

Appendix A9: Mercury and Radiological Data from the Full-Scale Column Tests

This appendix contains information pertaining to the removal of mercury and radiological constituents from the treated stormwater by each of the mixed media columns during long-term, full-depth, column tests. The appendix is organized showing the removal results for these constituents for each of the four mixed media combinations examined, in the following order:

- Rhyolite sand, surface modified zeolite, granular activated carbon, and peat moss (R-SMZ-GAC-P)
- Rhyolite sand – surface modified zeolite – granular activated carbon (R-SMZ-GAC)
- Layered site filter sand, site zeolite, and granular activated carbon (layered S-Z-GAC)
- Rhyolite sand and surface modified zeolite (R-SMZ)

Each section describes performance with the following plots and tables:

- ANOVA for regression plot of influent vs. effluent concentration for each constituent
- Line plot showing influent vs. effluent concentrations
- Scatterplot of influent vs. effluent concentrations, with best-fit regression line and equation if significant

In each of these sets, these analyses are presented for different heavy metals and trace constituents:

- Mercury
- Gross alpha
- Gross beta
- Radium 228
- Radium 226
- Total alpha radium
- Tritium
- Strontium 90
- Uranium, total

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Rhyolite sand, surface modified zeolite, granular activated carbon, and peat moss (R-SMZ-GAC-P)

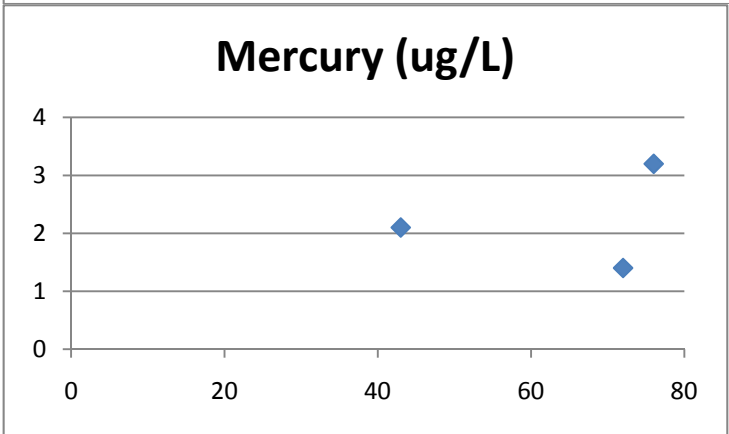
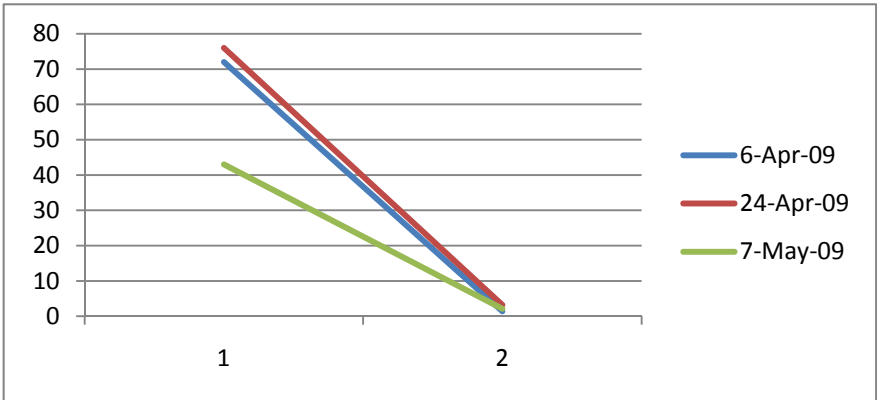
Mercury

Mercury: regression not significant
SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.237
R Square	0.056
Adjusted R Square	-0.888
Standard Error	24.746
Observations	3.000

ANOVA					
	df	SS	MS	F	Significance F
Regression	1.000	36.318	36.318	0.059	0.848
Residual	1.000	612.348	612.348		
Total	2.000	648.667			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	53.178	45.375	1.172	0.450	-523.371	629.727	-523.371	629.727
X Variable 1	4.696	19.284	0.244	0.848	-240.330	249.722	-240.330	249.722



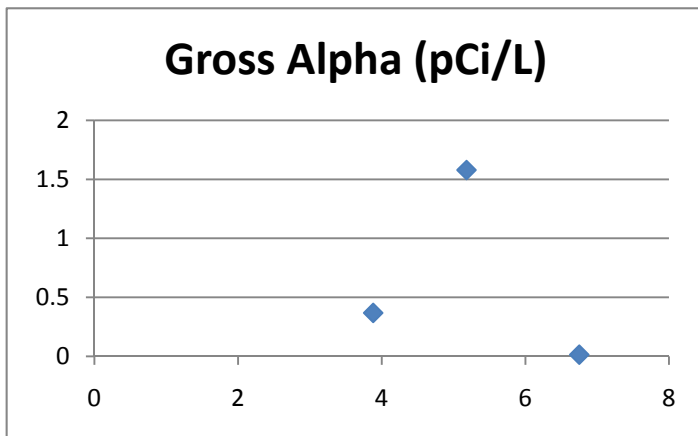
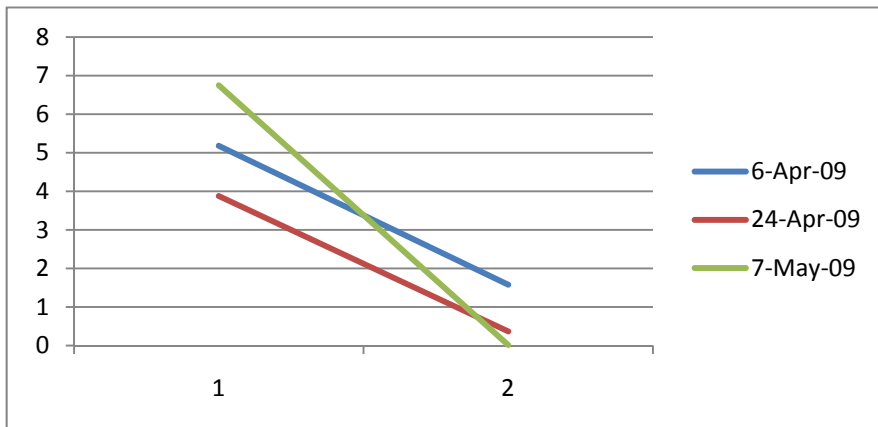
Gross Alpha

Gross Alpha: not significant
SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.268
R Square	0.072
Adjusted R Square	-0.856
Standard Error	1.958
Observations	3.000

ANOVA					
	df	SS	MS	F	Significance F
Regression	1.000	0.297	0.297	0.078	0.827
Residual	1.000	3.833	3.833		
Total	2.000	4.131			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	5.577	1.579	3.533	0.176	-14.482	25.636	-14.482	25.636
X Variable 1	-0.470	1.685	-0.279	0.827	-21.885	20.946	-21.885	20.946



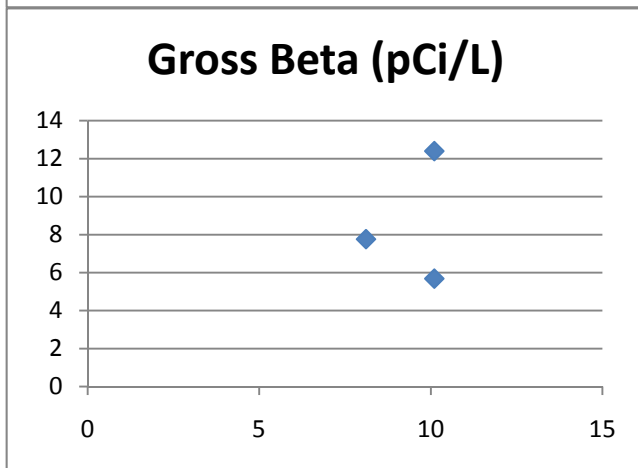
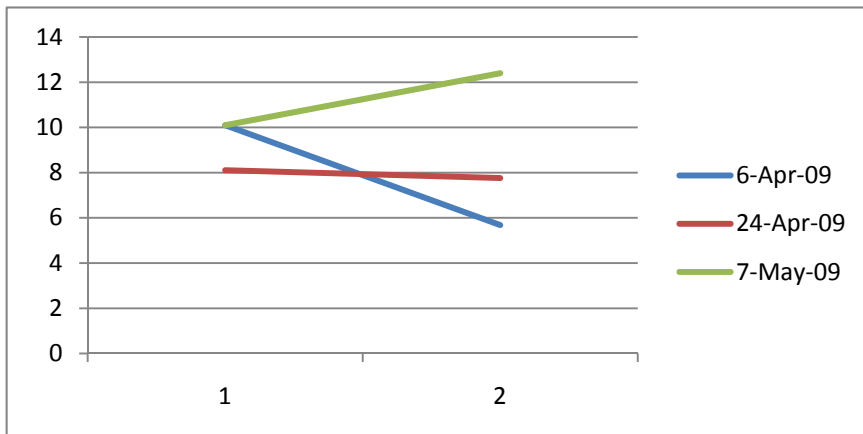
Gross Beta

Gross Beta: not significant
SUMMARY OUTPUT

<i>Regression Statistics</i>	
Multiple R	0.215
R Square	0.046
Adjusted R Square	-0.908
Standard Error	1.587
Observations	3.000

ANOVA						
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>	
Regression	1.000	0.122	0.122	0.048	0.862	
Residual	1.000	2.518	2.518			
Total	2.000	2.640				

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	8.819	2.955	2.984	0.206	-28.728	46.365	-28.728	46.365
X Variable 1	0.072	0.326	0.220	0.862	-4.073	4.216	-4.073	4.216



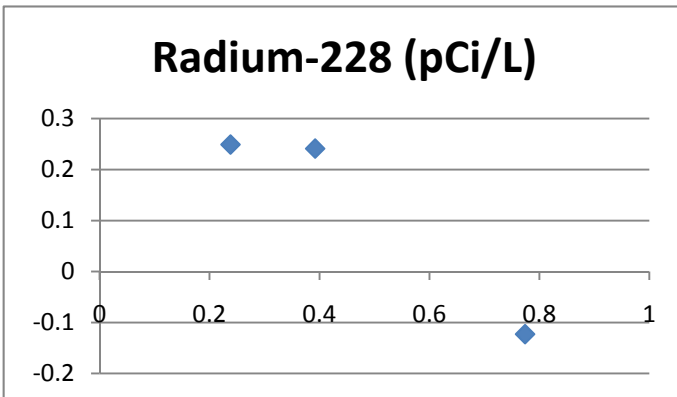
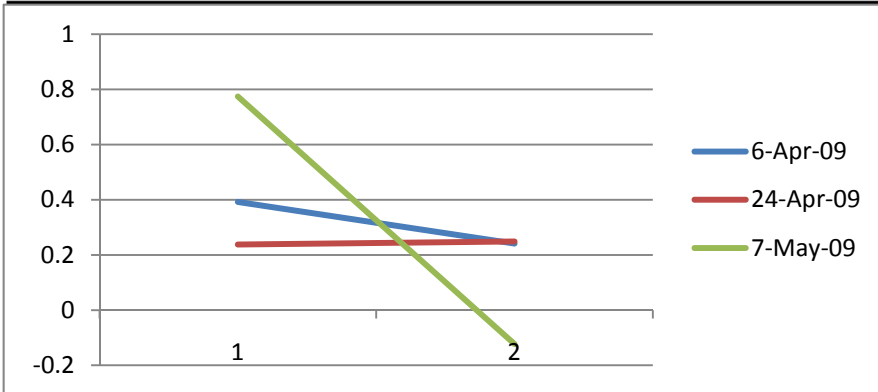
Radium 228

Radium 228: not significant
SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.965
R Square	0.932
Adjusted R Square	0.864
Standard Error	0.102
Observations	3.000

ANOVA						
	df	SS	MS	F	Significance F	
Regression	1.000	0.142	0.142	13.691	0.168	
Residual	1.000	0.010	0.010			
Total	2.000	0.152				

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.621	0.072	8.639	0.073	-0.293	1.535	-0.293	1.535
X Variable 1	-1.254	0.339	-3.700	0.168	-5.559	3.051	-5.559	3.051



