

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

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

| | |
|---------------------------|--|
| AP42 Section: | 9.10.1.2 |
| Background Chapter | 4 |
| Reference: | 13 |
| Title: | Emission Measurement Test Report of C.E. Boilers, Union Boilers, and Pulp Dryers--Permit Compliance for SO ₂ , Particulate, and PM-10 with Back-Half Emissions--Holly Sugar Corporation, Montana Division, The Emission Measurement Group, Inc., Englewood, CO, November 16, 1993. |

APPENDIX M

REPORT EXCERPTS FROM REFERENCE 13

(Holly Sugar Corporation, November 16, 1993)

EMISSION MEASUREMENT TEST REPORT

of

C.E. Boilers, Union Boilers & Pulp Dryers
Permit Compliance

for

SO₂, Particulate and PM10 with back-half Emission(s)

C.E. Boilers, Union Boilers, Pulp Dryers
Sidney, Montana Plant, Sidney, MT
Test Date: October 19-23, 1993

Prepared for:

Holly Sugar Corporation
Montana Division

East Holly Street
Sidney, MT 59270
Mr. Tom B. Jacobsen, Environmental Engineer
Phone: 307 532-7141, Ext.: N/A

Submitted to:

Montana State Department of Health and Environmental Sciences
Air Quality Bureau

Room A116
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Prepared by:

THE EMISSION MEASUREMENT GROUP, INC.

P.O. Box 4953, ENGLEWOOD, CO 80155-4953
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Report Date: November 16, 1993

The Emission Measurement Group, Inc.

Table 3-6 (Pulp - NE)
TEST RESULTS, by Run

Pulp Dryer - Northeast Sidney, MT

CORPORATE DATA

Company Name: Holly Sugar Corporation
 Division Name: Montana Division
 Plant/Fac. Name: Sidney, MT
 Dept. Name: Environmental
 Contact Name: Mr. Tom Jacobsen
 Contact's Title: Environmental Engineer
 Process Ident./Type: Sugar Beet Processing
 Fuel Type: #6 Fuel Oil
 Fd(dscf gas/10⁶ BTU): 9220
 Stack/Duct Identifier: Pulp Dryer - Northeast
 Equiv.Flue Dia,(ft.): 5.250
 Hrs of Oper./Year: 4320

TEST CONDITIONS

| | 10/23/93 | 10/23/93 | 10/23/93 | |
|----------------------------|-----------|-----------|-----------|----------------|
| Test Date, (mm/dd/yy): | 10/23/93 | 10/23/93 | 10/23/93 | |
| Test Operator, (LN,FI): | Lynn, M. | Lynn, M. | Lynn, M. | |
| Tech. Helper #1: | Floyd, J. | Floyd, J. | Floyd, J. | |
| Run ID Number, (VDRR): | 8101 | 8102 | 8103 | AVERAGE |
| Time- Start, (24hr.): | 10:24 | 16:32 | 20:02 | |
| - End, (24hr.): | 12:38 | 18:27 | 22:29 | |
| Time of Test, (t, min.): | 100.0 | 100.0 | 100.0 | 100.0 |
| Max. Rtd. Cap.,(TPH,Feed): | 48.8 | 48.8 | 48.8 | 48.8 |
| Feed Load, (TPH): | 25.0 | 25.0 | 25.0 | 25.0 |
| Test Cond., Feed, (%MRC): | 51.25 | 51.25 | 51.25 | 51.25 |

PARTICULATE RESULTS, (RM5)

| | 10/23/93 | 10/23/93 | 10/23/93 | AVERAGE |
|---------------------------|----------|----------|----------|---------|
| gr./dscf: | 0.0609 | 0.0596 | 0.0868 | 0.0691 |
| gr./acf: | 0.0273 | 0.0268 | 0.0367 | 0.0303 |
| lbs./hr.: | 9.03 | 7.62 | 10.72 | 9.12 |
| lbs./10 ⁶ BTU: | 0.439 | 0.296 | 0.554 | 0.430 |
| lbs./Ton of Feed: | 0.361 | 0.305 | 0.429 | 0.365 |
| Tons/Year: | 19.50 | 16.46 | 23.16 | 19.71 |

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Table 3-6 (Pulp - NE Continued)
TEST RESULTS, by Run

TEST CONDITIONS

| Test Date, (mm/dd/yy): | 10/23/93 | 10/23/93 | 10/23/93 | AVERAGE |
|------------------------|----------|----------|----------|---------|
| Run ID Number, (VDRR): | 8101 | 8102 | 8103 | |

PM-10 RESULTS, (including backhalf)

| | | | | |
|---------------------------|--------|-----|-----|--------|
| gr./dscf: | 0.0651 | N/A | N/A | 0.0651 |
| gr./acf: | 0.0292 | N/A | N/A | 0.0292 |
| lbs./hr.: | 9.65 | N/A | N/A | 9.65 |
| lbs./10 ⁶ BTU: | 0.470 | N/A | N/A | 0.470 |
| lbs./Ton of Feed: | 0.386 | N/A | N/A | 0.386 |
| Tons/Year: | 20.84 | N/A | N/A | 20.84 |

PARTICULATE TOTAL RESULTS (including backhalf)

| | | | | |
|---------------------------|--------|--------|--------|--------|
| gr./dscf: | 0.0876 | 0.0680 | 0.1204 | 0.0920 |
| gr./acf: | 0.0393 | 0.0305 | 0.0510 | 0.0403 |
| lbs./hr.: | 12.99 | 8.69 | 14.88 | 12.19 |
| lbs./10 ⁶ BTU: | 0.632 | 0.338 | 0.769 | 0.580 |
| lbs./Ton of Feed: | 0.52 | 0.35 | 0.60 | 0.49 |
| Tons/Year: | 28.07 | 18.77 | 32.13 | 26.32 |

SO2 RESULTS, (RM6C)

| | | | | |
|---------------------------|--------|--------|--------|--------|
| ppm, (dry, v/v): | 34.09 | 70.96 | 39.93 | 48.32 |
| ppm, (wet, v/v): | 20.96 | 43.38 | 22.95 | 29.10 |
| lbs./hr.: | 5.871 | 10.535 | 5.729 | 7.378 |
| lbs./10 ⁶ BTU: | 0.2857 | 0.4094 | 0.2963 | 0.3305 |
| lbs./Ton of Feed: | 0.23 | 0.42 | 0.23 | 0.30 |
| Tons/Year: | 12.68 | 22.76 | 12.37 | 15.94 |

PARAMETRIC FLUE GAS RESULTS

| | | | | |
|----------------------------------|--------|--------|--------|--------|
| Pres.Vel.Del.P(in.w.g.): | 0.1764 | 0.1318 | 0.1364 | 0.1482 |
| Moisture, (%v/v): | 38.50 | 38.86 | 42.53 | 39.97 |
| CO2, Inst., (% dry,v/v): | 4.08 | 4.88 | 4.26 | 4.41 |
| O2, Inst., (% dry,v/v): | 17.09 | 15.36 | 16.59 | 16.34 |
| Temperature, Stack, (°F): | 212.8 | 208.4 | 207.2 | 209.5 |
| Velocity, Flue Gas, (Furl/Ftnt): | 29.67 | 25.57 | 26.21 | 27.15 |
| Volume Flow, (DSCFM): | 17297 | 14912 | 14411 | 15540 |
| Volume Flow, (ACFM): | 39530 | 33200 | 34041 | 35263 |

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**Table 3-6 (Pulp - NW)
TEST RESULTS, by Run**

Pulp Dryer - Northwest Sidney, MT

CORPORATE DATA

| | |
|-----------------------------------|-------------------------|
| Company Name: | Holly Sugar Corporation |
| Division Name: | Montana Division |
| Plant/Fac. Name: | Sidney, MT |
| Dept. Name: | Environmental |
| Contact Name: | Mr. Tom Jacobsen |
| Contact's Title: | Environmental Engineer |
| Process Ident./Type: | Sugar Beet Processing |
| Fuel Type: | #6 Fuel Oil |
| Fd(dscf gas/10 ⁶ BTU): | 9220 |
| Stack/Duct Identifier: | Pulp Dryer - Northwest |
| Equiv.Flue Dia,(ft.): | 5.250 |
| Hrs of Oper./Year: | 4320 |

TEST CONDITIONS

| | | | | |
|----------------------------|-----------|-----------|-----------|----------------|
| Test Date, (mm/dd/yy): | 10/23/93 | 10/23/93 | 10/23/93 | |
| Test Operator, (LN,FI): | Lynn, M. | Lynn, M. | Lynn, M. | |
| Tech. Helper #1: | Floyd, J. | Floyd, J. | Floyd, J. | |
| Run ID Number, (VDRR): | 7101 | 7102 | 7103 | AVERAGE |
| Time- Start, (24hr.): | 10:26 | 15:18 | 19:18 | |
| - End, (24hr.): | 12:40 | 17:20 | 21:57 | |
| Time of Test, (t, min.): | 100.0 | 100.0 | 100.0 | 100.0 |
| Max. Rtd. Cap.,(TPH,Feed): | 48.8 | 48.8 | 48.8 | 48.8 |
| Feed Load, (TPH): | 25.0 | 25.0 | 25.0 | 25.0 |
| Test Cond., Feed, (%MRC): | 51.25 | 51.25 | 51.25 | 51.25 |

PARTICULATE RESULTS, (RM5)

| | | | | |
|---------------------------|--------|--------|--------|--------|
| gr./dscf: | 0.0524 | 0.0724 | 0.0755 | 0.0668 |
| gr./acf: | 0.0250 | 0.0337 | 0.0358 | 0.0315 |
| lbs./hr.: | 6.73 | 11.55 | 11.89 | 10.06 |
| lbs./10 ⁶ BTU: | 0.276 | 0.368 | 0.439 | 0.361 |
| lbs./Ton of Feed: | 0.269 | 0.462 | 0.476 | 0.402 |
| Tons/Year: | 14.54 | 24.95 | 25.69 | 21.73 |

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Table 3-6 (Pulp - NW Continued)
TEST RESULTS, by Run

TEST CONDITIONS

| Test Date, (mm/dd/yy): | 10/23/93 | 10/23/93 | 10/23/93 | |
|------------------------|----------|----------|----------|---------|
| Run ID Number, (VDRR): | 7101 | 7102 | 7103 | AVERAGE |

PM-10 RESULTS, (including backhalf)

| | | | | |
|---------------------------|-----|--------|--------|--------|
| gr./dscf: | N/A | 0.0567 | 0.0529 | 0.0548 |
| gr./acf: | N/A | 0.0264 | 0.0251 | 0.0258 |
| lbs./hr.: | N/A | 9.05 | 8.33 | 8.69 |
| lbs./10 ⁶ BTU: | N/A | 0.289 | 0.307 | 0.298 |
| lbs./Ton of Feed: | N/A | 0.362 | 0.333 | 0.348 |
| Tons/Year: | N/A | 19.55 | 17.99 | 18.77 |

PARTICULATE TOTAL RESULTS (including backhalf)

| | | | | |
|---------------------------|--------|--------|--------|--------|
| gr./dscf: | 0.1039 | 0.0946 | 0.0908 | 0.0964 |
| gr./acf: | 0.0496 | 0.0441 | 0.0431 | 0.0456 |
| lbs./hr.: | 13.35 | 15.10 | 14.30 | 14.25 |
| lbs./10 ⁶ BTU: | 0.548 | 0.481 | 0.527 | 0.519 |
| lbs./Ton of Feed: | 0.53 | 0.60 | 0.57 | 0.57 |
| Tons/Year: | 28.83 | 32.62 | 30.88 | 30.78 |

SO2 RESULTS, (RM6C)

| | | | | |
|---------------------------|--------|--------|--------|--------|
| ppm, (dry, v/v): | 39.10 | 70.56 | 32.44 | 47.37 |
| ppm, (wet, v/v): | 25.67 | 45.92 | 21.74 | 31.11 |
| lbs./hr.: | 5.833 | 13.083 | 5.933 | 8.283 |
| lbs./10 ⁶ BTU: | 0.2396 | 0.4171 | 0.2189 | 0.2919 |
| lbs./Ton of Feed: | 0.23 | 0.52 | 0.24 | 0.33 |
| Tons/Year: | 12.60 | 28.26 | 12.82 | 17.89 |

