 70
BAROMETRIC PRESSURE 24.77
STATIC PRESSURE, (P_s) -.13
FILTER NUMBER (s) 25442

PROBE LENGTH AND TYPE 3 1/2'
NOZZLE I.D. .242
ASSUMED MOISTURE, % 5%
SAMPLE BOX NUMBER 4
METER BOX NUMBER 1220
METER $\Delta H_@$ 1.92
C FACTOR 1.09
PITOT TUBE FACTOR SA
REFERENCE Δp .46
NOTE

$\gamma = .9952$

READ AND RECORD ALL DATA EVERY 4 MINUTES

TRAVERSE POINT NUMBER	SAMPLING TIME, min / CLOCK TIME (24-hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O DESIRED	ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m\,in}$), °F	OUTLET ($T_{m\,out}$), °F	PUMP VACUUM, in. Hg
	0 / 1735	557.606							
1	4	559.65	.14	.54	.54	72	84	86	1.0
	8	561.1	.06	.22	.22	76	86	88	1.0
	12	562.2	.06	.22	.22	77	90	88	1.0
2	16	564.2	.20	.78	.78	76	94	90	2.0
	20	566.6	.20	.78	.78	76	94	90	2.0
	24	568.8	.20	.78	.78	76	98	90	2.0
3	28	571.4	.24	.96	.96	75	101	92	2.0
	32	573.7	.27	1.05	1.05	74	104	92	2.0
	36	576.3	.26	1.0	1.0	75	104	92	2.0
4	40	578.7	.24	.96	.96	75	106	92	2.0
	44	581.1	.25	.98	.98	76	108	93	2.0
	48	583.557	.24	.96	.96	76	108	93	2.0
		583.557							
1	4	585.6	.15	.58	.58	75	94	92	1.0
	8	587.5	.15	.58	.58	75	94	92	1.0
	12	589.4	.15	.58	.58	75	96	92	1.0
2	16	591.3	.17	.64	.64	76	98	92	1.0
	20	593.5	.18	.68	.68	76	98	92	1.0
	24	595.6	.18	.68	.68	77	99	92	1.0
3	28	597.8	.23	.92	.92	76	100	92	1.0
	32	600.3	.23	.92	.92	76	100	92	1.0
	36	602.7	.24	.96	.96	76	100	92	2.0
4	40	605.2	.24	.96	.96	76	102	92	2.0
	44	607.5	.21	.85	.85	75	102	92	2.0
	48	609.806	.21	.85	.85	75	103	92	2.0

1 p

ΔP = .43680 ΔH = .76792 Ts 75.000 Tm 94.854

Transfer pt. Crusher Run 1

0.4368	[illegible]P
0.76792	[illegible]H
75.5	TS
94.854	TM
52.2	VMR
24.77	PBAR
0.	VIC
9.5	WSG
28.9[illegible]	MWD
.7853981634	[illegible]
96.	TT
-0.130	STAT
0.242	DN
0.99525	[illegible]
0.855	CP
9.5	TH2O
41.02132972	VMS
0.447925	VWS
1.08013757	[illegible]M
.9891986243	MD
28.85150891	MWS
24.76044118	PS
27.6426926	VACT
1302.6312	QACT
22.3117501	VSTD
1051.416453	QSTD
99.9292424	%I
0.0063	FHWT
0.	TWT
.0023700256	FHGR
.0213589334	FHLB
0.	TWGR
0.	TWLB

5%

START TIME: 20:58
FINISH: 22:45

FIELD DATA

PLANT: Exxon Mineral
DATE: 9/27/79
SAMPLING LOCATION: CRUSHER TRANSFER
SAMPLE TYPE: PARTICULATE
RUN NUMBER: 2
OPERATOR: Newton
AMBIENT TEMPERATURE: 70°F
BAROMETRIC PRESSURE: ~~[illegible]~~ 24.77
STATIC PRESSURE, (P_s): -.05
FILTER NUMBER (s): 25442

PROBE LENGTH AND TYPE: 3½' bo[...]
NOZZLE I.D.: .242
ASSUMED MOISTURE, %: 5%
SAMPLE BOX NUMBER: 5
METER BOX NUMBER: 1226
METER $\Delta H_@$: 1.92
C FACTOR: 1.09
PITOT TUBE FACTOR: SA
REFERENCE Δp: .46
NOTE:

READ AND RECORD ALL DATA EVERY 4 MINUTES

TRAVERSE POINT NUMBER	SAMPLING TIME, min	CLOCK TIME (24-hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O DESIRED	ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m\,in}$), °F	OUTLET ($T_{m\,out}$), °F	PUMP VACUUM, in. [...]		
	0	20:58	611.740									
1	4		613.4	.11	.44	.44	75°	82	80			
X	8		615.2	.11	.44	.44	75°	82	81			
	12		616.9	.10	.40	.40	75°	83	81			
2	16		618.8	.17	.70	.70	72°	85	81			
	20		621.0	.21	.82	.82	71°	88	81			
	24		623.4	.22	.90	.90	70°	90	81			
3	28		625.7	.23	.94	.94	71°	92	81			
	32		628.3	.26	1.05	1.05	70°	94	82			
	36		630.8	.24	.98	.98	70°	96	82			
4	40		633.8	.21	.82	.82	70°	97	83			
	44		635.6	.22	.90	.90	70	98	84			
	48		637.789	.22	.90	.90	70	98	84			
Y			637.789	~~.10~~	~~.40~~	~~.40~~	~~75~~					
1	4		639.2	.10	.40	.40	75	92	86			
	8		641.0	.11	.44	.44	72	92	8[...]			
	12		642.5	.09	.36	.36	72	92	8[...]			
2	16		644.4	.16	.62	.62	71	93				
	20		646.5	.17	.70	.70	71	94				
	24		648.5	.15	.60	.60	71	94				
3	28		650.7	.21	.82	.82	71	96				
	32		653.0	.21	.82	.82	70	97				
	36		655.4	.22	.90	.90	70	97	86	2.0		
4	40		658.0	.20	.81	.81	71	98	87	2.0	230	
	44		660.3	.19	.78	.78	71	98	87	2.0	230	
	48	22:45	662.389	.18 ✓✓	.74	.74 ✓✓	70	98 ✓✓	88	2.0	230 ✓✓	

50.649 $\overline{\sqrt{\Delta p}} = .41814$ $\overline{\Delta H} = .72000$ $\overline{T_s} = 71.417$ $\overline{T_m} = 88.396$

Transfer Pt.
Run 2

0.41814	$\sqrt{\Delta P}$
0.72	ΔH
71.417	TS
88.396	TM
50.649	VMA
24.77	PBAR
0.	VWC
10.	WSG
28.97	MWD
.7853981634	AS
96.	TT
-0.05	STAT
0.242	DN
0.99525	Y
0.855	CP
10.	TH2O
40.26548243	VMS
0.4715	VWS
1.157424954	%M
.9884257505	MD
28.84303048	MWS
24.76632353	PS
26.36147174	VACT
1242.255089	QACT
21.4294334	VSTD
1009.838258	QSTD
102.126563	%I
0.0086	FHWT
0.	T WT
.0032960042	FHGR
.0285293148	FHLB
0.	T GR
0.	T LB

A-5

FIELD DATA

PLANT EXXON MINERAL
DATE 9/27/79 ; 9/28/79
SAMPLING LOCATION CRUSHER TRANSFER PT.
SAMPLE TYPE PARTICULATE
RUN NUMBER 3
OPERATOR BOB NEWTON
AMBIENT TEMPERATURE 70°F
BAROMETRIC PRESSURE ~~30.+~~ 29.77
STATIC PRESSURE, (P_s) -.06
FILTER NUMBER (s) 25442

PROBE LENGTH AND TYPE 3 1/2' BORO SILICATE
NOZZLE I.D. .242
ASSUMED MOISTURE, % 5%
SAMPLE BOX NUMBER 4
METER BOX NUMBER 1226
METER $\Delta H_@$ 1.92
C FACTOR 1.09
PITOT TUBE FACTOR CA
REFERENCE Δp .46
NOTE

READ AND RECORD ALL DATA EVERY 4 MINUTES

TRAVERSE POINT NUMBER	SAMPLING TIME, min	CLOCK TIME (24-hr CLOCK)	GAS METER READING (V_m), ft³	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O DESIRED	ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m\,in}$), °F	OUTLET ($T_{m\,out}$), °F	PUMP VACUUM, in. Hg	SAMPLE TEMP
	0	23:55	662.653								
1	4		663.8	.04	.16	.16	69	76	72	1.0	2
	8		664.7	.04	.16	.16	69	76	72	1.0	2
	12		665.7	.03	.11	.11	69	76	73	1.0	2
2	16		667.4	.22	.90	.90	69	77	72	1.0	2
	20		669.5	.17	.68	.68	68	80	74	1.0	2
	24		671.6	.17	.68	.68	68	81	74	1.0	2
3	28		673.8	.20	.80	.80	68	81	74	1.0	2
	32		675.9	.25	1.0	1.0	66	87	78	2.0	2
	36		678.4	.24	.98	.98	66	88	78	2.0	2
4	40		680.7	.22	.90	.90	66	90	78	2.0	2
	44		683.1	.23	.94	.94	66	92	78	2.0	
	48		685.585	.24	.98	.98	66	92	78	2.0	
			685.585	—	—	—	—	—	—	—	
1	4		687.2	.10	.40	.40	69	88	78	1.0	
	8		688.5	.06	.24	.24	69	88	80	1.0	
	12		689.5	.04	.16	.16	68	88	80	1.0	
2	16		691.5	.21	.82	.82	67	88	80	1.0	
	20		693.7	.19	.78	.78	67	89	80	1.0	
	24		695.9	.19	.78	.78	67	90	80	1.0	
3	28		698.2	.24	.98	.98	66	92	81	2.0	
	32		700.5	.22	.90	.90	66	92	81	2.0	
	36		702.7	.21	.82	.82	67	93	81	2.0	
4	40		705.1	.23	.94	.94	67	93	82	2.0	
	44	01:38	707.5	.23	.94	.94	66	94	82	2.0	240
	48		710.071	.24	.98	.98	67	94	82	2.0	250

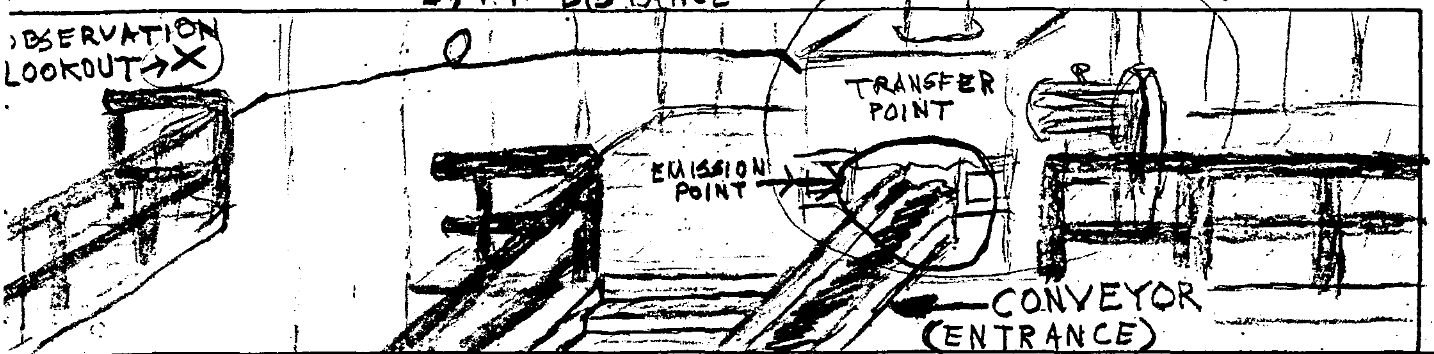
$\overline{\Delta p}$ = .40417 $\overline{\Delta H}$ = .70958 $\overline{T_s}$ = 67.333 $\overline{T_m}$ = 80.875

0.40417	
0.70958	
67.333	
80.875	
47.418	
24.77	PBAR
6.	
8.7	
28.97	
0.78539	
96.	
-0.05	STAT
0.242	
0.99525	
0.855	
14.7	
38.21987208	TH2O
0.692625	VMS
1.779955161	VWS
.9822004484	
28.77473892	MD
24.76632353	MWS
25.41274123	
1197.53477	VACT
20.68707648	QACT
974.8453797	VSTD
100.4168531	QSTD
0.0316	
0.	
.0127591008	
.1066123628	
0.	
0.	

FUGITIVE EMISSION
INSPECTION

Company Exxon Uranium	Inspector Scott R. Stanley
Location Douglass, Wyoming - Crusher Transfer Pt.	Affiliation Soil Scientist
Company Rep. R.F. Weston, Inc.	Date 9/27/79
Sky Conditions	Wind Direction
Precipitation	Wind Speed
Facility Type	Emission Source Transfer Point

Sketch emission source, indicate observer position relative to source; indicate potential emission points and/or actual emission points.



OBSERVATIONS

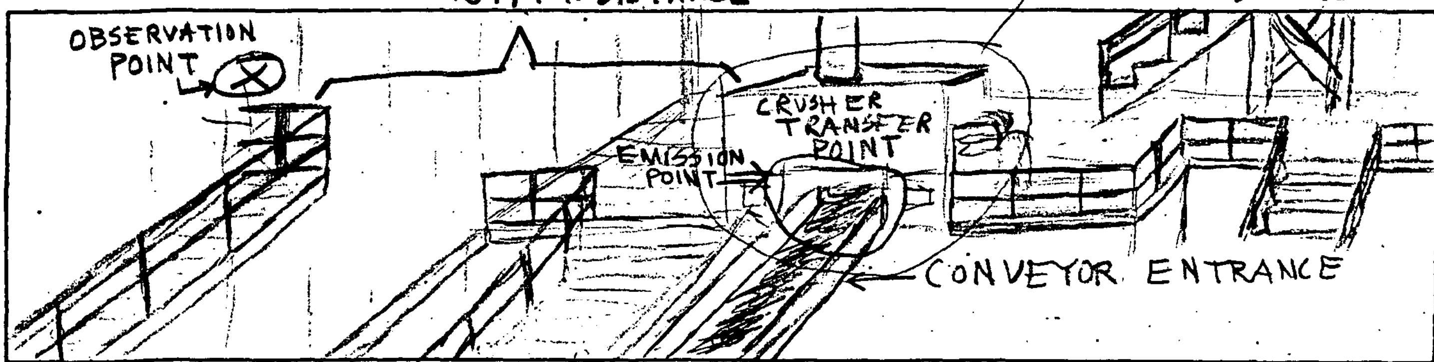
TRIAL #1

	Time	Accumulated Observation Period (Min: Sec)	Accumulated Emission Time (Min: Sec)
Begin Observation 5:43 PM	5:43 start	5:00	0:00
		5:00	0:00
	5:58 end	5:00	0:00
	6:03 start	5:00	0:00
		5:00	0:00
	6:18 end	5:00	0:00
Illumination = 13 f.c.	6:23 start	5:00	0:00
		5:00	0:00
	6:29 end / 6:30 start	1:02	0:00
		3:58	0:00
	6:39 end	5:00	0:00
	6:44 start	5:00	0:00
		5:00	0:00
	6:59 end	5:00	0:00
	7:04 start / 7:03 end	4:05	0:00
	7:08 start	:55	0:00
		5:00	0:00
	7:19 end	5:00	0:00
	7:25 start	5:00	0:00
		5:00	0:00
End Observation 7:40 PM	7:40	5:00	0:00
		80:00	0:00

FUGITIVE EMISSION
INSPECTION

Company	Exxon Mineral	Inspector	Scott R. Stanley
Location	Douglass, Wyoming	Affilitation	Soil Scientist
Company Rep.	Roy F. Weston, Inc.	Date	9/27/79
Sky Conditions	NA	Wind Direction	NA
Precipitation		Wind Speed	
Facility Type	NA	Emission Source	Crusher Transfer Pt.

Sketch emission source, indicate observer position relative to source; indicate potential emission points and/or actual emission points.



OBSERVATIONS
TRIAL #2

Begin Observation 9:00PM

Time: START - END	Accumulated Observation Period (Min: Sec)	Accumulated Emission Time (Min: Sec)
9:00-9:15	5:00	0:00
	5:00	0:00
	5:00	0:00
9:20-9:35	5:00	0:00
	5:00	0:00
	5:00	0:00
9:40-9:55	5:00	0:00
	5:00	0:00
	5:00	0:00
10:00-10:15	5:00	0:00
	5:00	0:00
	5:00	0:00
10:20-10:35	5:00	0:00
	5:00	0:00
	5:00	0:00
10:40-10:45	5:00	0:00

End Observation

Totals:	—	80:00	0:00

FUGITIVE EMISSION INSPECTION

Company: Exxon Mineral
Location: Douglass, Wyoming
Company Rep.: Roy F. Weston, Inc.

Inspector: Scott R. Stanley
Affiliation: Soil Scientist
Date: 9/27/79

Sky Conditions: NA
Precipitation:

Wind Direction: NA
Wind Speed:

Facility Type: NA

Emission Source: Crusher Transfer Point

Sketch emission source, indicate observer position relative to source; indicate potential emission points and/or actual emission points.

SEE TRIAL #'s 1 and 2.

OBSERVATIONS
TRIAL #3

Begin Observation: 12:00 AM

Time: START- END	Accumulated Observation Period (Min: Sec)	Accumulated Emission Time (Min: Sec)
12:00 - 12:15	5:00	0:00
	5:00	0:00
	5:00	0:00
12:20 - 12:35	5:00	0:00
	5:00	0:00
	5:00	0:00
12:40 - 12:55	5:00	0:00
	5:00	0:00
	5:00	0:00
1:00 - 1:15	5:00	0:00
	5:00	0:00
	5:00	0:00
1:20 - 1:35	5:00	0:00
	5:00	0:00
	5:00	0:00
1:40 - 1:45	5:00	0:00

End Observation: 1:45 AM

Totals:	—	80:00	0:00

RECORD OF VISIBLE EMISSIONS

Company Name Exxon Mineral Date 9-27-79

Plant Address Wyoming Observer C. Dobroski

Stack Location Crusher Transfer Observer's Location 50' from crusher 5' above on walkway

Weather Conditions Inside

HR	MIN	00	15	30	45	COMMENTS
	30					
	31					1740-1938 118 min 102
	32					2100-2242 98
	33					0000-0138 318 min = 5¼
	34					
	35					
	36					
	37					
	38					
	39					
17	40	0	0	0	0	Start #1
	41	0	0	0	0	
	42	0	0	0	0	
	43	0	0	0	0	
	44	0	0	0	0	
	45	0	0	0	0	
	46	0	0	0	0	
	47	0	0	0	0	
	48	0	0	0	0	
	49	0	0	0	0	
	50	0	0	0	0	
	51	0	0	0	0	
	52	0	0	0	0	
	53	0	0	0	0	
	54	0	0	0	0	
	55	0	0	0	0	
	56	0	0	0	0	
	57	0	0	0	0	
	58	0	0	0	0	
	59	0	0	0	0	

RECORD OF VISIBLE EMISSIONS

Company Name Exxon Mineral Date 9-27-79

Plant Address Wyoming Observer C. [illegible]

Stack Location Observer's Location 50' from transfer crusher at a height of about 5' above on walkway

Weather Conditions

HR	MIN	00	15	30	45	COMMENTS
18	00	0	0	0	0	Run 1
	01	0	0	0	0	
	02	0	0	0	0	
	03	0	0	0	0	
	04	0	0	0	0	
	05	0	0	0	0	
	06	0	0	0	0	
	07	0	0	0	0	
	08	0	0	0	0	
	09	0	0	0	0	
	10	0	0	0	0	
	11	0	0	0	0	
	12	0	0	0	0	
	13	0	0	0	0	
	14	0	0	0	0	
	15	0	0	0	0	
	16	0	0	0	0	
	17	0	0	0	0	
	18	0	0	0	0	
	19	0	0	0	0	
	20	0	0	0	0	
	21	0	0	0	0	
	22	0	0	0	0	
	23	0	0	0	0	
	24	0	0	0	0	
	25	0	0	0	0	
	26	0	0	0	0	
	27	0	0	0	0	line down at 1828; backup in
	28	0			0	30 seconds
	29	0	0	0	0	

RECORD OF VISIBLE EMISSIONS

Company Name Exxon Mineral Date 0-27-79

Plant Address Wyoming Observer C Dobrowski

Stack Location Crusher transfer Pt Observer's Location

Weather Conditions

TIME HR	MIN	SECONDS 00	15	30	45	COMMENTS
18	30	0	0	0	0	Run 1
	31	0	0	0	0	
	32	0	0	0	0	
	33	0	0	0	0	
	34	0	0	0	0	
	35	0	0	0	0	
	36	0	0	0	0	
	37	0	0	0	0	
	38	0	0	0	0	
	39	0	0	0	0	
	40	0	0	0	0	
	41	0	0	0	0	
	42	0	0	0	0	
	43	0	0	0	0	
	44	0	0	0	0	
	45	0	0	0	0	
	46	0	0	0	0	
	47	0	0	0	0	
	48	0	0	0	0	
	49	0	0	0	0	
	50	0	0	0	0	
	51	0	0	0	0	
	52	0	0	0	0	
	53	0	0	0	0	
	54	0	0	0	0	
	55	0	0	0	0	
	56	0	0	0	0	
	57	0	0	0	0	
	58	0	0	0	0	
	59	0	0	0	0	

RECORD OF VISIBLE EMISSIONS

Company Name Exxon Mineral Date 9-27-79

Plant Address Wyoming Observer C. Dobroski

Stack Location Crusher Transfer Pt Observer's Location

Weather Conditions

HR	MIN	00	15	30	45	COMMENTS
19	00	0	0	0	0	Run 1
	01	0	0	0	0	
	02	0	0	0	0	
	03	0	0	0	0	
	04	0	0	0	0	
	05	0	0	0	0	
	06	0	0	0	0	
	07	0	0	0	0	
	08	0	0	0	0	Line stopped 1908:15 back up
	09	0	0	0		at 1909
	10	0	0	0	0	
	11	0	0	0	0	
	12	0	0	0	0	
	13	0	0	0	0	
	14	0	0	0	0	
	15	0	0	0	0	
	16	0	0	0	0	
	17	0	0	0	0	
	18	0	0	0	0	
	19	0	0	0	0	
	20	0	0	0	0	
	21	0	0	0	0	
	22	0	0	0	0	
	23	0	0	0	0	
	24	0	0	0	0	
	25	0	0	0	0	
	26	0	0	0	0	
	27	0	0	0	0	
	28	0	0	0	0	
	29	0	0	0	0	

RECORD OF VISIBLE EMISSIONS

Company Name Exxon Mineral   Date 9-22-79

Plant Address Wyoming   Observer C. Dobroski

Stack Location Crusher Transfer   Observer's Location

Weather Conditions

TIME HR	MIN	SECONDS 00	15	30	45	COMMENTS
19	30	0	0	0	0	
	31	0	0	0	0	
	32	0	0	0	0	
	33	0	0	0	0	
	34	0	0	0	0	
	35	0	0	0	0	
	36	0	0	0	0	
	37	0	0	0	0	End Test Run
	38					
	39					
	40					
	41					
	42					
	43					
	44					
	45					
	46					
	47					
	48					
	49					
	50					
	51					
	52					
	53					
	54					
	55					
	56					
	57					
	58					
	59					

RECORD OF VISIBLE EMISSIONS

Company Name Exxon Mineral — Date 9/22/79

Plant Address , Wyoming — Observer C. Dobrocki

Stack Location Crusher transfer pt. — Observer's Location Approx 50' away; 5' above crusher on walkway

Weather Conditions Inside

HR	MIN	00	15	30	45	COMMENTS
21	00	0	0	0	0	Test starts #2
	01	0	0	0	0	
	02	0	0	0	0	
	03	0	0	0	0	
	04	0	0	0	0	
	05	0	0	0	0	
	06	0	0	0	0	
	07	0	0	0	0	
	08	0	0	0	0	
	09	0	0	0	0	
	10	0	0	0	0	
	11	0	0	0	0	
	12	0	0	0	0	
	13	0	0	0	0	
	14	0	0	0	0	
	15	0	0	0	0	
	16	0	0	0	0	
	17	0	0	0	0	
	18	0	0	0	0	
	19	0	0	0	0	
	20	0	0	0	0	
	21	0	0	0	0	
	22	0	0	0	0	
	23	0	0	0	0	
	24	0	0	0	0	
	25	0	0	0	0	
	26	0	0	0	0	
	27	0	0	0	0	
	28	0	0	0	0	
	29	0	0	0	0	

RECORD OF VISIBLE EMISSIONS

Company Name Exxon Mineral   Date 9-27-79

Plant Address , Wyoming   Observer C. Zobroski

Stack Location Crusher Transfer Pt.,   Observer's Location

Weather Conditions

TIME						COMMENTS
HR	MIN	SECONDS 00	15	30	45	
21	30	0	0	0	0	Test 2
	31	0	0	0	0	
	32	0	0	0	0	
	33	0	0	0	0	
	34	0	0	0	0	
	35	0	0	0	0	
	36	0	0	0	0	
	37	0	0	0	0	
	38	0	0	0	0	
	39	0	0	0	0	
	40	0	0	0	0	
	41	0	0	0	0	
	42	0	0	0	0	
	43	0	0	0	0	
	44	0	0	0	0	
	45	0	0	0	0	
	46	0	0	0	0	
	47	0	0	0	0	
	48	0	0	0	0	
	49	0	0	0	0	
	50	0	0	0	0	
	51	0	0	0	0	
	52	0	0	0	0	
	53	0	0	0	0	
	54	0	0	0	0	
	55	0	0	0	0	
	56	0	0	0	0	
	57	0	0	0	0	
	58	0	0	0	0	
	59	0	0	0	0	

RECORD OF VISIBLE EMISSIONS

Company Name Exxon Mineral Date 9-27-79

Plant Address , Wyoming Observer C. Dobroski

Stack Location Crusher transfer Pt. Observer's Location

Weather Conditions

HR	MIN	00	15	30	45	COMMENTS
[illegible]	00	0	0	0	0	Test 2
	01	0	0	0	0	
	02	0	0	0	0	
	03	0	0	0	0	
	04	0	0	0	0	
	05	0	0	0	0	
	06	0	0	0	0	
	07	0	0	0	0	
	08	0	0	0	0	
	09	0	0	0	0	
	10	0	0	0	0	
	11	0	0	0	0	
	12	0	0	0	0	
	13	0	0	0	0	
	14	0	0	0	0	
	15	0	0	0	0	
	16	0	0	0	0	
	17	0	0	0	0	
	18	0	0	0	0	
	19	0	0	0	0	
	20	0	0	0	0	
	21	0	0	0	0	
	22	0	0	0	0	
	23	0	0	0	0	
	24	0	0	0	0	
	25	0	0	0	0	
	26	0	0	0	0	
	27	0	0	0	0	
	28	0	0	0	0	
	29	0	0	0	0	

RECORD OF VISIBLE EMISSIONS

Company Name Exxon Minerals Date 9-27-79

Plant Address , Wyoming Observer C. Dobrowski

Stack Location Crusher Transfer DC Observer's Location

Weather Conditions

TIME						COMMENTS
HR	MIN	SECONDS				
		00	15	30	45	
22	30	0	0	0	0	
	31	0	0	0	0	
	32	0	0	0	0	
	33	0	0	0	0	
	34	0	0	0	0	
	35	0	0	0	0	
	36	0	0	0	0	
	37	0	0	0	0	
	38	0	0	0	0	
	39	0	0	0	0	
	40	0	0	0	0	
	41	0	0	0	0	End Test #2
	42					
	43					
	44					
	45					
	46					
	47					
	48					
	49					
	50					
	51					
	52					
	53					
	54					
	55					
	56					
	57					
	58					
	59					

RECORD OF VISIBLE EMISSIONS

Company Name *Exxon Mineral* Date *9-27-79*

Plant Address *, Wyoming* Observer *C. Dobroski*

Stack Location *Crusher Transfer Pt,* Observer's Location *50' away from point, 5' above on walkway.*

Weather Conditions *Inside*

HR	MIN	SECONDS 00	15	30	45	COMMENTS
00	00	0	0	0	0	start Test # 3
	01	0	0	0	0	
	02	0	0	0	0	
	03	0	0	0	0	
	04	0	0	0	0	
	05	0	0	0	0	
	06	0	0	0	0	
	07	0	0	0	0	
	08	0	0	0	0	
	09	0	0	0	0	
	10	0	0	0	0	
	11	0	0	0	0	
	12	0	0	0	0	
	13	0	0	0	0	
	14	0	0	0	0	
	15	0	0	0	0	
	16	0	0	0	0	
	17	0	0	0	0	
	18	0	0	0	0	
	19	0	0	0	0	
	20	0	0	0	0	
	21	0	0	0	0	
	22	0	0	0	0	
	23	0	0	0	0	
	24	0	0	0	0	
	25	0	0	0	0	
	26	0	0	0	0	
	27	0	0	0	0	
	28	0	0	0	0	
	29	0	0	0	0	

RECORD OF VISIBLE EMISSIONS

Company Name Exxon Mineral　　Date 9-27/28-79

Plant Address ______, Wyoming　　Observer C. Dobroski

Stack Location Crusher Transfer Pt.　　Observer's Location ______

Weather Conditions Inside

HR	MIN	00	15	30	45	COMMENTS
00	30	0	0	0	0	Run 3
	31	0	0	0	0	
	32	0	0	0	0	
	33	0	0	0	0	
	34	0	0	0	0	
	35	0	0	0	0	
	36	0	0	0	0	
	37	0	0	0	0	
	38	0	0	0	0	
	39	0	0	0	0	
	40	0	0	0	0	
	41	0	0	0	0	
	42	0	0	0	0	
	43	0	0	0	0	
	44	0	0	0	0	
	45	0	0	0	0	
	46	0	0	0	0	
	47	0	0	0	0	
	48	0	0	0	0	
	49	0	0	0	0	
	50	0	0	0	0	
	51	0	0	0	0	
	52	0	0	0	0	
	53	0	0	0	0	
	54	0	0	0	0	
	55	0	0	0	0	
	56	0	0	0	0	
	57	0	0	0	0	
	58	0	0	0	0	
	59	0	0	0	0	

RECORD OF VISIBLE EMISSIONS

Company Name [illegible]

Date [illegible]

Plant Address [illegible], Wyoming

Observer [illegible]

Stack Location Crusher Transfer [illegible]

Observer's Location

Weather Conditions Inside

HR	MIN	00	15	30	45	COMMENTS
01	00	0	0	0	0	Run 3
	01	0	0	0	0	
	02	0	0	0	0	
	03	0	0	0	0	
	04	0	0	0	0	
	05	0	0	0	0	
	06	0	0	0	0	
	07	0	0	0	0	
	08	0	0	0	0	
	09	0	0	0	0	
	10	0	0	0	0	
	11	0	0	0	0	
	12	0	0	0	0	
	13	0	0	0	0	
	14	0	0	0	0	
	15	0	0	0	0	
	16	0	0	0	0	
	17	0	0	0	0	
	18	0	0	0	0	
	19	0	0	0	0	
	20	0	0	0	0	
	21	0	0	0	0	
	22	0	0	0	0	
	23	0	0	0	0	
	24	0	0	0	0	
	25	0	0	0	0	
	26	0	0	0	0	
	27	0	0	0	0	
	28	0	0	0	0	
	29	0	0	0	0	

RECORD OF VISIBLE EMISSIONS

Company Name Exxon Minerals

Date 9-27/28-'79

Plant Address , Wyoming

Observer C. Dobroski

Stack Location Crusher Transfer Pt.

Observer's Location

Weather Conditions Inside

HR	MIN	00	15	30	45	COMMENTS
01	30	0	0	0	0	
	31	0	0	0	0	
	32	0	0	0	0	
	33	0	0	0	0	
	34	0	0	0	0	
	35	0	0	0	0	
	36	0	0	0	0	
	37	0	0	0	0	End Test #3
	38					
	39					
	40					
	41					
	42					
	43					
	44					
	45					
	46					
	47					
	48					
	49					
	50					
	51					
	52					
	53					
	54					
	55					
	56					
	57					
	58					
	59					

FUGITIVE EMISSION
INSPECTION

Company EXXON MINERAL
Location TP 9-10
Company Rep. DAVE RANGE

Inspector BOB CAPRARA
Affiliation ROY F. WESTON
Date 9/27

Sky Conditions N/A
Precipitation N/A

Wind Direction N/A
Wind Speed N/A

Facility Type URANIUM MILL

Emission Source TP 9-10
Lower Transfer Points

Sketch emission source, indicate observer position relative to source; indicate potential emission points and/or actual emission points.

OBSERVATIONS

Run 1

Illumination = 11 f.c.

	Time	Accumulated Observation Period (Min: Sec)	Accumulated Emission Time (Min: Sec)
Begin Observation	1745-1805	20:00	0:0
	1815-1836	20:00	0:0
	1840-1900	20:00	0:0
	1905-1925	20:00	0:0
	1930-1950	20:00	0:0
End Observation			

FUGITIVE EMISSION INSPECTION

Company: EXXON MINERAL	Inspector: BOB CAPRARA
Location: TP 9-10	Affilitation: ROY F. WESTON
Company Rep.: DAVE RANGE	Date: 9/27
Sky Conditions: N/A	Wind Direction: N/A
Precipitation: N/A	Wind Speed: N/A
Facility Type: URANIUM MILL	Emission Source: TP 9-10

Sketch emission source, indicate observer position relative to source; indicate potential emission points and/or actual emission points.

OBSERVATIONS

Run 2

	Time	Accumulated Observation Period (Min: Sec)	Accumulated Emission Time (Min: Sec)
Begin Observation	2115-2135	20:00	0:0
	2135-2155	20:00	0:0
	2200-2220	20:00	0:0
	2225-2245	20:00	0:0
	2250-2300	10:00	0:0
End Observation			

FUGITIVE EMISSION
INSPECTION

Company EXXON MINERAL

Location TP 9-10

Company Rep. DAVE RANGE

Inspector BOB CAPRARA

Affilitation ROY F WESTON

Date 9/28

Sky Conditions N/A

Precipitation N/A

Wind Direction N/A

Wind Speed N/A

Facility Type URANIUM MILL

Emission Source TP 9-10

Sketch emission source, indicate observer position relative to source; indicate potential emission points and/or actual emission points.

OBSERVATIONS

Run 3

	Time	Accumulated Observation Period (Min: Sec)	Accumulated Emission Time (Min: Sec)
Begin Observation	0000-0020	20:00	0.0
	0025-0045	20.00	0.0
	0050-0110	20:00	0.0
	0115-0135	20.00	0.0
End Observation			

SUMMARY
RECORD OF VISIBLE EMISSIONS

Run 1

Type of Plant Uranium Mine

Date 9-27-79

Company Name Exxon Mineral

Hours of Observation See below

Plant Address Casper, Wyoming

Observer J. D. O'Neill

Type of Discharge STACK OTHER process hoods

TP9 and TP10

Discharge Location ______

Height of Point of Discharge TP9 ~ 15' TP10 ~ 8'

Observer's Location:

Distance to Discharge Point ~ 25'

Height of Observation Point ground level

Direction from Discharge Point North

Background Description In side crusher buildings

N/A Weather: Clear Overcast Partly Cloudy Other ______ Sky Color ______

Wind Direction ______ Wind Velocity ______ mi/hr

Plume Description:

Detached: Yes No

Color: Black White Other ______

Plume Dispersion Behavior: Looping Coning Fanning N/A

Lofting Fumigating Other ______

Estimated Distance Plume Visible ______

Run 1 1745 - 1953 128 min

Run 2 2115 - 2305 110 min

Run 3 0005 - 0149 +105 min

343 min = 5 3/4 hrs

RECORD OF VISIBLE EMISSIONS

Company Name Exxon Uranium Date 9-27-79

Plant Address Casper Wyoming Observer J. D. O'Neill

Stack Location TP 9 + TP 10 Observer's Location

Weather Conditions N/A

HR	MIN	00	15	30	45	COMMENTS
	30					
	31					
	32					
	33					
	34					
	35					
	36					
	37					
	38					
	39					
	40					
	41					
	42					
	43					
	44					
17	45	0	0	0	0	Start run 1 1745
	46	0	0	0	0	
	47	0	0	0	0	
	48	0	0	0	0	
	49	0	0	0	0	
	50	0	0	0	0	
	51	0	0	0	0	
	52	0	0	0	0	
	53	0	0	0	0	
	54	0	0	0	0	
	55	0	0	0	0	
	56	0	0	0	0	
	57	0	0	0	0	
	58	0	0	0	0	
	59	0	0	0	0	

RECORD OF VISIBLE EMISSIONS

Company Name Exxon Mineral

Date 9-27-79

Plant Address Casper Wyo.

Observer J. D. O'Neill

Stack Location TP9 + TP10

Observer's Location

Weather Conditions N/A

HR	MIN	00	15	30	45	COMMENTS
18	00	0	0	0	0	
	01	0	0	0	0	
	02	0	0	0	0	
	03	0	0	0	0	
	04	0	0	0	0	
	05	0	0	0	0	
	06	0	0	0	0	
	07	0	0	0	0	
	08	0	0	0	0	
	09	0	0	0	0	
	10	0	0	0	0	
	11	0	0	0	0	
	12	0	0	0	0	
	13	0	0	0	0	
	14	0	0	0	0	
	15	0	0	0	0	
	16	0	0	0	0	
	17	0	0	0	0	
	18	0	0	0	0	
	19	0	0	0	0	
	20	0	0	0	0	
	21	0	0	0	0	
	22	0	0	0	0	
	23	0	0	0	0	
	24	0	0	0	0	
	25	0	0	0	0	
	26	0	0	0	0	
	27	0	0	0	0	
	28	0	0	0	0	
18	29	0	0	0	0	Belt stopped for 15 sec.

RECORD OF VISIBLE EMISSIONS

Company Name Exxon Mineral

Date 9-27-79

Plant Address Casper Wyo.

Observer J. P. O'Neill

Stack Location

Observer's Location

Weather Conditions N/A

TIME						COMMENTS
HR	MIN	SECONDS				
		00	15	30	45	
18	30	0	0	0	0	
	31	0	0	0	0	
	32	0	0	0	0	
	33	0	0	0	0	
	34	0	0	0	0	
	35	0	0	0	0	
	36	0	0	0	0	
	37	0	0	0	0	
	38	0	0	0	0	
	39	0	0	0	0	
	40	0	0	0	0	
	41	0	0	0	0	
	42	0	0	0	0	
	43	0	0	0	0	
1	44	0	0	0	0	
	45	0	0	0	0	
	46	0	0	0	0	
	47	0	0	0	0	
	48	0	0	0	0	
	49	0	0	0	0	
	50	0	0	0	0	
	51	0	0	0	0	
	52	0	0	0	0	
	53	0	0	0	0	
	54	0	0	0	0	
	55	0	0	0	0	
	56	0	0	0	0	
	57	0	0	0	0	
	58	0	0	0	0	
18	59	0	0	0	0	

RECORD OF VISIBLE EMISSIONS

Company Name Exxon Mineral

Date 9-27-79

Plant Address Casper

Observer J. D. O'Neill

Stack Location TP9 + TP10

Observer's Location

Weather Conditions N/A

HR	MIN	SECONDS 00	15	30	45	COMMENTS
19	00	O	O	O	O	
	01	O	O	O	O	
	02	O	O	O	O	
	03	O	O	O	O	
	04	O	O	O	O	
	05	O	O	O	O	
	06	O	O	O	O	
	07	O	O	O	O	
	08	O	O	O	O	
	09	O	O	—	—	Stopped ~~@~~ 1908 Down 30 sec
	10	—	O	O	O	
	11	O	O	O	O	
	12	O	O	O	O	
	13	O	O	O	O	
	14	O	O	O	O	
	15	O	O	O	O	
	16	O	O	O	O	
	17	O	O	O	O	
	18	O	O	O	O	
	19	O	O	O	O	
	20	O	O	O	O	
	21	O	O	O	O	
	22	O	O	O	O	
	23	O	O	O	O	
	24	O	O	O	O	
	25	O	O	O	O	~~End test 1 1925~~
	26	O	O	O	O	
	27	O	O	O	O	
	28	O	O	O	O	
19	29	O	O	O	O	

RECORD OF VISIBLE EMISSIONS

Company Name Exxon Mineral Date 9-27-79

Plant Address Casper Wyo. Observer J. D. O'Neill

Stack Location TP9 and TP10 Observer's Location

Weather Conditions N/A

HR	MIN	00	15	30	45	COMMENTS
19	30	0	0	0	0	Run 1 Crusher
	31	0	0	0	0	
	32	0	0	0	0	
	33	0	0	0	0	
	34	0	0	0	0	
	35	0	0	0	0	
	36	0	0	0	0	
	37	0	0	0	0	
	38	0	0	0	0	
	39	0	0	0	0	
	40	0	0	0	0	
	41	0	0	0	0	
	42	0	0	0	0	
	43	0	0	0	0	
	44	0	0	0	0	
	45	0	0	0	0	
	46	0	0	0	0	
	47	0	0	0	0	
	48	0	0	0	0	
	49	0	0	0	0	
	50	0	0	0	0	
	51	0	0	0	0	
	52	0	0	0	0	
	53	0	0	0		Stop 1953 End Run 1
	54					
	55					
	56					
	57					
	58					
	59					

RECORD OF VISIBLE EMISSIONS

Company Name Exxon Mineral

Date 7-27-79

Plant Address Casper Wyo.

Observer J. D O'Neill

Stack Location TP 9 and TP10

Observer's Location ~30 w of discharge

Weather Conditions N/A

HR	MIN	00	15	30	45	COMMENTS
	00					Crusher area
	01					
	02					
	03					
	04					
	05					
	06					
	07					
	08					
	09					
	10					
	11					
	12					
	13					
	14					
21	15	0	0	0	0	Start Run 2 2115
	16	0	0	0	0	
	17	0	0	0	0	
	18	0	0	0	0	
	19	0	0	0	0	
	20	0	0	0	0	
	21	0	0	0	0	
	22	0	0	0	0	
	23	0	0	0	0	
	24	0	0	0	0	
	25	0	0	0	0	
	26	0	0	0	0	
	27	0	0	0	0	
	28	0	0	0	0	
	29	0	0	0	0	

RECORD OF VISIBLE EMISSIONS

Company Name Exxon Mineral | Date 9-27-79

Plant Address Casper Wyo. | Observer J. D. O'Neill

Stack Location TP 9 + TP 10 | Observer's Location ~30 w of stack

Weather Conditions N/A

TIME HR	MIN	SECONDS 00	15	30	45	COMMENTS
21	30	0	0	0	0	
	31	0	0	0	0	
	32	0	0	0	0	
	33	0	0	0	0	
	34	0	0	0	0	
	35	0	0	0	0	
	36	0	0	0	0	
	37	0	0	0	0	
	38	0	0	0	0	
	39	0	0	0	0	
	40	0	0	0	0	
	41	0	0	0	0	
	42	0	0	0	0	
	43	0	0	0	0	
	44	0	0	0	0	
	45	0	0	0	0	
	46	0	0	0	0	
	47	0	0	0	0	
	48	0	0	0	0	
	49	0	0	0	0	
	50	0	0	0	0	
	51	0	0	0	0	
	52	0	0	0	0	
	53	0	0	0	0	
	54	0	0	0	0	
	55	0	0	0	0	
	56	0	0	0	0	
	57	0	0	0	0	
	58	0	0	0	0	
21	59	0	0	0	0	

RECORD OF VISIBLE EMISSIONS

Company Name Exxon Mineral   Date 9-27-79

Plant Address Casper Wyo.   Observer J.D. O'Neill

Stack Location TP9 + TP10   Observer's Location ~30 ω of discharge

Weather Conditions N/A

HR	MIN	SECONDS 00	15	30	45	COMMENTS
22	00	0	0	0	0	
	01	0	0	0	0	
	02	0	0	0	0	
	03	0	0	0	0	
	04	0	0	0	0	
	05	0	0	0	0	
	06	0	0	0	0	
	07	0	0	0	0	
	08	0	0	0	0	
	09	0	0	0	0	
	10	0	0	0	0	
	11	0	0	0	0	
	12	0	0	0	0	
	13	0	0	0	0	
	14	0	0	0	0	
	15	0	0	0	0	
	16	0	0	0	0	
	17	0	0	0	0	
	18	0	0	0	0	
	19	0	0	0	0	
	20	0	0	0	0	
	21	0	0	0	0	
	22	0	0	0	0	
	23	0	0	0	0	
	24	0	0	0	0	
	25	0	0	0	0	
	26	0	0	0	0	
	27	0	0	0	0	
	28	0	0	0	0	
	29	0	0	0	0	

RECORD OF VISIBLE EMISSIONS

Company Name Exxon Minerals   Date 9-27-79

Plant Address Casper Wyo.   Observer J.D. O'Neill

Stack Location TP9 + TP10   Observer's Location ~30' from discharge

Weather Conditions N/A

HR	MIN	00	15	30	45	COMMENTS
22	30	0	0	0	0	
	31	0	0	0	0	
	32	0	0	0	0	
	33	0	0	0	0	
	34	0	0	0	0	
	35	0	0	0	0	
	36	0	0	0	0	
	37	0	0	0	0	
	38	0	0	0	0	
	39	0	0	0	0	
	40	0	0	0	0	
	41	0	0	0	0	
	42	0	0	0	0	
	43	0	0	0	0	
	44	0	0	0	0	
	45	0	0	0	0	
	46	0	0	0	0	
	47	0	0	0	0	
	48	0	0	0	0	
	49	0	0	0	0	
	50	0	0	0	0	
	51	0	0	0	0	
	52	0	0	0	0	
	53	0	0	0	0	
	54	0	0	0	0	
	55	0	0	0	0	
	56	0	0	0	0	
	57	0	0	0	0	
	58	0	0	0	0	
22	59	0	0	0	0	

RECORD OF VISIBLE EMISSIONS

Company Name Exxon Mineral

Date 9-27-79

Plant Address Casper Wyo.

Observer J.D. O'Neill

Stack Location TP9 + TP10

Observer's Location 30' from discharge

Weather Conditions N/A

TIME						COMMENTS
HR	MIN	SECONDS				
		00	15	30	45	
23	00	0	0	0	0	
	01	0	0	0	0	
	02	0	0	0	0	
	03	0	0	0	0	
	04	0	0	0	0	
	05	0	0	0	0	Stopped 2305
	06					
	07					
	08					
	09					
	10					
	11					
	12					
	13					
	14					
	15					
	16					
	17					
	18					
	19					
	20					
	21					
	22					
	23					
	24					
	25					
	26					
	27					
	28					
	29					

RECORD OF VISIBLE EMISSIONS

Company Name Exxon Mineral

Date 9-28-79

Plant Address Casper Wyo.

Observer J.D. O'Neill

Stack Location TP9 + TP10

Observer's Location 30' W of discharge

Weather Conditions N/A

HR	MIN	SECONDS 00	15	30	45	COMMENTS
	00					
	01					
	02					
	03					
	04					
00	05	0	0	0	0	Start run 3
	06	0	0	0	0	
	07	0	0	0	0	
	08	0	0	0	0	
	09	0	0	0	0	
	10	0	0	0	0	
	11	0	0	0	0	
	12	0	0	0	0	
	13	0	0	0	0	
	14	0	0	0	0	
	15	0	0	0	0	
	16	0	0	0	0	
	17	0	0	0	0	
	18	0	0	0	0	
	19	0	0	0	0	
	20	0	0	0	0	
	21	0	0	0	0	
	22	0	0	0	0	
	23	0	0	0	0	
	24	0	0	0	0	
	25	0	0	0	0	
	26	0	0	0	0	
	27	0	0	0	0	
	28	0	0	0	0	
	29	0	0	0	0	

RECORD OF VISIBLE EMISSIONS

Company Name Exxon Mineral Date 9-27-79

Plant Address Casper Wyo. Observer J. D. O'Neill

Stack Location TP 9 + TP 10 Observer's Location ~30' W of discharge

Weather Conditions N/A

TIME HR	MIN	SECONDS 00	15	30	45	NO COMMENTS
00	30	0	0	0	0	
	31	0	0	0	0	
	32	0	0	0	0	
	33	0	0	0	0	
	34	0	0	0	0	
	35	0	0	0	0	
	36	0	0	0	0	
	37	0	0	0	0	
	38	0	0	0	0	
	39	0	0	0	0	
	40	0	0	0	0	
	41	0	0	0	0	
	42	0	0	0	0	
	43	0	0	0	0	
	44	0	0	0	0	
	45	0	0	0	0	
	46	0	0	0	0	
	47	0	0	0	0	
	48	0	0	0	0	
	49	0	0	0	0	
	50	0	0	0	0	
	51	0	0	0	0	
	52	0	0	0	0	
	53	0	0	0	0	
	54	0	0	0	0	
	55	0	0	0	0	
	56	0	0	0	0	
	57	0	0	0	0	
	58	0	0	0	0	
	59	0	0	0	0	

RECORD OF VISIBLE EMISSIONS

Company Name Exxon Mineral | Date 9-28-79

Plant Address Casper, Wyo. | Observer J.D. O'Neill

Stack Location TP9 & TP10 | Observer's Location 30' W of discharge

Weather Conditions N/A

HR	MIN	00	15	30	45	COMMENTS
01	00	0	0	0	0	
	01	0	0	0	0	
	02	0	0	0	0	
	03	0	0	0	0	
	04	0	0	0	0	
	05	0	0	0	0	
	06	0	0	0	0	
	07	0	0	0	0	
	08	0	0	0	0	
	09	0	0	0	0	
	10	0	0	0	0	
	11	0	0	0	0	
	12	0	0	0	0	
	13	0	0	0	0	
	14	0	0	0	0	
	15	0	0	0	0	
	16	0	0	0	0	
	17	0	0	0	0	
	18	0	0	0	0	
	19	0	0	0	0	
	20	0	0	0	0	
	21	0	0	0	0	
	22	0	0	0	0	
	23	0	0	0	0	
	24	0	0	0	0	
	25	0	0	0	0	
	26	0	0	0	0	
	27	0	0	0	0	
	28	0	0	0	0	
01	29	0	0	0	0	

RECORD OF VISIBLE EMISSIONS

Company Name Exxon Mineral

Date 9-28-79

Plant Address Casper Wyo.

