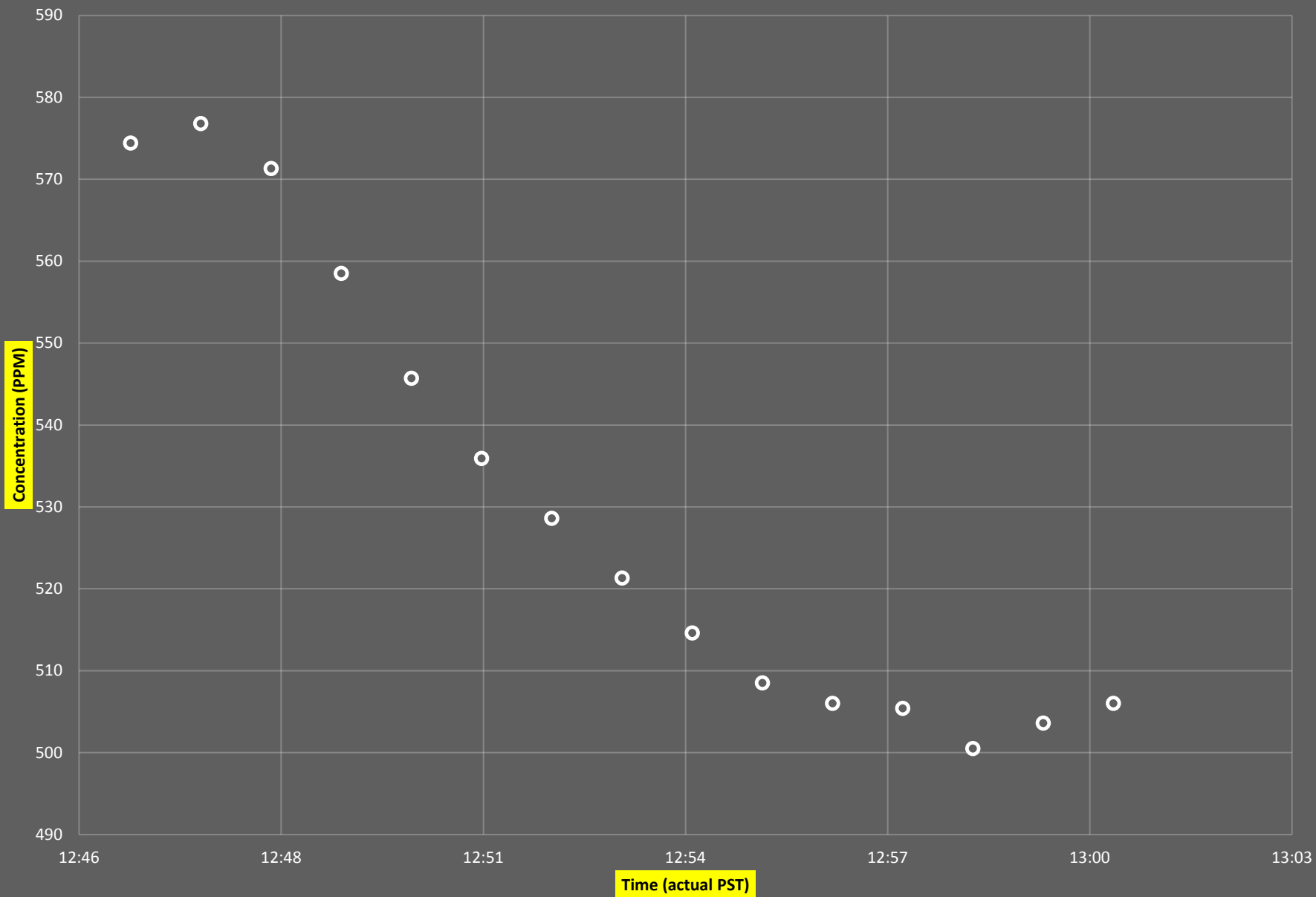
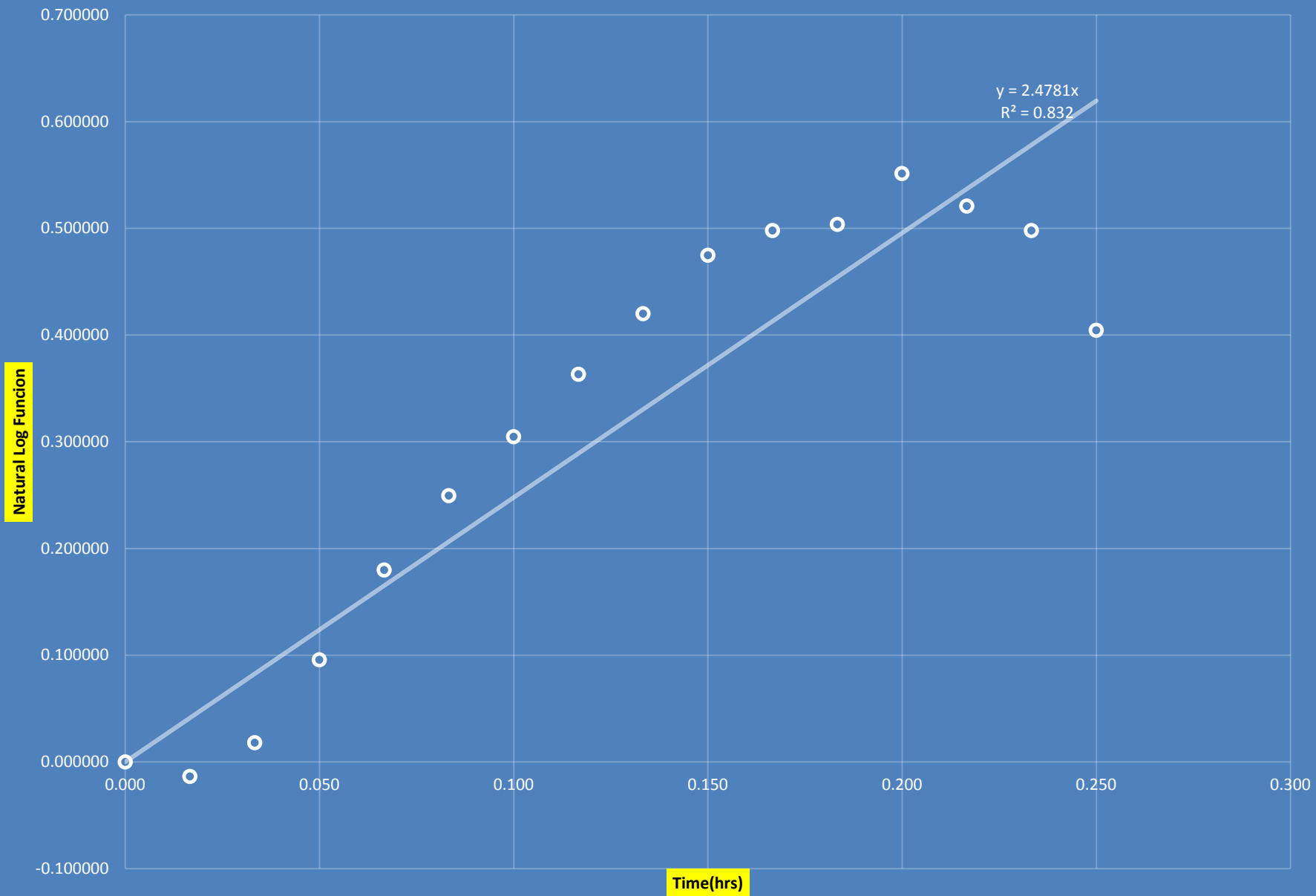


