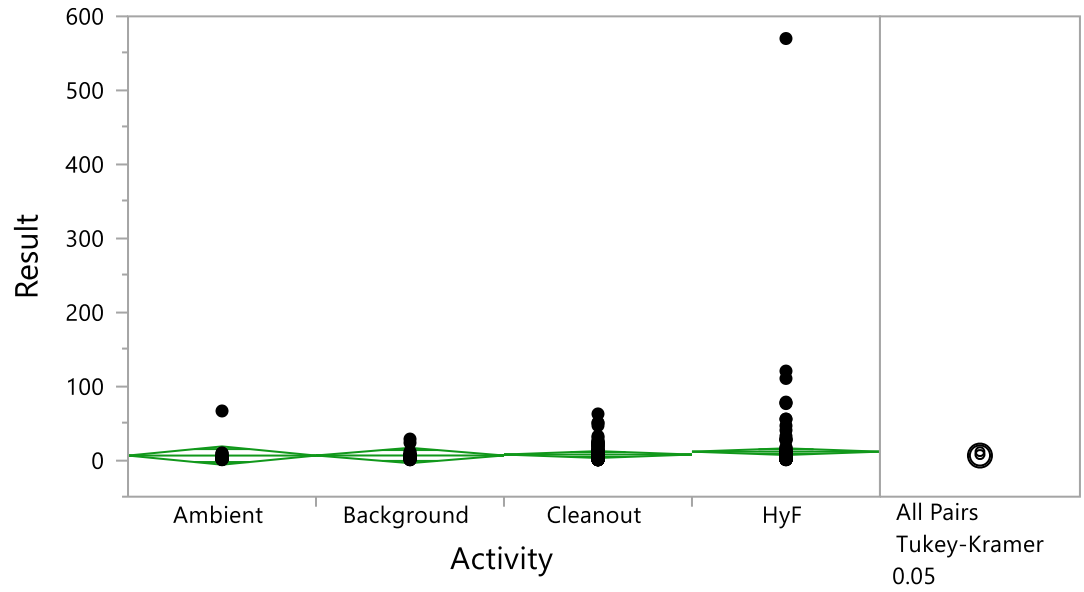
APPENDIX B

Tier 1 (>80% detected) only. Analytes that are significantly different concentration between locations or events identified as ambient, background, clean-out, and hydraulic fracturing (HyF). This appendix contains only analytes in Tier #1, which have a percent detection >80%, indicating a small level of censoring typical of environmental monitoring data. This appendix shows the results of comparisons between ambient, background, clean-out, and hydraulic fracturing (HyF) by Tukey-Kramer HSD test for all pairs and the Wilcoxon paired comparison test.

Oneway Analysis of Result By Activity Analyte (Units)=Butane (ppb v/v)



Missing Rows 156

Oneway Anova

Summary of Fit

Rsquare	0.004881
Adj Rsquare	-0.00249
Root Mean Square Error	30.86301
Mean of Response	8.572082
Observations (or Sum Wgts)	409

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Activity	3	1892.03	630.676	0.6621	0.5758
Error	405	385772.80	952.525		
C. Total	408	387664.83			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Ambient	24	5.6617	6.2999	-6.723	18.046
Background	34	5.7647	5.2930	-4.640	16.170
Cleanout	171	7.0362	2.3602	2.397	11.676
HyF	180	10.9495	2.3004	6.427	15.472

Std Error uses a pooled estimate of error variance

Nonparametric Comparisons For Each Pair Using Wilcoxon Method

q*	Alpha
1.95996	0.05

Level	- Level	Score Mean Difference	Std Err Dif	Z	p-Value	Hodges-Lehmann	Lower CL	Upper CL
Cleanout	Ambient	19.8849	12.29989	1.61667	0.1059	1.10000	-0.21246	2.900000
HyF	Ambient	15.1347	12.82734	1.17988	0.2380	0.53757	-0.37521	1.718565
Background	Ambient	8.7071	4.49541	1.93689	0.0528	2.50000	0.00000	3.500000
Cleanout	Background	-5.8179	11.13737	-0.52237	0.6014	-0.41234	-2.00000	0.925499
HyF	Cleanout	-12.7833	10.83491	-1.17983	0.2381	-0.37544	-1.18143	0.200000
HyF	Background	-21.7672	11.57766	-1.88010	0.0601	-1.40000	-2.60000	0.031142

Wilcoxon / Kruskal-Wallis Tests (Rank Sums)

Level	Count	Score Sum	Expected Score	Score Mean	(Mean-Mean0)/Std0
Ambient	24	4057.00	4920.00	169.042	-1.535
Background	34	7881.50	6970.00	231.809	1.380
Cleanout	171	36430.0	35055.0	213.041	1.166
HyF	180	35476.5	36900.0	197.092	-1.199

1-way Test, ChiSquare Approximation

ChiSquare	DF	Prob>ChiSq
5.5669	3	0.1347

Means Comparisons

Comparisons for all pairs using Tukey-Kramer HSD

Confidence Quantile

q*	Alpha
2.57976	0.05

HSD Threshold Matrix

Abs(Dif)-HSD

	HyF	Cleanout	Background	Ambient
HyF	-8.393	-4.589	-9.704	-12.014
Cleanout	-4.589	-8.611	-13.679	-15.981
Background	-9.704	-13.679	-19.311	-21.124
Ambient	-12.014	-15.981	-21.124	-22.984

Positive values show pairs of means that are significantly different.