PARAMETRIC FLUE GAS RESULTS

| | | | | |
|--------------------------|--------|--------|--------|--------|
| Pres.Vel.Del.P(in.w.g.): | 0.1188 | 0.1893 | 0.1767 | 0.1616 |
| Moisture, (%v/v): | 34.35 | 34.92 | 32.98 | 34.08 |
| CO2, Inst., (% dry,v/v): | 4.15 | 4.60 | 3.93 | 4.23 |
| O2, Inst., (% dry,v/v): | 15.68 | 15.49 | 16.16 | 15.78 |
| Temperature,Stack, (F): | 216.1 | 225.9 | 234.1 | 225.4 |
| Velocity,Flue Gas,(fps): | 24.20 | 30.78 | 29.80 | 28.26 |
| Volume Flow, (DSCFM): | 14984 | 18623 | 18370 | 17326 |
| Volume Flow, (ACFM): | 31426 | 39979 | 30709 | 30705 |

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**Table 3-6 (Pulp - SE)
TEST RESULTS, by Run**

Pulp Dryer - Southeast Sidney, MT

CORPORATE DATA

Company Name: Holly Sugar Corporation
 Division Name: Montana Division
 Plant/Fac. Name: Sidney, MT
 Dept. Name: Environmental
 Contact Name: Mr. Tom Jacobsen
 Contact's Title: Environmental Engineer
 Process Ident./Type: Sugar Beet Processing
 Fuel Type: #6 Fuel Oil
 Fd(dscf gas/10⁶ BTU): 9220
 Stack/Duct Identifier: Pulp Dryer - Southeast
 Equiv.Flue Dia,(ft.): 5.250
 Hrs of Oper./Year: 4320

TEST CONDITIONS

| Test Date, (mm/dd/yy): | 10/21/93 | 10/22/93 | 10/22/93 | 10/22/93 | |
|----------------------------|-----------|-----------|-----------|-----------|----------------|
| Test Operator, (LN,FI): | Lynn, M. | Lynn, M. | Lynn, M. | Lynn, M. | |
| Tech. Helper #1: | Floyd, J. | Floyd, J. | Floyd, J. | Floyd, J. | |
| Run ID Number, (VDRR): | 6101 | 6102 | 6103 | 6104 | AVERAGE |
| Time- Start, (24hr.): | 20:56 | 9:34 | 15:27 | 19:24 | |
| - End, (24hr.): | 21:16 | 13:36 | 17:46 | 21:50 | |
| Time of Test, (t, min.): | 20.0 | 113.5 | 120.0 | 120.0 | 93.4 |
| Max. Rtd. Cap.,(TPH,Feed): | 48.8 | 48.8 | 48.8 | 48.8 | 48.8 |
| Feed Load, (TPH): | 24.0 | 25.0 | 25.0 | 25.0 | 24.8 |
| Test Cond., Feed, (%MRC): | 49.20 | 51.25 | 51.25 | 51.25 | 50.74 |

PARTICULATE RESULTS, (RM5)

| | 10/21/93 | 10/22/93 | 10/22/93 | 10/22/93 | AVERAGE |
|---------------------------|----------|----------|----------|----------|---------|
| gr./dscf: | 0.1306 | 0.1281 | 0.0705 | 0.1047 | 0.1085 |
| gr./acf: | 0.0555 | 0.0582 | 0.0374 | 0.0440 | 0.0488 |
| lbs./hr.: | 15.99 | 24.34 | 12.61 | 14.33 | 16.82 |
| lbs./10 ⁶ BTU: | 0.535 | 0.518 | 0.278 | 0.393 | 0.431 |
| lbs./Ton of Feed: | 0.666 | 0.974 | 0.504 | 0.573 | 0.679 |
| Tons/Year: | 34.54 | 52.58 | 27.24 | 30.96 | 36.33 |

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Table 3-6 (Pulp - SE Continued)
TEST RESULTS, by Run

TEST CONDITIONS

| Test Date, (mm/dd/yy): | 10/21/93 | 10/22/93 | 10/22/93 | 10/22/93 | AVERAGE |
|------------------------|----------|----------|----------|----------|---------|
| Run ID Number, (VDRR): | 6101 | 6102 | 6103 | 6104 | |

PM-10 RESULTS, (including backhalf)

| | | | | | |
|---------------------------|--------|--------|-----|-----|--------|
| gr./dscf: | 0.0943 | 0.1494 | N/A | N/A | 0.1218 |
| gr./acf: | 0.0401 | 0.0679 | N/A | N/A | 0.0540 |
| lbs./hr.: | 11.54 | 28.40 | N/A | N/A | 19.97 |
| lbs./10 ⁶ BTU: | 0.386 | 0.605 | N/A | N/A | 0.495 |
| lbs./Ton of Feed: | 0.481 | 1.136 | N/A | N/A | 0.808 |
| Tons/Year: | 24.92 | 61.33 | N/A | N/A | 43.13 |

PARTICULATE TOTAL RESULTS (including backhalf)

| | | | | | |
|---------------------------|--------|--------|--------|--------|--------|
| gr./dscf: | 0.1582 | 0.2133 | 0.1089 | 0.1372 | 0.1544 |
| gr./acf: | 0.0673 | 0.0970 | 0.0577 | 0.0577 | 0.0699 |
| lbs./hr.: | 19.36 | 40.55 | 19.48 | 18.79 | 24.54 |
| lbs./10 ⁶ BTU: | 0.647 | 0.863 | 0.429 | 0.515 | 0.614 |
| lbs./Ton of Feed: | 0.81 | 1.62 | 0.78 | 0.75 | 0.99 |
| Tons/Year: | 41.82 | 87.58 | 42.07 | 40.59 | 53.01 |

SO2 RESULTS, (RM6C)

| | | | | | |
|---------------------------|--------|--------|--------|--------|--------|
| ppm, (dry, v/v): | 71.31 | 72.19 | 88.02 | 82.43 | 78.49 |
| ppm, (wet, v/v): | 42.00 | 45.29 | 63.96 | 47.45 | 49.67 |
| lbs./hr.: | 10.138 | 15.940 | 18.292 | 13.115 | 14.371 |
| lbs./10 ⁶ BTU: | 0.3389 | 0.3395 | 0.4030 | 0.3595 | 0.3602 |
| lbs./Ton of Feed: | 0.42 | 0.64 | 0.73 | 0.52 | 0.58 |
| Tons/Year: | 21.90 | 34.43 | 39.51 | 28.33 | 31.04 |

PARAMETRIC FLUE GAS RESULTS

| | | | | | |
|-------------------------------|--------|--------|--------|--------|--------|
| Pres. Vel. Del. P (in. w.g.): | 0.1312 | 0.2825 | 0.1940 | 0.1694 | 0.1943 |
| Moisture, (%v/v): | 41.10 | 37.27 | 27.34 | 42.44 | 37.04 |
| CO2, Inst., (% dry, v/v): | 5.32 | 5.20 | 5.57 | 6.18 | 5.57 |
| O2, Inst., (% dry, v/v): | 14.17 | 14.10 | 13.92 | 13.57 | 13.94 |
| Temperature, Stack, (°F): | 222.5 | 219.4 | 213.4 | 211.8 | 216.8 |
| Velocity, Flue Gas, (fps): | 25.86 | 37.54 | 30.32 | 29.26 | 30.74 |
| Volume Flow, (DSCFM): | 14279 | 22177 | 20872 | 15980 | 18327 |
| Volume Flow, (ACFM): | 33504 | 40757 | 39370 | 30000 | 39950 |

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**Table 3-6 (Pulp-SW)
TEST RESULTS, by Run**

Pulp Dryer - Southwest Sidney, MT

CORPORATE DATA

Company Name: Holly Sugar Corporation
 Division Name: Montana Division
 Plant/Fac. Name: Sidney, MT
 Dept. Name: Environmental
 Contact Name: Mr. Tom Jacobsen
 Contact's Title: Environmental Engineer
 Process Ident./Type: Sugar Beet Processing
 Fuel Type: #6 Fuel Oil
 Fd(dscf gas/10⁶ BTU): 9220
 Stack/Duct Identifier: Pulp Dryer - Southwest
 Equiv.Flue Dia,(ft.): 5.250
 Hrs of Oper./Year: 4320

TEST CONDITIONS

| | 10/21/93 | 10/22/93 | 10/22/93 | 10/22/93 | |
|-------------------------------|-------------|-------------|-------------|-------------|----------------|
| Test Date, (mm/dd/yy): | 10/21/93 | 10/22/93 | 10/22/93 | 10/22/93 | |
| Test Operator, (LN,FI): | Lynn, M. | Lynn, M. | Lynn, M. | Lynn, M. | |
| Tech. Helper #1: | Floyd, J. | Floyd, J. | Floyd, J. | Floyd, J. | |
| Run ID Number, (VDRR): | 5101 | 5102 | 5103 | 5104 | AVERAGE |
| Time- Start, (24hr.): | 21:08 | 9:43 | 15:24 | 19:27 | |
| - End, (24hr.): | 21:33 | 13:35 | 17:43 | 21:59 | |
| Time of Test, (t, min.): | 25.0 | 110.5 | 120.0 | 120.0 | 93.9 |
| Max. Rtd. Cap.,(TPH,Feed): | 48.8 | 48.8 | 48.8 | 48.8 | 48.8 |
| Feed Load, (TPH): | 24.0 | 25.0 | 25.0 | 25.0 | 24.8 |
| Test Cond., Feed, (%MRC): | 49.20 | 51.25 | 51.25 | 51.25 | 50.74 |

PARTICULATE RESULTS, (RM5)

| | 10/21/93 | 10/22/93 | 10/22/93 | 10/22/93 | |
|---------------------------|----------|----------|----------|----------|--------|
| gr./dscf: | 0.0431 | 0.0666 | 0.1409 | 0.1179 | 0.0921 |
| gr./acf: | 0.0183 | 0.0283 | 0.0609 | 0.0552 | 0.0407 |
| lbs./hr.: | 4.66 | 9.96 | 22.30 | 20.40 | 14.33 |
| lbs./10 ⁶ BTU: | 0.175 | 0.269 | 0.594 | 0.451 | 0.372 |
| lbs./Ton of Feed: | 0.194 | 0.398 | 0.892 | 0.816 | 0.575 |
| Tons/Year: | 10.06 | 21.51 | 48.17 | 44.07 | 30.95 |

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Table 3-6 (Pulp-SW Continued)
TEST RESULTS, by Run

TEST CONDITIONS

| Test Date, (mm/dd/yy): | 10/21/93 | 10/22/93 | 10/22/93 | 10/22/93 | AVERAGE |
|------------------------|----------|----------|----------|----------|---------|
| Run ID Number, (VDRR): | 5101 | 5102 | 5103 | 5104 | |

PM-10 RESULTS, (including backhalf)

| | | | | | |
|---------------------------|-----|-----|--------|--------|--------|
| gr./dscf: | N/A | N/A | 0.1154 | 0.1030 | 0.1092 |
| gr./acf: | N/A | N/A | 0.0499 | 0.0482 | 0.0491 |
| lbs./hr.: | N/A | N/A | 18.27 | 17.83 | 18.05 |
| lbs./10 ⁶ BTU: | N/A | N/A | 0.486 | 0.394 | 0.440 |
| lbs./Ton of Feed: | N/A | N/A | 0.731 | 0.713 | 0.722 |
| Tons/Year: | N/A | N/A | 39.45 | 38.51 | 38.98 |

PARTICULATE TOTAL RESULTS (including backhalf)

| | | | | | |
|---------------------------|--------|--------|--------|--------|--------|
| gr./dscf: | 0.1276 | 0.0916 | 0.1709 | 0.1585 | 0.1372 |
| gr./acf: | 0.0540 | 0.0390 | 0.0739 | 0.0742 | 0.0603 |
| lbs./hr.: | 13.77 | 13.71 | 27.05 | 27.43 | 20.49 |
| lbs./10 ⁶ BTU: | 0.518 | 0.370 | 0.720 | 0.606 | 0.554 |
| lbs./Ton of Feed: | 0.57 | 0.55 | 1.08 | 1.10 | 0.83 |
| Tons/Year: | 29.74 | 29.60 | 58.43 | 59.25 | 44.26 |