Observer J.D. O'Neill

Stack Location tp9 + TP10

Observer's Location 30' W of stack

Weather Conditions N/A

HR	MIN	00	15	30	45	COMMENTS
01	30	0	0	0	0	
	31	0	0	0	0	
	32	0	0	0	0	
	33	0	0	0	0	
	34	0	0	0	0	
	35	0	0	0	0	
	36	0	0	0	0	
	37	0	0	0	0	
	38	0	0	0	0	
	39	0	0	0	0	
	40	0	0	0	0	
	41	0	0	0	0	
	42	0	0	0	0	
	43	0	0	0	0	
	44	0	0	0	0	
	45	0	0	0	0	
	46	0	0	0	0	
	47	0	0	0	0	
	48	0	0	0	0	
	49	0	0	0	0	Stop 0149
	50					
	51					
	52					
	53					
	54					
	55					
	56					
	57					
	58					
	59					

TRAVERSE POINT LOCATION FOR CIRCULAR DUCTS

PLANT Exxon Uranium
DATE
SAMPLING LOCATION Crusher Pressure grizzley Exhaust Duct
INSIDE OF FAR WALL TO OUTSIDE OF PORT, (DISTANCE A) 22"
INSIDE OF NEAR WALL TO OUTSIDE OF PORT, (DISTANCE B) 6"
STACK I.D., (DISTANCE A - DISTANCE B) 16"
NEAREST UPSTREAM DISTURBANCE ≤1 Dia.
NEAREST DOWNSTREAM DISTURBANCE ≤1 Dia.
CALCULATOR Moxon

.125
2 .25
3 .375
4 .5
5 .625
6 .75
7 .875
8 1

SCHEMATIC OF SAMPLING LOCATION

TRAVERSE POINT NUMBER	FRACTION OF STACK I.D.	STACK I.D.	PRODUCT OF COLUMNS 2 AND 3 (TO NEAREST 1/8 INCH)	DISTANCE B	TRAVERSE POINT LOCATION FROM OUTSIDE OF PORT (SUM OF COLUMNS 4 & 5)
1	1.6	16	.26 1/4	6"	6 1/4
2	4.9		.78 3/4		6 3/4
3	8.5		1.36 1 3/8		7 3/8
4	12.5		2.0 2		8
5	16.9		2.7 2 3/4		8 3/4
6	22.0		3.52 3 1/2		9 1/2
7	28.3		4.53 4 1/2		10 1/2
8	37.5		6.0 6		12
9	62.5		10.0 10		16
10	71.7		11.47 11 1/2		17 1/2
11	78		12.48 12 1/2		18 1/2
12	83.1		13.3 13 1/4		19 1/4
13	87.5		14.0 14		20
14	91.5		14.64 14 5/8		20 5/8
15	95.1		15.22 15 1/4		21 1/4
16	98.4		15.74 15 3/4		21 3/4

PRELIMINARY VELOCITY TRAVERSE

PLANT Exxon Uranium
DATE 9 - 27 - 79
LOCATION Crusher Pressure grizzly
STACK I.D. 16"
BAROMETRIC PRESSURE, in. Hg 24.77
STACK GAUGE PRESSURE, in. H_2O -1.1
OPERATORS Kimble / Karzovick

TRAVERSE POINT NUMBER	VELOCITY HEAD (Δp_s), in. H_2O	STACK TEMPERATURE (T_s), °F
1	.24	65
2	.28	66
3	.26	65
4	.24	65
5	.23	66
6	.25	66
7	.21	66
8	.18	65
9	.34	65
10	.35	65
11	.36	65
12	.33	65
13	.32	65
14	.29	65
15	.27	66
16	.25	66
AVERAGE		

SCHEMATIC OF TRAVERSE POINT LAYOUT

TRAVERSE POINT NUMBER	VELOCITY HEAD (Δp_s), in. H_2O	STACK TEMPERATURE (T_s), °F
1	.15	69
2	.21	69
3	.25	69
4	.28	68
5	.29	68
6	.33	67
7	.32	67
8	.24	65
9	.29	64
10	.35	64
11	.39	64
12	.41	63
13	.47	64
14	.48	64
15	.46	64
16	.45	64
AVERAGE	.31	66.0

NOMOGRAPH DATA

PLANT Exxon Uranium

DATE 9/27/79

SAMPLING LOCATION Crusher pressure grizzly

CONTROL BOX NO. Nutech #1

CALIBRATED PRESSURE DIFFERENTIAL ACROSS ORIFICE, in. H_2O	$\Delta H_@$	1.76
AVERAGE METER TEMPERATURE (AMBIENT + 20°F), °F	$T_{m\,avg.}$	90
PERCENT MOISTURE IN GAS STREAM BY VOLUME	B_{wo}	5%
BAROMETRIC PRESSURE AT METER, in. Hg	P_m	24.77
STATIC PRESSURE IN STACK, in. Hg (P_m ±0.073 x STACK GAUGE PRESSURE in in. H_2O)	P_s	24.69
RATIO OF STATIC PRESSURE TO METER PRESSURE	P_s P_m	1.0
AVERAGE STACK TEMPERATURE, °F	$T_{s\,avg.}$	66
AVERAGE VELOCITY HEAD, in. H_2O	$\Delta p_{avg.}$	.31
MAXIMUM VELOCITY HEAD, in. H_2O	$\Delta p_{max.}$	.48
C FACTOR	1.1	
CALCULATED NOZZLE DIAMETER, in.	.275	
ACTUAL NOZZLE DIAMETER, in.	.241	
REFERENCE Δp, in. H_2O	.49	

Grizzly Crusher
Run 1

FIELD DATA

PLANT Exxon Uranium
DATE 9/27/79
SAMPLING LOCATION Crusher pressure grizzly
SAMPLE TYPE Part
RUN NUMBER 1
OPERATOR Kimball
AMBIENT TEMPERATURE 70°F
BAROMETRIC PRESSURE 24.77
STATIC PRESSURE, (P_s) -1.1
FILTER NUMBER (s) 25441

PROBE LENGTH AND TYPE 5' boro
NOZZLE I.D. .241
ASSUMED MOISTURE, % 5
SAMPLE BOX NUMBER 2
METER BOX NUMBER N.T. #1
METER $\Delta H_@$ 1.76
C FACTOR 1.0
PITOT TUBE FACTOR 3A
REFERENCE Δp 0.49
NOTE

22

$LC_I = 0.01$
$LC_F = 0.01$

READ AND RECORD ALL DATA EVERY 3 MINUTES

TRAVERSE POINT NUMBER	SAMPLING TIME, min	CLOCK TIME (24-hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O DESIRED	ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m\ in}$), °F	OUTLET ($T_{m\ out}$), °F	PUMP VACUUM, in. Hg	TE[illegible]	
		1751	420.323									
A1	3	17:54	422.05	0.26	0.99	0.99	74		80	9.0		
" 2	6	17:57	424.1	0.36	1.4	1.4	74		82	18.0		
" 3	9	18:00	426.9	0.37	1.4	1.4	74		82	18.0		
" 4	12	18:03	429.7	0.36	1.4	1.4	73		84	18.0		
" 5	15	18:06	432.5	0.41	1.5	1.5	73		86	20.0		
" 6	18	18:09	435.35	0.40	1.5	1.5	73		88	20.0		
" 7	21	18:11	437.2	0.40	1.5	1.5	75		96	17.0		
" 8	24	18:14	439.4	0.39	1.5	1.5	75		98	17.5		
" 9	27	18:17	441.6	0.33	1.3	1.3	76		102	13.5		
" 10	30	18:20	443.2	0.14	0.52	0.52	76		104	5.0		
" 11	33	18:23	445.3	0.39	1.5	1.5	77		104	17.0		
" 12	36	18:26	447.6	0.42	1.6	1.55	77		108	20.0		
" 13	39	18:29	449.9	0.40	1.5	1.5	79		110	20.0		
" 14	42	18:32	452.2	0.39	1.5	1.5	80		112	20.0		
" 15	45	18:35	454.5	0.40	1.5	1.5	80		114	20.0		
" 16	48	18:38	457.1	0.39	1.5	1.5	80		118	20.0		
		1902	457.202	—	—	—	—	—	—	—		
B 1	3		458.3	0.09	0.34	0.34	83		122	3.8		
" 2	6		459.8	0.17	0.64	0.64	83		122	5.5		
3	9		461.6	0.25	0.95	0.95	84		122	6.0	270	
4	12		463.2	0.21	0.80	0.80	80		122	7.0	225	
5	15		464.8	0.18	0.68	0.68	79		124	6.0	295	
6	18		466.3	0.17	0.64	0.64	79		124	5.5	260	
7	21		467.9	0.17	0.64	0.64	79		125	5.5	235	

0.55587	F.P
1.2131	ΔH
78.38	TS
110.1	TM
59.969	VMA
24.77	PBAR
-0.8	VWC
12.4	WSG
28.97	MWD
1.396263402	AS
86.	TT
-1.1	STAT
0.241	DN
0.99375	Y
0.856	CP
11.6	TH2O
45.85755715	VMS
0.547004	VWS
1.17872057	%M
.9882122794	MD
28.84068871	MWS
24.68911765	PS
35.37131279	VACT
2963.260171	QACT
28.2871349	VSTD
2369.777472	QSTD
99.17629518	%I
0.0246	FHWT
0.	T WT
0.0082784	FHGR
.1681534318	FHLB
0.	T GR
0.	T LB

A-44

45

TRAVERSE POINT NUMBER	SAMPLING TIME, min	CLOCK TIME (24 hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in H_2O		STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE		PUMP VACUUM, in Hg	FILTER ~~SAMPLE~~ BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
					DESIRED	ACTUAL		INLET ($T_{m\,in}$), °F	OUTLET ($T_{m\,out}$), °F			
8	24		469.4	0.18	0.68	0.68	78		125	6.0	220	
9	27		471.5	0.40	1.5	1.5	80		126	19.0	250	
10	30		473.8	0.40	1.5	1.5	82		126	19.0	255	
11	33		476.2	0.42	1.6	1.6	83		128	20.0	260	
12	36		478.6	0.41	1.55	1.55	83		129	20.0	250	
13	38	1945	480.292	0.41	1.55	1.55	84		130	21.5	250	

Stopped Test

Bell Ran out of oil

38
48
TT = 86 min

$\overline{\sqrt{\Delta p}}$ = .55587 ✓✓ $\overline{\Delta H}$ = 1.2131 ✓✓ $\overline{T_s}$ = 78.379 ✓✓ $\overline{T_m}$ = 110.10 ✓✓

FIELD DATA

PLANT Exxon Uranium
DATE 9/27/79
SAMPLING LOCATION Crusher Pressure grizzly
SAMPLE TYPE Particulate
RUN NUMBER 2
OPERATOR Kimball
AMBIENT TEMPERATURE 70°F
BAROMETRIC PRESSURE 24.77
STATIC PRESSURE, (P_s) -1.1 -1.1
FILTER NUMBER (s) 25449

PROBE LENGTH AND TYPE 5' boros
NOZZLE I.D. .241
ASSUMED MOISTURE, % 5
SAMPLE BOX NUMBER 3
METER BOX NUMBER NT #1
METER $\Delta H_@$ 1.76
C FACTOR 1.0
PITOT TUBE FACTOR S K =
REFERENCE Δp .49
NOTE

A
B

LK·CK₁ = 0.01 READ AND RECORD ALL DATA EVERY 3 MINUTES L.C.₂ =

TRAVERSE POINT NUMBER	SAMPLING TIME, min	CLOCK TIME (24-hr CLOCK)	GAS METER READING (V_m), ft³	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O DESIRED	ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET $(T_{m\,in})$, °F	OUTLET $(T_{m\,out})$, °F	PUMP VACUUM, in. Hg	SA... TE...	
	0	21:12	481.196									
B 1	3	21:15	482.9	0.26	0.99	0.99	70		106	9.0		
2	6	21:18	484.7	0.25	0.95	0.95	71		106	9.0		
3	9	21:21	486.5	0.24	0.92	0.92	72		108	9.0		
4	12	21:24	488.2	0.24	0.92	0.92	71		108	9.0		
5	15	21:27	490.0	0.24	0.92	0.92	70		110	9.0		
6	18	21:30	491.7	0.20	0.77	0.77	69		112	8.0		
7	21	21:33	493.3	0.21	0.80	0.80	69		112	8.0		
8	24	21:36	495.4	0.40	1.50	1.50	69		112	18.0		
9	27	21:39	497.7	0.39	1.50	1.50	70		114	19.0		
10	30	21:42	500.0	0.41	1.55	1.55	69		116	20.0		
11	33	21:45	502.3	0.41	1.55	1.55	69		118	20.0		
12	36	21:48	504.6	0.38	1.45	1.45	69		120	19.0		
13	39	21:51	506.9	0.36	1.40	1.40	70		121	15.5		
14	42	21:54	509.1	0.34	1.30	1.30	69		122	14.0		
15	45	21:57	511.2	0.32	1.25	1.25	70		124	12.5		
16	48	22:00	513.488	0.36	1.40	1.40	70		125	15.5		
	0	22:09	513.490	—	—	—	—	—	—	—		
A 1	3	22:12	515.5	0.29	1.10	1.10	76		122	7.5		
2	6	22:15	517.7	0.31	1.20	1.20	77		123	8.0	235	
3	9	22:18	519.7	0.33	1.30	1.30	79		124	8.5	245	
4	12	22:21	521.7	0.31	1.20	1.20	79		125	8.0	250	
5	15	22:24	524.1	0.42	1.60	1.60	79		126	11.0	245	
6	18	22:27	526.4	0.37	1.45	1.45	80		128	9.5	225	
7	21	22:30	528.8	0.43	1.65	1.65	80		128	11.0	230	

Grizzly Run 2

0.60224	AP
1.4209	H
75.219	TS
121.5	TM
70.885	VMA
24.77	PBAR
-7.	VWC
15.4	WSG
28.97	MWD
1.396263402	AS
96.	TT
-1.1	STAT
0.241	DN
0.99375	Y
0.856	CP
8.4	TH2O
53.17489324	VMS
0.39662	VWS
.7403561632	%M
.9925964384	MD
28.88878293	MWS
24.68911765	PS
38.17746019	VACT
3198.347425	QACT
30.8478342	VSTD
2584.302115	QSTD
94.47025622	%I
0.0356	FHWT
0.	T WT
.0103315525	FHGR
.2288551193	FHLB
0.	T GR
0.	T LB

Run #2

GRIZZLY

TRAVERSE POINT NUMBER	SAMPLING TIME, min	CLOCK TIME (24 hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in H_2O DESIRED	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in H_2O ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m\,in}$), °F	DRY GAS METER TEMPERATURE OUTLET ($T_{m\,out}$), °F	PUMP VACUUM, in Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
8	24	22:33	531.1	0.41	1.55	1.55	81		128	10.0	240	
9	27	22:37	533.6	0.44	1.70	1.70	81		129	11.0	255	
10	30	22:40	536.2	0.49	1.90	1.90	81		130	13.0	260	
11	33	22:43	539.9	0.51	2.00	2.00	82		130	14.0	245	
12	36	22:46	541.6	0.52	2.00	2.00	82		130	14.0	235	
13	39	22:49	544.2	0.52	2.00	2.00	83		132	14.0	250	
14	42	22:52	546.9	0.50	1.95	1.95	84		132	13.0	255	
15	45	22:55	549.5	0.49	1.90	1.90	83		133	12.5	245	
16	48	22:58	552.081	0.46	1.80	1.80	83		134	12.0	250	
			LK CHK - .01									

$\overline{\sqrt{\Delta p}} = .60224$ $\overline{\Delta H} = 1.4209$ $\overline{T_s} = 75.219$ $\overline{T_m} = 121.50$

FIELD DATA

PLANT Exxon Uranium
DATE 9/27/79
SAMPLING LOCATION Coucher pressure grizzly
SAMPLE TYPE Particulate
RUN NUMBER 3
OPERATOR Kimball
AMBIENT TEMPERATURE 74°
BAROMETRIC PRESSURE
STATIC PRESSURE, (P_s) -1.05, -1.1, -1.15
FILTER NUMBER (s) 2549 47

PROBE LENGTH AND TYPE 5' b
NOZZLE I.D. .241
ASSUMED MOISTURE, % 5
SAMPLE BOX NUMBER 3
METER BOX NUMBER NT #1
METER $\Delta H_@$ 1.76
C FACTOR 1.0
PITOT TUBE FACTOR 3A
REFERENCE Δp .45
NOTE

L.C. #1 = 0.016

READ AND RECORD ALL DATA EVERY 3 MINUTES

	TRAVERSE POINT NUMBER	SAMPLING TIME, min	CLOCK TIME (24-hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O DESIRED	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m\,in}$), °F	DRY GAS METER TEMPERATURE OUTLET ($T_{m\,out}$), °F	PUMP VACUUM, in. Hg		
		0	00:01	552.449									
B	1	3	00:04	554.2	0.26	1.0	1.0	70		102	8.0		
	2	6	00:07	556.0	0.23	0.88	0.88	70		102	7.0		
	3	9	00:10	557.9	0.29	1.10	1.10	70		102	9.0		
	4	12	00:13	559.7	0.25	0.95	0.95	69		102	8.0		
	5	15	00:16	561.4	0.22	0.84	0.84	68		102	7.0		
	6	18	00:19	562.9	0.18	0.68	0.68	67		104	6.0		
	7	21	00:22	564.4	0.16	0.60	0.60	66		104	5.5		
	8	24	00:25	565.8	0.18	0.68	0.68	64		105	6.0		
	9	27	00:28	568.1	0.41	1.55	1.55	61		106	13.0		
	10	30	00:31	570.5	0.45	1.70	1.70	61		108	13.5		
	11	33	00:34	572.9	0.45	1.70	1.70	62		110	13.5		
	12	36	00:37	575.2	0.41	1.55	1.55	62		112	12.0		
	13	39	00:40	577.5	0.39	1.50	1.50	63		113	12.0		
	14	42	00:43	579.8	0.37	1.40	1.40	63		115	11.0		
	15	45	00:46	581.9	0.33	1.30	1.30	63		116	10.0		
	16	48	00:49	584.144	0.35	1.35	1.35	61		118	10.5		
		0	00:55	584.144	—	—	—	—	—	—	—		
A	1	3	00:58	586.1	0.29	1.10	1.10	68		115	8.5		
	2	6	01:01	588.2	0.34	1.30	1.30	70		118	10.0		
	3	9	01:04	590.5	0.37	1.40	1.40	73		120	11.0		
	4	12	01:07	592.7	0.37	1.40	1.40	75		121	11.0		
	5	15	01:10	595.0	0.40	1.55	1.55	76		122	12.0	245	
	6	18	01:13	597.4	0.39	1.50	1.50	77		124	11.5	250	
	7	21	01:16	599.7	0.41	1.55	1.55	79		124	12.0	250	

Run 3
Grizzly

0.60089	F.P
1.4103	ΔH
71.5	TS
116.22	TM
70.182	VMA
24.77	PBAR
0.	VWC
8.7	WSG
28.97	MWD
1.396263402	AS
96.	TT
-1.1	STAT
0.241	DN
0.99375	Y
0.856	CP
8.7	TH2O
53.12828609	VMS
0.410205	VWS
.7661870771	%M
.9923381292	MD
28.88594928	MWS
24.68911765	PS
37.96116971	VACT
3180.227517	QACT
30.8796558	VSTD
2586.967995	QSTD
94.29018757	%I
0.0462	FHWT
0.	T WT
.0134195633	FHGR
.2975645582	FHLB
0.	T GR
0.	T LB

Run #3

GRIZZLY

TRAVERSE POINT NUMBER	SAMPLING TIME, min	CLOCK TIME (24 hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in H_2O		STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE		PUMP VACUUM, in Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
					DESIRED	ACTUAL		INLET ($T_{m\,in}$), °F	OUTLET ($T_{m\,out}$), °F			
			599.7									
8	24	01:19	602.1	0.42	1.60	1.60	79		125	12.0	255	
9	27	01:22	604.4	0.37	1.40	1.40	80		126	11.0	245	
10	30	01:23	606.9	0.50	1.90	1.90	81		127	15.0	240	
11	33	01:24	609.5	0.50	1.90	1.90	81		128	15.0	240	
12	36	01:27	612.1	0.52	2.00	2.00	81		128	16.5	240	
13	39	01:30	614.8	0.51	2.00	2.00	82		129	16.5	240	
14	42	01:33	617.4	0.50	1.90	1.90	82		130	15.0	240	
15	45	01:34	620.1	0.53	2.05	2.05	82		130	17.0	240	
16	48	01:39	622.631	0.47	1.80	1.80	82		131	15.5	235	

$\overline{\sqrt{\Delta p}} = .60089$ $\overline{\Delta H} = 1.4103$ $\overline{T_s} = 71.500$ $\overline{T_m} = 116.22$

FUGITIVE EMISSION INSPECTION

Company Exxon Uranium
Location 25 mi. NW Douglass Wyo.
Company Rep. Roy F. Weston Inc

Inspector Thomas J. Davis
Affilitation LAB. Tech
Date 9/27/79

Sky Conditions
Precipitation

Wind Direction
Wind Speed

Facility Type Uranium mine

Emission Source Crusher Pressure Grizzly Hood Area

Sketch emission source, indicate observer position relative to source; indicate potential emission points and/or actual emission points.

OBSERVATIONS

test #1

	Time	Accumulated Observation Period (Min: Sec)	Accumulated Emission Time (Min: Sec)
Begin Observation	1745	3hr. 5min	0
Illumination = 20 f.c.			
End Observation			

FUGITIVE EMISSION
INSPECTION

Company Exxon Uranium
Location 25 mi NW Douglass Wyo
Company Rep. Roy F. Westen Inc.

Inspector Thomas J. Davis
Affilitation LAB Tech
Date 9/27/79

Sky Conditions ____
Precipitation ____

Wind Direction ____
Wind Speed ____

Facility Type ____

Emission Source Crusher Pressure Grizzly

Sketch emission source, indicate observer position relative to source; indicate potential emission points and/or actual emission points.

OBSERVATIONS Test #2

Begin Observation 2115

Time	Accumulated Observation Period (Min: Sec)	Accumulated Emission Time (Min: Sec)
2115 - 2135	20 min.	0
2140 - 2200	20 min	0
2205 - 2225	20 min	0
2230 - 2250	20 min	0
2255 - 2300	5 min	0

End Observation 2300

FUGITIVE EMISSION
INSPECTION

Company Exxon Uranium	Inspector Thomas J. Osais
Location 25 mi NW Douglass Wyoming	Affilitation Lab. Tech
Company Rep. Roy F. Weston Inc.	Date 9/27-28/79

Sky Conditions	Wind Direction
Precipitation	Wind Speed

Facility Type Uranium Mine	Emission Source Crusher Pressure Grizzly

Sketch emission source, indicate observer position relative to source; indicate potential emission points and/or actual emission points.

OBSERVATIONS

Test #3

Begin Observation 0005

	Time	Accumulated Observation Period (Min: Sec)	Accumulated Emission Time (Min: Sec)
	0005- 0025	20	0
	0030- 0050	20	0
	0055- 0115	20	0
	0120- 0140	20	0
	0145-		
End Observation ~~00~~ 0140			

RECORD OF VISIBLE EMISSIONS

Company Name Exxon Uranium

Plant Address 25 NW Douglas Wyo.

Stack Location Crusher Pressure Grizzly

Weather Conditions Indoors

Date 9/27/79

Observer T. Moxon

Observer's Location 20' from hood

Run 1

HR	MIN	SECONDS 00	15	30	45	COMMENTS
0						
1751	00	0	0	0	0	
	01	0	0	0	0	
	02	0	0	0	0	
	03	0	0	0	0	
	04	0	0	0*	0	* heavy sand particle fall from above hood entrance 4 secs.
	05	0	0	0	0	
	06	0	0	0	0	
	07	0	0	0	0	
	08	0	0	0	0	
	09	0	0	0	0	
	10	0	0	0	0	
	11	0	0	0	0	
	12	0	0	0	0	
	13	0	0	0	0	
	14	0	0	0	0	1751 - 1907 - 76 min
	15	0	0	0	0	2116 - 2258 102 min
	16	0	0	0	0	0002 - 0138 96
	17	0	0	0	0	274
	18	0	0	0*	0	
	19	0	0	0	0	
	20	0	0	0	0	
	21	0	0	0	0	
	22	0	0	0	0	
	23	0	0	0	0	
	24	0	0	0	0	
	25	0	0	0	0	
	26	0	0	0	0	
	27	0	0	0	0	
	28	0	0	0*	0	
	29	0	0	0	0	

RECORD OF VISIBLE EMISSIONS

Company Name Exxon Uranium Date 9/27/79

Plant Address 25 NW Douglas Wyo Observer T. Moxon

Stack Location Crusher, Pressure Grizzly Observer's Location 20' from hood

Weather Conditions Indoors

Run 1

TIME HR	MIN	SECONDS 00	15	30	45	COMMENTS
0						
1821	30	0	0	0	0	
	31	0	0	0	0	
	32	0	0	0	0	
	33	0	0	0	0	
	34	0	0	0	0	
	35	0	0	0	0	
	36	0	0	0	0	
	37	0	0	0	0	
	38	0	0	0	0	
	39	0	0	0	0	
	40	0	0	0	0	
	41	0	0	0	0	
	42	0	0	0	0	
	43	0	0	0	0	
	44	0	0	0	0	
	45	0	0	0	0	
	46	0	0	0	0	
	47	0	0	0	0	
	48	0	0	0	0	
	49	0	0	0	0	
	50	0	0	0	0	
	51	0	0	0	0	
	52	0	0	0	0	
	53	0	0	0	0	
	54	0	0	0	0	
	55	0	0	0	0	
	56	0	0	0	0	
	57	0	0	0	0	
	58	0	0	0	0	
	59	0	0	0	0	

RECORD OF VISIBLE EMISSIONS

Company Name Exxon Uranium — Date 9/27/79

Plant Address 25 NW Douglas Wyoming — Observer T. Moxon

Stack Location Crusher pressure grizzly — Observer's Location 20' from hood

Weather Conditions Indoors

Run 1

	HR	MIN	00	15	30	45	COMMENTS
1851	1	00	0	0	0	0	
		01	0	0	0	0	
		02	0	0	0	0	
		03	0	0	0	0	
		04	0	0	0	0	
		05	0	0	0	0	
		06	0	0	0	0	
		07	0	0	0	0	
		08	0	0	0	0	
		09	0	0	0	0	
		10	0	0	0	0	
		11	0	0	0	0	
		12	0	0	0	0	
		13	0	0	0	0	
		14	0	0	0	0	
		15	0	0	0	0	
		16	0	0	0	0	
		17	0	0	0	0	
		18	0	0	0	0	
		19	0	0	0	0	
		20	0	0	0	0	
		21	0	0	0	0	
		22	0	0	0	0	
		23	0	0	0	0	
		24	0	0	0	0	
1907		25	0	0	0	0	
		26					
		27					
		28					
		29					

RECORD OF VISIBLE EMISSIONS

Company Name Exxon Uranium Date 9/27/79

Plant Address Douglass Wyoming Observer T. Moran

Stack Location Crusher pressure grizzly Observer's Location 20' from hood

Weather Conditions Indoors

Run 2 pg 1

	HR	MIN	SECONDS 00	15	30	45	COMMENTS
2116	0						
		00	0	0	0	0	
		01	0	0	0	0	
		02	0	0	0	0	
		03	0	0	0	0	
		04	0	0	0	0	
		05	0	0	0	0	
		06	0	0	0	0	
		07	0	0	0	0	
		08	0	0	0	0	
		09	0	0	0	0	
2126		10	0	0	0	0	
		11	0	0	0	0	
		12	0	0	0	0	
		13	0	0	0	0	
		14	0	0	0	0	
		15	0	0	0	0	
		16	0	0	0	0	
		17	0	0	0	0	
		18	0	0	0	0	
		19	0	0	0	0	
		20	0	0	0	0	
		21	0	0	0	0	
		22	0	0	0	0	
		23	0	0	0	0	
		24	0	0	0	0	
		25	0	0	0	0	
		26	0	0	0	0	
		27	0	0	0	0	
2146		28	0	0	0	0	
		29	0				

RECORD OF VISIBLE EMISSIONS

Company Name Exxon Uranium Date 9/27/79

Plant Address Douglass Wyoming Observer T. Moxon

Stack Location Crusher pressure grizzly Observer's Location 20' from Load

Weather Conditions Indoors

Run 2 pg 2

HR	MIN	00	15	30	45	COMMENTS
	30	0	0	0	0	
	31	0	0	0	0	
	32	0	0	0	0	
	33	0	0	0	0	
	34	0	0	0	0	
	35	0	0	0	0	
	36	0	0	0	0	
	37	0	0	0	0	
	38	0	0	0	0	
	39	0	0	0	0	
	40	0	0	0	0	
	41	0	0	0	0	
	42	0	0	0	0	
	43	0	0	0	0	
	44	0	0	0	0	
	45	0	0	0	0	
	46	0	0	0	0	
	47	0	0	0	0	
2159	48	0	0	0	0	
2209	49	0	0	0	0	
	50	0	0	0	0	
	51	0	0	0	0	
	52	0	0	0	0	
	53	0	0	0	0	
	54	0	0	0	0	
	55	0	0	0	0	
	56	0	0	0	0	
	57	0	0	0	0	
	58	0	0	0	0	
	59	0	0	0	0	

RECORD OF VISIBLE EMISSIONS

Company Name Exxon Uranium Date 9/27/79

Plant Address Douglas, Wyoming Observer T. Moxon

Stack Location Crusher Pressure Grizzly Observer's Location 20' from hood

Weather Conditions Indoors 3 of 4

HR	MIN	00	15	30	45	COMMENTS
1						
	00	0	0	0	0	
	01	0	0	0	0	
	02	0	0	0	0	
	03	0	0	0	0	
	04	0	0	0	0	
	05	0	0	0	0	
	06	0	0	0	0	
	07	0	0	0	0	
2232	08	0	0	0	0	
	09	0	0	0	0	
	10	0	0	0	0	
	11	0	0	0	0	
	12	0	0	0	0	
	13	0	0	0	0	
	14	0	0	0	0	
	15	0	0	0	0	
	16	0	0	0	0	
	17	0	0	0	0	
	18	0	0	0	0	
	19	0	0	0	0	
	20	0	0	0	0	
	21	0	0	0	0	
	22	0	0	0	0	
	23	0	0	0	0	
	24	0	0	0	0	
	25	0	0	0	0	
	26	0	0	0	0	
	27	0	0	0	0	
	28	0	0	0	0	
	29	0	0	0	0	

RECORD OF VISIBLE EMISSIONS

Company Name Exxon Uranium   Date 9/27/79

Plant Address Douglass Wyoming   Observer T. Moxon

Stack Location Crusher pressure grizzly   Observer's Location 20' from hood

Weather Conditions Indoors   4 of 4 Run 2

TIME HR	MIN	SECONDS 00	15	30	45	COMMENTS
	30	0	0	0	0	
	31	0	0	0	0	
2	32	0	0	0	0	
2255	33	0	0	0	0	
	34	0	0	0	0	
	35	0	0	0	0	
2258	36	0				
	37					
	38					
	39					
	40					
	41					
	42					
	43					
	44					
	45					
	46					
	47					
	48					
	49					
	50					
	51					
	52					
	53					
	54					
	55					
	56					
	57					
	58					
	59					

RECORD OF VISIBLE EMISSIONS

Company Name Exxon Uranium

Date 9/28/79

Plant Address Douglas Wyoming

Observer T. Moxon

Stack Location Crusher pressure grizzly

Observer's Location 20' from Load

Weather Conditions Indoors

Run 3 pg 1

HR	MIN	00	15	30	45	COMMENTS
0002	00	0	0	0	0	
	01	0	0	0	0	
	02	0	0	0	0	
	03	0	0	0	0	
	04	0	0	0	0	
	05	0	0	0	0	
	06	0	0	0	0	
	07	0	0	0	0	
	08	0	0	0	0	
	09	0	0	0	0	
	10	0	0	0	0	
	11	0	0	0	0	
	12	0	0	0	0	
	13	0	0	0	0	
	14	0	0	0	0	
	15	0	0	0	0	
	16	0	0	0	0	
	17	0	0	0	0	
	18	0	0	0	0	
	19	0	0	0	0	
	20	0	0	0	0	
	21	0	0	0	0	
	22	0	0	0	0	
	23	0	0	0	0	
	24	0	0	0	0	
	25	0	0	0	0	
	26	0	0	0	0	
	27	0	0	0	0	
	28	0	0	0	0	
	29	0	0	0	0	

RECORD OF VISIBLE EMISSIONS

Company Name Exxon Uranium Date 9/28/79

Plant Address Douglas Wyoming Observer T. Moxon

Stack Location Crusher Discharge grizzly Observer's Location 20' from head

Weather Conditions Indoors

pg 2 Run 3

HR	MIN	00	15	30	45	COMMENTS
	30	0	0	0	0	
	31	0	0	0	0	
	32	0	0	0	0	
	33	0	0	0	0	
	34	0	0	0	0	
	35	0	0	0	0	
	36	0	0	0	0	
	37	0	0	0	0	
	38	0	0	0	0	
	39	0	0	0	0	
	40	0	0	0	0	
	41	0	0	0	0	
	42	0	0	0	0	
	43	0	0	0	0	
	44	0	0	0	0	
	45	0	0	0	0	
	46	0	0	0	0	
	47	0	0	0	0	
0050	48	0				
part 2 0055	49	0	0	0	0	
	50	0	0	0	0	
	51	0	0	0	0	
	52	0	0	0	0	
	53	0	0	0	0	
	54	0	0	0	0	
	55	0	0	0	0	
	56	0	0	0	0	
	57	0	0	0	0	
	58	0	0	0	0	
	59	0	0	0	0	

RECORD OF VISIBLE EMISSIONS

Company Name Exxon Uranium

Date 9/27/79

Plant Address Douglas Wyoming

Observer T. Moxon

Stack Location Crusher pressure grizzly

Observer's Location 20' from Load entrance

Weather Conditions Indoors

Run 3 pg 3 of 4

HR	MIN	SECONDS 00	15	30	45	COMMENTS
0106	00	0	0	0	0	
	01	0	0	0	0	
	02	0	0	0	0	
	03	0	0	0	0	
	04	0	0	0	0	
	05	0	0	0	0	
	06	0	0	0	0	
	07	0	0	0	0	
	08	0	0	0	0	
	09	0	0	0	0	
	10	0	0	0	0	
	11	0	0	0	0	
	12	0	0	0	0	
	13	0	0	0	0	
	14	0	0	0	0	
	15	0	0	0	0	
	16	0	0	0	0	
	17	0	0	0	0	
	18	0	0	0	0	
	19	0	0	0	0	
	20	0	0	0	0	
	21	0	0	0	0	
	22	0	0	0	0	
	23	0	0	0	0	
	24	0	0	0	0	
	25	0	0	0	0	
	26	0	0	0	0	
	27	0	0	0	0	
	28	0	0	0	0	
	29	0	0	0	0	

RECORD OF VISIBLE EMISSIONS

Company Name Exxon Uranium — Date 9/27/79

Plant Address Douglas, Wyoming — Observer T. Moxon

Stack Location Crusher pressure stack — Observer's Location 20' from hood

Weather Conditions Indoors

Run 3 pg 4 of 4

HR	MIN	SECONDS 00	15	30	45	COMMENTS
0132	00	0	0	0	0	
	01	0	0	0	0	
	02	0	0	0	0	
	03	0	0	0	0	
	04	0	0	0	0	
	05	0	0	0	0	
0138	06	0				
	07					
	08					
	09					
	10					
	11					
	12					
	13					
	14					
	15					
	16					
	17					
	18					
	19					
	20					
	21					
	22					
	23					
	24					
	25					
	26					
	27					
	28					
	29					

TRAVERSE POINT LOCATION FOR CIRCULAR DUCTS

PLANT Exxon Uranium - Casper Wyo.
DATE 9-26-78
SAMPLING LOCATION Crusher Scrubber Inlet
INSIDE OF FAR WALL TO OUTSIDE OF PORT, (DISTANCE A) 33 7/8"
INSIDE OF NEAR WALL TO OUTSIDE OF PORT, (DISTANCE B) 6"
STACK I.D., (DISTANCE A - DISTANCE B) 33 7/8 - 6 = 27 7/8
actually 28" duct
NEAREST UPSTREAM DISTURBANCE < 1
NEAREST DOWNSTREAM DISTURBANCE < 1
CALCULATOR O'Neill

1/8 = .13 5/8 = .63
2/8 = .25 6/8 = .75
3/8 = .38 7/8 = .88
4/8 = .50

SCHEMATIC OF SAMPLING LOCATION

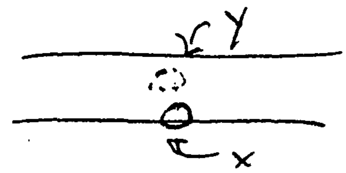
TRAVERSE POINT NUMBER	FRACTION OF STACK I.D.	STACK I.D.	PRODUCT OF COLUMNS 2 AND 3 (TO NEAREST 1/8 INCH)	DISTANCE B	TRAVERSE POINT LOCATION FROM OUTSIDE OF PORT (SUM OF COLUMNS 4 & 5)
X 1	.011	27 7/8	1/4	6.0	6 1/4
2	.032		7/8		6 7/8
3	.055		1 1/2		7 1/2
4	.079		2 1/4		8 1/4
5	.105		2 7/8		8 7/8
6	.132		3 5/8		9 5/8
7	.161		4 1/2		10 1/2
8	.194		5 3/8		11 3/8
9	.230		6 3/8		12 3/8
10	.272		7 5/8		13 5/8
11	.323		9		15
12	.398		11 1/8		17 1/8
13	.602		16 3/4		22 3/4
14	.677		18 7/8		24 7/8
15	.728		20 1/4		26 1/4
16	.770		21 1/2		27 1/2
17	.806		22 1/2		28 1/2
18	.839		23 3/8		29 3/8
19	.868		24 1/4		30 1/4
20	.895		25		31
21	.921		25 5/8		31 5/8
22	.945		26 3/8		32 3/8
23	.968		27		33
24	.989		27 5/8		33 5/8

PRELIMINARY VELOCITY TRAVERSE

Stack Gas = ambient

PLANT Exxon Uranium
DATE 9-27-79
LOCATION Crusher Scrubber Inlet
STACK I.D. 30"
BAROMETRIC PRESSURE, in. Hg 24.85 - .10 = 24.75
STACK GAUGE PRESSURE, in. H_2O -1.9
OPERATORS Goldberg / Mac

Cyclonic Flow Check – OK



SCHEMATIC OF TRAVERSE POINT LAYOUT

TRAVERSE POINT NUMBER	VELOCITY HEAD (Δp_s), in. H_2O	STACK TEMPERATURE (T_s), °F
X 1	.19	70
2		
3		
4	.38	70
5		
6		
7		
8	.32	70
9		
10		
11		
12	.23	69
13		
14		
15		
16	.31	68
17		
18		
19		
20	.35	68
21		
22		
23		
24	.44	69
AVERAGE		

TRAVERSE POINT NUMBER	VELOCITY HEAD (Δp_s), in. H_2O	STACK TEMPERATURE (T_s), °F
Y 1	.34	70
2		
3		
4	.30	70
5		
6		
7		
8	.24	70
9		
10		
11		
12	.30	69
13		
14		
15		
16	.44	70
17		
18		
19		
20	.55	70
21		
22		
23		
24	.55	70
AVERAGE		

NOMOGRAPH DATA

PLANT Exxon Uranium

DATE 9-26-79

SAMPLING LOCATION Crusher Inlet

CONTROL BOX NO. 2253

CALIBRATED PRESSURE DIFFERENTIAL ACROSS ORIFICE, in. H_2O	$\Delta H_@$	1.84
AVERAGE METER TEMPERATURE (AMBIENT + 20°F), °F	$T_{m\,avg.}$	85°
PERCENT MOISTURE IN GAS STREAM BY VOLUME	B_{wo}	3%
BAROMETRIC PRESSURE AT METER, in. Hg	P_m	24.75
STATIC PRESSURE IN STACK, in. Hg 24.75 - .14 ($P_m \pm 0.073$ x STACK GAUGE PRESSURE in in. H_2O)	P_s	24.61
RATIO OF STATIC PRESSURE TO METER PRESSURE	P_s P_m	1.0
AVERAGE STACK TEMPERATURE, °F	$T_{s\,avg.}$	75
AVERAGE VELOCITY HEAD, in. H_2O	$\Delta p_{avg.}$	.35
MAXIMUM VELOCITY HEAD, in. H_2O	$\Delta p_{max.}$	.55
C FACTOR	1.1	
CALCULATED NOZZLE DIAMETER, in.	0.250	
ACTUAL NOZZLE DIAMETER, in.	0.250	
REFERENCE Δp, in. H_2O	.42	

Fan Δp = 2.2

35 18 47

Record Total stop + 30 times + static pressure and leak rate

FIELD DATA

PLANT Exxon Uranium
DATE 9-28-79
SAMPLING LOCATION Crusher Inlet
SAMPLE TYPE Part. EPA-5
RUN NUMBER One
OPERATOR Goldberg
AMBIENT TEMPERATURE 70
BAROMETRIC PRESSURE 24.75
STATIC PRESSURE, (P_s) -1.9
FILTER NUMBER (s) 25443

PROBE LENGTH AND TYPE 5' Borosil
NOZZLE I.D. .25
ASSUMED MOISTURE, % 3%
SAMPLE BOX NUMBER 1
METER BOX NUMBER 2253
METER $\Delta H_@$ 1.84
C FACTOR 1.1
PITOT TUBE FACTOR 4A
REFERENCE Δp .42
NOTE LC_I = .031
$LC_{F_{18}}$ = .004 @15

READ AND RECORD ALL DATA EVERY 2.0 MINUTES

TRAVERSE POINT NUMBER	SAMPLING TIME, min / CLOCK TIME (24-hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O DESIRED	ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m\ in}$), °F	OUTLET ($T_{m\ out}$), °F	PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE	
	0 / 17:50	830.967									
x 1	2	832.0	.06	.26		77	94	92	3		
2	4	832.9	.17	.70		79	106	93	5		
3	6	834.5	.36	1.6		77	110	93	8		
4	8	836.0	.39	1.7		74	115	94	10		
5	10	837	.35	1.55		74	117	95	10		
6	12	839	.35	1.55		75	120	96	10		
7	14	840.5	.33	1.5		76	122	97	9		
8	16	842	.35	1.55		76	124	98	9		
9	18	843.7	.34	1.5		76	124	98	9		
10	20	846	.34	1.5		76	124	98	9		
11	22	846.9	.34	1.5		75	124	99	9		
12	24	847.7	.31	1.4		76	125	100	9		
13	26	847	.23	1.0		76	124	100	8		
14	28	848.8	.24	1.05		76	124	100	8		
15	30	849.7	.26	1.15		76	124	100	7		
16	32	851.2	.30	1.3		76	124	100	8		
17	34	852.9	.28	1.2		75	124	100	8		
18	36	854	.24	1.05		75	124	100	7		
19	38	855.4	.37	1.6		76	123	100	9		
20	40	857.3	.43	1.9		76	124	100	12		
21	42	859.4	.45	2.0		76	124	101	13		
22	44	860.4	.45	2.0		76	125	102	13		
23	46	862	.55	2.4		77	124	102	18	240	
24	48	863.424	.50	2.2		77	124	102	18	240	

0.54655	Γ R
1.3685	ΔH
76.625	TS
110.48	TM
65.059	VMA
24.77	RBAR
0.	VWC
14.4	WSG
28.97	MWD
4.27605	AS
96.	TT
-1.9	STAT
0.25	DN
0.9949	Y
0.853	CP
14.4	TH2O
49.79709131	VMS
0.67896	VWS
1.345113143	%M
.9865488686	MD
28.82244109	MWS
24.63029412	PS
34.65209677	VACT
8890.445904	QACT
27.68966513	VSTD
7104.143554	QSTD
91.59114429	%I
0.0393	FHWT
0.	T WT
.0121789764	FHGR
.7416077856	FHLB
0.	T GR
0.	T LB

A-67

Exxon - EPA
RUN 1
SCRUBBER INLET

TRAVERSE POINT NUMBER	SAMPLING TIME, min / CLOCK TIME (24 hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in H_2O DESIRED	ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET $(T_{m\,in})$, °F	OUTLET $(T_{m\,out})$, °F	PUMP VACUUM, in Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
	0	863.432									
Y 1	2	865.0	.24	1.05		75	106	100	6	220	
2	4	866.3	.16	.70		79	113	100	4	220	
3	6	867.5	.23	1.0		78	117	100	6	220	
4	8	868.7	.23	1.0		78	120	101	6	220	
5	10	870.0	.23	1.0		77	121	101	6	220	
6	12	871.1	.20	.90		77	121	101	6	220	
7	14	872.6	.26	1.15		78	122	101	7	220	
8	16	873.6	.26	1.15		77	123	100	7	220	
9	18	874.7	.14	.60		78	122	100	4	220	
10	20	875.6	.14	.60		77	122	100	4	220	
11	22	876.6	.13	.56		77	122	100	4	225	
12	24	877.8	.13	.56		77	122	101	4	225	
13	26	879.1	.22	.96		77	122	100	6	225	
14	28	880.3	.26	1.15		77	122	101	7	225	
15	30	881.7	.28	1.2		77	123	102	7	225	
16	32	883.0	.29	1.3		77	123	102	8	225	
17	34	884.5	.29	1.3		77	124	102	8	225	
18	36	886.2	.34	1.5		78	124	102	8.5	220	
19	38	887.6	.40	1.75		78	124	102	11	225	
20	40	889.2	.46	2.0		78	125	102	13	225	
21	42	891.0	.45	2.0		77	126	102	13	220	
22	44	892.9	.49	2.2		77	127	102	15	225	
23	46	894.8	.50	2.2		77	128	102	16	225	
24	48	896.026	.60	2.7		77	128	102	18	225	
	19:17		LCI =	.003							
			LCF =	.009	in 1 min @ 15 psi						

$\overline{\sqrt{\Delta p}} = .54655$ $\overline{\Delta H} = 1.3685$ $\overline{T_s} = 76.025$ $\overline{T_m} = ...4$

A-68

Pressure drop

FIELD DATA

PLANT Exxon - EPA
DATE 9-27-79
SAMPLING LOCATION scrubber inlet
SAMPLE TYPE particulate
RUN NUMBER 2
OPERATOR NG, VM
AMBIENT TEMPERATURE 69
BAROMETRIC PRESSURE 24.75
STATIC PRESSURE, (P_s) -1.8
FILTER NUMBER (s) 25444

PROBE LENGTH AND TYPE 5' Borosilicate
NOZZLE I.D. .25
ASSUMED MOISTURE, % —
SAMPLE BOX NUMBER —
METER BOX NUMBER 2253
METER $\Delta H_@$ 1.84
C FACTOR 1.1
PITOT TUBE FACTOR 4
REFERENCE Δp .042
NOTE LCI = .018 cfm
LCF = .009 "
5"

Run 2

READ AND RECORD ALL DATA EVERY 2 MINUTES

TRAVERSE POINT NUMBER	SAMPLING TIME, min	CLOCK TIME (24-hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O DESIRED	ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET $(T_{m\ in})$, °F	OUTLET $(T_{m\ out})$, °F	PUMP VACUUM, in. Hg	SAM[PLE] TEMP	
	0	21:20	896.462									
X - 1	2		897.2	.07	.3		69	86	80	2	2	
2	4		898.2	.09	.39		69	89	80	2		
3	6		899.1	.23	1.0		70	94	81	2		
4	8		900.3	.23	1.0		70	98	82	2		
5	10		901.9	.30	1.3		70	100	82	3		
6	12		903.1	.26	1.15		70	103	82	3		
7	14		904.3	.25	1.1		70	104	83	3		
8	16		905.6	.20	.89		69	104	84	2.5		
9	18		906.8	.18	.79		70	104	85	3		
10	20		907.7	.21	.92		69	105	85	2		
11	22		909.3	.21	.92		69	106	86	2		
12	24		910.1	.21	.92		69	107	86	2.5		
13	26		912.0	.3	1.3		69	108	86	3		
14	28		913.6	.36	1.6		69	109	87	3.5		
15	30		915.1	.39	1.7		70	110	88	3.5		
16	32		916.5	.41	1.8		70	112	88	3.5		
17	34		918.1	.41	1.8		70	112	89	3.5		
18	36		920.4	.45	2.0		70	114	90	4		
19	38		921.8	.48	2.1		71	114	90	4		
20	40		924.2	.49	2.2		71	114	90	4		
21	42		925.4	.49	2.2		72	115	91	4		
22	44		927.0	.58	2.6		71	116	92	4		
23	46		929.6	.59	2.6		71	116	92	4	235	
24	48		931.258	.59	2.6		71	117	92	4		

0.57612	C P
1.5204	H
70.896	TS
100.21	TM
71.028	VMA
24.77	PBAR
8.	VWC
11.	WSG
28.97	MWD
4.27605	AS
96.	TT
-1.8	STAT
0.25	DN
0.9949	Y
0.853	CP
19.	TH2O
55.38736926	VMS
0.89521	VWS
1.590563211	%M
.9840943679	MD
28.79551522	MWS
24.63764706	PS
36.342934	VACT
9324.252175	QACT
29.2898666	VSTD
7514.696044	QSTD
96.30759919	%I
0.0313	FHWT
0.	T WT
.0087207897	FHGR
.5617188472	FHLB
0.	T GR
0.	T LB

A-69

Run 2

TRAVERSE POINT NUMBER	SAMPLING TIME, min / CLOCK TIME (24 hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O		STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE		PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
				DESIRED	ACTUAL		INLET $(T_{m\,in})$, °F	OUTLET $(T_{m\,out})$, °F			
	0	931.261									50±10
Y-1	2	934.1	.36	1.6		72	104	92	2	235	50
2	4	936.7	.36	1.6		73	110	92	3	235	52
3	6	938.0	.32	1.4		73	112	94	3	235	52
4	8	938.8	.38	1.7		74	112	94	3	235	54
5	10	940.4	.40	1.8		73	114	94	3	235	54
6	12	942.0	.31	1.4		72	114	94	3	235	54
7	14	943.4	.37	1.6		72	114	94	3	235	54
8	16	945.0	.32	1.4		71	114	94	3	235	54
9	18	947.2	.30	1.3		72	114	94	3	235	55
10	20	948.2	.29	1.3		71	114	94	3	235	55
11	22	948.9	.29	1.3		71	114	95	3	235	56
12	24	949.6	.29	1.3		71	114	95	3	240	55
13	26	950.7	.29	1.3		71	114	96	3	240	56
14	28	952.0	.26	1.15		72	114	95	3	240	55
15	30	953.4	.26	1.15		72	114	95	3	240	56
16	32	954.7	.25	1.1		71	114	95	3	240	55
17	34	956.1	.25	1.1		72	113	95	3	240	56
18	36	957.4	.29	1.3		71	113	95	3	240	56
19	38	959.1	.38	1.6		71	114	95	3	240	57
20	40	960.6	.42	1.8		71	114	95	3	240	57
21	42	962.3	.48	2.1		72	114	95	3.5	240	58
22	44	964.1	.49	2.2		72	116	96	3.5	240	59
23	46	966.2	.60	2.65		72	116	96	4	245	59
24	48	967.490	.60	2.65		72	116	96	4	240	59
	11:08										

$\sqrt{\Delta p}$ = .57[illegible] ΔH = 1.5204 T_s 70.896 T_m = 100.21

A-71

FIELD DATA

PLANT Exxon-EPA
DATE 9-27-79
SAMPLING LOCATION SCRUBBER INlet
SAMPLE TYPE particulate
RUN NUMBER 3
OPERATOR NG, VM
AMBIENT TEMPERATURE 71
BAROMETRIC PRESSURE 29.75
STATIC PRESSURE, (P_s) -1.7
FILTER NUMBER (s) 25403

PROBE LENGTH AND TYPE 5' Boros
NOZZLE I.D. .25
ASSUMED MOISTURE, %
SAMPLE BOX NUMBER
METER BOX NUMBER 2253
METER $\Delta H_@$ 1.84
C FACTOR 1.1
PITOT TUBE FACTOR 4
REFERENCE Δp .42
NOTE LCI is .016 cfm
LCF is .018 "

READ AND RECORD ALL DATA EVERY 2 MINUTES

TRAVERSE POINT NUMBER	SAMPLING TIME, min / CLOCK TIME (24-hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O		STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE		PUMP VACUUM, in. Hg	SA[illegible] TEM[illegible]	[illegible]
				DESIRED	ACTUAL		INLET ($T_{m\,in}$), °F	OUTLET ($T_{m\,out}$), °F			
	0 / 2400	963.685									
X-1	2	964.9	.13	.57		71	88	82	2		
2	4	965.9	.13	.57		71	90	82	2		
3	6	967.0	.22	.94		70	94	83	3		
4	8	968.1	.26	1.15		70	98	83	3		
5	10	969.3	.23	1.0		68	102	84	3		
6	12	970.4	.23	1.0		67	105	84	3		
7	14	971.7	.17	.79		67	105	84	2		
8	16	973.0	.20	.89		68	106	85	2		
9	18	974.0	.22	.94		68	106	85	2.5		
10	20	975.1	.19	.83		69	107	86	2.5		
11	22	976.1	.16	.70		69	106	86	2		
12	24	977.2	.16	.70		69	106	86	2.5		
13	26	978.4	.16	.70		68	106	86	2.5		
14	28	979.5	.20	.89		69	107	87	2.5		
15	30	980.9	.24	1.05		69	108	87	3		
16	32	982.2	.29	1.3		68	109	87	3		
17	34	983.7	.34	1.5		68	110	88	3		
18	36	985.2	.38	1.65		68	112	88	3		
19	38	986.9	.38	1.65		68	112	88	3		
20	40	987.9	.41	1.8		68	114	89	3	240	57
21	42	991.6	.42	1.85		68	115	89	3.5	240	59
22	44	993.3	.52	2.3		69	116	90	3.5	240	60
23	46	994.9	.55	2.4		70	117	90	4	240	60
24	48	996.837	.57	2.5		70	118	90	4	240	61

Ru 3
[illegible] Inlet
?

0.52383	[illegible]
1.3015	H
71.333	TS
99.271	TM
62.189	VMR
24.77	PBAR
4.	VWC
5.	WSG
28.97	MWD
4.27605	AS
96.	TT
-1.7	STAT
0.25	DN
0.9949	Y
0.853	CP
9.	TH2O
48.54474829	VMS
0.42403	VWS
.8659190913	%M
.9913408091	MD
28.87500868	MWS
24.645	PS
33.00750041	VACT
8468.503327	QACT
26.7835747	VSTD
6871.674275	QSTD
92.30833679	%I
0.0182	FHWT
0.	T WT
.0057856392	FHGR
.3407733919	FHLB
0.	T GR
0.	T LB

Run 3 Exxon - EPA

FAN AF 2.2

Scrub Inlet

TRAVERSE POINT NUMBER	SAMPLING TIME, min / CLOCK TIME (24 hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in H_2O DESIRED	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in H_2O ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m\ in}$), °F	DRY GAS METER TEMPERATURE OUTLET ($T_{m\ out}$), °F	PUMP VACUUM, in Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F 50 ± 10
	0	993.848									
Y-1	2	994.9	.10	.44		74	100	90	2	240	50
2	4	995.7	.10	.44		74	102	90	2	240	51
3	6	+1 996.7	.12	.52		75	104	90	2	240	55
4	8	+2 997.8	.10	.44		75	106	90	2	245	55
5	10	+2 998.6	.10	.44		74	106	90	2	250	55
6	12	+2 999.2	.13	.56		73	107	90	2	275	55
7	14	1000.2	.16	.69		74	107	90	2	275	56
8	16	1001.4	.15	.65		74	108	90	2.5	275	58
9	18	+3 1002.4	.16	.69		73	110	90	2.5	275	60
10	20	1003.8	.16	.69		74	111	91	2	275	60
11	22	4.6	.15	.65		74	111	91	2	275	60
12	24	+3 5.4	.16	.69		75	111	91	2	275	60
13	26	6.7	.32	1.4		74	112	91	3	275	60
14	28	8.2	.39	1.7		74	114	92	3	275	59
15	30	+3 10.0	.38	1.65		74	114	92	3	275	60
16	32	11.6	.43	1.9		74	116	92	4	275	60
17	34	+3 13.2	.44	1.95		74	118	92	4	275	60
18	36	15.0	.47	2.1		74	119	93	4	275	61
19	38	+3 17.0	.53	2.3		74	120	94	4	275	61
20	40	18.8	.53	2.3		74	121	94	4	275	61
21	42	20.9	.54	2.35		74	122	94	4	275	61
22	44	22.6	.59	2.6		73	122	94	4	275	61
23	46	24.8	.62	2.7		73	122	94	4	275	61
24	48	923.874	.67	3.0		73	122	94	4	275	61
	0149	+12 1095.874									

cubic feet pulled numbers kept sticking

72.

$\sqrt{\Delta p}$ = .5238 ΔH = 1.3075 T_s = 71.553 T_m = 99.271

TRAVERSE POINT LOCATION FOR CIRCULAR DUCTS

PLANT EXXON URAN.
DATE 9-26-79
SAMPLING LOCATION SCRUBBER OUTLET
INSIDE OF FAR WALL TO
OUTSIDE OF PORT, (DISTANCE A) 45 1/2
INSIDE OF NEAR WALL TO
OUTSIDE OF PORT, (DISTANCE B) 4 1/2
STACK I.D., (DISTANCE A - DISTANCE B) 41"
NEAREST UPSTREAM DISTURBANCE <1
NEAREST DOWNSTREAM DISTURBANCE <1
CALCULATOR Celiano

SCHEMATIC OF SAMPLING LOCATION

TRAVERSE POINT NUMBER	FRACTION OF STACK I.D.	STACK I.D.	PRODUCT OF COLUMNS 2 AND 3 (TO NEAREST 1/8 INCH)	DISTANCE B	TRAVERSE POINT LOCATION FROM OUTSIDE OF PORT (SUM OF COLUMNS 4 & 5)
1	.011	41"	1/2	4 1/2	5
2	.032		1 1/2		6
3	.055		2 1/4		6 3/4
4	.079		3 1/4		7 3/4
5	.105		4 1/2		9
6	.132		5 3/8		9 3/4
7	.161		6 5/8		11 1/8
8	.194		8		12 1/2
9	.230		9 1/2		14
10	.272		11 1/8		15 5/8
11	.323		13 1/4		17 3/4
12	.398		16 3/8		20 7/8
13	.602		24 3/4		29 1/4
14	.677		27 3/4		32 1/2
15	.728		29 7/8		34 3/8
16	.770		31 1/2		36
17	.806		33 1/8		37 5/8
18	.839		34 3/8		38 7/8
19	.868		35 1/2		40
20	.895		36 3/4		41 1/4
21	.921		37 3/4		42 1/4
22	.945		38 3/4		43 1/4
23	.968		39 3/4		44 1/4
24	.989		40 1/2		45

PRELIMINARY VELOCITY TRAVERSE

PLANT Exxon Uran.
DATE 9-26-79
LOCATION Scrub. outlet
STACK I.D. 41"
BAROMETRIC PRESSURE, in. Hg 24.85 - .12 = 24.73
STACK GAUGE PRESSURE, in. H_2O +.18
OPERATORS Ralston / Ceriliano
Pitot = 8A

SCHEMATIC OF TRAVERSE POINT LAYOUT

STATIC +.18

TRAVERSE POINT NUMBER	VELOCITY HEAD (Δp_s), in. H_2O	STACK TEMPERATURE (T_s), °F	γ	
X- 1	.080	82	60	c
2	.150	81	58	c
3	.170	80	58	c
4	.150	80	58	c
5	.150	79	56	c
6	.125	79	56	c
7	.120	78	57	c
8	.195	78	59	c
9	.230	78	62	c
10	.260	78	62	c
11	.250	77	64	c
12	.185	77	64	c
13	.170	78	65	cc
14	.260	77	64	cc
15	.360		64	cc
16	.260		63	cc
17	.240	77	63	cc
18	.250		62	cc
19	.270		63	cc
20	.275	76	64	cc
21	.275		64	cc
22	.250		66	cc
23	.230	77	66	cc
24	.200		68	cc
AVERAGE				

TRAVERSE POINT NUMBER	VELOCITY HEAD (Δp_s), in. H_2O	STACK TEMPERATURE (T_s), °F		γ
y-1	.100			53 c
2	.100	78		[illegible]
3	.110			5_ c
4	.160			42 c
5	.140			[illegible]
6	.160			55 c
7	.140			4_ c
8	.130			53 c
9	.170			5_ c
10	.150			58 c
11	.170			5_ c
12	.150			60 c
13	.340		cc	5_
14	.470		cc	60
15	.475		cc	60
16	.430		cc	60
17	.400		cc	58
18	.340		cc	[illegible]
19	.310		cc	52
20	.300		cc	[illegible]
21	.280		cc	48
22	.250		cc	52
23	.230		cc	48
24	.210		cc	[illegible]
AVERAGE	0.225	78.3		

NOMOGRAPH DATA

PLANT Exxon Ukran

DATE 9-27-79

SAMPLING LOCATION ScruBBer outlet

CONTROL BOX NO. NUT 5

CALIBRATED PRESSURE DIFFERENTIAL ACROSS ORIFICE, in. H_2O	$\Delta H_@$	1.80
AVERAGE METER TEMPERATURE (AMBIENT + 20 °F), °F	$T_{m_{avg.}}$	80
PERCENT MOISTURE IN GAS STREAM BY VOLUME	B_{wo}	3.8
BAROMETRIC PRESSURE AT METER, in. Hg	P_m	29.73
STATIC PRESSURE IN STACK, in. Hg ($P_m \pm 0.073$ x STACK GAUGE PRESSURE in in. H_2O)	P_s	29.74
RATIO OF STATIC PRESSURE TO METER PRESSURE	P_s/P_m	1.0
AVERAGE STACK TEMPERATURE, °F	$T_{s_{avg.}}$	78
AVERAGE VELOCITY HEAD, in. H_2O	$\Delta p_{avg.}$	.225
MAXIMUM VELOCITY HEAD, in. H_2O	$\Delta p_{max.}$	.475
C FACTOR	1.1	
CALCULATED NOZZLE DIAMETER, in.	.250	
ACTUAL NOZZLE DIAMETER, in.	.250	
REFERENCE Δp, in. H_2O	0.43	

FIELD DATA

PLANT Exxon Uran.
DATE 9-27-79
SAMPLING LOCATION S. Outlet
SAMPLE TYPE Part
RUN NUMBER 1
OPERATOR Celiane
AMBIENT TEMPERATURE 72
BAROMETRIC PRESSURE 24.79
STATIC PRESSURE, (P_s) +.185
FILTER NUMBER (s) 25940

PROBE LENGTH AND TYPE 6' Boro
NOZZLE I.D. .250
ASSUMED MOISTURE, % 4
SAMPLE BOX NUMBER 1
METER BOX NUMBER NUTS
METER $\Delta H_@$ 1.80
C FACTOR 1.1
PITOT TUBE FACTOR 8A
REFERENCE Δp .43
NOTE
L.C.
L.C.