Radium 226

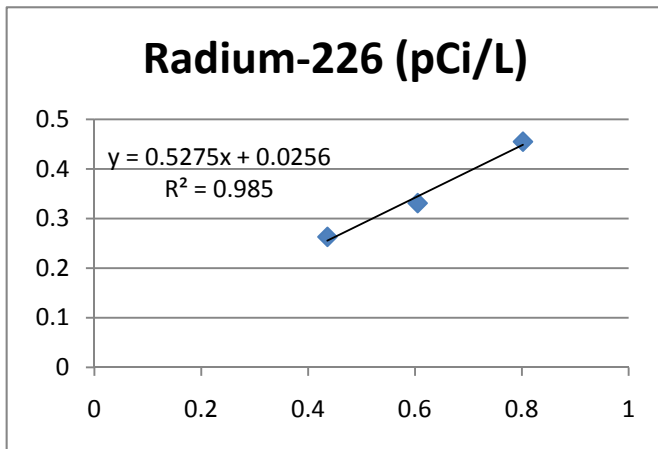
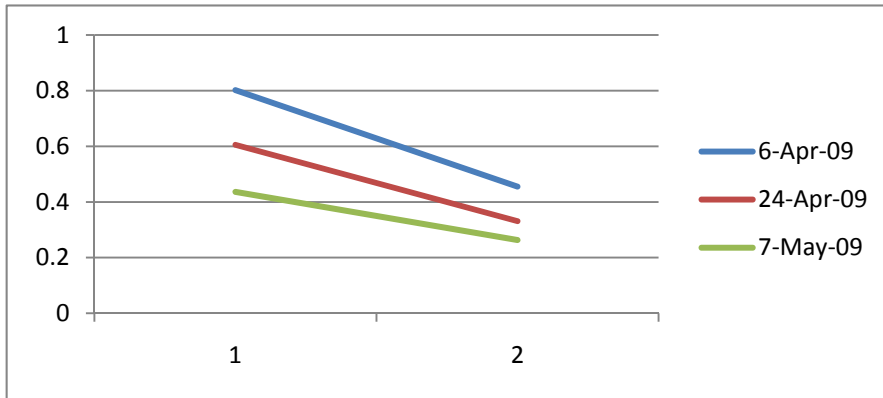
Radium 226:
SUMMARY OUTPUT

marginally significant

Regression Statistics	
Multiple R	0.992
R Square	0.985
Adjusted R Square	0.970
Standard Error	0.032
Observations	3.000

ANOVA						
	df	SS	MS	F	Significance F	
Regression	1.000	0.066	0.066	65.769	0.078	
Residual	1.000	0.001	0.001			
Total	2.000	0.067				

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	-0.039	0.083	-0.468	0.721	-1.088	1.011	-1.088	1.011
X Variable 1	1.867	0.230	8.110	0.078	-1.058	4.793	-1.058	4.793



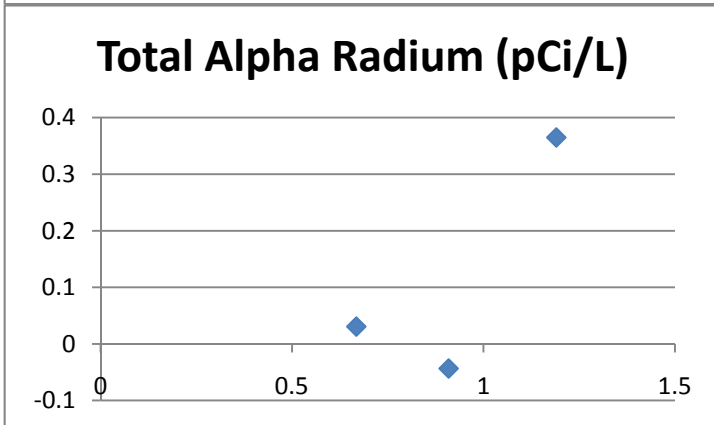
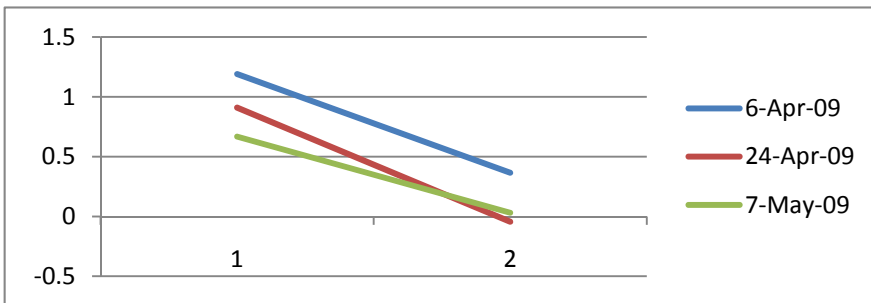
Total Alpha Radium

Total alpha radium: not significant
SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.796
R Square	0.633
Adjusted R Square	0.267
Standard Error	0.224
Observations	3.000

ANOVA						
	df	SS	MS	F	Significance F	
Regression	1.000	0.086	0.086	1.727	0.414	
Residual	1.000	0.050	0.050			
Total	2.000	0.137				

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.810	0.155	5.232	0.120	-1.157	2.778	-1.157	2.778
X Variable 1	0.956	0.727	1.314	0.414	-8.284	10.195	-8.284	10.195



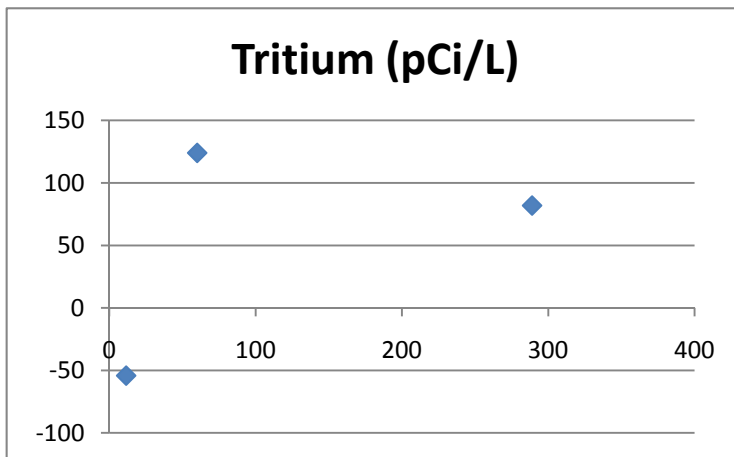
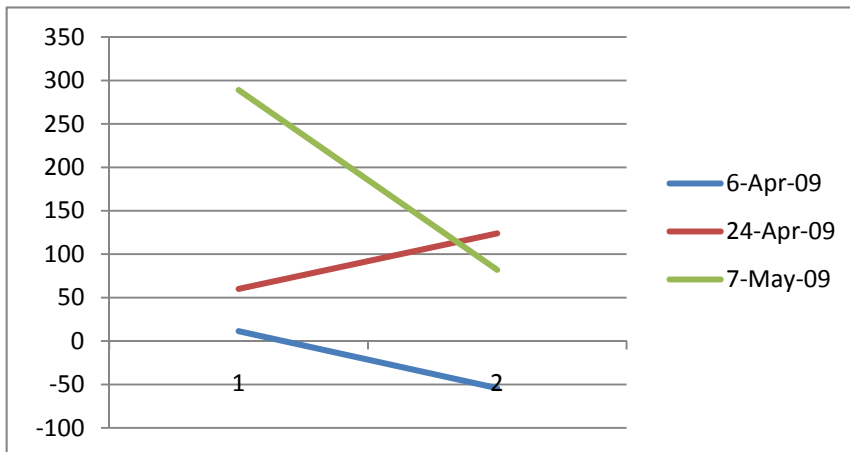
Tritium

Tritium: not significant
SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.444
R Square	0.197
Adjusted R Square	-0.605
Standard Error	187.757
Observations	3.000

ANOVA					
	df	SS	MS	F	Significance F
Regression	1.000	8668.575	8668.575	0.246	0.707
Residual	1.000	35252.565	35252.565		
Total	2.000	43921.140			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	84.458	130.177	0.649	0.634	-1569.604	1738.519	-1569.604	1738.519
X Variable 1	0.707	1.425	0.496	0.707	-17.405	18.818	-17.405	18.818



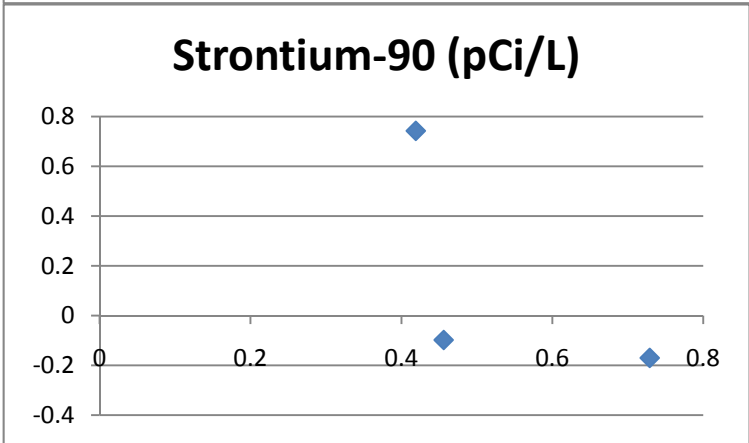
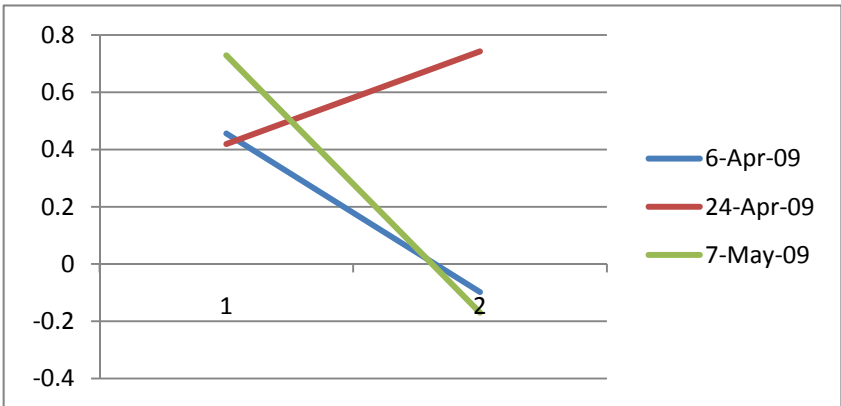
Strontium 90

Strontium 90: not significant
SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.648
R Square	0.419
Adjusted R Square	-0.161
Standard Error	0.182
Observations	3.000

ANOVA						
	df	SS	MS	F	Significance F	
Regression	1.000	0.024	0.024	0.722	0.552	
Residual	1.000	0.033	0.033			
Total	2.000	0.057				

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.569	0.113	5.044	0.125	-0.864	2.002	-0.864	2.002
X Variable 1	-0.216	0.254	-0.850	0.552	-3.446	3.014	-3.446	3.014



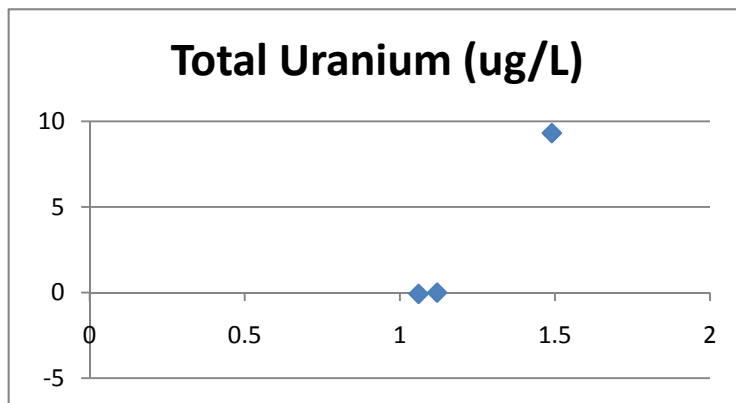
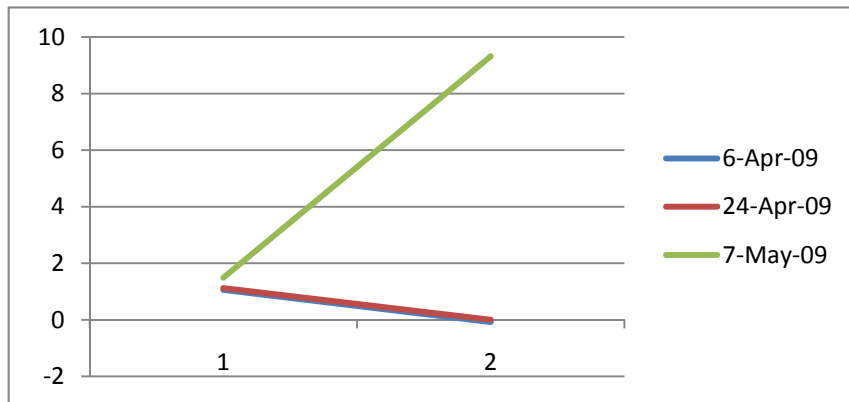
Uranium, total