SO2 RESULTS, (RM6C)

| | | | | | |
|---------------------------|--------|--------|--------|--------|--------|
| ppm, (dry, v/v): | 72.50 | 86.83 | 84.48 | 75.17 | 79.74 |
| ppm, (wet, v/v): | 44.16 | 52.20 | 51.94 | 49.84 | 49.54 |
| lbs./hr.: | 9.089 | 15.089 | 15.532 | 15.110 | 13.705 |
| lbs./10 ⁶ BTU: | 0.3419 | 0.4069 | 0.4137 | 0.3338 | 0.3741 |
| lbs./Ton of Feed: | 0.38 | 0.60 | 0.62 | 0.60 | 0.55 |
| Tons/Year: | 19.63 | 32.59 | 33.55 | 32.64 | 29.60 |

PARAMETRIC FLUE GAS RESULTS

| | | | | | |
|----------------------------|--------|--------|--------|--------|--------|
| Pres.Vel.Del.P(in.w.g.): | 0.1000 | 0.1928 | 0.2091 | 0.2197 | 0.1804 |
| Moisture, (%v/v): | 39.08 | 39.88 | 38.51 | 33.70 | 37.80 |
| CO2, Inst., (% dry,v/v): | 5.45 | 5.24 | 5.25 | 6.27 | 5.55 |
| O2, Inst., (% dry,v/v): | 14.12 | 14.08 | 14.37 | 13.70 | 14.07 |
| Temperature, Stack, (°F): | 248.7 | 235.9 | 238.4 | 235.4 | 239.6 |
| Velocity, Flue Gas, (fps): | 22.89 | 31.57 | 32.88 | 33.22 | 30.14 |
| Volume Flow, (DSCFM): | 12591 | 17453 | 18466 | 20189 | 17175 |
| Volume Flow, (ACFM): | 29735 | 40999 | 42701 | 43148 | 39146 |

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Table 3-7 (Pulp - NE)
 SAMPLING and ANALYTICAL DATA, by Run

Pulp Dryer - Northeast Sidney, MT

CORPORATE DATA

| | |
|-----------------------------------|-------------------------|
| Company Name: | Holly Sugar Corporation |
| Division Name: | Montana Division |
| Plant/Fac. Name: | Sidney, MT |
| Dept. Name: | Environmental |
| Contact Name: | Mr. Tom Jacobsen |
| Contact's Title: | Environmental Engineer |
| Process Ident./Type: | Sugar Beet Processing |
| Fuel Type: | #6 Fuel Oil |
| Fd(dscf gas/10 ⁶ BTU): | 9220 |
| Stack/Duct Identifier: | Pulp Dryer - Northeast |
| Equiv.Flue Dia,(ft.): | 5.250 |
| Hrs of Oper./Year: | 4320 |

TEST CONDITIONS

| | | | |
|--------------------------|-----------|-----------|-----------|
| Test Operator (LN,FI): | Lynn, M. | Lynn, M. | Lynn, M. |
| Tech. Helper #1: | Floyd, J. | Floyd, J. | Floyd, J. |
| Test Date, (mm/dd/yy): | 10/23/93 | 10/23/93 | 10/23/93 |
| Run ID Number, (VDRR): | 8101 | 8102 | 8103 |
| Time- Start, (24hr.): | 10:24 | 16:32 | 20:02 |
| - End, (24hr.): | 12:38 | 18:27 | 22:29 |
| Time of Test, (t, min.): | 100.0 | 100.0 | 100.0 |

PROCESS LOAD DATA

| | | | |
|------------------------------|-------|-------|-------|
| Max. Rtd. Cap., (TPH, Feed): | 48.8 | 48.8 | 48.8 |
| Feed Load, (TPH): | 25.0 | 25.0 | 25.0 |
| Test Cond., Feed, (%MRC): | 51.25 | 51.25 | 51.25 |

SAMPLE VOLUME DATA

| | | | |
|---|---------|---------|---------|
| Reference Diluent (CO ₂) %: | 12.0 | 12.0 | 12.0 |
| Reference Diluent (O ₂) %: | 15.0 | 15.0 | 15.0 |
| Console ID #: | CC-2 | CC-2 | CC-2 |
| Gas Meter ID Number: | 6848398 | 6848398 | 6848398 |
| Gas Mtr. Cal Factor, (Yo): | 0.99650 | 0.99650 | 0.99650 |
| Volume, Gas Samp. @ Std. Cond., (dscf): | 46.551 | 38.077 | 37.750 |
| Corrected for Excess Leak, (acf): | 50.476 | 41.847 | 40.498 |
| At Meter Conditions, (acf): | 50.476 | 41.847 | 40.498 |
| Temperature, @ Gas Meter, (°F): | 72.10 | 78.80 | 66.60 |
| Delta H Pres. @ Meter, (in.w.g.): | 1.09 | 0.80 | 0.86 |
| Pressure Barometric., Abs., (in.Hg.): | 27.825 | 27.820 | 27.850 |
| Leak Ck.Result, Post, Excessive, (acf): | 0.000 | 0.000 | 0.000 |
| Leak Rate Result, (cfm): | 0.000 | 0.000 | 0.000 |
| At Vacuum, (in. Hg.): | 24.00 | 25.00 | 25.00 |
| High During Run, (in. Hg.): | 15.00 | 5.80 | 3.00 |

The Emission Measurement Group, Inc.

Table 3-7 (Pulp - NE Continued)
 SAMPLING and ANALYTICAL DATA, by Run

TEST CONDITIONS

| | | | |
|------------------------|----------|----------|----------|
| Test Date, (mm/dd/yy): | 10/23/93 | 10/23/93 | 10/23/93 |
| Run ID Number, (VDRR): | 8101 | 8102 | 8103 |

STACK MOISTURE DATA

| | | | |
|--------------------------------------|--------|--------|--------|
| Press.H2O Vap.@ Saturation,(in.Hg.): | 0.2411 | 0.2586 | 0.2374 |
| Of Gas @ Silica Gel, (in. Hg.): | 19.025 | 23.620 | 25.850 |
| Temperature @ Silica Gel Imp., (°F): | 39.30 | 41.10 | 38.90 |
| Vacuum @ Silica Gel/Pump,(in.Hg.): | 8.800 | 4.200 | 2.000 |
| Volume H2O @ Silica Gel,(gm): | 13.75 | 9.83 | 7.97 |
| Condensed H2O @ Impingers,(ml.): | 605.0 | 504.0 | 585.0 |
| Total Vol. H2O Collected,(ml.): | 618.75 | 513.83 | 592.97 |

FLUE GAS MOL. WT. & FLOWRATE DATA

| | | | |
|----------------------------------|--------|--------|--------|
| Area of Flue, (sq. ft.): | 21.65 | 21.65 | 21.65 |
| Pres., Duct, Static, (in. w.g.): | 0.00 | 0.00 | 0.00 |
| Pitobe ID #: | PM-60 | PM-60 | PM-60 |
| Pitot ID #: | PM-60 | PM-60 | PM-60 |
| Pitot Side ID #: | A | A | A |
| Pitot Coef., (Cp): | 0.840 | 0.840 | 0.840 |
| Density of Flue Gas, (lb/cf): | 0.0647 | 0.0647 | 0.0635 |
| Molecular Weight, wet: | 24.984 | 24.980 | 24.533 |

PARTICULATE SAMPLING DATA

| | | | |
|--------------------------------------|---------|---------|---------|
| Isokinetic Sampling Rate, Final,(%): | 104.32 | 98.97 | 101.53 |
| " Point-by-Point, (Avg., %): | 104.40 | 96.90 | 94.30 |
| " Point-by-Point, (High, %): | 140.30 | 112.80 | 106.40 |
| " Point-by-Point, (Low, %): | 91.20 | 50.80 | 69.60 |
| Filter A ID #: | 7492 | 7490 | 7497 |
| B ID #: | N/A | N/A | N/A |
| Nozzle ID #: | PM10-11 | PM10-11 | PM10-11 |
| Nozzle Diameter, (in.): | 0.32000 | 0.32000 | 0.32000 |
| Orifice Factor, Del. Ha, (in. w.g.): | 1.904 | 1.904 | 1.904 |
| Sampling Rate Factor, (K3): | 4.29 | 4.18 | 4.06 |

The Emission Measurement Group, Inc.

Table 3-7 (Pulp - NW)
 SAMPLING and ANALYTICAL DATA, by Run

Pulp Dryer - Northwest Sidney, MT

CORPORATE DATA

| | |
|-----------------------------------|-------------------------|
| Company Name: | Holly Sugar Corporation |
| Division Name: | Montana Division |
| Plant/Fac. Name: | Sidney, MT |
| Dept. Name: | Environmental |
| Contact Name: | Mr. Tom Jacobsen |
| Contact's Title: | Environmental Engineer |
| Process Ident./Type: | Sugar Beet Processing |
| Fuel Type: | #6 Fuel Oil |
| Fd(dscf gas/10 ⁶ BTU): | 9220 |
| Stack/Duct Identifier: | Pulp Dryer - Northwest |
| Equiv.Flue Dia,(ft.): | 5.250 |
| Hrs of Oper./Year: | 4320 |

TEST CONDITIONS

| | | | |
|--------------------------|-----------|-----------|-----------|
| Test Operator (LN,FI): | Lynn, M. | Lynn, M. | Lynn, M. |
| Tech. Helper #1: | Floyd, J. | Floyd, J. | Floyd, J. |
| Test Date, (mm/dd/yy): | 10/23/93 | 10/23/93 | 10/23/93 |
| Run ID Number, (VDRR): | 7101 | 7102 | 7103 |
| Time- Start, (24hr.): | 10:26 | 15:18 | 19:18 |
| - End, (24hr.): | 12:40 | 17:20 | 21:57 |
| Time of Test, (t, min.): | 100.0 | 100.0 | 100.0 |

PROCESS LOAD DATA

| | | | |
|------------------------------|-------|-------|-------|
| Max. Rtd. Cap., (TPH, Feed): | 48.8 | 48.8 | 48.8 |
| Feed Load, (TPH): | 25.0 | 25.0 | 25.0 |
| Test Cond., Feed, (%MRC): | 51.25 | 51.25 | 51.25 |

SAMPLE VOLUME DATA

| | | | |
|---|---------|---------|---------|
| Reference Diluent (CO ₂) %: | 12.0 | 12.0 | 12.0 |
| Reference Diluent (O ₂) %: | 15.0 | 15.0 | 15.0 |
| Console ID #: | JC-1 | JC-1 | JC-1 |
| Gas Meter ID Number: | 382459 | 382459 | 382459 |
| Gas Mtr. Cal Factor, (Yo): | 0.99650 | 0.99650 | 0.99650 |
| Volume, Gas Samp. @ Std. Cond, (dscf): | 34.178 | 47.555 | 46.146 |
| Corrected for Excess Leak, (acf): | 37.149 | 53.029 | 49.506 |
| At Meter Conditions, (acf): | 37.149 | 53.029 | 49.506 |
| Temperature, @ Gas Meter, (°F): | 72.20 | 86.20 | 66.00 |
| Delta H Pres. @ Meter, (in.w.g.): | 0.25 | 0.46 | 0.43 |
| Pressure Barometric, Abs., (in.Hg.): | 27.825 | 27.820 | 27.850 |
| Leak Ck.Result, Post, Excessive, (acf): | 0.000 | 0.000 | 0.000 |
| Leak Rate Result, (cfm): | 0.000 | 0.000 | 0.000 |
| At Vacuum, (in. Hg.): | 23.50 | 23.50 | 23.50 |
| High During Run, (in. Hg.): | 17.00 | 5.20 | 4.00 |

The Emission Measurement Group, Inc.