READ AND RECORD ALL DATA EVERY 2 MINUTES

TRAVERSE POINT NUMBER	SAMPLING TIME, min / CLOCK TIME (24-hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O DESIRED	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m\ in}$), °F	DRY GAS METER TEMPERATURE OUTLET ($T_{m\ out}$), °F	PUMP VACUUM, in. Hg
	1800	67.635							
X-1		68.600	.20	.83	.83	79	87		1.5
2		69.800	.17	.70	.70	78	88		1.5
3		70.800	.185	.76	.76	75	89		1.5
4		71.900	.19	.79	.79	75	90		1.5
5		73.000	.185	.76	.76	77	91		1.5
6		74.100	.195	.82	.82	79	92		1.5
7		75.300	.21	.88	.88	76	92		2.5
8		76.600	.21	.88	.88	76	94		2.5
9		77.700	.24	1.0	1.0	76	95		3.0
10		78.900	.25	1.05	1.05	77	96		3.0
11		80.100	.25	1.05	1.05	76	96		3.0
12		81.200	.130	.53	.53	76	98		3.0
13		82.100	.185	.76	.76	78	98		1.5
14		83.600	.380	1.60	1.60	78	98		5
15		85.200	.380	1.60	1.60	78	100		5
16		86.600	.350	1.50	1.50	78	102		4.5
17		88.200	.320	1.38	1.38	80	103		4
18		89.700	.300	1.25	1.25	79	104		3.5
19		91.000	.320	1.38	1.38	79	104		4
20		92.300	.270	1.13	1.13	77	105		3.5
21		93.600	.250	1.05	1.05	78	106		2.5

Run 1
Scrubber Out

0.50405	ΔP
1.0871	ΔH
73.792	TS
101.04	TM
61.077	VMA
24.74	PBAR
2.	VWC
13.	WSG
28.97	MWD
9.168432727	AS
96.	TT
0.185	STAT
0.25	DN
0.98615	Y
0.855	CP
15.	TH2O
47.02170312	VMS
0.70709	VWS
1.481474711	%M
.9851852529	MD
28.80748222	MWS
24.75360294	PS
31.87639646	VACT
17535.39579	QACT
25.69948186	VSTD
14137.43824	QSTD
93.18396807	%I
0.0073	FHWT
0.	T WT
.0023957788	FHGR
.2903148177	FHLB
0.	T GR
0.	T LB

Benz #1 4/27/79 Scrubber OUTLET

TRAVERSE POINT NUMBER	SAMPLING TIME, min / CLOCK TIME (24 hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in H_2O DESIRED	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in H_2O ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m\,in}$), °F	DRY GAS METER TEMPERATURE OUTLET ($T_{m\,out}$), °F	PUMP VACUUM, in Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
22		94,900	.230	.96	.96	77	105		1.5	250±25	60±10
23		96,100	.230	.96	.96	77	105		1.5		
24	1846	96,879	.230	.96	.96	75	105		1.5		
y-1		97,500	.080	.33	.33	73	103		1		
2		99,000	.210	.88	.88	71	103		1.5		
3		99,900	.190	.78	.78	70	104		1.5		
4		101,100	.190	.78	.78	69	104		1.5		
5	1902	102,200	.180	.74	.74	72	104		1.5		
6		103,300	.200	.84	.84	72	103		1.5		
7		104,500	.210	.88	.88	68	103		1.5		
8		105,800	.240	1.00	1.00	70	103		3.5		
9		107,100	.260	1.09	1.09	70	103		3.5		
10		108,600	.275	1.14	1.14	69	104		3.5		
11		109,850	.310	1.30	1.30	70	104		4		
12		111,200	.310	1.30	1.30	70	104		4		
13		112,750	.300	1.25	1.25	71	104		4		
14		114,000	.370	1.55	1.55	69	104		5		
15		115,600	.450	1.85	1.85	71	104		5		
16		117,500	.470	1.98	1.98	70	106		5.5		
17		119,000	.400	1.70	1.70	70	106		5.0		
18		120,950	.370	1.54	1.54	70	106		4.5		
19		122,200	.300	1.25	1.25	70	106		3.5		
20		123,400	.300	1.25	1.25	70	106		3.5		
21		124,700	.270	1.12	1.12	71	106		3.5		
22		126,050	.260	1.09	1.09	70	106		3.0		
23		127,450	.240	.98	.98	71	106		3.0		
24	1940	128,712	.240	.98	.98	71	105		3.0		

$\overline{\sqrt{\Delta p}} = .50405$ ✓✓ $\overline{\Delta H} = 1.0871$ ✓✓ $\overline{T_s} = 73.792$ ✓✓ $\overline{T_m} = 101.04$ ✓✓

FIELD DATA

PLANT Exxon Cran
DATE 9-27-79
SAMPLING LOCATION Scrubb out
SAMPLE TYPE Part
RUN NUMBER 2
OPERATOR Celiano
AMBIENT TEMPERATURE 66°
BAROMETRIC PRESSURE 24.74
STATIC PRESSURE, (P_s) .19
FILTER NUMBER (s) 25448

PROBE LENGTH AND TYPE 6' Bo
NOZZLE I.D. .250
ASSUMED MOISTURE, % 4
SAMPLE BOX NUMBER 1
METER BOX NUMBER NUTS
METER $\Delta H_@$ 1.80
C FACTOR 1.1
PITOT TUBE FACTOR .84
REFERENCE Δp .43
NOTE
L.C.I
L.C.F

READ AND RECORD ALL DATA EVERY 2 MINUTES

TRAVERSE POINT NUMBER	SAMPLING TIME, min / CLOCK TIME (24-hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O DESIRED	ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET $(T_{m\ in})$, °F	OUTLET $(T_{m\ out})$, °F	PUMP VACUUM, in. Hg
	2119	329.601							
X-1		30.500	.175	.72	.72	67	84		1.5
2		31.650	.185	.77	.77	68	85		1.5
3		32.800	.185	.77	.77	67	87		1.5
4		33.980	.180	.75	.75	68	88		1.5
5		35.000	.170	.70	.70	68	88		1.5
6		36.150	.200	.84	.84	67	90		1.5
7		37.300	.220	.91	.91	68	91		2.0
8		38.500	.240	.98	.98	69	92		3.0
9		39.850	.290	1.20	1.20	70	93		3.5
10		41.250	.300	1.25	1.25	71	94		3.5
11		42.600	.260	1.10	1.10	71	95		3.0
12		43.750	.180	.75	.75	72	96		1.5
13		44.900	.225	.93	.93	72	96		2.0
14		46.700	.390	1.60	1.60	72	97		4.0
15		48.100	.450	1.90	1.90	73	100		4.5
16		49.500	.420	1.75	1.75	73	102		4.5
17		51.200	.390	1.60	1.60	72	102		4.0
18		52.800	.350	1.50	1.50	74	104		3.5
19		54.450	.320	1.35	1.35	73	104		3.5
20		55.600	.300	1.25	1.25	73	104		3.5
21		56.800	.280	1.18	1.18	74	104		3.0

Run 2
Crusher Scrub
Out.

0.49719	P
1.0404	H
71.625	TS
102.35	TM
61.091	VMA
24.74	PBAR
0.	VWC
14.	WSG
28.97	MWD
9.1684	AS
96.	TT
0.19	STAT
0.25	DN
0.98615	Y
0.855	CP
14.	TH2O
46.91642698	VMS
0.6601	VWS
1.387448899	%M
0.986125511	MD
28.81779686	MWS
24.75397059	PS
31.37282967	VACT
17258.31909	QACT
25.42121164	VSTD
13984.31021	QSTD
93.9930833	%I
0.0148	FHWT
0.	T WT
.0048680945	FHGR
.5835147141	FHLB
0.	T GR
0.	T LB

Run #2 [illegible]
9-27-[illegible] [illegible]
Exxon Yran.

TRAVERSE POINT NUMBER	SAMPLING TIME, min / CLOCK TIME (24 hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in H_2O DESIRED	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in H_2O ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m\,in}$), °F	DRY GAS METER TEMPERATURE OUTLET ($T_{m\,out}$), °F	PUMP VACUUM, in Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
22		58.250	.280	1.18	1.18	74	104		3.0	240	60
23		59.600	.270	1.12	1.12	73	104		3.0		
24	2207	61.150	.270	1.12	1.12	73	105		3.0	230	62
Y-1	2211	62.250	.135	.55	.55	73	102		2.0		
2		63.150	.155	.64	.64	73	104		2.0	255	62
3		64.200	.160	.65	.65	75	104		2.0		
4		65.200	.160	.65	.65	76	104		2.0		61
5		66.300	.170	.69	.69	76	105		2.0	260	
6		67.400	.180	.73	.73	76	106		2.0		
7		68.400	.200	.84	.84	74	106		2.5		64
8		69.700	.210	.86	.86	74	106		2.5	265	
9		71.150	.230	.95	.95	72	107		3.0		66
10		72.400	.250	1.00	1.00	72	108		3.0		
11		73.500	.260	1.08	1.08	71	108		3.0	260	66
12		74.550	.210	.86	.86	71	109		2.5		
13		75.850	.180	.73	.73	70	109		2.5	270	68
14		77.150	.300	1.22	1.22	69	110		4.0		
15		78.500	.320	1.31	1.31	70	110		4.0		70
16		80.000	.300	1.22	1.22	72	111		4.0	260	
17		81.400	.310	1.26	1.26	73	111		4.0		71
18		82.350	.300	1.22	1.22	73	112		4.0	240	
19		84.200	.290	1.18	1.18	73	112		4.0		66
20		85.900	.270	1.12	1.12	72	112		3.5	240	
21		87.000	.250	1.00	1.00	71	112		3.0		68
22		88.150	.250	1.00	1.00	70	112		3.0		
23		89.500	.240	.98	.98	70	112		2.5	235	64
24	2259	90.692	.240	.98	.98	70	112		2.5		

$\overline{\sqrt{\Delta p}}$ = .49719 $\overline{\Delta H}$ = 1.0404 $\overline{T_s}$ = 71.625 $\overline{T_m}$ = 102.35

FIELD DATA

PLANT Exxon Urani.
DATE 9-27-79
SAMPLING LOCATION Scrub. outlet
SAMPLE TYPE Part
RUN NUMBER 3
OPERATOR Celiano
AMBIENT TEMPERATURE 64°
BAROMETRIC PRESSURE 24.74
STATIC PRESSURE, (P_s) 7.190
FILTER NUMBER (s) 25400

PROBE LENGTH AND TYPE 6' Bor
NOZZLE I.D. .250
ASSUMED MOISTURE, % 4
SAMPLE BOX NUMBER 1
METER BOX NUMBER NOT 5
METER $\Delta H_@$ 1.80
C FACTOR 1.1
PITOT TUBE FACTOR .814
REFERENCE Δp .43
NOTE
L.C.
L.C

READ AND RECORD ALL DATA EVERY 2 MINUTES

TRAVERSE POINT NUMBER	SAMPLING TIME, min	CLOCK TIME (24-hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O DESIRED	ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m\,in}$), °F	OUTLET ($T_{m\,out}$), °F	PUMP VACUUM, in. Hg	SA TEM	
	0	0065	391.065									
y-1	2		92.150	.150	.62	.62	60	85		2.0		
2	4		93.150	.160	.65	.65	60	85		2.0		
3	6		94.200	.150	.62	.62	60	85		2.0		
4	8		95.200	.140	.57	.57	61	86		2.0		
5			96.100	.150	.62	.62	61	86		2.0		
6			97.100	.150	.62	.62	62	86		2.0		
7			98.100	.160	.65	.65	62	86		2.0		
8			99.150	.180	.73	.73	61	87		2.5		
9			100.200	.190	.80	.80	62	88		2.5		
10			101.500	.200	.83	.83	61	89		2.5		
11			102.600	.220	.90	.90	62	90		2.5		
12		D030	103.950	.250	1.02	1.02	63	91		3.0		
13			105.000	.180	.73	.73	63	91		2.5		
14			106.400	.280	1.16	1.16	65	92		3.0		
15			108.000	.300	1.23	1.23	64	92		3.5		
16			109.200	.280	1.16	1.16	64	93		3.5		
17			110.450	.260	1.09	1.09	66	94		3.0		
18			111.600	.240	.99	.99	68	95		3.0		
19			112.900	.230	.94	.94	66	96		3.0		
20			114.000	.210	.87	.87	67	96		2.5		
21			115.150	.210	.87	.87	67	96		2.5	245	59
22			116.300	.200	.83	.83	68	97		2.5		

0.488	F.P
1.0071	.H
71.312	TS
98.104	TM
60.184	VMA
24.74	PBAR
0.	VWC
10.5	WSG
28.97	MWD
9.1684	AS
96.	TT
0.19	STAT
0.25	DN
0.98615	Y
0.855	CP
10.5	TH2O
46.5669139	VMS
0.495075	VWS
1.051963616	%M
.9894803638	MD
28.85459959	MWS
24.75397059	PS
30.76423392	VACT
16923.52814	QACT
25.02761217	VSTD
13767.78956	QSTD
94.76004387	%I
0.0114	FHWT
0.	T WT
.0037778926	FHGR
.4458262038	FHLB
0.	T GR
0.	T LB

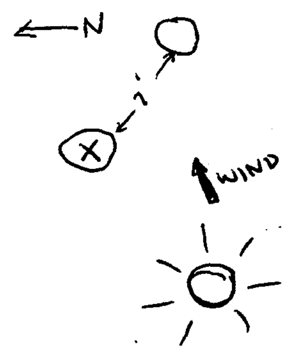
Run #3 Scrubber outlet 1 9/27/79 Exxon Uran.

TRAVERSE POINT NUMBER	SAMPLING TIME, min / CLOCK TIME (24 hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in H_2O DESIRED	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in H_2O ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m\,in}$), °F	DRY GAS METER TEMPERATURE OUTLET ($T_{m\,out}$), °F	PUMP VACUUM, in Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
23		117.600	.200	.83	.83	69	98		2.5	250	60
24	0052	118.722	.200	.83	.83	70	98		2.5		
X-1	0057	119.900	.220	.91	.91	73	96		2.5	260	62
2		120.950	.200	.83	.83	74	99		2.5		
3		121.950	.210	.87	.87	73	100		3.0	262	61
4		123.400	.190	.79	.79	74	100		3.0		
5		124.450	.190	.79	.79	75	101		3.0	265	60
6		125.650	.220	.91	.91	74	101		3.0		
7		127.000	.250	1.01	1.01	76	102		3.0	260	60
8		128.300	.260	1.10	1.10	77	102		3.0		
9		129.750	.300	1.25	1.25	75	104		3.5		
10		131.000	.315	1.33	1.33	76	104		3.5	245	60
11		132.550	.320	1.36	1.36	78	105		3.5		
12		133.900	.210	.87	.87	78	106		3.0		
13		135.600	.380	1.59	1.59	80	106		4.0	245	60
14		136.800	.450	1.86	1.86	81	108		5.0		
15		136.400	.430	1.80	1.80	79	108		5.0	225	58
16		140.200	.430	1.80	1.80	79	109		5.0		
17		141.800	.370	1.53	1.53	81	110		4.5	225	56
18		143.300	.330	1.40	1.40	82	110		4.5		
19		144.750	.300	1.25	1.25	84	110		4.5		
20		146.200	.260	1.10	1.10	86	110		4.0	235	59
21		147.600	.260	1.10	1.10	86	109		4.0		
22		148.850	.240	.99	.99	85	109		3.5	240	
23		150.000	.230	.87	.87	83	109		3.5		60
24	0145	151.249	.230	.87	.87	82	109		3.0	245	62

$\overline{\sqrt{\Delta p}}$ = .418800 ✓✓ $\overline{\Delta H}$ = 1.0071 ✓✓ $\overline{T_s}$ = 71.312 ✓✓ $\overline{T_m}$ = 98.104 ✓✓

SUMMARY
RECORD OF VISIBLE EMISSIONS

Type of Plant: Uranium Mine
Date: 9-27-79
Company Name: Exxon - Highland Opr.
Hours of Observation: 1804-1913 (70 min.)
Plant Address: Glenrock, Wyo.
Observer: B.L. Jackson
Type of Discharge: STACK OTHER ______
Discharge Location: Crusher - Scrubber Outlet
Height of Point of Discharge: ~120' above grd. level



Observer's Location:

Distance to Discharge Point: 7'

Height of Observation Point: 5' below lip

Direction from Discharge Point: NW

Background Description: Scattered

Weather: Clear Overcast Partly Cloudy Other ______ Sky Color: dk. blue

Wind Direction: SW Wind Velocity: 5-15 mi/hr

Plume Description:

Detached: Yes No

Color: Black White Other N.A.

Plume Dispersion Behavior: Looping Coning Fanning Lofting Fumigating Other N.A.

Estimated Distance Plume Visible: 0'

Note: ① Simultaneous readings with run 1 particulate tests.

RECORD OF VISIBLE EMISSIONS

Company Name Exxon Mineral — Date 9-27-79

Plant Address Casper Wyoming — Observer B. L. Jackson

Stack Location Crusher Area - Scrubber Outlet stack — Observer's Location 7' NW of stack 5' below lip

Weather Conditions sl. sunny, dk. blue bkg. (See

HR	MIN	00	15	30	45	COMMENTS
	00					
	01					
	02					
	03					
18	04	0	0	0	0	No visible plume observed.
	05	0	0	0	0	
	06	0	0	0	0	
	07	0	0	0	0	
	08	0	0	0	0	
	09	0	0	0	0	1804 - 1913
	10	0	0	0	0	
	11	0	0	0	0	
	12	0	0	0	0	
	13	0	0	0	0	
	14	0	0	0	0	
	15	0	0	0	0	
	16	0	0	0	0	
	17	0	0	0	0	
	18	0	0	0	0	
	19	0	0	0	0	
	20	0	0	0	0	
	21	0	0	0	0	
	22	0	0	0	0	
	23	0	0	0	0	
	24	0	0	0	0	
	25	0	0	0	0	
	26	0	0	0	0	
	27	0	0	0	0	
	28	0	0	0	0	
	29	0	0	0	0	

RECORD OF VISIBLE EMISSIONS

Company Name Exxon Mineral Date 9-27-79

Plant Address Casper Wyoming Observer B. L. Jackson

Stack Location Crusher Area - Scrubber Outlet Observer's Location See Summary Record

Weather Conditions See Summary Record

TIME						COMMENTS
HR	MIN	SECONDS				
		00	15	30	45	
18	30	0	0	0	0	No visible plume observed.
	31	0	0	0	0	
	32	0	0	0	0	
	33	0	0	0	0	
	34	0	0	0	0	
	35	0	0	0	0	
	36	0	0	0	0	
	37	0	0	0	0	
	38	0	0	0	0	
	39	0	0	0	0	
	40	0	0	0	0	
	41	0	0	0	0	
	42	0	0	0	0	
	43	0	0	0	0	
	44	0	0	0	0	
	45	0	0	0	0	
	46	0	0	0	0	
	47	0	0	0	0	
	48	0	0	0	0	
	49	0	0	0	0	
	50	0	0	0	0	
	51	0	0	0	0	
	52	0	0	0	0	
	53	0	0	0	0	
	54	0	0	0	0	
	55	0	0	0	0	
	56	0	0	0	0	
	57	0	0	0	0	
	58	0	0	0	0	
	59	0	0	0	0	

RECORD OF VISIBLE EMISSIONS

Company Name Exxon - Highland
Date 9-27-79
Plant Address Glenrock, Wyo.
Observer B. L. Jackson
Stack Location Crusher Area Scrubber Outlet
Observer's Location See Summary Record
Weather Conditions See Summary Record

HR	MIN	SECONDS 00	15	30	45	COMMENTS
19	00	0	0	0	0	
	01	0	0	0	0	
	02	0	0	0	0	
	03	0	0	0	0	
	04	0	0	0	0	
	05	0	0	0	0	
	06	0	0	0	0	
	07	0	0	0	0	
	08	0	0	0	0	
	09	0	0	0	0	
	10	0	0	0	0	
	11	0	0	0	0	
	12	0	0	0	0	
19	13	0	0	0	0	End Observations - Too dark!
	14					
	15					
	16					
	17					
	18					
	19					
	20					
	21					
	22					
	23					
	24					
	25					
	26					
	27					
	28					
	29					

TRAVERSE POINT LOCATION FOR CIRCULAR DUCTS

PLANT Exxon Uran

DATE 9-28-79

SAMPLING LOCATION Dust Collector Fineore Bins ~~Hopper Inlet~~ Exhaust duct

INSIDE OF FAR WALL TO OUTSIDE OF PORT, (DISTANCE A) 11 1/2"

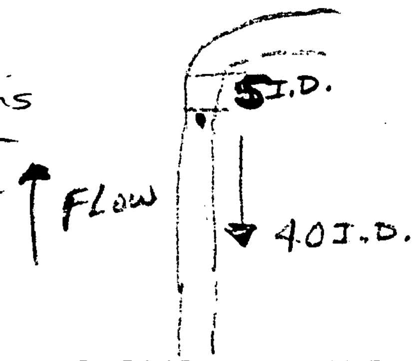
INSIDE OF NEAR WALL TO OUTSIDE OF PORT, (DISTANCE B) 5 1/2

STACK I.D., (DISTANCE A - DISTANCE B) 6"

NEAREST UPSTREAM DISTURBANCE 40 I.D.

NEAREST DOWNSTREAM DISTURBANCE 2 I.D.

CALCULATOR Coleman



SCHEMATIC OF SAMPLING LOCATION

TRAVERSE POINT NUMBER	FRACTION OF STACK I.D.	STACK I.D.	PRODUCT OF COLUMNS 2 AND 3 (TO NEAREST 1/8 INCH)	DISTANCE B	TRAVERSE POINT LOCATION FROM OUTSIDE OF PORT (SUM OF COLUMNS 4 & 5)
1	.500	6"	3"	5 1/2	8 1/2
			$A_J = .19634$		

PRELIMINARY VELOCITY TRAVERSE

PLANT Exxon Uran
DATE 9-28-79
LOCATION Dust coll Inlet
STACK I.D. 6"
BAROMETRIC PRESSURE, in. Hg
STACK GAUGE PRESSURE, in. H_2O
OPERATORS

Static = 5.4" H_2O 1 Point

SCHEMATIC OF TRAVERSE POINT LAYOUT

TRAVERSE POINT NUMBER	VELOCITY HEAD (Δp_s), in. H_2O	STACK TEMPERATURE (T_s), °F
1	.33	49
2	.27	49
3	.29	49
AVERAGE	.300	49

TRAVERSE POINT NUMBER	VELOCITY HEAD (Δp_s), in. H_2O	STACK TEMPERATURE (T_s), °F
AVERAGE		

FIELD DATA

PLANT Exxon Urban.
DATE 9-28-79
SAMPLING LOCATION Hopper Duster Inlet
SAMPLE TYPE Particulate
RUN NUMBER 1
OPERATOR Bob Newton
AMBIENT TEMPERATURE 74°F
BAROMETRIC PRESSURE 24.76
STATIC PRESSURE, (P_s) -4.7
FILTER NUMBER (s) 25404

PROBE LENGTH AND TYPE 3' Boros.
NOZZLE I.D. .250 No. 1
ASSUMED MOISTURE, % 3
SAMPLE BOX NUMBER 1
METER BOX NUMBER NUT #5
METER $\Delta H_@$ 1.82
C FACTOR 1.10
PITOT TUBE FACTOR .84
REFERENCE Δp .40
NOTE
L.C.I =
L.C.F =

READ AND RECORD ALL DATA EVERY 4 MINUTES

TRAVERSE POINT NUMBER	SAMPLING TIME, min / CLOCK TIME (24-hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O DESIRED	ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m\,in}$), °F	OUTLET ($T_{m\,out}$), °F	PUMP VACUUM, in. Hg	S… TE…
	18:45	453.554								
X-1	4	456.4	.36	1.6	1.6	73	98		2.5	
2	8	459.7	.36	1.6	1.6	71	100		3.0	
3	12	462.9	.36	1.6	1.6	70	101		3.0	
4	16	466.0	.36	1.6	1.6	72	103		3.0	
5	20	469.2	.36	1.6	1.6	71	103		3.0	
6	24	472.3	.36	1.6	1.6	68	104		3.0	
7	28	474.8	.36	1.6	1.6	68	104		3.0	
8	32	478.1	.26	1.2	1.2	70	104		3.0	
9	36	481.0	.34	1.55	1.55	70	104		3.0	
10	40	484.0	.36	1.6	1.6	66	104		3.0	
11	44	487.1	.36	1.6	1.6	68	102		3.0	
12	48	490.0	.29	1.3	1.3	68	100		3.0	
13	52	493.0	.36	1.6	1.6	67	98		3.0	
14	56	495.6	.29	1.3	1.3	69	96		3.0	
15	60	498.7	.36	1.6	1.6	71	96		3.0	
16	64/[illegible]	501.624	.36	1.6	1.6	72	94		3.0	
		48.07								

$\overline{\sqrt{\Delta p}}$ = .58563 $\overline{\Delta H}$ = 1.53 $\overline{T_s}$ = 69.625 $\overline{T_m}$ = 100.69

0.58563	ΓΔP
1.5344	ΔH
69.625	TS
100.69	TM
48.07	VMA
24.76	PBAR
2.	VWC
11.5	WSG
28.97	MWD
.1963495408	AS
64.	TT
-4.7	STAT
0.25	DN
0.98615	Y
0.855	CP
13.5	TH2O
37.1099411	VMS
0.636365	VWS
1.685900068	%M
.9831409993	MD
28.78505676	MWS
24.41441176	PS
37.16056503	VACT
437.7875929	QACT
29.71986211	VSTD
350.1288768	QSTD
95.38980179	%I
0.0077	FHWT
0.	TLWT
.0032020099	FHGR
.0096095349	FHLB
0.	TGR
0.	TLB

FIELD DATA

PLANT EXXON MINERAL
DATE 9/28/79
SAMPLING LOCATION HOPPER DUSTER INLET
SAMPLE TYPE PARTICULATE
RUN NUMBER 2
OPERATOR BOB NEWTON
AMBIENT TEMPERATURE 70°F
BAROMETRIC PRESSURE 24.77
STATIC PRESSURE, (P_s) -4.2
FILTER NUMBER (s) 25411

PROBE LENGTH AND TYPE 3' Bo
NOZZLE I.D. .250
ASSUMED MOISTURE, % 3
SAMPLE BOX NUMBER 1
METER BOX NUMBER NUT #5
METER $\Delta H_@$ 1.82
C FACTOR 1.1
PITOT TUBE FACTOR .84
REFERENCE Δp .46
NOTE

READ AND RECORD ALL DATA EVERY 4 MINUTES

TRAVERSE POINT NUMBER	SAMPLING TIME, min	CLOCK TIME (24-hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O DESIRED	ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m\,in}$), °F	OUTLET ($T_{m\,out}$), °F	PUMP VACUUM, in. Hg
	0	21:20	502.791							
1	4		506.4	.34	1.55	1.55	71	82		2.0
2	8		509.4	.36	1.6	1.6	69	84		2.0
3	12		512.5	.34	1.55	1.55	66	86		2.0
4	16		515.5	.34	1.55	1.55	67	88		2.0
5	20		518.7	.36	1.6	1.6	67	90		2.0
6	24		521.8	.34	1.55	1.55	66	91		2.0
7	28		524.8	.34	1.55	1.55	68	92		2.0
8	32		528.0	.36	1.6	1.6	66	92		2.0
9	36		531.2	.36	1.6	1.6	65	92		2.0
10	40		534.2	.26	1.2	1.2	66	92		2.0
11	44		537.3	.34	1.55	1.55	65	93		2.0
12	48		540.4	.36	1.6	1.6	64	94		2.0
13	52		543.7	.36	1.6	1.6	63	94		2.0
14	56		546.8	.34	1.55	1.55	62	94		2.0
15	60		547.877	.34	1.55	1.55	63	92		2.0
16	64									
		22:22								
			AVERAGE	$\sqrt{\Delta p}$ = .58498	ΔH = 1.5467		T_s = 65.867			T_m =

0.58498	ΔP
1.5467	ΔH
65.867	TS
90.4	TM
45.086	VMA
24.77	PBAR
0.	VWC
8.3	WSG
28.97	MWD
0.1963495	AS
58.466	TT
-4.2	STAT
0.25	DN
0.98615	Y
0.855	CP
8.3	TH2O
35.4725648	VMS
0.391345	VWS
1.091194469	%M
.9890880553	MD
28.85029597	MWS
24.46117647	PS
36.91021732	VACT
434.8381629	QACT
29.96773142	VSTD
353.0489148	QSTD
98.98600259	%I
0.0061	FHWT
0.	T WT
.0026537467	FHGR
.0080305657	FHLB
0.	T GR
0.	T LB

NOTE: TEST STOPPED: HOPPER DOWN
(55 min 28 SEC.)

FIELD DATA

PLANT EXXON MINERAL
DATE 9/28/79 - 9/29/79
SAMPLING LOCATION HOPPER INLET
SAMPLE TYPE PARTICULATE
RUN NUMBER 3
OPERATOR BOB NEWTON
AMBIENT TEMPERATURE 55°
BAROMETRIC PRESSURE [illegible]
STATIC PRESSURE, (P_s) -5.4
FILTER NUMBER (s) 25414

PROBE LENGTH AND TYPE 3' [illegible]
NOZZLE I.D. .250
ASSUMED MOISTURE, % 3
SAMPLE BOX NUMBER [illegible]
METER BOX NUMBER N-[illegible]
METER $\Delta H_@$ 1.82
C FACTOR 1.1
PITOT TUBE FACTOR .84
REFERENCE Δp .4
NOTE

L.C.$_I$: .015
L.C.$_F$: .020

READ AND RECORD ALL DATA EVERY 4 MINUTES

TRAVERSE POINT NUMBER	SAMPLING TIME, min	CLOCK TIME (24-hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O DESIRED	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m\,in}$), °F	DRY GAS METER TEMPERATURE OUTLET ($T_{m\,out}$), °F	PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
	0	23:25	548.341									
1	4		551.5	.32	1.45	1.45	66	84		2.0	225	50
2	8		554.4	.30	1.35	1.35	64	87		2.0	230	50
3	12		557.1	.27	1.25	1.25	63	86		2.0	230	50
4	16		560.2	.29	1.30	1.30	65	86		2.0	230	50
5	20		562.9	.29	1.30	1.30	65	86		2.0	230	50
6	24		565.8	.29	1.30	1.30	62	86		2.0	235	50
7	28		568.7	.29	1.30	1.30	62	84		2.0	235	50
8	32		571.6	.29	1.30	1.30	63	84		2.0	235	50
9	36		574.3	.30	1.35	1.35	65	83		2.0	230	50
10	40		577.3	.30	1.35	1.35	63	84		2.0	230	50
11	44		580.1	.29	1.30	1.30	64	84		2.0	230	50
12	48		582.9	.30	1.35	1.35	63	84		2.0	230	50
13	52		585.8	.30	1.35	1.35	62	84		2.0	230	50
14	56		589.0	.30	1.35	1.35	65	84		2.0	230	50
15	60		591.8	.30	1.35	1.35	64	85		2.0	230	50
16	64	00:31	594.714	.30	1.35	1.35	64	85		2.0	230	50
			46.373									

$\sqrt{\Delta p}$ .5364 ΔH 1.312 $\bar{T}_s$ 63.30 $\bar{T}_m$ 84.90

FUGITIVE EMISSION
INSPECTION

Company: Exxon Mineral	Inspector: Scott R. Stanley
Location: Douglas, Wyoming	Affiliation: Soil Scientist
Company Rep.: Roy F. Weston, Inc.	Date: 9/28/79
Sky Conditions: NA	Wind Direction: NA
Precipitation:	Wind Speed:
Facility Type: NA	Emission Source: Hopper Duster Inlet

Sketch emission source, indicate observer position relative to source; indicate potential emission points and/or actual emission points.

OBSERVATIONS

TRIAL #1

Illumination = 11 f.c.

	Time: START-END	Accumulated Observation Period (Min: Sec)	Accumulated Emission Time (Min: Sec)
Begin Observation: 6:50 PM	6:50 - 7:05	5:00	0:00
		5:00	0:00
		5:00	0:00
	7:10 - 7:25	5:00	0:00
		5:00	0:00
		5:00	0:00
	7:30 - 7:45	5:00	0:00
		5:00	0:00
		5:00	0:00
	7:50 - 8:05	5:00	0:00
		5:00	0:00
		5:00	0:00
End Observation: 8:10			
TOTALS:		60:00	0:00

FUGITIVE EMISSION
INSPECTION

Company: Exxon Mineral	Inspector: Scott R. Stanley
Location: Douglas, Wyoming	Affilitation: Soil Scientist
Company Rep.: Roy F. Weston, Inc.	Date: 9/28/79
Sky Conditions: NA	Wind Direction: NA
Precipitation:	Wind Speed:
Facility Type: NA	Emission Source: Hopper Duster Inlet

Sketch emission source, indicate observer position relative to source; indicate potential emission points and/or actual emission points.

OBSERVATIONS

TRIAL #2

	Time: START-END	Accumulated Observation Period (Min: Sec)	Accumulated Emission Time (Min: Sec)
Begin Observation: 9:23 PM	9:23 - 9:38	5:00	0:00
		5:00	0:00
		5:00	0:00
	9:43 - 9:58	5:00	0:00
		5:00	0:00
		5:00	0:00
10:02PM: Pump hose blew in recovery room			
End run #2.			
End Observation: 9:58			
TOTALS:		30:00	0:00

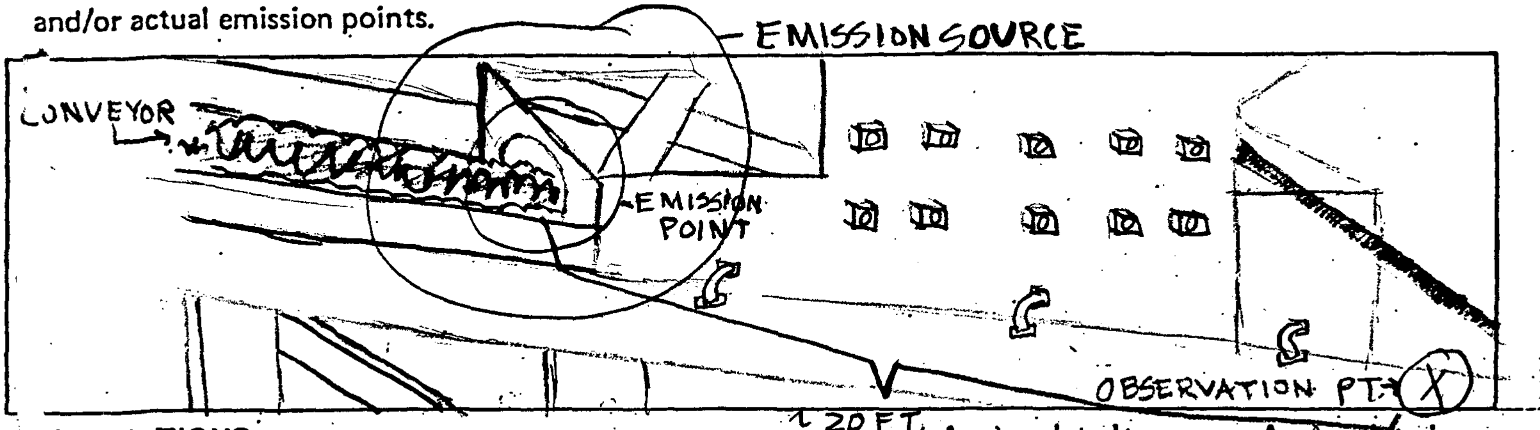
FUGITIVE EMISSION
INSPECTION

Company Exxon Mineral	Inspector Scott R. Stanley
Location Douglas, Wyoming	Affiliation Soil Scientist
Company Rep. Roy F. Weston, Inc.	Date 9/28/79

Sky Conditions NA	Wind Direction NA
Precipitation	Wind Speed

Facility Type NA	Emission Source Hopper Duster Inlet

Sketch emission source, indicate observer position relative to source; indicate potential emission points and/or actual emission points.



OBSERVATIONS

TRIAL #3

	Time START-END	Accumulated Observation Period (Min: Sec)	Accumulated Emission Time (Min: Sec)
Begin Observation 11:26PM	11:26 - 11:41	5:00	0:00
		5:00	0:00
		5:00	0:00
	11:46 - 12:01	5:00	0:00
		5:00	0:00
		5:00	0:00
	12:06 - 12:21	5:00	0:00
		5:00	0:00
		5:00	0:00
	12:26 - 12:31	5:00	0:00
End Observation 12:31 AM			
TOTALS		50:00	0:00

RECORD OF VISIBLE EMISSIONS

Company Name Exxon Mineral
Date 9-28-79
Plant Address Wyoming
Observer C. Dobroski
Stack Location Hopper
Observer's Location 50' from source, at eye level
Weather Conditions

HR	MIN	00	15	30	45	COMMENTS
	30					
	31					
	32					
	33					
	34					1848 - 2010 — 82 min
	35					2120 - 2200 — 40 min
	36					2325 - 0030 — 65 min
	37					187
	38					
	39					
	40					
	41					
	42					
	43					
	44					
	45					
	46					
	47					
18	48	0	0	0	0	Start Test #1
	49	0	0	0	0	
	50	0	0	0	0	
	51	0	0	0	0	
	52	0	0	0	0	
	53	0	0	0	0	
	54	0	0	0	0	
	55	0	0	0	0	
	56	0	0	0	0	
	57	0	0	0	0	
	58	0	0	0	0	
	59	0	0	0	0	

RECORD OF VISIBLE EMISSIONS

Company Name Exxon Mineral

Date 9-28-79

Plant Address , Wyoming

Observer C. Dobroski

Stack Location Hopper

Observer's Location 50' from source, about eye level

Weather Conditions

HR	MIN	SECONDS 00	15	30	45	COMMENTS
19	00	0	0	0	0	
	01	0	0	0	0	
	02	0	0	0	0	
	03	0	0	0	0	
	04	0	0	0	0	
	05	0	0	0	0	
	06	0	0	0	0	
	07	0	0	0	0	
	08	0	0	0	0	
	09	0	0	0	0	
	10	0	0	0	0	
	11	0	0	0	0	
	12	0	0	0	0	
	13	0	0	0	0	
	14	0	0	0	0	
	15	0	0	0	0	
	16	0	0	0	0	
	17	0	0	0	0	
	18	0	0	0	0	
	19	0	0	0	0	
	20	0	0	0	0	
	21	0	0	0	0	
	22	0	0	0	0	
	23	0	0	0	0	
	24	0	0	0	0	
	25	0	0	0	0	
	26	0	0	0	0	
	27	0	0	0	0	
	28	0	0	0	0	
	29	0	0	0	0	

RECORD OF VISIBLE EMISSIONS

Company Name Exxon Mineral Date 9-28-79

Plant Address Wyoming Observer C. Dobroski

Stack Location Hopper Observer's Location

Weather Conditions

TIME HR	MIN	SECONDS 00	15	30	45	COMMENTS
19	30	0	0	0	0	
	31	0	0	0	0	
	32	0	0	0	0	
	33	0	0	0	0	
	34	0	0	0	0	
	35	0	0	0	0	
	36	0	0	0	0	
	37	0	0	0	0	
	38	0	0	0	0	
	39	0	0	0	0	
	40	0	0	0	0	
	41	0	0	0	0	
	42	0	0	0	0	
	43	0	0	0	0	
	44	0	0	0	0	
	45	0	0	0	0	
	46	0	0	0	0	
	47	0	0	0	0	
	48	0	0	0	0	
	49	0	0	0	0	
	50	0	0	0	0	
	51	0	0	0	0	
	52	0	0	0	0	
	53	0	0	0	0	
	54	0	0	0	0	
	55	0	0	0	0	
	56	0	0	0	0	
	57	0	0	0	0	
	58	0	0	0	0	
	59	0	0	0	0	

RECORD OF VISIBLE EMISSIONS

Company Name Exxon mineral Date 9/28/79

Plant Address , Wyoming Observer C. Dobrocki

Stack Location Hopper Observer's Location

Weather Conditions

HR	MIN	00	15	30	45	COMMENTS
20	00	0	0	0	0	
	01	0	0	0	0	
	02	0	0	0	0	
	03	0	0	0	0	
	04	0	0	0	0	
	05	0	0	0	0	
	06	0	0	0	0	
	07	0	0	0	0	
	08	0	0	0	0	
	09	0	0	0	0	
20	10	0	0	0	0	Test #1 End
	11					
	12					
	13					
	14					
	15					
	16					
	17					
	18					
	19					
	20					
	21					
	22					
	23					
	24					
	25					
	26					
	27					
	28					
	29					

RECORD OF VISIBLE EMISSIONS

Company Name Exxon Mineral

Date 9-28-79

Plant Address , Wyoming

Observer C. Dobrosky

Stack Location Hopper

Observer's Location

Weather Conditions

HR	MIN	SECONDS 00	15	30	45	COMMENTS
	00					
	01					
	02					
	03					
	04					
	05					
	06					
	07					
	08					
	09					
	10					
	11					
	12					
	13					
	14					
	15					
	16					
	17					
	18					
	19					
21	20	0	0	0	0	Test #2 Start
	21	0	0	0	0	
	22	0	0	0	0	
	23	0	0	0	0	
	24	0	0	0	0	
	25	0	0	0	0	
	26	0	0	0	0	
	27	0	0	0	0	
	28	0	0	0	0	
	29	0	0	0	0	

RECORD OF VISIBLE EMISSIONS

Company Name Exxon mineral Date 9-28-79

Plant Address , Wyoming Observer C. Dobeoski

Stack Location Ore Bin Hopper Observer's Location

Weather Conditions

TIME HR	MIN	SECONDS 00	15	30	45	COMMENTS
21	30	0	0	0	0	
	31	0	0	0	0	
	32	0	0	0	0	
	33	0	0	0	0	
	34	0	0	0	0	
	35	0	0	0	0	
	36	0	0	0	0	
	37	0	0	0	0	
	38	0	0	0	0	
	39	0	0	0	0	
	40	0	0	0	0	
	41	0	0	0	0	
	42	0	0	0	0	
	43	0	0	0	0	
	44	0	0	0	0	
	45	0	0	0	0	
	46	0	0	0	0	
	47	0	0	0	0	
	48	0	0	0	0	
	49	0	0	0	0	
	50	0	0	0	0	
	51	0	0	0	0	
	52	0	0	0	0	
	53	0	0	0	0	
	54	0	0	0	0	
	55	0	0	0	0	
	56	0	0	0	0	
	57	0	0	0	0	
	58	0	0	0	0	
	59	0	0	0	0	Line down at 2200 h. End of Run #2.

RECORD OF VISIBLE EMISSIONS

Company Name Exxon Mineral Date 9-28-79

Plant Address Wyoming Observer C. Dobroski

Stack Location [illegible] Hopper Observer's Location 50' from source; eye level.

Weather Conditions

HR	MIN	00	15	30	45	COMMENTS
	00					
	01					
	02					
	03					
	04					
	05					
	06					
	07					
	08					
	09					
	10					
	11					
	12					
	13					
	14					
	15					
	16					
	17					
	18					
	19					
	20					
	21					
	22					
	23					
	24					
23	25	0	0	0	0	Start Test #3
	26	0	0	0	0	
	27	0	0	0	0	
	28	0	0	0	0	
	29	0	0	0	0	

RECORD OF VISIBLE EMISSIONS

Company Name Exxon Mineral

Date 9-28-79

Plant Address , Wyoming

Observer C. Dobrowski

Stack Location Ore Bin Hopper

Observer's Location

Weather Conditions

TIME		SECONDS				COMMENTS
HR	MIN	00	15	30	45	
23	30	0	0	0	0	
	31	0	0	0	0	
	32	0	0	0	0	
	33	0	0	0	0	
	34	0	0	0	0	
	35	0	0	0	0	
	36	0	0	0	0	
	37	0	0	0	0	
	38	0	0	0	0	
	39	0	0	0	0	
	40	0	0	0	0	
	41	0	0	0	0	
	42	0	0	0	0	
	43	0	0	0	0	
	44	0	0	0	0	
	45	0	0	0	0	
	46	0	0	0	0	
	47	0	0	0	0	
	48	0	0	0	0	
	49	0	0	0	0	
	50	0	0	0	0	
	51	0	0	0	0	
	52	0	0	0	0	
	53	0	0	0	0	
	54	0	0	0	0	
	55	0	0	0	0	
	56	0	0	0	0	
	57	0	0	0	0	
	58	0	0	0	0	
	59	0	0	0	0	

RECORD OF VISIBLE EMISSIONS

Company Name Exxon Mineral

Date 9-28/29-79

Plant Address , Wyoming

Observer C. Dobroski

Stack Location Ore Bin Hopper

Observer's Location

Weather Conditions

HR	MIN	00	15	30	45	COMMENTS
00	00	0	0	0	0	
	01	0	0	0	0	
	02	0	0	0	0	
	03	0	0	0	0	
	04	0	0	0	0	
	05	0	0	0	0	
	06	0	0	0	0	
	07	0	0	0	0	
	08	0	0	0	0	
	09	0	0	0	0	
	10	0	0	0	0	
	11	0	0	0	0	
	12	0	0	0	0	
	13	0	0	0	0	
	14	0	0	0	0	
	15	0	0	0	0	
	16	0	0	0	0	
	17	0	0	0	0	
	18	0	0	0	0	
	19	0	0	0	0	
	20	0	0	0	0	
	21	0	0	0	0	
	22	0	0	0	0	
	23	0	0	0	0	
	24	0	0	0	0	
	25	0	0	0	0	
	26	0	0	0	0	
	27	0	0	0	0	
	28	0	0	0	0	
	29	0	0	0	0	Test #3 End

TRAVERSE POINT LOCATION FOR CIRCULAR DUCTS

PLANT EPA - EXXON
DATE 9/28/79
SAMPLING LOCATION FINE ORE B.U SCRUBBER INLET
INSIDE OF FAR WALL TO OUTSIDE OF PORT, (DISTANCE A) 16"
INSIDE OF NEAR WALL TO OUTSIDE OF PORT, (DISTANCE B) 6"
STACK I.D., (DISTANCE A - DISTANCE B) 10"
NEAREST UPSTREAM DISTURBANCE < 1
NEAREST DOWNSTREAM DISTURBANCE < 1
CALCULATOR NG

32

1/8 = .13
2/8 = .25
3/8 = .38
4/8 = .50
5/8 = .63
6/8 = .75
7/8 = .88

SCHEMATIC OF SAMPLING LOCATION

TRAVERSE POINT NUMBER	FRACTION OF STACK I.D.	STACK I.D.	PRODUCT OF COLUMNS 2 AND 3 (TO NEAREST 1/8 INCH)	DISTANCE B	TRAVERSE POINT LOCATION FROM OUTSIDE OF PORT (SUM OF COLUMNS 4 & 5)
1	.026	10"	1/4	6"	6 1/4
2	.082		7/8		6 7/8
3	.146		1 1/2		7 1/2
4	.226		2 1/4		8 1/4
5	.342		3 3/8		9 3/8
6	.658		6		12
7	.774		7 3/4		13 3/4
8	.854		8 1/2		14 1/2
9	.918		9 1/8		15 1/8
10	.974		9 3/4		15 3/4

PRELIMINARY VELOCITY TRAVERSE

PLANT Exxon - EPA
DATE 9-28-79
LOCATION fine ore SCRUBBER INLET
STACK I.D. 10"
BAROMETRIC PRESSURE, in. Hg ~30"
STACK GAUGE PRESSURE, in. H_2O 6"
OPERATORS NG, VM

TRAVERSE POINT NUMBER	VELOCITY HEAD (Δp_s), in. H_2O	STACK TEMPERATURE (T_s), °F
X - 1	.9→1.4	
2		
3		
4		
5		
6		
7		
8		
9		
10		
AVERAGE	1.3	75

~3/16" neg.

SCHEMATIC OF TRAVERSE POINT LAYOUT

TRAVERSE POINT NUMBER	VELOCITY HEAD (Δp_s), in. H_2O	STACK TEMPERATURE (T_s), °F
Y - 1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
AVERAGE		

.187
16 | 3.00
16
140
128
120
112
8

16 × 5 = 80
16 × 7 = 112
16 × 8 = 128
16 × 9 = 144

NOMOGRAPH DATA

PLANT Exxon Uranium - EPA

DATE 9-28-79

SAMPLING LOCATION fine ore SCRUBBER INLET

CONTROL BOX NO. Nut 1

CALIBRATED PRESSURE DIFFERENTIAL ACROSS ORIFICE, in. H_2O	$\Delta H_@$	1.76
AVERAGE METER TEMPERATURE (AMBIENT + 20°F), °F	$T_{m\ avg.}$	90
PERCENT MOISTURE IN GAS STREAM BY VOLUME	B_{wo}	3
BAROMETRIC PRESSURE AT METER, in. Hg 30"	P_m	
STATIC PRESSURE IN STACK, in. Hg 6" x .073 (P_m ± 0.073 x STACK GAUGE PRESSURE in in. H_2O)	P_s	
RATIO OF STATIC PRESSURE TO METER PRESSURE	P_s/P_m	1.0
AVERAGE STACK TEMPERATURE, °F	$T_{s\ avg.}$	75
AVERAGE VELOCITY HEAD, in. H_2O	$\Delta p_{avg.}$	1.3
MAXIMUM VELOCITY HEAD, in. H_2O	$\Delta p_{max.}$	1.4
C FACTOR	1.05	
CALCULATED NOZZLE DIAMETER, in.		
ACTUAL NOZZLE DIAMETER, in.	.188	
REFERENCE Δp, in. H_2O	1.3	

ΔP Fan 9.9

FIELD DATA

PLANT EPA - EXXON Uranium mine
DATE 9-28-79
SAMPLING LOCATION Fine ore scrubber Inlet
SAMPLE TYPE part.
RUN NUMBER 1
OPERATOR NG, VM
AMBIENT TEMPERATURE 70
BAROMETRIC PRESSURE
STATIC PRESSURE, (P_s) -7.2
FILTER NUMBER (s) 25405

PROBE LENGTH AND TYPE 5' Bo[illegible]
NOZZLE I.D. .188
ASSUMED MOISTURE, % 3
SAMPLE BOX NUMBER
METER BOX NUMBER Nut 1
METER $\Delta H_@$ 1.76
C FACTOR 1.05
PITOT TUBE FACTOR 4
REFERENCE Δp 1.3
NOTE LCI = .018 @ 1[illegible]
LCF = .007 @ [illegible]

READ AND RECORD ALL DATA EVERY 3 MINUTES

TRAVERSE POINT NUMBER	SAMPLING TIME, min	CLOCK TIME (24-hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O DESIRED	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m\,in}$), °F	DRY GAS METER TEMPERATURE OUTLET ($T_{m\,out}$), °F	PUMP VACUUM, in. Hg	S[illegible] TE[illegible]	[illegible]
	0	18:48	685.640									
X-1	3		688.1	.91	1.25		71	86		4		
2	6		690.0	.92	1.15		72	86		4		
3	9		691.8	.82	1.15		71	87		4		
4	12		693.7	.86	1.2		71	87		4		
5	15		695.2	.86	1.2		71	88		4		
6	18		697.8	.80	1.1		70	88		4		
7	21		700.4	1.3	1.85		70	88		4		
8	24		702.7	1.6	2.3		70	89		5		
9	27		705.8	1.6	2.3		70	90		5		
10	30		708.370	1.7	2.4		70	90		5		
Y-1	33		710.7	1.2	1.7		72	87		4		
2	36		713.1	1.15	1.6		74	88		4		
3	39		716.2	1.2	1.7		74	88		4		
4	42		718.9	1.5	2.1		74	90		4.5		
5	45		721.0	1.1	1.55		72	90		4		
6	48		722.8	1.1	1.55		72	90		4		
7	51		725.7	1.5	2.1		72	90		4		
8	54		728.6	1.8	2.6		71	90		5		
9	57	2002	732.2	2.0	2.85		71	90		5	[illegible]	[illegible]
10	60		734.022	1.9	2.7		72	91		5	235	60

$\sqrt{\Delta p} = 1.1216$ ✓✓ $\Delta \bar{H} = 1.8175$ ✓✓ $\bar{T}_s = 71.500$ ✓✓ $\bar{T}_m = 88.650$ ✓✓

1.1216	$\sqrt{}$ P.R
1.8175	ΔH
71.5	TS
88.65	TM
48.382	VMA
24.77	PBAR
0.	VWG
8.	WSG
28.97	MWD
0.545415	AS
60.	TT
-7.2	STAT
0.188	DN
0.9983	%
0.849	CP
8.	TH2O
38.68861786	VMS
0.3772	VWS
.9655499889	%M
.9903445001	MD
28.86407917	MWS
24.24058824	PS
70.95160296	VACT
2321.884112	QACT
56.55347254	VSTD
1850.706734	QSTD
98.57696703	%I
0.0142	FHWT
0.	T WT
.0056640535	FHGR
.0898497167	FHLB
0.	T GR
0.	T LB

Y

FIELD DATA

PLANT	Exxon - EPA
DATE	9/28/79
SAMPLING LOCATION	fine ore bin scrubber inlet
SAMPLE TYPE	particulate
RUN NUMBER	2
OPERATOR	NG
AMBIENT TEMPERATURE	66
BAROMETRIC PRESSURE	
STATIC PRESSURE, (P_s)	-7.5
FILTER NUMBER (s)	25401

PROBE LENGTH AND TYPE	5' Boro.
NOZZLE I.D.	.188
ASSUMED MOISTURE, %	3
SAMPLE BOX NUMBER	-
METER BOX NUMBER	Nut 1
METER $\Delta H_@$	1.76
C FACTOR	1.05
PITOT TUBE FACTOR	4
REFERENCE Δp	1.3
NOTE	LCI = .012 @5ps. LCF .01 @ 7

READ AND RECORD ALL DATA EVERY 3 MINUTES

TRAVERSE POINT NUMBER	SAMPLING TIME, min	CLOCK TIME (24-hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O DESIRED	ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m\ in}$), °F	OUTLET ($T_{m\ out}$), °F	PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
	0	21:25	734.126									
Y-1	3		736.0	.90	1.25		65	82		5	235	45
-2	6		738.1	1.0	1.4		64	82		5	250	46
3	9		741.5	1.4	2.0		65	83		5.5	250	48
4	12		743.8	1.4	2.0		65	85		5.5	255	50
5	15		746.9	1.1	1.6		65	85		5	260	55
6	18		748.4	1.3	1.85		63	86		5.5	245	55
7	21		750.9	1.8	2.6		63	86		6.5	240	56
8	24		754.0	1.8	2.6		64	87		6.5	240	58
9	27		756.8	1.9	2.8		65	87		7	240	58
10	30		759.921	2.0	2.9		65	88		7	245	58
X-1	33		762.0	.82	1.15		61	84		4.5	250	55
2	36		764.0	.80	1.1		63	83		4.5	255	57
3	39		766.3	1.2	1.7		65	83		5	255	57
4	42		768.6	1.0	1.4		64	83		5	260	57
5	45		770.6	.95	1.35		64	82		5	250	57
6	48		772.8	.96	1.4		65	82		5	250	57
7	51		775.4	1.4	2.0		63	82		5.5	255	57
8	54		778.1	1.6	2.3		63	83		6	250	58
9	57		780.7	1.8	2.6		63	83		6.5	255	58
10	60		783.551	1.8	2.6		63	83		6.5	250	58
		22:38										
			49.425									

$\sqrt{\Delta p} = 1.1481$ $\Delta \bar{H} = 1.9300$ $\bar{T_s} = 63.900$ $\bar{T_m} = 83.950$

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FIELD DATA

PLANT Exxon - FPA
DATE 9-28-79
SAMPLING LOCATION fine ore scrubber inlet
SAMPLE TYPE particulate
RUN NUMBER 3
OPERATOR NG
AMBIENT TEMPERATURE 60
BAROMETRIC PRESSURE 24.
STATIC PRESSURE, (P_s) -7.1
FILTER NUMBER (s) 25415

PROBE LENGTH AND TYPE 5' Bo
NOZZLE I.D. .188 Nominal
ASSUMED MOISTURE, % 3
SAMPLE BOX NUMBER —
METER BOX NUMBER Nut 1
METER $\Delta H_@$ 1.76
C FACTOR 1.05
PITOT TUBE FACTOR 4
REFERENCE Δp 1.3
NOTE LCI = .018 @8
LCF= .01 @4

READ AND RECORD ALL DATA EVERY 3 MINUTES

TRAVERSE POINT NUMBER	SAMPLING TIME, min / CLOCK TIME (24-hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O DESIRED	ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET $(T_{m\ in})$, °F	OUTLET $(T_{m\ out})$, °F	PUMP VACUUM, in. Hg
	0 / 2328	783.712							
Y-1	3	785.5	.90	1.25		60	80		2
2	6	787.6	1.0	1.4		59	81		2.5
3	9	790.1	1.2	1.7		59	82		2.5
4	12	792.8	1.1	1.55		59	82		2.5
5	15	795.0	.97	1.4		59	83		2.5
6	18	797.3	.89	1.25		59	84		2
7	21	799.4	1.4	2.0		59	84		2.5
8	24	802.5	1.8	2.6		60	84		4
9	27	805.3	2.0	2.85		60	86		4
10	30	807.958	2.0	2.85		60	86		4
X-1	33	810.0	.80	1.1		63	83		2
2	36	812.4	1.3	1.85		63	83		4
3	39	814.9	1.3	1.85		63	84		4
4	42	817.2	1.2	1.7		64	84		4
5	45	819.5	.92	1.3		63	83		2
6	48	821.3	.76	1.1		62	83		2
7	51	823.5	1.4	2.0		63	83		2.5
8	54	826.1	1.6	2.25		63	84		4
9	57	829.2	1.8	2.6		63	84		4
10	60	831.877	1.8	2.6		63	85		4
	24:38								

$\overline{\sqrt{\Delta p}} = 1.1304$ $\Delta H = 1.8600$ $\overline{T_s} = 61.200$ $\overline{T_m} = 83.400$

1.1304	$\sqrt{\Delta P}$
1.86	ΔH
61.2	TS
83.4	TM
48.165	VMA
24.77	PBAR
0.	VWC
8.	WSG
28.97	MWD
0.545415	AS
60.	TT
-7.1	STAT
0.188	DN
0.9983	Y
0.849	CP
8.	TH2O
38.89208313	VMS
0.3772	VWS
.9605472012	%M
0.990394528	MD
28.86462797	MWS
24.24794118	PS
70.80060073	VACT
2316.942579	QACT
57.56871336	VSTD
1883.930388	QSTD
97.3478123	%I
0.0102	FHWT
0.	T WT
.0040472607	FHGR
.0653548459	FHLB
0.	T GR
0.	T LB

250

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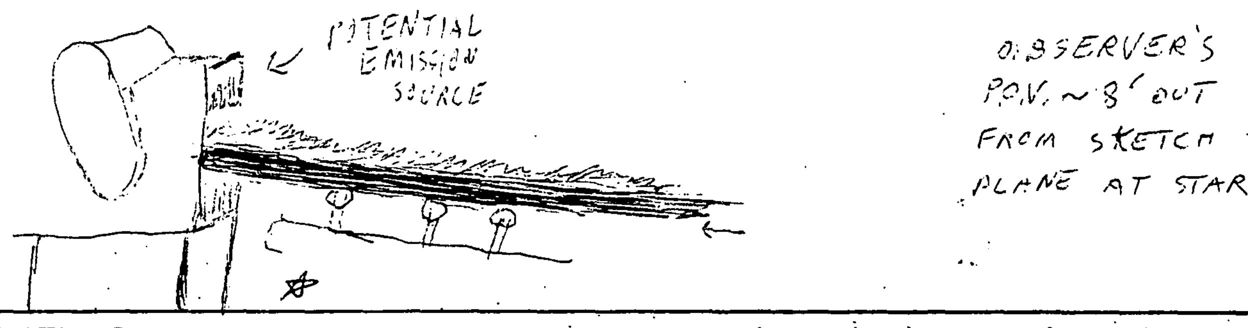
FUGITIVE EMISSION INSPECTION

Company: EXXON MINERAL	Inspector: BOB CAPRARA
Location: TP FINE ORE BIN	Affilitation: ROY F WESTON
Company Rep. TOM YARNICK	Date: 7/28

Sky Conditions: N/A	Wind Direction: N/A
Precipitation: N/A	Wind Speed: N/A

Facility Type: URANIUM MILL	Emission Source: FINE ORE BINS TRANSFER POINT

Sketch emission source, indicate observer position relative to source; indicate potential emission points and/or actual emission points.