Connecting Letters Report

Level		Mean
HyF	A	10.949511

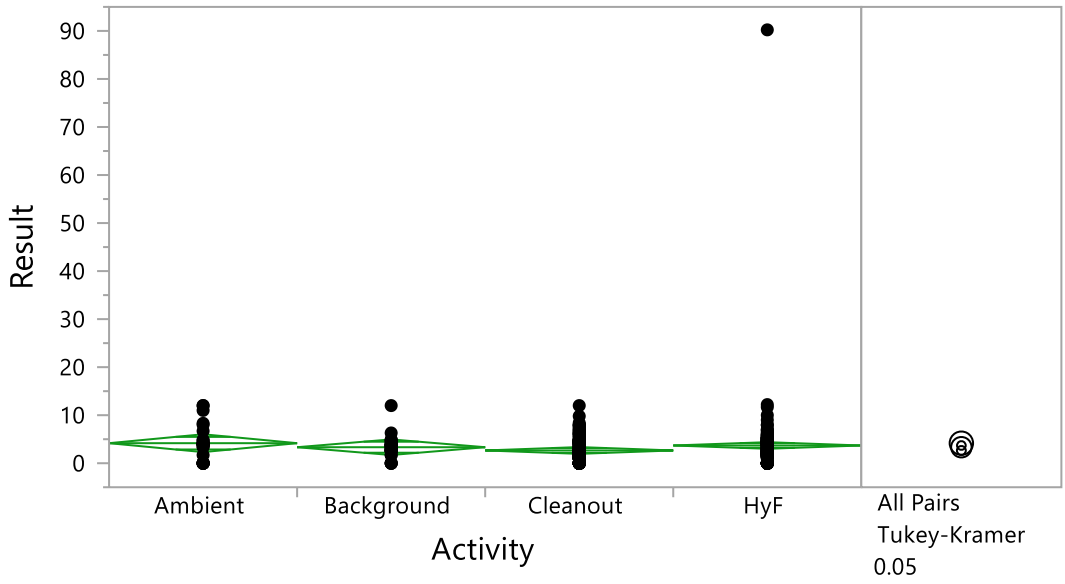
Level		Mean
Cleanout	A	7.036196
Background	A	5.764678
Ambient	A	5.661714

Levels not connected by same letter are significantly different.

Ordered Differences Report

Level	- Level	Difference	Std Err Dif	Lower CL	Upper CL	p-Value
HyF	Ambient	5.287796	6.706740	-12.0140	22.58961	0.8597
HyF	Background	5.184833	5.771244	-9.7036	20.07328	0.8057
HyF	Cleanout	3.913315	3.295775	-4.5890	12.41564	0.6352
Cleanout	Ambient	1.374481	6.727472	-15.9808	18.72978	0.9970
Cleanout	Background	1.271518	5.795324	-13.6791	16.22209	0.9963
Background	Ambient	0.102963	8.228245	-21.1240	21.32990	1.0000

Oneway Analysis of Result By Activity Analyte (Units)=Ethanol (ppb v/v)



Missing Rows 160

Oneway Anova

Summary of Fit

Rsquare	0.012274
Adj Rsquare	0.005302
Root Mean Square Error	4.814984
Mean of Response	3.259133
Observations (or Sum Wgts)	429

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Activity	3	122.4426	40.8142	1.7604	0.1541
Error	425	9853.2289	23.1841		
C. Total	428	9975.6715			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Ambient	26	4.17242	0.94430	2.3163	6.0285
Background	34	3.33293	0.82576	1.7098	4.9560
Cleanout	180	2.65802	0.35889	1.9526	3.3634
HyF	189	3.69271	0.35024	3.0043	4.3811

Std Error uses a pooled estimate of error variance

Nonparametric Comparisons For Each Pair Using Wilcoxon Method

q*	Alpha
1.95996	0.05

Level	- Level	Score Mean Difference	Std Err Dif	Z	p-Value	Hodges-Lehmann	Lower CL	Upper CL
HyF	Cleanout	34.7958	11.07635	3.14145	0.0017*	0.70000	0.20000	1.200000
HyF	Background	-1.6831	12.00544	-0.14019	0.8885	0.00000	-0.70000	0.611070
Background	Ambient	-5.1244	4.53189	-1.13075	0.2582	-0.40000	-1.48650	0.482570
HyF	Ambient	-11.0913	12.99160	-0.85373	0.3933	-0.37150	-1.70000	0.500000
Cleanout	Background	-22.7812	11.52025	-1.97749	0.0480*	-0.79889	-1.60000	0.000000
Cleanout	Ambient	-23.0429	12.42115	-1.85514	0.0636	-1.22407	-2.60000	0.000000

Wilcoxon / Kruskal-Wallis Tests (Rank Sums)

Level	Count	Score Sum	Expected Score	Score Mean	(Mean-Mean0)/Std0
Ambient	26	6444.00	5590.00	247.846	1.397
Background	34	7935.00	7310.00	233.382	0.903
Cleanout	180	34315.5	38700.0	190.642	-3.470
HyF	189	43540.5	40635.0	230.373	2.285

1-way Test, ChiSquare Approximation

ChiSquare	DF	Prob>ChiSq
12.4988	3	0.0059*

Means Comparisons

Comparisons for all pairs using Tukey-Kramer HSD

Confidence Quantile

q*	Alpha
2.57926	0.05

HSD Threshold Matrix

Abs(Dif)-HSD

	Ambient	HyF	Background	Cleanout
Ambient	-3.4444	-2.1180	-2.3960	-1.0912
HyF	-2.1180	-1.2775	-1.9537	-0.2587
Background	-2.3960	-1.9537	-3.0121	-1.6474
Cleanout	-1.0912	-0.2587	-1.6474	-1.3091

Positive values show pairs of means that are significantly different.

Connecting Letters Report

Level		Mean
Ambient	A	4.1724174

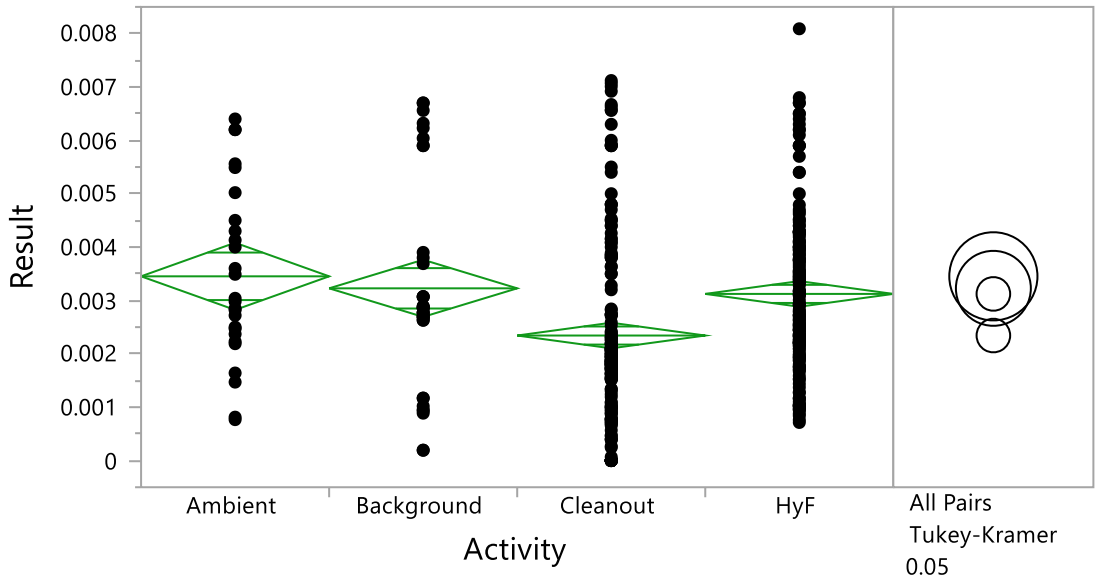
Level		Mean
HyF	A	3.6927101
Background	A	3.3329345
Cleanout	A	2.6580173

Levels not connected by same letter are significantly different.