Table 3-7 (Pulp - NW Continued)
 SAMPLING and ANALYTICAL DATA, by Run

TEST CONDITIONS

| | 10/23/93 | 10/23/93 | 10/23/93 |
|------------------------|----------|----------|----------|
| Test Date, (mm/dd/yy): | 10/23/93 | 10/23/93 | 10/23/93 |
| Run ID Number, (VDRR): | 7101 | 7102 | 7103 |

STACK MOISTURE DATA

| | | | |
|--------------------------------------|--------|--------|--------|
| Press.H2O Vap.@ Saturation,(in.Hg.): | 0.3586 | 0.3252 | 0.2392 |
| Of Gas @ Silica Gel, (in. Hg.): | 18.425 | 25.320 | 25.350 |
| Temperature @ Silica Gel Imp., (°F): | 49.70 | 47.10 | 39.10 |
| Vacuum @ Silica Gel/Pump,(in.Hg.): | 9.400 | 2.500 | 2.500 |
| Volume H2O @ Silica Gel,(gm): | 15.65 | 14.65 | 10.01 |
| Condensed H2O @ Impingers,(ml.): | 364.0 | 527.0 | 472.0 |
| Total Vol. H2O Collected,(ml.): | 379.65 | 541.65 | 482.01 |

FLUE GAS MOL. WT. & FLOWRATE DATA

| | | | |
|----------------------------------|--------|-----------|-----------|
| Area of Flue, (sq. ft.): | 21.65 | 21.65 | 21.65 |
| Pres., Duct, Static, (in. w.g.): | 0.20 | 0.20 | 0.20 |
| Pitobe ID #: | 60-1 | 60-2 | 60-2 |
| Pitot ID #: | 60-1 | 60-2-PM10 | 60-2-PM10 |
| Pitot Side ID #: | A | A | A |
| Pitot Coef., (Cp): | 0.840 | 0.840 | 0.840 |
| Density of Flue Gas, (lb/cf): | 0.0659 | 0.0658 | 0.0662 |
| Molecular Weight, wet: | 25.425 | 25.403 | 25.569 |

PARTICULATE SAMPLING DATA

| | | | |
|--------------------------------------|---------|---------|---------|
| Isokinetic Sampling Rate, Final,(%): | 88.41 | 98.97 | 97.37 |
| " Point-by-Point, (Avg., %): | 88.70 | 98.90 | 99.20 |
| " Point-by-Point, (High, %): | 118.00 | 111.60 | 114.60 |
| " Point-by-Point, (Low, %): | 81.50 | 94.10 | 88.50 |
| Filter A ID #: | 7493 | 7489 | 7496 |
| B ID #: | N/A | N/A | N/A |
| Nozzle ID #: | 10-2 | PM10-11 | PM10-11 |
| Nozzle Diameter, (in.): | 0.32000 | 0.32000 | 0.32000 |
| Orifice Factor, Del. Ha, (in. w.g.): | 0.940 | 0.940 | 0.940 |
| Sampling Rate Factor, (K3): | 2.16 | 2.29 | 2.21 |

The Emission Measurement Group, Inc.

**Table 3-7 (Pulp - SE)
SAMPLING and ANALYTICAL DATA, by Run**

Pulp Dryer - Southeast Sidney, MT

CORPORATE DATA

Company Name: Holly Sugar Corporation
 Division Name: Montana Division
 Plant/Fac. Name: Sidney, MT
 Dept. Name: Environmental
 Contact Name: Mr. Tom Jacobsen
 Contact's Title: Environmental Engineer
 Process Ident./Type: Sugar Beet Processing
 Fuel Type: #6 Fuel Oil
 Fd(dscf gas/10⁶ BTU): 9220
 Stack/Duct Identifier: Pulp Dryer - Southeast
 Equiv.Flue Dia,(ft.): 5.250
 Hrs of Oper./Year: 4320

TEST CONDITIONS

| | | | | |
|--------------------------|-----------|-----------|-----------|-----------|
| Test Operator (LN,FI): | Lynn, M. | Lynn, M. | Lynn, M. | Lynn, M. |
| Tech. Helper #1: | Floyd, J. | Floyd, J. | Floyd, J. | Floyd, J. |
| Test Date, (mm/dd/yy): | 10/21/93 | 10/22/93 | 10/22/93 | 10/22/93 |
| Run ID Number, (VDRR): | 6101 | 6102 | 6103 | 6104 |
| Time- Start, (24hr.): | 20:56 | 9:34 | 15:27 | 19:24 |
| - End, (24hr.): | 21:16 | 13:36 | 17:46 | 21:50 |
| Time of Test, (t, min.): | 20.0 | 113.5 | 120.0 | 120.0 |

PROCESS LOAD DATA

| | | | | |
|------------------------------|-------|-------|-------|-------|
| Max. Rtd. Cap., (TPH, Feed): | 48.8 | 48.8 | 48.8 | 48.8 |
| Feed Load, (TPH): | 24.0 | 25.0 | 25.0 | 25.0 |
| Test Cond., Feed, (%MRC): | 49.20 | 51.25 | 51.25 | 51.25 |

SAMPLE VOLUME DATA

| | | | | |
|---|---------|---------|---------|---------|
| Reference Diluent (CO ₂) %: | 12.0 | 12.0 | 12.0 | 12.0 |
| Reference Diluent (O ₂) %: | 15.0 | 15.0 | 15.0 | 15.0 |
| Console ID #: | CC-2 | CC-2 | CC-2 | CC-2 |
| Gas Meter ID Number: | 6848398 | 6848398 | 6848398 | 6848398 |
| Gas Mtr. Cal Factor, (Yo): | 0.99650 | 0.99650 | 0.99650 | 0.99650 |
| Volume, Gas Samp. @ Std. Cond, (dscf): | 8.719 | 51.819 | 27.042 | 46.895 |
| Corrected for Excess Leak, (acf): | 9.165 | 54.983 | 29.744 | 50.673 |
| At Meter Conditions, (acf): | 9.165 | 54.983 | 29.744 | 50.673 |
| Temperature, @ Gas Meter, (°F): | 57.60 | 62.70 | 79.70 | 69.80 |
| Delta H Pres. @ Meter, (in.w.g.): | 1.10 | 1.33 | 0.92 | 0.97 |
| Pressure Barometric, Abs., (in.Hg.): | 27.920 | 27.915 | 27.835 | 27.810 |
| Leak Ck.Result, Post, Excessive, (acf): | 0.000 | 0.000 | 0.000 | 0.000 |
| Leak Rate Result, (cfm): | 0.000 | 0.000 | 0.000 | 0.000 |
| At Vacuum, (in. Hg.): | 14.00 | 14.00 | 14.00 | 23.50 |
| High During Run, (in. Hg.): | 5.00 | 17.80 | 2.80 | 5.80 |

The Emission Measurement Group, Inc.

Table 3-7 (Pulp - SE)
 SAMPLING and ANALYTICAL DATA, by Run

STACK MOISTURE DATA

| | | | | |
|--------------------------------------|--------|--------|--------|--------|
| Press.H2O Vap.@ Saturation,(in.Hg.): | 0.2656 | 0.2430 | 0.2729 | 0.2656 |
| Of Gas @ Silica Gel, (in. Hg.): | 24.020 | 21.215 | 26.135 | 24.110 |
| Temperature @ Silica Gel Imp., (°F): | 41.80 | 39.50 | 42.50 | 41.80 |
| Vacuum @ Silica Gel/Pump,(in.Hg.): | 3.900 | 6.700 | 1.700 | 3.700 |
| Volume H2O @ Silica Gel,(gm): | 2.18 | 13.52 | 6.66 | 11.98 |
| Condensed H2O @ Impingers,(ml.): | 127.0 | 640.0 | 209.3 | 722.0 |
| Total Vol. H2O Collected,(ml.): | 129.18 | 653.52 | 215.96 | 733.98 |

FLUE GAS MOL. WT. & FLOWRATE DATA

| | | | | |
|----------------------------------|---------|---------|--------|--------|
| Area of Flue, (sq. ft.): | 21.65 | 21.65 | 21.65 | 21.65 |
| Pres., Duct, Static, (in. w.g.): | 0.00 | 0.00 | 0.00 | 0.00 |
| Pitobe ID #: | PM10-60 | PM10-60 | 60-1 | 60-1 |
| Pitot ID #: | PM10-60 | PM10-60 | 60-1 | 60-1 |
| Pitot Side ID #: | A | A | A | A |
| Pitot Coef., (Cp): | 0.840 | 0.840 | 0.840 | 0.840 |
| Density of Flue Gas, (lb/cf): | 0.0641 | 0.0652 | 0.0682 | 0.0638 |
| Molecular Weight, wet: | 24.739 | 25.162 | 26.332 | 24.651 |

PARTICULATE SAMPLING DATA

| | | | | |
|--------------------------------------|---------|---------|---------|---------|
| Isokinetic Sampling Rate, Final,(%): | 133.75 | 90.19 | 47.30 | 107.13 |
| " Point-by-Point, (Avg., %): | 80.40 | 100.00 | 103.30 | 94.20 |
| " Point-by-Point, (High, %): | 111.20 | 111.40 | 114.60 | 119.00 |
| " Point-by-Point, (Low, %): | 99.90 | 20.20 | 88.10 | 87.80 |
| Filter A ID #: | 7480 | 7481 | 7485 | 7488 |
| B ID #: | N/A | 7484 | N/A | N/A |
| Nozzle ID #: | PM10-10 | PM10-10 | 10.2 | 10.2 |
| Nozzle Diameter, (in.): | 0.30100 | 0.30100 | 0.30100 | 0.30100 |
| Orifice Factor, Del. Ha, (in. w.g.): | 1.904 | 1.904 | 1.904 | 1.904 |
| Sampling Rate Factor, (K3): | 5.02 | 3.28 | 3.30 | 3.09 |

The Emission Measurement Group, Inc.

**Table 3-7 (Pulp - SW)
SAMPLING and ANALYTICAL DATA, by Run**

Pulp Dryer - Southwest Sidney, MT

CORPORATE DATA

Company Name: Holly Sugar Corporation
 Division Name: Montana Division
 Plant/Fac. Name: Sidney, MT
 Dept. Name: Environmental
 Contact Name: Mr. Tom Jacobsen
 Contact's Title: Environmental Engineer
 Process Ident./Type: Sugar Beet Processing
 Fuel Type: #6 Fuel Oil
 Fd(dscf gas/10⁶ BTU): 9220
 Stack/Duct Identifier: Pulp Dryer - Southwest
 Equiv.Flue Dia.(ft.): 5.250
 Hrs of Oper./Year: 4320

TEST CONDITIONS

| | | | | |
|--------------------------|-----------|-----------|-----------|-----------|
| Test Operator (LN,FI): | Lynn, M. | Lynn, M. | Lynn, M. | Lynn, M. |
| Tech. Helper #1: | Floyd, J. | Floyd, J. | Floyd, J. | Floyd, J. |
| Test Date, (mm/dd/yy): | 10/21/93 | 10/21/93 | 10/21/93 | 10/21/93 |
| Run ID Number, (VDRR): | 5101 | 5102 | 5103 | 5104 |
| Time- Start, (24hr.): | 21:08 | 9:43 | 15:24 | 19:27 |
| - End, (24hr.): | 21:33 | 13:35 | 17:43 | 21:59 |
| Time of Test, (t, min.): | 25.0 | 110.5 | 120.0 | 120.0 |

PROCESS LOAD DATA

| | | | | |
|------------------------------|-------|-------|-------|-------|
| Max. Rtd. Cap., (TPH, Feed): | 48.8 | 48.8 | 48.8 | 48.8 |
| Feed Load, (TPH): | 24.0 | 25.0 | 25.0 | 25.0 |
| Test Cond., Feed, (%MRC): | 49.20 | 51.25 | 51.25 | 51.25 |

SAMPLE VOLUME DATA

| | | | | |
|--------------------------------------|---------|---------|---------|---------|
| Reference Diluent (CO2) %: | 12.0 | 12.0 | 12.0 | 12.0 |
| Reference Diluent (O2) %: | 15.0 | 15.0 | 15.0 | 15.0 |
| Console ID #: | JC-1 | JC-1 | JC-1 | JC-1 |
| Gas Meter ID Number: | 352648 | 352648 | 352648 | 352648 |
| Gas Mtr. Cal Factor, (Yo): | 0.99650 | 0.99650 | 0.99650 | 0.99650 |
| Volume, Gas Samp.@ Std.Cond,(dscf): | 8.704 | 45.704 | 47.334 | 54.085 |
| Corrected for Excess Leak,(acf): | 9.021 | 48.808 | 53.503 | 58.278 |
| At Meter Conditions, (acf): | 9.021 | 48.808 | 53.503 | 58.278 |
| Temperature, @ Gas Meter, (°F): | 49.00 | 64.90 | 93.80 | 67.50 |
| Delta H Pres.@ Meter, (in.w.g.): | 0.18 | 0.35 | 0.36 | 0.39 |
| Pressure Barometric.,Abs.,(in.Hg.): | 27.915 | 27.925 | 27.835 | 27.810 |
| Leak Ck.Result,Post,Excessive,(acf): | 0.000 | 0.000 | 0.000 | 0.000 |
| Leak Rate Result, (cfm): | 0.000 | 0.000 | 0.000 | 0.000 |
| At Vacuum, (in. Hg.): | 5.00 | 14.00 | 23.00 | 23.50 |
| High During Run, (in. Hg.): | 1.50 | 4.80 | 4.80 | 8.00 |

The Emission Measurement Group, Inc.

