CORRESPONDENCE/MEMORANDUM

STATE OF WISCONSIN

Date: July 27, 1990 File Ref: 4530

To: Files

From: Joseph G. Brehm-AM/3 GEF 2 JGB

Subject: Review of Stack Test Performed for Eau Claire Asphalt Corporation
Received 7/17/90

I. SOURCE

Eau Claire Asphalt Corporation
Route 4, Box 356
Eau Claire, WI 54702

Contact: Mr. Louis Thune, Coordinator

FID# 618006950

Plant Location: Township of Brunswick

Test Date: May 30, 1990

II. SOURCE DESCRIPTION

The source tested was a Barber-Greene DM 65 drum mix asphalt plant. It is rated at 300 tons per hour (TPH) on virgin aggregate only, and is fired with waste oil. During the test the plant was producing about 250 TPH which is about 83% of capacity.

Particulate emissions are controlled by a Standard Havens pulse jet baghouse. The pressure drop across the baghouse was 2.3-2.4 inches, W.C.

III. SAMPLING OPERATION

A. Purpose of Test

The test was performed as a requirement of Mandatory Operating Permit #618006950-N02, and to demonstrate compliance with the emission limitations contained in the permit.

B. Sampling Firm

Mathy Construction Company
915 Commercial Court
Onalaska, WI 54650

Crew Chief: Mr. James Tryba, 608/783-6411

C. Test Method

The test method used was EPA Method Five as stated in the Federal Register, Volume 42, #160, August 18, 1977. The test was performed in the circular stack, 45 inches inside diameter, through two ports situated 90 degrees radially to each other. The ports are located 22 inches from the stack exit and 330 inches from the nearest upstream flow disturbance. Twenty-four points were sampled, 12 per port, for two and one-half minutes per point. There were four such runs done as the second run failed it's post-test leak check.

D. Test Date

The test was performed on May 30, 1990. It was a clear day with winds from the Southwest at 5-10 mph and an ambient temperature of 65F.

E. Test Witness

The second run of the test was witnessed by Mr. Tom Ponty of the Western District's Eau Claire area office.

IV. TEST RESULTS

The results listed are those as calculated by the department as the report had errors in two of the test runs.

RUN NUMBER	EMISSION RATE (lb/hr)	EMISSION CONCENTRATION (gr/DSCF)	ISOKINETIC RATIO (%)
1 (50-3)	1.49	0.0073	105.85
2 (50-5)	1.56	0.0071	106.68
3 (50-6)	0.54	0.0025	104.91
AVE	1.20	0.0056	105.85

V. APPLICABLE EMISSION LIMITATIONS

The emission limits that apply to this source are as follows:

Particulates-0.04 grains per dry standard cubic foot (gr/DSCF), Section NR 440.25(3)(a)1., Wisconsin Administrative Code.

Visible Emissions-20% opacity, Section NR 440.25(3)(a)2., Wisconsin Administrative Code.

VI. DISCUSSION OF RESULTS

The emission concentration of 0.0056 gr/DSCF is below the limit of 0.04 gr/DSCF. The isokinetic ratio of 105.85% is within the limits of 90%-110% that the department uses to judge the validity of stack tests. I checked the field and laboratory data and found it to be accurate. However, when Mathy entered the data in their computer program there were two errors.

The particulate catches for the second and third runs (50-5 & 50-6) were reversed, and the field data for Run #50-5 used in their computer report was not the same as the actual field data for that run. I'm assuming the errant field data was from Run #50-4 which was voided do to the bad leak check.

A fyrite was used to obtain the carbon dioxide measurements for each run. The oxygen measurements were calculated based on an F-Factor for the type of oil that was fired in the dryer. Mathy has been told that for future tests the oxygen must be measured directly from the stack gas.

The visible emissions were read by Mathy personnel after the test was over. They were essentially zero for the 20 minute observation period.

The report contained all necessary plant operational data as well as the calibration for the test equipment.

cc: Joe Perez-AM/3
Tom Ponty-WD/ECA
USEPA-Region 5

NAME OF SOURCE: EAU CLAIRE ASPHALT CORP

LOCATION OF SOURCE: EAU CLAIRE WI

PROCESS TESTED: PLANT #50

DATE OF TEST: 5-30-90

RUN NUMBER: 1

N NUMBER OF SAMPLING POINTS= 24

VM DGM VOL,METER COND DRY= 42.432 CFD

PB BAR PRESS,STATION= 30.22 IN HG

VL TOTAL VOL OF WATER COLLECTED= 327 ML

%CO2 % CARBON DIOXIDE BY VOL,DRY BASIS= 6 %

%O2 % OXYGEN BY VOL,DRY BASIS= 12.8 %

%CO % CARBON MONOXIDE BY VOL, DRY BASIS= 0 %

%N2 % NITROGEN BY VOL,DRY BASIS= 81.2 %

CP PITOT TUBE COEFFICIENT= .84

PS STACK PRESS= 30.19 IN HG

AS AREA OF THE SAMPLING SITE= 11.04 SQ FEET

MT TOTAL DRY PARTICULATE= .02 GM

T TOTAL SAMPLING TIME= 60 MIN

AN AREA OF THE NOZZLE= .000317 SQ FEET

EAU CLAIRE ASPHALT CORP,PLANT #50,RUN: 1

PARTICULATE FIELD DATA

SAMPLING POINT NUMBER	STACK TEMP DEG F	VELOCITY PRESS IN H2O	SQ ROOT VEL PRESS	ORIFICE METER PRESS DROP IN H2O	DRY GAS METER TEMP DEG F INLET	DRY GAS METER TEMP DEG F OUTLET
1	215.0	0.670	0.81854	1.400	57.0	55.0
2	240.0	0.740	0.86023	1.500	62.0	56.0
3	266.0	0.820	0.90554	1.700	65.0	57.0
4	274.0	0.940	0.96954	1.900	68.0	59.0
5	276.0	1.000	1.00000	2.000	70.0	60.0
6	277.0	1.100	1.04881	2.200	71.0	63.0
7	276.0	1.100	1.04881	2.200	73.0	65.0
8	276.0	1.100	1.04881	2.200	75.0	66.0
9	278.0	1.000	1.00000	2.000	77.0	69.0
10	278.0	0.900	0.94868	1.900	79.0	70.0
11	279.0	0.850	0.92195	1.700	81.0	72.0
12	278.0	0.800	0.89443	1.600	84.0	74.0
13	226.0	0.750	0.86603	1.500	85.0	79.0
14	259.0	0.900	0.94868	1.900	90.0	80.0
15	278.0	1.000	1.00000	2.000	91.0	81.0
16	282.0	1.100	1.04881	2.200	91.0	82.0
17	283.0	1.100	1.04881	2.200	92.0	84.0
18	283.0	1.100	1.04881	2.200	92.0	84.0
19	284.0	0.950	0.97468	1.900	93.0	85.0
20	284.0	0.900	0.94868	1.900	94.0	85.0
21	286.0	0.850	0.92195	1.700	94.0	87.0
22	285.0	0.800	0.89443	1.600	96.0	87.0
23	276.0	0.770	0.87750	1.600	96.0	87.0
24	272.0	0.720	0.84853	1.500	96.0	88.0
AVERAGE	TS=		SR(VP)=	OP=	TM=	
VALUES	731.2916 DEG R		.9538433	1.854167 IN H2O	538.0625 DEG R	

EAU CLAIRE ASPHALT CORP,PLANT #50,RUN: 1

CALCULATED RESULTS

TS STACK TEMPERATURE = 271.2916 DEG F

VMSTD DGM VOL,STD COND DRY= 42.24569 SCFD

VWSTD VOL OF WATER VAPOR,STD COND= 15.39189 SCF

%M % MOISTURE IN STACK GAS BY VOL,STD COND= 26.70461 %

MD MOLE FRACTION OF DRY GAS= .732954

MWD MOLECULAR WT OF STACK GAS,DRY BASIS= 29.472 LB/LB-MOLE

MWS MOLECULAR WT OF STACK GAS,WET BASIS= 26.40845 LB/LB-MOLE

VS AVE STACK GAS VELOCITY,STACK COND= 65.60152 FPS

QACT ACTUAL STACK GAS FLOW RATE= 43454.45 CFM

QSTD AVE STACK GAS FLOW RATE,STD COND DRY= 23203.62 SCFMD

%EA AVE % EXCESS AIR= 148.203 %

PMRA AVE PMR BY RATIO OF AREAS METHOD= 1.535594 LB/HR

PMRC AVE PMR BY CONC METHOD= 1.453085 LB/HR

PMR(AVE) AVE PMR,STD COND DRY= 1.49434 LB/HR

C EMISSION CONC,STD COND DRY= 7.304887E-03 GR/SCFD

DGR AVE STACK GAS RATE,STD COND DRY= 106412.6 LB/HR

LB/MLB EMISSION CONC,STD COND DRY= 1.404289E-02 LB/MLB OF DRY GAS

WGR AVE STACK GAS RATE,STD COND WET= 130091.6 LB/HR

LB/MLB EMISSION CONC,STD COND WET= 1.148682E-02 LB/MLB OF WET GAS

%ISR % ISOKINETIC RATIO= 105.6781 %

NAME OF SOURCE: EAU CLAIRE ASPHALT CORP

LOCATION OF SOURCE: EAU CLAIRE WI

PROCESS TESTED: PLANT #50

DATE OF TEST: 5-30-90

RUN NUMBER: 2

N NUMBER OF SAMPLING POINTS= 24

VM DGM VOL,METER COND DRY= 35.612 CFD

PB BAR PRESS,STATION= 30.05 IN HG

VL TOTAL VOL OF WATER COLLECTED= 182 ML

%CO2 % CARBON DIOXIDE BY VOL,DRY BASIS= 5 %

%O2 % OXYGEN BY VOL,DRY BASIS= 14.2 %

%CO % CARBON MONOXIDE BY VOL, DRY BASIS= 0 %

%N2 % NITROGEN BY VOL,DRY BASIS= 80.8 %

CP PITOT TUBE COEFFICIENT= .84

PS STACK PRESS= 30.02 IN HG

AS AREA OF THE SAMPLING SITE= 11.04 SQ FEET

MT TOTAL DRY PARTICULATE= .0155 GM

T TOTAL SAMPLING TIME= 60 MIN

AN AREA OF THE NOZZLE= .000234 SQ FEET

EAU CLAIRE ASPHALT CORP,PLANT #50,RUN: 2

PARTICULATE FIELD DATA

SAMPLING POINT NUMBER	STACK TEMP DEG F	VELOCITY PRESS IN H2O	SQ ROOT VEL PRESS	ORIFICE METER PRESS DROP IN H2O	DRY GAS METER TEMP DEG F INLET	DRY GAS METER TEMP DEG F OUTLET
1	274.0	0.650	0.80623	0.870	85.0	83.0
2	287.0	0.750	0.86603	0.990	89.0	84.0
3	301.0	0.870	0.93274	1.100	92.0	85.0
4	302.0	0.950	0.97468	1.200	95.0	86.0
5	306.0	1.000	1.00000	1.300	96.0	90.0
6	303.0	1.100	1.04881	1.400	98.0	90.0
7	304.0	1.100	1.04881	1.400	97.0	91.0
8	306.0	1.100	1.04881	1.400	101.0	92.0
9	308.0	0.980	0.98995	1.300	102.0	93.0
10	306.0	0.950	0.97468	1.200	105.0	95.0
11	306.0	0.850	0.92195	1.100	106.0	96.0
12	307.0	0.780	0.88318	1.000	106.0	97.0
13	269.0	0.640	0.80000	0.860	104.0	100.0
14	272.0	0.870	0.93274	1.100	108.0	100.0
15	302.0	1.000	1.00000	1.300	111.0	101.0
16	308.0	1.100	1.04881	1.400	112.0	103.0
17	308.0	1.100	1.04881	1.400	113.0	104.0
18	308.0	1.100	1.04881	1.400	114.0	105.0
19	307.0	1.100	1.04881	1.400	115.0	105.0
20	311.0	1.100	1.04881	1.400	116.0	106.0
21	316.0	1.000	1.00000	1.300	116.0	107.0
22	320.0	0.920	0.95917	1.200	117.0	108.0
23	316.0	0.890	0.94340	1.100	118.0	109.0
24	314.0	0.880	0.93808	1.100	118.0	109.0
AVERAGE VALUES	TS= 762.5416 DEG R		SR(VP)= .9713869	OP= 1.2175 IN H2O	TM= 561.5208 DEG R	