Total Uranium: marginally significant
SUMMARY OUTPUT

<i>Regression Statistics</i>	
Multiple R	0.993
R Square	0.985
Adjusted R Square	0.970
Standard Error	0.040
Observations	3.000

ANOVA						
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>	
Regression	1.000	0.107	0.107	66.460	0.078	
Residual	1.000	0.002	0.002			
Total	2.000	0.108				

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	1.092	0.028	38.656	0.016	0.733	1.450	0.733	1.450
X Variable 1	0.043	0.005	8.152	0.078	-0.024	0.109	-0.024	0.109



Rhyolite sand – surface modified zeolite – granular activated carbon (R-SMZ-GAC)

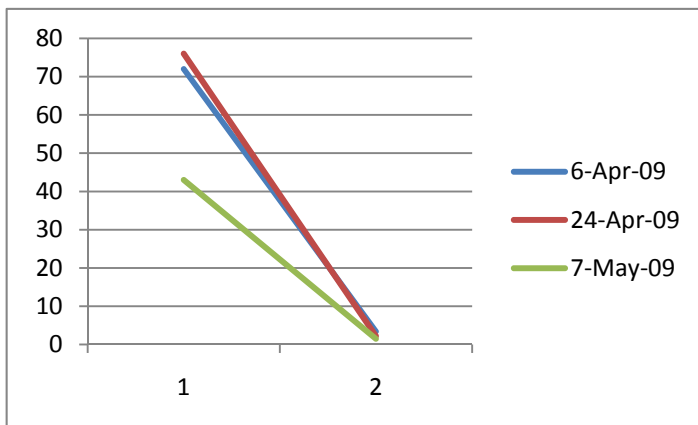
Mercury

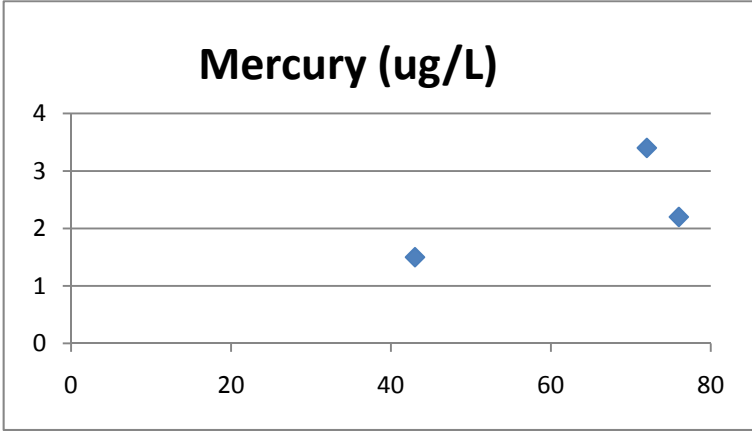
Mercury: not significant
SUMMARY OUTPUT

<i>Regression Statistics</i>	
Multiple R	0.707
R Square	0.500
Adjusted R Square	-0.001
Standard Error	18.014
Observations	3.000

ANOVA					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	1.000	324.161	324.161	0.999	0.500
Residual	1.000	324.505	324.505		
Total	2.000	648.667			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	32.310	33.052	0.978	0.507	-387.653	452.274	-387.653	452.274
X Variable 1	13.249	13.256	0.999	0.500	-155.186	181.684	-155.186	181.684





Gross Alpha

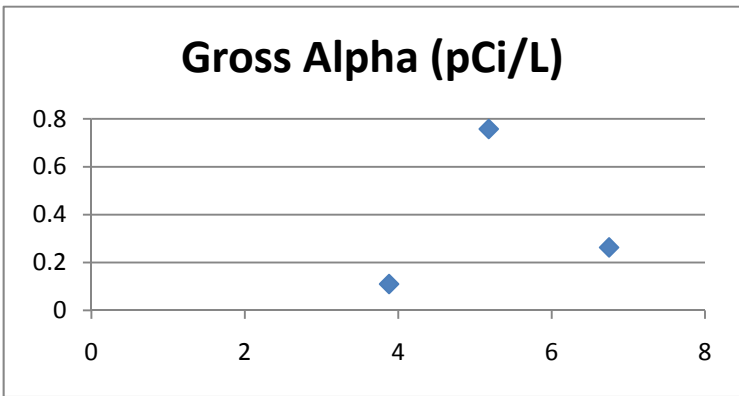
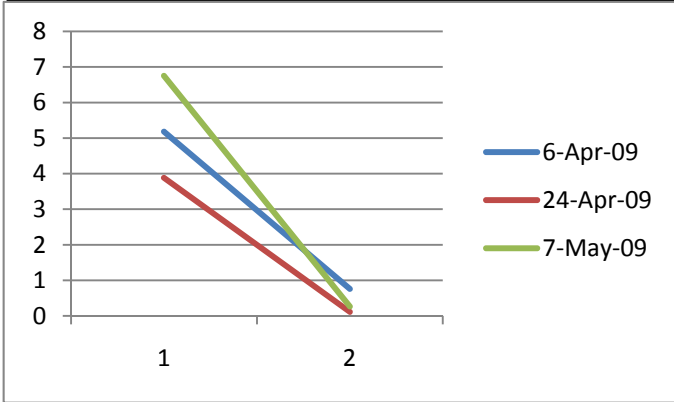
Gross alpha: not significant

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.173
R Square	0.030
Adjusted R Square	-0.940
Standard Error	2.002
Observations	3.000

ANOVA					
	df	SS	MS	F	Significance F
Regression	1.000	0.123	0.123	0.031	0.890
Residual	1.000	4.007	4.007		
Total	2.000	4.131			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	4.994	1.954	2.556	0.237	-19.834	29.822	-19.834	29.822
X Variable 1	0.733	4.179	0.175	0.890	-52.369	53.834	-52.369	53.834



Gross Beta

Gross Beta: not significant

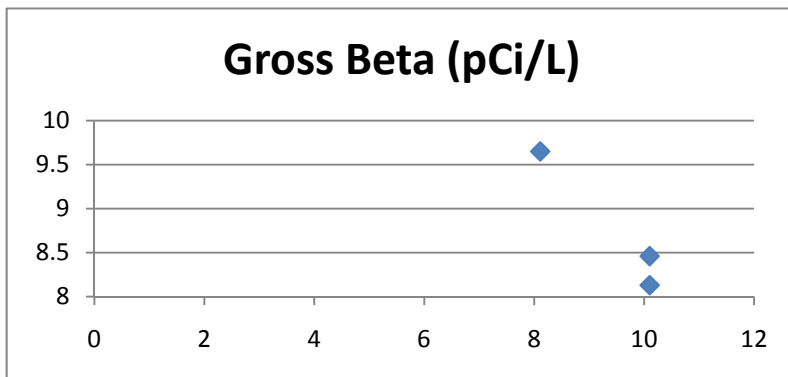
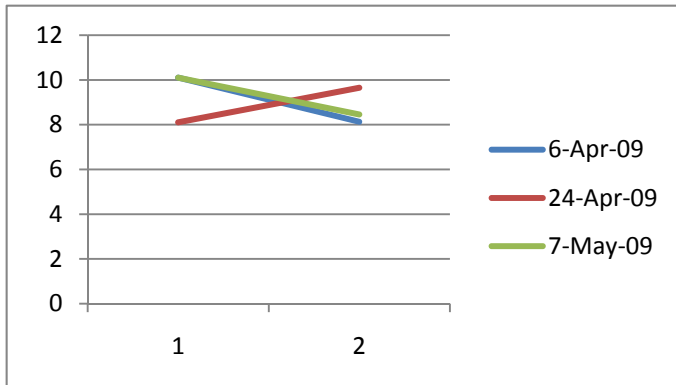
SUMMARY OUTPUT

<i>Regression Statistics</i>	
Multiple R	0.978
R Square	0.957
Adjusted R Square	0.915
Standard Error	0.335
Observations	3.000

ANOVA

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	1.000	2.528	2.528	22.480	0.132
Residual	1.000	0.112	0.112		
Total	2.000	2.640			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	21.735	2.601	8.356	0.076	-11.316	54.786	-11.316	54.786
X Variable 1	-1.406	0.297	-4.741	0.132	-5.174	2.362	-5.174	2.362



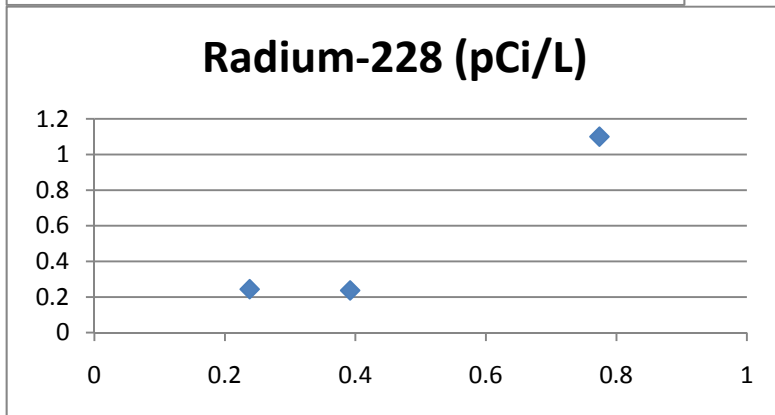
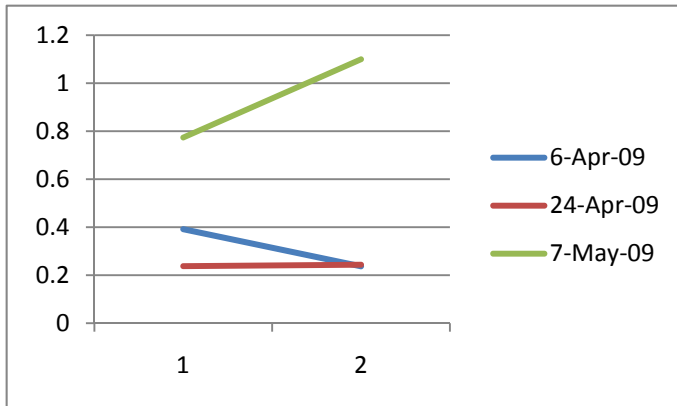
Radium 228

Radium 228: not significant
SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.958
R Square	0.918
Adjusted R Square	0.837
Standard Error	0.112
Observations	3.000

ANOVA					
	df	SS	MS	F	Significance F
Regression	1.000	0.140	0.140	11.244	0.185
Residual	1.000	0.012	0.012		
Total	2.000	0.152			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.187	0.106	1.772	0.327	-1.155	1.530	-1.155	1.530
X Variable 1	0.533	0.159	3.353	0.185	-1.486	2.552	-1.486	2.552



