



## SUMMARY

On April 25, 2002, Environmental Technology & Engineering Corp. personnel performed stack emissions testing at the Western Lime Corporation Green Bay Plant. The tests were performed as a provision of an Air Pollution Control Permit issued by the State of Wisconsin Department of Natural Resources. Tests were performed on the baghouse used to control the emissions from kiln no. 2 designated as S18 in order to determine compliance with the applicable particulate, carbon monoxide, nitrogen oxide, and sulfur dioxide emission limitations. All measured emissions and the permit limits are shown in the following tables:

TEST NO.	PARTICULATE	CO	NOx	SO2
1	0.081 lb/tstone	16.3 lb/hr	45.0 lb/hr	1.13 lb/hr
2	0.071	25.9	42.4	1.45
3	0.070	25.4	42.3	1.20
AVERAGE	0.074 lb/tstone	22.5 lb/hr	43.2 lb/hr	1.26 lb/hr
DNR LIMIT	0.12	102.0	60.0	10.0
% OF LIMIT	61.7 %	22.1 %	72 %	12.6 %

The DNR limits have been calculated based on a stone feed rate of 39.97 tons per hour.

\*This was a retest from 02/14/2002

CC Central Office - AM/7

Randy Matty - NER

Jim Crawford - NER

US EPA Region V

file

PARTICULATE CHECKLIST

Name of Source: Western Lime

Test Date: 04/04/2002

1. Are the isokinetics per run between 90 and 110%? YES X NO     
If the %I for a run is outside the range, void the run. See 5.
2. Is the sample volume per run  $\geq$  30 DSCF? YES X NO     
If the sample volume for a run is  $<$  30 DSCF, void the run. See 5.
3. Is the sample time per run  $\geq$  60 min.? YES X NO     
If the sample time for a run is  $<$  60 min., void the run. See 5.
4. Is the sample time per sample point  $\geq$  two min.? YES X NO     
If the sample time per point for a run is  $<$  two min., void the run. See 5.
5. A stack test shall consist of three valid runs or, at a minimum, two valid runs if one run is voided. Is this a valid test? YES X NO     
If no, inform the Region or the source that the test is unacceptable and should be redone. Your review is over.
6. Is the total particulate per run added correctly? YES X NO     
If an incorrect total is found, correct the total and the results or call the consultant and ask for a correction.
7. Was the backhalf included in the total particulate? YES X NO     
NSPS sources are exempt from including the backhalf. All other sources must include the backhalf. If they don't, the test is invalid. See 5.

Eq. 1  $Gr/DSCF = 15.43 * g \text{ of part./sample volume of run in DSCF}$

Eq. 2  $Gr/DSCF @ 12\% CO_2 = (Gr/DSCF) * 12 / \text{Stack } CO_2$

Eq. 3  $Gr/DSCF @ 7\% O_2 = (Gr/DSCF) * (20.9 - 7) / (20.9 - \text{Stack } O_2)$

Eq. 4  $Lb/DSCF = (Gr/DSCF) / 7000$     Eq. 5  $Lb/MLb_{DRY} = 385.6 * 10^3 * (Lb/DSCF) / MW_{DRY}$

Eq. 6  $Lb/MLb_{WET} = 385.6 * 10^3 * (Lb/DSCF) * (1 - (\% \text{ Moisture} / 100)) / MW_{WET}$

Eq. 7  $Lb/Hr = 60 * DSCFM * (Lb/DSCF)$     Eq. 8  $Lb/10^6 \text{ BTU} = (Lb/Hr) / (10^6 \text{ BTU/Hr})$

Eq. 9  $Lb/10^6 \text{ BTU} = (Lb/DSCF) * F \text{ Factor} * 20.9 / (20.9 - \text{Stack } O_2)$

8. If the emission limit is in Gr/DSCF, Lb/DSCF, Lb/MLb, Lb/Hr or Lb/10<sup>6</sup> BTU, solve the needed Eq. Do your results match the consultant's? YES X NO     
If no, fix the problem or call the consultant for a correction.
9. Is the three run(or two run) average correct? YES X NO     
If no, write in the correct average.
10. Is the average result in compliance? YES X NO     
If no, the Region should take appropriate action.
11. Was the source operating at a level representative of capacity? YES X NO     
If no, the Region may cap the source at the test level until a stack test at a higher production level (showing compliance) is performed.

GASEOUS TEST CHECKLIST

Name of Source: Western Lime Gas Tested: CO Test Date: 04/04/2002

1. A stack test shall consist of three valid runs or, at a minimum, two valid runs if one run is voided. Is this a valid test? YES X NO     
 If no, inform the Region or the source that the test is unacceptable and should be redone. Your review is over.