Ordered Differences Report

Level	- Level	Difference	Std Err Dif	Lower CL	Upper CL	p-Value
Ambient	Cleanout	1.514400	1.010196	-1.09116	4.119958	0.4389
HyF	Cleanout	1.034693	0.501465	-0.25872	2.328103	0.1669
Ambient	Background	0.839483	1.254424	-2.39600	4.074969	0.9087
Background	Cleanout	0.674917	0.900380	-1.64740	2.997233	0.8768
Ambient	HyF	0.479707	1.007155	-2.11801	3.077424	0.9643
HyF	Background	0.359776	0.896968	-1.95374	2.673290	0.9781

Oneway Analysis of Result By Activity Analyte (Units)=Formaldehyde (mg/m3)



Missing Rows 169

Oneway Anova

Summary of Fit

Rsquare	0.06212
Adj Rsquare	0.055356
Root Mean Square Error	0.001633
Mean of Response	0.002819
Observations (or Sum Wgts)	420

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Activity	3	0.00007351	0.000025	9.1845	<.0001*
Error	416	0.00110986	2.668e-6		
C. Total	419	0.00118337			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Ambient	26	0.003452	0.00032	0.00282	0.00408
Background	36	0.003227	0.00027	0.00269	0.00376
Cleanout	179	0.002343	0.00012	0.00210	0.00258
HyF	179	0.003122	0.00012	0.00288	0.00336

Std Error uses a pooled estimate of error variance

Nonparametric Comparisons For Each Pair Using Wilcoxon Method

q*	Alpha
1.95996	0.05

Level	- Level	Score Mean Difference	Std Err Dif	Z	p-Value	Hodges-Lehmann	Lower CL	Upper CL
HyF	Cleanout	62.1508	10.93877	5.68170	<.0001*	0.000890	0.000580	0.001220
HyF	Background	-0.6840	11.36267	-0.06019	0.9520	-0.000028	-0.000550	0.000620
Background	Ambient	-1.6229	4.64203	-0.34960	0.7266	-0.000150	-0.001300	0.000490
HyF	Ambient	-12.4216	12.45002	-0.99772	0.3184	-0.000300	-0.000970	0.000310
Cleanout	Background	-35.4997	11.36137	-3.12460	0.0018*	-0.000920	-0.001340	-0.000490
Cleanout	Ambient	-43.5636	12.44833	-3.49955	0.0005*	-0.001160	-0.001870	-0.000560

Wilcoxon / Kruskal-Wallis Tests (Rank Sums)

Level	Count	Score Sum	Expected Score	Score Mean	(Mean-Mean0)/Std0
Ambient	26	6770.00	5473.00	260.385	2.163
Background	36	8638.50	7578.00	239.958	1.522
Cleanout	179	30062.5	37679.5	167.947	-6.191
HyF	179	42939.0	37679.5	239.883	4.275

1-way Test, ChiSquare Approximation

ChiSquare	DF	Prob>ChiSq
38.9984	3	<.0001*

Means Comparisons

Comparisons for all pairs using Tukey-Kramer HSD

Confidence Quantile

q*	Alpha
2.57948	0.05

HSD Threshold Matrix

Abs(Dif)-HSD

	Ambient	Background	HyF	Cleanout
Ambient	-0.00117	-0.00086	-0.00055	0.00023
Background	-0.00086	-0.00099	-0.00067	0.00011
HyF	-0.00055	-0.00067	-0.00045	0.00033
Cleanout	0.00023	0.00011	0.00033	-0.00045

Positive values show pairs of means that are significantly different.

Connecting Letters Report

Level		Mean
Ambient	A	0.00345192

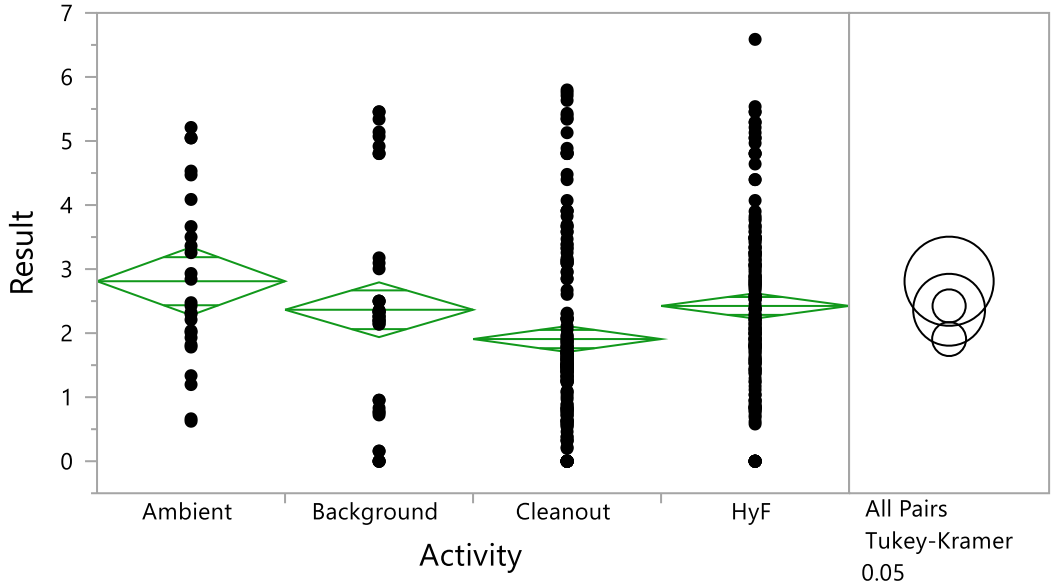
Level		Mean
Background	A	0.00322700
HyF	A	0.00312246
Cleanout	B	0.00234264

Levels not connected by same letter are significantly different.