EAU CLAIRE ASPHALT CORP,PLANT #50,RUN: 2

CALCULATED RESULTS

TS STACK TEMPERATURE = 302.5416 DEG F

VMSTD DGM VOL,STD COND DRY= 33.73177 SCFD

VWSTD VOL OF WATER VAPOR,STD COND= 8.56674 SCF

%M % MOISTURE IN STACK GAS BY VOL,STD COND= 20.25305 %

MD MOLE FRACTION OF DRY GAS= .7974695

MWD MOLECULAR WT OF STACK GAS,DRY BASIS= 29.368 LB/LB-MOLE

MWS MOLECULAR WT OF STACK GAS,WET BASIS= 27.06563 LB/LB-MOLE

VS AVE STACK GAS VELOCITY,STACK COND= 67.57781 FPS

QACT ACTUAL STACK GAS FLOW RATE= 44763.54 CFM

QSTD AVE STACK GAS FLOW RATE,STD COND DRY= 24800.36 SCFMD

%EA AVE % EXCESS AIR= 199.1249 %

PMRA AVE PMR BY RATIO OF AREAS METHOD= 1.612209 LB/HR

PMRC AVE PMR BY CONC METHOD= 1.507434 LB/HR

PMR(AVE) AVE PMR,STD COND DRY= 1.559822 LB/HR

C EMISSION CONC,STD COND DRY= 7.090199E-03 GR/SCFD

DGR AVE STACK GAS RATE,STD COND DRY= 113333.9 LB/HR

LB/MLB EMISSION CONC,STD COND DRY= 1.376306E-02 LB/MLB OF DRY GAS

WGR AVE STACK GAS RATE,STD COND WET= 130975.4 LB/HR

LB/MLB EMISSION CONC,STD COND WET= 1.190928E-02 LB/MLB OF WET GAS

%ISR % ISOKINETIC RATIO= 106.9506 %

NAME OF SOURCE: EAU CLAIRE ASPHALT CORP

LOCATION OF SOURCE: EAU CLAIRE WI

PROCESS TESTED: PLANT #50

DATE OF TEST: 5-30-90

RUN NUMBER: 3

N NUMBER OF SAMPLING POINTS= 24

VM DGM VOL,METER COND DRY= 36.621 CFD

PB BAR PRESS,STATION= 29.2 IN HG

VL TOTAL VOL OF WATER COLLECTED= 161 ML

%CO2 % CARBON DIOXIDE BY VOL,DRY BASIS= 5 %

%O2 % OXYGEN BY VOL,DRY BASIS= 14.2 %

%CO % CARBON MONOXIDE BY VOL, DRY BASIS= 0 %

%N2 % NITROGEN BY VOL,DRY BASIS= 80.8 %

CP PITOT TUBE COEFFICIENT= .84

PS STACK PRESS= 29.17 IN HG

AS AREA OF THE SAMPLING SITE= 11.04 SQ FEET

MT TOTAL DRY PARTICULATE= .0053 GM

T TOTAL SAMPLING TIME= 60 MIN

AN AREA OF THE NOZZLE= .000234 SQ FEET

EAU CLAIRE ASPHALT CORP,PLANT #50,RUN: 3

PARTICULATE FIELD DATA

SAMPLING POINT NUMBER	STACK TEMP DEG F	VELOCITY PRESS IN H2O	SQ ROOT VEL PRESS	ORIFICE METER PRESS DROP IN H2O	DRY GAS METER TEMP DEG F INLET	OUTLET
1	230.0	0.750	0.86603	0.990	96.0	97.0
2	276.0	0.850	0.92195	1.100	102.0	97.0
3	293.0	0.950	0.97468	1.200	104.0	98.0
4	295.0	1.000	1.00000	1.300	105.0	98.0
5	295.0	1.200	1.09545	1.500	107.0	99.0
6	298.0	1.100	1.04881	1.400	109.0	100.0
7	298.0	1.100	1.04881	1.400	109.0	102.0
8	300.0	1.100	1.04881	1.400	109.0	103.0
9	301.0	0.950	0.97468	1.200	109.0	104.0
10	301.0	0.930	0.96437	1.200	109.0	105.0
11	300.0	0.850	0.92195	1.100	110.0	105.0
12	301.0	0.780	0.88318	1.000	110.0	105.0
13	262.0	0.650	0.80623	0.870	106.0	105.0
14	287.0	0.900	0.94868	1.100	107.0	106.0
15	300.0	0.850	0.92195	1.100	108.0	107.0
16	300.0	0.900	0.94868	1.100	111.0	107.0
17	286.0	1.100	1.04881	1.400	113.0	108.0
18	295.0	1.100	1.04881	1.400	114.0	107.0
19	300.0	1.200	1.09545	1.500	114.0	108.0
20	290.0	1.100	1.04881	1.400	115.0	108.0
21	298.0	0.950	0.97468	1.200	114.0	108.0
22	299.0	0.850	0.92195	1.100	115.0	108.0
23	299.0	0.800	0.89443	1.000	116.0	108.0
24	284.0	0.730	0.85440	0.970	116.0	109.0

AVERAGE	TS=	SR(VP)=	OP=	TM=
VALUES	751.1666 DEG R	.9692328	1.205417 IN H2O	566.875 DEG R

EAU CLAIRE ASPHALT CORP,PLANT #50,RUN: 3

CALCULATED RESULTS

TS STACK TEMPERATURE = 291.1666 DEG F .

VMSTD DGM VOL,STD COND DRY= 33.38984 SCFD

VWSTD VOL OF WATER VAPOR,STD COND= 7.57827 SCF

%M % MOISTURE IN STACK GAS BY VOL,STD COND= 18.49797 %

MD MOLE FRACTION OF DRY GAS= .8150203

MWD MOLECULAR WT OF STACK GAS,DRY BASIS= 29.368 LB/LB-MOLE

MWS MOLECULAR WT OF STACK GAS,WET BASIS= 27.26515 LB/LB-MOLE

VS AVE STACK GAS VELOCITY,STACK COND= 67.64234 FPS

QACT ACTUAL STACK GAS FLOW RATE= 44806.29 CFM

QSTD AVE STACK GAS FLOW RATE,STD COND DRY= 25025.33 SCFMD

%EA AVE % EXCESS AIR= 199.1249 %

PMRA AVE PMR BY RATIO OF AREAS METHOD= .5512716 LB/HR

PMRC AVE PMR BY CONC METHOD= .5254473 LB/HR

PMR(AVE) AVE PMR,STD COND DRY= .5383594 LB/HR

C EMISSION CONC,STD COND DRY= 2.449218E-03 GR/SCFD

DGR AVE STACK GAS RATE,STD COND DRY= 114362 LB/HR

LB/MLB EMISSION CONC,STD COND DRY= 4.707503E-03 LB/MLB OF DRY GAS

WGR AVE STACK GAS RATE,STD COND WET= 130270.7 LB/HR

LB/MLB EMISSION CONC,STD COND WET= 4.13262E-03 LB/MLB OF WET GAS

%ISR % ISOKINETIC RATIO= 104.9147 %

I. INTRODUCTION

On May 30, 1990, personnel from Mathy Environmental conducted a source emissions test for emissions compliance at Eau Claire Asphalt Plant #50 hot mix asphalt plant located in Eau Claire, Wisconsin. The field testing was conducted by James Tryba and the laboratory analysis was performed by Gail Jensen. Custody of the samples were limited to Mr.Tryba and Mr. Jensen.

The purpose of the test was to determine if the rate of particulate emissions from the plant's baghouse and the total contaminants by weight are below the allowable limits as set forth by the State of Wisconsin.

II. TEST RESULTS

Table I summarizes the test results. The allowable emissions limitation for the State of Wisconsin is found in the Wisconsin Administrative Code, Chapter NR415, Control of Particulate Emissions, where the limit of particulate is 0.04 grains per dry standard cubic foot as per the permit.

TABLE I

SUMMARY OF TEST RESULTS

Test Run	Time	Grains/ DSCF	Isokinetic Variation
50-3	60 min.	0.0073	105.4 %
50-5	60 min.	0.0024	104.4 %
50-6	60 min.	0.0069	108.4 %

Average = 0.0055 grains/dscf.

III. TEST PROCEDURES

A. Method Used: The source sampling was conducted in accordance with requirements as set forth by the U.S. Environmental Agency.

B. Sampling Site: The emissions test was conducted on a baghouse with a circular stack measuring 45" in diameter. Two sampling ports were placed 22" down from the top of the stack and 330" up from the last flow disturbance. Twenty four points were sampled, twelve points through each port.

C. A problem did occur in Run 5-4. The post leak test showed a leakage rate of 0.030 cubic feet per minute, which is greater than the 0.02 cubic feet allowed, thus this run had to be voided.

IV. THE SOURCE

Eau Claire Asphalt employs a drum mix asphalt plant which is used to manufacture hot mix asphalt for pavements. The process consists of blending prescribed portions of cold feed materials (sand, gravel, and stone) uniformly and adding sufficient hot liquid asphalt to bind the mixture together. After the hot mix asphalt is manufactured at the plant, it is transported to the location where it is to be applied. The hot mix asphalt is spread evenly over the surface with a paver and then compacted with a heavy roller to produce the final product.

The following is a general description of the plant's manufacturing process. The cold feed materials (aggregate) are placed into separate bins which in turn feed a common conveyor. The aggregate is dispensed from the bins in accordance with the desired job mix formula onto the cold feed system conveyor to a rotating drum for continuous mixing with hot liquid asphalt at approximately 300 degrees Fahrenheit. This material is transferred to a storage silo. The hot mix asphalt is then discharged from the storage silo through a slide gate into waiting trucks, which then transport the material to the final destination. The rated capacity of the plant will vary with each aggregate mix and moisture content.

The drum dryer uses a burner fired with reprocessed waste oil and air to dry the aggregate. The air is drawn into the system via an exhaust fan located on the baghouse. After passing through the burner and mixing drum, the air passes through the baghouse, and is then discharged to the atmosphere through the stack.

LABORATORY PROCEDURES FOR PARTICULATE SAMPLING

I. FIELD PREPARATION

Filters: 4" fiberglass sampling filters are prepared before each test. The filters are placed in a dessicator to dry for a minimum of 24 hours. After the filters are dried, they are individually placed on a Satorious analytical balance and weighed. After being weighed to a constant weight, they are placed back into the dessicator until they are to be used for the test.

Silica Gel: The silica gel used for the test is indicating type, 6-16 mesh. The silica gel is dried prior to the test and stored in sealed containers. Approximately 200 grams are used for each test.

II. POST-TESTING LAB ANALYSIS

Filters: The filters are returned to the lab in the dessicator. In the lab, the filters are dessicated for at least 24 hours. Then, the filters are weighed every 6 hours until a constant weight is achieved. All data is recorded on the laboratory forms that will be found in the test report.

Alternately, the test team may opt to oven dry the filters at 220 degrees Fahrenheit for two to three hours, weigh the sample, and use this weight as a final weight.

Silica Gel: The silica gel used in the stack test is weighed to a constant weight.

Probe Rinsings: In all tests where a probe washout analysis in necessary, this is a accomplished in accordance with procedures as specified in "EPA Reference Method 5". These samples are returned in sealed containers to the laboratory for analysis. The reagents used for the rinsings are as outlined in the appropriate "EPA Method" used. Backhalf rinsings are also performed when required.

Reagents: The reagents used in the rinsings conform with the ACS grades of standards. Blanks of the reagents used in the field are taken and analyzed so as to insure their purity standards.

SPECIAL NOTE

When sampling sources high in moisture content, such as asphalt plants, the filter paper may adhere to the filter holder or gasket. When removing the filter from the holder, it may tear. In order to maintain control of any small pieces of filter paper, they are washed with the appropriate reagent into the probe wash container. This makes the filter weight light (sometimes negative) and the probe wash correspondingly heavier. The net weight is the same and no particulate is lost. This laboratory procedure is taught by EPA in the Quality Assurance for Source Emissions Workshop and is approved by the EPA.

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MATHY CONSTRUCTION CO.

(A CORPORATION)

GENERAL CONTRACTORS

915 COMMERCIAL COURT

ONALASKA, WISCONSIN 54650

PHONE 783-6411 :: POST OFFICE BOX 189

May 14, 1990

Mr. Tom Ponty
Air Management Engineer
Department of Natural Resources
2004 Highland Avenue
Eau Claire, WI 54701-4346

RE: **Stack Test for Eau Claire Asphalt Corporation Plant #50**

Dear Mr. Ponty:

We are preparing to test Plant #50 for an emission test for the purpose of determining compliance with the emission limitations as per the mandatory operating permit. The test plan is as follows:

Test Date: May 30, 1990

Time of Test: Approximately 7:00am

Source Location: Eau Claire Asphalt Corp. Plant #50
MOP No. 618006950-N02
Eau Claire, Wisconsin

Process to be Tested: The exhaust stack of the asphalt plant's baghouse.

Test Method: Methods 1-5, Method 8, Method 9, and Method 12 source sampling procedures in accordance with requirements as set forth by the U.S. Environmental Protection Agency.

Sampling Equipment:

A. Napp Model 31 manual stack sampling system. (see attached schematic)
B. Airguide Instruments Model 211-B aneroid barometer
C. Bacharach Instruments fyrite.

Sampling Ports and Locations: (see attached drawing)

MATHY CONSTRUCTION CO.

(A CORPORATION)

GENERAL CONTRACTORS

915 COMMERCIAL COURT

ONALASKA, WISCONSIN 54650

PHONE 783-6411 :: POST OFFICE BOX 189

Production Rate: Approximately 240 ton per hour. Test will be conducted at 80% of plant production or greater.

Type of Aggregate: Virgin material

Burner Fuel: Reprocessed waste oil

NOTE: See attached flow chart for step-by-step procedures.

If any additional information is needed or a scheduling conflict should arise, please feel free to call me at 715/693-5200.