OBSERVATIONS

Test 1

Illumination: 3 f.c.

	Time	Accumulated Observation Period (Min: Sec)	Accumulated Emission Time (Min: Sec)
Begin Observation	1850 - 1910	20:00	0:0
	1915 - 1935	20:00	0:0
	1940 - 2000	20:00	0:0
End Observation			

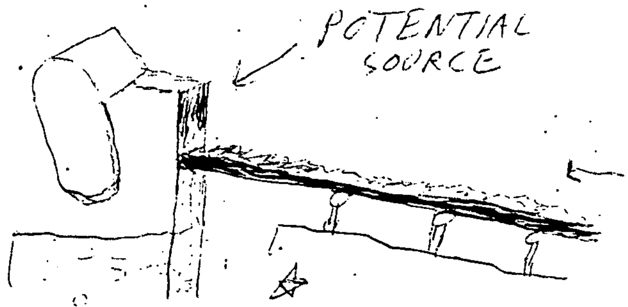
FUGITIVE EMISSION
INSPECTION

Company EXXON MINERAL	Inspector BOB CAPRARA
Location TP FINE ORE 3:N	Affiliation ROY F WESTON INC
Company Rep. TOM YARNICK	Date 7/28

Sky Conditions N/A	Wind Direction N/A
Precipitation N/A	Wind Speed N/A

Facility Type URANIUM MILL	Emission Source TP FINE ORE 3 N

Sketch emission source, indicate observer position relative to source; indicate potential emission points and/or actual emission points.



OBSERVER'S P.O.V. ~ 8' OUT FROM SKETCH PLANE AT STAR.

OBSERVATIONS

Test 2

	Time	Accumulated Observation Period (Min: Sec)	Accumulated Emission Time (Min: Sec)
Begin Observation	2120-2140	20:00	0:0
	2145-2205	20:00	0:0
	2210-2230	20:00	0:0
End Observation			

FUGITIVE EMISSION
INSPECTION

Company EXXON MINERAL
Location TP FINE ORE BIN
Company Rep. TOM JARNICK

Inspector BOB CAPRARA
Affiliation ROY F. WESTON INC
Date 7/28

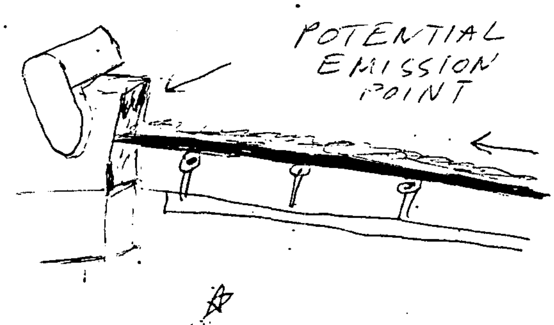
Sky Conditions N/A
Precipitation N/A

Wind Direction N/A
Wind Speed N/A

Facility Type URANIUM MILL

Emission Source TP FINE ORE BIN

Sketch emission source, indicate observer position relative to source; indicate potential emission points and/or actual emission points.



OBSERVER'S POV. ~8' OUT FROM SKETCH PLANE AT STAR

OBSERVATIONS

Test 3

	Time	Accumulated Observation Period (Min: Sec)	Accumulated Emission Time (Min: Sec)
Begin Observation	2330-2350	20:00	0:0
	2355-0015	20:00	0:0
	0020-0040	20:00	0:0
End Observation			

SUMMARY
RECORD OF VISIBLE EMISSIONS

Type of Plant Uranium Mine Date 9-28-79

Company Name Exxon Mineral Hours of Observation See below

Plant Address Casper Wyoming Observer J.D. O'Neill

Type of Discharge STACK OTHER transfer point

Discharge Location Fine Oar bines trasfer point

Height of Point of Discharge ~ 8'

Observer's Location:

Distance to Discharge Point ~25'

Height of Observation Point ____

Direction from Discharge Point East

Background Description N/A

Weather: Clear Overcast Partly Cloudy Other N/A Sky Color ____

Wind Direction N/A Wind Velocity N/A mi/hr

Plume Description:

Detached: Yes No

Color: Black White Other ____

Plume Dispersion Behavior: Looping Coning Fanning

Lofting Fumigating Other N/A

Estimated Distance Plume Visible N/A

Run 1 - 1850 - 2005 - 75 min
Run 2 - 2125 - 2240 75 min
Run 3 - 2330 - 0037 67 min
217

RECORD OF VISIBLE EMISSIONS

Company Name Exxon Mineral Date 9-28-79

Plant Address Casper Wyo. Observer J D O'Neill

Stack Location Transfer Point Observer's Location Transfer Point Fine Ore Bin

Weather Conditions N/A

TIME HR	MIN	SECONDS 00	15	30	45	COMMENTS
	30					
	31					
	32					
	33					
	34					
	35					
	36					
	37					
	38					
	39					
	40					
	41					
	42					
	43					
	44					
	45					
	46					
	47					
	48					
	49					
15	50	0	0	0	0	Start run 1 Fine Ore bins
	51	0	0	0	0	
	52	0	0	0	0	
	53	0	0	0	0	
	54	0	0	0	0	
	55	0	0	0	0	
	56	0	0	0	0	
	57	0	0	0	0	
	58	0	0	0	0	
	59	0	0	0	0	

RECORD OF VISIBLE EMISSIONS

Company Name Exxon Mineral   Date 9-28-79

Plant Address Casper Wyo.   Observer J. D. O'Neill

Stack Location Trasfer point fine ore   Observer's Location ~ 10' from discharge

Weather Conditions N/A

HR	MIN	SECONDS 00	15	30	45	COMMENTS
19 ~~20~~	00	0	0	0	0	
	01	0	0	0	0	
	02	0	0	0	0	
	03	0	0	0	0	
	04	0	0	0	0	
	05	0	0	0	0	
	06	0	0	0	0	
	07	0	0	0	0	
	08	0	0	0	0	
	09	0	0	0	0	
	10	0	0	0	0	
	11	0	0	0	0	
	12	0	0	0	0	
	13	0	0	0	0	
	14	0	0	0	0	
	15	0	0	0	0	
	16	0	0	0	0	
	17	0	0	0	0	
	18	0	0	0	0	
	19	0	0	0	0	
	20	0	0	0	0	
	21	0	0	0	0	
	22	0	0	0	0	
	23	0	0	0	0	
	24	0	0	0	0	
	25	0	0	0	0	
	26	0	0	0	0	
	27	0	0	0	0	
	28	0	0	0	0	
	29	0	0	0	0	

RECORD OF VISIBLE EMISSIONS

Company Name Exxon Mineral | Date 9-28-79

Plant Address Casper Wyo. | Observer J. D. O'Neill

Stack Location Transfer point | Observer's Location 10' S of discharge

Weather Conditions n/a

TIME						COMMENTS
HR	MIN	SECONDS				
		00	15	30	45	
19 ~~20~~	30	0	0	0	0	
	31	0	0	0	0	
	32	0	0	0	0	
	33	0	0	0	0	
	34	0	0	0	0	
	35	0	0	0	0	
	36	0	0	0	0	
	37	0	0	0	0	
	38	0	0	0	0	
	39	0	0	0	0	
	40	0	0	0	0	
	41	0	0	0	0	
	42	0	0	0	0	
	43	0	0	0	0	
	44	0	0	0	0	
	45	0	0	0	0	
	46	0	0	0	0	
	47	0	0	0	0	
	48	0	0	0	0	
	49	0	0	0	0	
	50	0	0	0	0	
	51	0	0	0	0	
	52	0	0	0	0	
	53	0	0	0	0	
	54	0	0	0	0	
	55	0	0	0	0	
	56	0	0	0	0	
	57	0	0	0	0	
	58	0	0	0	0	
20	59	0	0	0	0	

RECORD OF VISIBLE EMISSIONS

Company Name Exxon Mineral
Date 9-28-79
Plant Address Casper Wyo.
Observer J.D. O'Neill
Stack Location Transfer point
Observer's Location ~10' away from point
Weather Conditions N/A

HR	MIN	00	15	30	45	COMMENTS
20	00	0	0	0	0	
	01	0	0	0	0	
	02	0	0	0	0	
	03	0	0	0	0	
	04	0	0	0	0	
20	05					Stopped 2005 Run 1
	06					
	07					
	08					
	09					
	10					
	11					
	12					
	13					
	14					
	15					
	16					
	17					
	18					
	19					
	20					
	21					
	22					
	23					
	24					
	25					
	26					
	27					
	28					
	29					

RECORD OF VISIBLE EMISSIONS

Company Name Exxon Mineral Date 9-28-79

Plant Address Casper Wyo. Observer J.D. O'Neill

Stack Location Fine Ore Bin Transfer Observer's Location 10' away from discharge

Weather Conditions N/A

HR	MIN	00	15	30	45	COMMENTS
	00					
	01					
	02					
	03					
	04					
	05					
	06					
	07					
	08					
	09					
	10					
	11					
	12					
	13					
	14					
	15					
	16					
	17					
	18					
	19					
	20					
	21					
	22					
	23					
	24					
21	25	0	0	0	0	Start Run 2 (2125)
	26	0	0	0	0	
	27	0	0	0	0	
	28	0	0	0	0	
	29	0	0	0	0	

RECORD OF VISIBLE EMISSIONS

Company Name Exxon Mineral Date 9-28-79

Plant Address Casper Wyo. Observer J.D. O'Neill

Stack Location Fine Ore Bins (Transfer Point) Observer's Location 10' away from discharg

Weather Conditions N/A

TIME						COMMENTS
HR	MIN	SECONDS				
		00	15	30	45	
21	30	0	0	0	0	
	31	0	0	0	0	
	32	0	0	0	0	
	33	0	0	0	0	
	34	0	0	0	0	
	35	0	0	0	0	
	36	0	0	0	0	
	37	0	0	0	0	
	38	0	0	0	0	
	39	0	0	0	0	
	40	0	0	0	0	
	41	0	0	0	0	
	42	0	0	0	0	
	43	0	0	0	0	
	44	0	0	0	0	
	45	0	0	0	0	
	46	0	0	0	0	
	47	0	0	0	0	
	48	0	0	0	0	
	49	0	0	0	0	
	50	0	0	0	0	
	51	0	0	0	0	
	52	0	0	0	0	
	53	0	0	0	0	
	54	0	0	0	0	
	55	0	0	0	0	
	56	0	0	0	0	
	57	0	0	0	0	
	58	0	0	0	0	
	59	0	0	0	0	

RECORD OF VISIBLE EMISSIONS

Company Name Exxon Mineral

Date 9-28-79

Plant Address Casper Wyo.

Observer J.D. O'Neill

Stack Location Fine Ore Bin Transfer Pt.

Observer's Location 10' away from discharge

Weather Conditions N/A

HR	MIN	00	15	30	45	COMMENTS
22	00	0	0	0	0	
	01	0	0	0	0	
	02	0	0	0	0	
	03	0	0	0	0	
	04	0	0	0	0	
	05	0	0	0	0	
	06	0	0	0	0	
	07	0	0	0	0	
	08	0	0	0	0	
	09	0	0	0	0	
	10	0	0	0	0	
	11	0	0	0	0	
	12	0	0	0	0	
	13	0	0	0	0	
	14	0	0	0	0	
	15	0	0	0	0	
	16	0	0	0	0	
	17	0	0	0	0	
	18	0	0	0	0	
	19	0	0	0	0	
	20	0	0	0	0	
	21	0	0	0	0	
	22	0	0	0	0	
	23	0	0	0	0	
	24	0	0	0	0	
	25	0	0	0	0	
	26	0	0	0	0	
	27	0	0	0	0	
	28	0	0	0	0	
22	29	0	0	0	0	

RECORD OF VISIBLE EMISSIONS

Company Name Exxon Mineral   Date 9-28-79

Plant Address Casper Wyo.   Observer J.D. O'Neill

Stack Location Fire Ore Bin Transfer Pt.   Observer's Location 10' away for point

Weather Conditions N/A

HR	MIN	00	15	30	45	COMMENTS
	30	0	0	0	0	
	31	0	0	0	0	
	32	0	0	0	0	
	33	0	0	0	0	
	34	0	0	0	0	
	35	0	0	0	0	
	36	0	0	0	0	
	37	0	0	0	0	
	38	0	0	0	0	
22	39	0	0	0	0	Stopped Run 2 2240
	40					
	41					
	42					
	43					
	44					
	45					
	46					
	47					
	48					
	49					
	50					
	51					
	52					
	53					
	54					
	55					
	56					
	57					
	58					
	59					

RECORD OF VISIBLE EMISSIONS

Company Name Exxon Mineral Date 9-28-79

Plant Address Casper Wyo. Observer J. D. O'Neill

Stack Location Fine Ore Bin Transfer Pt. Observer's Location ~10' away from Pt.

Weather Conditions N/A

HR	MIN	00	15	30	45	COMMENTS
23	30	0	0	0	0	Start Run 3
	31	0	0	0	0	
	32	0	0	0	0	
	33	0	0	0	0	
	34	0	0	0	0	
	35	0	0	0	0	
	36	0	0	0	0	
	37	0	0	0	0	
	38	0	0	0	0	
	39	0	0	0	0	
	40	0	0	0	0	
	41	0	0	0	0	
	42	0	0	0	0	
	43	0	0	0	0	
	44	0	0	0	0	
	45	0	0	0	0	
	46	0	0	0	0	
	47	0	0	0	0	
	48	0	0	0	0	
	49	0	0	0	0	
	50	0	0	0	0	
	51	0	0	0	0	
	52	0	0	0	0	
	53	0	0	0	0	
	54	0	0	0	0	
	55	0	0	0	0	
	56	0	0	0	0	
	57	0	0	0	0	
	58	0	0	0	0	
	59	0	0	0	0	

RECORD OF VISIBLE EMISSIONS

Company Name Exxon Mineral | Date 9-28-78

Plant Address Casper Wyo. | Observer J.D. O'Neill

Stack Location Fine Ore Bin Transfer Pt. | Observer's Location 10' away from Point

Weather Conditions N/A

HR	MIN	TIME SECONDS 00	15	30	45	COMMENTS
24	00	0	0	0	0	Midnight
	01	0	0	0	0	
	02	0	0	0	0	
	03	0	0	0	0	
	04	0	0	0	0	
	05	0	0	0	0	
	06	0	0	0	0	
	07	0	0	0	0	
	08	0	0	0	0	
	09	0	0	0	0	
	10	0	0	0	0	
	11	0	0	0	0	
	12	0	0	0	0	
	13	0	0	0	0	
	14	0	0	0	0	
	15	0	0	0	0	
	16	0	0	0	0	
	17	0	0	0	0	
	18	0	0	0	0	
	19	0	0	0	0	
	20	0	0	0	0	
	21	0	0	0	0	
	22	0	0	0	0	
	23	0	0	0	0	
	24	0	0	0	0	
	25	0	0	0	0	
	26	0	0	0	0	
	27	0	0	0	0	
	28	0	0	0	0	
00	29	0	0	0	0	

RECORD OF VISIBLE EMISSIONS

Company Name Exxon Mineral

Date 9-29-79

Plant Address Casper Wyo.

Observer J.D. O'Neill

Stack Location Fine Ore Bin

Observer's Location 10' away from discharge

Weather Conditions N/A

HR	MIN	00	15	30	45	COMMENTS
00	30	0	0	0	0	
	31	0	0	0	0	
	32	0	0	0	0	
	33	0	0	0	0	
	34	0	0	0	0	
	35	0	0	0	0	
	36	0	0	0	0	
12	37	0	0	0	0	Stopped 1237.
	38					
	39					
	40					
	41					
	42					
	43					
	44					
	45					
	46					
	47					
	48					
	49					
	50					
	51					
	52					
	53					
	54					
	55					
	56					
	57					
	58					
	59					

TRAVERSE POINT LOCATION FOR CIRCULAR DUCTS

PLANT Exxon Uran
DATE 9-28-79
SAMPLING LOCATION Scrubber outlet FROM DUST
INSIDE OF FAR WALL TO OUTSIDE OF PORT, (DISTANCE A) 16¼
INSIDE OF NEAR WALL TO OUTSIDE OF PORT, (DISTANCE B) 4¼
STACK I.D., (DISTANCE A - DISTANCE B) 12
NEAREST UPSTREAM DISTURBANCE 3 I.D.
NEAREST DOWNSTREAM DISTURBANCE 1 I.D.
CALCULATOR Albano

SCHEMATIC OF SAMPLING LOCATION

TRAVERSE POINT NUMBER	FRACTION OF STACK I.D.	STACK I.D.	PRODUCT OF COLUMNS 2 AND 3 (TO NEAREST 1/8 INCH)	DISTANCE B	TRAVERSE POINT LOCATION FROM OUTSIDE OF PORT (SUM OF COLUMNS 4 & 5)
X,y-1	.016	12"	¼ → ½	4¼	4½ → 4¾
2	.049		5/8		4 7/8
3	.085		1		5½
4	.125		1½		6
5	.169		2¼		6¾
6	.220		2 5/8		6 7/8
7	.283		3 3/8		7 5/8
8	.375		4½		9
9	.625		7½		12
10	.717		8 5/8		12 7/8
11	.780		9 3/8		13 5/8
12	.831		10		14½
13	.875		10½		15
14	.915		11		15½
15	.951		11½		15¾
16	.984		11¾ → 11½		16¼ → 16

FIELD DATA

PLANT Exxon Urom
DATE 9-28-79
SAMPLING LOCATION S. Outlet
SAMPLE TYPE Part
RUN NUMBER 1
OPERATOR Celiano
AMBIENT TEMPERATURE 62°
BAROMETRIC PRESSURE 24.77
STATIC PRESSURE, (P_s) +1.1
FILTER NUMBER (s)

PROBE LENGTH AND TYPE 4' Bo
NOZZLE I.D. .183
ASSUMED MOISTURE, % 4
SAMPLE BOX NUMBER 1
METER BOX NUMBER 2253
METER $\Delta H_@$ 1.86
C FACTOR 1.10
PITOT TUBE FACTOR .850
REFERENCE Δp 1.30
NOTE

L.C.
L.C

READ AND RECORD ALL DATA EVERY 2 MINUTES

TRAVERSE POINT NUMBER	SAMPLING TIME, min / CLOCK TIME (24-hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O DESIRED	ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET $(T_{m\,in})$, °F	OUTLET $(T_{m\,out})$, °F	PUMP VACUUM, in. Hg		
	1855	029.591									
Y-1		31.200	1.30	1.88	1.88	69	74	74	6.0		
2		32.800	1.30	1.88	1.88	72	82	75	6.0		
3		34.400	1.10	1.58	1.58	70	86	75	5.0		
4		36.000	1.10	1.58	1.58	69	87	76	5.0		
5		37.900	1.60	2.30	2.30	72	88	76	7.0		
6		39.750	1.35	1.92	1.92	70	91	76	6.0		
7		41.250	.86	1.22	1.22	69	91	76	4.0		
8		42.600	.90	1.26	1.26	70	89	76	4.0		
9		43.800	.90	1.26	1.26	69	89	76	4.0		
10		45.000	.30	.42	.42	70	88	76	2.0		
11		46.200	.70	1.00	1.00	69	83	75	2.5		
12		47.400	1.10	1.58	1.58	69	85	75	4.5		
13		49.000	.86	1.22	1.22	68	86	75	4.0		
14		50.150	.50	.72	.72	68	84	74	3.0		
15		50.950	.50	.72	.72	68	82	74	3.0		
16	1930	52.170	.50	.72	.72	68	82	74	3.0		
X-1	1933	53.150	.40	.57	.57	66	73	71	2.0		
2		54.500	1.10	1.58	1.58	68	76	72	5.5		
3		56.000	.86	1.22	1.22	67	79	72	4.5		
4		57.650	1.10	1.58	1.58	66	80	71	5.5		
5		59.000	1.20	1.70	1.70	67	82	71	6.0	253	61

1.0165	ΓΔP
1.5262	ΔH
69.062	TS
78.672	TM
48.069	VMA
24.77	PBAR
0.	VWC
11.1	WSG
28.97	MWD
.7853981634	AS
64.	TT
1.1	STAT
0.183	DN
0.9949	Y
0.85	CP
11.1	TH2O
38.98343807	VMS
0.523365	VWS
1.324746523	%M
.9867525348	MD
28.82467531	MWS
24.85088235	PS
63.48071239	VACT
2991.458095	QACT
51.92256901	VSTD
2446.79342	QSTD
107.0434938	%I
0.0067	FHWT
0.	T WT
.0026522648	FHGR
.0556244777	FHLB
0.	T GR
0.	T LB

TRAVERSE POINT NUMBER	SAMPLING TIME, min / CLOCK TIME (24 hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in H_2O DESIRED	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in H_2O ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m\,in}$), °F	DRY GAS METER TEMPERATURE OUTLET ($T_{m\,out}$), °F	PUMP VACUUM, in Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
6		60.850	1.35	2.00	2.00	67	82	71	7.0	245	62
7		62.850	1.70	2.45	2.45	68	83	71	7.0		
8		64.500	1.00	1.43	1.43	70	85	71	6.0		
9		65.800	1.00	1.43	1.43	70	89	72	6.0	250	62
10		67.550	1.10	1.60	1.60	70	89	72	6.0		
11		68.800	1.05	1.52	1.52	70	84	72	6.0	245	61
12		70.500	1.50	2.10	2.10	70	84	72	7.0		
13		72.400	1.50	2.10	2.10	71	85	72	7.0	250	62
14		73.900	1.50	2.10	2.10	70	86	72	7.0		
15		75.800	1.50	2.10	2.10	70	86	72	7.0	250	61
16	2005	77.660	1.50	2.10	2.10	70	86	72	7.0		
		98.069									

$\overline{\sqrt{\Delta p}}$ = 1.0115 ✓✓ $\overline{\Delta H}$ = 1.5262 ✓✓ $\overline{T_s}$ = 69.1062 ✓✓ $\overline{T_m}$ = 78.672 ✓✓

FIELD DATA

PLANT Exxon Uran.
DATE 9-28-79
SAMPLING LOCATION S. Outlet (Fine Bin)
SAMPLE TYPE Part
RUN NUMBER 2
OPERATOR Celiano
AMBIENT TEMPERATURE 62°
BAROMETRIC PRESSURE
STATIC PRESSURE, (P_s)
FILTER NUMBER (s)

PROBE LENGTH AND TYPE 3' Bo
NOZZLE I.D. .183
ASSUMED MOISTURE, % 3
SAMPLE BOX NUMBER 1
METER BOX NUMBER NUTS
METER $\Delta H_@$ 1.83
C FACTOR 1.1
PITOT TUBE FACTOR
REFERENCE Δp 1.3
NOTE

READ AND RECORD ALL DATA EVERY 2 MINUTES

TRAVERSE POINT NUMBER	SAMPLING TIME, min / CLOCK TIME (24-hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O DESIRED	ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET $(T_{m\ in})$, °F	OUTLET $(T_{m\ out})$, °F	PUMP VACUUM, in. Hg		
	2122	78.600									
X-1		79.150	.13	.18	.18	65	66	66	1.5		
2		80.700	1.20	1.80	1.80	64	68	66	5		
3		82,300	1.20	1.80	1.80	69	74	66	5		
4		84,000	1.20	1.80	1.80	65	77	66	5		
5		85,500	1.40	2.0	2.0	64	79	67	6		
6		87.600	1.40	2.0	2.0	64	80	67	6.5		
7		88.700	1.20	1.80	1.80	65	80	68	6.0		
8		90.400	.86	1.20	1.20	66	79	68	4.0		
9		91,800	.90	1.30	1.30	64	78	68	4.0		
10		93,500	1.30	1.88	1.88	64	76	68	6.0		
11		95.200	1.40	2.00	2.00	63	78	68	6.0		
12		97.000	1.70	2.40	2.40	62	78	68	6.5		
13		98.700	1.4	2.0	2.0	62	80	68	6.0		
14		100.700	1.4	2.0	2.0	62	80	68	6.5		
15		102.200	1.5	2.1	2.1	64	80	68	6.5		
16		104.081	1.5	2.1	2.1	63	80	68	6.5		
	0										
Y-1	2	104.900	.30	.42	.42	62	68	66	1.5		
2	4	105.900	.95	1.4	1.4	63	70	66	3.0		
3	6	107.500	1.6	2.3	2.3	63	74	66	6.5	250	61
4	8	109.200	1.5	2.1	2.1	62	78	66	6.5		
5	10	110.600	1.5	2.1	2.1	63	80	66	6.5	350	62

1.0474	ΓΔP
1.6081	ΔH
63.812	TS
71.719	TM
47.544	VMA
24.77	PBAR
0.	VWC
10.	WSG
28.97	MWD
0.78539	AS
64.	TT
1.1	STAT
0.183	DN
0.9949	Y
0.849	CP
10.	TH2O
39.07132026	VMS
0.4715	VWS
1.19237828	%M
.9880762172	MD
28.8391961	MWS
24.85088235	PS
64.99213695	VACT
3062.650466	QACT
53.76362194	VSTD
2533.524662	QSTD
103.6110029	%I
0.0063	FHWT
0.	T WT
.0024883111	FHGR
.0540357988	FHLB
0.	T GR
0.	T LB

TRAVERSE POINT NUMBER	SAMPLING TIME, min / CLOCK TIME (24 hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in H_2O		STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE		PUMP VACUUM, in Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
				DESIRED	ACTUAL		INLET ($T_{m\,in}$), °F	OUTLET ($T_{m\,out}$), °F			
6	12	112.8	1.6	2.3	2.3	64	80	66	6.5	240	62
7	14	114.7	.5	.72	.72	64	80	66	6.5		
8	16	115.9	.5	.72	.72	64	78	60	6.5	250	61
9	18	116.95	.5	.72	.72	64	76	66	6.5		
10	20	118.50	.75	1.1	1.1	65	78	66	6.5	250	61
11	22	119.9	1.6	1.42	1.42	64	77	66	6.0		
12	24	121.8	1.1	1.6	1.6	65	76	66	6.5		62
13	26	122.6	1.3	1.4	1.4	65	77	66	6.5	250	
14	28	123.7	1.1	1.6	1.6	64	77	65	6.5		61
15	30	124.65	1.1	1.6	1.6	64	78	66	6.5	240	
16	32	126.144	1.1	1.6	1.6	65	77	66	6.0		62
	22:36										
		47.544									

$\overline{\sqrt{\Delta p}}$ = 1.0474, $\overline{\Delta H}$ = 1.6081, $\overline{T_s}$ = 63.812, $\overline{T_m}$ = 71.719

FIELD DATA

PLANT Exxon Uran
DATE 9-28-79
SAMPLING LOCATION S. OUT (F. Bin)
SAMPLE TYPE Part
RUN NUMBER 3
OPERATOR Celiano
AMBIENT TEMPERATURE 60°
BAROMETRIC PRESSURE
STATIC PRESSURE, (P_s)
FILTER NUMBER (s)

PROBE LENGTH AND TYPE 3' B
NOZZLE I.D. .183
ASSUMED MOISTURE, % 8
SAMPLE BOX NUMBER 1
METER BOX NUMBER 2253
METER $\Delta H_@$ 1.83
C FACTOR 1.1
PITOT TUBE FACTOR
REFERENCE Δp 1.3
NOTE

L.
L.

READ AND RECORD ALL DATA EVERY 2 MINUTES

TRAVERSE POINT NUMBER	SAMPLING TIME, min / CLOCK TIME (24-hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O DESIRED	ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m\ in}$), °F	OUTLET ($T_{m\ out}$), °F	PUMP VACUUM, in. Hg
	2331	126.520							
X-1		127.800	.10	.145	.145	60	61	60	1
2		128.300	1.00	1.41	1.41	65	62	60	4.5
3		129.800	1.10	1.60	1.60	61	66	61	4.5
4		131.200	1.30	1.88	1.88	61	70	62	5.5
5		133.000	1.20	1.72	1.72	59	72	62	5.5
6		134.500	1.20	1.72	1.72	62	73	62	5.5
7		136.050	1.20	1.72	1.72	62	74	62	5.5
8		137.250	1.10	1.60	1.60	62	74	62	5.0
9		138.850	.15	.22	.22	67	74	62	2.0
10		139.600	.25	.35	.35	61	70	62	2.0
11		140.200	.25	.35	.35	60	70	61	2.0
12		141.000	.35	.50	.50	62	68	63	3.
13		142.000	.62	.88	.88	61	68	63	4.0
14		143.400	1.00	1.41	1.41	63	70	63	5
15		144.800	1.30	1.88	1.88	64	73	63	6.0
16	0005	146.534	1.40	2.00	2.00	61	75	64	6.
Y-1		148.300	1.00	1.41	1.41	61	66	63	6
2		149.700	1.30	1.68	1.88	63	74	64	6.
3		151.200	1.00	1.41	1.41	65	76	64	6
4		154.500	1.00	1.41	1.41	63	76	64	6
5		156.000	1.10	1.60	1.60	63	76	64	6

0.95001	ΔP
1.3873	ΔH
62.719	TS
69.54	TM
44.23	VMA
24.77	PBAR
0.	VWC
8.6	WSG
28.97	MWD
0.78539	AS
64.	TT
1.1	STAT
0.183	DN
0.9949	Y
0.849	CP
8.6	TH2O
36.47365806	VMS
0.40549	VWS
1.099510215	%M
.9890048979	MD
28.84938973	MWS
24.85088235	PS
58.87706472	VACT
2774.487472	QACT
48.85274884	VSTD
2302.107624	QSTD
106.4453333	%I
0.0057	FHWT
0.	T WT
.0024116693	FHGR
.0475877459	FHLB
0.	T GR
0.	T LB

Run #3 EXXON UREA S. OUTLET (FINE BIN)

TRAVERSE POINT NUMBER	SAMPLING TIME, min / CLOCK TIME (24 hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in H_2O		STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE		PUMP VACUUM, in Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
				DESIRED	ACTUAL		INLET ($T_{m\,in}$), °F	OUTLET ($T_{m\,out}$), °F			
6		155,700	1.20	1.70	1.70	64	76	65	6.0		
7		157,200	1.35	1.92	1.92	63	77	65	6.0	240	60
8		159,000	1.40	2.00	2.00	64	78	66	6.5		
9		159.800	.20	.29	.29	65	78	66	2	245	
10		161,000	.53	.75	.75	63	74	66	2.5		
11		162.300	1.00	1.40	1.40	64	74	66	4.5	240	60
12		164,000	1.00	1.40	1.40	65	76	66	4.5		
13		165,400	1.55	2.20	2.20	64	76	67	7.5	240	58
14		167.200	1.30	1.88	1.88	65	77	66	6.0		
15		169.000	1.30	1.88	1.88	64	78	66	6.	245	
16		170.750	1.30	1.88	1.88	65	77	66	6.	248	60
	0040										

STATIC P. +1.10

$\sqrt{\Delta p}$ = .95077 ΔH = 1.3873 T_s = 62.719 T_m = 69.544

RECORD OF VISIBLE EMISSIONS

Company Name Exxon Uranium   Date 9/28/79

Plant Address Douglas Wyoming   Observer T. Moxon

Stack Location Fine Ore Bins - Scrubber Outlet   Observer's Location

Weather Conditions clear NW 5-15 mi/hr

HR	MIN	TIME SECONDS 00	15	30	45	COMMENTS
1845						
	00	0	0	0	0	Run 1
	01	0	0	0	0	
	02	0	0	0	0	
	03	0	0	0	0	
	04	0	0	0	0	
	05	0	0	0	0	
	06	0	0	0	0	
	07	0	0	0	0	
	08	0	0	0	0	
	09	0	0	0	0	
	10	0	0	0	0	
	11	0	0	0	0	
	12	0	0	0	0	
	13	0	0	0	0	
	14	0	0	0	0	
	15	0	0	0	0	
	16	0	0	0	0	
	17	0	0	0	0	
	18	0	0	0	0	
	19	0	0	0	0	
	20	0	0	0	0	
	21	0	0	0	0	
	22	0	0	0	0	
	23	0	0	0	0	
	24	0	0	0	0	
	25	0	0	0	0	
	26	0	0	0	0	
	27	0	0	0	0	
	28	0	0	0	0	
	29	0	0	0	0	

RECORD OF VISIBLE EMISSIONS

Company Name Exxon Uranium Date 9/28/79

Plant Address Douglas Wyoming Observer T. Moxon

Stack Location Fine Ore Bins - Scrubber Outlet Observer's Location

Weather Conditions Clear

TIME HR	MIN	SECONDS 00	15	30	45	COMMENTS
1915	30	0	0	0	0	Run 1
	31	0	0	0	0	
	32	0	0	0	0	
	33	0	0	0	0	
	34	0	0	0	0	
	35	0	0	0	0	
	36	0	0	0	0	
	37	0	0	0	0	
	38	0	0	0	0	
	39	0	0	0	0	
	40	0	0	0	0	
	41	0	0	0	0	
	42	0	0	0	0	
	43	0	0	0	0	
	44	0	0	0	0	
	45	[illegible]				
	46					
	47					
	48					
	49					
	50					
	51					
	52					
	53					
	54					
	55					
	56					
	57					
	58					
	59					

TRAVERSE POINT LOCATION FOR CIRCULAR DUCTS

7.0

PLANT EXXON MINERAL
DATE 9/30/79
SAMPLING LOCATION PACKAGING AREA DUCT INLET
INSIDE OF FAR WALL TO OUTSIDE OF PORT. (DISTANCE A) $9\frac{1}{4}$"
INSIDE OF NEAR WALL TO OUTSIDE OF PORT. (DISTANCE B) 3"
STACK I.D., (DISTANCE A - DISTANCE B) 6¼" = .21305 in² = 6¼"
NEAREST UPSTREAM DISTURBANCE 715 ID
NEAREST DOWNSTREAM DISTURBANCE 715 ID
CALCULATOR

SCHEMATIC OF SAMPLING LOCATION

TRAVERSE POINT NUMBER	FRACTION OF STACK I.D.	STACK I.D.	PRODUCT OF COLUMNS 2 AND 3 (TO NEAREST 1.8 INCH)	DISTANCE B	TRAVERSE POINT LOCATION FROM OUTSIDE OF PORT (SUM OF COLUMNS 4 & 5)
1	.3125	6¼	2"	3	5"

PRELIMINARY VELOCITY TRAVERSE

PLANT EXXON MINERAL
DATE 9/30/79
LOCATION PACKAGE ~~SCRUBBER~~ ~~OUTLET~~ AREA INLET
STACK I.D. 6 1/4"
BAROMETRIC PRESSURE, in. Hg 30.11
STACK GAUGE PRESSURE, in. H_2O
OPERATORS BOB NEWTON

STATIC PRESSURE .36

TRAVERSE POINT NUMBER	VELOCITY HEAD (Δp_s), in. H_2O	STACK TEMPERATURE (T_s), °F
1	1.9	88
2	2.0	89
3	2.1	91
AVERAGE		

SCHEMATIC OF TRAVERSE POINT LAYOUT

TRAVERSE POINT NUMBER	VELOCITY HEAD (Δp_s), in. H_2O	STACK TEMPERATURE (T_s), °F
AVERAGE		

NOMOGRAPH DATA

PLANT EXXON MINERAL

DATE 9\30\79

SAMPLING LOCATION PACKAGE AREA DUCT INLET

CONTROL BOX NO. ~~[illegible]~~ OMEN

CALIBRATED PRESSURE DIFFERENTIAL ACROSS ORIFICE, in. H_2O	$\Delta H_@$	1.85
AVERAGE METER TEMPERATURE (AMBIENT + 20 °F), °F	$T_{m\,avg.}$	100
PERCENT MOISTURE IN GAS STREAM BY VOLUME	B_{wo}	3%
BAROMETRIC PRESSURE AT METER, in. Hg	P_m	24.0
STATIC PRESSURE IN STACK, in. Hg ($P_m \pm 0.073$ x STACK GAUGE PRESSURE in in. H_2O)	P_s	24.0
RATIO OF STATIC PRESSURE TO METER PRESSURE	P_s/P_m	1.00
AVERAGE STACK TEMPERATURE, °F	$T_{s\,avg.}$	89.3
AVERAGE VELOCITY HEAD, in. H_2O	$\Delta p_{avg.}$	2.0
MAXIMUM VELOCITY HEAD, in. H_2O	$\Delta p_{max.}$	2.1
C FACTOR		
CALCULATED NOZZLE DIAMETER, in.	.188	
ACTUAL NOZZLE DIAMETER, in.	.188	
REFERENCE Δp, in. H_2O	1.4	

Ambient Air $MW_d = 28.97$

FIELD DATA

PLANT Exxon Mineral
DATE 10/11/79
SAMPLING LOCATION Packaging Area ~~Duct Inlet~~ Exhaust Duct
SAMPLE TYPE Particulate
RUN NUMBER 1
OPERATOR Bob Newton
AMBIENT TEMPERATURE 94°F
BAROMETRIC PRESSURE ~~30.13~~ 23.98
STATIC PRESSURE, (P_s) +2.4
FILTER NUMBER (s) 25413

PROBE LENGTH AND TYPE 4'
NOZZLE I.D. .183
ASSUMED MOISTURE, % 3%
SAMPLE BOX NUMBER 1
METER BOX NUMBER 1225
METER $\Delta H_@$ 1.92
C FACTOR
PITOT TUBE FACTOR SA
REFERENCE Δp 1.4
NOTE

READ AND RECORD ALL DATA EVERY 4 MINUTES

TRAVERSE POINT NUMBER	SAMPLING TIME, min	CLOCK TIME (24-hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O DESIRED	ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET $(T_{m\,in})$, °F	OUTLET $(T_{m\,out})$, °F	PUMP VACUUM in. Hg
	0	09:15	887.187							
1	4		891.0	2.0	2.7	2.7	98	98	96	2.0
2	8		894.9	2.0	2.7	2.7	97	101	96	2.0
3	12		* 898.8	2.0	2.7	2.7	97	106	96	2.0
4	16		902.8	2.0	2.7	2.7	97	108	96	2.0
5	20		906.9	2.0	2.7	2.7	94	108	96	2.0
6	24		910.9	2.0	2.7	2.7	99	110	98	2.0
7	28		914.9	2.0	2.7	2.7	97	112	98	2.0
8	32		918.9	2.0	2.7	2.7	93	114	98	2.0
9	36		923.0	2.0	2.7	2.7	97	116	100	2.0
10	40		927.0	2.0	2.7	2.7	98	116	100	2.0
11	44		931.0	2.0	2.7	2.7	96	118	100	2.0
12	48		935.0	2.0	2.7	2.7	97	118	101	2.0
13	52		939.1	2.0	2.7	2.7	101	118	102	2.0
14	56		943.1	2.0	2.7	2.7	100	118	103	2.0
15	60		947.0	2.0	2.7	2.7	104	120	103	2.0
16	64	10:15	951.048	2.0	2.7	2.7	104	120	103	2.0
			√ 63.861	√ 1.41421	2.7		98.0625	105.54375		

1.41421	$\sqrt{\Delta P}$
2.7	ΔH
98.0625	TS
105.84375	TM
63.861	VMA
23.98	PBAR
0.	VWC
17.	WSG
28.97	MWD
0.21305	AS
64.	TT
2.4	STAT
0.183	DN
1.006	Y
0.855	CP
17.	TH2O
48.44377079	VMS
0.80155	VWS
1.627667334	%M
.9837233267	MD
28.79144489	MWS
24.15647059	PS
92.59515966	VACT
1183.643926	QACT
69.57973678	VSTD
889.4377753	QSTD
99.26393069	%I
0.0206	FHWT
0.	T WT
.0065622307	FHGR
0.050028655	FHLB
0.	T GR
0.	T LB

* NOTE: STOPPED BOX APPROX. 20 MINUTES TO LET EVERYBODY TO CATCH UP

FIELD DATA

PLANT EXXON MINERAL
DATE 10/1/79
SAMPLING LOCATION PACKAGING AREA DUST INLET
SAMPLE TYPE PARTICULATE
RUN NUMBER 2
OPERATOR ROE (ICUSTON)
AMBIENT TEMPERATURE 104°F
BAROMETRIC PRESSURE 30.13
STATIC PRESSURE, (P_s) +2.5
FILTER NUMBER (s) 25450

17.4133

PROBE LENGTH AND TYPE 4'
NOZZLE I.D. .183
ASSUMED MOISTURE, % 3%
SAMPLE BOX NUMBER 1
METER BOX NUMBER 1225
METER $\Delta H_@$ 1.92
C FACTOR
PITOT TUBE FACTOR 5A
REFERENCE Δp 1.4
NOTE

READ AND RECORD ALL DATA EVERY 4 MINUTES

TRAVERSE POINT NUMBER	SAMPLING TIME, min / CLOCK TIME (24-hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O DESIRED	ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET $(T_{m\,in})$, °F	OUTLET $(T_{m\,out})$, °F	PUMP VACUUM, in. Hg
	0 1430	951.499							
1	4	955.1	1.8	2.4	2.4	103	108	108	2.0
2	8	959.0	1.8	2.4	2.4	107	112	108	2.0
3	12	962.8	1.8	2.4	2.4	107	114	108	2.0
4	16	966.6	1.8	2.4	2.4	106	116	108	2.0
5	20	970.4	1.8	2.4	2.4	103	120	108	2.0
6	24	974.3	1.8	2.4	2.4	103	120	108	2.0
7	28	978.2	1.8	2.4	2.4	107	122	108	2.0
8	32	982.0	1.8	2.4	2.4	104	122	108	2.0
9	36	985.9	1.8	2.4	2.4	103	123	108	2.0
10	40	989.7	1.7	2.3	2.3	105	123	109	2.0
11	44	993.5	1.7	2.3	2.3	106	124	109	2.0
12	48	997.2	1.7	2.3	2.3	106	124	110	2.0
13	52	001.0	1.8	2.4	2.4	106	124	110	2.0
14	56	004.8	1.8	2.4	2.4	106	124	110	2.0
15	60	008.7	1.8	2.4	2.4	108	124	110	2.0
16	64	012.645	1.8	2.4	2.4	105	124	110	2.0
	1540								
		61.146	1.33455	2.38125		105.31	114.5		

1.33455	ΔP
2.38125	ΔH
105.31	TS
114.5	TM
61.146	VMA
23.98	PBAR
0.	VWC
20.2	WSG
28.97	MWD
0.21305	AS
64.	TT
2.5	STAT
0.183	DN
1.006	Y
0.855	CP
20.2	TH2O
45.64104502	VMS
0.95243	VWS
2.044127422	%M
.9795587258	MD
28.74575922	MWS
24.16382353	PS
88.00146375	VACT
1124.922711	QACT
65.02348566	VSTD
831.1952172	QSTD
100.0740883	%I
0.0102	FHWT
0.	T WT
.0034487404	FHGR
.0245709306	FHLB
0.	T GR
0.	T LB

A-137

A-138

FIELD DATA

PLANT Exxon Mineral
DATE 10/11/79
SAMPLING LOCATION Packaging Area Duct Inlet
SAMPLE TYPE Particulate
RUN NUMBER 3
OPERATOR Bob Weston
AMBIENT TEMPERATURE 70°
BAROMETRIC PRESSURE 30.13
STATIC PRESSURE, (P_s) +2.3
FILTER NUMBER (s) 25456

PROBE LENGTH AND TYPE 4' B
NOZZLE I.D. .185
ASSUMED MOISTURE, % 3%
SAMPLE BOX NUMBER 1
METER BOX NUMBER 1225
METER $\Delta H_@$ 1.92
C FACTOR
PITOT TUBE FACTOR
REFERENCE Δp 1.4
NOTE

READ AND RECORD ALL DATA EVERY 4 MINUTES

TRAVERSE POINT NUMBER	SAMPLING TIME, min	CLOCK TIME (24-hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O DESIRED	ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m\,in}$), °F	OUTLET ($T_{m\,out}$), °F	PUMP VACUUM, in. Hg
	0	14:45	017.651							
1	4		021.4	1.8	2.4	2.4	108	116	112	2.0
2	8		025.2	1.9	2.5	2.5	109	118	112	2.0
3	12		029.1	1.9	2.5	2.5	109	122	112	2.0
4	16		033.0	1.9	2.5	2.5	110	124	112	2.0
5	20		037.0	1.9	2.5	2.5	112	126	113	2.0
6	24		040.9	1.9	2.5	2.5	111	126	114	2.0
7	28		044.9	1.9	2.5	2.5	111	126	114	2.0
8	32		048.8	1.9	2.5	2.5	111	127	114	2.0
9	36		052.8	1.9	2.5	2.5	111	127	114	2.0
10	40		056.9	1.9	2.5	2.5	110	128	115	2.0
11	44		060.8	1.9	2.5	2.5	110	128	116	2.0
12	48		064.9	1.9	2.5	2.5	111	129	116	2.0
13	52		068.9	1.9	2.5	2.5	112	129	116	2.0
14	56		072.8	1.9	2.5	2.5	112	129	116	2.0
15	60		076.8	1.9	2.5	2.5	113	129	116	2.0
16	64	15:45	080.665	1.9	2.5	2.5	111	130	116	2.0
			63.014	1.3761	2.49375		110.6875	120.0625		

1.3761	ΔP
2.49375	ΔH
110.688	TS
120.063	TM
63.014	VMA
23.98	PBAR
0.	VWC
15.4	WSG
28.97	MWD
0.21305	AS
64.	TT
2.3	STAT
0.183	DN
1.006	Y
0.855	CP
15.4	TH2O
46.60023924	VMS
0.72611	VWS
1.534261593	%M
.9846573841	MD
28.8016915	MWS
24.14911765	PS
91.11107403	VACT
1164.672859	QACT
66.9930454	VSTD
856.3720993	QSTD
99.17329326	%I
0.0097	FHWT
0.	T WT
.0032122239	FHGR
.0235787118	FHLB
0.	T GR
0.	T LB

FUGITIVE EMISSION INSPECTION

Company EXXON MINERAL	Inspector BOB CAPRARA
Location BARREL FILLING	Affilitation ROY F. WESTON INC
Company Rep. TOM YARNICK	Date 10/1
Sky Conditions N/A	Wind Direction N/A
Precipitation N/A	Wind Speed N/A
Facility Type URANIUM MILL	Emission Source BARREL FILLING BARRELING ENCLOSURE AREA

Sketch emission source, indicate observer position relative to source; indicate potential emission points and/or actual emission points.

OBSERVATIONS

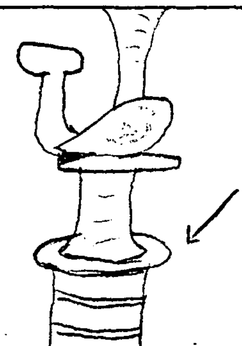
Illumination = 9 f.c.

	Time	Accumulated Observation Period (Min: Sec)	Accumulated Emission Time (Min: Sec)
Begin Observation	0930-0950	20:00	0:0
	0955-1015	20:00	0:0
	1020-1040	20:00	0:0
End Observation			

FUGITIVE EMISSION
INSPECTION

Company EXXON MINERAL	Inspector BOB CAPRARA
Location BARREL FILLING	Affiliation ROY F. WESTON
Company Rep. TOM YARNICK	Date 10/1
Sky Conditions N/A	Wind Direction N/A
Precipitation N/A	Wind Speed N/A
Facility Type URANIUM MILL	Emission Source BARREL FILLER

Sketch emission source, indicate observer position relative to source; indicate potential emission points and/or actual emission points.



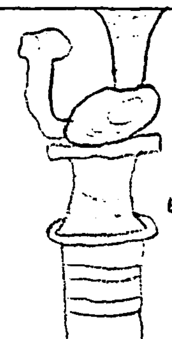
OBSERVATIONS

	Time	Accumulated Observation Period (Min: Sec)	Accumulated Emission Time (Min: Sec)
Begin Observation	1230 - 1250	20:00	0:0
	1255 - 1315	20:00	0:0
	1320 - 1335	15:00	0:0
End Observation			

FUGITIVE EMISSION INSPECTION

Company EXXON MINERAL	Inspector BOB CAPRARA
Location HIGHLAND MINE	Affiliation ROY F. WESTON
Company Rep. TOM YARNICK	Date 10/1
Sky Conditions N/A	Wind Direction N/A
Precipitation N/A	Wind Speed N/A
Facility Type URANIUM MILL	Emission Source BARREL FILLER

Sketch emission source, indicate observer position relative to source; indicate potential emission points and/or actual emission points.



OBSERVATIONS	Time	Accumulated Observation Period (Min: Sec)	Accumulated Emission Time (Min: Sec)
Begin Observation	1435-1455	20:00	0:0
	1500-1520	20:00	0:0
	1525-1540	15:00	0:0
End Observation			

RECORD OF VISIBLE EMISSIONS

Company Name Exxon Mineral Date 10-1-79

Plant Address , Wyoming Observer C. Dobroski

Stack Location ~~Barrel Fill~~ Packaging Enclosure Observer's Location 15' from source, eye level.