Ordered Differences Report

Level	- Level	Difference	Std Err Dif	Lower CL	Upper CL	p-Value
Ambient	Cleanout	0.0011093	0.0003428	0.000225	0.0019935	0.0071*
Background	Cleanout	0.0008844	0.0002984	0.000115	0.0016540	0.0169*
HyF	Cleanout	0.0007798	0.0001727	0.000334	0.0012252	<.0001*
Ambient	HyF	0.0003295	0.0003428	-0.000555	0.0012137	0.7716
Ambient	Background	0.0002249	0.0004204	-0.000859	0.0013093	0.9505
Background	HyF	0.0001045	0.0002984	-0.000665	0.0008741	0.9852

Oneway Analysis of Result By Activity Analyte (Units)=Formaldehyde (ppb)



Missing Rows 130

Oneway Anova

Summary of Fit

Rsquare	0.041514
Adj Rsquare	0.034811
Root Mean Square Error	1.376432
Mean of Response	2.228372
Observations (or Sum Wgts)	433

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Activity	3	35.20267	11.7342	6.1936	0.0004*
Error	429	812.76880	1.8946		
C. Total	432	847.97146			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Ambient	26	2.81042	0.26994	2.2798	3.3410
Background	40	2.36495	0.21763	1.9372	2.7927
Cleanout	179	1.90750	0.10288	1.7053	2.1097
HyF	188	2.42433	0.10039	2.2270	2.6216

Std Error uses a pooled estimate of error variance

Nonparametric Comparisons For Each Pair Using Wilcoxon Method

q*	Alpha
1.95996	0.05

Level	- Level	Score Mean Difference	Std Err Dif	Z	p-Value	Hodges-Lehmann	Lower CL	Upper CL
HyF	Cleanout	53.2418	11.07748	4.80631	<.0001*	0.618781	0.36493	0.895604
HyF	Background	5.3816	11.48424	0.46861	0.6393	0.104146	-0.35180	0.675654
Background	Ambient	-4.8548	4.83425	-1.00425	0.3153	-0.407093	-1.31084	0.270380
HyF	Ambient	-17.2934	12.95548	-1.33483	0.1819	-0.358242	-0.93631	0.179121
Cleanout	Background	-22.3129	11.07880	-2.01402	0.0440*	-0.602498	-0.89560	0.000000
Cleanout	Ambient	-43.5636	12.44843	-3.49953	0.0005*	-0.949785	-1.52000	-0.455944

Wilcoxon / Kruskal-Wallis Tests (Rank Sums)

Level	Count	Score Sum	Expected Score	Score Mean	(Mean-Mean0)/Std0
Ambient	26	7104.00	5642.00	273.231	2.363
Background	40	9155.00	8680.00	228.875	0.629
Cleanout	179	32241.0	38843.0	180.117	-5.149
HyF	188	45461.0	40796.0	241.814	3.614

1-way Test, ChiSquare Approximation

ChiSquare	DF	Prob>ChiSq
28.5574	3	<.0001*

Means Comparisons

Comparisons for all pairs using Tukey-Kramer HSD

Confidence Quantile

q*	Alpha
2.57917	0.05

HSD Threshold Matrix

Abs(Dif)-HSD

	Ambient	HyF	Background	Cleanout
Ambient	-0.98461	-0.35672	-0.44885	0.15784
HyF	-0.35672	-0.36616	-0.55877	0.14609
Background	-0.44885	-0.55877	-0.79381	-0.16342
Cleanout	0.15784	0.14609	-0.16342	-0.37525

Positive values show pairs of means that are significantly different.

Connecting Letters Report

Level		Mean
Ambient	A	2.8104154

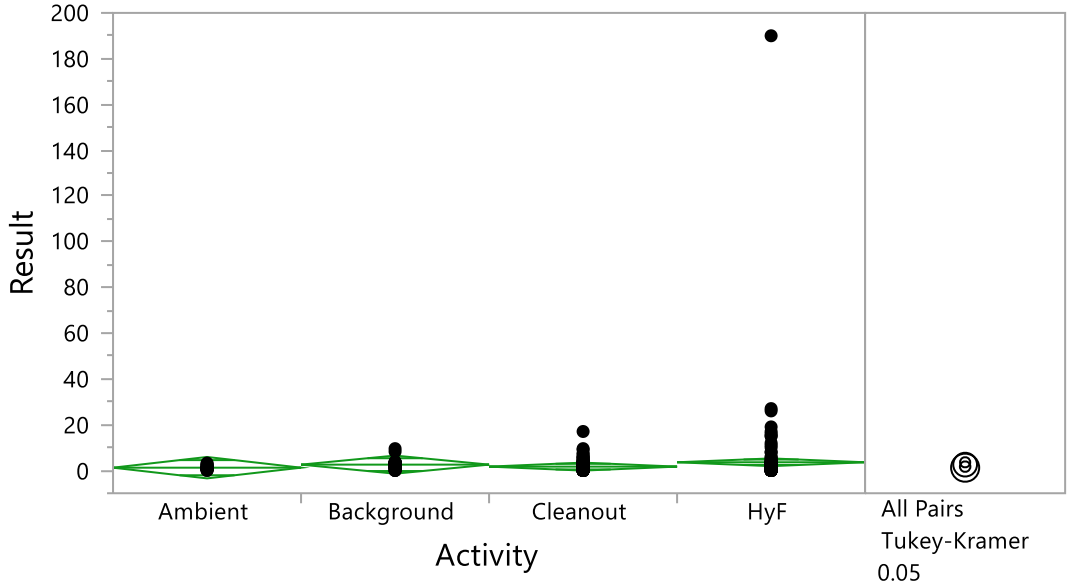
Level			Mean
HyF	A		2.4243266
Background	A	B	2.3649523
Cleanout		B	1.9075011

Levels not connected by same letter are significantly different.

Ordered Differences Report

Level	- Level	Difference	Std Err Dif	Lower CL	Upper CL	p-Value
Ambient	Cleanout	0.9029142	0.2888808	0.157843	1.647986	0.0102*
HyF	Cleanout	0.5168254	0.1437416	0.146092	0.887559	0.0020*
Background	Cleanout	0.4574512	0.2407246	-0.163417	1.078320	0.2294
Ambient	Background	0.4454631	0.3467450	-0.448850	1.339776	0.5732
Ambient	HyF	0.3860888	0.2880024	-0.356717	1.128895	0.5376
HyF	Background	0.0593743	0.2396698	-0.558774	0.677523	0.9947

Oneway Analysis of Result By Activity Analyte (Units)=I-Butane (ppb v/v)



Missing Rows 150

Oneway Anova

Summary of Fit

Rsquare	0.007891
Adj Rsquare	-0.00084
Root Mean Square Error	10.64616
Mean of Response	2.525248
Observations (or Sum Wgts)	345