Sincerely,
Mathy Construction Company

James Tryba
Senior Field Engineer

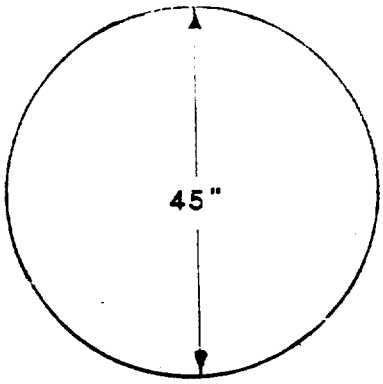
JT/clu
enclosures

MATHY CONSTRUCTION COMPANY - ENVIRONMENTAL
SAMPLING SITE DETAIL

Stack Dimensions :

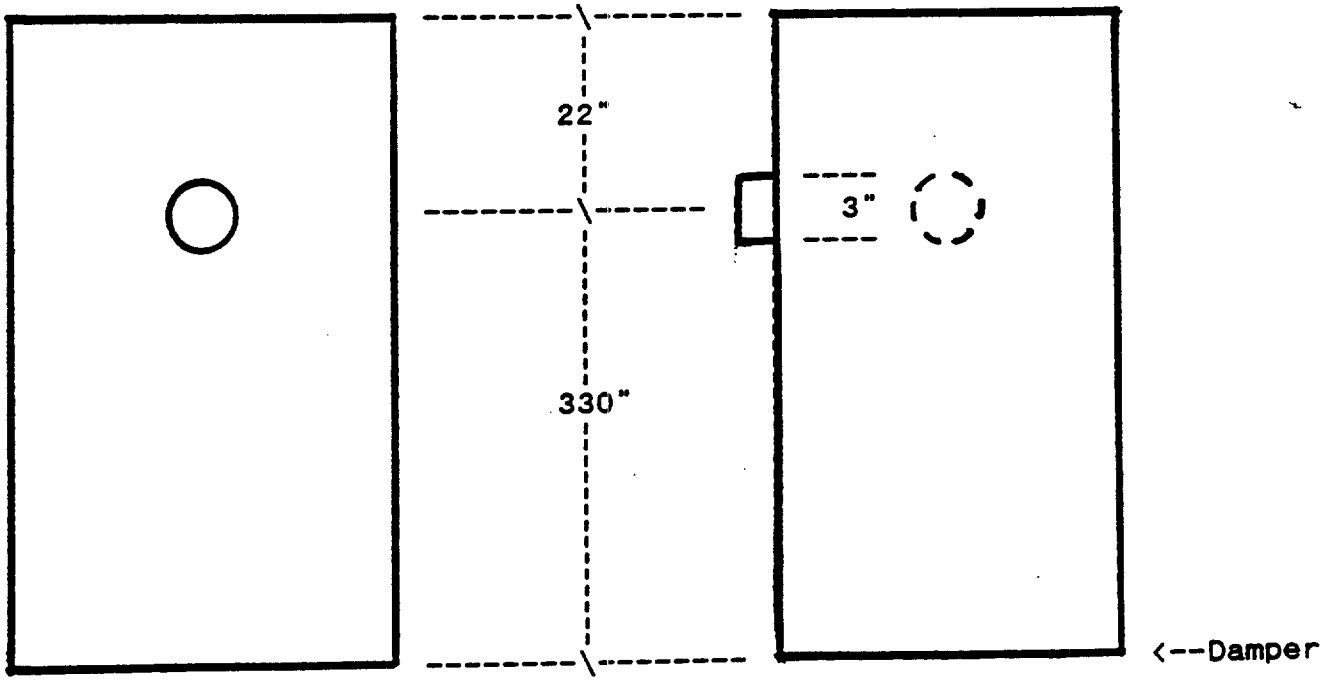
Diameter = 45 inches

No. of Ports = 2 No. of Traverse Points = 24



Point	Probe Mark *
1	1"
2	3"
3	5.3"
4	8"
5	11.3"
6	16"
7	29"
8	33.8"
9	37"
10	39.7"
11	42"
12	44"

* Distance from stack wall



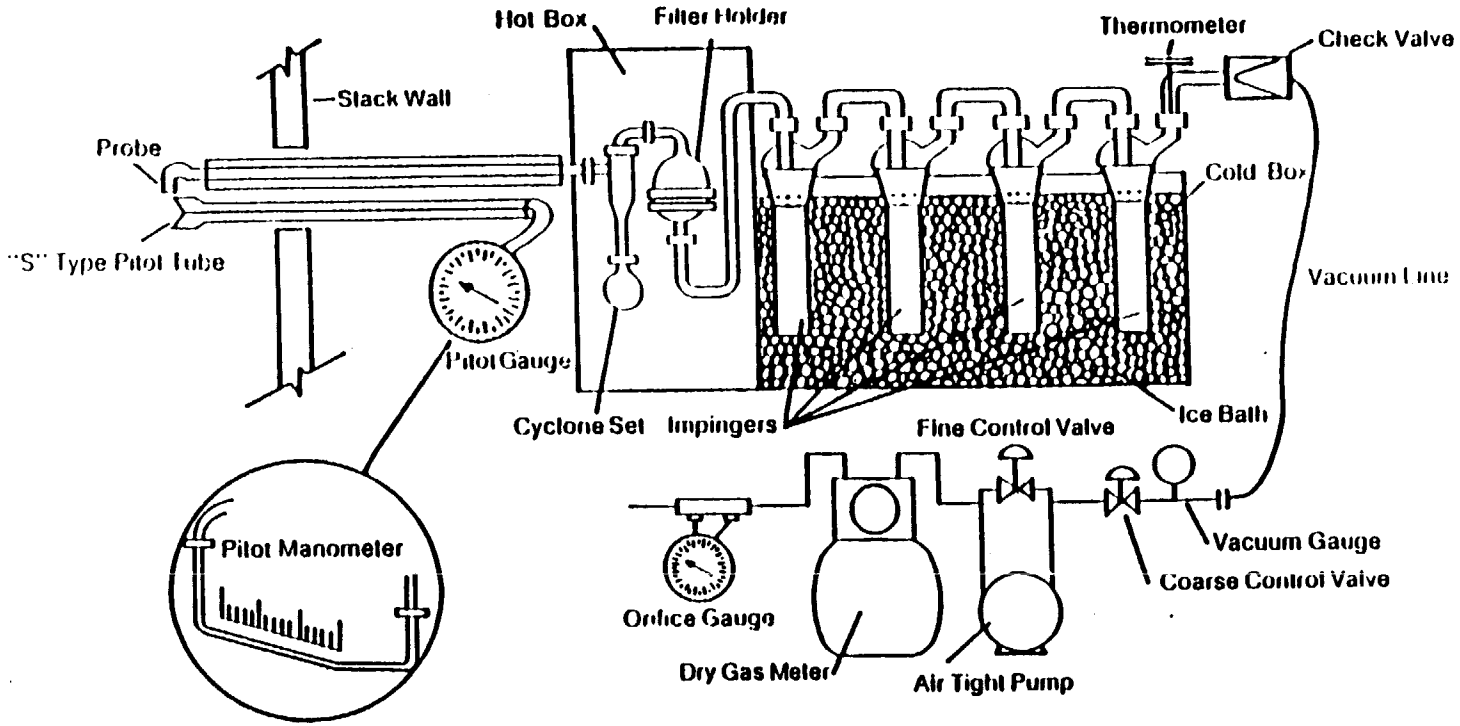
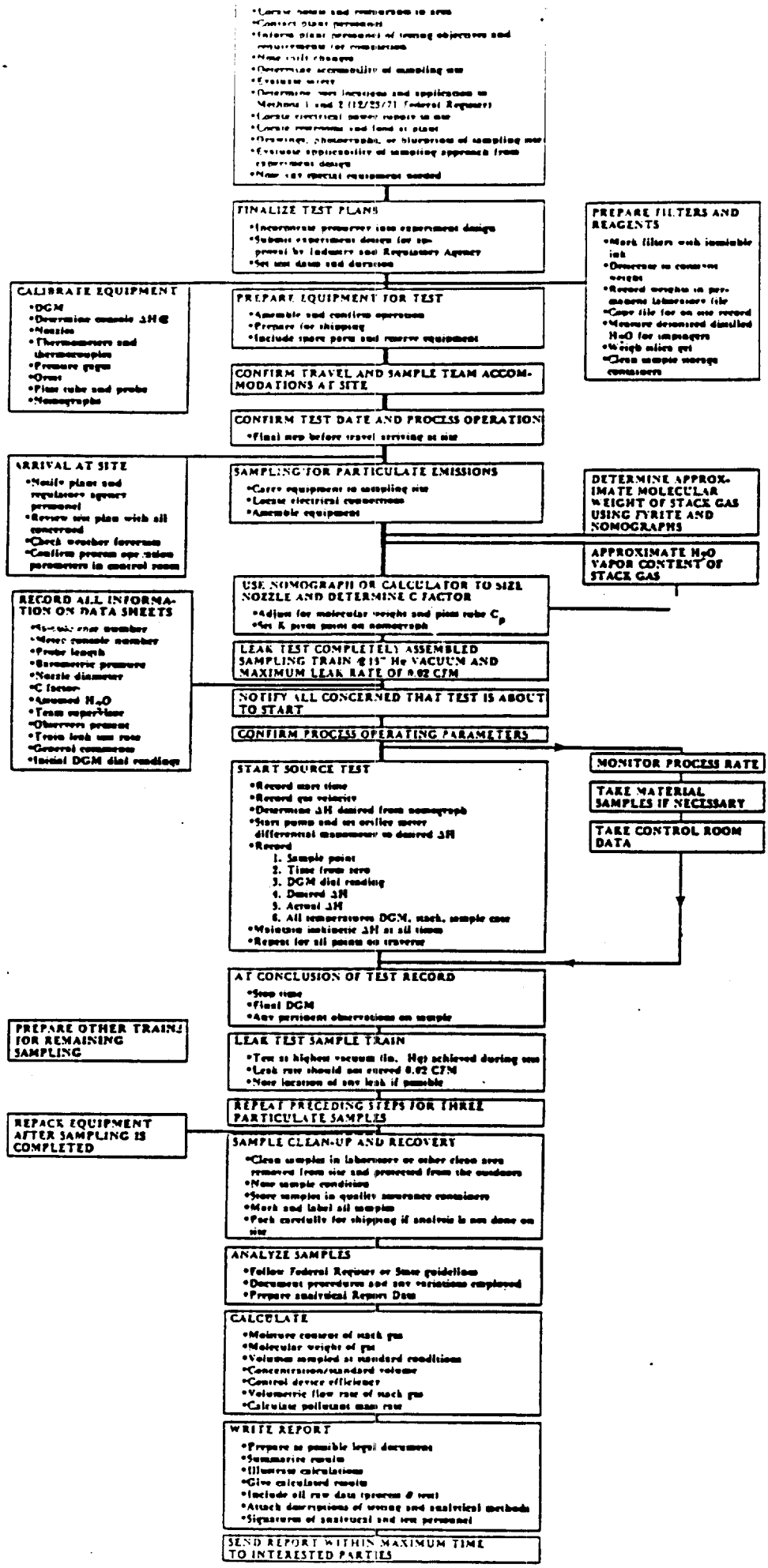


FIGURE 1-3 MODEL 31 SAMPLING TRAIN SCHEMATIC


FINALIZE TEST PLANS
•Incorporate preservice test experiment design
•Submit experiment design for approval by Industry and Regulatory Agency
•Set test dates and duration
PREPARE FILTERS AND REAGENTS
•Mark filters with ironable ink
•Determine to constant weight
•Record weights in permanent laboratory file
•Copy file for on site record
•Measure deionized distilled H2O for impingers
•Weigh silica gel
•Clean sample storage containers
CALIBRATE EQUIPMENT
•DGM
•Determine console ΔH@
•Nozzle
•Thermometers and thermocouples
•Pressure gages
•Orsat
•Pitot tube and probe
•Nomographs
PREPARE EQUIPMENT FOR TEST
•Assemble and confirm operation
•Prepare for shipping
•Include spare parts and reserve equipment
CONFIRM TRAVEL AND SAMPLE TEAM ACCOMMODATIONS AT SITE
CONFIRM TEST DATE AND PROCESS OPERATION
•Final step before travel arriving at site
ARRIVAL AT SITE
•Notify plant and regulatory agency personnel
•Review test plan with all concerned
•Check weather forecasts
•Confirm process operation parameters in control room
SAMPLING FOR PARTICULATE EMISSIONS
•Carry equipment to sampling site
•Locate electrical connections
•Assemble equipment
DETERMINE APPROXIMATE MOLECULAR WEIGHT OF STACK GAS USING ORSAT AND NOMOGRAPHS
APPROXIMATE H2O VAPOR CONTENT OF STACK GAS
USE NOMOGRAPH OR CALCULATOR TO SIZE NOZZLE AND DETERMINE C FACTOR
•Adjust for molecular weight and pitot tube Cp
•Set K point point on nomograph
RECORD ALL INFORMATION ON DATA SHEETS
•Test site run number
•Meter console number
•Probe length
•Barometric pressure
•Nozzle diameter
•C factor
•Assumed H2O
•Team supervisor
•Observers present
•Train leak test rate
•General comments
•Initial DGM dial readings
LEAK TEST COMPLETELY ASSEMBLED SAMPLING TRAIN @15" Hg VACUUM AND MAXIMUM LEAK RATE OF 0.02 CFM
NOTIFY ALL CONCERNED THAT TEST IS ABOUT TO START
CONFIRM PROCESS OPERATING PARAMETERS
MONITOR PROCESS RATE
TAKE MATERIAL SAMPLES IF NECESSARY
TAKE CONTROL ROOM DATA
START SOURCE TEST
•Record start time
•Record gas velocity
•Determine ΔH desired from nomograph
•Start pump and set orifice meter differential manometer to desired ΔH
•Record
1. Sample point
2. Time from zero
3. DGM dial reading
4. Desired ΔH
5. Actual ΔH
6. All temperatures DGM, stack, sample case
•Maintain isokinetic ΔH at all times
•Repeat for all points on traverse
AT CONCLUSION OF TEST RECORD
•Stop time
•Final DGM
•Any pertinent observations on sample
PREPARE OTHER TRAINS FOR REMAINING SAMPLING
LEAK TEST SAMPLE TRAIN
•Test at highest vacuum (in. Hg) achieved during test
•Leak rate should not exceed 0.02 CFM
•Note location of any leak if possible
REPEAT PRECEDING STEPS FOR THREE PARTICULATE SAMPLES
REPACK EQUIPMENT AFTER SAMPLING IS COMPLETED
SAMPLE CLEAN-UP AND RECOVERY
•Clean samples in laboratory or other clean area removed from site and protected from the outdoors
•Note sample condition
•Store samples in quality assurance containers
•Mark and label all samples
•Pack carefully for shipping if analysis is not done on site
ANALYZE SAMPLES
•Follow Federal Register or State guidelines
•Document procedures and any variations employed
•Prepare analytical Report Data
CALCULATE
•Moisture content of stack gas
•Molecular weight of gas
•Volume sampled at standard conditions
•Concentration/standard volume
•Control device efficiency
•Volumetric flow rate of stack gas
•Calculate pollutant mass rate
WRITE REPORT
•Prepare as possible legal document
•Summarize results
•Illustrate calculations
•Give calculated results
•Include all raw data (process & test)
•Attach descriptions of sampling and analytical methods
•Signatures of analytical and test personnel
SEND REPORT WITHIN MAXIMUM TIME TO INTERESTED PARTIES