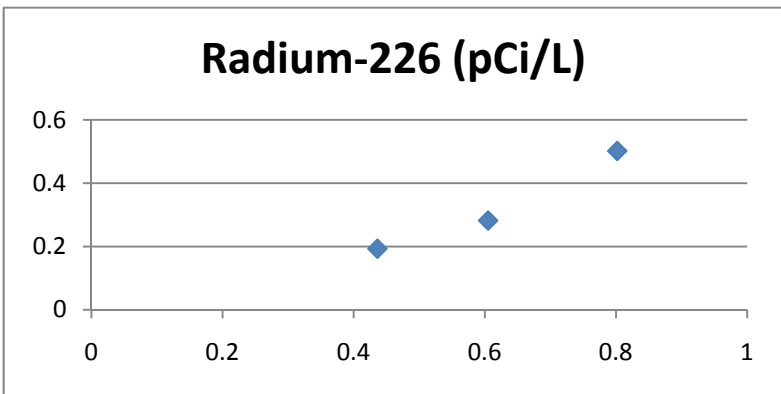
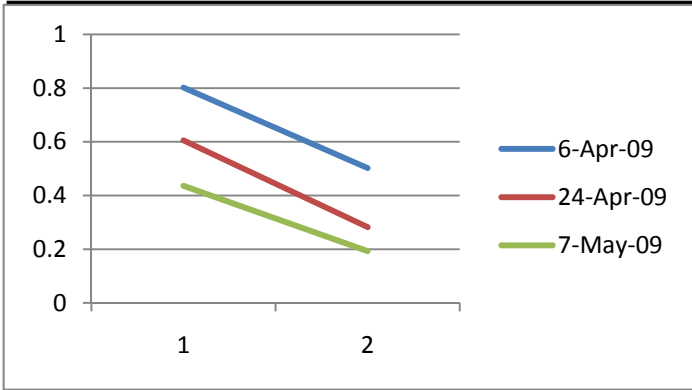
Radium 226

Radium 226: not significant
SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.981
R Square	0.962
Adjusted R Square	0.924
Standard Error	0.050
Observations	3.000

ANOVA					
	df	SS	MS	F	Significance F
Regression	1.000	0.065	0.065	25.391	0.125
Residual	1.000	0.003	0.003		
Total	2.000	0.067			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.246	0.079	3.136	0.197	-0.752	1.245	-0.752	1.245
X Variable 1	1.130	0.224	5.039	0.125	-1.719	3.978	-1.719	3.978



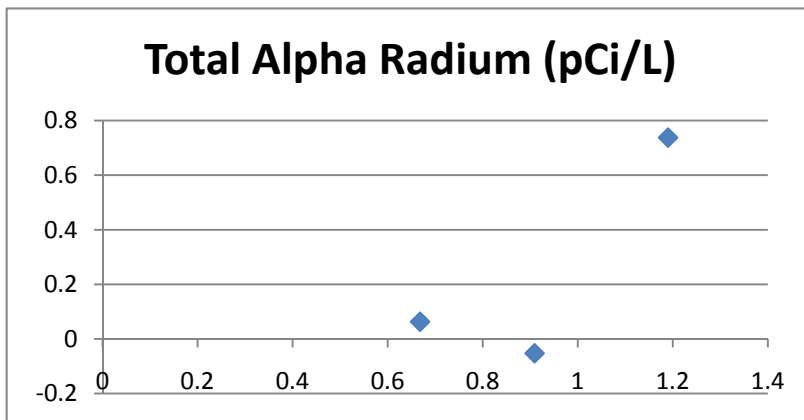
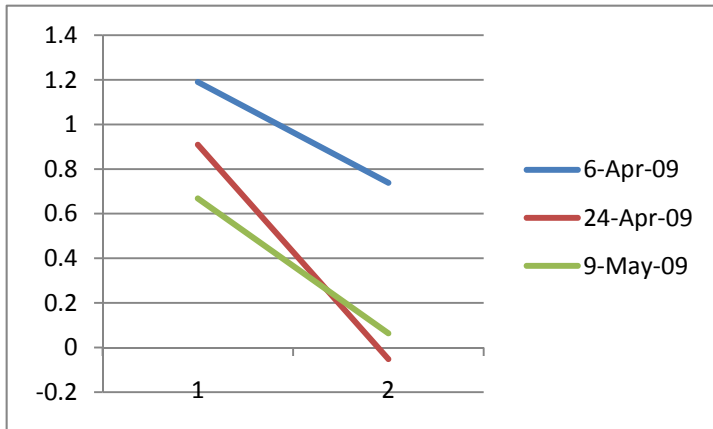
Total Alpha Radium

total alpha radium: not significant
SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.817
R Square	0.667
Adjusted R Square	0.334
Standard Error	0.213
Observations	3.000

ANOVA					
	df	SS	MS	F	Significance F
Regression	1.000	0.091	0.091	2.002	0.392
Residual	1.000	0.045	0.045		
Total	2.000	0.137			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.798	0.151	5.267	0.119	-1.126	2.722	-1.126	2.722
X Variable 1	0.500	0.353	1.415	0.392	-3.988	4.987	-3.988	4.987



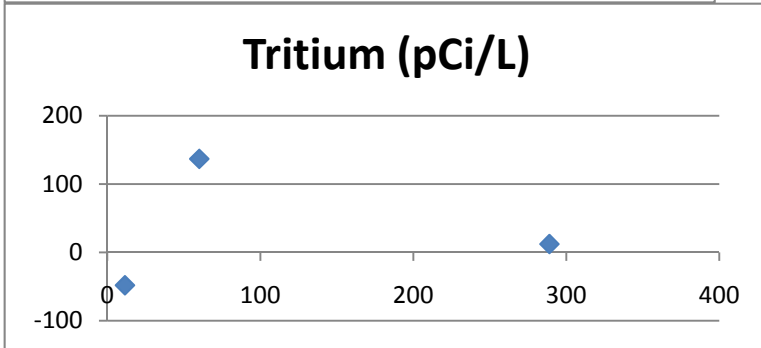
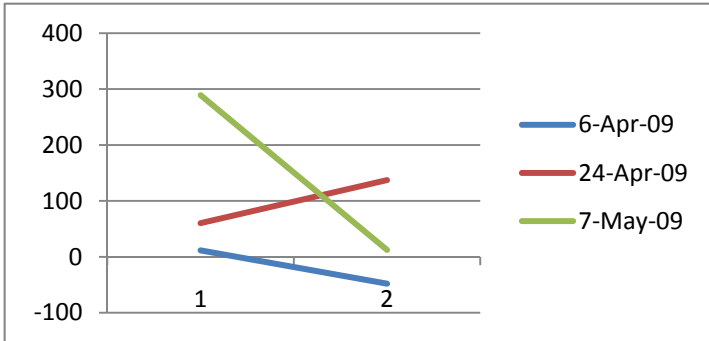
Tritium

Tritium: not significant
 SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.033
R Square	0.001
Adjusted R Square	-0.998
Standard Error	209.457
Observations	3.000

ANOVA					
	df	SS	MS	F	Significance F
Regression	1.000	49.002	49.002	0.001	0.979
Residual	1.000	43872.138	43872.138		
Total	2.000	43921.140			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	121.964	131.952	0.924	0.525	-1554.643	1798.572	-1554.643	1798.572
X Variable 1	-0.052	1.568	-0.033	0.979	-19.978	19.873	-19.978	19.873



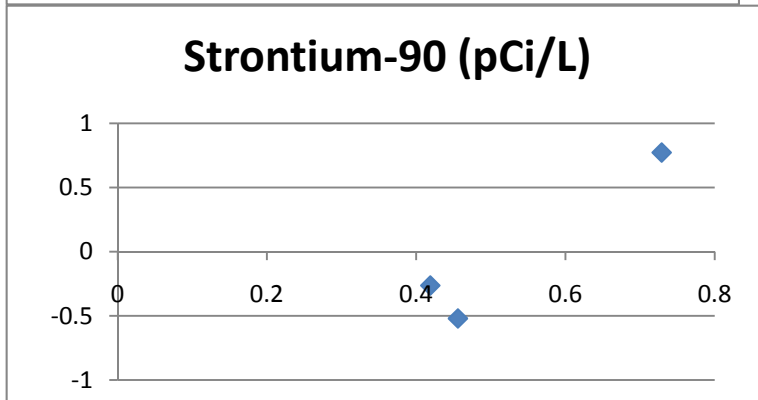
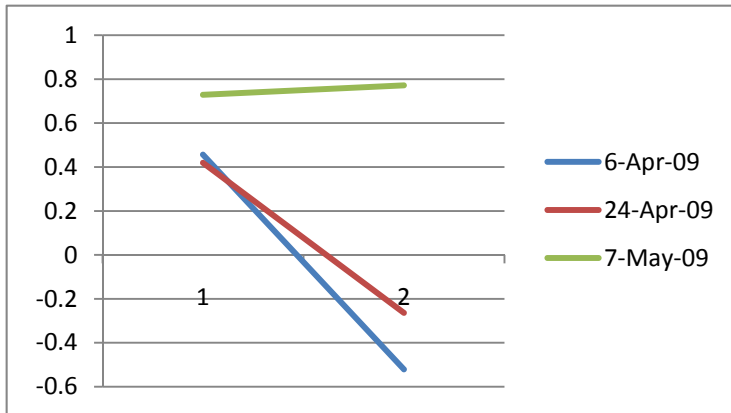
Strontium 90

Strontium 90: not significant
SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.956
R Square	0.914
Adjusted R Square	0.827
Standard Error	0.070
Observations	3.000

ANOVA					
	df	SS	MS	F	Significance F
Regression	1.000	0.052	0.052	10.575	0.190
Residual	1.000	0.005	0.005		
Total	2.000	0.057			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.536	0.041	13.183	0.048	0.019	1.052	0.019	1.052
X Variable 1	0.236	0.073	3.252	0.190	-0.687	1.160	-0.687	1.160



Uranium, Total

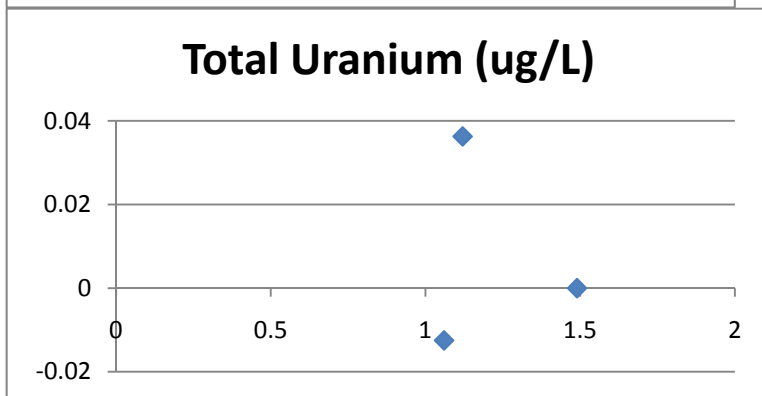
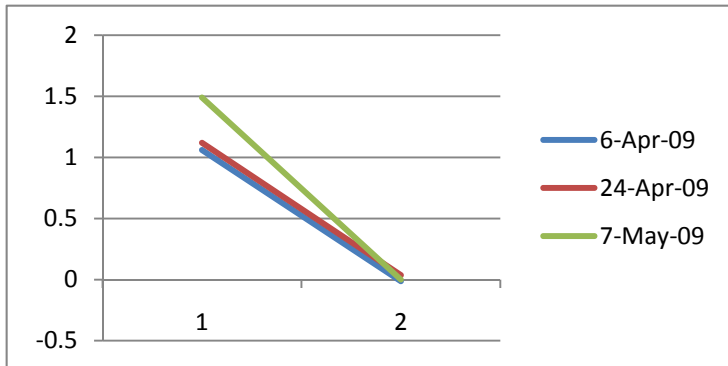
Uranium: not significant

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.145
R Square	0.021
Adjusted R Square	-0.958
Standard Error	0.326
Observations	3.000

ANOVA					
	df	SS	MS	F	Significance F
Regression	1.000	0.002	0.002	0.021	0.908
Residual	1.000	0.106	0.106		
Total	2.000	0.108			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	1.234	0.201	6.124	0.103	-1.326	3.794	-1.326	3.794
X Variable 1	-1.330	9.090	-0.146	0.908	-116.832	114.172	-116.832	114.172



Layered site filter sand, site zeolite, and granular activated carbon (layered S-Z-GAC)