Weather Conditions Indoor

TIME HR	MIN	SECONDS 00	15	30	45	COMMENTS
09	30	0	0	0	0	Start Test #1
	31	0	0	0	0	
	32	0	0	0	0	
	33	0	0	0	0	
	34	0	0	0	0	
	35	0	0	0	0	
	36	0	0	0	0	
	37	0	0	0	0	0930 - 1034 - 64
	38	0	0	0	0	1230 - 1333 - 63
	39	0	0	0	0	1435 - 1545 - 70
	40	0	0	0	0	197
	41	0	0	0	0	
	42	0	0	0	0	
	43	0	0	0	0	
	44	0	0	0	0	
	45	0	0	0	0	
	46	0	0	0	0	
	47	0	0	0	0	
	48	0	0	0	0	
	49	0	0	0	0	
	50	0	0	0	0	
	51	0	0	0	0	
	52	0	0	0	0	
	53	0	0	0	0	
	54	0	0	0	0	
	55	0	0	0	0	
	56	0	0	0	0	
	57	0	0	0	0	
	58	0	0	0	0	
	59	0	0	0	0	

RECORD OF VISIBLE EMISSIONS

Company Name Exxon Mineral
Date 10-1 [redacted] -79

Plant Address Wyoming
Observer C. Dobroski

Stack Location Packaging Enclosure
Observer's Location 15' from source - eye level

Weather Conditions

HR	MIN	00	15	30	45	COMMENTS
10	00	0	0	0	0	
	01	0	0	0	0	
	02	0	0	0	0	
	03	0	0	0	0	
	04	0	0	0	0	
	05	0	0	0	0	
	06	0	0	0	0	
	07	0	0	0	0	
	08	0	0	0	0	
	09	0	0	0	0	
	10	0	0	0	0	
	11	0	0	0	0	
	12	0	0	0	0	
	13	0	0	0	0	
	14	0	0	0	0	
	15	0	0	0	0	
	16	0	0	0	0	
	17	0	0	0	0	
	18	0	0	0	0	
	19	0	0	0	0	
	20	0	0	0	0	
	21	0	0	0	0	
	22	0	0	0	0	
	23	0	0	0	0	
	24	0	0	0	0	
	25	0	0	0	0	
	26	0	0	0	0	
	27	0	0	0	0	
	28	0	0	0	0	
	29	0	0	0	0	

RECORD OF VISIBLE EMISSIONS

Company Name Exxon Mineral Date 10-1-79

Plant Address , Wyoming Observer C. Doboski

Stack Location Packaging Enclosure Observer's Location 15' from source, eye level

Weather Conditions

TIME						COMMENTS
HR	MIN	SECONDS				
		00	15	30	45	
10	30	0	0	0	0	
	31	0	0	0	0	
	32	0	0	0	0	
	33	0	0	0	0	
	34	0	0	0	0	
10	35	0				End Test #1
	36					
	37					
	38					
	39					
	40					
	41					
	42					
	43					
	44					
	45					
	46					
	47					
	48					
	49					
	50					
	51					
	52					
	53					
	54					
	55					
	56					
	57					
	58					
	59					

RECORD OF VISIBLE EMISSIONS

Company Name Exxon Mineral　　Date 10-1-79

Plant Address , Wyoming　　Observer C. Dobroski

Stack Location Packaging Enclosure　　Observer's Location 15' from source, eye level

Weather Conditions

TIME						COMMENTS
HR	MIN	SECONDS				
		00	15	30	45	
12	30	0	0	0	0	Start Test #2
	31	0	0	0	0	
	32	0	0	0	0	
	33	0	0	0	0	
	34	0	0	0	0	
	35	0	0	0	0	
	36	0	0	0	0	
	37	0	0	0	0	
	38	0	0	0	0	
	39	0	0	0	0	
	40	0	0	0	0	
	41	0	0	0	0	
	42	0	0	0	0	
	43	0	0	0	0	
	44	0	0	0	0	
	45	0	0	0	0	
	46	0	0	0	0	
	47	0	0	0	0	
	48	0	0	0	0	
	49	0	0	0	0	
	50	0	0	0	0	
	51	0	0	0	0	
	52	0	0	0	0	
	53	0	0	0	0	
	54	0	0	0	0	
	55	0	0	0	0	
	56	0	0	0	0	
	57	0	0	0	0	
	58	0	0	0	0	
	59	0	0	0	0	

RECORD OF VISIBLE EMISSIONS

Company Name Exxon Mineral Date 10-1-79

Plant Address , Wyoming Observer C. Dobroski

Stack Location Packaging Enclosure Observer's Location 15' from source, eye level

Weather Conditions ______

HR	MIN	SECONDS 00	15	30	45	COMMENTS
13	00	0	0	0	0	
	01	0	0	0	0	
	02	0	0	0	0	
	03	0	0	0	0	
	04	0	0	0	0	
	05	0	0	0	0	
	06	0	0	0	0	
	07	0	0	0	0	
	08	0	0	0	0	
	09	0	0	0	0	
	10	0	0	0	0	
	11	0	0	0	0	
	12	0	0	0	0	
	13	0	0	0	0	
	14	0	0	0	0	
	15	0	0	0	0	
	16	0	0	0	0	
	17	0	0	0	0	
	18	0	0	0	0	
	19	0	0	0	0	
	20	0	0	0	0	
	21	0	0	0	0	
	22	0	0	0	0	
	23	0	0	0	0	
	24	0	0	0	0	
	25	0	0	0	0	
	26	0	0	0	0	
	27	0	0	0	0	
	28	0	0	0	0	
	29	0	0	0	0	

RECORD OF VISIBLE EMISSIONS

Company Name Exxon Mineral Date 10-1-79

Plant Address , Wyoming Observer C. [illegible]

Stack Location Packaging Enclosure Observer's Location 15' from source, eye level

Weather Conditions

TIME						COMMENTS
HR	MIN	SECONDS				
		00	15	30	45	
13	30	0	0	0	0	
	31	0	0	0	0	
	32	0	0	0	0	
	33	0	0	0	0	
13	34	0				End Test #2
	35					
	36					
	37					
	38					
	39					
	40					
	41					
	42					
	43					
	44					
	45					
	46					
	47					
	48					
	49					
	50					
	51					
	52					
	53					
	54					
	55					
	56					
	57					
	58					
	59					

RECORD OF VISIBLE EMISSIONS

Company Name Exxon Mineral Date 10-1-79

Plant Address , Wyoming Observer C. Dobeoski

Stack Location Packaging Enclosure Observer's Location 15' from source, eye level

Weather Conditions

TIME HR	MIN	SECONDS 00	15	30	45	COMMENTS
	30					
	31					
	32					
	33					
	34					
14	35	0	0	0	0	Start Test #3
	36	0	0	0	0	
	37	0	0	0	0	
	38	0	0	0	0	
	39	0	0	0	0	
	40	0	0	0	0	
	41	0	0	0	0	
	42	0	0	0	0	
	43	0	0	0	0	
	44	0	0	0	0	
	45	0	0	0	0	
	46	0	0	0	0	
	47	0	0	0	0	
	48	0	0	0	0	
	49	0	0	0	0	
	50	0	0	0	0	
	51	0	0	0	0	
	52	0	0	0	0	
	53	0	0	0	0	
	54	0	0	0	0	
	55	0	0	0	0	
	56	0	0	0	0	
	57	0	0	0	0	
	58	0	0	0	0	
	59	0	0	0	0	

RECORD OF VISIBLE EMISSIONS

Company Name Exxon Mineral Date 10-1-79

Plant Address Wyoming Observer C. [illegible]

Stack Location Packaging Enclosure Observer's Location 15' from source - eye level

Weather Conditions

TIME						COMMENTS
HR	MIN	SECONDS				
		00	15	30	45	
15	30	0	0	0	0	
	31	0	0	0	0	
	32	0	0	0	0	
	33	0	0	0	0	
	34	0	0	0	0	
15	35	0	0	0	0	
	36	0	0	0	0	
	37	0	0	0	0	
	38	0	0	0	0	
	39	0	0	0	0	
	40	0	0	0	0	
	41	0	0	0	0	
	42	0	0	0	0	
	43	0	0	0	0	
	44	0	0	0	0	
15	45	0	0	0	0	End Test #3
	46					
	47					
	48					
	49					
	50					
	51					
	52					
	53					
	54					
	55					
	56					
	57					
	58					
	59					

RECORD OF VISIBLE EMISSIONS

Company Name Exxon Mineral

Date 10-1-79

Plant Address , Wyoming

Observer C. Dobroski

Stack Location Packaging Enclosure

Observer's Location 15' from source; eye level

Weather Conditions

HR	MIN	00	15	30	45	COMMENTS
15	00	0	0	0	0	
	01	0	0	0	0	
	02	0	0	0	0	
	03	0	0	0	0	
	04	0	0	0	0	
	05	0	0	0	0	
	06	0	0	0	0	
	07	0	0	0	0	
	08	0	0	0	0	
	09	0	0	0	0	
	10	0	0	0	0	
	11	0	0	0	0	
	12	0	0	0	0	
	13	0	0	0	0	
	14	0	0	0	0	
	15	0	0	0	0	
	16	0	0	0	0	
	17	0	0	0	0	
	18	0	0	0	0	
	19	0	0	0	0	
	20	0	0	0	0	
	21	0	0	0	0	
	22	0	0	0	0	
	23	0	0	0	0	
	24	0	0	0	0	
	25	0	0	0	0	
	26	0	0	0	0	
	27	0	0	0	0	
	28	0	0	0	0	
	29	0	0	0	0	

TRAVERSE POINT LOCATION FOR CIRCULAR DUCTS

PLANT Exxon Uran
DATE 9-30-79
SAMPLING LOCATION Dryer OUTLET
INSIDE OF FAR WALL TO OUTSIDE OF PORT, (DISTANCE A) 17 1/2
INSIDE OF NEAR WALL TO OUTSIDE OF PORT, (DISTANCE B) 4"
STACK I.D., (DISTANCE A - DISTANCE B) 13 1/2
NEAREST UPSTREAM DISTURBANCE 29 1/2 2 I.D.
NEAREST DOWNSTREAM DISTURBANCE ~~[illegible]~~ 83 6.14 I.D.
CALCULATOR Celiano

SCHEMATIC OF SAMPLING LOCATION

TRAVERSE POINT NUMBER	FRACTION OF STACK I.D.	STACK I.D.	PRODUCT OF COLUMNS 2 AND 3 (TO NEAREST 1/8 INCH)	DISTANCE B	TRAVERSE POINT LOCATION FROM OUTSIDE OF PORT (SUM OF COLUMNS 4 & 5)
X,Y 1	.032	13 1/2"	1/2	4"	4 1/2
2	.105		1 3/8		5 3/8
3	.194		2 5/8		6 5/8
4	.323		4 3/8		8 3/8
5	.677		9 1/4		13 1/4
6	.806		10 7/8		14 7/8
7	.895		12		16
8	.968		13		17

PRELIMINARY VELOCITY TRAVERSE

PLANT Exxon Uran.
DATE 9-30-79
LOCATION Outlet
STACK I.D. 13.5"
BAROMETRIC PRESSURE, in. Hg 23.98
STACK GAUGE PRESSURE, in. H_2O .90
OPERATORS Coliano

SCHEMATIC OF TRAVERSE POINT LAYOUT

TRAVERSE POINT NUMBER	VELOCITY HEAD (Δp_s), in. H_2O	STACK TEMPERATURE (T_s), °F
X-1	.27	129
2	.38	131
3	.26	130
4	.95	131
5	1.20	130
6	1.25	131
7	1.20	131
8	.95	131
AVERAGE	.81	130

TRAVERSE POINT NUMBER	VELOCITY HEAD (Δp_s), in. H_2O	STACK TEMPERATURE (T_s), °F
Y-1		
2		
3		
4		
5		
6		
7		
8		
AVERAGE		

NOMOGRAPH DATA

PLANT Exxon Uran.

DATE 9-30-79

SAMPLING LOCATION Scrubber outlet

CONTROL BOX NO. 2253

CALIBRATED PRESSURE DIFFERENTIAL ACROSS ORIFICE, in. H_2O	$\Delta H_@$	1.86
AVERAGE METER TEMPERATURE (AMBIENT + 20 °F), °F	$T_{m\,avg.}$	100
PERCENT MOISTURE IN GAS STREAM BY VOLUME	B_{wo}	13.0
BAROMETRIC PRESSURE AT METER, in. Hg	P_m	24.0
STATIC PRESSURE IN STACK, in. Hg ($P_m \pm 0.073$ x STACK GAUGE PRESSURE in in. H_2O)	P_s	24.0
RATIO OF STATIC PRESSURE TO METER PRESSURE	P_s / P_m	1.00
AVERAGE STACK TEMPERATURE, °F	$T_{s\,avg.}$	130
AVERAGE VELOCITY HEAD, in. H_2O	$\Delta p_{avg.}$	.81
MAXIMUM VELOCITY HEAD, in. H_2O	$\Delta p_{max.}$	1.25
C FACTOR	.97	
CALCULATED NOZZLE DIAMETER, in.	.235	
ACTUAL NOZZLE DIAMETER, in.	.235	
REFERENCE Δp, in. H_2O	.65	

FIELD DATA

PLANT Exxon Uran.
DATE 10-1-79
SAMPLING LOCATION Scrub. outlet
SAMPLE TYPE Part
RUN NUMBER 1
OPERATOR Caliano
AMBIENT TEMPERATURE 100
BAROMETRIC PRESSURE 23.98
STATIC PRESSURE, (P_s) +.90
FILTER NUMBER (s) 25451

PROBE LENGTH AND TYPE 5'
NOZZLE I.D. .235
ASSUMED MOISTURE, % 13
SAMPLE BOX NUMBER 1
METER BOX NUMBER 22
METER $\Delta H_@$ 1.86
C FACTOR .9
PITOT TUBE FACTOR .8
REFERENCE Δp .6
NOTE

READ AND RECORD ALL DATA EVERY 4 MINUTES

TRAVERSE POINT NUMBER	SAMPLING TIME, min	CLOCK TIME (24-hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O DESIRED	ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m\,in}$), °F	OUTLET ($T_{m\,out}$), °F	PUMP VACUUM in. Hg
		0939	49.810							
X-1			52.500	.54	1.51	1.51	129	86	85	4.
2			56.500	.97	2.73	2.73	127	90	86	7
3			60.500	1.00	2.81	2.81	126	99	86	7
4			64.600	1.05	2.92	2.92	123	106	87	8
5			68.900	1.10	3.05	3.05	122	111	89	8
6			73.000	1.10	3.05	3.05	122	115	91	8
7			77.500	1.10	3.05	3.05	124	118	92	8
8		1015	81.855	1.10	3.05	3.05	127	121	94	8
		1020								
Y-1			85.600	.85	2.45	2.45	142	99	95	6.
2			89.400	1.10	3.05	3.05	137	119	99	8
3			94.000	1.10	3.05	3.05	136	126	100	8
4			99.000	1.10	3.05	3.05	135	129	102	8
5			102.700	1.10	3.05	3.05	135	131	104	8
6			106.750	1.10	3.05	3.05	134	132	106	8.
7			111.000	1.05	2.92	2.92	134	134	107	9.
8		1052	115.385	1.00	2.81	2.81	135	134	108	9.
			65.575	1.00815	2.85		130.5		105.65	

1.00815	ΓP
2.85	ΔH
130.5	TS
105.65	TM
65.575	VMA
23.98	PBAR
145.	VWC
29.5	WSG
28.97	MWD
.9940195505	AS
64.	TT
0.9	STAT
0.235	DN
0.9979	Y
0.855	CP
144.5	TH2O
49.38287425	VMS
6.803975	VWS
12.10955071	%M
.8789044929	MD
27.64158229	MWS
24.04617647	PS
69.45636846	VACT
4142.459289	QACT
43.86829655	VSTD
2616.356665	QSTD
97.32588407	%I
0.401	FHWT
0.	T WT
.1253112966	FHGR
2.810211027	FHLB
0.	T GR
0.	T LB

A-154

DRY MOLECULAR WEIGHT DETERMINATION

PLANT EXXON · URAN

DATE 10-1-79

SAMPLING TIME (24-hr CLOCK)

SAMPLING LOCATION SCRUBBER OUTLET

SAMPLE TYPE (BAG, INTEGRATED, CONTINUOUS) GRAB

ANALYTICAL METHOD ORSAT

AMBIENT TEMPERATURE 112

OPERATOR V.M.

COMMENTS:

Run 1

GAS \ RUN	1		2		3		AVERAGE NET VOLUME	MULTIPLIER	MOLECULAR WEIGHT OF STACK GAS (DRY BASIS) M_d, lb/lb-mole
	ACTUAL READING	NET	ACTUAL READING	NET	ACTUAL READING	NET			
CO_2	1.6	1.6	1.5	1.5	1.6	1.6	1.56	44/100	0.689
O_2 (NET IS ACTUAL O_2 READING MINUS ACTUAL CO_2 READING)	19.4	17.8	19.4	17.9	19.6	18.0	17.9	32/100	5.728
CO (NET IS ACTUAL CO READING MINUS ACTUAL O_2 READING)	19.4	0.0	19.4	0.0	19.6	0.0	0.0	28/100	0.000
N_2 (NET IS 100 MINUS ACTUAL CO READING)	80.6	80.6	80.6	80.6	80.4		80.53	28/100	22.55
								TOTAL	28.97

FIELD DATA

PLANT Exxon Uran
DATE 10-1-79
SAMPLING LOCATION S. outlet
SAMPLE TYPE Parts
RUN NUMBER 2
OPERATOR Celiano
AMBIENT TEMPERATURE 78°
BAROMETRIC PRESSURE 23.98
STATIC PRESSURE, (P_s) +1.03
FILTER NUMBER (s) 25451

PROBE LENGTH AND TYPE 5' Bor
NOZZLE I.D. .235
ASSUMED MOISTURE, % 13
SAMPLE BOX NUMBER 1
METER BOX NUMBER 2253
METER $\Delta H_@$ 1.86
C FACTOR .97
PITOT TUBE FACTOR 8A
REFERENCE Δp .65
NOTE

READ AND RECORD ALL DATA EVERY 4 MINUTES

TRAVERSE POINT NUMBER	SAMPLING TIME, min / CLOCK TIME (24-hr CLOCK)	GAS METER READING (V_m), ft³	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O DESIRED	ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m\,in}$), °F	OUTLET ($T_{m\,out}$), °F	PUMP VACUUM, in. Hg
	1226	316.566							
Y-1		19.950	.67	1.91	1.91	137	106	105	2.5
2		23.500	.80	2.30	2.30	138	122	108	3
3		27.600	1.00	2.80	2.80	138	128	109	4
4		31.950	1.05	2.95	2.95	138	133	110	4
5		36.000	.98	2.70	2.70	135	134	111	3.5
6		40.200	1.05	2.95	2.95	135	135	111	4
7	1258	44.500	1.05	2.95	2.95	131	135	112	4
8	1307	49.076	1.10	3.05	3.05	130	136	112	4.5
X-1		52.000	.59	1.67	1.67	137	110	107	2.0
2		55.750	.75	2.18	2.18	137	124	111	2.5
3		59.500	.80	2.30	2.30	138	128	111	3.0
4		63.400	.81	2.34	2.34	139	130	111	3.0
5		67.400	.83	2.40	2.40	141	132	112	3.5
6		71.200	.85	2.50	2.50	140	132	112	3.5
7		75.150	.85	2.50	2.50	138	134	113	3.5
8	1339	79.268	.83	2.40	2.40	139	133	113	3.5
		62.702	.9325		2.494	136.94		119.38	

0.9325	ΔP
2.494	ΔH
136.94	TS
119.38	TM
62.702	VMA
23.98	PBAR
144.	VWC
26.5	WSG
28.99	MWD
0.99401	AS
64.	TT
1.03	STAT
0.235	DN
0.9979	Y
0.855	CP
170.5	TH2O
46.05041291	VMS
8.027555	VWS
14.84440949	%M
.8515559051	MD
27.3585994	MWS
24.05573529	PS
64.9141485	VACT
3871.518765	QACT
39.31075367	VSTD
2344.516935	QSTD
101.2802869	%I
0.1515	FHWT
0.	T WT
.0507693168	FHGR
1.020249653	FHLB
0.	T GR
0.	T LB

DRY MOLECULAR WEIGHT DETERMINATION

PLANT EXXON-URAN

COMMENTS: Run 2

DATE 10-1-79

SAMPLING TIME (24-hr CLOCK)

SAMPLING LOCATION SCRUBBER OUTLET

SAMPLE TYPE (BAG, INTEGRATED, CONTINUOUS) GRAB

ANALYTICAL METHOD ORSAT

AMBIENT TEMPERATURE 112°

OPERATOR V.M.

GAS \ RUN	1		2		3		AVERAGE NET VOLUME	MULTIPLIER	MOLECULAR WEIGHT OF STACK GAS (DRY BASIS) M_d, lb/lb-mole
	ACTUAL READING	NET	ACTUAL READING	NET	ACTUAL READING	NET			
CO_2	1.6	1.6	1.8	1.8	1.7	1.7	1.7	44/100	.748
O_2 (NET IS ACTUAL O_2 READING MINUS ACTUAL CO_2 READING)	19.4	17.8	19.6	17.8	19.4	17.7	17.8	32/100	5.69
CO (NET IS ACTUAL CO READING MINUS ACTUAL O_2 READING)	19.4	0.0	19.6	0.0	19.4	0.0	0.0	28/100	0.000
N_2 (NET IS 100 MINUS ACTUAL CO READING)	80.6	80.6	80.4	80.4	80.6	80.6	80.5	28/100	22.54
								TOTAL	28.99

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FIELD DATA

PLANT Exxon Uran
DATE 10-1-79
SAMPLING LOCATION S. outlet
SAMPLE TYPE Parts
RUN NUMBER 3
OPERATOR Coliano
AMBIENT TEMPERATURE 80°
BAROMETRIC PRESSURE
STATIC PRESSURE, (P_s) +1.00
FILTER NUMBER (s) 25454

PROBE LENGTH AND TYPE 5' Be
NOZZLE I.D. .235
ASSUMED MOISTURE, % 13
SAMPLE BOX NUMBER 1
METER BOX NUMBER 2252
METER $\Delta H_@$ 1.86
C FACTOR .97
PITOT TUBE FACTOR 8A
REFERENCE Δp .65
NOTE
L.(
L.(

READ AND RECORD ALL DATA EVERY 4 MINUTES

TRAVERSE POINT NUMBER	SAMPLING TIME, min / CLOCK TIME (24-hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O DESIRED	ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m\,in}$), °F	OUTLET ($T_{m\,out}$), °F	PUMP VACUUM, in. Hg
	1439	380.618							
X-1		84.000	.66	1.87	1.87	124	100	99	4.5
2		87.800	.85	2.45	2.45	126	115	102	6
3		91.850	.95	2.75	2.75	127	124	103	7
4		95.900	.96	2.80	2.80	128	129	105	7
5		100.000	1.02	2.93	2.93	127	132	106	7
6		104.400	1.08	3.00	3.00	127	134	108	7.5
7	1510	109.000	1.10	3.05	3.05	127	136	109	7.5
8	1518	113.258	1.10	3.05	3.05	129	137	110	8.0
y-1		117.350	1.10	3.05	3.05	126	114	109	8.0
2		120.650	1.10	3.05	3.05	125	131	112	8.0
3		125.900	1.10	3.05	3.05	124	133	113	8.0
4		130.500	1.10	3.05	3.05	125	134	113	8.0
5		134.650	1.00	2.90	2.90	125	136	114	8.0
6		139.000	1.08	3.00	3.00	123	139	115	8.0
7		143.200	1.05	2.96	2.96	122	140	116	8.5
6	1550	147.002	.70	2.01	2.01	121	140	116	7.5
		66.384	.9957	2.81		125.37	119.5		

0.9957	Γ.B
2.81	ΔH
125.37	TS
119.5	TM
66.384	VMA
23.98	PBAR
94.	VWC
24.5	WSG
28.98	MWD
0.994	AS
64.	TT
1.	STAT
0.235	DN
0.9979	Y
0.855	CP
118.5	TH2O
48.79137134	VMS
5.579755	VWS
10.26234948	%M
.8973765052	MD
27.85319403	MWS
24.05352941	PS
68.02965402	VACT
4057.288566	QACT
44.26823346	VSTD
2640.157443	QSTD
95.29137581	%I
0.0847	FHWT
0.	T WT
.0267893762	FHGR
.6062394437	FHLB
0.	T GR
0.	T LB

DRY MOLECULAR WEIGHT DETERMINATION

PLANT Exxon Uran.
DATE 10-1-79
SAMPLING TIME (24-hr CLOCK) 1330
SAMPLING LOCATION Scrubber outlet
SAMPLE TYPE (BAG, INTEGRATED, CONTINUOUS) grab
ANALYTICAL METHOD ORSAT
AMBIENT TEMPERATURE 112°
OPERATOR V. M

COMMENTS: Run 3

RUN / GAS 1	1451 1 ACTUAL READING	NET	2 ACTUAL READING	NET	3 ACTUAL READING	NET	AVERAGE NET VOLUME	MULTIPLIER	MOLECULAR WEIGHT OF STACK GAS (DRY BASIS) M_d, lb/lb-mole
CO_2	1.5	1.5	1.7	1.7	1.6	1.6	1.6	44/100	.710
O_2 (NET IS ACTUAL O_2 READING MINUS ACTUAL CO_2 READING)	19.4	17.9	19.5	17.8	19.5	17.9	17.9	32/100	5.728
CO (NET IS ACTUAL CO READING MINUS ACTUAL O_2 READING)	19.4	0.0	19.5	0.0	19.5	0.0	0.0	28/100	0.00
N_2 (NET IS 100 MINUS ACTUAL CO READING)	80.6	80.6	80.5	80.5	80.5	80.5	80.5	28/100	22.54
								TOTAL	28.98

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RECORD OF VISIBLE EMISSIONS

Company Name Exxon Uranium Date 10/1/79

Plant Address 25 miles NW Douglas Wyo. Observer T. Moxon

Stack Location Dryer Scrubber Outlet Observer's Location 150' South

Weather Conditions Clear Run 1

HR	MIN	TIME SECONDS 00	15	30	45	COMMENTS
0930	00	0	5	0	5	
	01	5	5	5	0	
	02	5	5	0	0	
	03	5	5	5	5	
	04	5	0	0	0	
	05	5	0	5	0	
	06	0	0	0	0	
	07	5	0	5	5	
	08	0	0	0	5	
	09	5	5	0	5	
	10	5	5	0	5	
	11	0	0	0	0	
	12	0	0	0	0	
	13	0	0	0	0	
	14	0	0	0	0	
	15	0	5	0	0	
	16	0	0	0	0	
	17	0	0	0	0	
	18	0	0	0	0	
	19	0	0	0	0	
	20	0	0	0	0	
	21	0	0	0	0	
	22	0	0	0	0	
	23	0	0	0	0	
	24	0	0	5	0	
	25	0	0	0	0	
	26	0	0	0	0	
	27	0	0	0	0	
	28	0	0	0	0	
	29	0	0	0	0	

RECORD OF VISIBLE EMISSIONS

Company Name Exxon Uranium

Date 10/[illegible]/79

Plant Address 25 mi NW Douglas Wyo

Observer T. Maxon

Stack Location Dryer Scrubber Outlet

Observer's Location 150' South

Weather Conditions Clear

TIME						COMMENTS
HR	MIN	SECONDS				
		00	15	30	45	
1000	30	0	0	0	0	
	31	0	0	0	0	
	32	0	0	0	0	
	33	0	0	0	0	
	34	0	0	0	0	
	35	0	0	0	0	
	36	0	0	0	0	
	37	0	0	0	0	
	38	0	0	0	0	
	39	0	0	0	0	
	40	0	0	0	0	
	41	0	0	0	0	
	42	0	0	0	0	
	43	0	0	0	0	
	44	0	0	0	0	
	45	0	0	0	0	
	46	0	0	0	0	
	47	0	0	0	0	
	48	0	0	0	0	
	49	0	0	0	0	
	50	0	0	0	0	
	51	0	0	0	0	
	52	0	0	0	0	
	53	0	0	0	0	
	54	0	0	0	0	
	55	0	0	0	0	
	56	0	0	0	0	
	57	0	0	0	0	
	58	0	0	0	0	
	59	0	0	0	0	

RECORD OF VISIBLE EMISSIONS

Company Name Exxon Uranium
Date 10/1/79
Plant Address 25 m N.W. Douglas Wyo.
Observer T. Moxon
Stack Location Dryer Scrubber Outlet
Observer's Location 150' South
Weather Conditions Clear
Run 1 - outlet

HR	MIN	SECONDS 00	15	30	45	COMMENTS
1						
1030	00	0	0	0	0	
	01	0	0	0	0	
	02	0	0	0	0	
	03	0	0	0	0	
	04	0				
	05					
	06					
	07					
	08					
	09					
	10					
	11					
	12					
	13					
	14					
	15					
	16					
	17					
	18					
	19					
	20					
	21					
	22					
	23					
	24					
	25					
	26					
	27					
	28					
	29					

RECORD OF VISIBLE EMISSIONS

Company Name Exxon Uranium Date 10/1/79

Plant Address 25 m NW Douglas Wyo Observer T. Moxon

Stack Location Dryer Scrubber Outlet Observer's Location 150' South

Weather Conditions Partly Cloudy

Run 2

HR	MIN	00	15	30	45	COMMENTS
12	30	5	5	5	5	
	31	10	5	0	5	
	32	5	5	10	5	
	33	5	0	10	5	
	34	10	10	0	5	
	35	5	5	5	5	0930 - 1034 - 64 min
	36	5	0	0	0	1230 - 1340 - 70 min
	37	5	0	0	10	1430 - 1535 - 65
	38	0	5	0	0	199
	39	5	5	10	5	
	40	5	10	0	10	
	41	5	5	0	0	
	42	10	5	10	10	
	43	15	0	5	5	
	44	0	5	5	5	
	45	5	0	5	5	
	46	10	0	0	0	
	47	0	10	5	0	
	48	5	0	0	0	
	49	5	5	0	0	
	50	5	10	5	5	
	51	10	5	10	0	
	52	5	5	0	0	
	53	10	5	10	5	
	54	0	5	15	5	
	55	5	5	5	5	
	56	5	5	5	5	
	57	5	5	5	0	
	58	0	0	0	5	
	59	5	5	10	0	

RECORD OF VISIBLE EMISSIONS

Company Name Exxon Uranium

Date 10/2/79

Plant Address 25 mi NW Douglas Wyoming

Observer T. Moran

Stack Location Dryer Scrubber Outlet

Observer's Location 150' South

Weather Conditions Clear

Run 2

HR	MIN	SECONDS 00	15	30	45	COMMENTS
13	00	5	10	5	5	
	01	5	0	10	5	
	02	15	5	5	10	
	03	10	5	5	0	
	04	10	0	10	5	
	05	0	0	0	0	
	06	0	0	0	5	
	07	5	5	0	0	
	08	0	5	0	5	
	09	5	0	0	5	
	10	0	5	10	5	
	11	5	5	5	0	
	12	10	5	0	5	
	13	0	0	5	5	
	14	0	5	0	5	
	15	5	0	5	5	
	16	0	0	0	0	
	17	5	0	5	5	
	18	5	0	0	5	
	19	5	5	5	5	
	20	5	0	0	5	
	21	10	0	5	5	
	22	5	5	0	10	
	23	5	5	5	5	
	24	0	0	5	0	
	25	0	0	5	5	
	26	5	5	5	5	
	27	5	5	5	5	
	28	0	5	5	5	
	29	5	5	5	10	
	~~30~~	~~5~~	~~5~~	~~0~~	~~0~~	

RECORD OF VISIBLE EMISSIONS

Company Name Exxon Uranium
Plant Address 25 m NW Douglas Wyo
Stack Location Dryer Scrubber Outlet
Weather Conditions clear

Date 10/2/79
Observer T. Moxon
Observer's Location 150' south
Run 2

TIME HR	MIN	SECONDS 00	15	30	45	COMMENTS
13	30	5	5	0	0	
	31	5	5	0	0	
	32	0	0	0	5	
	33	5	0	5	5	
	34	5	0	5	0	
	35	5	5	0	5	
	36	5	0	0	0	
	37	0	0	0	5	
	38	5	5	0	0	
	39	5	0	0	0	
	40	5	0	0	0	
	41					
	42					
	43					
	44					
	45					
	46					
	47					
	48					
	49					
	50					
	51					
	52					
	53					
	54					
	55					
	56					
	57					
	58					
	59					

RECORD OF VISIBLE EMISSIONS

Company Name Exxon Uranium Date 10/2/78

Plant Address 25 miles NW Douglas Wyo Observer T. Moxon

Stack Location Dryer Scrubber Outlet Observer's Location 150' South

Weather Conditions partly cloudy under clear skies

COMMENTS Run 3

TIME HR	MIN	SECONDS 00	15	30	45	COMMENTS
1430						
14	30	0	0	0	0	
14	31	0	0	0	0	
14	32	0	0	0	0	
	33	0	0	0	0	
	34	0	5	0	0	
	35	0	0	0	0	
	36	0	0	0	0	
	37	0	0	0	0	
	38	0	0	0	0	
	39	0	0	0	0	
	40	0	0	0	0	
	41	0	0	0	0	
	42	0	0	0	0	
	43	0	0	0	0	
	44	0	0	0	0	
	45	0	0	0	0	
	46	0	0	0	0	
	47	0	0	0	0	
	48	0	0	0	0	
	49	0	0	0	0	
	50	0	0	0	0	
	51	0	0	0	0	
	52	0	0	0	0	
	53	0	0	0	0	
	54	0	0	0	0	
	55	0	0	0	0	
	56	0	0	0	0	
	57	0	0	0	0	
	58	0	0	0	0	
	59	0	0	0	0	

RECORD OF VISIBLE EMISSIONS

Company Name Exxon Uranium | Date 10/1/79

Plant Address 25 mi NW Douglas Wyo | Observer T. Moxon

Stack Location Dryer Scrubber outlet | Observer's Location 150' South

Weather Conditions Partly cloudy under clear skies

Run 3

HR	MIN	SECONDS 00	15	30	45	COMMENTS
15	00	0	0	0	0	
	01	0	0	0	0	
	02	0	0	0	0	
	03	0	0	0	0	
	04	0	0	0	0	
	05	0	0	0	0	
	06	0	0	0	0	
	07	0	0	0	0	
	08	0	0	0	0	
	09	0	0	0	0	
	10	0	0	0	0	
	11	0	0	0	0	
	12	0	0	0	0	
	13	0	0	0	0	
	14	0	0	0	0	
	15	0	0	5	0	
	16	0	0	0	0	
	17	0	0	0	0	
	18	5	0	0	0	
	19	0	0	0	5	
	20	0	0	0	0	
	21	0	0	0	0	
	22	0	0	0	0	
	23	0	0	0	0	
	24	0	0	0	0	
	25	0	0	0	0	
	26	0	0	0	0	
	27	0	0	0	0	
	28	0	0	0	0	
	29	0	0	0	0	

RECORD OF VISIBLE EMISSIONS

Company Name Exxon Uranium | Date 10/2/79
Plant Address Douglas Wyoming | Observer T. Moxon
Stack Location Dryer Scrubber Outlet | Observer's Location 150' South
Weather Conditions partly cloudy under clear skies | Run 3

TIME HR	MIN	SECONDS 00	15	30	45	COMMENTS
15	30	0	0	0	0	
	31	0	0	0	0	
	32	0	0	0	0	
	33	0	0	0	0	
	34	0	0	0	0	
	35	0				
	36					
	37					
	38					
	39					
	40					
	41					
	42					
	43					
	44					
	45					
	46					
	47					
	48					
	49					
	50					
	51					
	52					
	53					
	54					
	55					
	56					
	57					
	58					
	59					

TRAVERSE POINT LOCATION FOR CIRCULAR DUCTS

PLANT Exxon Ukran
DATE 9-30-79
SAMPLING LOCATION Dryer Inlet
INSIDE OF FAR WALL TO OUTSIDE OF PORT, (DISTANCE A) 17 3/4"
INSIDE OF NEAR WALL TO OUTSIDE OF PORT, (DISTANCE B) 4"
STACK I.D., (DISTANCE A - DISTANCE B) 13 3/4" 1.0312
NEAREST UPSTREAM DISTURBANCE 77 5.6 I.D.
NEAREST DOWNSTREAM DISTURBANCE 28 2 I.D.
CALCULATOR Celiano

SCHEMATIC OF SAMPLING LOCATION

TRAVERSE POINT NUMBER	FRACTION OF STACK I.D.	STACK I.D.	PRODUCT OF COLUMNS 2 AND 3 (TO NEAREST 1/8 INCH)	DISTANCE B	TRAVERSE POINT LOCATION FROM OUTSIDE OF PORT (SUM OF COLUMNS 4 & 5)
1	.016	13 3/4	1/4	4	4 1/4
2	.049		5/8		4 5/8
3	.085		1 1/8		5 1/8
4	.125		1 3/4		5 3/4
5	.169		2 3/8		6 3/8
6	.220		3		7
7	.283		3 7/8		7 7/8
8	.375		5 1/4		9 1/4
9	.625		8 5/8		12 5/8
10	.717		9 7/8		13 7/8
11	.780		10 3/4		14 3/4
12	.831		11 1/2		15 1/2
13	.875		12		16
14	.915		12 5/8		16 5/8
15	.951		13		17
16	.984		13 1/2		17 1/2

PRELIMINARY VELOCITY TRAVERSE

PLANT Exxon - EPA
DATE 9-30-79
LOCATION dryer inlet
STACK I.D. 13 3/4"
BAROMETRIC PRESSURE, in. Hg 29.0
STACK GAUGE PRESSURE, in. H_2O -.24
OPERATORS Goldberg / McGlinchey

monometer tubing
lead wire
9-D connector
Rheostat pyrometer,
strip
control box

SCHEMATIC OF TRAVERSE POINT LAYOUT

TRAVERSE POINT NUMBER	VELOCITY HEAD (Δp_s), in. H_2O	STACK TEMPERATURE (T_s), °F
X-1	.04	535
2	.07	540
3	.05	545
4	.09	590
5	.09	584
6	.1	590
7	.1	596
8	.1	621
9	.1	624
10	.11	625
11	.11	624
12	.11	619
13	.11	616
14	.09	606
15	.08	595
16	.07	592
AVERAGE	.05	594

TRAVERSE POINT NUMBER	VELOCITY HEAD (Δp_s), in. H_2O	STACK TEMPERATURE (T_s), °F
AVERAGE		

NOMOGRAPH DATA

PLANT Exxon - EPA

DATE 9/30/79

SAMPLING LOCATION dryer inlet

CONTROL BOX NO. # 1205

1205

CALIBRATED PRESSURE DIFFERENTIAL ACROSS ORIFICE, in. H_2O	$\Delta H_@$	1.74
AVERAGE METER TEMPERATURE (AMBIENT + 20°F), °F	$T_{m\,avg.}$	132
PERCENT MOISTURE IN GAS STREAM BY VOLUME	B_{wo}	8 %
BAROMETRIC PRESSURE AT METER, in. Hg	P_m	24.8
STATIC PRESSURE IN STACK, in. Hg ($P_m \pm 0.073$ x STACK GAUGE PRESSURE in in. H_2O)	P_s	24.8
RATIO OF STATIC PRESSURE TO METER PRESSURE	P_s/P_m	1.0
AVERAGE STACK TEMPERATURE, °F	$T_{s\,avg.}$	594
AVERAGE VELOCITY HEAD, in. H_2O	$\Delta p_{avg.}$	.08
MAXIMUM VELOCITY HEAD, in. H_2O	$\Delta p_{max.}$	.11
C FACTOR	1.0	
CALCULATED NOZZLE DIAMETER, in.	.5	
ACTUAL NOZZLE DIAMETER, in.	.492	
REFERENCE Δp, in. H_2O	.06	

FIELD DATA

PLANT Exxon - EPA
DATE 10-1-79
SAMPLING LOCATION Dryer Inlet
SAMPLE TYPE Part.
RUN NUMBER 1
OPERATOR NG
AMBIENT TEMPERATURE 93
BAROMETRIC PRESSURE 23.98
STATIC PRESSURE, (P_s) -.36
FILTER NUMBER (s) 25412

PROBE LENGTH AND TYPE 5' Boro.
NOZZLE I.D. .492
ASSUMED MOISTURE, % 8
SAMPLE BOX NUMBER 2
METER BOX NUMBER Nut. 1
METER $\Delta H_@$ 1.74
C FACTOR 1.0
PITOT TUBE FACTOR 4
REFERENCE Δp .06
NOTE LCI - .018 @ 15 psi
LCF = .018

READ AND RECORD ALL DATA EVERY 4 MINUTES

TRAVERSE POINT NUMBER	SAMPLING TIME, min / CLOCK TIME (24-hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O		STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE		PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
				DESIRED	ACTUAL		INLET ($T_{m\,in}$), °F	OUTLET ($T_{m\,out}$), °F			
	0 0935	832.271									50±10
X-1	4	836.0	.09	2.8		550	120		5.5	250	50
2	8	841.7	.09	2.8		560	123		6.5	255	55
3	12	844.2	.10	3.1		587	128		7	255	56
4	16	848.2	.10	3.1		587	129		7.5	250	57
5	20	852.6	.10	3.1		587	130		8	240	57
6	24	857.4	.12	3.75		610	132		12	250	58
7	28	862.5	.14	4.3		599	134		15	255	60
8	32	866	.11	3.4		587	134		14	260	60
9	36	871.8	.12	3.75		592	135		16	260	60
10	40	875.6	.09	2.8		605	136		14	260	60
11	44	880.3	.09	2.8		604	136		17	260	60
12	48	883.5	.12	3.75		611	134		10	260	60
13	52	888.1	.11	3.4		612	136		11	265	60
14	56	892.2	.12	3.75		617	138		15	265	60
15	60	896.1	.11	3.4		616	136		20	260	60
16	64	899.400	.09	2.8		590	136		20.5	250	60
	10:45										
		67.129 ✓	.3252 ✓	3.3 ✓		~~572.13~~	132.31 ✓				
						594.63 ✓					

DRY MOLECULAR WEIGHT DETERMINATION

PLANT EXXON - URAN

DATE 10-1-79

SAMPLING TIME (24-hr CLOCK)

SAMPLING LOCATION SCRUBBER INLET

SAMPLE TYPE (BAG, INTEGRATED, CONTINUOUS) GRAB

ANALYTICAL METHOD ORSAT

AMBIENT TEMPERATURE 112°

OPERATOR V.M

COMMENTS:

Run 1

RUN / GAS	1		2		3		AVERAGE NET VOLUME	MULTIPLIER	MOLECULAR WEIGHT OF STACK GAS (DRY BASIS) M_d, lb/lb-mole
	ACTUAL READING	NET	ACTUAL READING	NET	ACTUAL READING	NET			
CO_2	3.8	3.8	3.8	3.8	4.0	4.0	~~11.6~~ 3.86	44/100	~~5.104~~ 1.70
O_2 (NET IS ACTUAL O_2 READING MINUS ACTUAL CO_2 READING)	18.0	14.2	18.2	14.4	18.4	14.4	14.33	32/100	4.586
CO (NET IS ACTUAL CO READING MINUS ACTUAL O_2 READING)	18.0	0.0	18.2	0.0	18.4	0.0	0.0	28/100	0.00
N_2 (NET IS 100 MINUS ACTUAL CO READING)	82.0	82.0	81.8	81.8	81.6		81.8	28/100	22.90
								TOTAL	29.19

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327 ml of H_2O

FIELD DATA

PLANT Exxon Uranium [illegible]
DATE 10-1-79
SAMPLING LOCATION Dryer inlet
SAMPLE TYPE [illegible]
RUN NUMBER 2
OPERATOR NG
AMBIENT TEMPERATURE 106
BAROMETRIC PRESSURE [illegible] 23.98
STATIC PRESSURE, (P_s) -.34
FILTER NUMBER (s) 25452

PROBE LENGTH AND TYPE 5' [illegible]
NOZZLE I.D. .356
ASSUMED MOISTURE, % 22.5
SAMPLE BOX NUMBER 2
METER BOX NUMBER Nut 1
METER $\Delta H_@$ 1.74
C FACTOR .77
PITOT TUBE FACTOR 4
REFERENCE Δp .28
NOTE LCI = .011

L.C.F = .01

READ AND RECORD ALL DATA EVERY 4 MINUTES

TRAVERSE POINT NUMBER	SAMPLING TIME, min	CLOCK TIME (24 hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O DESIRED	ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m\,in}$), °F	OUTLET ($T_{m\,out}$), °F	PUMP VACUUM, in. Hg	S… TE…
	0	1230	900.747								
X-1	4		902.9	.11	.72		590	136		2	
2	8		904.9	.12	.78		595	136		2	
3	12		906.9	.10	.66		595	136		2	
4	16		908.5	.05	.32		595	136		2	
5	20		910.7	.12	.78		595	136		3	
6	24		912.7	.11	.72		595	136		4	
7	28		914.9	.12	.78		595	136		4	
8	32		917.1	.11	.72		595	136		4.5	
9	36		919.4	.13	.85		595	136		5.0	
10	40		922.0	.15	1.2		595	136		5.0	
11	44		924.3	.13	.85		595	136		5.5	
12	48		927.0	.15	1.2		595	136		6.0	
13	52		929.4	.14	.92		595	137		7	
14	56		931.8	.14	.92		595	137		7.5	
15	60		934.2	.14	.92		595	138		8	
16	64	13:25	936.615	.12	.78		595	138		9	
			35.868		0.82		594.7	136.38			
				.3462							

0.3462	$\sqrt{\Delta P}$
0.82	ΔH
594.7	TS
136.38	TM
35.868	VMA
23.98	PBAR
250.	VWC
12.	WSG
29.19	MWD
1.031775	AS
64.	TT
-0.34	STAT
0.356	DN
0.9977	Y
0.849	CP
262.	TH2O
25.45626744	VMS
12.3333	VWS
32.63678532	%M
.6736321468	MD
25.53794372	MWS
23.955	PS
32.99312812	VACT
2041.301333	QACT
8.908086234	VSTD
551.1477494	QSTD
107.6586 92	%I
5.501	FHWT
0.	T WT
3.334794446	FHGR
15.75393088	FHLB
0.	T GR
0.	T LB

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DRY MOLECULAR WEIGHT DETERMINATION

PLANT EXXON - URAW
DATE 10-1-79
SAMPLING TIME (24-hr CLOCK)
SAMPLING LOCATION SCRUBBER INLET
SAMPLE TYPE (BAG, INTEGRATED, CONTINUOUS) GRAB
ANALYTICAL METHOD ORSAT
AMBIENT TEMPERATURE 112°
OPERATOR VM

COMMENTS: Run 2

RUN / GAS	1 ACTUAL READING	1 NET	2 ACTUAL READING	2 NET	3 ACTUAL READING	3 NET	AVERAGE NET VOLUME	MULTIPLIER	MOLECULAR WEIGHT OF STACK GAS (DRY BASIS) M_d, lb/lb-mole
CO_2	3.8	3.8	4.0	4.0	4.0	4.0	3.93	44/100	1.73
O_2 (NET IS ACTUAL O_2 READING MINUS ACTUAL CO_2 READING)	18.0	14.2	18.2	14.2	18.0	14.0	14.13	32/100	4.52
CO (NET IS ACTUAL CO READING MINUS ACTUAL O_2 READING)	18.0	0.0	18.2	0.0	18.0	0.0	0.0	28/100	0.00
N_2 (NET IS 100 MINUS ACTUAL CO READING)	82.0		81.8		82.0		81.93	28/100	22.94
								TOTAL	29.19

FIELD DATA

PLANT Exxon Virginia - EPA
DATE 10-1-79
SAMPLING LOCATION dryer scrubber inlet
SAMPLE TYPE part.
RUN NUMBER 3
OPERATOR NG, V.M.
AMBIENT TEMPERATURE 112
BAROMETRIC PRESSURE 23.98
STATIC PRESSURE, (P_s) -.46
FILTER NUMBER (s) 25455

PROBE LENGTH AND TYPE 5'
NOZZLE I.D. .356
ASSUMED MOISTURE, % 22
SAMPLE BOX NUMBER —
METER BOX NUMBER Nut 1
METER $\Delta H_@$ 1.74
C FACTOR .77
PITOT TUBE FACTOR 4
REFERENCE Δp .28
NOTE LCI = .01
LCF = .01

READ AND RECORD ALL DATA EVERY 4 MINUTES

TRAVERSE POINT NUMBER	SAMPLING TIME, min	CLOCK TIME (24 hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O DESIRED	ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET $(T_{m\,in})$, °F	OUTLET $(T_{m\,out})$, °F	PUMP VACUUM, in. Hg
	0	1430	936.816							
X-1	4		938.6	.09	.58		580	138		4
2	8		940.3	.06	.39		585	139		3.5
3	12		942.0	.06	.39		590	139		3.5
4	16		944.0	.09	.58		594	139		4
5	20		945.9	.09	.58		595	139		4
6	24		949.3	.10	.64		598	140		4
7	28		950.5	.10	.64		600	140		4
8	32		952.5	.09	.58		604	140		4
9	36		954.3	.10	.64		599	140		4
10	40		955.8	.09	.58		595	140		4
11	44		957.8	.10	.64		580	140		4.5
12	48		959.9	.10	.64		592	140		4
13	52		962.0	.10	.64		591	140		4.5
14	56		964.2	.10	.64		596	140		4.5
15	60		966.3	.09	.58		605	140		4.5
16	64		968.391	.11	.70		608	140		5
		1545								
			31.575	.30219	0.59		594.5	139.44		

0.30219	ΔP
0.59	ΔH
594.5	TS
139.44	TM
31.575	VMA
23.98	PBAR
100.	VWC
9.	WSG
29.18	MWD
1.031[illegible]75	AS
64.	TT
-0.46	STAT
0.356	DN
0.9977	Y
0.849	CP
109.	TH2O
22.27935[illegible]92	VMS
5.13[illegible]35	VWS
18.72023[illegible]56	%M
.8127976044	MD
27.08707[illegible]22	MWS
23.94617[illegible]47	PS
27.96579[illegible]61	VACT
1730.257[illegible]43	QACT
9.108987[illegible]13	VSTD
563.5776[illegible]05	QSTD
92.14484056	%I
1.2[illegible]97	FHWT
0.	T WT
.9002490[illegible]23	FHGR
4.348787[illegible]53	FHLB
0.	T GR
0.	T LB

DRY MOLECULAR WEIGHT DETERMINATION

PLANT EXXON - URAN

DATE 10.1.79

SAMPLING TIME (24-hr CLOCK)

SAMPLING LOCATION SCRUBBER INLET

SAMPLE TYPE (BAG, INTEGRATED, CONTINUOUS) GRAB

ANALYTICAL METHOD ORSAT

AMBIENT TEMPERATURE 112°

OPERATOR V.M

COMMENTS: Run 3

1545

RUN / GAS	1 ACTUAL READING	1 NET	2 ACTUAL READING	2 NET	3 ACTUAL READING	3 NET	AVERAGE NET VOLUME	MULTIPLIER	MOLECULAR WEIGHT OF STACK GAS (DRY BASIS) M_d, lb/lb-mole
CO_2	4.0	4.0	3.8	3.8	3.6	3.6	3.8	44/100	1.672
O_2 (NET IS ACTUAL O_2 READING MINUS ACTUAL CO_2 READING)	18.2	14.2	18.2	14.4	18.0	14.4	14.333	32/100	4.5867
CO (NET IS ACTUAL CO READING MINUS ACTUAL O_2 READING)	18.2	0.0	18.2	0.0	18.0	0.0	0.0	28/100	0.0
N_2 (NET IS 100 MINUS ACTUAL CO READING)	81.8		81.8	–	82.0		81.867	28/100	22.92267
								TOTAL	29.18137

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FIELD DATA

PLANT: Exxon Uraw.
DATE: 9-27-79
SAMPLING LOCATION: S. OUTLET
SAMPLE TYPE: Partic. Size
RUN NUMBER: 1
OPERATOR: Celiano
AMBIENT TEMPERATURE: 68°
BAROMETRIC PRESSURE: ~~29~~ 24.74
STATIC PRESSURE, (P_s): +.19
FILTER NUMBER (s): Set 33A

PROBE LENGTH AND TYPE: 3' S.Steel
NOZZLE I.D.: .250
ASSUMED MOISTURE, %: 5
SAMPLE BOX NUMBER: —
METER BOX NUMBER: 1205
METER $\Delta H_@$:
C FACTOR: 1.1
PITOT TUBE FACTOR: —
REFERENCE Δp: .43
NOTE: LC_I = .005cfm

READ AND RECORD ALL DATA EVERY 5 MINUTES

TRAVERSE POINT NUMBER	SAMPLING TIME, min / CLOCK TIME (24-hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O DESIRED	ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m\,in}$), °F	OUTLET ($T_{m\,out}$), °F	PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
	0 1755	852.794									
#1	5	56.000	.260	1.1	1.1		73	73	1.5		
Y-	10	59.200	.260	1.1	1.1		76	73	1.5		
	15	62.400	.260	1.1	1.1		81	74	1.5		
	20	65.600	.260	1.1	1.1		84	75	1.5		
	25	68.800	.260	1.1	1.1		86	76	1.5		
	30	72.400	.260	1.1	1.1		88	77	1.5		
	35	74.800	.260	1.1	1.1		90	79	1.5		
	40 1835	78.200	.260	1.1	1.1		92	80	1.5		
	45	81.200	.260	1.1	1.1		92	81	1.5		
X-1	50 1845 off 1850 on	84.372	.260	1.1	1.1		90	81	1.5		
	55	87.600	.260	1.1	1.1		81	78	1.5		
	60	90.600	.260	1.1	1.1		84	80	1.5		
	5	94.300	.260	1.1	1.1		85	80	1.5		
	10	97.250	.260	1.1	1.1		86	79	1.5		
	15	100.800	.260	1.1	1.1		87	79	1.5		
	20	104.000	.260	1.1	1.1		88	80	1.5		
	25 1925	107.000	.260	1.1	1.1		88	80	1.5		
	30	109.700	.260	1.1	1.1		88	79	1.5		
	35 1935	114.700	.260	1.1	1.1		88	79	1.5		
	40	116.400	.260	1.1	1.1		90	79	1.5		
	45 OFF	118.200	.260	1.1	1.1		90	80	1.5		
	50 1955	124.977	.260	1.1	1.1		91	80	1.5		

50
50
60
160 min
(2hr 40min)

Run #1 Particle Size ~~Serus~~ outlet

Bu... every 10 min

TRAVERSE POINT NUMBER	SAMPLING TIME, min / CLOCK TIME (24 hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in H_2O DESIRED	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in H_2O ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m\,in}$), °F	DRY GAS METER TEMPERATURE OUTLET ($T_{m\,out}$), °F	PUMP VACUUM, in Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
	~~0 2105~~	924.978									
	10 2115	31.200	.260	1.1	1.1		66	67	1.5		
	20 2125	37.300	.260	1.1	1.1		75	68	1.5		
	30 2135	43.500	.260	1.1	1.1		70	82	1.5		
	40 2145	50.300	.260	1.1	1.1		72	85	1.5		
	50 2155	56.400	.260	1.1	1.1		77	88	1.5		
	60 2205	963.275	.260	1.1	1.1		77	90	2.0		
		110.481	$\sqrt{\Delta p}$ =					82.21			
			.5099	1.1							
	TT = 160 min										

$$\frac{17.71(110.481)\ 1.001\left(24.74 + \frac{1.1}{13.6}\right)}{.9869(460 + 82.21)} = 90.848 \div 160 = 0.5678 \text{ wscfm}$$

FIELD DATA

PLANT Exxon Uranium
DATE 9-28-79
SAMPLING LOCATION Crusher pressure Grizzly
SAMPLE TYPE particle size
RUN NUMBER 1
OPERATOR Marvin
AMBIENT TEMPERATURE 70 °F
BAROMETRIC PRESSURE 24.79
STATIC PRESSURE, (P_s) -1.1
FILTER NUMBER (s) Set 34 A

PROBE LENGTH AND TYPE –
NOZZLE I.D. .241
ASSUMED MOISTURE, % 5
SAMPLE BOX NUMBER –
METER BOX NUMBER NT #1
METER $\Delta H_@$ 1.76
C FACTOR 1.1
PITOT TUBE FACTOR –
REFERENCE Δp .49
NOTE

LK Ch- .004 in/15"

READ AND RECORD ALL DATA EVERY 5 MINUTES

TRAVERSE POINT NUMBER	SAMPLING TIME, min / CLOCK TIME (24-hr CLOCK)	GAS METER READING (V_m), ft³	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O DESIRED	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m\,in}$), °F	DRY GAS METER TEMPERATURE OUTLET ($T_{m\,out}$), °F	PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
	0 / 0235	622.772									
A-10	5	26.8	.45	1.7				105	6.5		
	10	30.9						105	6.5		
	15	34.9						108	6.5		
	20	39.0						110	6.5		
	25	43.2						111	6.5		
	30	47.4						114	6.5		
	35	51.6						116	6.5		
	40	55.8						117	5.5 -	silica gel was	
	45	60.0						120	5.5	Shaken by vibrations	
	50	64.3						122	5.5		
	55	68.4						123	5.5		
	60	72.5						124	5.5		
	65	76.6						125	5.5		
	70	80.7						126	5.5		
	75	84.988						126	5.5		
	75 min	62.216	$V_{\Delta P}$ =								
			.6708	1.7				116.8			
			1.7								
	17.71 (62.216)	.985 (24.79 +	13.6)								
		.9910 (460+116.8)		= 47.306		÷ 15	= ~~[illegible]~~ 0.631				

H I

FIELD DATA

PLANT Exxon Uranium
DATE 2-28-79
SAMPLING LOCATION Crusher - Pressure Grizzly
SAMPLE TYPE part. size
RUN NUMBER 2
OPERATOR Jackson
AMBIENT TEMPERATURE 75°F
BAROMETRIC PRESSURE 24.76
STATIC PRESSURE, (P_s) -1.1
FILTER NUMBER (s) Set 63 A