WISCONSIN DEPARTMENT OF NATURAL RESOURCES
PERMIT NO. 618006950 - NO2
PERMIT REVISION

On January 6, 1987, Air Pollution Control Permit No. 618006950-NO1 was issued to:

Eau Claire Asphalt Corp.
P.O. Box 326
Eau Claire, WI 54702

Mr. Louie Thune, Coordinator

Authorizing Operation of a drum hot mix Asphalt Plant in accordance with the emission limitations, monitoring requirements and other conditions set forth in Parts I and II thereof and in conformity with the plans and specifications as approved by the Department.

It has since come to the attention of the Department that Part I of the Permit No. 618006950-NO1 was not sufficient to address the limitations applicable to the use of waste oil as fuel and fugitive particulates emissions. Accordingly, Part I of the permit is hereby corrected to read:

PART I.

SPECIFIC PERMIT CONDITIONS

BY CATEGORY OF EMISSION UNITS:

A. Plant (S10, P30):

This plant was constructed after June 11, 1973, therefore New Source Performance Standards apply.

1. Categorical Emission Limitation

Pollutant	Applicable Wisconsin Adm. Code or Statute	Limitation/ Requirement
Particulates	Sec. NR 440.25(3)(a)1., Wis. Adm. Code	0.04 grain per dry standard cubic feet (dscf)
	Sec. NR 415.04(1), Wis. Adm. Code	(See Note 1)
Visible Emissions	Sec. NR 440.25(3)(a)2., Wis. Adm. Code	20% opacity
SO_2	Sec. NR 417.025, Wis. Adm. Code	128.8 pounds per hour, 249 tons per year
NO_x	Sec. NR 426.025, Wis. Adm. Code	33 pounds per hour, 63.8 tons per year
CO	Sec. NR 428.03, Wis. Adm.	3.2 pounds per hour, 6.2 tons per year

HC	Sec. NR 419.03, Wis. Adm. Code	0.7 pounds per hour, 1.3 tons per year
Lead	Sec. NR 427.03, Wis. Adm. Code	0.36 pounds per hour, 0.7 tons per year
Malodorous Emissions	Sec. NR 429.03(1), Wis. Adm. Code	(See Note 2)
Fugitive Emission	Sec. NR 415.04, Wis. Adm. Code	(See Note 3)
Hazardous Emissions	Sec. NR 445.03, Wis. Adm. Code	(See Note 4)

Note 1: No person shall cause, allow, or permit any materials to be handled, transported, or stored without taking precautions to prevent particulate matter from becoming airborne. Nor shall a person allow a road to be used without taking such precautions.

Such precautions shall include, but not be limited to:

(a) Application of asphalt, oil, water, suitable chemicals, or plastic covering on dirt roads, material stockpiles, and other surfaces which can create airborne dust, provided such application does not create a hydrocarbon, odor, or water pollution problem.

(b) Installation and use of hoods, fans, and air cleaning devices to enclose and vent the areas where dusty materials are handled.

(c) Covering or securing of materials likely to become airborne while being moved on public roads.

(d) The paving or maintenance of roadways so as not to create air pollution.

Note 2: No person shall cause, suffer, allow, or permit emission into the ambient air any substance or combination of substances in such quantities that an objectionable odor is determined to result unless preventive measures satisfactory to the Department are taken to abate or control such emission.

Note 3: No person shall cause, allow, or permit any materials to be handled, transported or stored without taking precautions to prevent particulate matter from becoming airborne.

Note 4: No person may cause, allow, or permit emissions into the ambient air of hazardous substances in such quantity, concentrations or duration as to be injurious to human health, plant or animal life unless the purpose of that emission is for the control of plant or animal life.

Chromium, total	4.93×10^{-2} pounds per hour
Halogens, total	0.9 pounds per hour

GENERAL CONDITIONS APPLICABLE TO THE ENTIRE FACILITY

A. Source performance tests shall be conducted within 30 days after the issuance of this permit to prove compliance with the particulates and visible emissions limitations, while operating at least 10 working days prior to the tests so a Department representative can witness the testing. At the time of notification, a stack test plan following the provisions set forth in sec. NR 439.05, Wis. Adm. Code, shall also be submitted for approval.

   Two copies of the report of the tests shall be submitted to the Department for evaluation within 30 days after the tests.

B. A certified visible emissions reader shall do visible emissions readings during the source performance tests.

C. The maximum sulfur content of any fuel oil may not exceed 1.35% by weight.

D. Operating hours may not exceed 3,867 hours beginning from March 1 through November 30 calendar year.

E. The company shall keep records of the type of fuel used; specifications of the fuel and operating hours, and shall make this record available for inspection by a Department staff anytime during normal business hours.

F. Instrumentation shall be installed and maintained properly to measure the pressure drop across the venturi scrubber.

G. The concentrations (by weight) of the following substances contained in the waste oil may not exceed:

Substances	Maximum Allowable Concentrations
Arsenic	5 parts per million
Cadmium	2 parts per million
Chromium	10 parts per million
Lead	400 parts per million
Total halogens	1000 parts per million

H. Under Federal requirements anyone burning used oil with a lead level above 100 parts per million must notify the U.S. Environmental Protection Agency (U.S. EPA) per the requirements of 40 CFR Part 266, Subpart E, Section 266.44.

I. The flash point of waste oil shall be lower than or equal to 140°F.

J. The heat content of waste oil shall be higher than or equal to 150,000 BTU per gallon.

K. Waste/used oil may not be burned at this source if oil containing polychlorinated byphenyls (PCBs) has been added to the waste/used oil.

L. A representative sample shall be taken from each shipment of used oil received. That sample shall be analyzed by the permittee for flash point and the concentrations of arsenic, sulfur cadmium, chromium, lead and totally halogens and the analysis retained by the permittee for three years. The Department will accept, in lieu of an analysis on each shipment, an analysis of a representative sample of the batch of used oil from which the shipment was taken. This analysis must be certified by the distributor of the used oil as being correct and retained by the permittee for three years.

All other terms and conditions of the permit shall not be affected hereby.

Dated at Madison, Wisconsin this 12thday of October, 1987.

STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES
For the Secretary

By Donald F. Theiler
Donald F. Theiler, Director
Bureau of Air Management

cc: Air Enforcement Branch - EPA Region V
West Central District - Eau Claire Area Office

4936C

PART II
GENERAL PERMIT CONDITIONS

A. Scope

This permit is valid only for any structure, building, facility, equipment or operation specifically identified herein. All emissions authorized hereby shall be consistent with the terms and conditions of Parts I and II of this permit.

B. Prevention of Air Pollution

No person may cause, allow or permit the emissions of any air contaminant into the ambient air from a source subject to this permit which substantially contribute to the exceeding of an air standard or which cause air pollution.

C. Notification Requirements

Pursuant to sec. 144.394(3), Wis. Stats. and section NR 154.06(1) and (2)(f), Wis. Adm. Code, the Department shall be notified of the following events:

Event	Timing
Hazardous substance air spill	Immediate-call: (608)266-3232
Malfunction or event not reported in advance which causes or may cause any violation of an emission limitation.	Within 8 hours of onset
Noncompliance with any other condition specified in this permit	Written notification within 5 days identifying noncompliance, cause, duration, and steps taken to prevent reoccurrence.

D. Right of Entry

Pursuant to sec. 144.34, Wis. Stats., the permittee shall allow authorized representatives of the Department of Natural Resources to enter upon the permit's premises; to have access to and copy any records required to be kept under the terms and conditions of this permit; and to make any inspection necessary to ascertain compliance.

E. Malfunction Prevention and Abatement Plans

Pursuant to section NR 154.06(9), Wis. Adm. Code, the owner or operator of any direct or portable source which may emit hazardous substances or emits more than 15 pounds in any day or 3 pounds in any hour of carbon monoxide, particulate matter, hydrocarbons, sulfur oxides, nitrogen dioxide or photochemical oxidants shall prepare a written malfunction prevention and abatement plan to prevent, detect and correct malfunctions or equipment failures which may cause any emission limitation to be violated or which may cause air pollution. Any such plan shall be carried out by the owner or operator. The plan shall be updated as needed and is subject to Department review, approval and amendment.

F. Episode Plans

Pursuant to section NR 449.02, Wis. Adm. Code, if the source(s) covered by this permit emits 0.25 tons per day or more of carbon monoxide, particulate matter, hydrocarbons, sulfur oxides, nitrogen dioxide or photochemical oxidants, the permittee shall prepare an emission control action program consistent with good industrial practice and safe operating procedures, for reducing the emission of air contaminants into the outdoor atmosphere during periods of an air pollution alert, air pollution warning or air pollution emergency. The emission control action program shall be in writing, available on the premises for inspection and subject to review and approval by the Department on request.

G. Permit Alteration, Revocation, Suspension

After notice and opportunity for a hearing, as provided in sec. 144.395, Wis. Stats., this permit may be altered, suspended, or revoked in whole or in part for cause, including but not limited to, the following:

1. A significant or recurring violation of any term or condition of this permit;

2. Obtaining this permit by misrepresentation or failure to disclose fully all relevant facts;

3. A change in any applicable rule.

In addition to the above circumstances, failure to pay any required permit fees may result in permit revocation or suspension.

H. Civil Liability

Nothing in this permit shall be construed to relieve the permit holder from civil penalties under sec. 144.426, 144.99, Wis. Stats., for violation of the terms or conditions of this permit, or for violation of secs. 144.30 to 144.426, 144.176 and 144.96, Wis. Stats., or of any rule or any special order issued under those sections.

I. Other Laws

Nothing in this permit shall be construed to preclude the institution of any legal action or to relieve the permit holder from any responsibilities, liabilities, or penalties established pursuant to any other applicable Federal, State, or local law or regulation. The issuance of this permit does not convey any property rights in either real or personal property, nor does it authorize any injury to private property or any invasion of personal rights.

J. Records Retention

All records and information resulting from any monitoring activities required by this permit shall be retained by the permittee for a minimum of three years pursuant to section NR 154.06(3), Wis. Adm. Code, unless specified in writing by the Department.

K. Reporting

Reports required by Part I of this permit, if any, shall be signed by an authorized representative of the source.

L. Confidential Information

Except for information determined to be confidential under sec. 144.33, Wis. Stats., any information or reports received by the Department in the permit application process, or subsequently obtained, will be available for public inspection at the offices of the Department of Natural Resources.

M. Notification of Transfer

In the event of a transfer of control of operation or ownership of the source, the permittee, prior to such transfer, shall notify its successor by letter of need for a permit. A copy of this letter shall be forwarded to the Department.

N. Nonexempt Modification

"Modification" means any change in the physical size or method of operation of a stationary source which:

(1) increases the potential amount of emissions of an air contaminant;

(2) results in the emission of an air contaminant not previously emitted; or

(3) results in the violation of an ambient air increment.

Any modification of a source subject to this permit which is in violation of a term or condition of this permit is prohibited, and may not occur unless a modification of the permit is obtained. If the modification is not in violation of a term or condition of this permit and the

modification is an exempt modification under Section 144.391(4), Stats., or Section NR 154.04, Wis. Adm. Code, or is authorized by a permit, no additional permit is required for the modification. All other modifications require a permit prior to commencing the modification.

O. Reconstruction or Replacement

Unless the replacement is authorized by a permit or is exempt under Section NR 154.04, Wis. Adm. Code, replacement of the source(s) covered by this permit is prohibited. If the source(s) covered by this permit is a nonattainment major source or is subject to New Source Performance Standards, reconstruction may also be prohibited unless authorized by a permit.

P. Circumvention

Pursuant to section NR 154.06(8)(a), Wis. Adm. Code, the installation or use of any article, machine, equipment, process, or method, which conceals an emission which would otherwise constitute a violation of an applicable rule is prohibited unless written approval has been obtained from the Department. Such concealment includes, but is not limited to, the use of gaseous diluents to achieve compliance and the unnecessary separation of an operation into parts to avoid coverage by a rule that applies only to operations larger than a specified size.