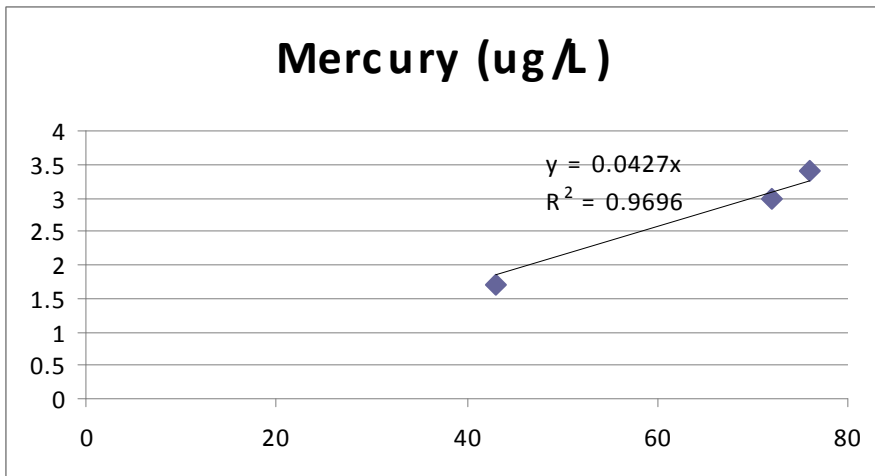
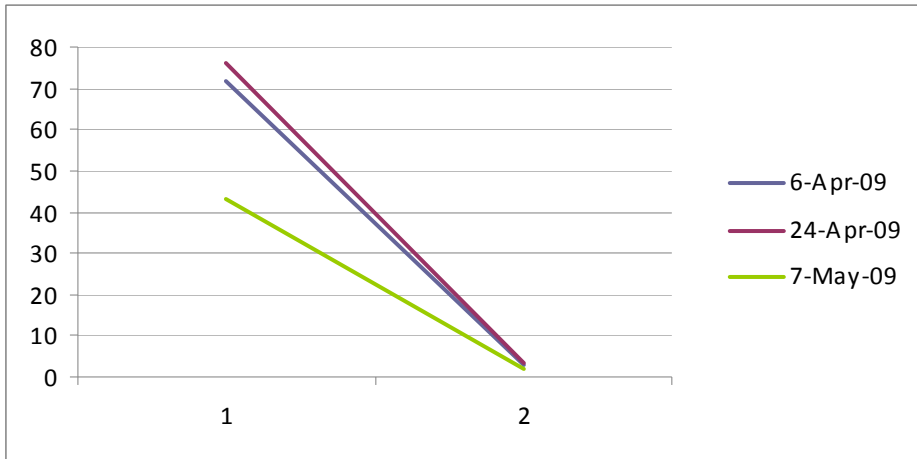
Mercury

Mercury: regression and trend significant
 SUMMARY OUTPUT
 no intercept (wasn't significant)

Regression Statistics	
Multiple R	0.999
R Square	0.998
Adjusted R Square	0.498
Standard Error	3.621
Observations	3.000

ANOVA					
	df	SS	MS	F	Significance F
Regression	1.000	12782.783	12782.783	975.134	0.020
Residual	2.000	26.217	13.109		
Total	3.000	12809.000			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.000	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
X Variable 1	23.348	0.748	31.227	0.001	20.131	26.565	20.131	26.565



Gross Alpha

Gross alpha: significant w/o constant term

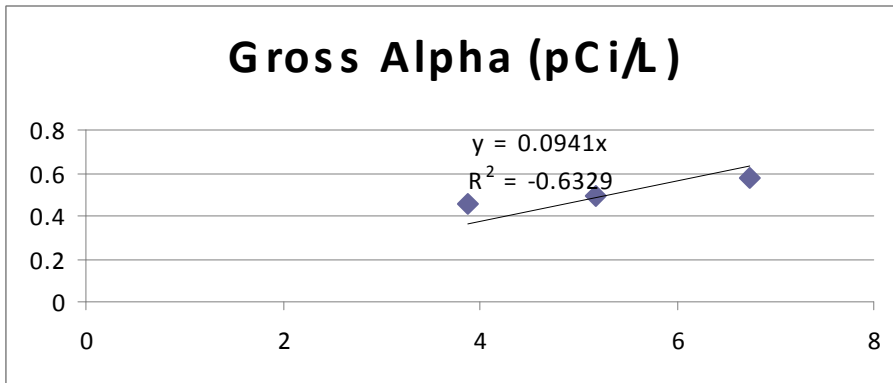
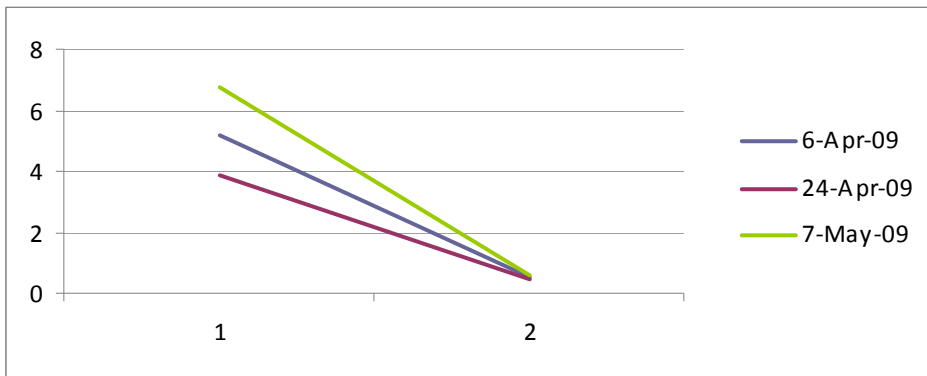
SUMMARY OUTPUT

no intercept (wasn't significant)

Regression Statistics	
Multiple R	0.992
R Square	0.985
Adjusted R Square	0.485
Standard Error	0.817
Observations	3.000

ANOVA					
	df	SS	MS	F	Significance F
Regression	1.000	86.113	86.113	128.898	0.056
Residual	2.000	1.336	0.668		
Total	3.000	87.449			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.000	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
X Variable 1	10.463	0.922	11.353	0.008	6.498	14.428	6.498	14.428



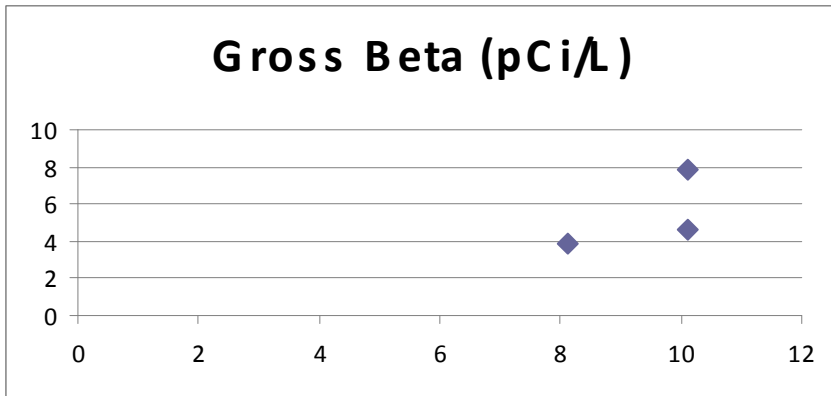
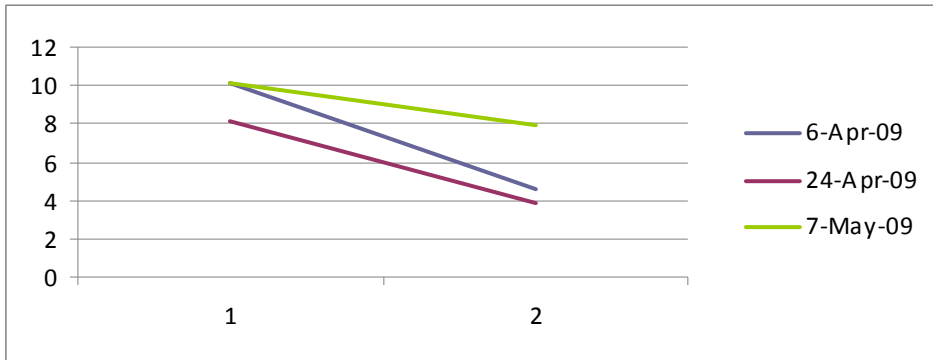
Gross Beta

Gross beta: not significant
SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.650
R Square	0.423
Adjusted R Square	-0.155
Standard Error	1.235
Observations	3.000

ANOVA					
	df	SS	MS	F	Significance F
Regression	1.000	1.116	1.116	0.732	0.549
Residual	1.000	1.524	1.524		
Total	2.000	2.640			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	7.554	2.313	3.266	0.189	-21.838	36.946	-21.838	36.946
X Variable 1	0.346	0.405	0.855	0.549	-4.794	5.486	-4.794	5.486



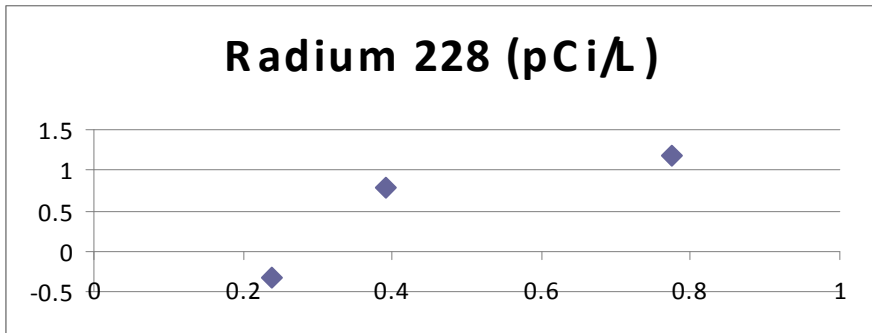
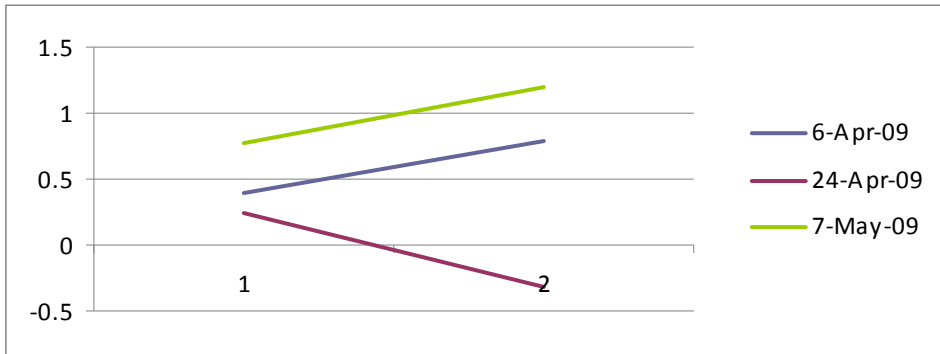
Radium 228

Radium 228: not significant
SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.874
R Square	0.765
Adjusted R Square	0.529
Standard Error	0.189
Observations	3.000

ANOVA					
	df	SS	MS	F	Significance F
Regression	1.000	0.116	0.116	3.250	0.322
Residual	1.000	0.036	0.036		
Total	2.000	0.152			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.297	0.145	2.053	0.289	-1.542	2.136	-1.542	2.136
X Variable 1	0.309	0.171	1.803	0.322	-1.667	2.484	-1.667	2.484



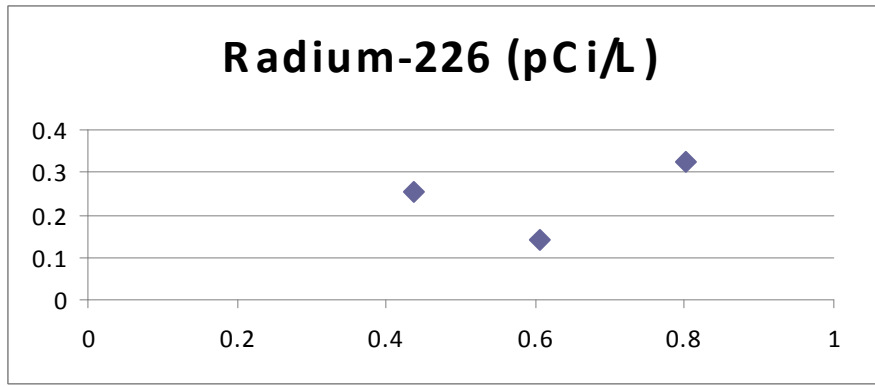
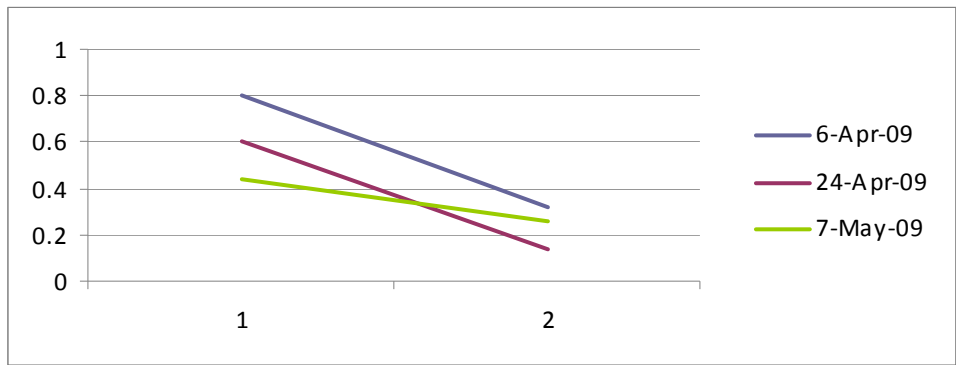
Radium 226