Eq. 1  $PPM_{DRY} = PPM_{WET} / (1 - \% \text{ Moisture as Decimal})$

Eq. 2  $PPM_{DRY@ 7\% O_2} = PPM_{DRY} * (20.9 - 7) / (20.9 - \text{Stack } O_2)$

Eq. 3  $PPM_{DRY@ 12\% CO_2} = PPM_{DRY} * 12 / \text{Stack } CO_2$

2. If the limit is in  $PPM_{DRY}$  or in  $PPM_{DRY}$  corrected to a certain  $O_2$  or  $CO_2$  value, solve Eq. 1-3. Do your results match the consultant's? YES    NO     
 If no, fix the problem or call the consultant for a correction.

Eq. 4  $mg/DSCM = PPM_{DRY} * \text{Molecular Weight of Gas} / 24.06$

Eq. 5  $Lb/DSCF = 2.595 * 10^{-9} * PPM_{DRY} * \text{Molecular Weight of Gas}$

Eq. 6  $Lb/DSCF = 6.243 * 10^{-8} * (mg/DSCM)$

**Eq. 7  $Lb/Hr = 60 * DSCFM * (Lb/DSCF)$**  Eq. 8  $Lb/10^6 \text{ BTU} = (Lb/Hr) / (10^6 \text{ BTU/Hr})$

Eq. 9  $Lb/10^6 \text{ BTU} = (Lb/DSCF) * F \text{ Factor} * 20.9 / (20.9 - \text{Stack } O_2)$

3. If the limit is in  $mg/DSCM$ ,  $Lb/DSCF$ ,  $Lb/Hr$ , or  $Lb/10^6 \text{ BTU}$ , solve the needed Eq. Eq. 1-3 may also be needed. Do your results match the consultant's? YES X NO     
 If no, fix the problem or call the consultant for a correction.

Eq. 10  $\% \text{ Capture Eff.} = \frac{(Lb \text{ VOC/Hr to Control Equip.}) * 100}{(Lb \text{ VOC/Hr Input to Process})}$

Eq. 11  $\% \text{ Destruction Eff.} = \frac{(\text{Inlet } Lb \text{ VOC/Hr} - \text{Outlet } Lb \text{ VOC/Hr}) * 100}{(\text{Inlet } Lb \text{ VOC/Hr})}$

Eq. 12  $\% \text{ Overall Eff.} = (\% \text{ Cap. Eff.} / 100) * (\% \text{ Dest. Eff.} / 100) * 100$

4. If the limit is in terms of  $\% \text{ Capture Eff.}$ ,  $\% \text{ Dest. Eff.}$ , or  $\% \text{ Overall Eff.}$ , solve the needed Eq. Eq. 1-9 may also be needed. Do your results match the consultant's? YES    NO     
 If no, fix the problem or call the consultant for a correction.

5. Is the three run (or two run) average correct? YES X NO     
 If no, write in the correct average.

6. Is the average result in compliance? YES X NO     
 If no, the Region should take appropriate action.

7. Was the source operating at a level representative of capacity? YES X NO     
 If no, the Region may cap the source at the test level until a stack test at a higher production level (showing compliance) is performed.

GASEOUS TEST CHECKLIST

Name of Source: Western Lime Gas Tested: NOx Test Date: 04/04/2002

1. A stack test shall consist of three valid runs or, at a minimum, two valid runs if one run is voided. Is this a valid test? YES X NO     
 If no, inform the Region or the source that the test is unacceptable and should be redone. Your review is over.

Eq. 1  $PPM_{DRY} = PPM_{WET} / (1 - \% \text{ Moisture as Decimal})$

Eq. 2  $PPM_{DRY@ 7\% O_2} = PPM_{DRY} * (20.9 - 7) / (20.9 - \text{Stack } O_2)$

Eq. 3  $PPM_{DRY@ 12\% CO_2} = PPM_{DRY} * 12 / \text{Stack } CO_2$

2. If the limit is in  $PPM_{DRY}$  or in  $PPM_{DRY}$  corrected to a certain  $O_2$  or  $CO_2$  value, solve Eq. 1-3. Do your results match the consultant's? YES    NO     
 If no, fix the problem or call the consultant for a correction.

Eq. 4  $mg/DSCM = PPM_{DRY} * \text{Molecular Weight of Gas} / 24.06$

Eq. 5  $Lb/DSCF = 2.595 * 10^{-9} * PPM_{DRY} * \text{Molecular Weight of Gas}$

Eq. 6  $Lb/DSCF = 6.243 * 10^{-8} * (mg/DSCM)$

**Eq. 7  $Lb/Hr = 60 * DSCFM * (Lb/DSCF)$**     Eq. 8  $Lb/10^6 \text{ BTU} = (Lb/Hr) / (10^6 \text{ BTU/Hr})$

Eq. 9  $Lb/10^6 \text{ BTU} = (Lb/DSCF) * F \text{ Factor} * 20.9 / (20.9 - \text{Stack } O_2)$

3. If the limit is in mg/DSCM, Lb/DSCF, Lb/Hr, or Lb/10<sup>6</sup> BTU, solve the needed Eq. Eq. 1-3 may also be needed. Do your results match the consultant's? YES X NO     
 If no, fix the problem or call the consultant for a correction.