Q. Operating Permit Review

Operating permits shall be reviewed at least once every 5 years and not more than once every 2 years, in accordance with sec. 144.397, Wis. Stats. The Department may use information received in public comments or at the public hearing as the basis to initiate proceedings under sec. 144.395, Wis. Stats., to alter, suspend or revoke the permit.

R. Forfeitures

In addition to other penalties or remedies, sec. 144.426, Wis. Stats., provides that any person who violates this permit shall forfeit not less than $10 nor more than $25,000 for each violation. Each day of continued violation is a separate offense.

S. Severability

The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

T. Pursuant to sec. NR 410.05, Wis. Adm. Code, any person who owns or operates an air contaminant source for which an air pollution control permit has been issued shall pay an annual fee for the implementation and enforcement of the permit conditions.

6962S

SUMMARY OF TEST DATA

SAMPLING TRAIN DATA		RUN 50-3	RUN 50-6	RUN 50-5
1. Sampling time, minutes		60	60	60
2. Sampling nozzle diameter, inches	Dn	0.241	0.207	0.207
3. Sampling nozzle area, sq.ft.	An	0.000317	0.000234	0.000234
4. Isokinetic variation, %	I	105.4	108.4	104.4
5. Sample gas volume, cubic feet	Vm	42.432	36.621	35.612
6. Avg.meter temperature, deg R	Tm	538.1	549.3	561.5
7. Avg.oriface pressure drop, in.H2O	dH	1.85	1.86	1.22
8. Total particulate collected, mg	Mn	20.00	15.50	5.20
VELOCITY TRAVERSE DATA				
9. Stack Area, sq.ft.	A	11.040	11.040	11.040
10. Abs.stack gas pressure, in.Hg.	Ps	30.19	29.17	30.02
11. Barometric pressure, in.Hg.	Pbar	30.22	29.20	30.05
12. Avg.stack temperature, deg R	Ts	731.29	740.92	762.54
13. Avg. sq.rt. velocity head		0.9538	0.9568	0.9714
14. Avg.stack gas velocity, ft./sec.	Vs	65.774	66.345	67.673
STACK MOISTURE CONTENT				
15. Total water collected, ml	Vic	327	161	182
16. Moisture in stack gas, %	Bws	26.72	18.05	20.32
EMISSIONS DATA				
17. Stack gas flow rate, dscf/hr.	Qsd	1395584	1501302	1488867
18. Particulate concentration, gr/dscf	Cs	0.0073	0.0069	0.0024
19. Particulate concentration, lb./hr.	E	1.46	1.48	0.51
FYRITE DATA				
20 Percent CO2 by volume	CO2	6.0	5.0	5.0
21. Percent O2 by volume	O2	12.8	14.2	14.2
22. Percent CO by volume	CO	0.0	0.0	0.0
23. Percent N2 by volume	N2	81.2	80.8	80.8

* DRY GAS VOLUME *

Vm(std) = Vm [T(std) / Tm] [(Pbar + (dH/13.6)) / P(std)]

= 17.64 x [degR / in.Hg.] x Y x Vm [(Pbar + (dH/13.6))/Tm]

Where:
Vm(std) = Dry Gas Volume through meter at standard conditions
Vm = Dry Gas Volume measured by meter
Pbar = Barometric pressure at oriface meter
Pstd = Standard absolute pressure
Tm = Absolute temperature at meter degR.
Tstd = Standard absolute temperature (528 degR).
dH = Average pressure drop across oriface meter
Y = Dry gas meter calibration factor.
13.6 = Inches water per inches Hg.

RUN 50-3

Vm(std)=17.64 x 1.00 x42.43 [(30.22 +(1.85 /13.6))/ 538] = 42.229 dscf

RUN 50-6

Vm(std)=17.64 x 1.00 x36.62 [(29.2 +(1.85 /13.6))/ 549] = 34.501 dscf

RUN 50-5

Vm(std)=17.64 x 1.00 x35.61 [(30.05 +(1.21 /13.6))/ 562] = 33.718 dscf

* TOTAL CONTAMINENTS by WEIGHT: GRAIN LOADING *

C's = [0.0154 gr/mg] [Mn/Vm(std)]

Where:
C's = Concentration of particulate matter in stack gas corrected to standard conditions
Mn = Total amount of particulate matter collected
Vm(std) = Dry gas volume through meter at standard conditions

RUN 50-3

C's = 0.0154 x [0.0200 x 1000] / 42.229 = 0.0073 gr/dscf

RUN 50-6

C's = 0.0154 x [0.0155 x 1000] / 34.501 = 0.0069 gr/dscf

RUN 50-5

C's = 0.0154 x [0.0052 x 1000] / 33.718 = 0.0024 gr/dscf

* DRY MOLECULAR WEIGHT *

$Md = 0.44\ (\%\ CO_2) + 0.32\ (\%\ O_2) + 0.28\ (\%\ CO + \%\ N_2)$

Where:

Md	=	Dry molecular weight
% CO2	=	Percent carbon dioxide by volume (dry basis).
% O2	=	Percent oxygen by volume (dry basis).
% N2	=	Percent nitrogen by volume (dry basis).
% CO	=	Percent carbon monoxide by volume (dry basis).
0.264	=	Ratio of O2 to N2 in air
0.28	=	Molecular wieght of N2 or CO
0.32	=	Molecular wieght of O2 divided by 100.
0.44	=	Molecular weight of CO2 divided by 100.

RUN 50-3

$Md = 0.44\ (\ 6.0\ ) + 0.32\ (\ 12.8\ ) + 0.28\ (\ 81.2\ ) =$ 29.472 lb/lb-mole

RUN 50-6

$Md = 0.44\ (\ 5.0\ ) + 0.32\ (\ 14.2\ ) + 0.28\ (\ 80.8\ ) =$ 29.368 lb/lb-mole

RUN 50-5

$Md = 0.44\ (\ 5.0\ ) + 0.32\ (\ 14.2\ ) + 0.28\ (\ 80.8\ ) =$ 29.368 lb/lb-mole

* WATER VAPOR CONDENSED *

$$V_{wc(std)} = (V_f - V_i) \left[P_w R T_{(std)} / M_w P_{(std)}\right] = 0.04707 (V_f - V_i)$$

$$V_{wsg(std)} = (W_f - W_i) \left[R T_{(std)} / M_w P_{(std)}\right] = 0.04715 (W_f - W_i)$$

Where:

0.04707	=	Conversion factor
0.04715	=	Conversion factor
$V_{wc(std)}$	=	Volume of water vapor condensed (standard conditions)
$V_{wsg(std)}$	=	Volume of water vapor collected in silica gel (standard conditions)
$V_f - V_i$	=	Final volume of impinger contents less initial volume
$W_f - W_i$	=	Final weight of silica gel less initial weight
P_w	=	Density of water
R	=	Ideal gas constant
M_w	=	Molecular weight of water vapor
$T_{(std)}$	=	Absolute temperature at standard conditions
$P_{(std)}$	=	Absolute pressure at standard conditions

RUN 50-3

$V_{wc(std)}$ = 0.04707 x 310 ml = 14.6 cu.ft.

$V_{wsg(std)}$ = 0.04715 x 17 gr = 0.8 cu.ft.

RUN 50-6

$V_{wc(std)}$ = 0.04707 x 151 ml = 7.1 cu.ft.

$V_{wsg(std)}$ = 0.04715 x 10 gr = 0.5 cu.ft.

RUN 50-5

$V_{wc(std)}$ = 0.04707 x 172 ml = 8.1 cu.ft.

$V_{wsg(std)}$ = 0.04715 x 10 gr = 0.5 cu.ft.

* MOISTURE CONTENT OF STACK GASES *

Bws = [Vwc(std) + Vwsg(std)] / [Vwc(std) + Vwsg(std) + Vm(std)] x 100

Where:
Bws = Proportion of water vapor
Vm = Dry gas volume measured by dry gas meter
Vwc(std) = Volume of water vapor condensed corrected to standard conditions
Vwsg(std) = Volume of water vapor collected in silica gel corrected to standard conditions

RUN 50-3

Bws = (14.6 + 0.8) / (14.6 + 0.8 + 42.229) x 100 = 26.72 %

RUN 50-6

Bws = (7.1 + 0.5) / (7.1 + 0.5 + 34.501) x 100 = 18.05 %

RUN 50-5

Bws = (8.1 + 0.5) / (8.1 + 0.5 + 33.718) x 100 = 20.32 %

* MOLECULAR WEIGHT of STACK GASES *

Ms = Md (1- Bws) + 18 (Bws)

Where:
Ms = Molecular weight of stack gas
Md = Molecular weight of stack gas
Bws = Proportion of water vapor

RUN 50-3

Ms = 29.28 (1 - 26.72 %) + 18 (26.72 %) = 26.27 lb/lb-mole

RUN 50-6

Ms = 29.28 (1 - 18.05 %) + 18 (18.05 %) = 27.24 lb/lb-mole

RUN 50-5

Ms = 29.28 (1 - 20.32 %) + 18 (20.32 %) = 26.99 lb/lb-mole

* STACK GAS VELOCITY *

Vs = Kp Cp [sq.rt.dP] x avg. [sq.rt.(Ts(avg.)/Ps Ms)]

Where :
Vs = Average velocity of gas stream in stack

Kp = 85.49 ft/sec [(g/g-mole) - (mm Hg) / (degK) (mm H2O)] 1/2
Cp = Pitot tube coefficient
dP = Velocity head of stack gas
Pbar = Barometric pressure at measurement site
Pg = Stack static pressure
Ps = Absolute stack gas pressure
Pstd = Standard absolute pressure
ts = stack temperature
Ts = Absolute stack temperature
Ms = Molecular weight of stack gas

RUN 50-3

Vs = 85.49 x 0.84 x 0.954 x Sq.Rt.[731 /(30.19 x26.27) = 65.774 ft/sec.
==========

RUN 50-6

Vs = 85.49 x 0.84 x 0.957 x Sq.Rt.[741 /(29.17 x27.24) = 66.345 ft/sec.
==========

RUN 50-5

Vs = 85.49 x 0.84 x 0.971 x Sq.Rt.[763 /(30.02 x26.99) = 67.673 ft/sec.
==========

* STACK GAS FLOW RATE *

Qstd = 3600 (1 - Bws) Vs A (Tstd / Ts) (Ps / Pstd)

Where :
Qstd = Dry volumetric stack gas flow rate corrected to std.conditions
A = Cross sectional area of stack
3600 = Conversion factor
ts = Stack temperature
Ts = Absolute stack temperature
Tstd = Standard absolute temperature
Pbar = Barometric pressure at measurement site
Pg = Stack static pressure
Ps = Absolute stack gas pressure
Pstd = Standard absolute pressure

RUN 50-3

Q (std) = 3600(1- 0.2672)(65.774)(11.04)(528/731)(30.19 /29.92)

Q (std) = 1,395,584 dscf/hr
==========

RUN 50-6

Q(std) = 3600(1- 0.1805)(66.345)(11.04)(528/740)(29.17 /29.92)

Q (std) = 1,501,302 dscf/hr
==========

RUN 50-5

Q(std) = 3600(1- 0.2032)(67.673)(11.04)(528/762)(30.02 /29.92)

Q (std) = 1,488,867 dscf/hr
==========

* EMISSIONS RATE FROM STACK *

E = [Cs Qstd] / 7000 gr./lb. = lb. / hr.

Where :
E = Emissions rate
Cs = Concentration of particulate matter corrected to std.conditions.
Qstd = Dry volumetric stack gas flow rate corrected to std.conditions.