Radium 226: not significant
SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.408
R Square	0.167
Adjusted R Square	-0.667
Standard Error	0.236
Observations	3.000

ANOVA					
	df	SS	MS	F	Significance F
Regression	1.000	0.011	0.011	0.200	0.732
Residual	1.000	0.056	0.056		
Total	2.000	0.067			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.421	0.454	0.928	0.524	-5.344	6.186	-5.344	6.186
X Variable 1	0.808	1.808	0.447	0.732	-22.161	23.778	-22.161	23.778



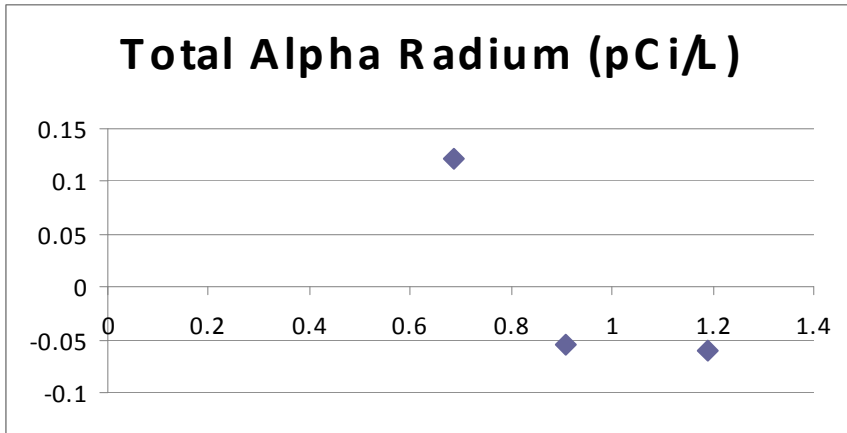
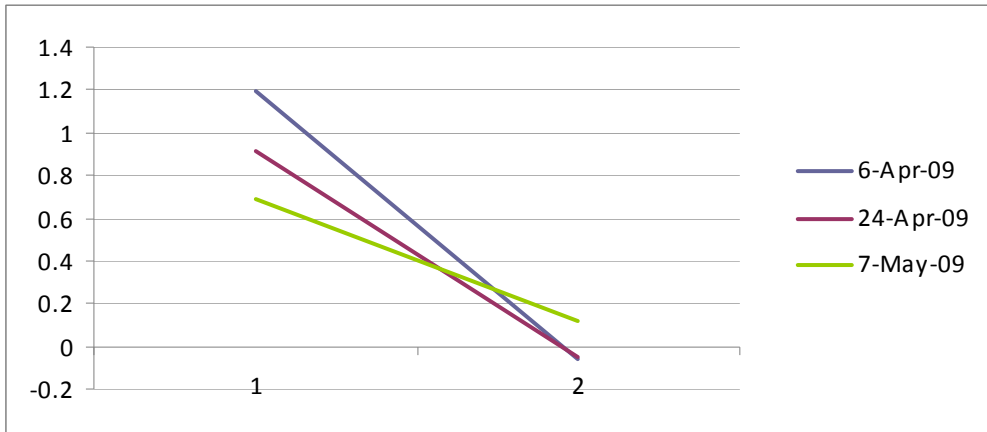
Total Alpha Radium

Total alpha radium: not significant
SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.848
R Square	0.719
Adjusted R Square	0.439
Standard Error	0.188
Observations	3.000

ANOVA					
	df	SS	MS	F	Significance F
Regression	1.000	0.091	0.091	2.564	0.355
Residual	1.000	0.036	0.036		
Total	2.000	0.127			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.934	0.109	8.579	0.074	-0.449	2.317	-0.449	2.317
X Variable 1	-2.059	1.286	-1.601	0.355	-18.393	14.276	-18.393	14.276



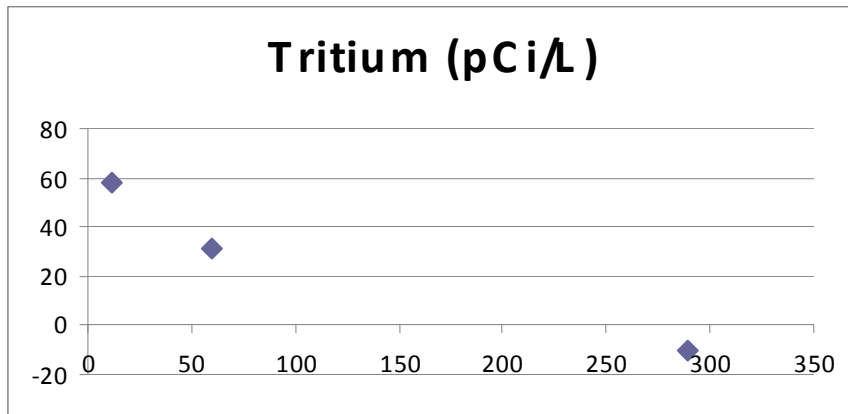
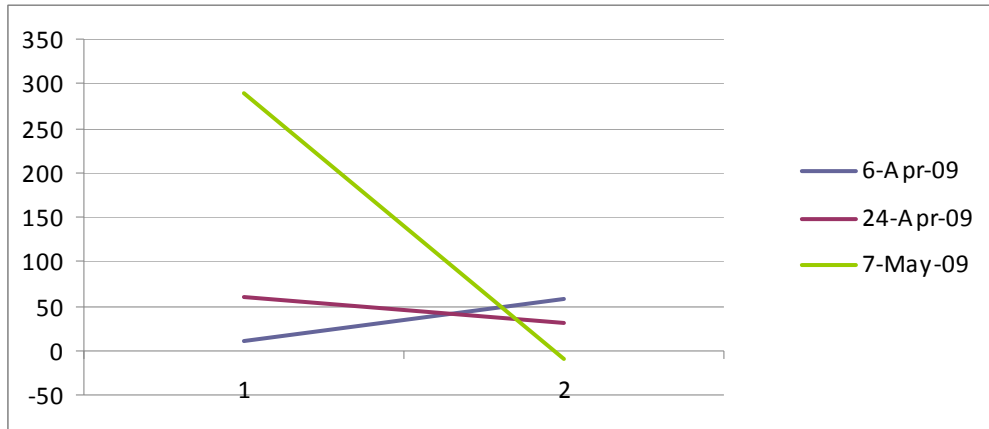
Tritium

Tritium: not significant
SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.972
R Square	0.945
Adjusted R Square	0.890
Standard Error	49.127
Observations	3.000

ANOVA					
	df	SS	MS	F	Significance F
Regression	1.000	41507.714	41507.714	17.199	0.151
Residual	1.000	2413.426	2413.426		
Total	2.000	43921.140			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	229.976	38.796	5.928	0.106	-262.978	722.930	-262.978	722.930
X Variable 1	-4.169	1.005	-4.147	0.151	-18.941	8.604	-18.941	8.604



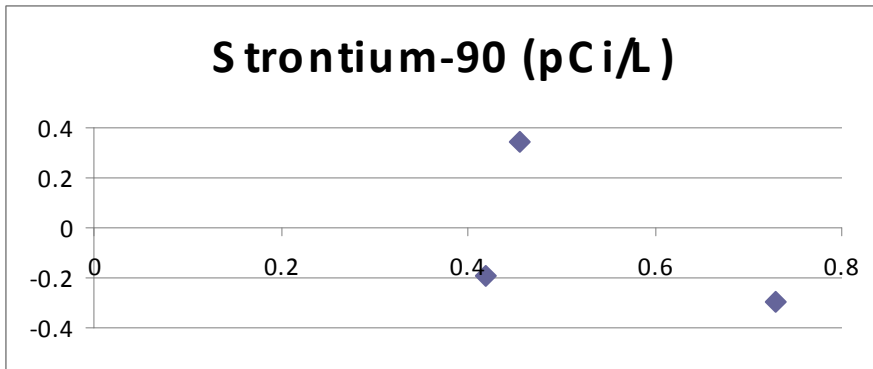
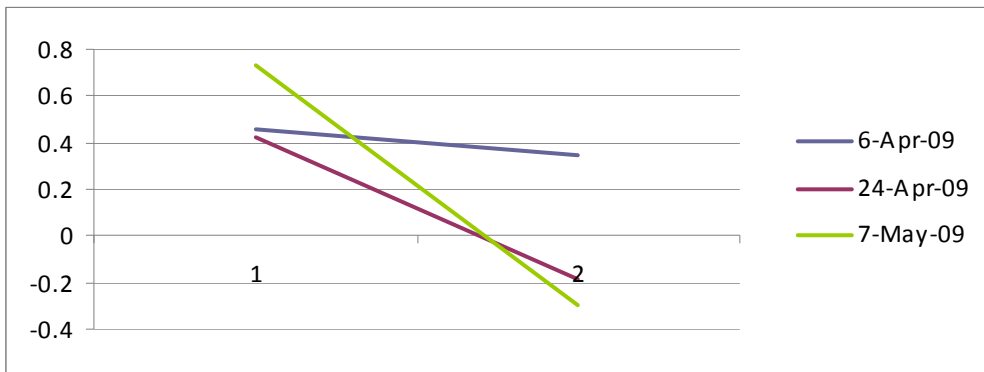
Strontium 90

Strontium 90: not significant
SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.544
R Square	0.296
Adjusted R Square	-0.408
Standard Error	0.201
Observations	3.000

ANOVA					
	df	SS	MS	F	Significance F
Regression	1.000	0.017	0.017	0.421	0.634
Residual	1.000	0.040	0.040		
Total	2.000	0.057			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.522	0.118	4.438	0.141	-0.973	2.016	-0.973	2.016
X Variable 1	-0.267	0.411	-0.649	0.634	-5.492	4.958	-5.492	4.958



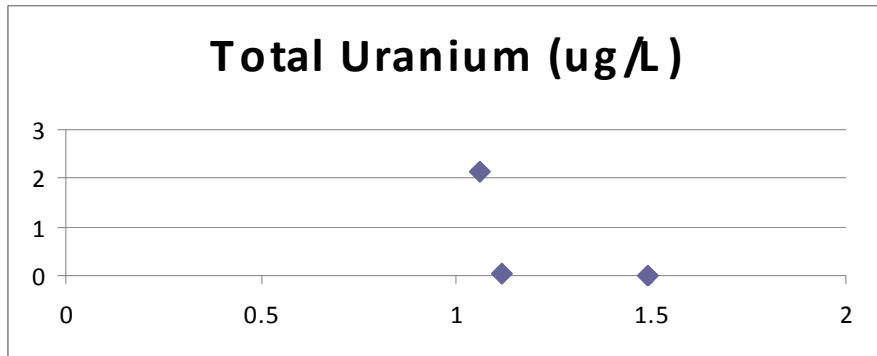
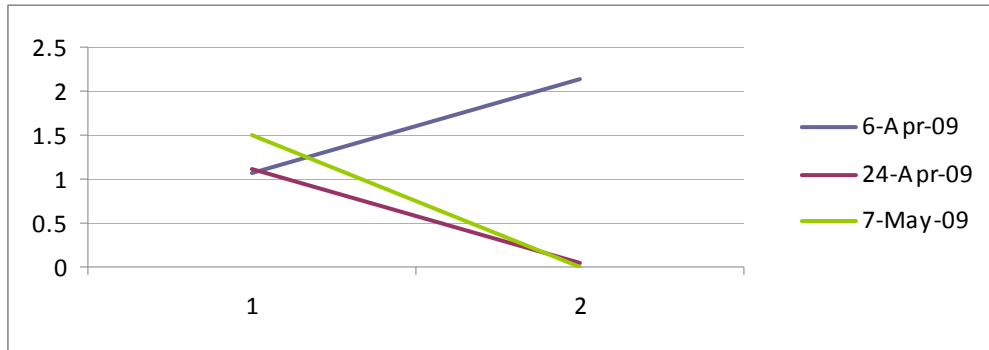
Uranium, Total

