



APPLIED ENVIRONMENTAL SCIENCES, INC.

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January 15, 1993

Mr. Paul Maliszewski
FPC Great Lakes
1001 West Glen Oaks Lane, Ste 241
Mequon, Wisconsin 53092

RE: Laidlaw Transit Inc. Vehicle Measurements Summary

Dear Mr. Maliszewski:

Attached are two copies of the Vehicle Measurements summary report covering the field measurements conducted at the Laidlaw Transit, Inc. West Allis, Wisconsin operations. This test report and the attached table indicate the following:

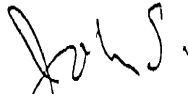
1. The fleet of six school buses tested had an average fuel economy improvement as measured by the carbon balance method, of 6.95 %.
2. Hydrocarbon emissions decreased in all six vehicles as a result of treatment with the FPC-1 catalyst.
3. Calculated hydrocarbon mass emissions decreases for these vehicles ranged from 9.5 - 30.9 lbs/yr (as carbon).

Based on the above hydrocarbon emissions decreases, a fleet of 500 buses could generate as much as 9 tons per year of hydrocarbon emissions reduction credits, which could be sold, retained for use at other Laidlaw facilities, or offered to the State of Wisconsin. While an exact market value has not been set for these credits, a typical price would be \$2,000 - \$4,000 per ton.

In addition, use of the FPC-1 catalyst reduced particulate matter (exhaust smoke) by an average of 17 % in the Laidlaw fleet. I would be very interesting in approaching the Wisconsin DNR regarding the possibility of obtaining emissions offset credits for Laidlaw, using the results summarized in the attached report. Please contact me if you have any questions regarding this information.

Very truly yours,

Applied Environmental Sciences, Inc.



John S. Flickinger

Principal Scientist

SCIENCE - ENGINEERING - MANAGEMENT

**Comparison of Hydrocarbon (HC) Mass Emissions¹
Laidlaw Transit Inc./Mayflower Bus Company and Green Bay**

<u>Vehicle #</u>	<u>Type</u>	<u>Baseline HC (g/sec)</u>	<u>Treated HC (g/sec)</u>	<u>Decrease² (g/s)</u>	<u>Decrease³ (lbs/yr)</u>
164	School Bus	.0131	.0120	.0009	21.4
167	School Bus	.0078	.0074	.0007	16.7
262	School Bus	.0091	.0085	.0005	11.9
266	School Bus	.0078	.0074	.0004	9.5
1082	School Bus	.0088	.0075	.0013	30.9
1085	School Bus	.0101	.0093	.0008	19.0
43	School Bus	.0049	.00050	<.0001 ⁴	-
584	School Bus	.0047	.0049	- .0005 / .0001 ⁵	-
586	School Bus	.0042	.0039	.0003	7.1
1249	School Bus	.0032	.0022	.0010	23.8

1299	School Bus	.0055	.0047	.0007	16.6
1358	School Bus	.0050	.0044	.0006	14.3
1935	School Bus	.0050	.0040	.0012	28.5
3782	School Bus	.0084	.0078	.0006	14.3

- 1 Hydrocarbon mass emissions are expressed as "carbon". Equivalent mass emissions as hydrocarbons (assuming that exhaust hydrocarbons have the same H/C ratio as hexane) is obtained by multiplying the "as carbon" emissions by 1.19.
- 2 This is the average per vehicle decrease in g/sec between the baseline and treated test periods.
- 3 This is the annual per vehicle decrease, assuming an annual run time of 3,000 hrs/yr.
- 4 One of the five baseline tests recorded had a low measured HC concentration which was eliminated from the data set as an outlier.
- 5 Test run HC reductions ranged from -0.0005 to 0.0001 in the four recorded tests.