RUN 50-3

E = [0.0073 x 1,395,584] / 7000 = 1.46 lb./hr.
==========

RUN 50-6

E = [0.0069 x 1,501,302] / 7000 = 1.48 lb./hr.
==========

RUN 50-5

E = [0.0024 x 1,488,867] / 7000 = 0.51 lb./hr.
==========

* ISOKINETIC VARIATION *

$$I = 100\ Ts\ [0.002669\ Vic + (Vm / Tm)\ (Pbar + dH / 13.6)] / 60\ e\ Vs\ Ps\ An$$

Where :

I	=	Percent isokinetic sampling.
100	=	Conversion to percent.
Ts	=	Absolute average stack gas temperature
0.002669	=	Conversion factor
Vic	=	Total volume of liquid collected in impingers and silica gel
Tm	=	Absolute average dry gas meter temperature
Pbar	=	Barometric pressure at sampling site
dH	=	Average pressure differential across the oriface meter
13.6	=	Specific gravity of mercury.
60	=	Conversion seconds to minutes.
e	=	Total sampling time
Vs	=	Stack gas velocity
Ps	=	Absolute stack gas pressure
An	=	Cross sectional area of nozzle

RUN 50-3

$$I = 100 \times \frac{731 \left[(0.002669 \times 327) + (42.432 / 538)\left[30.22 + (1.854 / 13.6)\right]\right]}{60 \times 60 \times 65.774 \times 30.19 \times 0.000317}$$

I = 105.4 %

RUN 50-6

$$I = 100 \times \frac{741 \left[(0.002669 \times 161) + (36.621 / 549)\left[29.2 + (1.858 / 13.6)\right]\right]}{60 \times 60 \times 66.345 \times 29.17 \times 0.000234}$$

I = 108.4 %

RUN 50-5

$$I = 100 \times \frac{763 \left[(0.002669 \times 182) + (35.612 / 562)\left[29.2 + (1.217 / 13.6)\right]\right]}{60 \times 60 \times 67.673 \times 30.02 \times 0.000234}$$

I = 104.4 %

MATHY CONSTRUCTION COMPANY - ENVIRONMENTAL
PLANT DATA

Plant Number - 50 Operator - [illegible]

Plant Location - 3 miles south of Eau Claire at intersection of [illegible]

Plant Manufacturer - BARBER GREENE

Plant Model - DM 65

Plant Type - CONTINUOUS MIX

Mix Type - COMMERCIAL Oil Type - 85/100

Time	Burner Fuel	Burner Setting	Aggregate TPH	Recycle TPH	Liquid Asphalt TPH	Mix Temp. °F	Pressure Drop In./H2O
7:30	DRAIN OIL	.85	232		12.6	295°	31
8:00	"	.85	234		12.7	295°	29
8:30	"	.85	235		12.7	300°	28
9:00	"	.85	240		12.9	300°	26
9:30	"	.85	235		12.7	300°	28
10:00	"	.9	240		13.1	280°	26
10:30	"	.9	237		12.8	295°	27
11:00	"	.9	240		13.0	290°	27
11:30	"	.9	244		13.0	280°	30
12:00	"	.9	240		12.7	290°	34
12:30	"	.9	242		12.9	290°	31
1:00	"	.9	239		12.6	290°	31
1:30	"	.9	238		12.7	285°	32
2:00	"	.9	234		12.6	290°	31
2:30	"	.9	233		12.5	290°	32
			237.5		12.77		
					250.3	TPH	

Plant # & Location	=	EAU CLAIRE ASPHALT PLANT #50		
Date of Test	=	5/30/90		
Process Tested	=	BAGHOUSE		
Number of Sampling Points	=	24		
Pitot Tube Coefficient	=	0.80		
Stack Area, sq.ft.	=	11.04		
		RUN 50-3	RUN 50-6	RUN 50-5
Dry Gas Meter Volume, cfd.	=	42.432	36.621	35.612
Barometric Pressure, in.Hg.	=	30.22	29.2	30.05
Stack Pressure, in.Hg.	=	30.19	29.17	30.02
Total Water Collected, ml.	=	327	161	182
% Carbon Dioxide	=	6.0	5.0	5.0
% Oxygen	=	12.8	14.2	14.2
% Carbon Monoxide	=	0.0	0.0	0.0
% Nitrogen	=	81.2	80.8	80.8
Total Particulate, gr.	=	0.0200	0.0155	0.0052
Total Sampling Time, min.	=	60	60	60
Nozzle Diameter, inches	=	0.241	0.207	0.207
Nozzle Area, sq.ft.	=	0.000317	0.000234	0.000234

RUN 50-3

Ts =	731.29	dH =	1.854167	Impinger Water =	310
Tm =	538.06	SR dP =	0.953844	Silica Gel =	17

RUN 50-3 Point #	Stack Temp.	Velocity Pressure	Orifice Pressure	Meter Temperature Inlet	Meter Temperature Outlet	Sq.Root Velocity Pressure
1	215	0.67	1.4	57	55	0.81854
2	240	0.74	1.5	62	56	0.86023
3	266	0.82	1.7	65	57	0.90554
4	274	0.94	1.9	68	59	0.96954
5	276	1	2	70	60	1.00000
6	277	1.1	2.2	71	63	1.04881
7	276	1.1	2.2	73	65	1.04881
8	276	1.1	2.2	75	66	1.04881
9	278	1	2	77	69	1.00000
10	278	0.9	1.9	79	70	0.94868
11	279	0.85	1.7	81	72	0.92195
12	278	0.8	1.6	84	74	0.89443
13	226	0.75	1.5	85	79	0.86603
14	259	0.9	1.9	90	80	0.94868
15	278	1	2	91	81	1.00000
16	282	1.1	2.2	91	82	1.04881
17	283	1.1	2.2	92	84	1.04881
18	283	1.1	2.2	92	84	1.04881
19	284	0.95	1.9	93	85	0.97468
20	284	0.9	1.9	94	85	0.94868
21	286	0.85	1.7	94	87	0.92195
22	285	0.8	1.6	96	87	0.89443
23	276	0.77	1.6	96	87	0.87750
24	272	0.72	1.5	96	88	0.84853

RUN 50-6

Ts = 740.92 dH = 1.858333 Impinger Water = 151 ml
Tm = 549.29 SR dP = 0.956755 Silica Gel = 10 gr

RUN 50-6 Point #	Stack Temp.	Velocity Pressure	Orifice Pressure	Meter Temperature Inlet	Meter Temperature Outlet	Sq.Root Velocity Pressure
1	225	0.65	1.3	73	73	0.80623
2	261	0.73	1.5	78	74	0.85440
3	281	0.8	1.6	80	75	0.89443
4	288	0.9	1.9	82	76	0.94868
5	289	0.95	1.9	83	77	0.97468
6	288	1	2	84	78	1.00000
7	289	1.1	2.2	86	80	1.04881
8	289	1.1	2.2	87	81	1.04881
9	287	1.1	2.2	89	83	1.04881
10	289	0.98	2	91	84	0.98995
11	286	0.95	1.9	93	86	0.97468
12	285	0.85	1.7	94	87	0.92195
13	249	0.82	1.7	94	90	0.90554
14	256	0.85	1.7	97	90	0.92195
15	281	1.1	2.2	99	91	1.04881
16	285	1.1	2.2	98	91	1.04881
17	286	1.1	2.2	98	92	1.04881
18	287	1.1	2.2	98	92	1.04881
19	288	0.95	1.9	99	93	0.97468
20	290	0.88	1.8	101	94	0.93808
21	290	0.78	1.6	102	95	0.88318
22	291	0.8	1.6	103	95	0.89443
23	291	0.78	1.6	104	96	0.88318
24	291	0.73	1.5	104	96	0.85440

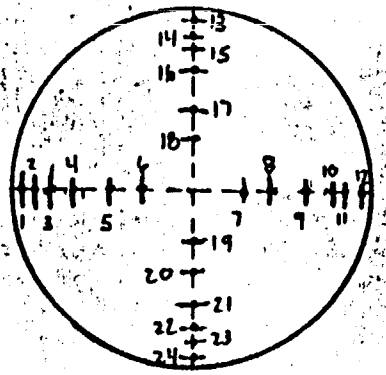
RUN 50-5

Ts = 762.54 dH = 1.217500 Impinger Water = 172 ml
Tm = 561.52 SR dP = 0.971388 Silica Gel = 10 gr

RUN 50-5 Point #	Stack Temp.	Velocity Pressure	Orifice Pressure	Meter Temperature Inlet	Meter Temperature Outlet	Sq.Root Velocity Pressure
1	274	0.65	0.87	85	83	0.80623
2	287	0.75	0.99	89	84	0.86603
3	301	0.87	1.1	92	85	0.93274
4	302	0.95	1.2	95	86	0.97468
5	306	1	1.3	96	90	1.00000
6	303	1.1	1.4	98	90	1.04881
7	304	1.1	1.4	97	91	1.04881
8	306	1.1	1.4	101	92	1.04881
9	308	0.98	1.3	102	93	0.98995
10	306	0.95	1.2	105	95	0.97468
11	306	0.85	1.1	106	96	0.92195
12	307	0.78	1	106	97	0.88318
13	269	0.64	0.86	104	100	0.80000
14	272	0.87	1.1	108	100	0.93274
15	302	1	1.3	111	101	1.00000
16	308	1.1	1.4	112	103	1.04881
17	308	1.1	1.4	113	104	1.04881
18	308	1.1	1.4	114	105	1.04881
19	307	1.1	1.4	115	105	1.04881
20	311	1.1	1.4	116	106	1.04881
21	316	1	1.3	116	107	1.00000
22	320	0.92	1.2	117	108	0.95917
23	316	0.89	1.1	118	109	0.94340
24	314	0.88	1.1	118	109	0.93808

MATHY CONSTRUCTION COMPANY - ENVIRONMENTAL

Plant ALL D BLACKTOP #50
Location EAU CLAIRE, WI
Date 5/20/90
Operator TIM HUEBNER
Ambient Temp. 52°
Run No. 50-3 P, L
Sample Box No. 1
Meter Box No. 1
Meter ΔH@ 2.04
C & Y Factors: C= .99 Y= 1.0
Pitot Tube Coeff. .84
Probe Heater Setting 7
Static Pressure, in.Hg. - .03
Filter No. 50-3



Stack Cross Section
D= 45" Area= 11.04 SFt.

Barometric Press. 30.27
Assumed Moisture, % 29
Probe Length, ft 4'
Nozzle I.D./Area 2123 / .000317 SFt
Avg. Calibrated Nozzle Dia., (in.) .241
Leak Rate, cfm @ 15" Hg. .004 @ .003 @ 14"
Probe Liner Material STAINLESS STEEL

	Final		Initial		Diff.
Impinger 1 Vol.:	318	-	100 H2O2	=	218
Impinger 2 Vol.:	183	-	100 H2O2	=	83
Impinger 3 Vol.:	9	-	0	=	9
Silica Gel Wt.:	217	-	200	=	17
			Total Volume	=	327

Point No.	Sample Time (min.)	Stack Temp. (oF) 1	Velocity Head (in.H2O) (Stack)	Press.Dif Orf.Meter (in.H2O) (Meter)	Filter Holder Temp. 3	Gas Temp. @ Last Impinger 4	Gas Sample Temp. @ Dry Gas Meter Inlet 5	Gas Sample Temp. @ Dry Gas Meter Outlet 6	Vacuum (in.Hg.)	Gas Volume (cft)
										42.432 ✓
1	7:26	215	.67	1.4	241	27	57	55	8	275.032 / 76.5
2	2.5 MIN	240	.74	1.5	245	25	62	56	8	78.1
3		266	.82	1.7	244	25	65	57	9	79.8
4		274	.94	1.9	248	27	68	59	11	81.5
5		276	1.0	2.0	248	29	70	60	13	83.3
6		277	1.1	2.2	246	30	71	63	14	85.2
7		276	1.1	2.2	246	31	73	65	14	87.1
8		276	1.1	2.2	250	32	75	66	14	89.1
9		278	1.0	2.0	256	33	77	69	13	90.9
10		278	.90	1.9	260	34	79	70	12	92.7
11		279	.85	1.7	263	33	81	72	11	94.4
12	7:56	278	.80	1.6	265	34	84	74	10	96.1

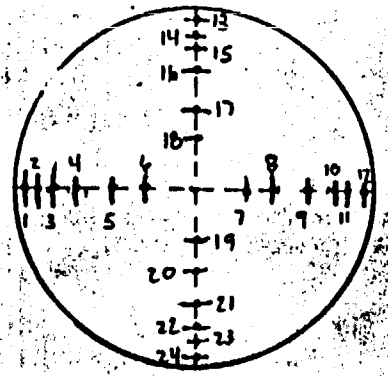
MATHY CONSTRUCTION COMPANY - ENVIRONMENTAL

Run No. 50-3 (cont'd.)

Point No.	Sample Time (min.)	Stack Temp. (oF) 1	Velocity Head (in.H2O) (Stack)	Press.Dif Orf.Meter (in.H2O) (Meter)	Filter Holder Temp. 3	Gas Temp. @ Last Impinger 4	Gas Sample Temp. @ Dry Gas Meter		Vacuum (in.Hg.)	Gas Volume (cft)
							Inlet 5	Outlet 6		
13	8:05	226	.75	1.5	268	29	85	79	9	97.7
14		259	.90	1.9	259	27	90	80	10	99.5
15		278	1.0	2.0	259	28	91	81	11	301.3
16		282	1.1	2.2	252	30	91	82	13	3.2
17		283	1.1	2.2	254	32	92	84	13	5.1
18		283	1.1	2.2	257	34	92	84	13	7.0
19		284	.95	1.9	252	37	93	85	11	8.9
20		284	.90	1.9	254	39	94	85	11	10.7
21		286	.85	1.7	252	40	94	87	10	12.5
22		285	.80	1.6	253	42	96	87	10	14.2
23		276	.77	1.6	252	47	96	87	10	15.9
24	8:35	272	.72	1.5	251	54	96	88	10	317.514

MATHY CONSTRUCTION COMPANY - ENVIRONMENTAL

Plant ALL D BLACKTOP #50
Location EAU CLAIRE, WI
Date 5/20/90
Operator TIM HUEBNER
Ambient Temp. 75°
Run No. 50-5 P ONLY
Sample Box No. 3
Meter Box No. 1
Meter ΔH@ 2.04
C & Y Factors: C= .99 Y= 1.0
Pitot Tube Coeff. " .84
Probe Heater Setting 7
Static Pressure, in.Hg. -.03
Filter No. 50-5



Stack Cross Section
D= 45" Area= 11.04 SFt.