Total Uranium: not significant
SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.626
R Square	0.392
Adjusted R Square	-0.217
Standard Error	0.257
Observations	3.000

ANOVA					
	df	SS	MS	F	Significance F
Regression	1.000	0.042	0.042	0.644	0.570
Residual	1.000	0.066	0.066		
Total	2.000	0.108			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	1.311	0.184	7.120	0.089	-1.028	3.650	-1.028	3.650
X Variable 1	-0.120	0.150	-0.802	0.570	-2.022	1.782	-2.022	1.782



Rhyolite sand and surface modified zeolite (R-SMZ)

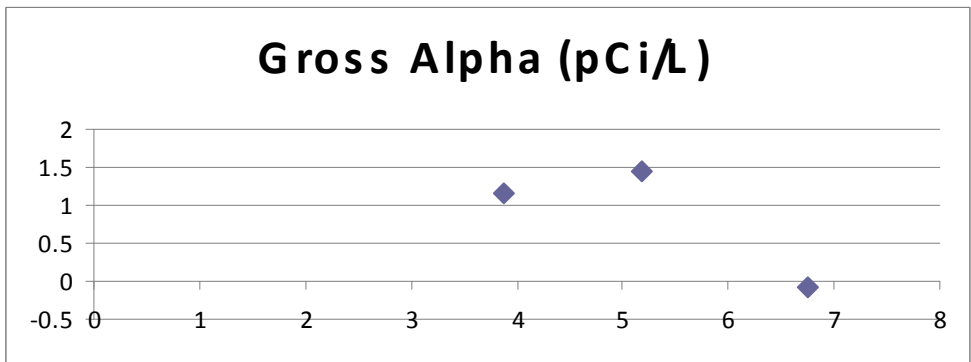
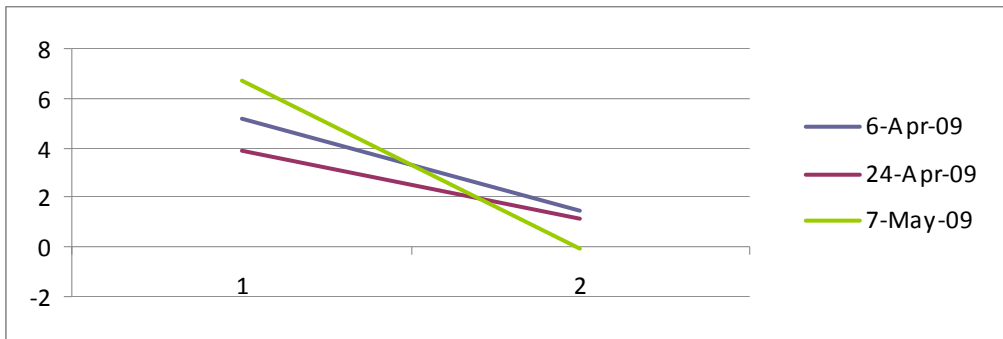
Gross Alpha

Gross Alpha: nothing significant
SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.790
R Square	0.624
Adjusted R Square	0.248
Standard Error	1.246
Observations	3.000

ANOVA					
	df	SS	MS	F	Significance F
Regression	1.000	2.578	2.578	1.660	0.420
Residual	1.000	1.553	1.553		
Total	2.000	4.131			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	6.437	1.157	5.565	0.113	-8.262	21.137	-8.262	21.137
X Variable 1	-1.388	1.077	-1.289	0.420	-15.072	12.297	-15.072	12.297



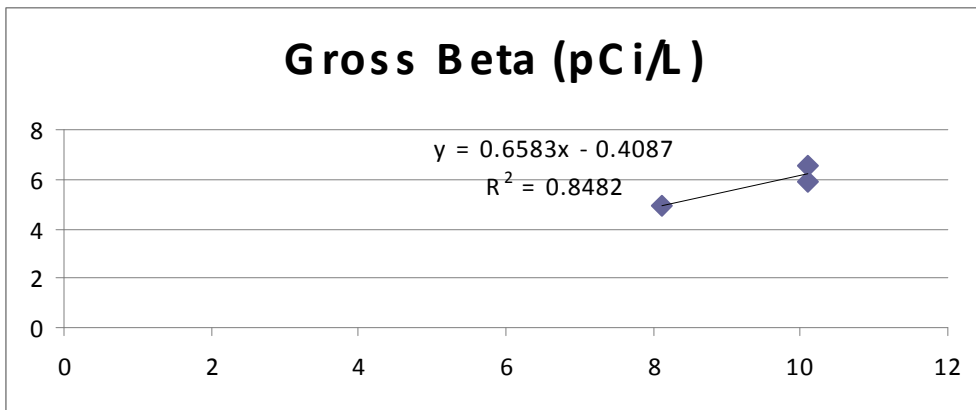
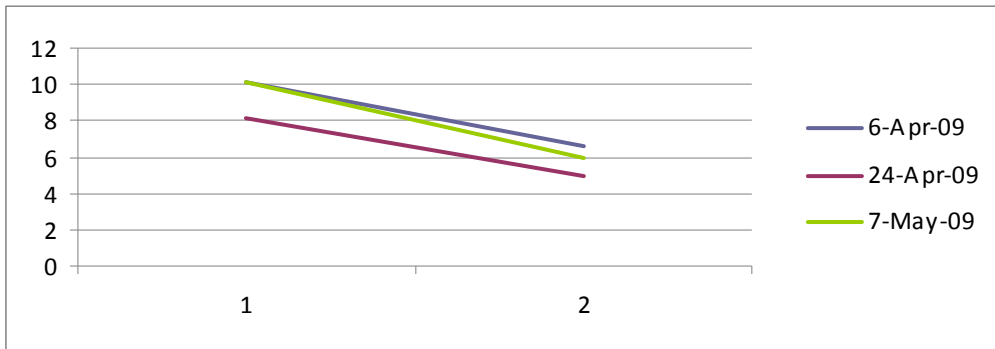
Gross Beta

Gross Beta: nothing significant
 SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.921
R Square	0.848
Adjusted R Square	0.696
Standard Error	0.633
Observations	3.000

ANOVA					
	df	SS	MS	F	Significance F
Regression	1.000	2.239	2.239	5.586	0.255
Residual	1.000	0.401	0.401		
Total	2.000	2.640			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	1.959	3.185	0.615	0.649	-38.505	42.424	-38.505	42.424
X Variable 1	1.288	0.545	2.364	0.255	-5.638	8.215	-5.638	8.215



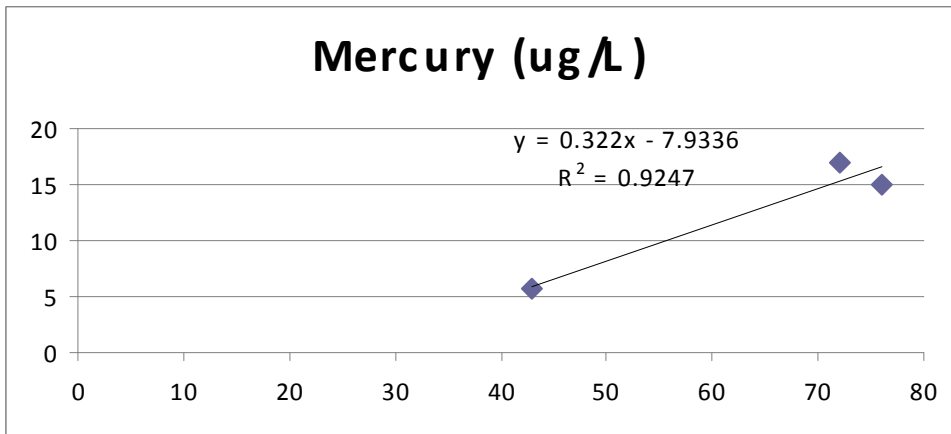
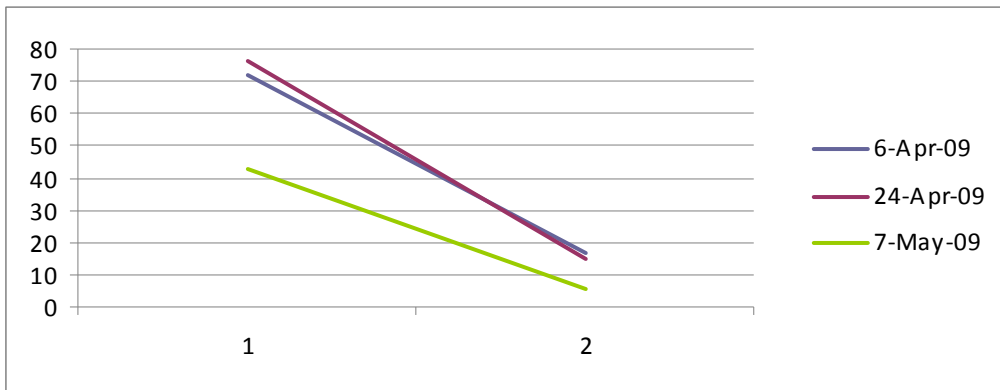
Mercury

Mercury: nothing significant
SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.962
R Square	0.925
Adjusted R Square	0.849
Standard Error	6.987
Observations	3.000

ANOVA					
	df	SS	MS	F	Significance F
Regression	1.000	599.853	599.853	12.289	0.177
Residual	1.000	48.814	48.814		
Total	2.000	648.667			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	27.576	11.057	2.494	0.243	-112.923	168.074	-112.923	168.074
X Variable 1	2.872	0.819	3.506	0.177	-7.538	13.282	-7.538	13.282



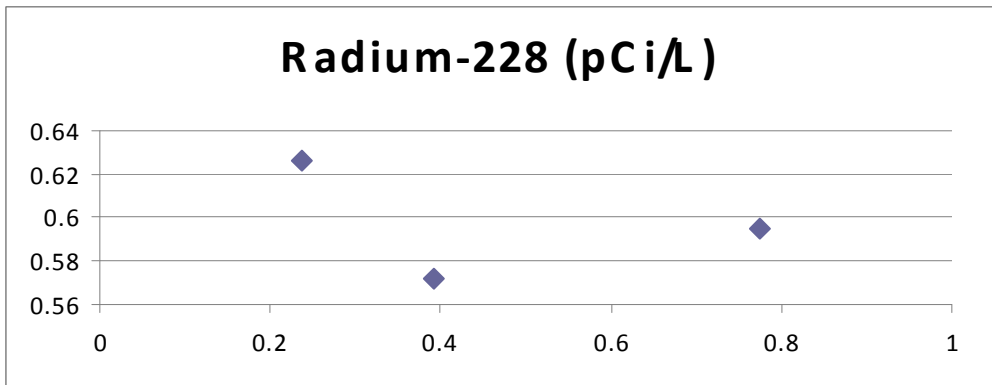
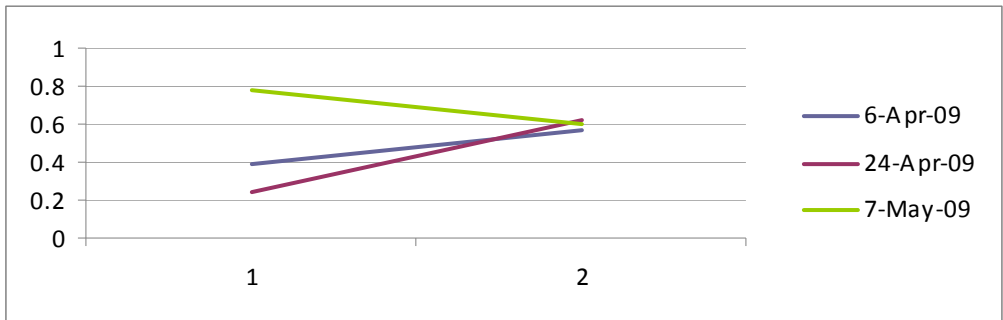
Radium 228