CO2 CONCENTRATION



AIR EXCHANGE (LIB 314)



Caleb Wegener
ENGR-115
Friday 11:00am
April 1st 2016

Input Parameters

Measured Concentration (outdoor) 488
Assumed Concentration (outdoor) 400
Correction factor -88

Analysis

Measurement #	Date/time	Measureme	Actual CO2 concentration (ppm)
63	12:45	662.4	574.4
64	12:46	664.8	576.8
65	12:47	659.3	571.3
66	12:48	646.5	558.5
67	12:49	633.7	545.7
68	12:50	623.9	535.9
69	12:51	616.6	528.6
70	12:52	609.3	521.3
71	12:53	602.6	514.6
72	12:54	596.5	508.5
73	12:55	594	506
74	12:56	593.4	505.4
75	12:57	588.5	500.5
76	12:58	591.6	503.6
77	12:59	594	506
78	13:00	604.4	516.4

t=(mins)	t=(hrs)	c(t)	"-ln((c(t)-c(out))/(c(0)-c(out)))"	Y*t
0	0.000	574.4		0.000000
1	0.017	576.8		-0.013668
2	0.033	571.3		0.017935
3	0.050	558.5		0.095597
4	0.067	545.7		0.179802
5	0.083	535.9		0.249432
6	0.100	528.6		0.304645
7	0.117	521.3		0.363085
8	0.133	514.6		0.419904
9	0.150	508.5		0.474601
10	0.167	506		0.497912
11	0.183	505.4		0.503589
12	0.200	500.5		0.551194
13	0.217	503.6		0.520814
14	0.233	506		0.497912
15	0.250	516.4		0.404319

Air Exchange Rate(1/hr) 2.478 (as calculated in graph 2)
Room Volume 2132.68
Capacity 5
Ventilation Rate(ft3/min/person) 17.62

Time to remove non-reactive chemical 1.21 hrs (see question #2)

1)

What is the air exchange rate (λ) of the room tested?

2.4781 (1/hr)

2)

If it takes $3/(\text{exchange rate})$ to remove a non-reactive chemical from indoor air, what recommendations would you make to people in the room?

$3/(\text{exchange rate}) =$

1.21 hrs

I would recommend that the room be given at least 2 hours to clear any non-reactive chemical that might have been released or introduced to the room via ventilation.

3)

Compare the ventilation rate for a typical # of occupants to the ASHRAE recommended ventilation rate. Based on this comparison are we wasting energy on running ventilation or not supplying sufficient ventilation?

This seems to be an adequate ventilation rate. I would say the typical amount of people in the Lib314 would be 6 or less. Based on the calculation that 5 or less people would exceed the recommendations for air exchange for a room of this size.

4)

Based on the recommendation of ASHRAE I would have to say that the room capacity would be 5 persons