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Activity	3	307.404	102.468	0.9041	0.4393
Error	341	38649.189	113.341		
C. Total	344	38956.593			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Ambient	20	1.17434	2.3806	-3.508	5.8568
Background	28	2.50777	2.0119	-1.450	6.4651
Cleanout	144	1.63807	0.8872	-0.107	3.3831
HyF	153	3.54003	0.8607	1.847	5.2330

Std Error uses a pooled estimate of error variance

Nonparametric Comparisons For Each Pair Using Wilcoxon Method

q*	Alpha
1.95996	0.05

Level	- Level	Score Mean Difference	Std Err Dif	Z	p-Value	Hodges-Lehmann	Lower CL	Upper CL
Background	Ambient	12.0000	4.08909	2.93464	0.0033*	1.06522	0.37000	2.00000
Cleanout	Ambient	3.2743	11.26932	0.29055	0.7714	0.05000	-0.46000	0.57000
HyF	Ambient	1.1307	11.87320	0.09523	0.9241	0.00000	-0.40000	0.52000
HyF	Cleanout	0.5527	9.92217	0.05570	0.9556	0.00000	-0.20000	0.26696
HyF	Background	-29.3005	10.73518	-2.72939	0.0063*	-0.90000	-1.50000	-0.26522
Cleanout	Background	-30.0531	10.22594	-2.93891	0.0033*	-1.00000	-1.50000	-0.20728

Wilcoxon / Kruskal-Wallis Tests (Rank Sums)

Level	Count	Score Sum	Expected Score	Score Mean	(Mean-Mean0)/Std0
Ambient	20	3241.00	3460.00	162.050	-0.507
Background	28	6383.50	4844.00	227.982	3.055
Cleanout	144	24223.5	24912.0	168.219	-0.756
HyF	153	25837.0	26469.0	168.869	-0.689

1-way Test, ChiSquare Approximation

ChiSquare	DF	Prob>ChiSq
9.4219	3	0.0242*

Means Comparisons

Comparisons for all pairs using Tukey-Kramer HSD

Confidence Quantile

q*	Alpha
2.58177	0.05

HSD Threshold Matrix

Abs(Dif)-HSD

	HyF	Background	Cleanout	Ambient
HyF	-3.1425	-4.6174	-1.2893	-4.1697
Background	-4.6174	-7.3459	-4.8073	-6.7136
Cleanout	-1.2893	-4.8073	-3.2393	-6.0953
Ambient	-4.1697	-6.7136	-6.0953	-8.6918

Positive values show pairs of means that are significantly different.

Connecting Letters Report

Level		Mean
HyF	A	3.5400278

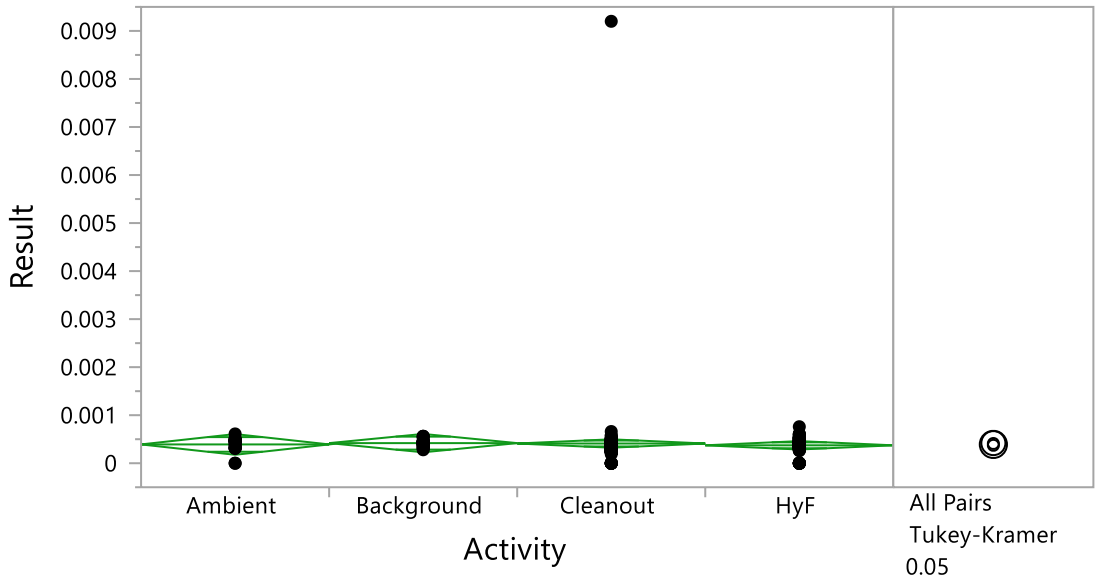
Level		Mean
Background	A	2.5077682
Cleanout	A	1.6380699
Ambient	A	1.1743370

Levels not connected by same letter are significantly different.

Ordered Differences Report

Level	- Level	Difference	Std Err Dif	Lower CL	Upper CL	p-Value
HyF	Ambient	2.365691	2.531368	-4.16973	8.901113	0.7863
HyF	Cleanout	1.901958	1.236073	-1.28931	5.093221	0.4155
Background	Ambient	1.333431	3.116877	-6.71364	9.380504	0.9737
HyF	Background	1.032260	2.188304	-4.61745	6.681966	0.9652
Background	Cleanout	0.869698	2.198857	-4.80725	6.546651	0.9790
Cleanout	Ambient	0.463733	2.540497	-6.09526	7.022724	0.9978

Oneway Analysis of Result By Activity Analyte (Units)=Methane (% v/v)



Missing Rows 271

Oneway Anova

Summary of Fit

Rsquare	0.00136
Adj Rsquare	-0.00818
Root Mean Square Error	0.000514
Mean of Response	0.000394
Observations (or Sum Wgts)	318

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Activity	3	0.00000011	3.7636e-8	0.1425	0.9344
Error	314	0.00008292	2.6407e-7		
C. Total	317	0.00008303			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Ambient	22	0.000391	0.00011	0.00018	0.00061
Background	28	0.000419	0.0001	0.00023	0.00061
Cleanout	134	0.000410	4.44e-5	0.00032	0.00050
HyF	134	0.000373	4.44e-5	0.00029	0.00046