Barometric Press. 30.05
Assumed Moisture, % 18
Probe Length, ft 4
Nozzle I.D./Area .2297 / .000234 SFt
Avg. Calibrated Nozzle Dia., (in.) .207
Leak Rate, cfm @ 15" Hg. .01 / .002 @ 6"
Probe Liner Material STAINLESS STEEL

	Final	Initial	Diff.
Impinger 1 Vol.:	252	- 100 H_2O	= 152
Impinger 2 Vol.:	120	- 100 H_2O	= 20
Impinger 3 Vol.:	0	- 0	= 0
Silica Gel Wt.:	210	- 200	= 10
		Total Volume	= 182

Point No.	Sample Time (min.)	Stack Temp. (oF) 1	Velocity Head (in.H2O) (Stack)	Press.Dif Orf.Meter (in.H2O) (Meter)	Filter Holder Temp. 3	Gas Temp. @ Last Impinger 4	Gas Sample Temp. @ Dry Gas Meter Inlet 5	Gas Sample Temp. @ Dry Gas Meter Outlet 6	Vacuum (in.Hg.)	Gas Volume (cft)
										35.612
1	12:00	274	.65	.87	212	46	85	83	4	376.200 / 77.5
2	2.5MIN	287	.75	.99	221	45	89	84	4	78.8
3		301	.87	1.1	227	44	92	85	5	80.2
4		302	.95	1.2	222	40	95	86	5	81.6
5		306	1.0	1.3	236	41	96	90	6	83.2
6		303	1.1	1.4	238	40	98	90	6	84.8
7		304	1.1	1.4	239	40	97	91	6	86.3
8		306	1.1	1.4	249	41	101	92	6	87.9
9		308	.98	1.3	251	43	102	93	6	89.4
10		306	.95	1.2	259	43	105	95	6	90.9
11		306	.85	1.1	258	44	106	96	6	92.4
12	12:30	307	.78	1.0	257	42	106	97	5	93.8

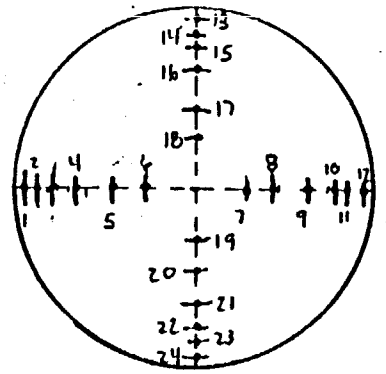
MATHY CONSTRUCTION COMPANY - ENVIRONMENTAL

Run No. 56-5 (cont'd.)

Point No.	Sample Time (min.)	Stack Temp. (oF) 1	Velocity Head (in.H2O) (Stack)	Press.Dif Orf.Meter (in.H2O) (Meter)	Filter Holder Temp. 3	Gas Temp. @ Last Impinger 4	Gas Sample Temp. @ Dry Gas Meter Inlet 5	Gas Sample Temp. @ Dry Gas Meter Outlet 6	Vacuum (in.Hg.)	Gas Volume (cft)
13	12:33	269	.64	.86	263	48	104	100	4	95.1
14		272	.87	1.1	261	48	108	100	5	96.4
15		302	1.0	1.3	261	46	111	101	6	98.0
16		308	1.1	1.4	260	43	112	102	6	99.5
17		308	1.1	1.4	261	42	113	104	6	101.1
18		308	1.1	1.4	260	42	114	105	6	2.7
19		307	1.1	1.4	255	42	115	105	6	4.3
20		311	1.1	1.4	259	43	116	106	6	5.9
21		316	1.0	1.3	257	44	116	107	6	7.4
22		320	.92	1.2	254	44	117	108	5	8.9
23		316	.89	1.1	255	44	118	109	5	10.4
24	1:03	314	.88	1.1	257	46	118	109	5	111.8

MATHY CONSTRUCTION COMPANY - ENVIRONMENTAL

Plant ALLIED BLACKTOP #50
Location EAU CLAIRE, WI
Date 5/30/90
Operator TIM HUEBNER
Ambient Temp. 80°
Run No. 50-6 PONCE
Sample Box No. 2
Meter Box No. 1
Meter ΔH@ 2.04
C & Y Factors: C= .99 Y= 1.0
Pitot Tube Coeff. .84
Probe Heater Setting 7
Static Pressure, in.Hg. -.03
Filter No. 50-6



Stack Cross Section
D= 45" Area= 11.04 SFt.

Barometric Press. 29.[illegible]
Assumed Moisture,% 19
Probe Length,ft 4'
Nozzle I.D./Area .2997 / .000244 SFt
Avg.Calibrated Nozzle Dia., (in.) .301
Leak Rate,cfm @ 15" Hg. .008 / .00[illegible]
Probe Liner Material Stain[illegible]

	Final	Initial	Diff.
Impinger 1 Vol.:	211	[illegible]	111
Impinger 2 Vol.:	132	[illegible]	32
Impinger 3 Vol.:	8	0	8
Silica Gel Wt.:	227	[illegible]	10
		Total Volume =	161

Point No.	Sample Time (min.)	Stack Temp. (oF) 1	Velocity Head (in.H20) (Stack)	Press.Dif Orf.Meter (in.H20) (Meter)	Filter Holder Temp. 3	Gas Temp. @ Last Impinger 4	Gas Sample Temp. @ Dry Gas Meter Inlet 5	Gas Sample Temp. @ Dry Gas Meter Outlet 6	Vacuum (in.Hg.)	Gas Volume (cft)
										36.621
1	1:35	220	.75	.99	199	59	96	97	4	413.157 11.5
2	2.5 min	276	.85	1.1	215	51	102	97	4	15.7
3		293	.95	1.2	220	48	104	98	5	17.4
4		295	1.0	1.3	221	46	105	98	6	18.7
5		295	1.2	1.5	222	46	107	99	6	20.6
6		298	1.1	1.4	229	48	109	100	7	22.2
7		298	1.1	1.4	235	48	109	102	7	23.8
8		300	1.1	1.4	244	49	109	103	7	25.5
9		301	.95	1.2	248	48	109	104	7	27.1
10		301	.92	1.2	252	50	109	105	7	28.7
11		300	.85	1.1	254	51	110	105	6	30.1
12	2:05	301	.78	1.0	256	53	110	105	5	31.5

MATHY CONSTRUCTION COMPANY - ENVIRONMENTAL

Run No. SO-6 (cont'd.)

Point No.	Sample Time (min.)	Stack Temp. (oF) 1	Velocity Head (in.H2O) (Stack)	Press.Dif Orf.Meter (in.H2O) (Meter)	Filter Holder Temp. 3	Gas Temp. @ Last Impinger 4	Gas Sample Temp. @ Dry Gas Meter Inlet 5	Gas Sample Temp. @ Dry Gas Meter Outlet 6	Vacuum (in.Hg.)	Gas Volume (cft)
13	2:10	262	.65	.87	271	54	106	105	4	[illegible]
14		287	.90	1.1	273	54	107	106	5	[illegible]
15		300	.85	1.1	275	55	108	107	5	[illegible]
16		300	.90	1.1	280	55	111	107	6	[illegible]
17		286	1.1	1.4	268	56	113	108	7	[illegible]
18		295	1.1	1.4	263	56	114	107	7	40.6
19		300	1.2	1.5	269	57	114	108	7	[illegible]
20		290	1.1	1.4	256	57	115	108	7	43.9
21		298	.95	1.2	259	57	114	108	6	[illegible]
22		299	.85	1.1	263	58	115	108	5	46.9
23		299	.80	1.0	259	59	116	108	5	[illegible]
24	2:40	284	.73	.97	256	61	116	109	4	49.728

MATHY CONSTRUCTION COMPANY - ENVIRONMENTAL
FYRITE ANALYSIS, ABSOLUTE PRESSURE, & PERCENT MOISTURE

Fyrite Analysis :
Burner Fuel Type - Oil F Factor * - 1.3465
* Oil=1.3465, Propane=1.5095, Gas=1.7489, Butane=1.4791

Run # S-3 :
CO2 = 6.0 % (from Fyrite)
O2 = 20.9 - (F x CO2%) = 20.9 - (1.3465 % x 6.7 %) = 12.8 %
N2 = 100% - CO2% - O2% = 100% - 6.0 % - 12.8 % = 81.2 %

Run # S-6 :
CO2 = 5.0 % (from Fyrite)
O2 = 20.9 - (F x CO2%) = 20.9 - (1.3465 % x 5.0 %) = 14.2 %
N2 = 100% - CO2% - O2% = 100% - 5.0 % - 14.2 % = 80.8 %

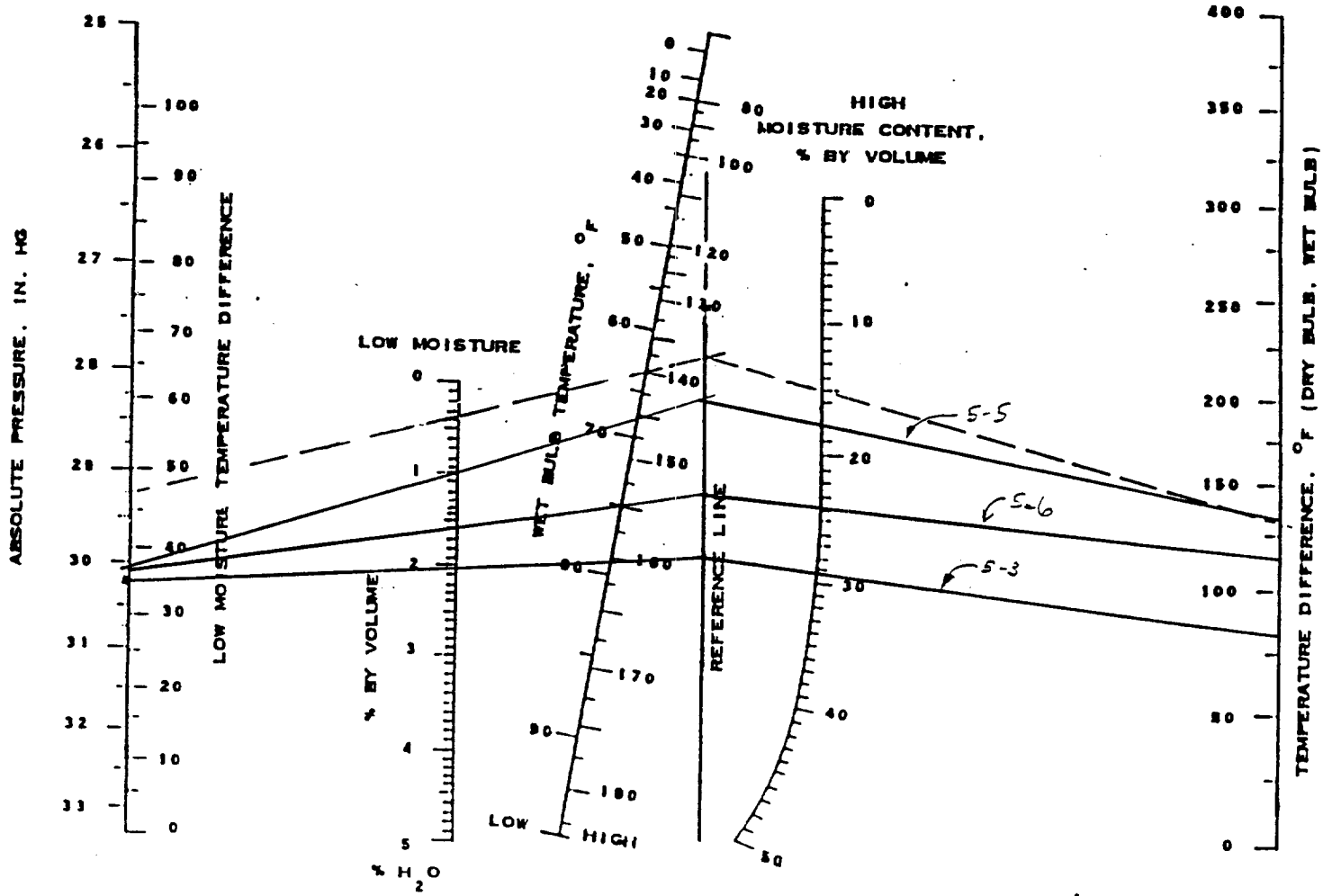
Run # S-5 :
CO2 = 5.0 % (from Fyrite)
O2 = 20.9 - (F x CO2%) = 20.9 - (1.3465 % x 5.0 %) = 14.2 %
N2 = 100% - CO2% - O2% = 100% - 5.0 % - 14.2 % = 80.8 %

==========

Absolute Pressure :
P abs = P atm 30.22 in.Hg. + (Ps = -.40 in.H2O/13.6) = 30.19 in.Hg.

==========

Percent Moisture :	Run # S-3	Run # S-6	Run # S-5
Dry Bulb Temp.deg.F =	240	270	280
Wet Bulb Temp.deg.F =	161	155	145
Difference =	79	115	135
% Moisture (graph) =	29	24	18



Visible Emission Observation Form

SOURCE NAME: PLANT #50

ADDRESS: EAU CLAIRE ASPHALT

CITY: EAU CLAIRE | STATE: WI | ZIP:

PHONE: | SOURCE ID NUMBER: 618006750

PROCESS EQUIPMENT: HOT MIX STANDARD HAVENS PLANT | OPERATING MODE: 280 TPH

CONTROL EQUIPMENT: STANDARD HAVENS BAGHOUSE | OPERATING MODE: 99 %

DESCRIBE EMISSION POINT
START BAGHOUSE STACK STOP BAGHOUSE STACK

HEIGHT ABOVE GROUND LEVEL: START 30' STOP 30' | HEIGHT RELATIVE TO OBSERVER: START 35' STOP 35'

DISTANCE FROM OBSERVER: START 200' STOP 200' | DIRECTION FROM OBSERVER: START N.W. STOP N.W.