PROBE LENGTH AND TYPE –
NOZZLE I.D. .291
ASSUMED MOISTURE, % –
SAMPLE BOX NUMBER –
METER BOX NUMBER 1205
METER $\Delta H_@$ 1.76
C FACTOR 1.1
PITOT TUBE FACTOR –
REFERENCE Δp .49
NOTE $LC_{I_{15}}$ = .004 CFM

READ AND RECORD ALL DATA EVERY 5 MINUTES

TRAVERSE POINT NUMBER	SAMPLING TIME, min / CLOCK TIME (24-hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O DESIRED	ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m\ in}$), °F	OUTLET ($T_{m\ out}$), °F	PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
	0 2059	111.856									
A-10	5		.45	1.7			75	78	3		
	10						80	78	3		
	15						85	78	3		
	20						90	79	3		
	25						94	80	3		
	30						96	80	3		
	35						96	81	3		
	40						96	81	3		
	45						97	81	3		
	50						97	82	3		
	55						97	82	3		
	60						97	81	3		
	65						97	81	3		
	70						97	82	3		
	75 2209	169.994					97	82	3		
		58.138	$\sqrt{\Delta p}$ = .6708	1.7				86.56			
	TT = 75 min										

$$\frac{17.71(58.138)\,1.001\left(24.76+\frac{1.7}{13.6}\right)}{.9910(460+86.56)} = 47.352 \div 75 = 0.631$$

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FIELD DATA

PLANT Exxon Uranium
DATE 9-28-79
SAMPLING LOCATION Crusher - Pressure Grizzly
SAMPLE TYPE Part. Size
RUN NUMBER 3
OPERATOR Jackson
AMBIENT TEMPERATURE 75°F
BAROMETRIC PRESSURE 24.76
STATIC PRESSURE, (P_s) -1.1
FILTER NUMBER (s) Set 48A

PROBE LENGTH AND TYPE —
NOZZLE I.D. .241
ASSUMED MOISTURE, % —
SAMPLE BOX NUMBER —
METER BOX NUMBER 1205
METER $\Delta H_@$ 1.76
C FACTOR 1.1
PITOT TUBE FACTOR —
REFERENCE Δp .49
NOTE L.C. I_{15} = .005 cfm

READ AND RECORD ALL DATA EVERY 5 MINUTES

TRAVERSE POINT NUMBER	SAMPLING TIME, min	CLOCK TIME (24-hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O DESIRED	ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m\,in}$), °F	OUTLET ($T_{m\,out}$), °F	PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
	0	2208	170.012									
A-10	5			.45	1.7			88	80	3		
	10							89	80	3		
	15							91	80	3		
	20							93	80	3		
	25							94	80	3		
	30							95	80	3		
	35							96	81	3		
	40							96	81	3		
	45							97	81	3		
	50							97	81	3		
	55							97	81	3		
	66							97	81	3		
	65							97	81	3		
	70	down @	2320 for 4 min					97	81	3		
	75	2327	end test 227.420					95	81	3		
			57.408	.6708	1.7				82.6			
	tT = 75 min											

$$\frac{17.71(57.408)\,1.001\left(24.76+\frac{1.7}{13.6}\right)}{.9910(460+82.6)}$$

46.668 ÷ 75 = 0.622

FIELD DATA

PLANT Exxon - Highland
DATE 9-27-79
SAMPLING LOCATION Crusher Scrubber Inlet
SAMPLE TYPE Andersen Part. Size
RUN NUMBER 1
OPERATOR Jackson
AMBIENT TEMPERATURE 75
BAROMETRIC PRESSURE 29.75
STATIC PRESSURE, (P_s) -1.9
FILTER NUMBER (s) Set 55A

PROBE LENGTH AND TYPE —
NOZZLE I.D. 0.250
ASSUMED MOISTURE, % 3
SAMPLE BOX NUMBER —
METER BOX NUMBER 1205
METER $\Delta H_@$ 1.84
C FACTOR 1.1
PITOT TUBE FACTOR —
REFERENCE Δp .42
NOTE L.C. $_{I15}$ = .004 cfm

READ AND RECORD ALL DATA EVERY 5.0 MINUTES

A-1 stopped after 31 min for 45 sec

TRAVERSE POINT NUMBER	SAMPLING TIME, min	CLOCK TIME (24-hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O DESIRED	ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m\ in}$), °F	OUTLET ($T_{m\ out}$), °F	PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
	0	1160	964.828									
Y-5	5		969.9	.4	1.8		—	86	80	4.0	N.A.	50 ± 10
	10		964.5				—	93	80	4.0	N.A.	5 ± 10
	15		978.2				—	97	82	4.0		
	20		982.2				—	104	84	4.0		
	25		985.5				—	105	84	4.0		
	30		989.3				—	106	85	4.0		
	35		994.1				—	106	86	4.0		
	40		998.8				—	105	87	4.0		
	45		1003.2				—	105	88	4.0		
	50		105.8				—	106	88	4.0		
	55		009.5				—	106	88	4.0		
	60	1201	114.001				—	106	89	4.0		
			49.173	$\sqrt{\Delta P}$ =	1.8				93.58			
	+ T = 60 min			.63245								

$$\frac{17.71(49.173)\,1.001\left(29.75+\frac{1.8}{13.6}\right)}{.9873(460+93.58)} = 39.686 \div 60 = .6614 \text{ wscfm}$$

FIELD DATA

PLANT Exxon Mineral
DATE 9-28-79
SAMPLING LOCATION Scrubber In. Crusher
SAMPLE TYPE Particle Zize
RUN NUMBER TWO
OPERATOR O'Neill
AMBIENT TEMPERATURE 60°
BAROMETRIC PRESSURE 29.75
STATIC PRESSURE, (P_s) -1.9
FILTER NUMBER (s) Set 54A

PROBE LENGTH AND TYPE —
NOZZLE I.D. .250
ASSUMED MOISTURE, % 3
SAMPLE BOX NUMBER —
METER BOX NUMBER 1205
METER $\Delta H_@$ 1.89
C FACTOR 1.1
PITOT TUBE FACTOR —
REFERENCE Δp ~~A2~~
NOTE L.C.I = .009 cfm

READ AND RECORD ALL DATA EVERY 5 MINUTES

TRAVERSE POINT NUMBER	SAMPLING TIME, min	CLOCK TIME (24-hr CLOCK)	GAS METER READING (V_m), ft³	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O DESIRED	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m\,in}$), °F	DRY GAS METER TEMPERATURE OUTLET ($T_{m\,out}$), °F	PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
	0	0156	17.029									
Y-15	5		20.7	.1	1.8	—	—	68	70	3.5	—	60±10
	10		23.6			—	—	70	80	3.5	—	
	15		27.3			—	—	70	82	3.5	—	
	20		30.5			—	—	72	86	3.5	—	
	25		33.7			—	—	72	89	3.5	—	
	30		37.8			—	—	72	89	3.5	—	
	35		41.6			—	—	73	90	3.5	—	
	40		44.6			—	—	74	90	3.5	—	
	45		48.3			—	—	74	91	3.5	—	
	50		49.0			—	—	74	91	3.5	—	
	55		52.7			—	—	76	91	3.5	—	
	60		56.2			—	—	75	91	3.5	—	
	65		60.5			—	—	75	91	3.5	—	
	70		64.868			—	—	75	91	3.5	—	
			47.839	$\sqrt{\Delta P}$ = .6324				80.07				
	TT = 70 min											

$$\frac{17.71(47.839)1.001\left(29.75 + \frac{1.8}{13.6}\right)}{.9873(460+80.07)} = 39.575 \div 70 = .565 \text{ wscfm}$$

A-184

FIELD DATA

PLANT Exxon
DATE 9-28-79
SAMPLING LOCATION Crisher Scrubber Inlet
SAMPLE TYPE Particle Size
RUN NUMBER 3
OPERATOR O'Neill
AMBIENT TEMPERATURE 60°F
BAROMETRIC PRESSURE 29.78
STATIC PRESSURE, (P_s) -1.9
FILTER NUMBER (s) Set [illegible] 56A

PROBE LENGTH AND TYPE —
NOZZLE I.D. .250
ASSUMED MOISTURE, % 3
SAMPLE BOX NUMBER —
METER BOX NUMBER 1205
METER $\Delta H_@$ 1.84
C FACTOR 1.1
PITOT TUBE FACTOR —
REFERENCE Δp .42
NOTE K_{gas} = .011 CFM at 15

READ AND RECORD ALL DATA EVERY 5 MINUTES

TRAVERSE POINT NUMBER	SAMPLING TIME, min	CLOCK TIME (24-hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O DESIRED	ORIFICE PRESSURE DIFFERENTIAL ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET $(T_{m\,in})$, °F	DRY GAS METER TEMPERATURE OUTLET $(T_{m\,out})$, °F	PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
	0	0355	64.974									
Y	5		66.3	0.4	1.8		—	66	68	4	—	60±10
	10		68.6				—	68	75	4	—	
	15		71.8				—	70	80	4	—	
	20		75.1				—	70	86	4	—	
	25		77.6				—	70	86	4	—	
	30		80.3				—	70	88	4	—	
	32		81.292				—	70	88	4	—	
			(32min.)					71	88	4		
		Stopped	0427 9/28									
		restart	1928 9/29									
			81.672									
	35							92	84	4		
	40							84	84	4		
	45							88	85	4		
	50							92	85	4		
	55							96	86	4		
	60							100	86	4		
	65							101	86	4		
	70	end 2006	111.841	$\overline{\Delta P}$ =				102	86	4		
			46.487	.63249	1.8				82.53			
	70min. test											

30.169
+16.318
46.487

$$\frac{17.71(46.487)1.001\left(24.78+\frac{1.8}{13.6}\right)}{.9873(460+82.53)} = 38.328 \div 70 = .5476 \text{ wscfm}$$

A-185

FIELD DATA

PLANT Exxon Mineral
DATE 9-27/28-79
SAMPLING LOCATION Crusher transfer Pt
SAMPLE TYPE Particle Size
RUN NUMBER 1
OPERATOR [illegible]
AMBIENT TEMPERATURE 65
BAROMETRIC PRESSURE 24.77
STATIC PRESSURE, (P_s) -.06
FILTER NUMBER (s) Set 57A

PROBE LENGTH AND TYPE 3' stainless
NOZZLE I.D. .242
ASSUMED MOISTURE, % 5
SAMPLE BOX NUMBER 4
METER BOX NUMBER 1226
METER $\Delta H_@$ 1.92
C FACTOR 1.09
PITOT TUBE FACTOR 5A
REFERENCE Δp .46
NOTE L_C / t_s = .006 cfm

READ AND RECORD ALL DATA EVERY 5 MINUTES

TRAVERSE POINT NUMBER	SAMPLING TIME, min / CLOCK TIME (24-hr CLOCK)	GAS METER READING (V_m), ft³	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O DESIRED	ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m\,in}$), °F	OUTLET ($T_{m\,out}$), °F	PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
	0 / 0210	710.660									
	5	13.6	.24	.97	.97		78	76	2		
	10	17.0	.24	.97	.97		80	76	2		
	15	19.8	.24	.97	.97		85	77	2		
	20	22.8	.24	.97	.97		87	77	2		
	25	25.8	.24	.97	.97		89	78	2		
	30	28.8	.24	.97	.97		90	78	2		
	35	31.9	.24	.97	.97		90	78	2		
	40	34.9	.24	.97	.97		90	79	2		
	45	38.3	.24	.97	.97		91	80	2		
Line down	50	41.5	.24	.97	.97		91	80	2		
at 0305	55	44.0	.24	.97	.97		91	80	2		
up at	60	47.1	.24	.97	.97		81	78	2		
0328	65	50.2	.24	.97	.97		85	80	2		
	70	53.2	.24	.97	.97		88	80	2		
	75	756.312	.24	.97	.97		89	80	2		
	0345		$\sqrt{\Delta P}$ =								
		45.652	.48989		.97			82.73			
	tt =										
	75 min										

$$\frac{17.71\,(45.652)\,1.006\left(24.77 + \frac{.97}{13.6}\right)}{.9866\,(460+82.7)} = 37.7355 \div 75 = 0.503 \text{ wscFM}$$

A-186

FIELD DATA

PLANT Exxon Uranium
DATE 9/28/79
SAMPLING LOCATION Crusher transfer point
SAMPLE TYPE Particle Size
RUN NUMBER 3
OPERATOR Maxon
AMBIENT TEMPERATURE 70°F
BAROMETRIC PRESSURE 24.76
STATIC PRESSURE, (P_s) -.06
FILTER NUMBER (s) Set 62 A

PROBE LENGTH AND TYPE -
NOZZLE I.D. .242
ASSUMED MOISTURE, % 5
SAMPLE BOX NUMBER 4
METER BOX NUMBER 1225
METER $\Delta H_@$ 1.92
C FACTOR 1.09
PITOT TUBE FACTOR 5A
REFERENCE Δp .46
NOTE

LK CK .009-60" @ .15 READ AND RECORD ALL DATA EVERY 5 MINUTES

TRAVERSE POINT NUMBER	SAMPLING TIME, min / CLOCK TIME (24-hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O DESIRED	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m\,in}$), °F	DRY GAS METER TEMPERATURE OUTLET ($T_{m\,out}$), °F	PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
	0 / 2000	771.512									
X3	5	75.5	.27		1.05		80	75	2		
	10	78.6				-	85	78	2		
	15	81.8					90	82	2		
	20	85.0					94	83	2		
	25	88.2					97	84	2		
	30	91.4					98	85	2		
	35	94.6					99	86	2		
	40	97.8					99	86	2		
	45	801.0					99	87	2		
	50	4.1					99	88	2		
	55	7.3					99	88	2		
	60	10.5					99	89	2		
	65	13.6					99	89	2		
	70	16.7					99	89	2		
	75	19.9					99	89	2		
	80	23.1 ~~[illegible]~~					99	89	2		
	85	26.2					99	89	2		
	90	829.385					99	89	2		
			$\sqrt{\Delta p}$ =								
	90, min	57.873	.5196		1.05			91.027			

$$\frac{17.71\,(57.873)\;1.006\left(24.76+\frac{1.05}{13.6}\right)}{.9866\,(460+91.027)} = 47.1065 \div 90 = .5234 \text{ wscfm}$$

A-187

FIELD DATA

PLANT Exxon Uranium
DATE 9/28/79
SAMPLING LOCATION Crusher Transfer point
SAMPLE TYPE Particle Size
RUN NUMBER 3
OPERATOR Moxon
AMBIENT TEMPERATURE 70°F
BAROMETRIC PRESSURE 24.76
STATIC PRESSURE, (P_s) -.06
FILTER NUMBER (s) 5 of 46A

PROBE LENGTH AND TYPE -
NOZZLE I.D. .242
ASSUMED MOISTURE, % 5
SAMPLE BOX NUMBER 4
METER BOX NUMBER 1226
METER $\Delta H_@$ 1.92
C FACTOR 1.09
PITOT TUBE FACTOR —
REFERENCE Δp .46
NOTE

.001 - 60" @ 15 READ AND RECORD ALL DATA EVERY 5 MINUTES

TRAVERSE POINT NUMBER	SAMPLING TIME, min / CLOCK TIME (24-hr CLOCK)	GAS METER READING (V_m), ft³	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O DESIRED	ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m\ in}$), °F	OUTLET ($T_{m\ out}$), °F	PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
	0	829.474									
X 3	5	832.6	.27	1.05	1.05		82	80	2		
	10	835.8					85	81	2		
	15	38.9					88	81	2		
	20	42.0					90	82	2		
	25	45.2					93	82	2		
	30	48.3					95	83	2		
	35	51.5					95	83	2		
	40	54.6					96	84	2		
	45	57.8					97	84	2		
	50	61.0					98	85	2		
	55	64.1					98	85	2		
	60	67.3					98	85	2		
	65	70.4					98	86	2		
	70	73.6					98	86	2		
	75	76.8					98	86	2		
	80	80.0					98	86	2		
	85	83.1					98	86	2		
	90	886.306					98	86	2		
	90 min		$\sqrt{P}$:								
		.56,832	.5196	1.05				88.0			

$17.71(56.832)\,1.006\left(24.76 + \frac{1.05}{13.6}\right) = 46.5147 \div 90 = .5168$ wscfm

.9866(460 + 88.0)

A-188

FIELD DATA

PLANT Exxon Uranium
DATE 9-28-79
SAMPLING LOCATION Scrubber Outlet
SAMPLE TYPE Particle Size
RUN NUMBER 1
OPERATOR Moxon
AMBIENT TEMPERATURE
BAROMETRIC PRESSURE
STATIC PRESSURE, (P_s)
FILTER NUMBER (s) Set 38-A

PROBE LENGTH AND TYPE
NOZZLE I.D.
ASSUMED MOISTURE, %
SAMPLE BOX NUMBER
METER BOX NUMBER 2253
METER $\Delta H_@$
C FACTOR
PITOT TUBE FACTOR
REFERENCE Δp
NOTE

READ AND RECORD ALL DATA EVERY ______ MINUTES

A-189
28 2"
191.939

TRAVERSE POINT NUMBER	SAMPLING TIME, min	CLOCK TIME (24-hr CLOCK)	GAS METER READING (V_m), ft³	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O DESIRED	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m\ in}$), °F	DRY GAS METER TEMPERATURE OUTLET ($T_{m\ out}$), °F	PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
	0	0110	166.934									
y-13	5			1.55	2.2	2.2		65	62	6.5		
	10							66	62	6.5		
	15							68	62	6.5		
	20							71	62	6.5		
1600	25		189.2/192.020					74	63	6.5		
	30		195.3					83	81	6.5		
	35		198.5				t_s =	83	81	6.5		
	40		202.9				65	97	84	6.5		
	45		~~98.5~~ 207.7					101	84	6.5		
	50		12.5					101	86	6.5		
	55		17.0					101	87	6.5		
	60		21.7					102	87	6.5		
	65		26.3					105	89	6.5		
	70		31.0					104	89	6.5		
	75		35.6					103	88	6.5		
	80		40.2					101	88	6.5		
	85		45.0					105	89	6.5		
	90		249.635	$\sqrt{\Delta p}$ =				110	89	6.5		
	90 min		79.801	1.244	2.2				85.41			

$$\frac{17.71(79.801)\ .9888\left(23.98+\frac{2.2}{13.6}\right)}{.9879(460+85.4)} = 62.6146 \div 90 = 0.6957 \text{ wscfm}$$

FIELD DATA

PLANT Exxon Uranium
DATE 9-29-79
SAMPLING LOCATION Fine Ore Bin - Hopper Inlet
SAMPLE TYPE Part. Size
RUN NUMBER 1
OPERATOR Jackson
AMBIENT TEMPERATURE 65°F
BAROMETRIC PRESSURE 24.88 - .12 = 24.76
STATIC PRESSURE, (P_s)
FILTER NUMBER (s) Set 47A

γ = .9680

PROBE LENGTH AND TYPE —
NOZZLE I.D.
ASSUMED MOISTURE, % 3
SAMPLE BOX NUMBER —
METER BOX NUMBER Nutech 5
METER $\Delta H_@$
C FACTOR
PITOT TUBE FACTOR —
REFERENCE Δp
NOTE LC = .03 CFM
I.S

READ AND RECORD ALL DATA EVERY 5 MINUTES

TRAVERSE POINT NUMBER	SAMPLING TIME, min	CLOCK TIME (24-hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O DESIRED	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m\,in}$), °F	DRY GAS METER TEMPERATURE OUTLET ($T_{m\,out}$), °F	PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
	0	0108	595.011									
Ctr. Pt.	5			.38	1.7			73		5		
	10							74		5		
	15							77		5		
	20							80		5		
	25						T_s = 66	82		5		
	30							77		5		
	35							77		5		
1600	40		~~626.38~~ 26.4					79		5		
	45		30.					83		5		
	50		634.6					86		5		
	55		38.6					89		5		
	60		42.7					92		5		
	65		46.7					94		5		
	70		50.8					95		5		
	75		654.391	$\sqrt{\Delta P}$ =				96		5		
	45 min		59.880	.664	1.7			83.6				

$$\frac{17.71(59.880).9680\left(24.76 + \frac{1.7}{13.6}\right)}{.9876(460 + 83.6)} = 47.883 \div 75 = \text{[redacted] wscfm } 0.6344$$

A-190

FIELD DATA

PLANT Exxon Uranium
DATE 10/1/79
SAMPLING LOCATION Hopper Inlet - Fine Ore bin
SAMPLE TYPE Particle Size
RUN NUMBER 2
OPERATOR Moxon
AMBIENT TEMPERATURE
BAROMETRIC PRESSURE
STATIC PRESSURE, (P_s)
FILTER NUMBER (s) Set 39 A

PROBE LENGTH AND TYPE
NOZZLE I.D.
ASSUMED MOISTURE, %
SAMPLE BOX NUMBER
METER BOX NUMBER
METER $\Delta H_@$
C FACTOR
PITOT TUBE FACTOR
REFERENCE Δp
NOTE

READ AND RECORD ALL DATA EVERY 5 MINUTES

TRAVERSE POINT NUMBER	SAMPLING TIME, min / CLOCK TIME (24-hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O DESIRED	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET $(T_{m\,in})$, °F	DRY GAS METER TEMPERATURE OUTLET $(T_{m\,out})$, °F	PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
	0	54.905									
1 point	5	59.0	.36		1.7		89		4.5		
	10	63.2					90		4.5		
	15	66.9					93		4.5		
	20	70.9					94		4.5		
	25	74.8					95		4.5		
	30	79.0					96		4.5		
	35	82.8					97		4.5		
	40	86.8					98		4.5		
	45	90.8					98		4.5		
	50	94.8					98		4.5		
	55	98.7					99		4.5		
	60	702.7					100		4.5		
	65	706.7					100		4.5		
	70	10.7					100		4.5		
	75 min	714.680	ΔP =				100		4.5		
		59.775	.600		1.7		96.46				

$$\frac{17.71\,(59.775)\,.9680\left(24.76+\frac{1.7}{13.6}\right)}{.9876\,(460+96.46)} = 46.4019 \div 75 = 0.61870 \text{ scfm}$$

A-191

FIELD DATA

PLANT EXXON MINERAL
DATE 10/1/79
SAMPLING LOCATION ~~Hopper~~ Inlet Fine Ore Bin
SAMPLE TYPE Particle Size
RUN NUMBER 3
OPERATOR ~~Bob Newton~~ T. Moxon
AMBIENT TEMPERATURE
BAROMETRIC PRESSURE
STATIC PRESSURE, (P_s)
FILTER NUMBER (s) ~~2540~~ set 41A

PROBE LENGTH AND TYPE
NOZZLE I.D.
ASSUMED MOISTURE, %
SAMPLE BOX NUMBER
METER BOX NUMBER
METER $\Delta H_@$
C FACTOR
PITOT TUBE FACTOR
REFERENCE Δp
NOTE

READ AND RECORD ALL DATA EVERY 5 MINUTES

TRAVERSE POINT NUMBER	SAMPLING TIME, min / CLOCK TIME (24-hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O DESIRED	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET $(T_{m\ in})$, °F	DRY GAS METER TEMPERATURE OUTLET $(T_{m\ out})$, °F	PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
	0	714.~~674~~ 743									
1point	5	718.7	.36		1.7		74		5		
	10	722.6					74		5		
	15	26.6					76		5		
	20	30.5					78		5		
	25	34.3					79		5		
	30	38.2					80		5		
	35	42.1					80		5		
	40	46.0					80		5		
	45	50.0					81		5		
	50	53.9					82		5		
	55	57.8					83		5		
	60	61.7					83		5		
	65	65.6					84		5		
	70	69.5					85		5		
	75	73.4					85		5		
	80	77.4	$\sqrt{\Delta P}$		1.7		85		5		
	85 min	781.288	.600				85		5		
		66.545					80.82				

$$\frac{17.71(66.545)\ .9680\left(24.76+\frac{1.7}{13.6}\right)}{.9876(460+80.82)} = 53.1512 \div 85 = 0.6253 \text{ wscfm}$$

FIELD DATA

PLANT Exxon Mineral
DATE 9-26/80-79
SAMPLING LOCATION Fine Ore Bin Scrubber Inlet
SAMPLE TYPE Particle Size
RUN NUMBER 1
OPERATOR Dobroski
AMBIENT TEMPERATURE
BAROMETRIC PRESSURE
STATIC PRESSURE, (P_s)
FILTER NUMBER (s) 49A

PROBE LENGTH AND TYPE 3 1/2' stainless
NOZZLE I.D. 3/16
ASSUMED MOISTURE, %
SAMPLE BOX NUMBER
METER BOX NUMBER 1205
METER $\Delta H_@$
C FACTOR
PITOT TUBE FACTOR
REFERENCE Δp
NOTE

READ AND RECORD ALL DATA EVERY 5 MINUTES

TRAVERSE POINT NUMBER	SAMPLING TIME, min / CLOCK TIME (24-hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O DESIRED	ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET $(T_{m\,in})$, °F	OUTLET $(T_{m\,out})$, °F	PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
	0 1255	227.541									
	5	32.2	1.3	1.85	1.85		66	64	3		
	10	36.4	1.3	1.85	1.85		75	65	4		
	15	40.3	1.3	1.85	1.85		79	66	4		
	20	44.0	1.3	1.85	1.85		81	67	4		
	25	48.1	1.3	1.85	1.85		84	68	4		
	30	52.1	1.3	1.85	1.85	Ts =	85	69	4		
	35	56.0	1.3	1.85	1.85		85	70	3		
	40	60.2	1.3	1.85	1.85	65.5	86	70	4		
	45 stopped at 46 min	64.0	1.3	1.85	1.85		86	70	4		
restart	50 (64.5)	67.7	1.3	1.85	1.85		86	70	4		
1600	55	70.4	1.3	1.85	1.85		86	80	4		
9/30	60	75.1	1.3	1.85	1.85		90	82	4		
	65	79.0	1.3	1.85	1.85		95	85	4		
	70	83.0	1.3	1.85	1.85		102	86	4		
	75	87.0	1.3	1.85	1.85		104	87	4		
	80	91.2	1.3	1.85	1.85		106	88	4		
	85	95.2	1.3	1.85	1.85		108	88	4		
	90 90 min	299.324	1.3	1.85	1.85		108	89	4		
	90 min	71.783	1.140 $\sqrt{\Delta p}$ =		1.85			82.6			

$$\frac{17.71(71.783)\,1.001\left(24.76+\frac{1.85}{13.6}\right)}{.9904\,(460+82.6)} = 58.954 \div 90 = 0.655 \text{ wscFM}$$

A-193

FIELD DATA

PLANT Exxon Mineral
DATE 9-30-79
SAMPLING LOCATION Ore ... Sand Inc.
SAMPLE TYPE Part Size
RUN NUMBER 2
OPERATOR Dobinski
AMBIENT TEMPERATURE
BAROMETRIC PRESSURE
STATIC PRESSURE, (P_s)
FILTER NUMBER (s) 40A

PROBE LENGTH AND TYPE 3 1/2' stainless
NOZZLE I.D. 3/16
ASSUMED MOISTURE, %
SAMPLE BOX NUMBER
METER BOX NUMBER 1205
METER $\Delta H_@$
C FACTOR
PITOT TUBE FACTOR
REFERENCE Δp
NOTE

READ AND RECORD ALL DATA EVERY 5 MINUTES

TRAVERSE POINT NUMBER	SAMPLING TIME, min	CLOCK TIME (24-hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O DESIRED	ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m\,in}$), °F	OUTLET ($T_{m\,out}$), °F	PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
	0	1800	299.332									
	5		303.3	1.3	1.85	1.85		91	88	5		
	10		7.3	1.3	1.85	1.85		95	88	5		
	15		11.4	1.3	1.85	1.85		99	88	5		
	20		15.4	1.3	1.85	1.85		102	88	5		
	25		19.4	1.3	1.85	1.85		102	87	5		
	30		23.5	1.3	1.85	1.85		102	87	6		
	35		27.6	1.3	1.85	1.85		101	86	6		
	40		31.6	1.3	1.85	1.85		100	86	6		
	45		35.7	1.3	1.85	1.85		100	85	6		
	50		39.7	1.3	1.85	1.85		100	84	6		
	55		43.8	1.3	1.85	1.85		100	83	6		
	60		47.9	1.3	1.85	1.85		100	83	6		
	65		51.9	1.3	1.85	1.85		99	82	6		
	70		56.0	1.3	1.85	1.85		98	82	6		
	75		60.0	1.3	1.85	1.85		98	81	6		
	80		64.1	1.3	1.85	1.85		97	81	6		
	85		68.1	1.3	1.85	1.85		97	81	6		
	90 min		372.151	1.3	1.85	1.85		97	81	6		
			72.819	$\sqrt{\Delta P}$ = 1.1401	1.85				91.64			

$$\frac{17.71(72.819)\,1.001\left(24.76+\frac{1.85}{13.6}\right)}{.9904(460+91.64)} = 58.8248 \div 90 = 0.6536 \text{ wscfm}$$

A-194

FIELD DATA

PLANT Exxon Mineral
DATE 9-30-79
SAMPLING LOCATION Oil Bin Scrub. In
SAMPLE TYPE Part. Size
RUN NUMBER 3
OPERATOR Dobroski
AMBIENT TEMPERATURE
BAROMETRIC PRESSURE
STATIC PRESSURE, (P_s)
FILTER NUMBER (s) 59 60A

PROBE LENGTH AND TYPE 3 1/2' stainless
NOZZLE I.D. 3/16 .188
ASSUMED MOISTURE, %
SAMPLE BOX NUMBER
METER BOX NUMBER 1205
METER $\Delta H_@$
C FACTOR
PITOT TUBE FACTOR
REFERENCE Δp
NOTE

READ AND RECORD ALL DATA EVERY 5 MINUTES

TRAVERSE POINT NUMBER	SAMPLING TIME, min	CLOCK TIME (24-hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O DESIRED	ORIFICE PRESSURE DIFFERENTIAL ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m\,in}$), °F	DRY GAS METER TEMPERATURE OUTLET ($T_{m\,out}$), °F	PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
	0	2010	372.152									
	5		76.1	1.3	1.85	1.85		73	72	4		
	10		80.1	1.3	1.85	1.85		82	73	4		
	15		84.2	1.3	1.85	1.85		84	73	4		
	20		88.3	1.3	1.85	1.85		86	72	4		
	25		92.4	1.3	1.85	1.85		88	73	4		
	30		96.4	1.3	1.85	1.85		90	73	4		
	35		400.3	1.3	1.85	1.85		90	73	4		
	40		404.2	1.3	1.85	1.85		92	73	4		
	45		8.3	1.3	1.85	1.85		92	73	4		
	50		12.5	1.3	1.85	1.85		92	74	4		
	55		16.5	1.3	1.85	1.85		92	74	4		
	60		20.6	1.3	1.85	1.85		92	73	4		
	65		24.6	1.3	1.85	1.85		92	73	4		
	70		28.6	1.3	1.85	1.85		92	74	4		
	75		32.5	1.3	1.85	1.85		92	74	4		
	80		36.6	1.3	1.85	1.85		92	74	4		
	85	2034	40.687	1.3	1.85	1.85		92	74	4		
	85 min		68.535	ΔP= 1.140	1.85				81.205			

$$\frac{17.71\,(68.535)\,1.001\left(24.76 + \frac{1.85}{13.6}\right)}{.9904\,(460 + 81.205)} = 56.4316 \div 85 = 0.6659 \text{ wscfm}$$

A-195

FIELD DATA

PLANT Exxon
DATE 10 - 1 - 79
SAMPLING LOCATION Packaging Area Duct
SAMPLE TYPE Particle Size
RUN NUMBER 1
OPERATOR Jackson
AMBIENT TEMPERATURE 95°F
BAROMETRIC PRESSURE 24.02 - .04 = 23.98
STATIC PRESSURE, (P_s) 2.5
FILTER NUMBER (s) Set 66A

PROBE LENGTH AND TYPE 3' Stainless
NOZZLE I.D. .183
ASSUMED MOISTURE, % 3
SAMPLE BOX NUMBER Nutech I
METER BOX NUMBER 1226
METER $\Delta H_@$ 1.92
C FACTOR
PITOT TUBE FACTOR —
REFERENCE Δp 1.4
NOTE $1\ C_{T_{15}}$ = .002 cfm

READ AND RECORD ALL DATA EVERY 5 MINUTES

TRAVERSE POINT NUMBER	SAMPLING TIME, min	CLOCK TIME (24-hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O DESIRED	ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m\ in}$), °F	OUTLET ($T_{m\ out}$), °F	PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
	0	0934	781.328									
	5			2.0	2.7			65		7		
	10							72		7		
	15							79		7		
	20							88		7		
	25							95		7		
	30						Ts =	100		7		
	35						104	105		7		
	40							110		7		
	45							114		7		
	50							116		7		
	55	1029	836.212					118		7		
	~~60~~		54.884	$\sqrt{\Delta P}$ =								
			TT = 55 min	1.4142	2.7			96.54				

$$\frac{17.71(54.884)\ .985\left(23.98+\frac{2.7}{13.6}\right)}{.9826(460+96.54)} = 42.3308 \div 55 = 0.7696 \text{ wscfm}$$

FIELD DATA

PLANT Exxon Uranium
DATE 10-1-79
SAMPLING LOCATION Pack. Area Duct
SAMPLE TYPE P.S.
RUN NUMBER 2
OPERATOR O'Neill
AMBIENT TEMPERATURE 80
BAROMETRIC PRESSURE
STATIC PRESSURE, (P_s)
FILTER NUMBER (s) Set 28A

PROBE LENGTH AND TYPE —
NOZZLE I.D. .183
ASSUMED MOISTURE, % —
SAMPLE BOX NUMBER —
METER BOX NUMBER 1205
METER $\Delta H_@$
C FACTOR —
PITOT TUBE FACTOR —
REFERENCE Δp —
NOTE LCF = .013

READ AND RECORD ALL DATA EVERY 5 MINUTES

TRAVERSE POINT NUMBER	SAMPLING TIME, min	CLOCK TIME (24-hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O DESIRED	ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m\,in}$), °F	OUTLET ($T_{m\,out}$), °F	PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
	0	1307	458.452									
	5		63.7	2.0	2.7	–	–	82	83	5	–	60 ± 10
	10		67.3			–	–	82	94	5	–	
	15		71.7			–	–	82	94	5	–	
	20		76.8			–	–	82	100	5	–	
	25		80.9			–	–	80	95	5	–	
	30		85.9			–	–	80	100	5	–	
	35		90.4			–	–	80	99	5	–	
	40		94.7			–	–	80	104	5	–	
	45		99.6			–	–	82	106	5	–	
	50		504.5			–	–	85	110	5	–	
	55	1402	509.218	$\sqrt{\Delta P}$ =		–	–	88	113	5	–	
			50.766	1.414	2.7							
	55 min		TT = 55 min						90.95			

$$\frac{17.71(50.766)\ 1.001\left(23.98 + \frac{2.7}{13.6}\right)}{.9806(460 + 90.95)} = 40.194 \div 55 = 0.7308 \text{ wscfm}$$

FIELD DATA

PLANT Exxon Uranium
DATE 10/1/79
SAMPLING LOCATION Packaging Duct
SAMPLE TYPE P.S.
RUN NUMBER 3
OPERATOR O'Neill
AMBIENT TEMPERATURE 80
BAROMETRIC PRESSURE
STATIC PRESSURE, (P_s) —
FILTER NUMBER (s) 42A

PROBE LENGTH AND TYPE —
NOZZLE I.D. .193
ASSUMED MOISTURE, % —
SAMPLE BOX NUMBER —
METER BOX NUMBER 1205
METER $\Delta H_@$ —
C FACTOR —
PITOT TUBE FACTOR —
REFERENCE Δp —
NOTE L_f = .015 CFM

READ AND RECORD ALL DATA EVERY 5.0 MINUTES

TRAVERSE POINT NUMBER	SAMPLING TIME, min	CLOCK TIME (24-hr CLOCK)	GAS METER READING (V_m), ft³	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O DESIRED	ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m\,in}$), °F	OUTLET ($T_{m\,out}$), °F	PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
	0	1420	509.323									
	5		514.7	2.0	2.7	—	—	85	89	5	—	60±10
	10		518.6			—	—	90	111	5	—	
	15		523.0			—	—	92	117	5	—	
	20		528.4			—	—	93	117	5	—	
	25		531.8			—	—	93	117	5	—	
	30		535.5			—	—	93	118	5	—	
	35		542.7			—	—	94	116	5	—	
	40		547.5			—	—	94	116	5	—	
	45		551.4			—	—	94	114	5	—	
	50		556.3			—	—	94	113	5	—	
	55	1515	561.218			—	—				—	
			51.895						102.5			
	55 min			1.4142	2.7							

$$\frac{17.71(51.895)\,1.001\left(23.98+\frac{2.7}{13.6}\right)}{.9826(460+102.5)} = 40.244 \div 55 = 0.7317 \text{ DSCFM}$$

A-198

FIELD DATA

PLANT Exxon Uranium
DATE 10/1/79
SAMPLING LOCATION Dryer Scrubber Out
SAMPLE TYPE P.S.
RUN NUMBER One
OPERATOR O'Neill
AMBIENT TEMPERATURE 85°
BAROMETRIC PRESSURE 23.98
STATIC PRESSURE, (P_s) .90
FILTER NUMBER (s) Set 59A

PROBE LENGTH AND TYPE —
NOZZLE I.D. .188
ASSUMED MOISTURE, % —
SAMPLE BOX NUMBER —
METER BOX NUMBER 2253
METER $\Delta H_@$ 1.86
C FACTOR .97
PITOT TUBE FACTOR —
REFERENCE Δp .65
NOTE 6cf = 04

READ AND RECORD ALL DATA EVERY 4 MINUTES

TRAVERSE POINT NUMBER	SAMPLING TIME, min	CLOCK TIME (24-hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O DESIRED	ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m\ in}$), °F	OUTLET ($T_{m\ out}$), °F	PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
	0	1610	47.235									
	4	1614	50.080		1.2		—	108	108	3	—	—
			2.845									

$$\frac{17.71(2.845)\,.9919\left(23.98+\frac{1.2}{13.6}\right)}{.8759(460+108)} = 2.417 \div 4 = 0.6044 \text{ wscfm}$$

$T_s = 130$

A-199

Exxon Uranium
Box #1205 Particle Size Run 1 Dryer Scrubber In.

TRAVERSE POINT NUMBER	SAMPLING TIME, min	CLOCK TIME (24 hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in H_2O DESIRED	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in H_2O ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m\,in}$), °F	DRY GAS METER TEMPERATURE OUTLET ($T_{m\,out}$), °F	PUMP VACUUM, in Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
	0	0959	440.737									
Void	5			.09	2.8		—	100	82	12	—	60±3
	10						—	107	86	12		—
	12	1011		↓	↓			100	139	13	—	—
Filter 27A		1040										
#1	0	1047	451.948	.09	2.8		—	99	95	8	—	—
	2	min	53.804	.09	2.8		—	100	97	12	—	—
			1.856						97.75			
47A		1105										
#2	0	1107	53.848	.09	2.8		—	98	95	7	—	—
	2	min	55.770	.09	2.8		—	98	95	12	—	—
			1.922						96.5			
45A #3	0	1140	58.000	.09	2.8		—	97	100			
	1.5	min	59.215					100	102			
		1142	1.215						99.75			

$$\#1 = \frac{17.71(1.856)\,1.001\left(23.98 + \frac{2.8}{13.6}\right)}{.7499\,(460+97.8)} = 1.9022 \div 2 = 0.9511 \text{ wscfm}$$

T_s 587

$$.9511 \text{ wscfm} \times \frac{(587+460)}{530} \times \frac{29.92}{28.95} = 2.35 \text{ acfm sampling rate}$$

$$\#2 = \frac{17.71(1.922)\,1.001\left(23.98 + \frac{2.8}{13.6}\right)}{.7499\,(460+96.5)} = 1.9744 \div 2 = 0.9872 \text{ wscfm}$$

$$\#3 = \frac{17.71(1.215)\,1.001\left(23.98 + \frac{2.8}{13.6}\right)}{.7499\,(460+99.8)} = 1.2408 \div 1.5 = 0.8272 \text{ wscfm}$$

Note $\Delta N = 0.78$

10/11/79

A-200

Appendix B

Laboratory Reports

PARTICULATE SAMPLE ANALYSES Analyst GAC Date 10-10-

Plant EPA- Casper Sampling Location C. Press. Scru. outlet Run # 1
Test Date 9-27-79 Test Period 9-27 / 10-1-79 Stack # ____ Process# ____

	Beaker #	Volume ml	Tare (1) grams	Tare (2) grams		Final (1) grams	Final (2) grams	Δ wt. grams	Blk. Cor. grams	Net wt. grams
FHA	LS-1	195	110.1961	110.1957		110.2032	110.2035	0.0075	0.0000077	0.0060
FILTER1 #	25440		.4614	.4618		.4627	.4627			0.0013
FILTER2 #										
FH TOTAL										
BHW										
BHA										
TOTAL										
Comments										

Plant EPA - Casper Sampling Location C. Press. Scru. outlet Run # 2
Test Date 9-27-79 Test Period 9-27 / 10-1-79 Stack # ____ Process# ____

	Beaker #	Volume ml	Tare (1) grams	Tare (2) grams		Final (1) grams	Final (2) grams	Δ wt. grams	Blk. Cor. grams	Net wt. grams
FHA	LS-2	380	110.5158	110.5155		110.5322	110.5322	0.0167	0.0000077	0.0138
FILTER1 #	25448		4600	.4595		.4607	.4605			0.0010
FILTER2 #										
FH TOTAL										
BHW										
BHA										
TOTAL										
Comments										

Plant EPA -Casper Sampling Location C. Press. Scrub. outlet Run # 3
Test Date 9-27-79 Test Period 9-27 / 10-1-79 Stack # ____ Process# ____

	Beaker #	Volume ml	Tare (1) grams	Tare (2) grams		Final (1) grams	Final (2) grams	Δ wt. grams	Blk. Cor. grams	Net wt. grams
FHA	LS-3	415	105.8366	105.8362		105.8500	105.8495	0.0133	0.0000077	0.0101
FILTER1 #	25400		4614	.4618		.4627	.4627			0.0013
FILTER2 #										
FH TOTAL										
BHW										
BHA										
TOTAL										
Comments										
ACETONE BLK	LS-31	195	110.7040	110.7036		110.7051	110.7053	0.0015	0.0000077 g/ml	
WATER BLK										

CODE: FHA=Front half acetone wash BHW=Back half water (impinger contents + water wash) BHA=Back half acetone wash FH TOTAL=Front half catch weight TOTAL=Total train catch weight

ROY F. WESTON

PARTICULATE SAMPLE ANALYSES

Plant EPA- Casper | Sampling Location Press. Scrub. Inlet | Analyst GAC | Date 10-10-7 | Run # 1.
Test Date 9-27-79 | Test Period 9-27 / 10-1-79 | Stack # | Process#

	Beaker #	Volume ml	Tare (1) grams	Tare (2) grams		Final (1) grams	Final (2) grams	Δ wt. grams	Blk. Cor. grams	Net wt. grams
FHA	LS-4	140	108.9125	108.9120		108.9387	108.9387	0.0267	0.0000077	0.0256
FILTER$_1$ #	25443		.4605	.4605		.4744	.4742			0.0137
FILTER$_2$ #										
FH TOTAL										
BHW										
BHA										
TOTAL										

Comments

Plant EPA- Casper | Sampling Location Press. S. Inlet | Run # 2
Test Date 9-27-79 | Test Period 9/27 to 10-1-79 | Stack # | Process#

	Beaker #	Volume ml	Tare (1) grams	Tare (2) grams		Final (1) grams	Final (2) grams	Δ wt. grams	Blk. Cor. grams	Net wt. grams
FHA	LS-5	170	104.0248	104.0244		104.0414	104.0414	0.0170	0.0000077	0.0157
FILTER$_1$ #	25444		.4605	.4605		4761	.4761			0.0156
FILTER$_2$ #										
FH TOTAL										
BHW										
BHA										
TOTAL										

Comments

Plant EPA -Casper | Sampling Location Press. S. Inlet | Run # 3.
Test Date 9-27-79 | Test Period 9-27 / to 10-1-79 | Stack # | Process#

	Beaker #	Volume ml	Tare (1) grams	Tare (2) grams		Final (1) grams	Final (2) grams	Δ wt. grams	Blk. Cor. grams	Net wt. grams
FHA	LS-6	235	105.5346	105.5341		105.5470	105.5470	0.0129	0.0000077	0.0111
FILTER$_1$ #	25403		.4625	.4627		.4696	.4696			0.0071
FILTER$_2$ #										
FH TOTAL										
BHW										
BHA										
TOTAL										

Comments

ACETONE BLK									
WATER BLK									

CODE: FHA=Front half acetone wash BHW=Back half water (impinger contents + water wash) BHA=Back half

ROY F. WESTON

PARTICULATE SAMPLE ANALYSES

Plant: EPA - Casper | Sampling Location: Crus. Press. Griz. | Analyst: GAC | Date: 10-10-79
Test Date: 9-27-79 | Test Period: 9/27 to 10-1-79 | Run #: 1 | Stack #: | Process#:

	Beaker #	Volume ml	Tare (1) grams	Tare (2) grams		Final (1) grams	Final (2) grams	Δ wt. grams	Blk. Cor. grams	Net wt. grams
FHA	LS-7	255	103.5025	103.5030		103.5189	103.5189	0.0164	0.0000077	0.0144
FILTER$_1$ #	25441		.4630	.4630		.4732	.4736			0.0102
FILTER$_2$ #										
FH TOTAL										
BHW										
BHA										
TOTAL										

Comments

Plant: EPA - Casper | Sampling Location: CRUS. Press. GRIZ. | Run #: 2
Test Date: 9-27-79 | Test Period: 9-27 to 10-1-79 | Stack #: | Process#:

	Beaker #	Volume ml	Tare (1) grams	Tare (2) grams		Final (1) grams	Final (2) grams	Δ wt. grams	Blk. Cor. grams	Net wt. grams
FHA	LS-8	420	110.0460	110.0465		110.0757	110.0757	0.0297	0.0000077	0.0265
FILTER$_1$ #	25449		.4609	.4609		.4700	.4700			0.0091
FILTER$_2$ #										
FH TOTAL										
BHW										
BHA										
TOTAL										

Comments

Plant: EPA - Casper | Sampling Location: CRUS. PRESS, GRIZ | Run #: 3
Test Date: 9-27-79 | Test Period: 9-27 to 10-1-79 | Stack #: | Process#:

	Beaker #	Volume ml	Tare (1) grams	Tare (2) grams		Final (1) grams	Final (2) grams	Δ wt. grams	Blk. Cor. grams	Net wt. grams
FHA	LS-9	388	104.9330	104.9332		104.9763	104.9763	0.0433	0.0000077	0.0403
FILTER$_1$ #	25447		.4615	.4615		.4674	.4674			0.0059
FILTER$_2$ #										
FH TOTAL										
BHW										
BHA										
TOTAL										

Comments

ACETONE BLK										
WATER BLK										

CODE: FHA=Front half acetone wash BHW=Back half water(impinger contents + water wash) BHA=Back half acetone wash FH TOTAL=Front half catch weight TOTAL=Total train catch weight

ROY F. WESTON

PARTICULATE SAMPLE ANALYSES

Plant EPA - Casper | Sampling Location Crus. Trans. PT. | Analyst GAC. | Run # 1 | Date 10-10-79

Test Date 9-27-79 | Test Period 9/27 To 10-1-79 | Stack # | Process#

	Beaker #	Volume ml	Tare (1) grams	Tare (2) grams		Final (1) grams	Final (2) grams	Δ wt. grams	Blk. Cor. grams	Net wt. grams
FHA	LS-10	355	106.6638	106.6638		106.6690	106.6685	0.0047	0.0000077	0.0049
FILTER$_1$ #	25442		.4619	.4619		.4638	.4642			0.0019
FILTER$_2$ #										
FH TOTAL										
BHW										
BHA										
TOTAL										
Comments										

Plant EPA - Casper | Sampling Location Crus. Trans. PT. | Run # 2

Test Date 9-27-79 | Test Period 9-27 to 10-1-79 | Stack # | Process#

	Beaker #	Volume ml	Tare (1) grams	Tare (2) grams		Final (1) grams	Final (2) grams	Δ wt. grams	Blk. Cor. grams	Net wt. grams
FHA	LS-11	450	105.7495	105.7499		105.7592	105.7590	0.0095	0.0000077	0.0060
FILTER$_1$ #	25445		.4606	.4606		.4632	.4632			0.0026
FILTER$_2$ #										
FH TOTAL										
BHW										
BHA										
TOTAL										
Comments										

Plant EPA - Casper | Sampling Location Crus. Trans. PT. | Run # 3

Test Date 9-27-79 | Test Period 9-27 To 10-1-79 | Stack # | Process#

	Beaker #	Volume ml	Tare (1) grams	Tare (2) grams		Final (1) grams	Final (2) grams	Δ wt. grams	Blk. Cor. grams	Net wt. grams
FHA	LS-12	360	103.0261	103.0266		103.0600	103.0595	0.0334	0.0000077	0.0306
FILTER$_1$ #	25446		.4593	.4593		.4606	.4603			0.0010
FILTER$_2$ #										
FH TOTAL										
BHW										
BHA										
TOTAL										
Comments										
ACETONE BLK										
WATER BLK										

CODE: FHA=Front half acetone wash BHW=Back half water (impinger contents + water wash) BHA=Back half acetone wash FH TOTAL=Front half catch weight TOTAL=Total train catch weight

B-4

ROY F. WESTON

PARTICULATE SAMPLE ANALYSES

Plant EPA- Casper Sampling Location Hopper Inlet Analyst GAC Run # 1 Date 10-10-79
Test Date 9-28-79 Test Period 9/27 To 10-1-79 Stack # Process#

	Beaker #	Volume ml	Tare(1) grams	Tare(2) grams		Final(1) grams	Final(2) grams	Δ wt. grams	Blk. Cor. grams	Net wt. grams
FHA	LS-13	248	108.2112	108.2109		108.2193	108.2193	0.0084	0.0000077	0.0065
FILTER$_1$ #	25404		.4660	.4660		.4672	.4675			0.0012
FILTER$_2$ #										
FH TOTAL										
BHW										
BHA										
TOTAL										
Comments										

Plant EPA—Casper Sampling Location Hopper Inlet Run # 2
Test Date 9-28-79 Test Period 9/27 To 10-1-79 Stack # Process#

	Beaker #	Volume ml	Tare(1) grams	Tare(2) grams		Final(1) grams	Final(2) grams	Δ wt. grams	Blk. Cor. grams	Net wt. grams
FHA	LS-14	197	104.8220	104.8215		104.8282	104.8285	0.0067	0.0000077	0.0052
FILTER$_1$ #	25411		.4646	.4646		.4655	.4655			0.0009
FILTER$_2$ #										
FH TOTAL										
BHW										
BHA										
TOTAL										
Comments										

Plant EPA—Casper Sampling Location Hopper Inlet Run # 3
Test Date 9-28-79 Test Period 9/27 To 10-1-79 Stack # Process#

	Beaker #	Volume ml	Tare(1) grams	Tare(2) grams		Final(1) grams	Final(2) grams	Δ wt. grams	Blk. Cor. grams	Net wt. grams
FHA	LS-15	256	110.4116	110.4113		110.4194	110.4190	0.0077	0.0000077	0.0057
FILTER$_1$ #	25414		.4656	.4658		.4670	.4672			0.0014
FILTER$_2$ #										
FH TOTAL										
BHW										
BHA										
TOTAL										
Comments										
ACETONE BLK										
WATER BLK										

CODE: FHA=Front half acetone wash BHW=Back half water(impinger contents + water wash) BHA=Back half acetone wash FH TOTAL=Front half catch weight TOTAL=Total train catch weight

PARTICULATE SAMPLE ANALYSES

Analyst GAC Date 10-10-79

Plant EPA - Casper Sampling Location Scrubber outlet Run # 1
Test Date 9-28-79 Test Period 9-27 to 10-1-79 Stack # ____ Process# ____

	Beaker #	Volume ml	Tare (1) grams	Tare (2) grams		Final (1) grams	Final (2) grams	Δ wt. grams	Blk. Cor. grams	Net wt. grams
FHA	LS-16	280	103.7343	103.7342		103.7421	103.7419	.0077	.0021	.0056
FILTER$_1$ #	25408		.4650	.4652		.4661	.4664			.0011
FILTER$_2$ #										
FH TOTAL										
BHW										
BHA										
TOTAL										.0067
Comments										

Plant EPA - Casper Sampling Location Scrubber outlet Run # 2
Test Date 9-28-79 Test Period 9-27 to 10-1-79 Stack # ____ Process# ____

	Beaker #	Volume ml	Tare (1) grams	Tare (2) grams		Final (1) grams	Final (2) grams	Δ wt. grams	Blk. Cor. grams	Net wt. grams
FHA	LS-17	258	107.3007	107.3003		107.3075	107.3072	.0069		.0049
FILTER$_1$ #	25410		.4658	.4658		.4672	.4674			.0014
FILTER$_2$ #										
FH TOTAL										
BHW										
BHA										
TOTAL										
Comments										.0063

Plant EPA - Casper Sampling Location Scrubber outlet Run # 3
Test Date 9-28-79 Test Period 9-27 to 10-1-79 Stack # ____ Process# ____

	Beaker #	Volume ml	Tare (1) grams	Tare (2) grams		Final (1) grams	Final (2) grams	Δ wt. grams	Blk. Cor. grams	Net wt. grams
FHA	LS-18	340	104.8930	104.8928		104.9000	104.8996	.0068	.0026	.0042
FILTER$_1$ #	25417		.4655	.4659		.4670	.4670			.0015
FILTER$_2$ #										
FH TOTAL										
BHW										
BHA										
TOTAL										
Comments										.0057
ACETONE BLK										
WATER BLK										

CODE: FHA=Front half acetone wash BHW=Back half water(impinger contents + water wash) BHA=Back half ace[illegible] wash FH TOTAL=Front half catch weight TOTAL=Total train catch weight

PARTICULATE SAMPLE ANALYSES Analyst GAC Date 10-10-79

Plant EPA- Casper Sampling Location Scrub Inlet Run # 1
Test Date 9-28-79 Test Period 9-27 to 10-1-79 Stack # Process#

	Beaker #	Volume ml	Tare (1) grams	Tare (2) grams		Final (1) grams	Final (2) grams	Δ wt. grams	Blk. Cor. grams	Net wt. grams
FHA	LS-19	150	105.4903	105.4901		105.5016	105.5015	.0114	.0000077	.0103
FILTER$_1$ #	25405		.4674	.4674		.4713	.4715			.0039
FILTER$_2$ #										
FH TOTAL										
BHW										
BHA										
TOTAL										
Comments										.0142

Plant EPA- Casper Sampling Location Scrubber Inlet Run # 2
Test Date 9-28-79 Test Period 9-27 to 10-1-79 Stack # Process#

	Beaker #	Volume ml	Tare (1) grams	Tare (2) grams		Final (1) grams	Final (2) grams	Δ wt. grams	Blk. Cor. grams	Net wt. grams
FHA	LS-20	390	104.6408	104.6406		104.6503	104.6503	.0097	.0000077	.0067
FILTER$_1$ #	25407		.4642	.4642		.4665	.4670			.0023
FILTER$_2$ #										
FH TOTAL										
BHW										
BHA										
TOTAL										
Comments										.0090

Plant EPA- Casper Sampling Location Scrubber Inlet Run # 3
Test Date 9-28-79 Test Period 9-27 to 10-1-79 Stack # Process#

	Beaker #	Volume ml	Tare (1) grams	Tare (2) grams		Final (1) grams	Final (2) grams	Δ wt. grams	Blk. Cor. grams	Net wt. grams
FHA	LS-21	140	107.2255	107.2255		107.2354	107.2352	.0097	.0000077	.0086
FILTER$_1$ #	25415		.4680	.4685		.4696	.4698			.0016
FILTER$_2$ #										
FH TOTAL										
BHW										
BHA										
TOTAL										
Comments										.0102
ACETONE BLK										
WATER BLK										