Table 3-7 (Pulp - SW Continued)
 SAMPLING and ANALYTICAL DATA, by Run

TEST CONDITIONS

| | 10/21/93 | 10/21/93 | 10/21/93 | 10/21/93 |
|------------------------|----------|----------|----------|----------|
| Test Date, (mm/dd/yy): | 10/21/93 | 10/21/93 | 10/21/93 | 10/21/93 |
| Run ID Number, (VDRR): | 5101 | 5102 | 5103 | 5104 |

STACK MOISTURE DATA

| | | | | |
|--------------------------------------|--------|--------|--------|--------|
| Press.H2O Vap.@ Saturation,(in.Hg.): | 0.2143 | 0.2365 | 0.3015 | 0.2576 |
| Of Gas @ Silica Gel, (in. Hg.): | 26.585 | 25.525 | 25.835 | 23.810 |
| Temperature @ Silica Gel Imp., (°F): | 36.30 | 38.80 | 45.10 | 41.00 |
| Vacuum @ Silica Gel/Pump,(in.Hg.): | 1.330 | 2.400 | 2.000 | 4.000 |
| Volume H2O @ Silica Gel,(gm): | 1.56 | 9.69 | 13.41 | 13.53 |
| Condensed H2O @ Impingers,(ml.): | 117.0 | 634.0 | 616.0 | 570.0 |
| Total Vol. H2O Collected,(ml.): | 118.56 | 643.69 | 629.41 | 583.53 |

FLUE GAS MOL. WT. & FLOWRATE DATA

| | | | | |
|----------------------------------|--------|--------|--------|--------|
| Area of Flue, (sq. ft.): | 21.65 | 21.65 | 21.65 | 21.65 |
| Pres., Duct, Static, (in. w.g.): | 0.00 | 0.00 | 0.00 | 0.00 |
| Pitobe ID #: | 60-1 | 60-1 | 60-1 | 60-1 |
| Pitot ID #: | 60-1 | 60-1 | 60-1 | 60-1 |
| Pitot Side ID #: | A | A | A | A |
| Pitot Coef., (Cp): | 0.840 | 0.840 | 0.840 | 0.840 |
| Density of Flue Gas, (lb/cf): | 0.0647 | 0.0644 | 0.0648 | 0.0665 |
| Molecular Weight, wet: | 24.980 | 24.868 | 25.032 | 25.672 |

PARTICULATE SAMPLING DATA

| | | | | |
|--------------------------------------|---------|---------|---------|---------|
| Isokinetic Sampling Rate, Final,(%): | 139.59 | 103.82 | 93.58 | 97.80 |
| " Point-by-Point, (Avg., %): | 172.95 | 91.60 | 94.50 | 104.30 |
| " Point-by-Point, (High, %): | 240.00 | 181.80 | 127.20 | 118.60 |
| " Point-by-Point, (Low, %): | 105.90 | 42.50 | 34.10 | 94.70 |
| Filter A ID #: | 7479 | 7482 | 7486 | 7487 |
| B ID #: | N/A | N/A | N/A | N/A |
| Nozzle ID #: | 9.2 | 10.2 | 10.2 | 10.2 |
| Nozzle Diameter, (in.): | 0.28040 | 0.30100 | 0.30100 | 0.30100 |
| Orifice Factor, Del. Ha, (in. w.g.): | 0.940 | 0.940 | 0.940 | 0.940 |
| Sampling Rate Factor, (K3): | 1.75 | 1.52 | 1.50 | 1.62 |

HOLLY SUGAR CORPORATION
SIDNEY, MT FACTORY
OPERATING CONDITIONS

11/10/93

SUMMARY

PULP DRYERS

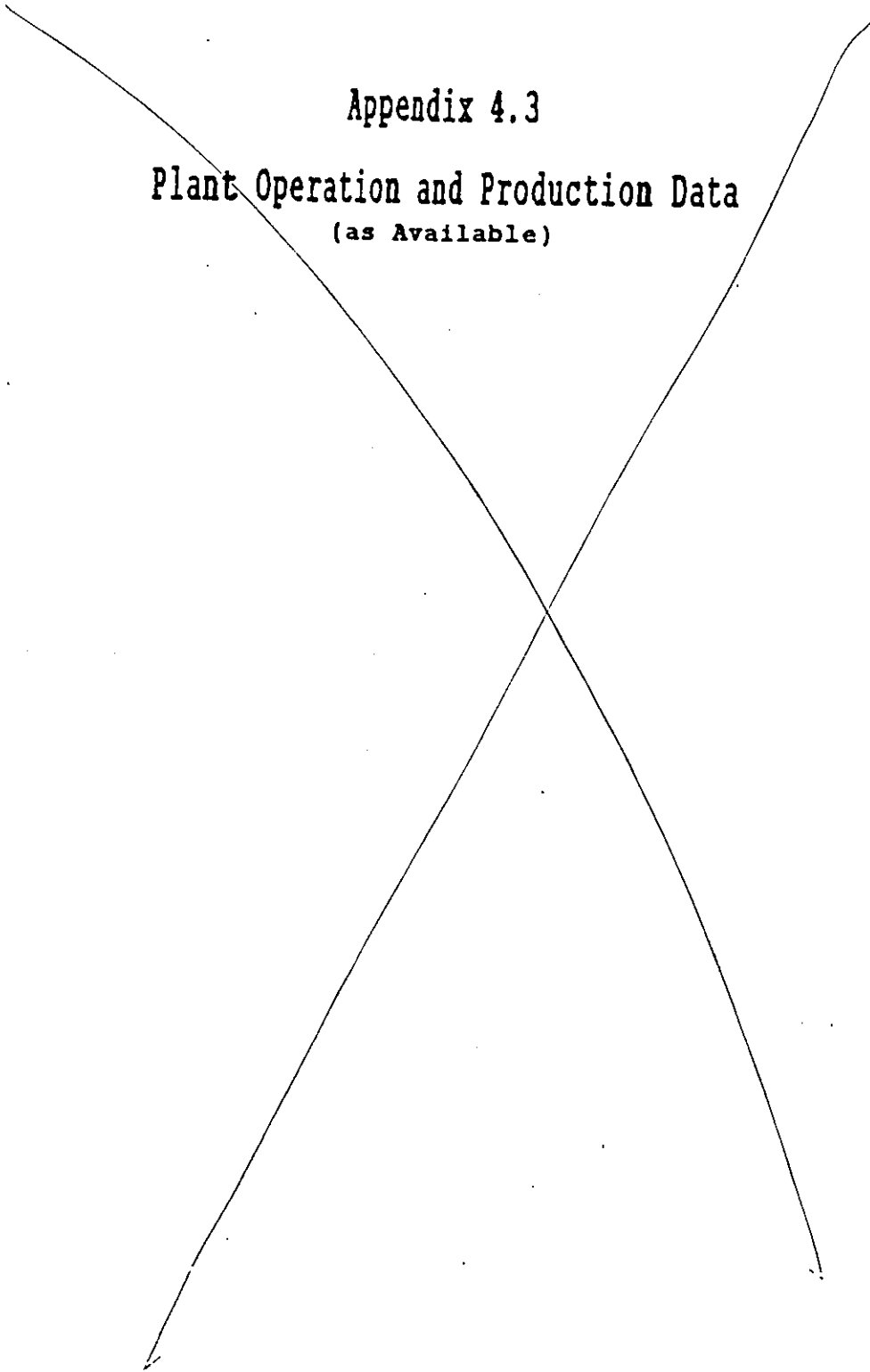
| <u>PULP DRYER No. 1 (South)</u> | <u>TONS WET PULP PER HOUR INPUT</u> | <u>*gallons per hour Fuel Oil Consumed</u> |
|---------------------------------|---|--|
| 10-21-93 RUNS 5101 thru 6101 | 24 | 275* |
| 10-22-93 RUNS 5102 thru 6104 | 25 | 275* |

| <u>PULP DRYER No. 2 (North)</u> | | |
|---------------------------------|----|------|
| 10-23-93 RUNS 7101 thru 8103 | 25 | 275* |

* Data were collected of fuel oil consumed during testing by monitoring elevation changes in the fuel oil storage tank, temperature of the tank, and fuel oil deliveries. All testing was performed with only one unit (2 union boilers + 2 pulp dryers) on fuel oil in an attempt to get accurate information. But calculated fuel oil consumption was highly variable though the process ran steady. Our best estimate of fuel oil consumed is based on recent data on Dryer No. 2 (North) over a number of days of operation with no other units on fuel oil. They had been averaging approx. 275 gph at \approx 225 TPH size rate. The same method of tank measurement was employed, but over periods of days rather than hours. Testing was performed at 220 to 224 TPH size.

Appendix 4.3

Plant Operation and Production Data
(as Available)



Filename: BEET13.WQ1
 Date: 23-Jan-95
 Facility: Holly Sugar Corporation
 Location: Sidney, Montana
 Source: #6 fuel oil-fired pulp dryer with dry scrubber w/skimmer fan and cyclone
 Test date: October 19-23, 1993

D. Emission Data/Mass Flux Rates/Emission Factors

| Test ID | Parameter | Units | Values reported | | | |
|-----------------------------------|----------------------------|--------|-----------------|---------|---------|---------|
| | | | Run 1 | Run 2 | Run 3 | Run 4 |
| 1 | Stack temperature | Deg F | 212.8 | 208.4 | 207.2 | |
| Northeast pulp dryer | Pressure | in. HG | 27.825 | 27.82 | 27.85 | |
| | Moisture | % | 38.5 | 38.86 | 42.53 | |
| | Oxygen | % | 17.09 | 15.36 | 16.59 | |
| | Volumetric flow, actual | acfm | 38539 | 33209 | 34041 | |
| | Volumetric flow, standard* | dscfm | 17298 | 14913 | 14411 | 0 |
| | Isokinetic variation | % | 104.32 | 98.97 | 101.53 | |
| Wet Pulp Feed Rate To Dryer | | TPH | 25 | 25 | 25 | |
| Pollutant concentrations: | | | | | | |
| | Total PM | G/dscf | 0.0876 | 0.068 | 0.1204 | |
| | Total PM-10 | G/dscf | 0.0651 | no data | no data | |
| | Filterable PM | G/dscf | 0.0609 | 0.0596 | 0.0868 | |
| | Condensable inorganic PM | G/dscf | 0.0267 | 0.0084 | 0.0336 | |
| | CO2 | % dv | 4.08 | 4.88 | 4.26 | |
| | SO2 | ppmdv | 34.09 | 70.96 | 39.93 | |
| Pollutant mass flux rates: | | | | | | |
| | Total PM | lb/hr | 13.0 | 8.69 | 14.9 | |
| | Total PM-10 | lb/hr | 9.65 | no data | no data | |
| | Filterable PM | lb/hr | 9.03 | 7.62 | 10.72 | |
| | Condensable inorganic PM | lb/hr | 3.96 | 1.07 | 4.15 | |
| | CO2 | lb/hr | 4837 | 4988 | 4207 | |
| | SO2 | lb/hr | 5.88 | 10.56 | 5.74 | |
| Emission factors (ENGLISH UNITS): | | | | | | AVERAGE |
| | Total PM | lb/ton | 0.520 | 0.348 | 0.595 | 0.487 |
| | Total PM-10 | lb/ton | 0.386 | no data | no data | |
| | Filterable PM | lb/ton | 0.361 | 0.305 | 0.429 | 0.365 |
| | Condensable inorganic PM | lb/ton | 0.158 | 0.043 | 0.166 | 0.122 |
| | Filterable PM-10 | lb/ton | 0.228 | no data | no data | |
| | CO2 | lb/ton | 193 | 200 | 168 | 187 |
| | SO2 | lb/ton | 0.235 | 0.422 | 0.230 | 0.296 |
| Emission factors (METRIC UNITS): | | | | | | AVERAGE |
| | Total PM | kg/Mg | 0.260 | 0.174 | 0.297 | 0.244 |
| | Total PM-10 | kg/Mg | 0.193 | no data | no data | |
| | Filterable PM | kg/Mg | 0.181 | 0.152 | 0.214 | 0.182 |
| | Condensable inorganic PM | kg/Mg | 0.0792 | 0.0215 | 0.0830 | 0.0612 |
| | Filterable PM-10 | kg/Mg | 0.114 | no data | no data | |
| | CO2 | kg/Mg | 96.7 | 99.8 | 84.1 | 93.5 |
| | SO2 | kg/Mg | 0.118 | 0.211 | 0.115 | 0.148 |