Std Error uses a pooled estimate of error variance

Nonparametric Comparisons For Each Pair Using Wilcoxon Method

q*	Alpha
1.95996	0.05

Level	- Level	Score Mean Difference	Std Err Dif	Z	p-Value	Hodges-Lehmann	Lower CL	Upper CL
HyF	Cleanout	19.5373	9.46129	2.06497	0.0389*	0.000030	0.000000	0.000050
Background	Ambient	-1.5016	4.14473	-0.36230	0.7171	-0.000010	-0.000050	0.000060
HyF	Ambient	-12.5678	10.38131	-1.21062	0.2260	-0.000030	-0.000080	0.000020
HyF	Background	-17.5083	9.73862	-1.79782	0.0722	-0.000030	-0.000070	0.000000
Cleanout	Ambient	-24.1038	10.38211	-2.32167	0.0203*	-0.000060	-0.000100	-0.000010
Cleanout	Background	-31.2170	9.73703	-3.20600	0.0013*	-0.000060	-0.000090	-0.000020

Wilcoxon / Kruskal-Wallis Tests (Rank Sums)

Level	Count	Score Sum	Expected Score	Score Mean	(Mean-Mean0)/Std0
Ambient	22	4222.00	3509.00	191.909	1.714
Background	28	5576.50	4466.00	199.161	2.391
Cleanout	134	18884.0	21373.0	140.925	-3.076
HyF	134	22038.5	21373.0	164.466	0.822

1-way Test, ChiSquare Approximation

ChiSquare	DF	Prob>ChiSq
13.8264	3	0.0032*

Means Comparisons

Comparisons for all pairs using Tukey-Kramer HSD

Confidence Quantile

q*	Alpha
2.58287	0.05

HSD Threshold Matrix

Abs(Dif)-HSD

	Background	Cleanout	Ambient	HyF
Background	-0.00035	-0.00027	-0.00035	-0.00023
Cleanout	-0.00027	-0.00016	-0.00029	-0.00012
Ambient	-0.00035	-0.00029	-0.00040	-0.00029
HyF	-0.00023	-0.00012	-0.00029	-0.00016

Positive values show pairs of means that are significantly different.

Connecting Letters Report

Level		Mean
Background	A	0.00041857

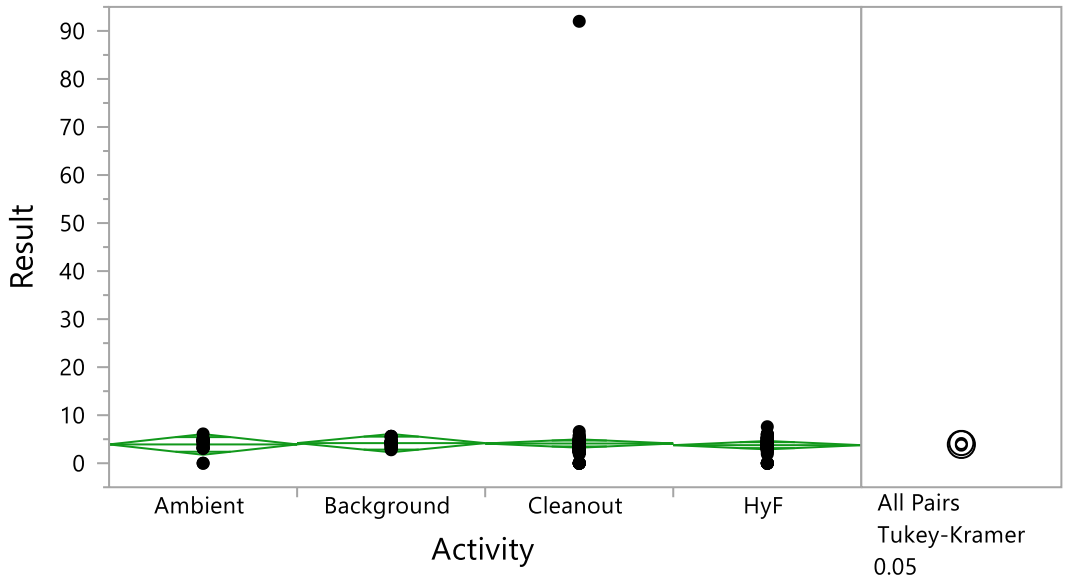
Level		Mean
Cleanout	A	0.00041045
Ambient	A	0.00039136
HyF	A	0.00037291

Levels not connected by same letter are significantly different.

Ordered Differences Report

Level	- Level	Difference	Std Err Dif	Lower CL	Upper CL	p-Value
Background	HyF	0.0000457	0.0001068	-0.000230	0.0003215	0.9737
Cleanout	HyF	0.0000375	0.0000628	-0.000125	0.0001997	0.9326
Background	Ambient	0.0000272	0.0001464	-0.000351	0.0004054	0.9977
Cleanout	Ambient	0.0000191	0.0001182	-0.000286	0.0003244	0.9985
Ambient	HyF	0.0000185	0.0001182	-0.000287	0.0003238	0.9986
Background	Cleanout	0.0000081	0.0001068	-0.000268	0.0002839	0.9998

Oneway Analysis of Result By Activity Analyte (Units)=Methane-ppmv (ppmv)



Missing Rows 271

Oneway Anova

Summary of Fit

Rsquare	0.001159
Adj Rsquare	-0.00838
Root Mean Square Error	5.131772
Mean of Response	3.953459
Observations (or Sum Wgts)	318

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Activity	3	9.5933	3.1978	0.1214	0.9474
Error	314	8269.2179	26.3351		
C. Total	317	8278.8112			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Ambient	22	3.91364	1.0941	1.7609	6.0663
Background	28	4.18571	0.9698	2.2776	6.0939
Cleanout	134	4.10448	0.4433	3.2322	4.9767
HyF	134	3.76045	0.4433	2.8882	4.6327

Std Error uses a pooled estimate of error variance

Nonparametric Comparisons For Each Pair Using Wilcoxon Method

q*	Alpha
1.95996	0.05

Level	- Level	Score Mean Difference	Std Err Dif	Z	p-Value	Hodges-Lehmann	Lower CL	Upper CL
HyF	Cleanout	19.7313	9.46176	2.08538	0.0370*	0.300000	0.00000	0.500000
Background	Ambient	-1.5016	4.14473	-0.36230	0.7171	-0.100000	-0.50000	0.600000
HyF	Ambient	-12.4620	10.38230	-1.20031	0.2300	-0.300000	-0.80000	0.200000
HyF	Background	-17.5083	9.73917	-1.79772	0.0722	-0.300000	-0.70000	0.000000
Cleanout	Ambient	-24.1038	10.38211	-2.32167	0.0203*	-0.600000	-1.00000	-0.100000
Cleanout	Background	-31.2170	9.73703	-3.20600	0.0013*	-0.600000	-0.90000	-0.200000

Wilcoxon / Kruskal-Wallis Tests (Rank Sums)

Level	Count	Score Sum	Expected Score	Score Mean	(Mean-Mean0)/Std0
Ambient	22	4220.00	3509.00	191.818	1.709
Background	28	5576.50	4466.00	199.161	2.391
Cleanout	134	18871.0	21373.0	140.828	-3.092
HyF	134	22053.5	21373.0	164.578	0.841

1-way Test, ChiSquare Approximation

ChiSquare	DF	Prob>ChiSq
13.8853	3	0.0031*

Means Comparisons

Comparisons for all pairs using Tukey-Kramer HSD

Confidence Quantile

q*	Alpha
2.58287	0.05

HSD Threshold Matrix

Abs(Dif)-HSD

	Background	Cleanout	Ambient	HyF
Background	-3.5425	-2.6730	-3.5042	-2.3289
Cleanout	-2.6730	-1.6193	-2.8582	-1.2753
Ambient	-3.5042	-2.8582	-3.9964	-2.8959
HyF	-2.3289	-1.2753	-2.8959	-1.6193

Positive values show pairs of means that are significantly different.