Eq. 10  $\% \text{ Capture Eff.} = \frac{(Lb \text{ VOC/Hr to Control Equip.}) * 100}{(Lb \text{ VOC/Hr Input to Process})}$

Eq. 11  $\% \text{ Destruction Eff.} = \frac{(\text{Inlet } Lb \text{ VOC/Hr} - \text{Outlet } Lb \text{ VOC/Hr}) * 100}{(\text{Inlet } Lb \text{ VOC/Hr})}$

Eq. 12  $\% \text{ Overall Eff.} = (\% \text{ Cap. Eff.} / 100) * (\% \text{ Dest. Eff.} / 100) * 100$

4. If the limit is in terms of % Capture Eff., % Dest. Eff., or % Overall Eff., solve the needed Eq. Eq. 1-9 may also be needed. Do your results match the consultant's? YES    NO     
 If no, fix the problem or call the consultant for a correction.

5. Is the three run (or two run) average correct? YES X NO     
 If no, write in the correct average.

6. Is the average result in compliance? YES X NO     
 If no, the Region should take appropriate action.

7. Was the source operating at a level representative of capacity? YES X NO     
 If no, the Region may cap the source at the test level until a stack test at a higher production level (showing compliance) is performed.

GASEOUS TEST CHECKLIST

Name of Source: Western Lime Gas Tested: SO<sub>2</sub> Test Date: 04/04/2002

1. A stack test shall consist of three valid runs or, at a minimum, two valid runs if one run is voided. Is this a valid test? YES X NO     
 If no, inform the Region or the source that the test is unacceptable and should be redone. Your review is over.

Eq. 1  $PPM_{DRY} = PPM_{WET} / (1 - \% \text{ Moisture as Decimal})$

Eq. 2  $PPM_{DRY@ 7\% O_2} = PPM_{DRY} * (20.9 - 7) / (20.9 - \text{Stack } O_2)$

Eq. 3  $PPM_{DRY@ 12\% CO_2} = PPM_{DRY} * 12 / \text{Stack } CO_2$

2. If the limit is in  $PPM_{DRY}$  or in  $PPM_{DRY}$  corrected to a certain  $O_2$  or  $CO_2$  value, solve Eq. 1-3. Do your results match the consultant's? YES    NO     
 If no, fix the problem or call the consultant for a correction.

Eq. 4  $mg/DSCM = PPM_{DRY} * \text{Molecular Weight of Gas} / 24.06$

Eq. 5  $Lb/DSCF = 2.595 * 10^{-9} * PPM_{DRY} * \text{Molecular Weight of Gas}$

Eq. 6  $Lb/DSCF = 6.243 * 10^{-8} * (mg/DSCM)$

**Eq. 7  $Lb/Hr = 60 * DSCFM * (Lb/DSCF)$**  Eq. 8  $Lb/10^6 \text{ BTU} = (Lb/Hr) / (10^6 \text{ BTU/Hr})$

Eq. 9  $Lb/10^6 \text{ BTU} = (Lb/DSCF) * F \text{ Factor} * 20.9 / (20.9 - \text{Stack } O_2)$

3. If the limit is in mg/DSCM, Lb/DSCF, Lb/Hr, or Lb/10<sup>6</sup> BTU, solve the needed Eq. Eq. 1-3 may also be needed. Do your results match the consultant's? YES X NO     
 If no, fix the problem or call the consultant for a correction.

Eq. 10  $\% \text{ Capture Eff.} = \frac{(Lb \text{ VOC/Hr to Control Equip.}) * 100}{(Lb \text{ VOC/Hr Input to Process})}$

Eq. 11  $\% \text{ Destruction Eff.} = \frac{(\text{Inlet Lb VOC/Hr} - \text{Outlet Lb VOC/Hr}) * 100}{(\text{Inlet Lb VOC/Hr})}$

Eq. 12  $\% \text{ Overall Eff.} = (\% \text{ Cap. Eff.} / 100) * (\% \text{ Dest. Eff.} / 100) * 100$

4. If the limit is in terms of % Capture Eff., % Dest. Eff., or % Overall Eff., solve the needed Eq. Eq. 1-9 may also be needed. Do your results match the consultant's? YES    NO     
 If no, fix the problem or call the consultant for a correction.

5. Is the three run (or two run) average correct? YES X NO     
 If no, write in the correct average.

6. Is the average result in compliance? YES X NO     
 If no, the Region should take appropriate action.

7. Was the source operating at a level representative of capacity? YES X NO     
 If no, the Region may cap the source at the test level until a stack test at a higher production level (showing compliance) is performed.