*DSCFM BASED ON A STANDARD TEMPERATURE OF 68 DEGREES FAHRENHEIT

TOTAL EMISSION FACTORS-NORTHEAST AND NORTHWEST STACKS

| Emission factors (ENGLISH UNITS): | | | | | | AVERAGE |
|-----------------------------------|--------------------------|--------|------|-------|------|---------|
| | Total PM | lb/ton | 1.1 | 0.95 | 1.2 | 1.1 |
| | *Total PM-10 | lb/ton | 0.77 | 0.72 | 0.67 | 0.72 |
| | Filterable PM | lb/ton | 0.63 | 0.77 | 0.91 | 0.77 |
| | Condensable inorganic PM | lb/ton | 0.42 | 0.19 | 0.26 | 0.29 |
| | Filterable PM-10 | lb/ton | 0.46 | 0.54 | 0.40 | 0.47 |
| | CO2 | lb/ton | 363 | 435 | 366 | 388 |
| | SO2 | lb/ton | 0.47 | 0.95 | 0.47 | 0.63 |
| Emission factors (METRIC UNITS): | | | | | | AVERAGE |
| | Total PM | kg/Mg | 0.53 | 0.48 | 0.58 | 0.53 |
| | *Total PM-10 | kg/Mg | 0.39 | 0.36 | 0.33 | 0.36 |
| | Filterable PM | kg/Mg | 0.32 | 0.38 | 0.45 | 0.38 |
| | Condensable inorganic PM | kg/Mg | 0.21 | 0.093 | 0.13 | 0.15 |
| | Filterable PM-10 | kg/Mg | 0.23 | 0.27 | 0.20 | 0.23 |
| | CO2 | kg/Mg | 182 | 218 | 183 | 194 |
| | SO2 | kg/Mg | 0.23 | 0.47 | 0.23 | 0.31 |

*TOTAL PM-10 DOES NOT INCLUDE CONDENSIBLE ORGANIC PM

Filename: BEET13A.WQ1

Date: 08-Dec-94

Facility: Holly Sugar Corporation

Location: Sidney, Montana

Source: #6 fuel oil-fired pulp dryer with dry scrubber w/skimmer fan and cyclone

Test date: October 19-23, 1993

D. Emission Data/Mass Flux Rates/Emission Factors

| Test ID | Parameter | Units | Values reported | | | |
|-----------------------------------|----------------------------|--------|-----------------|--------|--------|---------|
| | | | Run 1 | Run 2 | Run 3 | Run 4 |
| 1 | Stack temperature | Deg F | 216.1 | 225.9 | 234.1 | |
| Northwest pulp dryer | Pressure | in. HG | 27.825 | 27.82 | 27.85 | |
| | Moisture | % | 34.35 | 34.92 | 32.98 | |
| | Oxygen | % | 15.68 | 15.49 | 16.16 | |
| | Volumetric flow, actual | acfm | 31428 | 39979 | 38709 | |
| | Volumetric flow, standard* | dscfm | 14985 | 18623 | 18369 | 0 |
| | Isokinetic variation | % | 88.41 | 98.97 | 97.37 | |
| Wet Pulp Feed Rate To Dryer | | TPH | 25 | 25 | 25 | |
| Pollutant concentrations: | | | | | | |
| | Total PM | G/dscf | 0.1039 | 0.0946 | 0.0908 | |
| | Total PM-10 | G/dscf | ND | 0.0567 | 0.0529 | |
| | Filterable PM | G/dscf | 0.0524 | 0.0724 | 0.0755 | |
| | Condensable inorganic PM | G/dscf | 0.0515 | 0.0222 | 0.0153 | |
| | Filterable PM-10 | G/dscf | ND | 0.0345 | 0.0376 | |
| | CO2 | % dv | 4.15 | 4.6 | 3.93 | |
| | SO2 | ppmdv | 39.1 | 70.56 | 32.44 | |
| Pollutant mass flux rates: | | | | | | |
| | Total PM | lb/hr | 13.3 | 15.10 | 14.3 | |
| | Total PM-10 | lb/hr | ND | 9.05 | 8.33 | |
| | Filterable PM | lb/hr | 6.73 | 11.56 | 11.89 | |
| | Condensable inorganic PM | lb/hr | 6.61 | 3.54 | 2.41 | |
| | Filterable PM-10 | lb/hr | ND | 5.51 | 5.92 | |
| | CO2 | lb/hr | 4262 | 5871 | 4948 | |
| | SO2 | lb/hr | 5.84 | 13.11 | 5.94 | |
| Emission factors (ENGLISH UNITS): | | | | | | AVERAGE |
| | Total PM | lb/ton | 0.534 | 0.604 | 0.572 | 0.570 |
| | Total PM-10 | lb/ton | ND | 0.362 | 0.333 | 0.348 |
| | Filterable PM | lb/ton | 0.269 | 0.462 | 0.476 | 0.402 |
| | Condensable inorganic PM | lb/ton | 0.265 | 0.142 | 0.096 | 0.168 |
| | Filterable PM-10 | lb/ton | ND | 0.220 | 0.237 | 0.229 |
| | CO2 | lb/ton | 170 | 235 | 198 | 201 |
| | SO2 | lb/ton | 0.234 | 0.524 | 0.238 | 0.332 |
| Emission factors (METRIC UNITS): | | | | | | AVERAGE |
| | Total PM | kg/Mg | 0.267 | 0.302 | 0.286 | 0.285 |
| | Total PM-10 | kg/Mg | ND | 0.181 | 0.167 | 0.174 |
| | Filterable PM | kg/Mg | 0.135 | 0.231 | 0.238 | 0.201 |
| | Condensable inorganic PM | kg/Mg | 0.1323 | 0.0709 | 0.0482 | 0.0838 |
| | Filterable PM-10 | kg/Mg | ND | 0.110 | 0.118 | 0.114 |
| | CO2 | kg/Mg | 85.2 | 117.4 | 99.0 | 100.5 |
| | SO2 | kg/Mg | 0.117 | 0.262 | 0.119 | 0.166 |

*DSCFM BASED ON A STANDARD TEMPERATURE OF 68 DEGREES FAHRENHEIT

Filename: BEET13B.WQ1
 Date: 01-Feb-95
 Facility: Holly Sugar Corporation
 Location: Sidney, Montana
 Source: #6 fuel oil-fired pulp dryer with dry scrubber w/skimmer fan and cyclone
 Test date: October 19-23, 1993

D. Emission Data/Mass Flux Rates/Emission Factors

| Test ID | Parameter | Units | Values reported | | | |
|-----------------------------------|----------------------------|--------|-----------------|--------|--------|--------|
| | | | Run 1 | Run 2 | Run 3 | Run 4 |
| 1 | Stack temperature | Deg F | 222.5 | 219.4 | 213.4 | 211.8 |
| Southeast pulp dryer | Pressure | in. HG | 27.92 | 27.915 | 27.835 | 27.81 |
| | Moisture | % | 41.1 | 37.27 | 27.34 | 42.44 |
| | Oxygen | % | 14.17 | 14.1 | 13.92 | 13.57 |
| | Volumetric flow, actual | acfm | 33584 | 48757 | 39378 | 38003 |
| | Volumetric flow, standard* | dscfm | 14280 | 22177 | 20871 | 15980 |
| | Isokinetic variation | % | 133.75 | 90.19 | 47.3 | 107.13 |
| Wet Pulp Feed Rate To Dryer | | TPH | 24 | 25 | 25 | 25 |
| Pollutant concentrations: | | | | | | |
| Total PM | G/dscf | | 0.1582 | 0.2133 | 0.1089 | 0.1372 |
| Total PM-10 | G/dscf | | 0.0943 | 0.1494 | ND | ND |
| Filterable PM | G/dscf | | 0.1306 | 0.1281 | 0.0705 | 0.1047 |
| Condensable inorganic PM | G/dscf | | 0.0276 | 0.0852 | 0.0384 | 0.0325 |
| Filterable PM-10 | G/dscf | | 0.0667 | 0.0642 | ND | ND |
| CO2 | % dv | | 5.32 | 5.2 | 5.57 | 6.18 |
| SO2 | ppmdv | | 71.31 | 72.19 | 88.02 | 82.43 |
| Pollutant mass flux rates: | | | | | | |
| Total PM | lb/hr | | 19.4 | 40.55 | 19.5 | 18.8 |
| Total PM-10 | lb/hr | | 11.54 | 28.40 | ND | ND |
| Filterable PM | lb/hr | | 15.99 | 24.35 | 12.61 | 14.34 |
| Condensable inorganic PM | lb/hr | | 3.38 | 16.20 | 6.87 | 4.45 |
| Filterable PM-10 | lb/hr | | 8.16 | 12.20 | ND | ND |
| CO2 | lb/hr | | 5207 | 7903 | 7967 | 6768 |
| SO2 | lb/hr | | 10.16 | 15.97 | 18.33 | 13.14 |
| Emission factors (ENGLISH UNITS): | | | | | | |
| Total PM | lb/ton | void | 1.62 | void | 0.752 | 1.19 |
| Total PM-10 | lb/ton | void | 1.136 | void | ND | |
| Filterable PM | lb/ton | void | 0.974 | void | 0.574 | 0.774 |
| Condensable inorganic PM | lb/ton | void | 0.648 | void | 0.178 | 0.413 |
| Filterable PM-10 | lb/ton | void | 0.488 | void | ND | |
| CO2 | lb/ton | void | 316 | void | 271 | 293 |
| SO2 | lb/ton | void | 0.639 | void | 0.526 | 0.582 |
| Emission factors (METRIC UNITS): | | | | | | |
| Total PM | kg/Mg | void | 0.811 | void | 0.376 | 0.593 |
| Total PM-10 | kg/Mg | void | 0.568 | void | ND | |
| Filterable PM | kg/Mg | void | 0.487 | void | 0.287 | 0.387 |
| Condensable inorganic PM | kg/Mg | void | 0.324 | void | 0.0890 | 0.206 |
| Filterable PM-10 | kg/Mg | void | 0.244 | void | ND | |
| CO2 | kg/Mg | void | 158 | void | 135 | 147 |
| SO2 | kg/Mg | void | 0.319 | void | 0.263 | 0.291 |

*DSCFM BASED ON A STANDARD TEMPERATURE OF 68 DEGREES FAHRENHEIT

Run 1 and 3 PM measurements are void because of isokinetics.

TOTAL EMISSION FACTORS FOR SOUTHEAST AND SOUTHWEST STACKS

| Emission factors (ENGLISH UNITS): | | | | | | | AVERAGE |
|-----------------------------------|--------|------|------|------|------|------|---------|
| Total PM | lb/ton | void | 2.2 | 2.2 | 1.8 | 2.1 | |
| *Total PM-10 | lb/ton | void | 2.3 | 1.5 | 1.4 | 1.7 | |
| Filterable PM | lb/ton | void | 1.4 | 1.8 | 1.4 | 1.5 | |
| Condensable inorganic PM | lb/ton | void | 0.80 | 0.38 | 0.46 | 0.55 | |
| Filterable PM-10 | lb/ton | void | 1.5 | 1.1 | 0.97 | 1.2 | |
| CO2 | lb/ton | void | 567 | 532 | 618 | 572 | |
| SO2 | lb/ton | void | 1.2 | 1.2 | 1.1 | 1.2 | |
| Emission factors (METRIC UNITS): | | | | | | | AVERAGE |
| Total PM | kg/Mg | void | 1.1 | 1.1 | 0.92 | 1.0 | |
| *Total PM-10 | kg/Mg | void | 1.1 | 0.73 | 0.71 | 0.86 | |
| Filterable PM | kg/Mg | void | 0.69 | 0.89 | 0.69 | 0.76 | |
| Condensable inorganic PM | kg/Mg | void | 0.40 | 0.19 | 0.23 | 0.27 | |
| Filterable PM-10 | kg/Mg | void | 0.74 | 0.54 | 0.48 | 0.59 | |
| CO2 | kg/Mg | void | 283 | 266 | 309 | 286 | |
| SO2 | kg/Mg | void | 0.62 | 0.62 | 0.57 | 0.60 | |

*TOTAL PM-10 DOES NOT INCLUDE CONDENSIBLE ORGANIC PM IN THIS TEST

Filename: BEET13C.WQ1
 Date: 01-Feb-95
 Facility: Holly Sugar Corporation
 Location: Sidney, Montana
 Source: #6 fuel oil-fired pulp dryer with dry scrubber w/skimmer fan and cyclone
 Test date: October 19-23, 1993