Connecting Letters Report

Level		Mean
Background	A	4.1857143

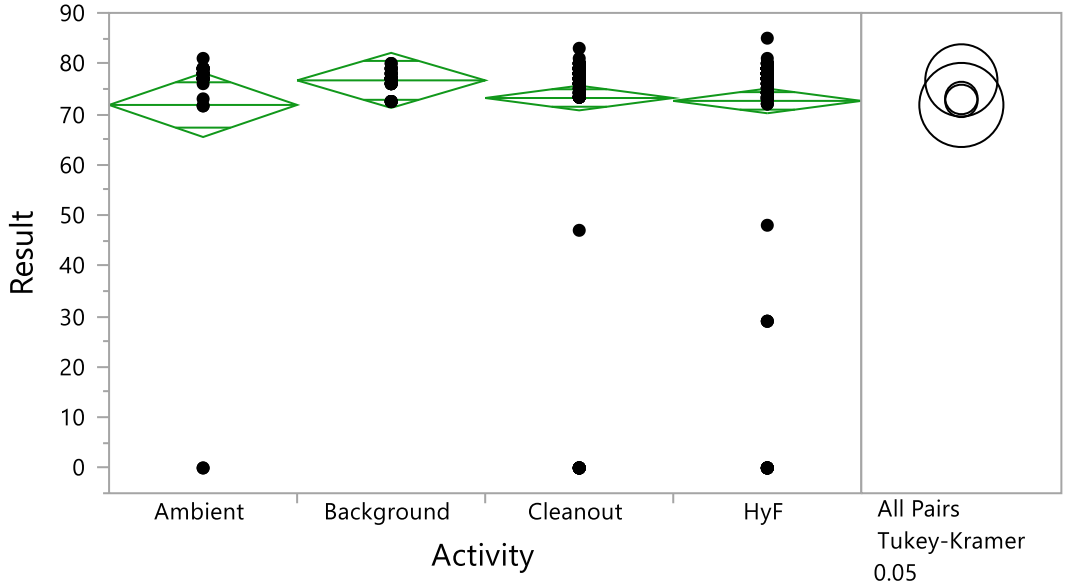
Level		Mean
Cleanout	A	4.1044776
Ambient	A	3.9136364
HyF	A	3.7604478

Levels not connected by same letter are significantly different.

Ordered Differences Report

Level	- Level	Difference	Std Err Dif	Lower CL	Upper CL	p-Value
Background	HyF	0.4252665	1.066335	-2.32894	3.179470	0.9785
Cleanout	HyF	0.3440299	0.626946	-1.27529	1.963349	0.9468
Background	Ambient	0.2720779	1.462049	-3.50421	4.048361	0.9977
Cleanout	Ambient	0.1908412	1.180500	-2.85824	3.239919	0.9985
Ambient	HyF	0.1531886	1.180500	-2.89589	3.202266	0.9992
Background	Cleanout	0.0812367	1.066335	-2.67297	2.835440	0.9998

Oneway Analysis of Result By Activity Analyte (Units)=Nitrogen (% v/v)



Missing Rows 147

Oneway Anova

Summary of Fit

Rsquare	0.004492
Adj Rsquare	-0.00233
Root Mean Square Error	17.06991
Mean of Response	73.13801
Observations (or Sum Wgts)	442

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Activity	3	575.90	191.966	0.6588	0.5778
Error	438	127625.23	291.382		
C. Total	441	128201.12			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Ambient	28	71.7932	3.2259	65.453	78.133
Background	38	76.6545	2.7691	71.212	82.097
Cleanout	188	73.1693	1.2450	70.722	75.616
HyF	188	72.5962	1.2450	70.149	75.043

Std Error uses a pooled estimate of error variance

Nonparametric Comparisons For Each Pair Using Wilcoxon Method

q*	Alpha
1.95996	0.05

Level	- Level	Score Mean Difference	Std Err Dif	Z	p-Value	Hodges-Lehmann	Lower CL	Upper CL
Cleanout	Background	19.3764	11.41234	1.69785	0.0895	0.8732331	0.00000	1.000000
HyF	Background	10.5028	11.42570	0.91923	0.3580	0.0000000	0.00000	1.000000
Cleanout	Ambient	3.8161	12.39905	0.30777	0.7583	0.0000000	-1.00000	1.000000
Background	Ambient	-5.1175	4.67157	-1.09545	0.2733	0.0000000	-1.00000	0.000000
HyF	Ambient	-5.6421	12.42908	-0.45394	0.6499	0.0000000	-1.00000	0.394882
HyF	Cleanout	-15.7234	11.00779	-1.42839	0.1532	0.0000000	-1.00000	0.000000

Wilcoxon / Kruskal-Wallis Tests (Rank Sums)

Level	Count	Score Sum	Expected Score	Score Mean	(Mean-Mean0)/Std0
Ambient	28	6329.50	6202.00	226.054	0.198
Background	38	7388.50	8417.00	194.434	-1.391
Cleanout	188	43827.0	41642.0	233.122	1.676
HyF	188	40358.0	41642.0	214.670	-0.984

1-way Test, ChiSquare Approximation

ChiSquare	DF	Prob>ChiSq
3.9775	3	0.2639

Means Comparisons

Comparisons for all pairs using Tukey-Kramer HSD

Confidence Quantile

q*	Alpha
2.57896	0.05

HSD Threshold Matrix

Abs(Dif)-HSD

	Background	Cleanout	HyF	Ambient
Background	-10.099	-4.345	-3.772	-6.103
Cleanout	-4.345	-4.541	-3.967	-7.541
HyF	-3.772	-3.967	-4.541	-8.115
Ambient	-6.103	-7.541	-8.115	-11.766

Positive values show pairs of means that are significantly different.