DESCRIBE EMISSIONS
START BAGHOUSE EXHAUST STOP BAGHOUSE EXHAUST

EMISSION COLOR: START CLEAR STOP CLEAR | PLUME TYPE: CONTINUOUS ☑ FUGITIVE ☐ INTERMITTENT ☐

WATER DROPLETS PRESENT: NO ☑ YES ☐ | IF WATER DROPLET PLUME: ATTACHED ☐ DETACHED ☐

POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED
START 8' ABOVE STACK STOP 8' ABOVE STACK

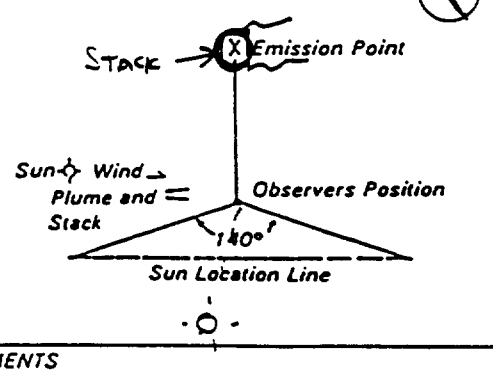
DESCRIBE BACKGROUND
START SKY STOP SKY

BACKGROUND COLOR: START BLUE STOP BLUE | SKY CONDITIONS: START CLEAR STOP CLEAR

WIND SPEED: START LIGHT STOP LIGHT | WIND DIRECTION: START WEST STOP WEST

AMBIENT TEMP.: START 80° STOP 80° | WET BULB TEMP.: - | RH.percent: -

Source Layout Sketch — Draw North Arrow



OBSERVATION DATE: 5/30/90 | START TIME: 3:10 P.M. | STOP TIME: 3:30 P.M.

SEC / MIN	0	15	30	45	MIN / SEC	0	15	30	45
1	0	0	0	0	31				
2	0	0	0	5	32				
3	0	0	0	0	33				
4	0	0	0	0	34				
5	0	0	5	0	35				
6	0	0	0	0	36				
7	0	0	0	0	37				
8	5	0	0	0	38				
9	0	0	0	0	39				
10	0	0	0	0	40				
11	0	0	0	0	41				
12	0	5	0	0	42				
13	0	0	0	0	43				
14	0	0	0	0	44				
15	0	0	0	5	45				
16	0	0	0	0	46				
17	0	0	0	0	47				
18	0	5	0	0	48				
19	0	0	0	0	49				
20	0	0	0	0	50				
21					51				
22					52				
23					53				
24					54				
25					55				
26					56				
27					57				
28					58				
29					59				
30					60				

AVERAGE OPACITY FOR HIGHEST PERIOD 0.4 % | NUMBER OF READINGS ABOVE 20 % WERE 0

RANGE OF OPACITY READINGS 0 % MINIMUM 5 % MAXIMUM

OBSERVER'S NAME (PRINT) JAMES TRYBA

COMMENTS

OBSERVER'S SIGNATURE [signature] | DATE 5/30/90

ORGANIZATION AMERICAN ASPHALT OF WI

I HAVE RECEIVED A COPY OF THESE OPACITY OBSERVATIONS
SIGNATURE | TITLE | DATE

CERTIFIED BY JOE PEREZ | DATE 4/17/90

VERIFIED BY | DATE

Plant # 50

Date:5/30/90
Time:3:10 p.m.

Results:
Average Opacity ---> 0.4%
for Highest Period
(Max.Allowed is 20% for this Plant)

Minimum Reading - 0 %

Maximum Reading - 5 %

	0	15	30	45	6 Minute Average
1	0	0	0	0	
2	0	0	0	5	
3	0	0	0	0	
4	0	0	0	0	
5	0	0	5	0	
6	0	0	0	0	0.4%
7	0	0	0	0	0.4%
8	5	0	0	0	0.4%
9	0	0	0	0	0.4%
10	0	0	0	0	0.4%
11	0	0	0	0	0.2%
12	0	5	0	0	0.4%
13	0	0	0	0	0.4%
[illegible]	0	0	0	0	0.2%
[illegible]	0	0	0	5	0.4%
16	0	0	0	0	0.4%
17	0	0	0	0	0.4%
18	0	5	0	0	0.4%
19	0	0	0	0	0.4%
20	0	0	0	0	0.4%

MATHY CONSTRUCTION COMPANY - ENVIRONMENTAL
PARTICULATE LAB ANALYSIS - NSPS SOURCES

Plant Location 50 - EAU CLAIRE Rel.Humidity in Lab 50 %

Sample Location ASPHALT PLANT Density of Acetone **(Pa)** .7854 g/ml

Blank Volume **(Va)** 100 ml

Date/Time Wt.Blank 6/6 7:50 A.M. Gross Wt. 106.0434 g

Date/Time Wt.Blank 6/7 8:10 A.M Gross Wt. 106.0433 g

Average Gross Wt. 106.0434 g

Tare Wt. 106.0358 g

Weight of Blank **(Mab)** .0076 g

Acetone Blank Residue Concentration **(Ca)** Ca = Mab / Va x Pa = .0000967 mg/g

Weight of Residue in Acetone Wash **(Wa)** Wa = Ca x Va x Pa = .0076 g

	Run #50-3	Run #50-5	Run #50-6
Acetone Rinse Volume **(Va)** ml	96	78	52
Date/Time of Wt 6/6 8:00 A.M. Gross Wt g	102.6163	100.9874	107.0860
Date/Time of Wt 6/7 8:15 A.M. Gross Wt g	102.6164	100.9871	107.0861
Average Gross Wt g	102.6164	100.9873	107.0860
Tare Wt g	102.5902	100.9639	107.0776
Less Acetone Blank Wt **(Wa)** g	0.0073	0.0059	0.0040
Wt of Particulate in Acetone Rinse (Ma) g	0.0189	0.0125 ✓	0.0044
Filter Numbers #	50-3 ✓	50-5	50-6
Date/Time of Wt 6/4 7:50 A.M. Gross Wt g	.4286	.4295	.4226
Date/Time of Wt 6/5 8:25 A.M. Gross Wt g	.4282	.4296	.4231
Average Gross Wt g	.4284	.4296	.4229
Tare Wt g	.4273	.4266	.4221
Wt of Particulate on Filter (Mf) g	.0011	.0030	.0008
Wt of Particulate in Acetone Rinse (Ma) g	.0189	.0125	.0044
Total Weight of Particulate (Mn) g	.0200 ✓	.0155 ✓	.0052 .0053

Note: In no case should a blank residue greater than 0.01 mg/g be subtracted from the sample weight.

Form No. 115-153

MEMORANDUM

TO

DATE 4-26-90

LOCATION Ft. Rock

Test meter for Mathy Const-Co.
Onalaska, Wis

meter no - 1037068
Rockwell R 275
100% Open test 100.0 % Accuracy
20% Check test 100.5 " "

(SIGNED)

LAST FIRST OTHER

NAME Mathy Construction Co.
SERVICE ADDRESS
MAILING ADDRESS 915 Commercial Ln.
CITY Onalaska STATE WI ZIP
DATE 4.26.91 /M CUSTOMER ACCOUNT NO.
CUSTOMER PHONE NO. CODE

Job Ticket 08144
CUSTOMER COPY

DISP	ARR	LEFT	DATE

INSTRUCTIONS: test mtr

RESULTS: tested mtr

BY

BY

LEAK REPORT NO.
APPLIANCE INSPECTION
W.C. W.C.
PO. VEND.

MAT'L	EA	AMOUNT	DATE	EMP	W.O. NO. LOC.	W.O. NO. PRIM	YR. SUB	ACCOUNT LTR	ACCOUNT Veh/Proj	EST. NO. Cost Ele	RATE R	RATE OT	RATE CO	AMOUNT	Truck No.	HR./Mi.	AMOUNT
Ells			4-26	006H	010	817	823				1/2						
St. Ells																	
Tees																	
Coup.																	
Bush.																	
Nipples																	
Unions																	
Pipe																	

CONTRIBUTION / ADVANCE (b) Total Labor (c) Total Vehicle

REFERENCE WORK ORDER DATA

Ref. W.O. No.	Year	Account No.	Est. No.

BILLING DATA

W.O. NO. LOC.	W.O. NO. PRIM	YR. SUB	ACCOUNT LTR	ACCOUNT Veh/Proj	EST. NO. Cost Ele	AMOUNT

BILL D.N.B. AUTHORIZED CREDIT (a + b + c) TOTAL REVENUE

Form 159-8002 Rev. 8/86

WISCONSIN PUBLIC SERVICE CORPORATION

NOZZLE SN = 2296

INSIDE DIAMETER = .264 DATE CALIBRATED = 4/30/90

Table 1. Orifice Calibration Data Sheet

Meter Box No.								
Δm in. H_2O	V_1 cf	V_2 cf	θ min	T_1 °F	T_2 °F	$V_2 - V_1$ cf	Q_m cfm	K_m
0.5	92.40	92.78	1	71	63	.38	0.377	0.689
1.0	93.10	93.64	1	72	64	.54	0.536	0.672
2.0	94.30	95.04	1	74	64	.74	0.733	0.669
6.0	95.60	96.83	1	75	66	1.23	1.220	0.642

Calculations

1. Calculate Q_m as follows:

$$Q_m = \frac{V_2 - V_1}{\theta} \left[\frac{t_2 + 460}{\frac{t_1 + t_2}{2} + 460} \right]$$

2. Calculate K_m for each Δm as follows:

$$K_m = Q_m \sqrt{\frac{P_m M_m}{T_m \Delta m}}$$

$P_m = P_{atm} = 30.11$

$M_m = M_{(air)} = 29$

$T_m = t_2 + 460$

3. Calculate the average K_m as follows:

$$\overline{K_m} = \frac{\Sigma K_m}{4}$$

$K_m = 0.673$

4. Calculate $\Delta H_@$

$$\Delta H_@ = \frac{0.9244}{K_m^2} = \frac{0.9244}{0.673^2} = 2.04$$

MATHY CONSTRUCTION COMPANY - ENVIRONMENTAL
THERMOCOUPLE CALIBRATION

Date 4/30/90 Thermocouple Location IMPINGER

Ambient Temperature 70° Barometric Pressure 29.68

Calibrator James Truca Reference: Mercury-in-glass X

Other

Reference Point Number (a)	Source (specify) (b)	Reference Thermometer Temperature	Thermocouple Potentiometer Temperature	Temperature Difference (c)
A	Ice Water	32° F	32° F	0 %
B	Boiling Water	211° F	210 °F	0.5 %
C	Ambient	70° F	70° F	0 %

(a) Every 30° C (50° F) for each reference point.

(b) Type of calibration system used.

(c) $\left[\frac{\text{(Reference Temperature - Thermocouple Temperature)}}{\text{Reference Temperature}}\right] \times 100$ < 1.5 % =

MATHY CONSTRUCTION COMPANY - ENVIRONMENTAL
THERMOCOUPLE CALIBRATION

Date 4/30/90 Thermocouple Location PROBE

Ambient Temperature 70° Barometric Pressure 29.68

Calibrator JAMES TRYEA Reference: Mercury-in-glass X

Other _____

Reference Point Number (a)	Source (specify) (b)	Reference Thermometer Temperature	Thermocouple Potentiometer Temperature	Temperature Difference (c)
A	ICE WATER	32° F	32° F	0 %
B	BOILING WATER	211° F	210° F	0.5 %
C	AMBIENT	70° F	70° F	0 %

(a) Every 30° C (50° F) for each reference point.

(b) Type of calibration system used.

(c) $\left[\frac{\text{(Reference Temperature - Thermocouple Temperature)}}{\text{Reference Temperature}}\right] \times 100$ **< 1.5 %** =

MATHY CONSTRUCTION COMPANY - ENVIRONMENTAL
THERMOCOUPLE CALIBRATION

Date 4/30/90 Thermocouple Location H/C-20V 1, 2, 3

Ambient Temperature 70°F Barometric Pressure 29.62

Calibrator James Trulla Reference: Mercury-in-glass X

Other

Reference Point Number (a)	Source (specify) (b)	Reference Thermometer Temperature	Thermocouple Potentiometer Temperature	Temperature Difference (c)
A	Ice Water	32°F	1 - 32°F 2 - 32°F 3 - 32°F	1 - 0% 2 - 0% 3 - 0%
B	Boiling Water	211°F	1 - 212°F 2 - 211°F 3 - 212°F	1 - 0.5% 2 - 0% 3 - 0.5%
C	Ambient	70°F	1 - 70°F 2 - 70°F 3 - 69°F	1 - 0% 2 - 0% 3 - 1.4%

(a) Every 30° C (50° F) for each reference point.

(b) Type of calibration system used.

(c) $\left[\frac{\text{(Reference Temperature - Thermocouple Temperature)}}{\text{Reference Temperature}}\right] \times 100$ < 1.5 % =

MATHY CONSTRUCTION COMPANY - ENVIRONMENTAL
THERMOCOUPLE CALIBRATION

Date 4/20/90 Thermocouple Location GAS METER INLET OUTLET

Ambient Temperature 72° Barometric Pressure 29.63

Calibrator JAMES TREA Reference: Mercury-in-glass X

Other

Reference Point Number (a)	Source (specify) (b)	Reference Thermometer Temperature	Thermocouple Potentiometer Temperature	Temperature Difference (c)
A	AMBIENT	72°F	INLET - 72°F OUTLET - 72°F	INLET - 0% OUTLET - 1.4%

(a) Every 30° C (50° F) for each reference point.

(b) Type of calibration system used.

(c) $\left[\frac{\text{(Reference Temperature - Thermocouple Temperature)}}{\text{Reference Temperature}}\right] \times 100$ < 1.5 % =