D. Emission Data/Mass Flux Rates/Emission Factors

| Test ID | Parameter | Units | Values reported | | | | |
|-----------------------------------|----------------------------|--------|-----------------|--------|--------|---------|-------|
| | | | Run 1 | Run 2 | Run 3 | Run 4 | |
| 1 | Stack temperature | Deg F | 248.7 | 235.9 | 238.4 | 235.4 | |
| Southwest pulp dryer | Pressure | in. HG | 27.915 | 27.925 | 27.835 | 27.81 | |
| | Moisture | % | 39.08 | 39.88 | 38.51 | 33.7 | |
| | Oxygen | % | 14.12 | 14.08 | 14.37 | 13.7 | |
| | Volumetric flow, actual | acfm | 29735 | 40999 | 42701 | 43148 | |
| | Volumetric flow, standard* | dscfm | 12591 | 17455 | 18467 | 20189 | |
| | Isokinetic variation | % | 139.59 | 103.82 | 93.58 | 97.8 | |
| Wet Pulp Feed Rate To Dryer | | TPH | 24 | 25 | 25 | 25 | |
| Pollutant concentrations: | | | | | | | |
| | Total PM | G/dscf | 0.1276 | 0.0916 | 0.1709 | 0.1585 | |
| | Total PM-10 | G/dscf | ND | ND | 0.1154 | 0.103 | |
| | Filterable PM | G/dscf | 0.0431 | 0.0666 | 0.1409 | 0.1179 | |
| | Condensable inorganic PM | G/dscf | 0.0845 | 0.0250 | 0.0300 | 0.0406 | |
| | Filterable PM-10 | G/dscf | ND | ND | 0.0854 | 0.0624 | |
| | CO2 | % dv | 5.45 | 5.24 | 5.25 | 6.27 | |
| | SO2 | ppmdv | 72.5 | 86.83 | 84.48 | 75.17 | |
| Pollutant mass flux rates: | | | | | | | |
| | Total PM | lb/hr | void | 13.70 | 27.1 | 27.4 | |
| | Total PM-10 | lb/hr | void | ND | 18.3 | 17.8 | |
| | Filterable PM | lb/hr | void | 9.96 | 22.3 | 20.4 | |
| | Condensable inorganic PM | lb/hr | void | 3.74 | 4.75 | 7.03 | |
| | Filterable PM-10 | lb/hr | void | ND | 13.5 | 10.8 | |
| | CO2 | lb/hr | void | 6268 | 6645 | 8675 | |
| | SO2 | lb/hr | void | 15.1 | 15.6 | 15.1 | |
| Emission factors (ENGLISH UNITS): | | | | | | AVERAGE | |
| | Total PM | lb/ton | void | 0.548 | 1.082 | 1.097 | 0.909 |
| | Total PM-10 | lb/ton | void | ND | 0.731 | 0.713 | 0.722 |
| | Filterable PM | lb/ton | void | 0.399 | 0.892 | 0.816 | 0.702 |
| | Condensable inorganic PM | lb/ton | void | 0.150 | 0.190 | 0.281 | 0.207 |
| | Filterable PM-10 | lb/ton | void | ND | 0.541 | 0.432 | 0.486 |
| | CO2 | lb/ton | void | 251 | 266 | 347 | 288 |
| | SO2 | lb/ton | void | 0.605 | 0.623 | 0.606 | 0.611 |
| Emission factors (METRIC UNITS): | | | | | | AVERAGE | |
| | Total PM | kg/Mg | void | 0.274 | 0.541 | 0.549 | 0.455 |
| | Total PM-10 | kg/Mg | void | ND | 0.365 | 0.356 | 0.361 |
| | Filterable PM | kg/Mg | void | 0.199 | 0.446 | 0.408 | 0.351 |
| | Condensable inorganic PM | kg/Mg | void | 0.0748 | 0.0950 | 0.141 | 0.103 |
| | Filterable PM-10 | kg/Mg | void | ND | 0.270 | 0.216 | 0.243 |
| | CO2 | kg/Mg | void | 125 | 133 | 174 | 144 |
| | SO2 | kg/Mg | void | 0.302 | 0.311 | 0.303 | 0.305 |

*DSCFM BASED ON A STANDARD TEMPERATURE OF 68 DEGREES FAHRENHEIT

Run 1 PM measurements are void because of isokinetics.

The Emission Measurement Group, Inc.

Table 1-1
AGENCY, COMPANY, and PLANT INFORMATION

Air Pollution Control Agency *****
 Agency Name: Montana State Department of Health and Environmental Sciences
 Department: Air Quality Bureau
 Address/City: Room A116
 Cogswell Bldg., Helena, MT 59620
 Department Manager: Mr. Jeff Chaffe, Chief, Air Quality Bureau
 Observer Contact: Mr. Brian B. Hohn, Environmental Specialist
 Phone, AC, No., Ext.: 406 444-3454
 Fax: 406 444-1374

Operating Company, Corporate Offices *****
 Company: Holly Sugar Corporation
 Street/City: East Holly Street, Sidney, MT 59270
 Mailing/City: P.O. Box 1168, Sidney, MT 59270
 Contact/Title: Mr. Tom B. Jacobsen, Environmental Engineer
 Phone, AC, No., Ext.: 307 532-7141, Ext.: N/A
 Fax: 307 532-4117(WY)/406-482-5892(MT)

Facility and Plant Process *****
 Facility Name: Sidney, Montana Plant
 Test Location: Sidney, MT
 Mailing/City: P.O. Box 1168, Sidney, MT 59270
 Contact/Title: Mr. Gene Thompson, District/Factory Manager
 Phone, AC, No., Ext.: 406 482-3303
 Directions to Plant: See Protocol, Appendix 4.1.3
 Base Elevation (ft., MSL): 1924
 Processes Tested: C.E. Boilers, Union Boilers & Pulp Dryers
 Stack/Duct ID: C.E. Boiler #1, C.E. Boiler #2
 Unit No(s): Unit 1 (West) and Unit 2 (East)
 Equipment Type: Combustion Engineering Boilers
 Model/S.N.:
 Max. Rated Capacity (MRC): 92500 (Oper.) 95000(Plate)Units: lb/hr steam
 Cap. During Tests, % MRC: >90%
 BTU Rate/hr.: 115 MMBTU/hr each boiler
 Hours of Operation/Year: 4320 hrs (= 180 days/yr @ 24 hrs/day)

| | | |
|--|------------------------|------------------------|
| Process Variables: | ----- (1) ----- | ----- (2) ----- |
| Feed Type: | steam | steam |
| Coal Stoker Feed Rate: | 17400 lbs/hr. | 17400 lbs/hr. |
| Fuel Type: | Lignite Coal | Lignite Coal |
| F _d , (dscf/10 ⁶ BTU): | 9900 (O ₂) | 9900 (O ₂) |
| F _c , (orsat range): | 1.016 - 1.130 | 1.016 - 1.130 |

Air Pollution Control Equipment *****

| | | |
|--------------------|---|--|
| Location: | ---- Primary ---- | ---- Primary ---- |
| Pollutant Removed: | Particulate | SO ₂ |
| Type(s)/Design: | Organ Pipe Dust Collector 6 OPOWHS No. 8-240 | Venturi Anderson 2000 WAV-162 Separator Anderson 2000 VES-162 |

The Emission Measurement Group, Inc.

Table 1-1 - continued
 AGENCY, COMPANY, and PLANT INFORMATION

Stack/Duct ID: Union Boiler #1, Union Boiler #2
 Unit No(s).: Unit 1 (East) and Unit 2 (West)
 Equipment Type: Union Iron Works
 Model/S.N.: S.N.: 23418 S.N.: 23001
 Max. Rated Capacity (MRC): 100,000 lb/hr steam 60,000 lb/hr steam
 Cap. During Tests, % MRC: >90%
 BTU Rate/hr.: 130 MMBTU/hr 83 MMBTU/hr
 Hours of Operation/Year: 4320 hrs (= 180 days/yr @ 24 hrs/day)

Process Variables: ----- (1) ----- ----- (2) -----
 Feed Type: steam steam
 Test Fuel Type #6 Fuel Oil #6 Fuel Oil
 F_d, (dscf/10⁶BTU): 9220 (O₂) 9220 (O₂)
 F_o, (orsat range): 1.260-1.413 1.260-1.413

Air Pollution Control Equipment *****
 Location: ---- Primary ----
 Pollutant Removed: Particulate
 Type(s)/Design:

Stack/Duct ID: Pulp Dryer #1, Pulp Dryer #2
 Unit No(s).: Unit 1 (South) and Unit 2 (North)
 Equipment Type: Coen Co., Model 200 Series
 Model: Style DAZ 30 Style DAZ 34
 Serial Number: S.N.: D3940 S.N.: D6909
 Max. Rated Capacity (MRC): 48.78 Tons wet pulp input/hr
 Cap. During Tests, % MRC: >90%
 BTU Rate/hr.: 95 MMBTU/hr 95 MMBTU/hr
 Hours of Operation/Year: 4320 hrs (= 180 days/yr @ 24 hrs/day)

Process Variables: ----- (1) ----- ----- (2) -----
 Feed Type: wet beet pulp wet beet pulp
 Test Fuel Type #6 Fuel Oil #6 Fuel Oil
 F_d, (dscf/10⁶BTU): 9220 (O₂) 9220 (O₂)
 F_o, (orsat range): 1.260-1.413 1.260-1.413
 Alt. Fuel Type: Nat. Gas Nat. Gas

Air Pollution Control Equipment *****
 Location: ---- Primary ----
 Pollutant Removed: Particulate
 Type(s)/Design: Dry Scrubber w/ Skimmer fans and cyclones
 Model: Mac Equipment

The Emission Measurement Group, Inc.

Table 1-3 (Continued)
 EXECUTIVE SUMMARY of RESULTS
 Holly Sugar Corporation
 Sidney, Montana Plant

| Unit: | Pulp Dryer North ¹ | Pulp Dryer South ¹ |
|---------------------------------------|-------------------------------|-------------------------------|
| Parameter: | | |
| <u>PM-10</u> | | |
| gr./dscf: ² | 0.0597 | 0.1157 |
| lb./hr.: | 18.34 | 38.02 |
| lbs/10 ⁶ BTU: ² | 0.379 | 0.468 |
| TPY: | 39.61 | 82.11 |
| <u>Particulate</u> | | |
| gr./dscf: ² | 0.094 | 0.146 |
| lb./hr.: | 26.44 | 45.03 |
| lbs/10 ⁶ BTU: ² | 0.548 | 0.585 |
| TPY: | 57.10 | 97.27 |
| <u>Sulphur Dioxide</u> | | |
| ppmd: ² | 47.82 | 79.09 |
| lb./hr.: | 15.66 | 28.08 |
| lbs/10 ⁶ BTU: ² | 0.310 | 0.367 |
| TPY: | 33.83 | 60.64 |

¹ Totals from both stacks on each dryer.

² Weighed average of both stacks on each dryer with respect to DSCFM.

The Emission Measurement Group, Inc.