Radium 228: nothing significant
SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.360
R Square	0.129
Adjusted R Square	-0.741
Standard Error	0.364
Observations	3.000

ANOVA					
	df	SS	MS	F	Significance F
Regression	1.000	0.020	0.020	0.149	0.766
Residual	1.000	0.133	0.133		
Total	2.000	0.152			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	2.658	5.683	0.468	0.721	-69.546	74.863	-69.546	74.863
X Variable 1	-3.665	9.502	-0.386	0.766	-124.393	117.064	-124.393	117.064



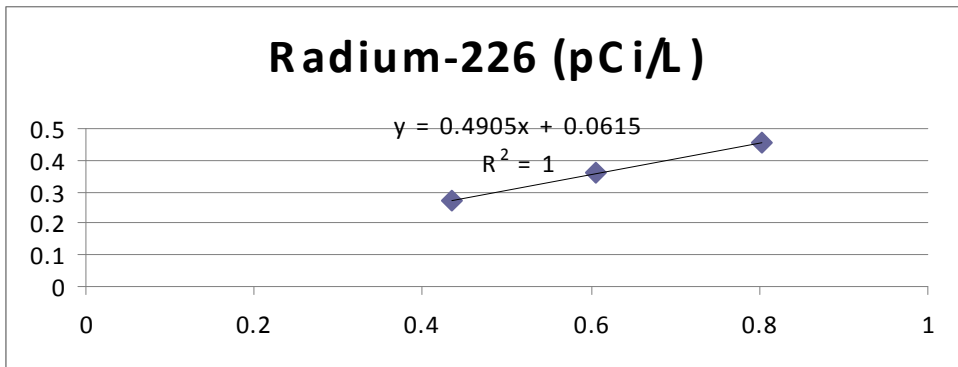
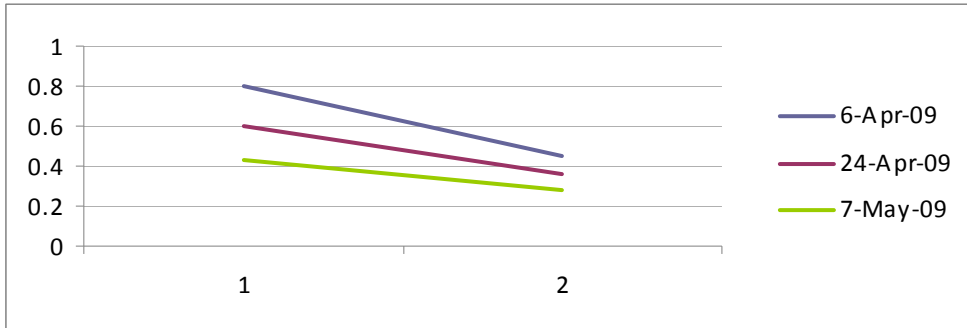
Radium 226

Radium 226: significant regression and all coefficients significant
 SUMMARY OUTPUT

Regression Statistics	
Multiple R	1.000
R Square	1.000
Adjusted R Square	1.000
Standard Error	0.001
Observations	3.000

ANOVA					
	df	SS	MS	F	Significance F
Regression	1.000	0.067	0.067	170045.026	0.002
Residual	1.000	0.000	0.000		
Total	2.000	0.067			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	-0.125	0.002	-68.521	0.009	-0.149	-0.102	-0.149	-0.102
X Variable 1	2.039	0.005	412.365	0.002	1.976	2.101	1.976	2.101



Total Alpha Radium

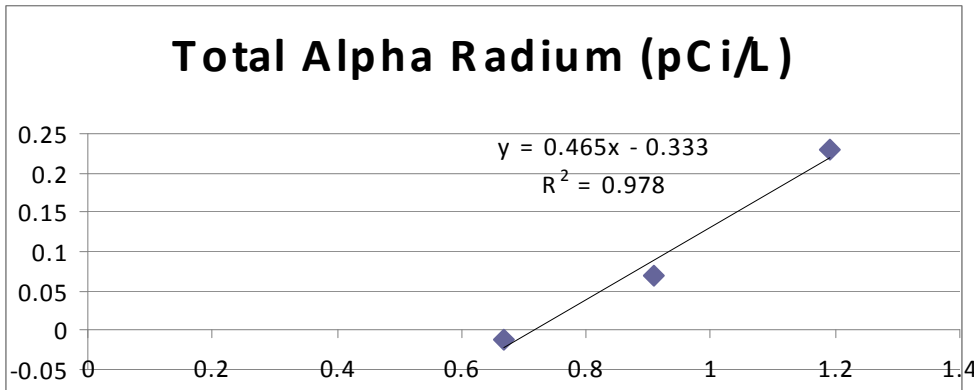
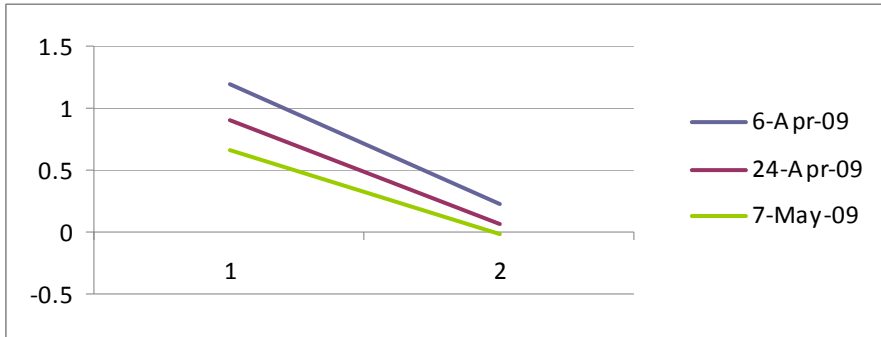
Total alpha Radium:
SUMMARY OUTPUT

significant regression and all coefficients significant at 0.1 alpha

Regression Statistics	
Multiple R	0.989
R Square	0.978
Adjusted R Square	0.956
Standard Error	0.055
Observations	3.000

ANOVA					
	df	SS	MS	F	Significance F
Regression	1.000	0.134	0.134	44.384	0.085
Residual	1.000	0.003	0.003		
Total	2.000	0.137			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.721	0.044	16.458	0.039	0.164	1.277	0.164	1.277
X Variable 1	2.103	0.316	6.662	0.085	-1.908	6.115	-1.908	6.115



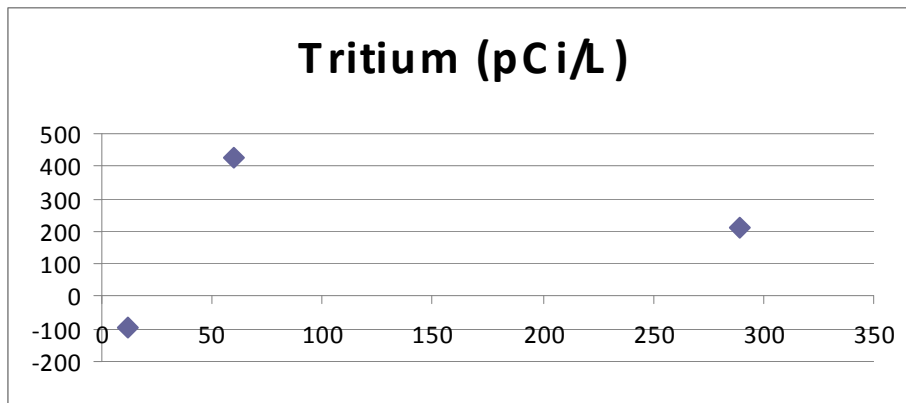
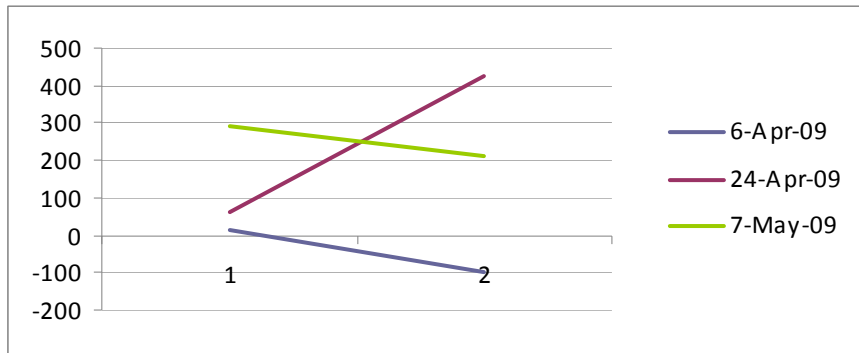
Tritium

Tritium: nothing significant
 SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.262
R Square	0.069
Adjusted R Square	-0.862
Standard Error	202.236
Observations	3.000

ANOVA					
	df	SS	MS	F	Significance F
Regression	1.000	3021.836	3021.836	0.074	0.831
Residual	1.000	40899.304	40899.304		
Total	2.000	43921.140			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	93.695	152.122	0.616	0.649	-1839.199	2026.589	-1839.199	2026.589
X Variable 1	0.148	0.546	0.272	0.831	-6.789	7.086	-6.789	7.086



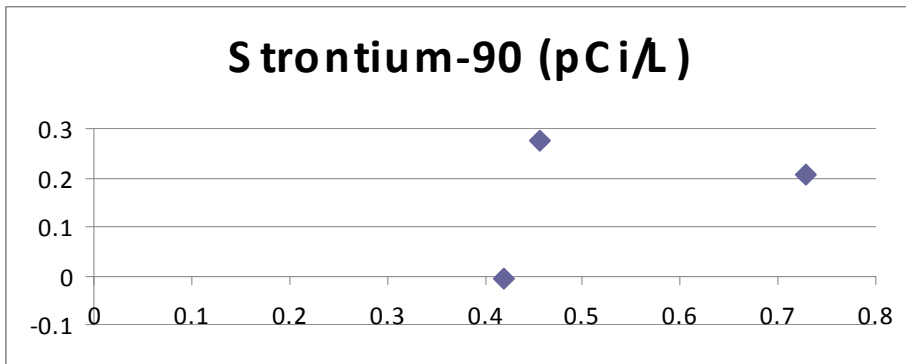
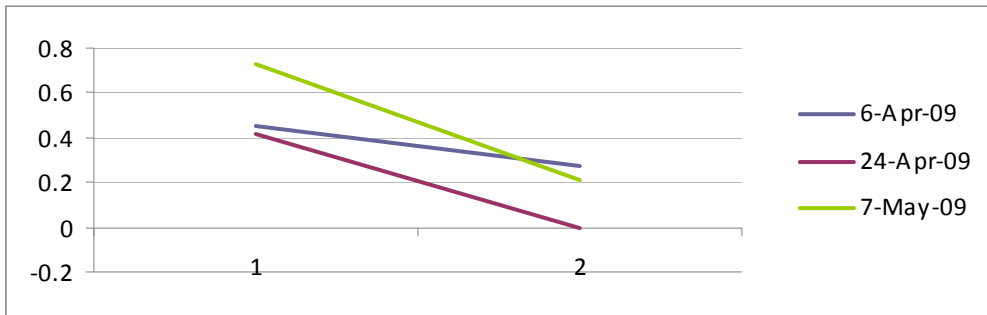
Strontium 90

Strontium 90:
SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.390
R Square	0.152
Adjusted R Square	-0.696
Standard Error	0.220
Observations	3.000

ANOVA					
	df	SS	MS	F	Significance F
Regression	1.000	0.009	0.009	0.179	0.745
Residual	1.000	0.049	0.049		
Total	2.000	0.057			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.464	0.210	2.207	0.271	-2.206	3.134	-2.206	3.134
X Variable 1	0.448	1.057	0.423	0.745	-12.986	13.881	-12.986	13.881



Uranium, Total

total Uranium:
SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.369
R Square	0.136
Adjusted R Square	-0.728
Standard Error	0.306
Observations	3.000

ANOVA					
	df	SS	MS	F	Significance F
Regression	1.000	0.015	0.015	0.158	0.759
Residual	1.000	0.094	0.094		
Total	2.000	0.108			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	1.370	0.408	3.353	0.185	-3.821	6.560	-3.821	6.560
X Variable 1	-0.466	1.175	-0.397	0.759	-15.401	14.468	-15.401	14.468