Connecting Letters Report

Level		Mean
Background	A	76.654476

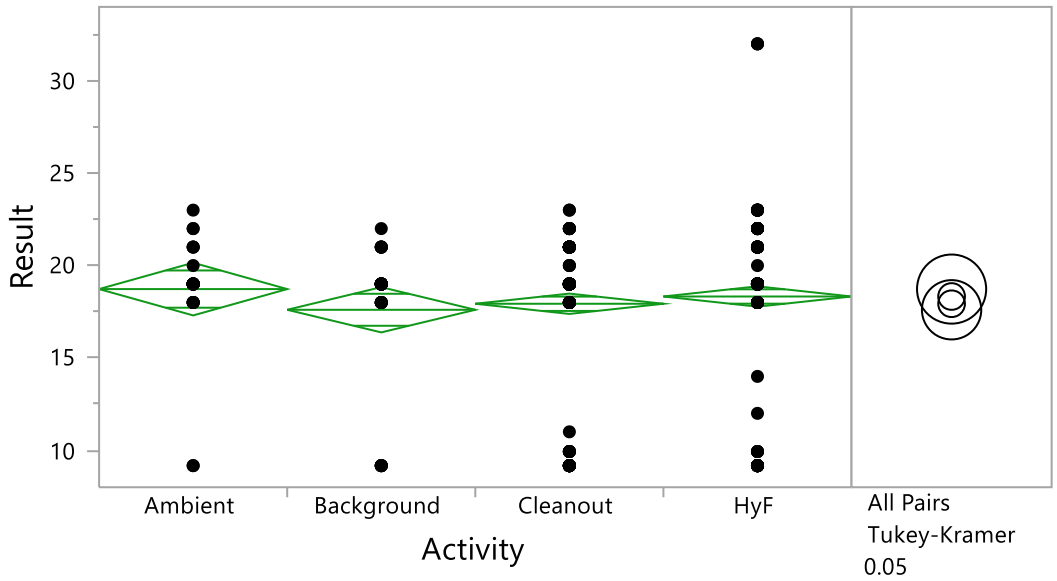
Level		Mean
Cleanout	A	73.169312
HyF	A	72.596215
Ambient	A	71.793223

Levels not connected by same letter are significantly different.

Ordered Differences Report

Level	- Level	Difference	Std Err Dif	Lower CL	Upper CL	p-Value
Background	Ambient	4.861254	4.251404	-6.10294	15.82545	0.6628
Background	HyF	4.058261	3.036090	-3.77169	11.88821	0.5400
Background	Cleanout	3.485164	3.036090	-4.34479	11.31512	0.6600
Cleanout	Ambient	1.376089	3.457802	-7.54144	10.29362	0.9786
HyF	Ambient	0.802993	3.457802	-8.11454	9.72052	0.9956
Cleanout	HyF	0.573097	1.760627	-3.96749	5.11368	0.9881

Oneway Analysis of Result By Activity Analyte (Units)=Oxygen (% v/v)



Missing Rows 147

Oneway Anova

Summary of Fit

Rsquare	0.005381
Adj Rsquare	-0.00143
Root Mean Square Error	3.839152
Mean of Response	18.12129
Observations (or Sum Wgts)	442

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Activity	3	34.9243	11.6414	0.7898	0.5000
Error	438	6455.7207	14.7391		
C. Total	441	6490.6450			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Ambient	28	18.7264	0.72553	17.300	20.152
Background	38	17.6056	0.62279	16.382	18.830
Cleanout	188	17.9316	0.28000	17.381	18.482
HyF	188	18.3251	0.28000	17.775	18.875

Std Error uses a pooled estimate of error variance

Nonparametric Comparisons For Each Pair Using Wilcoxon Method

q*	Alpha
1.95996	0.05

Level	- Level	Score Mean Difference	Std Err Dif	Z	p-Value	Hodges-Lehmann	Lower CL	Upper CL
HyF	Background	13.7454	10.71773	1.28249	0.1997	0	0.00000	1.000000
Cleanout	Background	12.6856	10.56561	1.20065	0.2299	0	0.00000	0.000000
HyF	Cleanout	2.5426	10.22313	0.24871	0.8036	0	0.00000	0.000000
HyF	Ambient	-3.5699	11.66484	-0.30604	0.7596	0	0.00000	0.000000
Background	Ambient	-5.2415	4.44795	-1.17842	0.2386	0	-1.00000	0.000000
Cleanout	Ambient	-5.2523	11.49139	-0.45706	0.6476	0	0.00000	0.000000

Wilcoxon / Kruskal-Wallis Tests (Rank Sums)

Level	Count	Score Sum	Expected Score	Score Mean	(Mean-Mean0)/Std0
Ambient	28	6503.00	6202.00	232.250	0.502
Background	38	7495.50	8417.00	197.250	-1.337
Cleanout	188	41675.5	41642.0	221.678	0.027
HyF	188	42229.0	41642.0	224.622	0.483

1-way Test, ChiSquare Approximation

ChiSquare	DF	Prob>ChiSq
2.0066	3	0.5710

Means Comparisons

Comparisons for all pairs using Tukey-Kramer HSD

Confidence Quantile

q*	Alpha
2.57896	0.05

HSD Threshold Matrix

Abs(Dif)-HSD

	Ambient	HyF	Cleanout	Background
Ambient	-2.6462	-1.6043	-1.2109	-1.3452
HyF	-1.6043	-1.0212	-0.6278	-1.0416
Cleanout	-1.2109	-0.6278	-1.0212	-1.4350
Background	-1.3452	-1.0416	-1.4350	-2.2714

Positive values show pairs of means that are significantly different.

Connecting Letters Report

Level		Mean
Ambient	A	18.726353

Level		Mean
HyF	A	18.325059
Cleanout	A	17.931628
Background	A	17.605623

Levels not connected by same letter are significantly different.

Ordered Differences Report

Level	- Level	Difference	Std Err Dif	Lower CL	Upper CL	p-Value
Ambient	Background	1.120730	0.9561730	-1.34520	3.586661	0.6448
Ambient	Cleanout	0.794725	0.7776859	-1.21089	2.800345	0.7367
HyF	Background	0.719436	0.6828398	-1.04158	2.480451	0.7179
Ambient	HyF	0.401295	0.7776859	-1.60433	2.406914	0.9552
HyF	Cleanout	0.393431	0.3959783	-0.62778	1.414642	0.7532
Cleanout	Background	0.326005	0.6828398	-1.43501	2.087020	0.9640