Table 2-1 (Continued)
 SUMMARY of PROCESS & EMISSION MEASUREMENT RESULTS
 Sidney, Montana Plant

| Stack/Duct ID: | Pulp Dryer-Northeast ¹ | Pulp Dryer-Northwest |
|--|-----------------------------------|----------------------|
| Plant Process and Production Results ***** | | |
| Feed Rate, TPH: | 25 | 25 |
| Particulate Emission Results ***** | | |
| gr./dscf: | 0.0691 | 0.0668 |
| gr./acf: | 0.0303 | 0.0315 |
| lbs./hr.: | 9.12 | 10.06 |
| lbs./10 ⁶ BTU: | 0.430 | 0.361 |
| lbs./Ton: | 0.365 | 0.402 |
| Tons/Year: | 19.71 | 21.73 |
| PM-10 Emission Results ***** | | |
| gr./dscf: | 0.0651 | 0.0548 |
| gr./acf: | 0.0292 | 0.0258 |
| lbs./hr.: | 9.65 | 8.69 |
| lbs./10 ⁶ BTU: | 0.470 | 0.298 |
| lbs./Ton: | 0.386 | 0.348 |
| Tons/Year: | 20.84 | 18.77 |
| Total Particulate Emission Results ***** | | |
| gr./dscf: | 0.0920 | 0.0964 |
| gr./acf: | 0.0403 | 0.0456 |
| lbs./hr.: | 12.19 | 14.25 |
| lbs./10 ⁶ BTU: | 0.580 | 0.519 |
| lbs./Ton: | 0.49 | 0.57 |
| Tons/Year: | 26.32 | 30.78 |
| Sulfur Dioxide (SO ₂) Emission Results ***** | | |
| ppm, (dry, v/v): | 48.32 | 47.37 |
| ppm, (wet, v/v): | 29.10 | 31.11 |
| lbs./hr.: | 7.378 | 8.283 |
| lbs./10 ⁶ BTU: | 0.3305 | 0.2919 |
| lbs./Ton: | 0.30 | 0.33 |
| Tons/Year: | 15.94 | 17.89 |
| Parametric (Non-Pollutant) Flue Gas Results ***** | | |
| Pressure, Velocity, | | |
| Delta P, (in. w.g.): | 0.1482 | 0.1616 |
| Moisture, (% w/w): | 39.97 | 34.08 |
| CO ₂ , Inst, (% dry, v/v): | 4.41 | 4.23 |
| O ₂ , Inst., (% dry, v/v): | 16.34 | 15.78 |
| Temp. of Stack, (°F): | 209.5 | 225.4 |
| Velocity, (fps): | 27.15 | 28.26 |
| Vol. Flow, (DSCFM): | 15540 | 17326 |
| Vol. Flow, (ACFM): | 35263 | 36705 |

¹ Average of all valid test runs, see Tables 3-6 and 3-7.

The Emission Measurement Group, Inc.

Table 2-1 (Continued)
 SUMMARY of PROCESS & EMISSION MEASUREMENT RESULTS
 Sidney, Montana Plant

| Stack/Duct ID: | Pulp Dryer-Southeast ¹ | Pulp Dryer-Southwest |
|--|-----------------------------------|----------------------|
| Plant Process and Production Results ***** | | |
| Feed Rate, TPH: | 24.8 | 24.8 |
| Particulate Emission Results ***** | | |
| gr./dscf: | 0.1085 | 0.0921 |
| gr./acf: | 0.0488 | 0.0407 |
| lbs./hr.: | 16.82 | 14.33 |
| lbs./10 ⁶ BTU: | 0.431 | 0.372 |
| lbs./Ton: | 0.679 | 0.575 |
| Tons/Year: | 36.33 | 30.95 |
| PM-10 Emission Results ***** | | |
| gr./dscf: | 0.1218 | 0.1092 |
| gr./acf: | 0.0540 | 0.0491 |
| lbs./hr.: | 19.97 | 18.05 |
| lbs./10 ⁶ BTU: | 0.495 | 0.440 |
| lbs./Ton: | 0.808 | 0.722 |
| Tons/Year: | 43.13 | 38.98 |
| Total Particulate Emission Results ***** | | |
| gr./dscf: | 0.1544 | 0.1372 |
| gr./acf: | 0.0699 | 0.0603 |
| lbs./hr.: | 24.54 | 20.49 |
| lbs./10 ⁶ BTU: | 0.614 | 0.554 |
| lbs./Ton: | 0.99 | 0.83 |
| Tons/Year: | 53.01 | 44.26 |
| Sulfur Dioxide (SO ₂) Emission Results ***** | | |
| ppm, (dry, v/v): | 78.49 | 79.74 |
| ppm, (wet, v/v): | 49.67 | 49.54 |
| lbs./hr.: | 14.371 | 13.705 |
| lbs./10 ⁶ BTU: | 0.3602 | 0.3741 |
| lbs./Ton: | 0.58 | 0.55 |
| Tons/Year: | 31.04 | 29.60 |
| Parametric (Non-Pollutant) Flue Gas Results ***** | | |
| Pressure, velocity, Delta P, (in. w.g.): | 0.1943 | 0.1804 |
| Moisture, (% w/w): | 37.04 | 37.80 |
| CO ₂ , Inst, (% dry, v/v): | 5.57 | 5.55 |
| O ₂ , Inst., (% dry, v/v): | 13.94 | 14.07 |
| Temp. of Stack, (°F): | 216.8 | 239.6 |
| Velocity, (fps): | 30.74 | 30.14 |
| Vol. Flow, (DSCFM): | 18327 | 17175 |
| Vol. Flow, (ACFM): | 39930 | 39146 |

¹ Average of all valid test runs, see Tables 3-6 and 3-7.

PULP DRYER No. 1 (South)

| DATE | TIME | BELT COUNTER | WET PULP TO DRYER | FUEL OIL LEVEL READING | FUEL CONSUMED | COMMENTS |
|--|------|--------------|-------------------|------------------------|------------------------|----------|
| 10-21-93 | 1938 | — | — | 9'5 1/16" @ 46° | | |
| | 1947 | 0211 | | — | | |
| | 2036 | 0391 | | — | | |
| | 2044 | — | — | 9'5 1/16" @ 47 | | |
| | 2151 | 0668 | | — | | |
| | 2200 | — | — | 9'6" @ 44 | | |
| $(668 - 391) \times .9945 \times .0599 = 16.5$ | | | Tons Dry Pulp | | (Slice Rate = 220 TPH) | |
| $\% \text{ Moisture in dry pulp} =$ | | | 11.27% | | | |
| $\% \text{ Moisture in wet pulp} =$ | | | 76.03% | | | |
| $\frac{16.5 \times (1.00 - .1127)}{(1.00 - .7603)} \div \left(\frac{2151 \text{ hrs} - 2036 \text{ hrs}}{75 \text{ min.}} \right) \times 60 \text{ min} \div 2 \text{ pulp dryers} =$ | | | | | 24 TPH | |

1. Approx. 50% split on wet pulp to two dryers.
2. WET PULP () = 24 TPH 4.3.3

PULP DRYER No. 1 (South)

| DATE | TIME | BELT COUNTER | WET PULP TO DRYER | FUEL OIL LEVEL READING | FUEL CONSUMED | COMMENTS |
|---|------|--------------|-------------------|------------------------|---------------|---|
| 10-22-93 | 0941 | — | — | 9' 4 5/8" @ 440 | | |
| | 0954 | 3268 | | — | | |
| | 1009 | 3327 | | — | | |
| | 1040 | 3444 | | — | | 15.3 barrels (42 gal.) No. 6 Fuel Oil added to storage. |
| | 1049 | — | — | 9' 1 7/8" @ 45 | | |
| | 1151 | 3707 | | — | | |
| | 1333 | 4091 | | — | | |
| | 1456 | — | — | 9' 3 1/2" @ 49 | | |
| | 1505 | 4432 | | — | | |
| | 1609 | 4671 | | — | | |
| | 1630 | — | — | 9' 4" @ 50 | | |
| | 1714 | 4918 | | — | | |
| | 1834 | 5219 | | — | | |
| | 1938 | — | — | 9' 5 5/16" @ 47 | | |
| | 1947 | 5491 | | — | | |
| | 2112 | 5812 | | — | | |
| | 2118 | — | — | 9' 5 15/16" @ 46 | | |
| | 2214 | — | — | 9' 6 7/8" @ 46 | | |
| | 2222 | 6068 | | — | | |
| <p>correction factor scale % pulp on beet estimate (6068 - 3268) * .9745 * .0577 = 166.8 tons Dry Pulp (since pulp = 222 TPH)</p> <p>% Moisture in dry pulp = 10.74% % Moisture in wet pulp = 76.03%</p> <p>166.8 * (1.00 - .1074) / (1.00 - .7603) = 222 lbs - 0954 hrs ÷ (748 min) * 60 min. ÷ 2 pulp dryers = 25 TPH</p> | | | | | | |

1. Approx. 50% split on wet pulp to two dryers.

2. WET PULP @ = 25 TPH 4.3.4

PULP DRYER No. 2 (NORTH)

| DATE | TIME | BELT COUNTER | WET PULP TO DRYER | FUEL OIL LEVEL READING | FUEL CONSUMED | COMMENTS |
|----------|------|--------------|-------------------|--|---------------|---|
| 10-23-93 | 0830 | — | — | 9' 10 ¹⁵ / ₁₆ " @ 4690 | | |
| | 0836 | 8218 | | — | | |
| | 1029 | 8637 | | — | | fuel oil added to tank (tech. Services will have quantity). |
| | 1033 | — | — | 9' 2 ¹ / ₈ " @ 49 | | |
| | 1134 | 8881 | | — | | |
| | 1235 | 9112 | | — | | |
| | 1240 | — | — | 9' 2 ⁷ / ₈ " @ 52 | | |
| | 1350 | 9396 | | — | | |
| | 1454 | 9640 | | — | | |
| | 1504 | — | — | 9' 3 ³ / ₄ " @ 47 | | |
| | 1616 | 9954 | | — | | |
| | 1713 | 0173 | | — | | COUNTER TURNED OVER. 46 + 173 = 219. |
| | 1721 | — | — | 9' 4 ³ / ₁₆ " @ 48 | | |
| | 1835 | 0475 | | | | |
| | 1900 | 0566 | | | | |
| | 1953 | 0764 | | | | |
| | 2001 | — | — | 9' 5 ⁹ / ₁₆ " @ 48 | | |
| | 2056 | 0999 | | — | | |
| | 2142 | 1168 | | — | | |
| | 2150 | — | — | 9' 6 ⁷ / ₈ " @ 47 | | (Slice Rate = 224 TPH) |
| | | | | | | % Moisture in dry pulp = 11.26% |
| | | | | | | % Moisture in wet pulp = 75.80% |
| | | | | | | pulp dryers = 25 TPH |
| | | | | | | |

1. Approx. 50% split on wet pulp to two dryers.

2. WET PULP (C) = 25 TPH @ 4.35

11/10/43

Union Boilers

Recent attempts at estimating fuel oil consumed during stack testing of the pulp dryers indicate that data collected on fuel oil consumption during testing of the Union Boilers may also be highly variable. The only means the factory has for estimating fuel oil consumption is by measuring of tank level changes by use of a float in the storage tank and chain. This provides good information over long periods of time, but does not appear to be accurate over a short period of time.

The factory switched to fuel oil on each unit (one at a time) for each stack test to better able to measure fuel oil consumption. Consequently we do not have a series of 24 hour days of operation for each fuel oil operated piece of equipment to estimate fuel oil consumption accurately.

~~HM/BD/WR~~

The C.E. Boilers were tested at 90% of operating capacity (92,500 LBS/HR Steam).
Name plate capacity = 95,000.

The No. 3 Union Boiler (East) was run at approximately 77% of rated capacity. This unit was tested at conditions above which it is normally operated.

The No. 4 Union Boiler (West) was run at approximately 88% of rated capacity. This unit was tested at conditions above which it is normally operated.

Pulp dryers were tested at approximately 90+% of what is currently expected to be fed to these units based on the beet slicing rate ~~at the factory~~ currently being seen at the factory. It is assumed that approx. 50% of the wet pulp goes to each drier (based on factory personnel knowledge).

OPERATING CONDITION SUMMARY

| <u>C.E. BOILERS</u> | <u>LBS/HR STEAM</u> | <u>STEAM % OPERATING CAPACITY</u> | <u>LBS. COAL PER HOUR</u> |
|---------------------------|-------------------------|---|--------------------------------------|
| <u>No. 1 (WEST)</u> | | | |
| Run 1101 | 83,882 | 90.7 | 15,099 |
| 1102 | 82,920 | 89.6 | 14,926 |
| 1103 | 83,680 | 90.5 | 15,062 |
| <u>No. 2 (EAST)</u> | | | |
| Run 2101 | 85,047 | 91.9 | 15,308 |
| 2102 | 83,927 | 90.7 | 15,107 |
| 2103 | 83,360 | 90.1 | 15,005 |
| <u>UNION BOILERS</u> | <u>LBS/HR STEAM</u> | <u>STEAM % OPERATING CAPACITY</u> | <u>FUEL OIL (No. 6) CONSUMED</u> |
| <u>No. 4 UNION (WEST)</u> | | | |
| Run 3101 | 52,176 | 87.0 | 395 gallons/hour |
| 3102 | 53,591 | 89.3 | OVER 3 runs. |
| 3103 | 52,778 | 88.0 | |
| <u>No. 3 UNION (EAST)</u> | | | |
| Run 4101 | 77,474 | 77.5 | 583 gal./hr. |
| 4102 | 78,632 | 78.6 | over 4 runs |
| 4103 | 77,424 | 77.4 | |
| 4104 | 76,000 | 76.0 | |