CODE: FHA=Front half acetone wash BHW=Back half water (impinger contents + water wash) BHA=Back half acetone wash FH TOTAL=Front half catch weight TOTAL=Total train catch weight

ROY F. WESTON

PARTICULATE SAMPLE ANALYSES

Analyst GAC Date 10-10-79

Plant EPA- Casper Sampling Location Pack. Area Duct Run # 1

Test Date 10-1-79 Test Period 9-27 to 10-1-79 Stack # Process#

	Beaker #	Volume ml	Tare(1) grams	Tare(2) grams		Final(1) grams	Final(2) grams	Δ wt. grams	Blk. Cor. grams	Net wt. grams
FHA	LS-22	258	107.2742	107.2737		107.2870	107.2870	.0133	.0000077	.0113
FILTER₁ #	25413		.4675	.4675		.4768	.4768			.0093
FILTER₂ #										
FH TOTAL										
BHW										
BHA										
TOTAL										.0206
Comments										

Plant EPA- Casper Sampling Location Pack area Duct Run # 2

Test Date 10-1-79 Test Period 9-27 to 10-1-79 Stack # Process#

	Beaker #	Volume ml	Tare(1) grams	Tare(2) grams		Final(1) grams	Final(2) grams	Δ wt. grams	Blk. Cor. grams	Net wt. grams
FHA	LS-23	160	106.5108	106.5106		106.5189	106.5189	.0083	.0000077	.0071
FILTER₁ #	25450		.4621	.4621		.4652	.4655			.0031
FILTER₂ #										
FH TOTAL										
BHW										
BHA										
TOTAL										
Comments										.0102

Plant EPA- Casper Sampling Location Pack Area Duct Run # 3

Test Date 10-1-79 Test Period 9-27 to 10-1-79 Stack # Process#

	Beaker #	Volume ml	Tare(1) grams	Tare(2) grams		Final(1) grams	Final(2) grams	Δ wt. grams	Blk. Cor. grams	Net wt. grams
FHA	LS-24	148	105.8651	105.8646		105.8744	105.8746	.0098	.0000077	.0087
FILTER₁ #	25456		.4532	.4532		.4542	.4545			.0010
FILTER₂ #										
FH TOTAL										
BHW										
BHA										
TOTAL										
Comments										
ACETONE BLK										.0097
WATER BLK										

CODE: FHA=Front half acetone wash BHW=Back half water(impinger contents + water wash) BHA=Back half acetone wash FH TOTAL=Front half catch weight TOTAL=Total train catch weight

ROY F. WESTON

PARTICULATE SAMPLE ANALYSES

Plant EPA- Casper Sampling Location Scrub. Inlet Analyst GAC Date 10-10-79 Run # 1
Test Date 10-1-79 Test Period 9-27 to 10-1-79 Stack # ___ Process# ___

	Beaker #	Volume ml	Tare (1) grams	Tare (2) grams		Final (1) grams	Final (2) grams	Δ wt. grams	Blk. Cor. grams	Net wt. grams
FHA	LS-28	165	103.0166	103.0167		104.2617	104.2620	1.2451	.0000022	1.2438
FILTER₁ #	25412		4681	.4685		7.1405	7.1400			6.6719
FILTER₂ #										
FH TOTAL										
BHW										
BHA										
TOTAL										
Comments										7.9157

Plant EPA- Casper Sampling Location Scrubber Inlet Run # 2
Test Date 10-1-79 Test Period 9/27 TO 10-1-79 Stack # ___ Process# ___

	Beaker #	Volume ml	Tare (1) grams	Tare (2) grams		Final (1) grams	Final (2) grams	Δ wt. grams	Blk. Cor. grams	Net wt. grams
FHA	LS-29	285	102.1459	102.1454		102.8571	102.8571	0.7117	.000007	.7097
FILTER₁ #	25452		.4560	.4560		5.2473	5.2474			4.7913
FILTER₂ #										
FH TOTAL										
BHW										
BHA										
TOTAL										5.5010
Comments										

Plant EPA- Casper Sampling Location Scrub. Inlet Run # 3
Test Date ___ Test Period 9/27 to 10-1-79 Stack # ___ Process# ___

	Beaker #	Volume ml	Tare (1) grams	Tare (2) grams		Final (1) grams	Final (2) grams	Δ wt. grams	Blk. Cor. grams	Net wt. grams
FHA	LS-27	318	105.18400	105.1840		105.6491	105.6491	.4651	.000007	.4629
FILTER₁ #	25455		.4542	.4542		1.2915	1.2910			.8368
FILTER₂ #										
FH TOTAL										
BHW										
BHA										
TOTAL										1.2997
Comments										
ACETONE BLK										
WATER BLK										

CODE: FHA=Front half acetone wash BHW=Back half water(impinger contents + water wash) BHA=Back half acetone wash FH TOTAL=Front half catch weight TOTAL=Total train catch weight

PARTICULATE SAMPLE ANALYSES

Plant: EPA-Casper Sampling Location: Scrubber outlet Analyst: GAC Date: 10-10-79
Test Date: 10-1-79 Test Period: 9/27 to 10-1-79 Run #: 1 Stack #: Process#:

grams/ml

	Beaker #	Volume ml	Tare (1) grams	Tare (2) grams		Final (1) grams	Final (2) grams	Δ wt. grams	Blk. Cor. grams	Net wt. grams
FHA	LS-25	200	104.1883	104.1883		104.4772	104.4775	0.2889	.000007	.2875
FILTER$_1$ #	25419		.4685	.4690		.5820	.5823			.1135
FILTER$_2$ #										
FH TOTAL										
BHW										
BHA										
TOTAL										.4010
Comments										

Plant: EPA-Casper Sampling Location: Scrubber outlet Run #: 2
Test Date: 10-1-79 Test Period: 9-27 to 10-1-79 Stack #: Process#:

	Beaker #	Volume ml	Tare (1) grams	Tare (2) grams		Final (1) grams	Final (2) grams	Δ wt. grams	Blk. Cor. grams	Net wt. grams
FHA	LS-26	438	104.5937	104.5937		104.6919	104.6920	.0982	.000007	.0952
FILTER$_1$ #	25451		.4539	.4543		.5102	.5102	~~.095~~		.0563
FILTER$_2$ #										
FH TOTAL										
BHW										
BHA										
TOTAL										.1515
Comments										

Plant: EPA-Casper Sampling Location: Scrubber outlet Run #: 3
Test Date: 10-1-79 Test Period: 9-27 To 10-1-79 Stack #: Process#:

	Beaker #	Volume ml	Tare (1) grams	Tare (2) grams		Final (1) grams	Final (2) grams	Δ wt. grams	Blk. Cor. grams	Net wt. grams
FHA	LS-30	354	106.3030	106.3026		106.3273	106.3270	.0244	.00007	.0219
FILTER$_1$ #	25454		.4544	.4544		.5175	.5172			.0628
FILTER$_2$ #										
FH TOTAL										
BHW										
BHA										
TOTAL										
Comments										.[illegible]47
ACETONE BLK										
WATER BLK										

CODE: FHA=Front half acetone wash BHW=Back half water (impinger contents + water wash) BHA=Back half acetone wash FH TOTAL=Front half catch weight TOTAL=Total train catch weight

TITLE ANDERSON PARTICLE SIZE

Project No. ______

Book No. ______

From Page No. ______

CLIENT	FILTER NUMBER	FINAL (1)	FINAL 2	TARE (1)	TARE (2)		WT GRAMS
	65A-1			0.1843	0.18[illegible]		
	2			0.1659	0.1659		
	3			0.1832	0.1833		
	4			0.1682	0.1682		
	5			0.1840	0.1840		
	6			0.1682	0.1682		
	7			0.1848	0.1848		
	8			0.1676	0.1676		
	9 34			0.1901	0.19[illegible]		
Anderson impactor run Decl final	66A-1	.1847	.1850	0.1834	0.1836		.0013
	2	.1681	.1684	0.1665	0.1668		.0016
	3	.1844	.1844	0.1834	0.1834		.0010
	4	.1696	.1696	0.1689	0.1686		.0010
	5	.1833	.1833	0.18[illegible]	0.181[illegible]		.0019
	6	.1681	.1683	0.1660	0.1660		.0021
	7	.1793	.1793	0.17[illegible]	0.1763		.0010
	8	.1686	.1687	0.1677	0.16[illegible]		.0009
	9 B4	.1900	.1900	0.1887	0.1887		.0013
Anderson impactor sheet final	67A-1	.2046	.2046	0.1798	[illegible]		.0248
	2	.1959	.1959	0.1[illegible]7	0.1[illegible]		.02[illegible]
	3	.1917	.1919	0.1[illegible]7	[illegible]		.012[illegible]
	4	.1828	.1828	0.1[illegible]	0.1690		.0129
	5	.1853	.1853	0.1775	0.177[illegible]		.0079
	6	.1652	.1655	0.1619	0.1618		.0034
	7	.1849	.1849	0.18[illegible]	0.18[illegible]		.0023
	8	.1712	.1715	0.1693	0.16[illegible]		.0020
	9 34	.1921	.1[illegible]	0.1[illegible]2	0.18[illegible]		.0029
[illegible]	24594	.4633	.4631	0.4116	0.4115		51.8
P-CSO-17F	24595	.4632	.4628	0.4136	0.4136		49.2
P-CSO-18P	24596	3.5885	3.5890	0.4109	0.4101	3.1776	3177.6
P-CFI-18P	24597	.4363	.4363	0.4160	0.4160		20.3
P-CSO-18F	24598	.4324	.4319	0.4097	0.4098		22.[illegible]
18P-CSI-18F	24599	.43[illegible]	.4352	0.4123	0.4123		22.[illegible]
P-CSO-19-P	24600	.4284	.4279	0.4108	0.4105		17.3
P-CSI-19P	24601	.46[illegible]	.4657	0.4142	0.4139		52.[illegible]
	[illegible]	[illegible]	.4368	0.41[illegible]	0.4115		

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Recorded by me: B. I. Johnson

Date: 3-13-79 3-14-79

Invented by

TITLE ANDERSON PARTICLE SIZE

Project No. ______
Book No. ______

COPY

From Page No. ______

CLIENT	FILTER NUMBER	FINAL (1)	FINAL (2)	TARE (1)	TARE (2)		Δ WT. GRAMS
	61A-1			0.1786	0.1786		-
	2			0.1692	0.1691		
	3			0.1867	0.1866		
	4			0.1669	0.1669		
	5			0.1859	0.1859		
	6			0.1673	0.1872		
	7			0.1851	0.1850		
	8			0.1687	0.1687		
	9 B.U.			0.1879	0.1879		
EPA-EXXON Crusher Transfer pt Run 2	62A-1	.1828	.1830	0.1822	0.1823		.0006
	2	.1668	.1668	0.1660	0.1661		.0008
	3	.1832	.1835	0.1827	0.1828		.0005
	4	.1684	.1687	0.1681	0.1682		.0003
	5	.1849	.1850	0.1837	0.1837		.0012
	6	.1674	.1674	0.1664	0.1664		.0010
	7	.1814	.1814	0.1809	0.1811		.0005
	8	.1694	.1694	0.1688	0.1688		.0006
	9 B.U.	.1874	.1874	0.1871	0.1872		.0003
EPA-EXXON Crusher Pressure Run	63A-1	.1849	.1849	0.1832	0.1832		.0017
	2	.1698	.1699	0.1686	0.1686		.0012
	3	.1862	.1865	0.1854	0.1854		.0008
	4	.1676	.1678	0.1672	0.1672		.0004
	5	.1860	.1860	0.1853	0.1853		.0007
	6	.1690	.1690	0.1683	0.1682		.0008
	7	.1717	.1719	0.1809	0.1809		.0008
	8	.1700	.1700	0.1695	0.1694		.0006
	9 B.U.	.1888	.1888	0.1881	0.1881		.0007
PECO CROMBY ESP OUTLET	✓ 64A-1	.1855	.1852	0.1841	0.1841		.0011
	2	.1702	.1699	0.1679	0.1677		.0022
	3	.1885	.1883	0.1864	0.1862		.0021
	4	.1692	.1690	0.1677	0.1675		.0015
	5	.1867	.1864	0.1851	0.1849		.0015
	6	.1712	.1713	0.1703	0.1701		.0011
	7	.1846	.1849	0.1833	0.1831		.0015
	8	.1689	.1692	0.1683	0.1682		.0007
	9 B.U.	.1908	.1905	0.1891	0.1890		.0015

To Page No. ______

Witnessed & Understood by me, | Date | Invented by | Date

Recorded by

LE ANDERSON PARTICLE SIZE

Project No. ______
Book No. ______

n Page No.____ CLIENT	FILTER NUMBER	FINAL (1)	FINAL (2)	TARE (1)	TARE (2)		Δ WT. GRAMS
Exxon af ansfer Pt. Tun 1	57A-1	.1797	.1800	0.1792	0.1792		.0005
	2	.1643	.1645	0.1639	0.1639		.0004
	3	.1766	.1766	0.1761	0.1761		.0005
	4	.1645	.1647	0.1641	0.1641		.0004
	5	.1757	.1758	0.1754	0.1754		.0003
	6	.1638	.1639	0.1632	0.1632		.0006
	7	.1861	.1861	0.1857	0.1856		.0005
	8	.1622	.1625	0.1618	0.1618		.0004
	9 Bu	.1860	.1864	0.1854	0.1854		.0006
OCE-Amarillo	58A-1	.1987	.1985	0.1802	0.1802	.0183	
	2	.1898	.1897	0.1630	0.1630	.0267	
	3	.2093	.2092	0.1785	0.1785	.0307	
	4	.1829	.1825	0.1607	0.1607	.0218	
	5	.1889	.1884	0.1852	0.1852	.0032	
	6	.1700	.1700	0.1632	0.1632	.0068	
	7	.1749	.1752	0.1836	0.1836	-.0087	
	8	.1636	.1638	0.1618	0.1618	.0018	
	9 Bu	.2038	.2038	0.1899	0.1899	.0139	
At Exxon Dryer Scrubber outlet - Run 1	59A-1	.1848	.1850	0.1837	0.1837		.0011
	2	.1636	.1637	0.1629	0.1629		.0007
	3	.1834	.1834	0.1831	0.1831		.0003
	4	.1611	.1613	0.1609	0.1609		.0002
	5	.1860	.1860	0.1856	0.1856		.0004
	6	.1625	.1625	0.1617	0.1617		.0008
	7	.1850	.1853	0.1845	0.1845		.0005
	8	.1620	.1625	0.1617	0.1617		.0003
	9 Bu	.1853	.1853	0.1848	0.1845		.0008
At Exxon #2 Bin scrubber Inlet Run 3	60A-1	.1843	.1845	0.1834	0.1834		.0009
	2	.1633	.1633	0.1627	0.1627		.0006
	3	.1829	.1829	0.1819	0.1820		.0010
	4	.1614	.1616	0.1611	0.1611		.0003
	5	.1836	.1839	0.1822	0.1824		.0015
	6	.1637	.1637	0.1631	0.1630		.0007
	7	.1775	.1777	0.1768	0.1768		.0007
	8	.1622	.1622	0.1616	0.1616		.0006
	9 Bu	.1912	.1912	0.1908	0.1907		.0005

To Page No. .0005

Witnessed & Understood by me,	Date	Invented by	Date
		Recorded by	

ANDERSON PARTICLE SIZE

From Page No. ____ Client	Filter Number	Final (1)	Final (2)	Tare 1	Tare 2		Δ Wt. Grams
	53A-1			0.1844			-
	2			0.1621			
	3			0.18[illegible]			
	4			0.1615			
	5			0.1847			
	6			0.1642			
	7			0.1556			
	8			0.1635			
	9 Bu			0.1890			.0009
	54A-1	.1871	.1875	0.1862			.0003
Run 2	2	.1628	.1629	0.1625			.0006
	3	.1815	.1815	0.1809			.0008
	4	.1661	.1663	0.1655			.0011
	5	.1862	.1862	0.1851			.0012
	6	.1633	.1633	0.1621			.0012
	7	.1765	.1767	0.1753			.0008
	8	.1646	.1647	0.1639			.0014
	9 Bu	.1862	.18[illegible]2	0.1848			.0010
scrubber	55A-1	.1880	.1874	0.1868	1868		.0008
	2	.1633	.1634	0.1626	25		[illegible]
	3	.1562	.1562	0.1556	56		.0006
inlet Run 1	4	.1639	.1642	0.1634	34		.0008
	5	.1855	.1855	0.1847	4		.0010
	6	.1664	.1664	0.1654	55		.0010
	7	.1865	.1867	0.1858	55		.0013
	8	.1643	.1643	0.163[illegible]	3		.0013
	9	.1864	.1869	[illegible]51	1851		[illegible]
	56A-1	.1865	.1869	[illegible]56	58		.0005
	2	.1657	.1658	[illegible]53	55		.0010
	3	.1845	.1845	[illegible]35	37		.0007
	4	.1640	.164[illegible]	[illegible]3	3		.0016
	5	.1815	.1819	[illegible]79	9		.0009
	6	.1638	.1638	[illegible]2	3		.0010
	7	.1787	.1791	7			[illegible]
	8	.1639	.1639	3	3		[illegible]
	9 Bu	.1891	.1893	[illegible]	[illegible]		

1-

Project No. ______

TITLE ANDERSON PARTICLE SIZE   Book No. ______   -18

From Page No. ______

CLIENT	FILTER NUMBER	FINAL (1)	FINAL (2)	TARE (1)	TARE (2)		Δ WT. in GRAMS
FA-Xtra Ore Bin Scrubber Inlet Run 1	49A-1	.1782	.1785	0.1776	0.1776		.0006
	2	.1668	.1670	0.1648	0.1648		.0020
	3	.1831	.1831	0.1796	0.1796		.0035
	4	.1612	.1615	0.1602	0.1601		.0011
	5	.1803	.1806	0.1787	0.1786		.0017
	6	.1684	.1684	0.1664	0.1664		.0020
	7	.1785	.1787	0.1774	0.1774		.0011
	8	.1636	.1636	0.1627	0.1627		.0009
	9 B.U.	.1860	.1862	0.1853	0.1853		.0007
	50A-1	0.1852	.1850	0.1789	0.1789		6.1
	2	0.1719	.1720	0.1630	0.1630		8.9
	3	0.1875	.1875	0.1785	0.1785		9.0
	4	0.1673	.1673	0.1608	0.1609		6.5
	5	0.1861	.1861	0.1789	0.1789		7.2
	6	0.1895	.1893	0.1640	0.1640		25.3
	7	0.2107	.2102	0.1783	0.1783		31.9
	8	0.1831	0.1831	0.1612	0.1612		21.9
	9 B.U.	0.2086	.2086	0.1913	0.1913		17.3
	51A-1	0.1942	0.1940	0.1793	0.1795		14.7
	2	0.1700	0.1700	0.1633	0.1633		6.7
	3	0.1832	0.1832	0.1776	0.1776		5.6
	4	0.1674	0.1675	0.1628	0.1628		4.6
	5	0.1813	0.1813	0.1763	0.1763		5.0
	6	0.1861	.1862	0.1652	0.1652		20.9
	7	0.2033	.2033	0.1787	0.1787		24.6
	8	0.1773	0.1770	0.1628	0.1628		14.2
	9 B.U.	0.1954	0.1952	0.1868	0.1868		8.4
	52A-1	0.1821	.1825	0.1787	0.1787		3.4
	2	0.1761	.1758	0.1679	0.1678		7.9
	3	0.1836	0.1838	0.1766	0.1766		9.7
	4	0.1672	0.1675	0.1622	0.1622		5.0
	5	0.1909	.1909	0.1860	0.1860		4.9
	6	0.1879	0.1879	0.1644	0.1645		23.5
	7	0.2106	.2104	0.1843	0.1843		26.1
	8	0.1847	.1850	0.1698	0.1698		14.9
	9 B.U.	0.2015	.2015	0.1909	0.1909		

To Page 0.6

Witnessed & Understood by me, NHK | Date 9 | Invented by wt. of 52A-1 3rd time .1825 wt. of 50A-7 " " .2100 | Date

Recorded by

						Project No.	COPY
						Book No.	1

ITLE ANDERSON PARTICLE SIZE

rom Page No.____ CLIENT	FILTER NUMBER	FINAL (1)	FINAL (2)	TARE (1)	TARE (2)		Δ WT. grams
EPA-EXXON Scrubber Inlet Dryer Run 3	45A-1	.2081	.2082	0.1788	0.1789		.0293
	2	.1943	.1943	0.1696	0.1697		.0247
	3	.1910	.1910	0.1778	0.1778		.0132
	4	.1784	.1786	0.1692	0.1692		.0092
	5	.1809	.1811	0.1750	0.1750		.0059
	6	.1720	.1725	0.1697	0.1697		.0023
	7	.1817	.1818	0.1800	0.1800		.0017
	8	.1651	.1652	0.1639	0.1639		.0012
	9 B.H	.1882	.1882	0.1862	0.1864		.0020
EPA EXXON Crusher Transfer Pt Run 3	46A-1	.1796	.1797	0.1789	0.1789		.0007
	2	.1683	.1683	0.1680	0.1680		.0003
	3	.1800	.1805	0.1795	0.1798		.0005
	4	.1685	.1687	0.1678	0.1678		.0007
	5	.1764	.1767	0.1754	0.1754		.0010
	6	.1686	.1686	0.1681	0.1681		.0005
	7	.1793	.1795	0.1788	0.1786		.0005
	8	.1675	.1676	0.1668	0.1668		.0007
	9 B.H	.1884	.1884	0.1878	0.1878		.0006
EPA EXXON Fine Ore Bin Hopper Inlet Run 1	47A-1	.1780	.1783	0.1778	0.1779		.0002
	2	.1694	.1695	0.1691	0.1692		.0003
	3	.1790	.1793	0.1786	0.1787		.0004
	4	.1700	.1700	0.1693	0.1694		.0007
	5	.1790	.1793	0.1780	0.1780		.0010
	6	.1694	.1696	0.1686	0.1688		.0008
	7	.1805	.1806	0.1798	0.1798		.0007
	8	.1685	.1687	0.1680	0.1681		.0005
	9 B.H	.1892	.1892	0.1887	0.1888		.0005
EPA Exxon Crusher [illegible] Run 3	48A-1	.1791	.1791	0.1782	0.1782		.0010
	2	.1685	.1685	0.1680	0.1650		.0005
	3	.1789	.1789	0.1785	0.1755		.0004
	4	.1682	.1685	0.1677	0.1677		.0005
	5	.1810	.1812	0.1798	0.1798		.0012
	6	.1643	.1645	0.1630	0.1630		.0013
	7	.1800	.1800	0.1793	0.1791		.0009
	8	.1654	.1654	0.1648	0.1646		.0008
	9 B.H	.1917	.1917	0.1909	0.190		.0010

To Page No.____

Witnessed & Understood by me,	Date	Invented by	Date	
		Recorded by		

Project No. ______
Book No. ______

TITLE ANDERSON PARTICLE SIZE

From Page No. ____

CLIENT	FILTER NUMBER	FINAL (1)	FINAL (2)	TARE (1)	TARE (2)		Δ WT grams
EPA. Exxon F. Drain Bin Hopper Inlet Run 3	41A-1	.1812	.1815	0.1810	0.1810	.0002	
	2	.1645	.1648	0.1644	0.1644	.0001	
	3	.1808	.1811	0.1804	0.1804	.0004	
	4	.1644	.1644	0.1637	0.1637	.0007	
	5	.1809	.1810	0.1800	0.1800	.0009	
	6	.1665	.1665	0.1654	0.1654	.0011	
	7	.1794	.1795	0.1787	0.1787	.0007	
	8	.1644	.1645	0.1641	0.1639	.0005	
	9 B.U.	.1897	.1897	0.1895	0.1895	.0002	
EPA Exxon R.K. area Duct Run 3	42A-1	.1800	.1800	0.1790	0.1789	.0010	
	2	.1651	.1650	0.1644	0.1642	.0008	
	3	.1814	.1814	0.1806	0.1804	.0010	
	4	.1658	.1660	0.1645	0.1648	.0013	
	5	.1827	.1829	0.1813	0.1811	.0016	
	6	.1643	.1643	0.1632	0.1630	.0013	
	7	.1802	.1804	0.1790	0.1790	.0012	
	8	.1670	.1670	0.1660	0.1660	.0010	
	9 B.U.	.1914	.1914	0.1903	0.1903	.0011	
	43A-1			0.1799	0.1799		
	2			0.1645	0.1645		
	3			0.1797	0.1796		
	4			0.1657	0.1656		
	5			0.1815	0.1815		
	6			0.1666	0.1664		
	7			0.1801	0.1800		
	8			0.1655	0.1654		
	9 B.U.			0.1897	0.1897		
	44A-1			0.1827	0.1827		
	2			0.1659	0.1657		
	3			0.1818	0.1818		
	4			0.1656	0.1657		
	5			0.1840	0.1838		
	6			0.1644	0.1644		
	7			0.1812	0.1810		
	8			0.1662	0.1661		
	9 B.U.			0.1901	0.1900		

To Page No. ______

Witnessed & Understood by me, [illegible] Date 1-24-79

Invented by ______ Date ______

Recorded by ______

Project No. ______ COPY
Book No. ______

TITLE Anderson Particle Size

From Page No. ____ CLIENT	FILTER NUMBER	FINAL (1)	FINAL (2)	TARE (1)	TARE (2)		Δ wt grams
	37A-1	.6777	.6781	0.1805	0.1805		
	2	.2363	.2358	0.1660	0.1660		
	3	.2990	.2989	0.1790	0.1790		
	4	.2584	.2579	0.1645	0.1645		
	5	.2033	.2030	0.1801	0.1801		
	6	.1794	.1789	0.1630	0.1630		
	7	.1874	.1873	0.1807	0.1807		
	8	.1692	.1691	0.1660	0.1660		
	9 B.H.	.1946	.1941	0.1904	0.1904		
EPA Exxon Fine Ore Bin Scrubber Outlet Run	38A-1	.1800	.1802	0.1800	0.7999		.0001
	2	.1655	.1655	0.1654	0.1654		.0001
	3	.1788	.1790	0.1786	0.1786		.000
	4	.1652	.1653	0.1650	0.1649		.0003
	5	.1808	.1808	0.1804	0.1804		.000
	6	.1657	.1657	0.1651	0.1650		.000
	7	.1750	.1752	0.1742	0.1742		.000
	8	.1642	.1644	0.1637	0.1637		.000
	9 B.H.	.1879	.1880	0.1876	0.1876		.0003
EPA Exxon Fine Ore Bin Hopper Inlet Run 2	39A-1	.1800	.1803	0.1798	0.1799		.000
	2	.1676	.1676	0.1675	0.1675		.0001
	3	.1800	.1802	0.1797	0.1798		.000
	4	.1653	.1653	0.1650	0.1649		.000
	5	.1815	.1815	0.1810	0.1811		.000
	6	.1645	.1647	0.1638	0.1635		.000
	7	.1801	.1803	0.1795	0.1795		.000
	8	.1640	.1642	0.1637	0.1635		.000
	9 B.H.	.1908	.1908	0.1907	0.1905		.0003
EPA-Exxon Fine Ore Bin Scrubber Inlet Run 2	40A-1	.1696	.1696	0.1694	0.1692		.000
	2	.1650	.1652	0.1649	0.1648		.0002
	3	.1822	.1823	0.1817	0.1819		.000
	4	.1640	.1642	0.1634	0.1633		.000
	5	.1830	.1830	0.1822	0.1824		.000
	6	.1816	.1816	0.1813	0.1811		.000
	7	.1805	.1807	0.1800	0.1800		.0005
	8	.1639	.1639	0.1637	0.1635		.000
	9 B.H.	.1884	.1884	0.1882	0.1882		.00

To Page No. ____

Witnessed & Understood by me, [signature] | Date 9-24-79 | Invented by | Recorded by | Date

Sm Circle = Config II

TITLE ANDERSON PARTICLE SIZE .07 — Project No. ______ Book No. ______

From Page No. ______

CLIENT	FILTER NUMBER	FINAL (1)	FINAL (2)	TARE (1)	TARE (2)		Δ Wt. grams
Elim-Exxon Washer Scrubber outlet Run	33A-1 II	.1818	.1818	0.1818	0.1816		.0002
	2 I	.1662	.1662	0.1660	0.1660		.0002
	3 II	.1812	.1812	0.1811	0.1809		.0003
	4 I	.1663	.1660	0.1656	0.1656		.0004
	5 II	.1809	.1810	0.1803	0.1802		.0007
	6 I	.1658	.1656	0.1650	0.1650		.0006
	7 II	.1840	.1837	0.1831	0.1830		.0007
	8 I	.1647	.1649	0.1638	0.1637		.0010
	9 BU	.1860	.1860	0.1853	0.1855		.0007
Elim-Exxon Under Pressure Energy Run	34A-1	.1832	.1832	0.1821	0.1823		.0011
	2	.1660	.1662	0.1654	0.1654		.0006
	3	.1800	.1802	0.1791	0.1791		.0009
	4	.1646	.1646	0.1641	0.1641		.0005
	5	.1851	.1853	0.1838	0.1838		.0013
	6	.1666	.1666	0.1656	0.1656		.0010
	7	.1828	.1831	0.1819	0.1819		.0009
	8	.1655	.1657	0.1649	0.1648		.0007
	9 B.U.	.1826	.1826	0.1916	0.1916		.0010
	35A-1	.1849	.1846	0.1836	0.1838		.0010
	2	.1641	.1642	0.1625	0.1627		.0016
	3	.1817	.1817	0.1787	0.1787		.0030
	4	.1678	.1675	0.1652	0.1652		.0023
	5	.1838	.1835	0.1819	0.1820		.0016
	6	.1690	.1689	0.1663	0.1662		.0027
	7	.1809	.1806	0.1795	0.1795		.0011
	8	.1646	.1643	0.1636	0.1636		.0007
	9 B.U.	.1937	.1934	0.1908	0.1908		.0026
✓	36-A-1	2.6560	2.6553	0.1812	0.1812		
	2	.5652	.5653	0.1640	0.1640		
	3	.3831	.3829	0.1821	0.1821		
	4	.4741	.4746	0.1647	0.1648		
	5	.2695	.2688	0.1812	0.1812		
	6	.2751	.2747	0.1648	0.1648		
	7	.2220	.2217	0.1797	0.1795		
	8	.1800	.1795	0.1633	0.1633		
	9 B.U.	.2080	.2075	0.1903	0.1903		

To Page No. ______

Signed & Understood by me, | Date ... 79 | Invented by | Date

Recorded by

TITLE Anderson Particle Size

Project No. ______
Book No. ______

From Page No. ____

Client	Filter Number	Final (1)	Final (2)	Tare (1)	Tare (2)		ΔWt. grams
OCF - Ashton, R.I.	25A-1	.1845	.1847	0.1811	0.1812		.0034
	2	.1669	.1669	0.1637	0.1638		.0032
	3	.1852	.1852	0.1814	0.1814		.0038
	4	.1691	.1691	0.1655	0.1656		.0036
	5	.1856	.1857	0.1822	0.1822		.0034
	6	.1689	.1689	0.1655	0.1655		.0034
	7	.1878	.1877	0.1832	0.1832		.0045
	8	.1737	.1737	0.1662	0.1663		.0075
	9 B.U.	.2577	.2577	0.2038	0.2038		.0539
OCF Ashton, R.I.	26A-1	.1881	.1880	0.1846	0.1847		.0034
	2	.1682	.1683	0.1648	0.1850		.0034
	3	.1862	.1862	0.1824	0.1825		.0038
	4	.1696	.1696	0.1660	0.1660		.0036
	5	.1870	.1871	0.1827	0.1827		.0043
	6	.1707	.1707	0.1658	0.1858		.0049
	7	.1950	.1950	0.1838	0.1839		.0112
	8	.2145	.2144	0.1653	0.1653		.0491
	9 B.U.	.3485	.3485	0.2018	0.2018		.1467
PA-Exxon Dryer Scrubber Inlet Run 1	27A-1	.2095	.2096	0.1789	0.1789		.0306
	2	.1873	.1875	0.1652	0.1652		.0221
	3	.1954	.1954	0.1813	0.1814		.0141
	4	.1771	.1773	0.1645	0.1647		.0126
	5	.1921	.1921	0.1827	0.1827		.0094
	6	.1678	.1679	0.1655	0.1655		.0023
	7	.1840	.1840	0.1805	0.1806		.0035
	8	.1685	.1685	0.1659	0.1659		.0026
	9 B.U.	.2070	.2073	0.2040	0.2040		.0030
PA Exxon Packaging area duct Run 2	28A-1	.1830	.1832	0.1814	0.1815		.0016
	2	.1706	.1706	0.1690	0.1691		.0016
	3	.1810	.1811	0.1802	0.1802		.0008
	4	.1670	.1670	0.1660	0.1662		.0010
	5	.1795	.1795	0.1776	0.1775		.0020
	6	.1676	.1677	0.1662	0.1662		.0014
	7	.1820	.1822	0.1806	0.1807		.0014
	8	.1657	.1657	0.1649	0.1649		.0008
	9 B.U.	.2018	.2020	0.2003	0.2003		.0015

To Page No. ____

Witnessed & Understood by me, D M Maloney

Date

Invented by

Date

Recorded by

ANALYTICAL DATA

PLANT Exxon

DATE 9-27-79

SAMPLING LOCATION Crusher transfer Pt.

SAMPLE TYPE EPA 5 Part.

RUN NUMBER 1

SAMPLE BOX NUMBER 4

CLEAN UP MAN Dobroski.

COMMENTS:

FRONT HALF

LABORATORY RESULTS

ACETONE WASH OF NOZZLE, PROBE, CYCLONE (BYPASS), FLASK, FRONT HALF OF FILTER HOLDER — CONTAINER ______ ______ mg

FILTER NUMBER 25442 — CONTAINER ______ ______ mg

FRONT HALF SUBTOTAL ______ mg

BACK HALF

IMPINGER CONTENTS AND WATER WASH OF IMPINGERS, CONNECTORS, AND BACK HALF OF FILTER HOLDER — CONTAINER ______ ______ mg

ETHER-CHLOROFORM EXTRACTION ______ mg

ACETONE WASH OF IMPINGERS, CONNECTORS, AND BACK HALF OF FILTER HOLDER — CONTAINER ______ ______ mg

BACK HALF SUBTOTAL ______ mg

TOTAL WEIGHT ______ mg

MOISTURE

IMPINGERS

FINAL VOLUME	198	ml
INITIAL VOLUME	200	ml
NET VOLUME	-2	ml

SILICA GEL

FINAL WEIGHT	211.5	g		g
INITIAL WEIGHT	200	g		g
NET WEIGHT	11.5	g		g

SUBTOTAL ______ g

TOTAL MOISTURE 9.5 g

ANALYTICAL DATA

PLANT EXXON MINERAL

DATE 9/27/79

SAMPLING LOCATION CRUSHER TRANSFER PT.

SAMPLE TYPE EPA METHOD #5 PART.

RUN NUMBER 2

SAMPLE BOX NUMBER 4

CLEAN UP MAN ~~Dombroski~~ Dobroski

COMMENTS:

FRONT HALF

LABORATORY RESULTS

ACETONE WASH OF NOZZLE, PROBE, CYCLONE (BYPASS), FLASK, FRONT HALF OF FILTER HOLDER

CONTAINER ________ ________ mg

FILTER NUMBER 25442

CONTAINER ________ ________ mg

FRONT HALF SUBTOTAL ________ mg

BACK HALF

IMPINGER CONTENTS AND WATER WASH OF IMPINGERS, CONNECTORS, AND BACK HALF OF FILTER HOLDER

ACETONE WASH OF IMPINGERS, CONNECTORS, AND BACK HALF OF FILTER HOLDER

CONTAINER ________ ________ mg

ETHER-CHLOROFORM EXTRACTION ________ mg

CONTAINER ________ ________ mg

BACK HALF SUBTOTAL ________ mg

TOTAL WEIGHT ________ mg

MOISTURE

IMPINGERS

FINAL VOLUME 200 ml

INITIAL VOLUME 200 ml

NET VOLUME 0 ml

SILICA GEL

FINAL WEIGHT 210 g ________ g

INITIAL WEIGHT 200 g ________ g

NET WEIGHT 10 g ________ g

SUBTOTAL 10 g

TOTAL MOISTURE 10

ANALYTICAL DATA

PLANT EXXON MINERAL

DATE 9/27/79

SAMPLING LOCATION CRUSHER TRANSFER PT.

SAMPLE TYPE EPA METHOD #5 PART

RUN NUMBER 3

SAMPLE BOX NUMBER 4

CLEAN UP MAN Dombroski

COMMENTS:

FRONT HALF

LABORATORY RESULTS

ACETONE WASH OF NOZZLE, PROBE, CYCLONE (BYPASS), FLASK, FRONT HALF OF FILTER HOLDER

CONTAINER ______ ______ mg

FILTER NUMBER 25442 ______

CONTAINER ______ ______ mg

FRONT HALF SUBTOTAL ______ mg

BACK HALF

IMPINGER CONTENTS AND WATER WASH OF IMPINGERS, CONNECTORS, AND BACK HALF OF FILTER HOLDER

ACETONE WASH OF IMPINGERS, CONNECTORS, AND BACK HALF OF FILTER HOLDER

CONTAINER ______ ______ mg

ETHER-CHLOROFORM EXTRACTION ______ mg

CONTAINER ______ ______ mg

BACK HALF SUBTOTAL ______ mg

TOTAL WEIGHT ______ mg

MOISTURE

IMPINGERS

FINAL VOLUME	206	ml
INITIAL VOLUME	200	ml
NET VOLUME	6	ml

SILICA GEL

FINAL WEIGHT	208.7	g	______	g
INITIAL WEIGHT	200	g	______	g
NET WEIGHT	8.7	g	______	g

SUBTOTAL ______ g

TOTAL MOISTURE 14.7 g

ANALYTICAL DATA

PLANT Exxon Uranium

DATE 9/22/79

SAMPLING LOCATION Crusher pressure grizzly

SAMPLE TYPE Particulate

RUN NUMBER 1

SAMPLE BOX NUMBER 3

CLEAN UP MAN T. Moron

COMMENTS:

FRONT HALF

LABORATORY RESULTS

ACETONE WASH OF NOZZLE, PROBE, CYCLONE (BYPASS), FLASK, FRONT HALF OF FILTER HOLDER — CONTAINER ______ ______ mg

FILTER NUMBER 25441 ______ — CONTAINER ______ ______ mg

FRONT HALF SUBTOTAL ______ mg

BACK HALF

IMPINGER CONTENTS AND WATER WASH OF IMPINGERS, CONNECTORS, AND BACK HALF OF FILTER HOLDER — CONTAINER ______ ______ mg

ETHER-CHLOROFORM EXTRACTION ______ mg

ACETONE WASH OF IMPINGERS, CONNECTORS, AND BACK HALF OF FILTER HOLDER — CONTAINER ______ ______ mg

BACK HALF SUBTOTAL ______ mg

TOTAL WEIGHT ______ mg

MOISTURE

IMPINGERS

FINAL VOLUME	192	ml
INITIAL VOLUME	200	ml
NET VOLUME	-8	ml

SILICA GEL

FINAL WEIGHT	212.4	g	______	g
INITIAL WEIGHT	200	g	______	g
NET WEIGHT	12.4	g	______	g

SUBTOTAL ______ g

TOTAL MOISTURE 4.4

ANALYTICAL DATA

PLANT Exxon Uranium

DATE 9-27-79

SAMPLING LOCATION Crusher pressure grizzly

SAMPLE TYPE Part

RUN NUMBER 2

SAMPLE BOX NUMBER 3

CLEAN UP MAN T. Moxon

COMMENTS:

FRONT HALF

LABORATORY RESULTS

ACETONE WASH OF NOZZLE, PROBE, CYCLONE (BYPASS), FLASK, FRONT HALF OF FILTER HOLDER — CONTAINER ______ ______ mg

FILTER NUMBER 25449 ______ — CONTAINER ______ ______ mg

FRONT HALF SUBTOTAL ______ mg

BACK HALF

IMPINGER CONTENTS AND WATER WASH OF IMPINGERS, CONNECTORS, AND BACK HALF OF FILTER HOLDER — CONTAINER ______ ______ mg

ETHER-CHLOROFORM EXTRACTION ______ mg

ACETONE WASH OF IMPINGERS, CONNECTORS, AND BACK HALF OF FILTER HOLDER — CONTAINER ______ ______ mg

BACK HALF SUBTOTAL ______ mg

TOTAL WEIGHT ______ mg

MOISTURE

IMPINGERS

FINAL VOLUME 193 ml

INITIAL VOLUME 200 ml

NET VOLUME -7 ml

SILICA GEL

FINAL WEIGHT 215.4 g ______ g

INITIAL WEIGHT 200 g ______ g

NET WEIGHT 15.4 g ______ g

SUBTOTAL ______ g

TOTAL MOISTURE 8.4 g

ANALYTICAL DATA

PLANT Exxon Uranium

DATE 9/27/79

SAMPLING LOCATION Crusher pressure grizzly

SAMPLE TYPE Particulate

RUN NUMBER 3

SAMPLE BOX NUMBER 3

CLEAN UP MAN Moxon/Davis

COMMENTS:

FRONT HALF

LABORATORY RESULTS

ACETONE WASH OF NOZZLE, PROBE, CYCLONE (BYPASS), FLASK, FRONT HALF OF FILTER HOLDER — CONTAINER ______ ______ mg

FILTER NUMBER 25447 ______ — CONTAINER ______ ______ mg

FRONT HALF SUBTOTAL ______ mg

BACK HALF

IMPINGER CONTENTS AND WATER WASH OF IMPINGERS, CONNECTORS, AND BACK HALF OF FILTER HOLDER — CONTAINER ______ ______ mg

ETHER-CHLOROFORM EXTRACTION ______ mg

ACETONE WASH OF IMPINGERS, CONNECTORS, AND BACK HALF OF FILTER HOLDER — CONTAINER ______ ______ mg

BACK HALF SUBTOTAL ______ mg

TOTAL WEIGHT ______ mg

MOISTURE

IMPINGERS

- FINAL VOLUME 193 ml
- INITIAL VOLUME 200 ml
- NET VOLUME -7 ml

SILICA GEL

- FINAL WEIGHT 215.1 g ______ g
- INITIAL WEIGHT 200 g ______ g
- NET WEIGHT 15.7 g ______ g

SUBTOTAL ______ g

TOTAL MOISTURE 8.7

ANALYTICAL DATA

PLANT Exxon Uranium

DATE 9-27-79 Scrubber

SAMPLING LOCATION Crusher Inlet

SAMPLE TYPE Part EPA5

RUN NUMBER One

SAMPLE BOX NUMBER 2

CLEAN UP MAN NG, VM

COMMENTS:

FRONT HALF

LABORATORY RESULTS

ACETONE WASH OF NOZZLE, PROBE, CYCLONE (BYPASS), FLASK, FRONT HALF OF FILTER HOLDER — CONTAINER ______ ______ mg

FILTER NUMBER 25443 ______ — CONTAINER ______ ______ mg

FRONT HALF SUBTOTAL ______ mg

BACK HALF

IMPINGER CONTENTS AND WATER WASH OF IMPINGERS, CONNECTORS, AND BACK HALF OF FILTER HOLDER — CONTAINER ______ ______ mg

ETHER-CHLOROFORM EXTRACTION ______ mg

ACETONE WASH OF IMPINGERS, CONNECTORS, AND BACK HALF OF FILTER HOLDER — CONTAINER ______ ______ mg

BACK HALF SUBTOTAL ______ mg

TOTAL WEIGHT ______ mg

MOISTURE

IMPINGERS

FINAL VOLUME 194 ml

INITIAL VOLUME 200 ml

NET VOLUME -6 ml

SILICA GEL

FINAL WEIGHT 214.4 g ______ g

INITIAL WEIGHT 200 g ______ g

NET WEIGHT 14.4 g ______ g

-6

8.4

SUBTOTAL 8.4 g

TOTAL MOISTURE 8.4 g

ANALYTICAL DATA

PLANT Exxon - EPA

DATE 9-27-79

SAMPLING LOCATION Scrubber inlet

SAMPLE TYPE particulate

RUN NUMBER 2

SAMPLE BOX NUMBER 2

CLEAN UP MAN NG, VM

COMMENTS:

FRONT HALF

LABORATORY RESULTS

ACETONE WASH OF NOZZLE, PROBE, CYCLONE (BYPASS), FLASK, FRONT HALF OF FILTER HOLDER — CONTAINER ______ ______ mg

FILTER NUMBER 25444 ______ — CONTAINER ______ ______ mg

FRONT HALF SUBTOTAL ______ mg

BACK HALF

IMPINGER CONTENTS AND WATER WASH OF IMPINGERS, CONNECTORS, AND BACK HALF OF FILTER HOLDER — CONTAINER ______ ______ mg

ETHER-CHLOROFORM EXTRACTION ______ mg

ACETONE WASH OF IMPINGERS, CONNECTORS, AND BACK HALF OF FILTER HOLDER — CONTAINER ______ ______ mg

BACK HALF SUBTOTAL ______ mg

TOTAL WEIGHT ______ mg

MOISTURE

IMPINGERS

FINAL VOLUME	208	ml
INITIAL VOLUME	200	ml
NET VOLUME	8	ml

SILICA GEL

FINAL WEIGHT	211	g		g
INITIAL WEIGHT	200	g		g
NET WEIGHT	11	g		g

SUBTOTAL ______ g

TOTAL MOISTURE 19 g

ANALYTICAL DATA

PLANT Exxon - EPA

DATE 9-27-79

SAMPLING LOCATION Scrubber Inlet

SAMPLE TYPE particulate

RUN NUMBER 3

SAMPLE BOX NUMBER 2

CLEAN UP MAN NG, VM

COMMENTS:

FRONT HALF

LABORATORY RESULTS

ACETONE WASH OF NOZZLE, PROBE, CYCLONE (BYPASS), FLASK, FRONT HALF OF FILTER HOLDER

CONTAINER ______ ______ mg

FILTER NUMBER 25403 ______

CONTAINER ______ ______ mg

FRONT HALF SUBTOTAL ______ mg

BACK HALF

IMPINGER CONTENTS AND WATER WASH OF IMPINGERS, CONNECTORS, AND BACK HALF OF FILTER HOLDER

CONTAINER ______ ______ mg

ETHER-CHLOROFORM EXTRACTION ______ mg

ACETONE WASH OF IMPINGERS, CONNECTORS, AND BACK HALF OF FILTER HOLDER

CONTAINER ______ ______ mg

BACK HALF SUBTOTAL ______ mg

TOTAL WEIGHT ______ mg

MOISTURE

IMPINGERS

FINAL VOLUME 204 ml

INITIAL VOLUME 200 ml

NET VOLUME 4 ml

SILICA GEL

FINAL WEIGHT 205 g ______ g

INITIAL WEIGHT 200 g ______ g

NET WEIGHT 5 g ______ g

SUBTOTAL ______ g

TOTAL MOISTURE 9 g

ANALYTICAL DATA

PLANT Exxon Uran

DATE 9-27-79

SAMPLING LOCATION Scrubber outlet

SAMPLE TYPE Part

RUN NUMBER 1

SAMPLE BOX NUMBER 1

CLEAN UP MAN Celiano

COMMENTS:

FRONT HALF

LABORATORY RESULTS

ACETONE WASH OF NOZZLE, PROBE, CYCLONE (BYPASS), FLASK, FRONT HALF OF FILTER HOLDER

CONTAINER ______ ______ mg

FILTER NUMBER 25440 ______

CONTAINER ______ ______ mg

FRONT HALF SUBTOTAL ______ mg

BACK HALF

IMPINGER CONTENTS AND WATER WASH OF IMPINGERS, CONNECTORS, AND BACK HALF OF FILTER HOLDER

CONTAINER ______ ______ mg

ETHER-CHLOROFORM EXTRACTION ______ mg

ACETONE WASH OF IMPINGERS, CONNECTORS, AND BACK HALF OF FILTER HOLDER

CONTAINER ______ ______ mg

BACK HALF SUBTOTAL ______ mg

TOTAL WEIGHT ______ mg

MOISTURE

IMPINGERS

FINAL VOLUME 202 ml

INITIAL VOLUME 200 ml

NET VOLUME 2 ml

SILICA GEL

FINAL WEIGHT 213 g ______ g

INITIAL WEIGHT 200 g ______ g

NET WEIGHT 13 g ______ g

SUBTOTAL ______ g

$$\begin{array}{r} 13 \\ +2 \\ \hline 15 \end{array}$$

TOTAL MOISTURE 15

ANALYTICAL DATA

PLANT Exxon Uranium -
DATE 9-27-79
SAMPLING LOCATION ScruBBer outlet
SAMPLE TYPE Part
RUN NUMBER 2
SAMPLE BOX NUMBER 1
CLEAN UP MAN Coliano.

COMMENTS:

FRONT HALF

LABORATORY RESULTS

ACETONE WASH OF NOZZLE, PROBE, CYCLONE (BYPASS), FLASK, FRONT HALF OF FILTER HOLDER — CONTAINER ______ ______ mg

FILTER NUMBER 25448 ______ — CONTAINER ______ ______ mg

FRONT HALF SUBTOTAL ______ mg

BACK HALF

IMPINGER CONTENTS AND WATER WASH OF IMPINGERS, CONNECTORS, AND BACK HALF OF FILTER HOLDER — CONTAINER ______ ______ mg

ETHER-CHLOROFORM EXTRACTION ______ mg

ACETONE WASH OF IMPINGERS, CONNECTORS, AND BACK HALF OF FILTER HOLDER — CONTAINER ______ ______ mg

BACK HALF SUBTOTAL ______ mg

TOTAL WEIGHT ______ mg

MOISTURE

IMPINGERS
FINAL VOLUME 198 ml
INITIAL VOLUME 200 ml
NET VOLUME -2 ml

SILICA GEL
FINAL WEIGHT 216 g ______ g
INITIAL WEIGHT 200 g ______ g
NET WEIGHT 16 g ______ g

SUBTOTAL ______ g

$$\begin{array}{r} 16 \\ -2 \\ \hline 14 \end{array}$$

TOTAL MOISTURE 14 g

ANALYTICAL DATA

PLANT Exxon Ulean.
DATE 9-27-79
SAMPLING LOCATION ScrubBer outlet
SAMPLE TYPE Part
RUN NUMBER 3
SAMPLE BOX NUMBER 1
CLEAN UP MAN Celiano.

COMMENTS:

FRONT HALF

LABORATORY RESULTS

ACETONE WASH OF NOZZLE, PROBE, CYCLONE (BYPASS), FLASK, FRONT HALF OF FILTER HOLDER

CONTAINER ______ ______ mg

FILTER NUMBER 25400

CONTAINER ______ ______ mg

FRONT HALF SUBTOTAL ______ mg

BACK HALF

IMPINGER CONTENTS AND WATER WASH OF IMPINGERS, CONNECTORS, AND BACK HALF OF FILTER HOLDER

CONTAINER ______ ______ mg

ETHER-CHLOROFORM EXTRACTION ______ mg

ACETONE WASH OF IMPINGERS, CONNECTORS, AND BACK HALF OF FILTER HOLDER

CONTAINER ______ ______ mg

BACK HALF SUBTOTAL ______ mg

TOTAL WEIGHT ______ mg

MOISTURE

IMPINGERS
FINAL VOLUME 194 ml
INITIAL VOLUME 200 ml
NET VOLUME -6 ml

16.5
-6.0
10.5

SILICA GEL
FINAL WEIGHT 2165 g ______ g
INITIAL WEIGHT 200 g ______ g
NET WEIGHT 16.5 g ______ g

SUBTOTAL ______ g

TOTAL MOISTURE 10.5 g

ANALYTICAL DATA

PLANT Exxon Uran

DATE 9-28-79

SAMPLING LOCATION Hopper Duct

SAMPLE TYPE Part.

RUN NUMBER 1

SAMPLE BOX NUMBER 1

CLEAN UP MAN Cibrano.

COMMENTS:

FRONT HALF

LABORATORY RESULTS

ACETONE WASH OF NOZZLE, PROBE, CYCLONE (BYPASS), FLASK, FRONT HALF OF FILTER HOLDER — CONTAINER ______ ______ mg

FILTER NUMBER 25404 — CONTAINER ______ ______ mg

FRONT HALF SUBTOTAL ______ mg

BACK HALF

IMPINGER CONTENTS AND WATER WASH OF IMPINGERS, CONNECTORS, AND BACK HALF OF FILTER HOLDER — CONTAINER ______ ______ mg

ETHER-CHLOROFORM EXTRACTION ______ mg

ACETONE WASH OF IMPINGERS, CONNECTORS, AND BACK HALF OF FILTER HOLDER — CONTAINER ______ ______ mg

BACK HALF SUBTOTAL ______ mg

TOTAL WEIGHT ______ mg

MOISTURE

IMPINGERS

FINAL VOLUME 202 ml

INITIAL VOLUME 200 ml

NET VOLUME 2 ml

SILICA GEL

FINAL WEIGHT 211.5 g ______ g

INITIAL WEIGHT 200 g ______ g

NET WEIGHT 11.5 g ______ g

SUBTOTAL ______ g

11.5
+ 2.0
13.5

TOTAL MOISTURE 13.5 g

ANALYTICAL DATA

PLANT EXXON MINERAL

DATE 9/28/79

SAMPLING LOCATION HOPPER INLET

SAMPLE TYPE PARTICULATE EPA METHOD #5

RUN NUMBER 2

SAMPLE BOX NUMBER ______

CLEAN UP MAN BOB NEWTON

COMMENTS:

FRONT HALF

LABORATORY RESULTS

ACETONE WASH OF NOZZLE, PROBE, CYCLONE (BYPASS), FLASK, FRONT HALF OF FILTER HOLDER — CONTAINER ______ ______ mg

FILTER NUMBER 25411 — CONTAINER ______ ______ mg

FRONT HALF SUBTOTAL ______ mg

BACK HALF

IMPINGER CONTENTS AND WATER WASH OF IMPINGERS, CONNECTORS, AND BACK HALF OF FILTER HOLDER — CONTAINER ______ ______ mg

ETHER-CHLOROFORM EXTRACTION ______ mg

ACETONE WASH OF IMPINGERS, CONNECTORS, AND BACK HALF OF FILTER HOLDER — CONTAINER ______ ______ mg

BACK HALF SUBTOTAL ______ mg

TOTAL WEIGHT ______ mg

MOISTURE

IMPINGERS

FINAL VOLUME	194 ml
INITIAL VOLUME	200 ml
NET VOLUME	-6 ml

SILICA GEL

FINAL WEIGHT	214.3 g	______ g
INITIAL WEIGHT	200 g	______ g
NET WEIGHT	+14.3 g	______ g

SUBTOTAL ______ g

TOTAL MOISTURE 8.3

ANALYTICAL DATA

PLANT EXXON MINERAL

DATE 9/29/79

SAMPLING LOCATION HOPPER INLET

SAMPLE TYPE PARTICULATE

RUN NUMBER 3

SAMPLE BOX NUMBER

CLEAN UP MAN BOB NEWTON

COMMENTS:

FRONT HALF

LABORATORY RESULTS

ACETONE WASH OF NOZZLE, PROBE, CYCLONE (BYPASS), FLASK, FRONT HALF OF FILTER HOLDER — CONTAINER ______ ______ mg

FILTER NUMBER 25414 ______ — CONTAINER ______ ______ mg

FRONT HALF SUBTOTAL ______ mg

BACK HALF

IMPINGER CONTENTS AND WATER WASH OF IMPINGERS, CONNECTORS, AND BACK HALF OF FILTER HOLDER — CONTAINER ______ ______ mg

ETHER-CHLOROFORM EXTRACTION ______ mg

ACETONE WASH OF IMPINGERS, CONNECTORS, AND BACK HALF OF FILTER HOLDER — CONTAINER ______ ______ mg

BACK HALF SUBTOTAL ______ mg

TOTAL WEIGHT ______ mg

MOISTURE

IMPINGERS

FINAL VOLUME 193 ml

INITIAL VOLUME 200 ml

NET VOLUME -7 ml

SILICA GEL

FINAL WEIGHT ~~[illegible]~~ 214.4 g ______ g

INITIAL WEIGHT 200 g ______ g

NET WEIGHT ~~[illegible]~~ 14.4 g ______ g

SUBTOTAL ______ g

TOTAL MOISTURE 7.4 g

ANALYTICAL DATA

PLANT Exxon-EPA

DATE 9-21-79

SAMPLING LOCATION fine ore scrubber inlet

SAMPLE TYPE particulate

RUN NUMBER 1

SAMPLE BOX NUMBER

CLEAN UP MAN NG, UM

COMMENTS:

FRONT HALF

LABORATORY RESULTS

ACETONE WASH OF NOZZLE, PROBE, CYCLONE (BYPASS), FLASK, FRONT HALF OF FILTER HOLDER — CONTAINER ______ ______ mg

FILTER NUMBER 25405 — CONTAINER ______ ______ mg

FRONT HALF SUBTOTAL ______ mg

BACK HALF

IMPINGER CONTENTS AND WATER WASH OF IMPINGERS, CONNECTORS, AND BACK HALF OF FILTER HOLDER — CONTAINER ______ ______ mg

ETHER-CHLOROFORM EXTRACTION ______ mg

ACETONE WASH OF IMPINGERS, CONNECTORS, AND BACK HALF OF FILTER HOLDER — CONTAINER ______ ______ mg

BACK HALF SUBTOTAL ______ mg

TOTAL WEIGHT ______ mg

MOISTURE

IMPINGERS
- FINAL VOLUME 192 ml
- INITIAL VOLUME 200 ml
- NET VOLUME -8 ml

SILICA GEL
- FINAL WEIGHT 210 g ______ g
- INITIAL WEIGHT 200 g ______ g
- NET WEIGHT 10 g ______ g

SUBTOTAL 2 g

TOTAL MOISTURE 2

ANALYTICAL DATA

PLANT Exxon - EPA

DATE 9/28/79

SAMPLING LOCATION fine ore bin

SAMPLE TYPE part.

RUN NUMBER 3

SAMPLE BOX NUMBER –

CLEAN UP MAN NG, VM

COMMENTS:

FRONT HALF

LABORATORY RESULTS

ACETONE WASH OF NOZZLE, PROBE, CYCLONE (BYPASS), FLASK, FRONT HALF OF FILTER HOLDER — CONTAINER ______ ______ mg

FILTER NUMBER 25415 — CONTAINER ______ ______ mg

FRONT HALF SUBTOTAL ______ mg

BACK HALF

IMPINGER CONTENTS AND WATER WASH OF IMPINGERS, CONNECTORS, AND BACK HALF OF FILTER HOLDER — CONTAINER ______ ______ mg

ETHER-CHLOROFORM EXTRACTION ______ mg

ACETONE WASH OF IMPINGERS, CONNECTORS, AND BACK HALF OF FILTER HOLDER — CONTAINER ______ ______ mg

BACK HALF SUBTOTAL ______ mg

TOTAL WEIGHT ______ mg

MOISTURE

IMPINGERS

FINAL VOLUME 198 ml

INITIAL VOLUME 200 ml

NET VOLUME -2 ml

SILICA GEL

FINAL WEIGHT 210 g ______ g

INITIAL WEIGHT 200 g ______ g

NET WEIGHT 10 g ______ g

SUBTOTAL 8 g

TOTAL MOISTURE ______ g

ANALYTICAL DATA

PLANT Exxon Clean

DATE 9-28-79

SAMPLING LOCATION Scrub. outlet

SAMPLE TYPE Part.

RUN NUMBER 1

SAMPLE BOX NUMBER 1

CLEAN UP MAN C. [illegible]

COMMENTS:

FRONT HALF

LABORATORY RESULTS

ACETONE WASH OF NOZZLE, PROBE, CYCLONE (BYPASS), FLASK, FRONT HALF OF FILTER HOLDER — CONTAINER ______ ______ mg

FILTER NUMBER 25408 ______ — CONTAINER ______ ______ mg

FRONT HALF SUBTOTAL ______ mg

BACK HALF

IMPINGER CONTENTS AND WATER WASH OF IMPINGERS, CONNECTORS, AND BACK HALF OF FILTER HOLDER — CONTAINER ______ ______ mg

ETHER-CHLOROFORM EXTRACTION ______ mg

ACETONE WASH OF IMPINGERS, CONNECTORS, AND BACK HALF OF FILTER HOLDER — CONTAINER ______ ______ mg

BACK HALF SUBTOTAL ______ mg

TOTAL WEIGHT ______ mg

MOISTURE

IMPINGERS
- FINAL VOLUME 199 ml
- INITIAL VOLUME 200 ml
- NET VOLUME -1 ml

SILICA GEL
- FINAL WEIGHT 212.2 g ______ g
- INITIAL WEIGHT 200 g ______ g
- NET WEIGHT 12.2 g ______ g

SUBTOTAL ______ g

12.2
-1
11.1

TOTAL MOISTURE 11.1

ANALYTICAL DATA

PLANT Exxon Clean

DATE 9-28-79

SAMPLING LOCATION S. outlet (Fine Bin)

SAMPLE TYPE Part

RUN NUMBER 2

SAMPLE BOX NUMBER

CLEAN UP MAN

COMMENTS:

FRONT HALF

LABORATORY RESULTS

ACETONE WASH OF NOZZLE, PROBE, CYCLONE (BYPASS), FLASK, FRONT HALF OF FILTER HOLDER — CONTAINER ______ ______ mg

FILTER NUMBER 25410 — CONTAINER ______ ______ mg

FRONT HALF SUBTOTAL ______ mg

BACK HALF

IMPINGER CONTENTS AND WATER WASH OF IMPINGERS, CONNECTORS, AND BACK HALF OF FILTER HOLDER — CONTAINER ______ ______ mg

ETHER-CHLOROFORM EXTRACTION ______ mg

ACETONE WASH OF IMPINGERS, CONNECTORS, AND BACK HALF OF FILTER HOLDER — CONTAINER ______ ______ mg

BACK HALF SUBTOTAL ______ mg

TOTAL WEIGHT ______ mg

$$\begin{array}{r} 15 \\ +\ -5 \\ \hline 10 \end{array}$$

MOISTURE

IMPINGERS

FINAL VOLUME 195 ml

INITIAL VOLUME 200 ml

NET VOLUME -5 ml

SILICA GEL

FINAL WEIGHT 215 g ______ g

INITIAL WEIGHT 200 g ______ g

NET WEIGHT 15 g ______ g

SUBTOTAL ______ g

TOTAL MOISTURE 10 g

ANALYTICAL DATA

PLANT Exxon URB.

DATE 9

SAMPLING LOCATION S, OUTLET (FINE Bin)

SAMPLE TYPE Parts

RUN NUMBER 3

SAMPLE BOX NUMBER

CLEAN UP MAN Celiamu.

COMMENTS:

FRONT HALF

LABORATORY RESULTS

ACETONE WASH OF NOZZLE. PROBE. CYCLONE (BYPASS). FLASK. FRONT HALF OF FILTER HOLDER — CONTAINER ______ ______ mg

FILTER NUMBER 25417 — CONTAINER ______ ______ mg

FRONT HALF SUBTOTAL ______ mg

BACK HALF

IMPINGER CONTENTS AND WATER WASH OF IMPINGERS. CONNECTORS. AND BACK HALF OF FILTER HOLDER — CONTAINER ______ ______ mg

ETHER-CHLOROFORM EXTRACTION ______ mg

ACETONE WASH OF IMPINGERS. CONNECTORS. AND BACK HALF OF FILTER HOLDER — CONTAINER ______ ______ mg

BACK HALF SUBTOTAL ______ mg

TOTAL WEIGHT ______ mg

MOISTURE

IMPINGERS

FINAL VOLUME 195 ml
INITIAL VOLUME 200 ml
NET VOLUME -5 ml

SILICA GEL

FINAL WEIGHT 213.6 g ______ g
INITIAL WEIGHT 200 g ______ g
NET WEIGHT 13.6 g ______ g

SUBTOTAL ______ g

13.6
- 5.0
8.6

TOTAL MOISTURE 8.6

ANALYTICAL DATA

PLANT EXXON MINERAL

DATE 10/1/79

SAMPLING LOCATION PACKAGING AREA DUCT INLET

SAMPLE TYPE PARTICULATE

RUN NUMBER 1

SAMPLE BOX NUMBER 1

CLEAN UP MAN BOB NEWTON

COMMENTS:

FRONT HALF

LABORATORY RESULTS

ACETONE WASH OF NOZZLE, PROBE, CYCLONE (BYPASS), FLASK, FRONT HALF OF FILTER HOLDER — CONTAINER ______ ______ mg

FILTER NUMBER 25413 — CONTAINER ______ ______ mg

FRONT HALF SUBTOTAL ______ mg

BACK HALF

IMPINGER CONTENTS AND WATER WASH OF IMPINGERS, CONNECTORS, AND BACK HALF OF FILTER HOLDER — CONTAINER ______ ______ mg

ETHER-CHLOROFORM EXTRACTION ______ mg

ACETONE WASH OF IMPINGERS, CONNECTORS, AND BACK HALF OF FILTER HOLDER — CONTAINER ______ ______ mg

BACK HALF SUBTOTAL ______ mg

TOTAL WEIGHT ______ mg

MOISTURE

IMPINGERS

FINAL VOLUME	192	ml
INITIAL VOLUME	200	ml
NET VOLUME	-8	ml

SILICA GEL

FINAL WEIGHT	225	g		g
INITIAL WEIGHT	200	g		g
NET WEIGHT	25	g		g

SUBTOTAL ______ g

TOTAL MOISTURE 17 g

ANALYTICAL DATA

PLANT Exxon Uran.
DATE 10-1-79
SAMPLING LOCATION Dryer S. Inlet
SAMPLE TYPE Part
RUN NUMBER 2
SAMPLE BOX NUMBER 1
CLEAN UP MAN Newton

COMMENTS:

FRONT HALF

LABORATORY RESULTS

ACETONE WASH OF NOZZLE, PROBE, CYCLONE (BYPASS), FLASK, FRONT HALF OF FILTER HOLDER — CONTAINER ______ ______ mg

FILTER NUMBER 25450 ______ — CONTAINER ______ ______ mg

FRONT HALF SUBTOTAL ______ mg

BACK HALF

IMPINGER CONTENTS AND WATER WASH OF IMPINGERS, CONNECTORS, AND BACK HALF OF FILTER HOLDER — CONTAINER ______ ______ mg

ETHER-CHLOROFORM EXTRACTION ______ mg

ACETONE WASH OF IMPINGERS, CONNECTORS, AND BACK HALF OF FILTER HOLDER — CONTAINER ______ ______ mg

BACK HALF SUBTOTAL ______ mg

TOTAL WEIGHT ______ mg

MOISTURE

IMPINGERS
FINAL VOLUME 198 ml
INITIAL VOLUME 200 ml
NET VOLUME -2 ml

SILICA GEL
FINAL WEIGHT 222.2 g ______ g
INITIAL WEIGHT 200 g ______ g
NET WEIGHT 22.2 g ______ g

SUBTOTAL ______ g

TOTAL MOISTURE 20.2

ANALYTICAL DATA

PLANT EXXON MINERAL

DATE 1/11/79

SAMPLING LOCATION PACKAGING AREA DUCT INLET

SAMPLE TYPE PARTICULATE EPA METHOD #5

RUN NUMBER 3

SAMPLE BOX NUMBER 1

CLEAN UP MAN BOB NEWTON

COMMENTS:

FRONT HALF

LABORATORY RESULTS

ACETONE WASH OF NOZZLE, PROBE, CYCLONE (BYPASS), FLASK, FRONT HALF OF FILTER HOLDER

CONTAINER ______ ______ mg

FILTER NUMBER 25456

CONTAINER ______ ______ mg

FRONT HALF SUBTOTAL ______ mg

BACK HALF

IMPINGER CONTENTS AND WATER WASH OF IMPINGERS, CONNECTORS, AND BACK HALF OF FILTER HOLDER

ACETONE WASH OF IMPINGERS, CONNECTORS, AND BACK HALF OF FILTER HOLDER

CONTAINER ______ ______ mg

ETHER-CHLOROFORM EXTRACTION ______ mg

CONTAINER ______ ______ mg

BACK HALF SUBTOTAL ______ mg

TOTAL WEIGHT ______ mg

MOISTURE

IMPINGERS

FINAL VOLUME 196 ml

INITIAL VOLUME 200 ml

NET VOLUME -4 ml

SILICA GEL

FINAL WEIGHT 219.4 g ______ g

INITIAL WEIGHT 200 g ______ g

NET WEIGHT 19.4 g ______ g

SUBTOTAL ______ g

TOTAL MOISTURE 15.4 g

ANALYTICAL DATA

PLANT Exxon Lean

DATE 10-1-79

SAMPLING LOCATION S outlet

SAMPLE TYPE Part

RUN NUMBER 1

SAMPLE BOX NUMBER 1

CLEAN UP MAN Calcino

COMMENTS:

FRONT HALF

LABORATORY RESULTS

ACETONE WASH OF NOZZLE, PROBE, CYCLONE (BYPASS), FLASK, FRONT HALF OF FILTER HOLDER — CONTAINER ______ ______ mg

FILTER NUMBER 25419 ______ — CONTAINER ______ ______ mg

FRONT HALF SUBTOTAL ______ mg

BACK HALF

IMPINGER CONTENTS AND WATER WASH OF IMPINGERS, CONNECTORS, AND BACK HALF OF FILTER HOLDER — CONTAINER ______ ______ mg

ETHER-CHLOROFORM EXTRACTION ______ mg

ACETONE WASH OF IMPINGERS, CONNECTORS, AND BACK HALF OF FILTER HOLDER — CONTAINER ______ ______ mg

BACK HALF SUBTOTAL ______ mg

TOTAL WEIGHT ______ mg

MOISTURE

IMPINGERS
- FINAL VOLUME 315 ml
- INITIAL VOLUME 200 ml
- NET VOLUME 115 ml

SILICA GEL
- FINAL WEIGHT 229.5 g ______ g
- INITIAL WEIGHT 200 g ______ g
- NET WEIGHT 29.5 g ______ g

SUBTOTAL ______ g

115.0
29.5
144.5

TOTAL MOISTURE 144.5

ANALYTICAL DATA

PLANT Exxon Uran.

DATE 10-1-79

SAMPLING LOCATION S. outlet (Dryer)

SAMPLE TYPE Part

RUN NUMBER 2

SAMPLE BOX NUMBER

CLEAN UP MAN

COMMENTS:

FRONT HALF

LABORATORY RESULTS

ACETONE WASH OF NOZZLE, PROBE, CYCLONE (BYPASS), FLASK, FRONT HALF OF FILTER HOLDER — CONTAINER ______ ______ mg

FILTER NUMBER 25451 — CONTAINER ______ ______ mg

FRONT HALF SUBTOTAL ______ mg

BACK HALF

IMPINGER CONTENTS AND WATER WASH OF IMPINGERS, CONNECTORS, AND BACK HALF OF FILTER HOLDER — CONTAINER ______ ______ mg

ETHER-CHLOROFORM EXTRACTION ______ mg

ACETONE WASH OF IMPINGERS, CONNECTORS, AND BACK HALF OF FILTER HOLDER — CONTAINER ______ ______ mg

BACK HALF SUBTOTAL ______ mg

TOTAL WEIGHT ______ mg

MOISTURE

IMPINGERS

FINAL VOLUME 344 ml

INITIAL VOLUME 200 ml

NET VOLUME 144 ml

SILICA GEL

FINAL WEIGHT 226.5 g ______ g

INITIAL WEIGHT 200 g ______ g

NET WEIGHT 26.5 g ______ g

SUBTOTAL ______ g

144
26.5
170.5

TOTAL MOISTURE 170.5 g

PLANT Exxon Uran. ANALYTICAL Sheet
DATE 10-1-79
SAMPLING LOCATION S. OUTLet Dryer
SAMPLE TYPE Part
RUN NUMBER 3
OPERATOR Celiano
AMBIENT TEMPERATURE
BAROMETRIC PRESSURE
STATIC PRESSURE, (P_s)
FILTER NUMBER (s) 25454

PROBE LENGTH AND TYPE
NOZZLE I.D.
ASSUMED MOISTURE, %
SAMPLE BOX NUMBER
METER BOX NUMBER
METER $\Delta H_@$
C FACTOR
PITOT TUBE FACTOR
REFERENCE Δp
NOTE

READ AND RECORD ALL DATA EVERY ______ MINUTES

TRAVERSE POINT NUMBER	SAMPLING TIME, min / CLOCK TIME (24 hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O DESIRED	ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m\,in}$), °F	OUTLET ($T_{m\,out}$), °F	PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
		224.5 FINAL									
	Silica	200 INIT									
		24.5									
	H_2O	FINAL 294									
	200 H_2O	INITIAL 200									
		94									

94
24.5
118.5

ANALYTICAL DATA

PLANT Exxon-EPA

DATE 10-1-79

SAMPLING LOCATION dryer Inlet

SAMPLE TYPE part

RUN NUMBER 1

SAMPLE BOX NUMBER 2

CLEAN UP MAN Goldberg

COMMENTS:

FRONT HALF

LABORATORY RESULTS

ACETONE WASH OF NOZZLE, PROBE, CYCLONE (BYPASS), FLASK, FRONT HALF OF FILTER HOLDER — CONTAINER ______ ______ mg

FILTER NUMBER 25412 ______ — CONTAINER ______ ______ mg

FRONT HALF SUBTOTAL ______ mg

BACK HALF

IMPINGER CONTENTS AND WATER WASH OF IMPINGERS, CONNECTORS, AND BACK HALF OF FILTER HOLDER — CONTAINER ______ ______ mg

ETHER-CHLOROFORM EXTRACTION ______ mg

ACETONE WASH OF IMPINGERS, CONNECTORS, AND BACK HALF OF FILTER HOLDER — CONTAINER ______ ______ mg

BACK HALF SUBTOTAL ______ mg

TOTAL WEIGHT ______ mg

MOISTURE

250

IMPINGERS

FINAL VOLUME 500 ml

INITIAL VOLUME 200 ml

NET VOLUME 300 ml

SILICA GEL

FINAL WEIGHT 227 g ______ g

INITIAL WEIGHT 200 g ______ g

NET WEIGHT 27 g ______ g

SUBTOTAL 327 g

TOTAL MOISTURE ______ g

ANALYTICAL DATA

PLANT Exxon - EPA

DATE 10-1-79

SAMPLING LOCATION dryer scrubber inlet

SAMPLE TYPE part

RUN NUMBER 2

SAMPLE BOX NUMBER —

CLEAN UP MAN BLJ

COMMENTS:

FRONT HALF

LABORATORY RESULTS

ACETONE WASH OF NOZZLE, PROBE, CYCLONE (BYPASS), FLASK, FRONT HALF OF FILTER HOLDER — CONTAINER ______ ______ mg

FILTER NUMBER 25452 — CONTAINER ______ ______ mg

FRONT HALF SUBTOTAL ______ mg

BACK HALF

IMPINGER CONTENTS AND WATER WASH OF IMPINGERS, CONNECTORS, AND BACK HALF OF FILTER HOLDER — CONTAINER ______ ______ mg

ETHER-CHLOROFORM EXTRACTION ______ mg

ACETONE WASH OF IMPINGERS, CONNECTORS, AND BACK HALF OF FILTER HOLDER — CONTAINER ______ ______ mg

BACK HALF SUBTOTAL ______ mg

TOTAL WEIGHT ______ mg

MOISTURE

IMPINGERS

FINAL VOLUME 450 ml

INITIAL VOLUME 200 ml

NET VOLUME 250 ml

250

SILICA GEL

FINAL WEIGHT 212 g ______ g

INITIAL WEIGHT 200 g ______ g

NET WEIGHT 12 g ~~9~~ g

SUBTOTAL 262 g

TOTAL MOISTURE 262

ANALYTICAL DATA

PLANT Exxon Uranium - EPA

DATE 10-1-79

SAMPLING LOCATION dry scrubber Inlet

SAMPLE TYPE part.

RUN NUMBER 3

SAMPLE BOX NUMBER -

CLEAN UP MAN BLJ, NG, VM.

COMMENTS:

FRONT HALF

LABORATORY RESULTS

ACETONE WASH OF NOZZLE. PROBE. CYCLONE (BYPASS). FLASK. FRONT HALF OF FILTER HOLDER	CONTAINER ____	____ mg
FILTER NUMBER 25455	CONTAINER ____	____ mg

FRONT HALF SUBTOTAL ____ mg

BACK HALF

IMPINGER CONTENTS AND WATER WASH OF IMPINGERS. CONNECTORS. AND BACK HALF OF FILTER HOLDER	CONTAINER ____	____ mg
	ETHER-CHLOROFORM EXTRACTION	____ mg
ACETONE WASH OF IMPINGERS. CONNECTORS. AND BACK HALF OF FILTER HOLDER	CONTAINER ____	____ mg
	BACK HALF SUBTOTAL	____ mg
	TOTAL WEIGHT	____ mg

250

MOISTURE

IMPINGERS

FINAL VOLUME	300	ml
INITIAL VOLUME	200	ml
NET VOLUME	100	ml

SILICA GEL

FINAL WEIGHT	209 g	____ g
INITIAL WEIGHT	200 g	____ g
NET WEIGHT	9 g	____ g

SUBTOTAL ____ g

TOTAL MOISTURE 109 g

ALBUQUERQUE LABORATORY

REPORT OF ANALYSIS

CUSTOMER WESTON, ENVIRONMENTAL CONSULTANTS-DESIGNERS
ATTENTION Barry L. Jackson
ADDRESS 1 Weston Way
CITY Westchester, Pennsylvania 19380
S.O. NO. 4374

TYPE OF ANALYSIS DETERMINATION of NATURAL URANIUM, ISOTOPIC URANIUM, ISOTOPIC THORIUM, RADIUM-226, LEAD-210 and POLONIUM-210 in AIR FILTER SAMPLES

CUSTOMER ORDER NUMBER 24658-32

SAMPLES RECEIVED 11/27/79

Sample Identification	Sample Number	Date Collected	Total Weight (g)	Type of Analysis	ug/g	pCi/g
Run 1 - Dryer Scrubber Inlet	1	10/01/79	7.9157	Uranium	650,000	
				U-234		200,000 ± 40,000
				U-235		<13,000
				U-238		190,000 ± 40,000
				Th-228		36 ± 13
				Th-230		13,000 ± 1000
				Th-232		36 ± 13
				Ra-226		20 ± 6
				Pb-210		320 ± 80
				Po-210		170 ± 40
Run 1 - Dryer Scrubber Outlet	2	10/01/79	0.4010	Uranium	310,000	
				U-234		92,000 ± 4000
				U-235		6000 ± 400
				U-238		94,000 ± 4000
				Th-228		170 ± 80
				Th-230		1400 ± 100
				Th-232		120 ± 60
				Ra-226		6.8 ± 2.0
				Pb-210		250 ± 30
				Po-210		140 ± 30
Blank	3	--	--	Uranium	63	
				U-234		96 ± 4
				U-235		3.0 ± 0.6
				U-238		100 ± 10
				Th-228		<0.20
				Th-230		<0.20
				Th-232		<0.20
				Ra-226		0.08 ± 0.05
				Pb-210		4.5 ± 2.1
				Po-210		<5.4

☐ REPORTED VIA TELEPHONE
☐ REPORTED VIA TWX

PAGE 1 OF 1 PAGE

APPROVED BY Michael A. Ortiz
MICHAEL A. ORTIZ, Laboratory Manager

DATE 2/06/80

eberline
P.O. BOX 3874 ALBUQUERQUE, NEW MEXICO 87110
PHONE (505) 345-3461 TWX: 910-985-0678

Appendix C

Sample Calculations

SAMPLE CALCULATIONS

Test Run 1 CRUSHER TRANSFER POINT EXHAUST DUCT

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

$$V_{m(std)} = \frac{17.647 \times Y \times V_m \times \left(P_b + \frac{\Delta H}{13.6}\right)}{\left(T_m + 460\right)}$$

$$V_{m(std)} = \frac{17.647 \times 0.995 \times 52.20 \times \left(24.77 + \frac{0.77}{13.6}\right)}{\left(95 + 460\right)} = 41.02$$

Where:

$V_{m(std)}$ = Volume of gas sample measured by the dry gas meter, corrected to standard conditions, dscf.

V_m = Volume of gas sample measured by the dry gas meter at meter conditions, dcf.

P_b = Barometric pressure, in. Hg.

ΔH = Average pressure drop across the orifice meter, in. H_2O.

T_m = Average dry gas meter temperature, °F.

17.647 = Factor that includes ratio of standard temperature (528°R) to standard pressure (29.92 in. Hg), °R/in. Hg.

Y = Dry gas meter calibration factor.

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

$$V_{w(std)} = (0.04707 \times V_{wc}) + (0.04715 \times W_{wsg})$$

$$V_{w(std)} = (0.04707 \times 0.0) + (0.04715 \times 9.5) = 0.448$$

Where:

$V_{w(std)}$ = Volume of water vapor in the gas sample corrected to standard conditions, scf.

V_{wc} = Volume of liquid condensed in impingers, ml.

W_{wsg}	=	Weight of water vapor collected in silica gel, g.
0.04707	=	Factor which includes the density of water (0.002201 lb/ml), the molecular weight of water (18.0 lb/lb-mole), the ideal gas constant [21.85 (in. Hg) (ft^3)/(lb-mole)(^{o}R)] ; absolute temperature at standard conditions (528^{o}R), absolute pressure at standard conditions (29.92 in. Hg), ft^3/ml.
0.04715	=	Factor which includes the molecular weight of water (18.0 lb/lb-mole), the ideal gas constant [21.85 (in. Hg)(ft^3)/(lb-mole)(^{o}R)], absolute temperature at standard conditions (528^{o}R), absolute pressure at standard conditions (29.92 in. Hg), and 453.6 g/lb, ft^3/g.

3. Moisture content.

$$B_{ws} = \frac{V_{w(std)}}{V_{w(std)} + V_{m(std)}}$$

$$B_{ws} = \frac{0.448}{0.448 + 41.02} = 0.011$$

Where:

B_{ws} = Proportion of water vapor, by volume, in the gas stream, dimensionless.

4. Mole fraction of dry gas.

$$M_d = 1 - B_{ws}$$

$$M_d = 1 - 0.011 = 0.989$$

Where:

M_d = Mole fraction of dry gas, dimensionless

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

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

MW_d = $(0.440 \times 0.0) + (0.320 \times 20.9) + [0.280 (0.0 + 79.1)]$

= 28.97 (ambient air)

Where:

MW_d = Dry molecular weight, lb/lb-mole.

$\%CO_2$ = Percent carbon dixoide by volume, dry basis.

$\%O_2$ = Percent oxygen by volume, dry basis.

$\%N_2$ = Percent nitrogen by volume, dry basis.

%CO = Percent carbon monoxide by volume, dry basis.

0.440 = Molecular weight of carbon dioxide, divided by 100.

0.320 = Molecular weight of oxygen, divided by 100.

0.280 = Molecular weight of nitrogen or carbon monoxide, divided by 100.

6. Actual molecular weight of gas stream (wet basis), lb/lb-mole.

MW_s = $(MW_d \times M_d) + [18 (1 - M_d)]$

MW_s = $(28.97 \times 0.989) + [18 (1 - 0.989)]$

= 28.85

Where:

MW_s = Molecular weight of wet gas, lb/lb-mole.

18 = Molecular weight of water, lb/lb-mole.

7. Average velocity of gas stream at actual conditions, ft/sec.

$$v_s = 85.49 \times C_p \times (\sqrt{\Delta p})_{avg.} \times \left[\frac{T_{s\,(avg)}}{P_s \times MW_s}\right]^{\frac{1}{2}}$$

$$v_s = 85.49 \times 0.855 \times 0.437 \times \left[\frac{(75.5 + 460)}{24.76 \times 28.85}\right]^{\frac{1}{2}}$$

$$= 27.64$$

Where:

v_s = Average gas stream velocity, ft/sec.

85.49 = Pitot tube constant, ft/sec $\times \left[\frac{(lb/lb\text{-}mole)(in.Hg)}{(^{o}R)\ (in.\ H_2O)}\right]^{\frac{1}{2}}$.

C_p = Pitot tube coefficient, dimensionless.

Δp = Velocity head of stack gas, in H_2O.

T_s = Absolute gas stream temperature, ^{o}R.

P_s = Absolute gas stack pressure, in. Hg.

8. Average gas stream dry volumetric flow rates, dscf/min.

$$Q_{s(std)} = \frac{1058.8 \times v_s \times A_s \times M_d \times P_s}{T_s}$$

$$Q_{s(std)} = \frac{1058.8 \times 27.64 \times 0.785 \times 0.989 \times 24.76}{(95. + 460)}$$

$$= 1{,}050. \quad (ACFM = 1{,}300 = 27.64 \times 0.785 \times 60)$$

Where:

$Q_{s(std)}$ = Volumetric flow rate of dry stack gas, corrected to standard conditions, dscf/min.

A_s = Cross-sectional area of stack, ft^2.

1058.8 = Factor which includes standard temperature ($528^{o}R$), standard pressure (29.92 in. Hg), and 60 sec/min, $\frac{(^{o}R)\ (sec)}{(in.\ Hg)(min)}$.

9. Isokinetic variation calculated from intermediate values, percent.

$$I = \frac{17.316 \times T_s \times V_{m(std)}}{v_s \times \theta \times P_s \times M_d \times (D_n)^2}$$

$$I = \frac{17.316 \times 75.5 \times 41.02}{27.64 \times 96 \times 24.76 \times 0.989 \times (0.242)^2}$$

$$= 99.9$$

Where:

I = Percent of isokinetic sampling.

θ = Total sampling time, minutes.

D_n = Diameter of nozzle, inches.

17.316 = Factor which includes standard temperature (528°R), standard pressure (29.92 in. Hg), the formula for calculating area of circle $\frac{\pi D^2}{4}$, conversion of square feet to square inches (144), conversion of seconds to minutes (60), and conversion to percent (100), $\frac{(\text{in. Hg})(\text{in}^2)(\text{min})}{(^\circ\text{R})(\text{ft}^2)(\text{sec})}$.

10. Particulate concentration, gr/dscf.

$$C_1 = 0.015432 \times \frac{M_t}{V_{m(std)}}$$

$$C_1 = 0.015432 \times \frac{6.30}{41.02} = 0.0024$$

Where:

C_1 = Particulate concentration, gr/dscf.

M_t = Total weight of particulate caught by train, mg.

0.015432 = Conversion factor of gr/mg.

11. Particulate mass emission rate, lb/hr.

$$PMR_t = 0.0085714 \times C_1 \times Q_{s(std)}$$

$$= 0.0085714 \times 0.0024 \times 1050. = 0.021$$

Where:

PMR_t	=	Particulate mass emission rate, lb/hr.
0.0085714	=	Conversion factor relating minutes to hours (60), and grains to pounds (7,000), (lb) (min)/(gr) (hr).

Appendix D

Equipment Calibration Data

Date 9/18/79 DK Box No. 1225

Barometric pressure, P_b = 30.13 in. Hg Dry gas meter No. ______

Orifice manometer setting, ΔH, in. H_2O	Gas volume wet test meter V_w, ft^3	Gas volume dry gas meter V_d, ft^3	Temperature: Wet test: Meter t_w, °F	Temperature: Dry gas meter: Inlet t_{di}, °F	Outlet t_{do}, °F	Average t_d, °F	Time θ, min	γ	$\Delta H_@$
0.5	5	88.715 93.682	65	66	77	72	12.33	1.013	1.78
1.0	5	93.682 98.706	68	72	68	70	9.9	.9165	1.87
2.0	10	98.706 08.546	68	76	72	74	13.4	.9925	1.88
4.0	10.001	08.846 19.142	68	86	74	77	9.26	.9786	1.94
2c ~~6.0~~	10 ~~10~~	19.142 29.377	68	82	76	79	13.10	.9922	1.89
8.0	10								
						Average		.995	1.87

Calculations

ΔH	$\frac{\Delta H}{13.6}$	γ: $\frac{V_w P_b (t_d + 460)}{V_d\left(P_b + \frac{\Delta H}{13.6}\right)(t_w + 460)}$	$\Delta H_@$: $\frac{0.0317\ \Delta H}{P_b\ (t_d + 460)}\left[\frac{(t_w + 460)\ \theta}{V_w}\right]^2$
0.5	0.0368		
1.0	0.0737		
2.0	0.147		
4.0	0.294		
6.0	0.431		
8.0	0.588		

γ = Ratio of accuracy of wet test meter to dry test meter. Tolerance = ± 0.01

$\Delta H_@$ = Orifice pressure differential that gives 0.75 cfm of air at 70° F and 29.92 inches of mercury, in. H_2O. Tolerance - ± 0.15

Date Sept. 20th 1979 ___ Box No. 1205

Barometric pressure, P_b = 30.24 in. Hg ___ Dry gas meter No. ______

Orifice manometer setting, ΔH, in. H_2O	Gas volume wet test meter V_w, ft^3	Gas volume dry gas meter V_d, ft^3	Temperature: Wet test: Meter t_w, °F	Temperature: Dry gas meter: Inlet t_{di}, °F	Temperature: Dry gas meter: Outlet t_{do}, °F	Temperature: Dry gas meter: Average t_d, °F	Time θ, min	γ	$\Delta H_@$
0.5	5	20.000 25.034	65°	67°	65°	66°	12.49 ~~4E4~~	.9939	1.7199
1.0	5	25.034 30.191	65°	71°	68°	69.5°	9.28	.9755	1.8797
2.0	10	30.191 40.274	65°	75°	70°	72.5°	13.58	1.0010	2.0013
4.0	10	40.274 50.618	65°	81°	72°	76.5°	9.83	.9784	2.0816
6.0	10								
8.0	10								
						Average		.9872	1.9206

Calculations

ΔH	$\frac{\Delta H}{13.6}$	γ: $\frac{V_w P_b (t_d + 460)}{V_d\left(P_b + \frac{\Delta H}{13.6}\right)(t_w + 460)}$	$\Delta H_@$: $\frac{0.0317\ \Delta H}{P_b\ (t_d + 460)}\left[\frac{(t_w + 460)\ \theta}{V_w}\right]^2$
0.5	0.0368		
1.0	0.0737		
2.0	0.147		
4.0	0.294		
6.0	0.431		
8.0	0.588		

γ = Ratio of accuracy of wet test meter to dry test meter. Tolerance = ± 0.01

$\Delta H_@$ = Orifice pressure differential that gives 0.75 cfm of air at 70° F and 29.92 inches of mercury, in. H_2O. Tolerance - ± 0.15

Date ~~Nov.~~ Nov. 6th 1979 Box No. NUTECH #5

(AR) Barometric pressure, P_b = 30.35 in. Hg Dry gas meter No. ________

Orifice manometer setting, ΔH, in. H_2O	Gas volume wet test meter V_w, ft^3	Gas volume dry gas meter V_d, ft^3	Temperature: Wet test Meter t_w, °F	Dry gas meter ~~Inlet~~ t_{di}, °F	Dry gas meter ~~Outlet~~ t_{do}, °F	Dry gas meter Average t_d, °F	Time θ, min	γ	$\Delta H_@$
0.5	5	693.599 698.566	54°	51°	55° 59°	55°	12.68	1.0073	1.7230
1.0	5	698.566 703.611	56°	58°	63° 66°	62°	9.13	1.0001	1.7763
[redacted] 1.5	[redacted] 5	703.611 708.732	57°	65°	70° 73°	69°	7.58	.9954	1.8193
[redacted] 2.0	10	708.732 719.136	58°	71°	78° 82	77°	13.37	.9916	1.8658
6.0	10								
8.0	10								
						Average		.9986	1.7961

Calculations

ΔH	$\frac{\Delta H}{13.6}$	γ: $\frac{V_w P_b (t_d + 460)}{V_d\left(P_b + \frac{\Delta H}{13.6}\right)\left(t_w + 460\right)}$	$\Delta H_@$: $\frac{0.0317\ \Delta H}{P_b\ (t_d + 460)}\left[\frac{(t_w + 460)\ \theta}{V_w}\right]^2$
0.5	0.0368		
1.0	0.0737		
2.0	0.147		
4.0	0.294		
6.0	0.431		
8.0	0.588		

γ = Ratio of accuracy of wet test meter to dry test meter. Tolerance = ± 0.01

$\Delta H_@$ = Orifice pressure differential that gives 0.75 cfm of air at 70° F and 29.92 inches of mercury, in. H_2O. Tolerance - ± 0.15

Date Sept. 20 1979 RR   Box No. 1226

Barometric pressure, P_b = 30.24 in. Hg   Dry gas meter No. ______

Orifice manometer setting, ΔH, in. H_2O	Gas volume wet test meter V_w, ft^3	Gas volume dry gas meter V_d, ft^3	Temperature: Wet test: Meter t_w, °F	Temperature: Dry gas meter: Inlet t_{di}, °F	Temperature: Dry gas meter: Outlet t_{do}, °F	Temperature: Dry gas meter: Average t_d, °F	Time θ, min	γ	$\Delta H_@$
0.5	5	30.80 35.793	64°	63°	63°	63°	12.50	.9983	1.7161
1.0	5	35.793 30.549	64	69°	65°	67°	9.17	.9922	1.8371
2.0	10	30.549 41.047	64°	73°	67°	70°	13.65	.9851	2.0238
4.0	10	41.047 51.451	64	88	61	74.5	9.85	.9729	2.0899
6.0	10								
8.0	10								
						Average		9871	1.9167

Calculations

ΔH	$\frac{\Delta H}{13.6}$	γ: $\frac{V_w P_b (t_d + 460)}{V_d\left(P_b + \frac{\Delta H}{13.6}\right)(t_w + 460)}$	$\Delta H_@$: $\frac{0.0317\ \Delta H}{P_b\ (t_d + 460)}\left[\frac{(t_w + 460)\ \theta}{V_w}\right]^2$
0.5	0.0368		
1.0	0.0737		
2.0	0.147		
4.0	0.294		
6.0	0.431		
8.0	0.588		

γ = Ratio of accuracy of wet test meter to dry test meter. Tolerance = ± 0.01

$\Delta H_@$ = Orifice pressure differential that gives 0.75 cfm of air at 70° F and 29.92 inches of mercury, in. H_2O. Tolerance - ± 0.15

Date *Oct. 19th 1979* Box No. *2253*

Barometric pressure, P_b = *30.30* in. Hg Dry gas meter No. ______

Orifice manometer setting, ΔH, in. H_2O	Gas volume wet test meter V_w, ft^3	Gas volume dry gas meter V_d, ft^3	Temperature: Wet test: Meter t_w, °F	Temperature: Dry gas meter: Inlet t_{di}, °F	Temperature: Dry gas meter: Outlet t_{do}, °F	Temperature: Dry gas meter: Average t_d, °F	Time θ, min	γ	$\Delta H_@$
0.5	5	833.170 838.232	64°	60 75 83	60 62 66	68°	12.67	.9940	1.7467
1.0	5	838.232 843.373	64°	76 93 97	66 70 72	79°	9.25	.9979	1.8240
1.5	5	843.373 848.627	64°	82 104 108	78 80 82	89°	7.68	.9934	1.8517
2.0	10	848.627 859.262	64°	97 115 116	82 87 90	98°	13.43	.9964	1.8570
6.0	10								
8.0	10								
						Average		.9954	1.8198

alculations

ΔH	$\frac{\Delta H}{13.6}$	γ: $\frac{V_w P_b (t_d + 460)}{V_d\left(P_b + \frac{\Delta H}{13.6}\right)(t_w + 460)}$	$\Delta H_@$: $\frac{0.0317\ \Delta H}{P_b\ (t_d + 460)}\left[\frac{(t_w + 460)\ \theta}{V_w}\right]^2$
0.5	0.0368		
1.0	0.0737		
2.0	0.147		
4.0	0.294		
6.0	0.431		
8.0	0.588		

γ = Ratio of accuracy of wet test meter to dry test meter. Tolerance = ± 0.01

$\Delta H_@$ = Orifice pressure differential that gives 0.75 cfm of air at 70° F and 29.92 inches of mercury, in. H_2O. Tolerance - ± 0.15

Nozzles 5-21-79 GAC

(1) Nominal 3/16"

I = .188 VI = .184

II = .186

III = .186

IV = .195 X = .180

V = .188 XI = .183

(2) Nominal 1/4"

I = .250 IV = .249

II = .242 V = .246

III = .250 VI = .248

VIII = .235 VII = .241

(3) Nominal 1/8"

I = .121

II = .123

III = .125

(4) Nominal 5/16"

I = .311

II = .313

(5) Nominal 3/8"

I = .350 VI = .360

II = .373 VII = .362

III = .368 VIII = .379

IV = .369 IX = .357

V = .355 X = .356

(6) Nominal 7/16

I III = .438

II IV

(7) Nominal 5/8"

I = .626

II = .625

(8) Nominal 1/2"

IV = .468

V = .465

XI = .490

XII = .500

III = .485

IIV = .~~4~~92

PITOT TUBE IDENTIFICATION NUMBER: 8 DATE: 12/28/78

CALIBRATED BY: BWC / RU

	"A" SIDE CALIBRATION			
RUN NO.	Δp_{std} cm H_2O (in. H_2O)	$\Delta p_{(s)}$ cm H_2O (in. H_2O)	$C_{p(S)}$	DEV.
1	1.30	1.81	.847	
2	0.65	0.89	.855	
3	0.32	0.43	.863	
		AVERAGE	.855	
4	.016	.022	.853	

AVG. .855

	"B" SIDE CALIBRATION"			
RUN NO.	Δp_{std} cm H_2O (in. H_2O)	$\Delta p_{(s)}$ cm H_2O (in. H_2O)	$C_{p(S)}$	DEV.
1	1.30	1.82	.845	
2	0.65	0.89	.855	
3	0.32	0.43	.863	
		AVERAGE		
4	.016	.025	0.80	

AVG. .854

DEV. = $\underline{C_{p(S)} - C_{p(S)(avg.)}}$ (MUST BE $\leq$ 0.01)

C_p DIFFERENCE: $A_{avg} - B_{avg}$ = ________ (MUST BE $\leq$ 0.01)

Pitot tube calibration data.

PITOT TUBE IDENTIFICATION NUMBER: 5 DATE: 5/28/78

CALIBRATED BY: BVC / RW

	"A" SIDE CALIBRATION			
RUN NO.	Δp_{std} cm H_2O (in. H_2O)	$\Delta p_{(s)}$ cm H_2O (in. H_2O)	$C_{p(S)}$	DEV.
1	1.23	1.74	.841	
2	0.65	.89	.854	
3	0.32	0.44	.853	
		AVERAGE		
4	.019	.025	.872	AUG. .855

	"B" SIDE CALIBRATION"			
RUN NO.	Δp_{std} cm H_2O (in. H_2O)	$\Delta p_{(s)}$ cm H_2O (in. H_2O)	$C_{p(S)}$	DEV.
1	1.23	1.73	.843	
2	0.65	.88	.859	
3	0.32	0.44	.853	
		AVERAGE		
4		.028	.824	AUG. .845

DEV. = $C_{p(S)} - C_{p(S)(avg.)}$ (MUST BE $\leq$ 0.01)

C_p DIFFERENCE: $A_{avg} - B_{avg}$ = ________ (MUST BE $\leq$ 0.01)

Pitot tube calibration data.

PITOT TUBE IDENTIFICATION NUMBER: 4 DATE: 12/25/78

CALIBRATED BY: Bwc / RU

"A" SIDE CALIBRATION					
RUN NO.	Δp_{std} cm H_2O (in. H_2O)	$\Delta p_{(s)}$ cm H_2O (in. H_2O)	$C_{p(S)}$	DEV.	
1	1.23	1.75	.838		
2	0.65	0.90	.850		AVG.
3	0.32	0.44	.853		.849
		AVERAGE			
4	.016	.022	.853		

"B" SIDE CALIBRATION"					
RUN NO.	Δp_{std} cm H_2O (in. H_2O)	$\Delta p_{(s)}$ cm H_2O (in. H_2O)	$C_{p(S)}$	DEV.	
1	1.23	1.76	.836		
2	0.65	0.91	.845		
3	0.32	0.44	.853		AVG.
		AVERAGE			.852
4	.016	.021	.873		

DEV. = $C_{p(S)} - C_{p(S)(avg.)}$ (MUST BE $\leq$ 0.01)

C_p DIFFERENCE: $A_{avg} - B_{avg}$ = ______ (MUST BE $\leq$ 0.01)

Pitot tube calibration data.

PITOT TUBE IDENTIFICATION NUMBER: 3 DATE: 12/28/78

CALIBRATED BY: BWC / RW

	"A" SIDE CALIBRATION			
RUN NO.	Δp_{std} cm H_2O (in. H_2O)	$\Delta p_{(s)}$ cm H_2O (in. H_2O)	$C_p(S)$	DEV.
1	1.23	1.77	.834	
2	0.65	0.87	.864	
3	0.32	0.44	.853	
		AVERAGE		
4	.019	.025	.872	

.856 AVG.

	"B" SIDE CALIBRATION"			
RUN NO.	Δp_{std} cm H_2O (in. H_2O)	$\Delta p_{(s)}$ cm H_2O (in. H_2O)	$C_p(S)$	DEV.
1	1.23	1.78	.831	
2	0.65	0.87	.864	
3	0.32	0.43	.863	
		AVERAGE		
4	.019	.027	.839	

.850 AVG

DEV. = $\underline{C_p(S) - C_p(S)(avg.)}$ (MUST BE $\leq$ 0.01)

C_p DIFFERENCE: $A_{avg} - B_{avg}$ = ______________ (MUST BE $\leq$ 0.01)

Pitot tube calibration data.

Probe	Temp, °F 150	200	250
1-3'	30	40	50
2-3'	29	38	50
1-4'	35	46	56
2-4'	39	49	60
1-5'	38	52	62
2-5'	37	50	61

Rheo Setting

Calibration Check: Nomograph

Laboratory Weston by BLJ

Date 9-18-77

1. Check pyrometers/thermocouples/leads vs. certified reference thermometer @ 32°F and @ 212°F: OK ±2°F.
2. Sample box thermometers: OK @ 212°F.
3. Control " & exit impinger thermometers: OK @ 32°F.

(1) C Factor Adjustment

Probe 1	Probe 2	Probe 3
C_p = ______	C_p = ______	C_p = ______

If $C_p > 0.87$ or $C_p < 0.83$

Probe 1	Probe 2	Probe 3
$C_{adj} = C \dfrac{C_p^2}{(0.85)^2}$	$C_{adj} = C \dfrac{C_p^2}{(0.85)^2}$	$C_{adj} = C \dfrac{C_p^2}{(0.85)^2}$
$= C \dfrac{(\quad)^2}{(0.85)^2}$	$= C \dfrac{(\quad)^2}{(0.85)^2}$	$= C \dfrac{(\quad)^2}{(0.85)^2}$
$= C(\quad)$.	$= C(\quad)$.	$= C(\quad)$.

(2) Accuracy (±10% Deviation acceptable)

(a) *K*-factor line, ΔH and Δp scales

Aline	Set	ΔH Reading 1	Nomograph 2	3	Nomograph 4	5
$\Delta p = 0.001$; $\Delta H = 0.1$	$\Delta p = 0.01$	1.02	0.97	0.93	1.00	0.92
	$\Delta p = 0.1$	10.0	9.4	8.7	9.8	8.6
$\Delta p = 10.0$; $\Delta H = 10.0$	$\Delta p = 1.0$	1.02	1.02	1.06	0.99	1.04
	$\Delta p = 0.1$	0.103	0.108	0.108	0.100	0.112
$\Delta p = 0.1$; $\Delta H = 1.0$	$\Delta p = 1.0$	9.9	9.4	9.5	9.9	9.4
	$\Delta p = 0.01$	0.101	0.104	0.106	0.102	0.106

(b) C, t_s and D_n scales

ΔH, calc.	C	D_n	t_s (°F)	Δp	ΔH Readings 1	Nomograph 2	3	Nomograph 4	5
0.47	2.0	0.5	2500	0.02	0.47	0.49	0.51	0.48	0.49
8.6	1.5	0.4	1500	0.8	8.7	8.6	8.6	9.0	8.5
0.31	1.0	0.3	1000	0.1	0.32	0.32	0.33	0.31	0.33
4.7	0.7	0.25	500	3.0	4.8	4.7	4.8	4.8	4.7
0.60	0.5	0.2	200	0.9	0.64	0.65	0.66	0.62	0.65

$$\Delta H_{calc} = K_@ \, C \, \frac{D_n^4}{T_s} \, \Delta p$$

$K_@ = 5.507 \times 10^5$

1, 2, 4 OK

3, 5 Unacceptable

THE PENNSYLVANIA STATE UNIVERSITY

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This certifies that

CHARLES DOBROSKI

has completed

VISIBLE EMISSIONS EVALUATION SEMINAR

Recertified: Date:
Robert J. Hemeon 23 May 79

Robert J. Hemeon 21 Nov 78
Certified Date:

Recertified: Date:

Robert J. Hemeon
PROJECT DIRECTOR OF VISIBLE EMISSIONS
TRAINING PROGRAM
CENTER FOR AIR ENVIRONMENT STUDIES

Lloyd B. Fischer
VICE PRESIDENT FOR
CONTINUING EDUCATION

THE PENNSYLVANIA STATE UNIVERSITY

CONTINUING EDUCATION

This certifies that

TED MOXON

has completed

VISIBLE EMISSIONS EVALUATION SEMINAR

Recertified: Robert J. Hensil Date: 20 Nov '79

Robert J. Hensil 23 May '79
Certified Date:

Recertified: Date:

Robert J. Hensil
PROJECT DIRECTOR OF VISIBLE EMISSIONS
TRAINING PROGRAM
CENTER FOR AIR ENVIRONMENT STUDIES

Floyd B. Fischer
VICE PRESIDENT FOR
CONTINUING EDUCATION

THE PENNSYLVANIA STATE UNIVERSITY

CONTINUING EDUCATION

THE PENNSYLVANIA STATE UNIVERSITY · 1855 ·

This certifies that

JEFFREY D. O'NEILL

has completed

VISIBLE EMISSIONS EVALUATION SEMINAR

Robert J. Hensoh June '78

Certified Date:

Recertified: Date:

Robert J. Hensohn 21 Nov '78

Robert J. Hensoil 23 May '79

Recertified: Date:

Robert J. Hensohn

PROJECT DIRECTOR OF VISIBLE EMISSIONS
TRAINING PROGRAM
CENTER FOR AIR ENVIRONMENT STUDIES

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This certifies that

BARRY L. JACKSON

has completed

VISIBLE EMISSIONS EVALUATION SEMINAR

W. J. Moroz 3/5/75.

Certified Date:

Recertified:	Date:
Robert J. Hemsoth	2 March '77
Robert J. Hemsoth	1 June '78
Robert J. Hemsoth	21 Nov '78
Robert J. Hemsoth	23 May '79

Recertified:	Date:

W. J. Moroz

DIRECTOR, CENTER FOR AIR ENVIRONMENT STUDIES

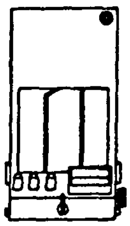
Floyd B. Fischer

VICE PRESIDENT FOR CONTINUING EDUCATION

Serviced by
Mettler
INSTRUMENT CORPORATION
609-448-3000

DATE SERVICED	SERIAL NO.
7-9-79	388106
TECHNICIAN Joe Rogowicz	

Mettler Analytical Balances Performance Data, Contd.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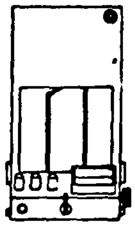
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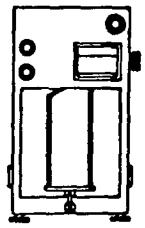
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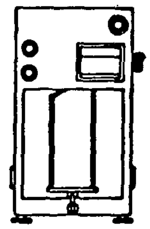
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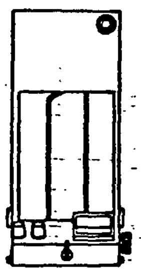
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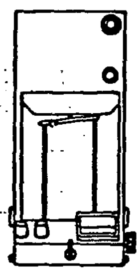
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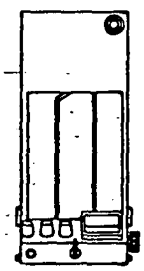
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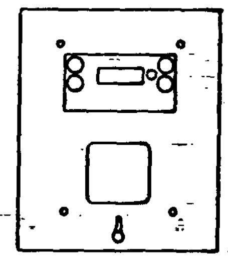
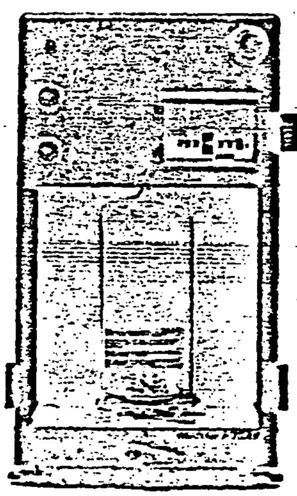

M5*

Specially designed, low-cost Student Models H72 and H78AR now available

Two economical balances with digital readout and weight knobs at eye level above weighing compartment. Big readout numerals and clearly labeled controls make it easy for the novice. Weight knob direction arrows and rapid filling guide keep students on target and shorten weighing time significantly. Designed to hold their own through the academic storm: a weight knob interlock avoids abrupt weight application. Slip clutches prevent forcing of weight knobs. And, in the H78AR, an air release system safeguards knife edges.

Model H78AR buyers receive a condensed instruction label that can be attached to balance. Pads of weighing instructions and overhead transparencies on operating procedures are included in packing carton.

See specifications in table.


1-909-78AR

H78AR

Economical student model. Same as H72 except with air release system. Protective features enable 2-year warranty even in school lab use.

Special Features	H78AR
Air Release System	
Automatic Preweighing	
Optical Range Taring	
Full Range Taring	
Capacity	
Weighing Range (g)	0-160
Taring in Optical Range (g)	—
Additional Tare Weight (g)	—
Total (g)	160
Precision	
Standard Deviation (mg)	±0.05
Readability	
Analog Scale-Est. (mg)	—
Digital Reading Device-Direct (mg)	0.1
Optical Scale	
Range (mg)	0-1000
1 Scale Div (mg)	10
1 Digital Step (mg)	0.1
Filling Guide	
1 Scale Div (mg)	100
Built-in Weights	
Set of Wts (g)	159
Additional Tare Wt (g)	—
Accuracy Ea Wt Comb (mg)	±0.25
1 Digital Step (g)	1
Taring System	
Max Tare (g)	159
By Setting Optical Scale to Zero (g)	—
By Use of Built-in Wts (g)	159
Pan Dia x Bow H (cm)	8.9x18
Housing	
LxW (cm)	46x24
H (cm)	41
Chamber	
LxW (cm)	17x20
H (cm)	20
Shp Wt (kg/lb)	18/40
Net Wt (kg)	11
Cat. No.	1-909-78AR
Ea	1195.00

Appendix E

Project Participants

APPENDIX E

PROJECT PARTICIPANTS

The following Weston employees participated in this project:

Peter J. Marks Vice President, Laboratory Services	econENVIRONomics Division
Barry L. Jackson Supervisor, Air Testing	econENVIRONomics Division
Gregory A. Celiano Assistant Project Scientist	econENVIRONomics Division
Charles Dobroski Assistant Project Scientist	econENVIRONomics Division
Theodore Moxon Senior Laboratory Technician	econENVIRONomics Division
Andrew Watkins Assistant Project Scientist	econENVIRONomics Division
Nancy Goldberg Chemist	econENVIRONomics Division
Wayne Kimball Civil Engineer	Environmental Engineers Division
David Ralston Laboratory Technician	econENVIRONomics Division
Robert Newton Laboratory Technician	econENVIRONomics Division
Virginia McGlincy Laboratory Technician	econENVIRONomics Division
Jeffery D. O'Neill Project Scientist	econENVIRONomics Division
Robert Caprara Laboratory Technician	econENVIRONomics Division
Thomas Davis Laboratory Technician	econENVIRONomics Division

Scott Stanley Laboratory Technician	econENVIRONomics Division
Thomas Feeley Laboratory Technician	econENVIRONomics Division
Robert Karpovich Laboratory Technician	econENVIRONomics Division