Arsenic Release as a Function of LS Ratio

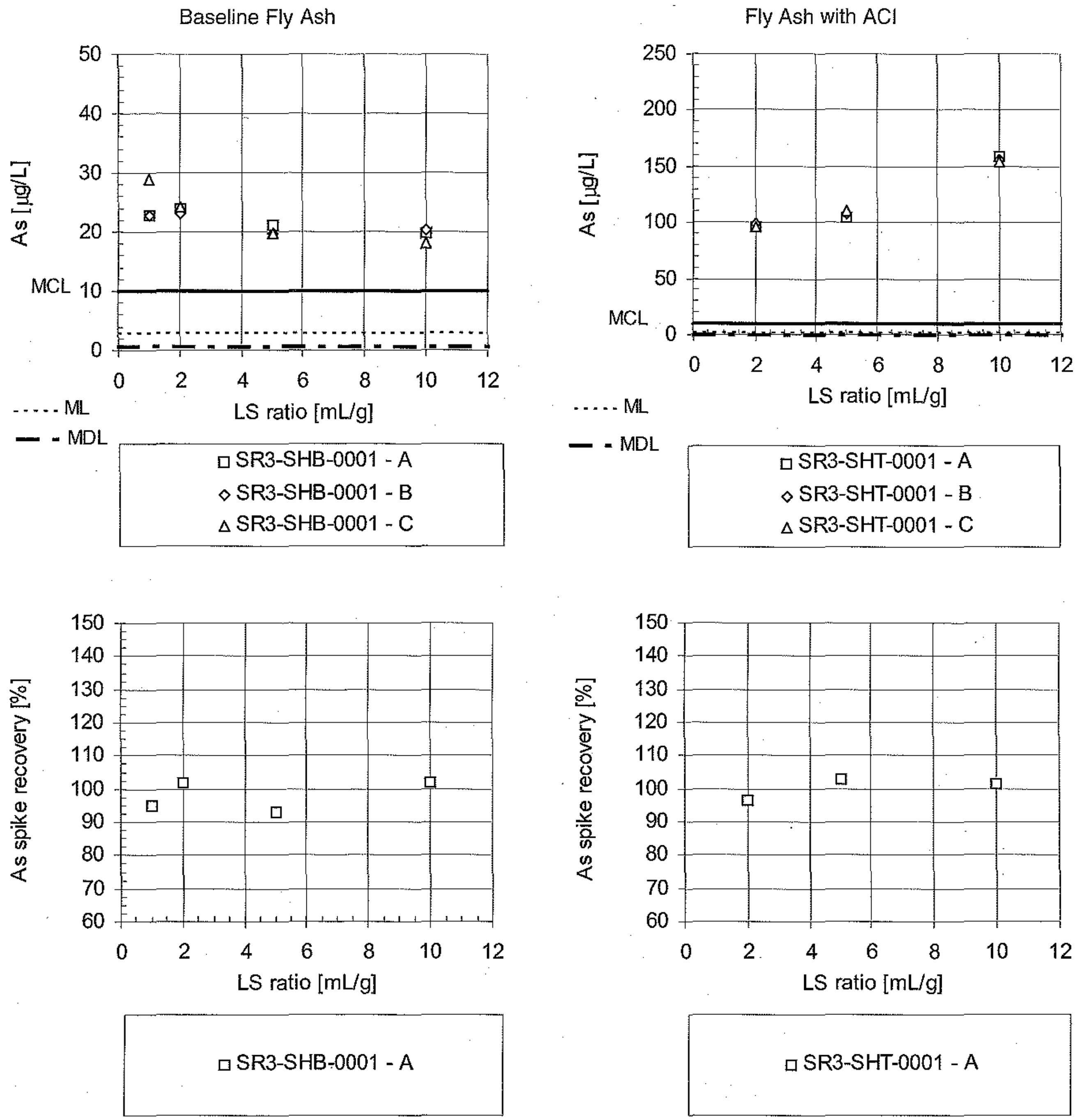
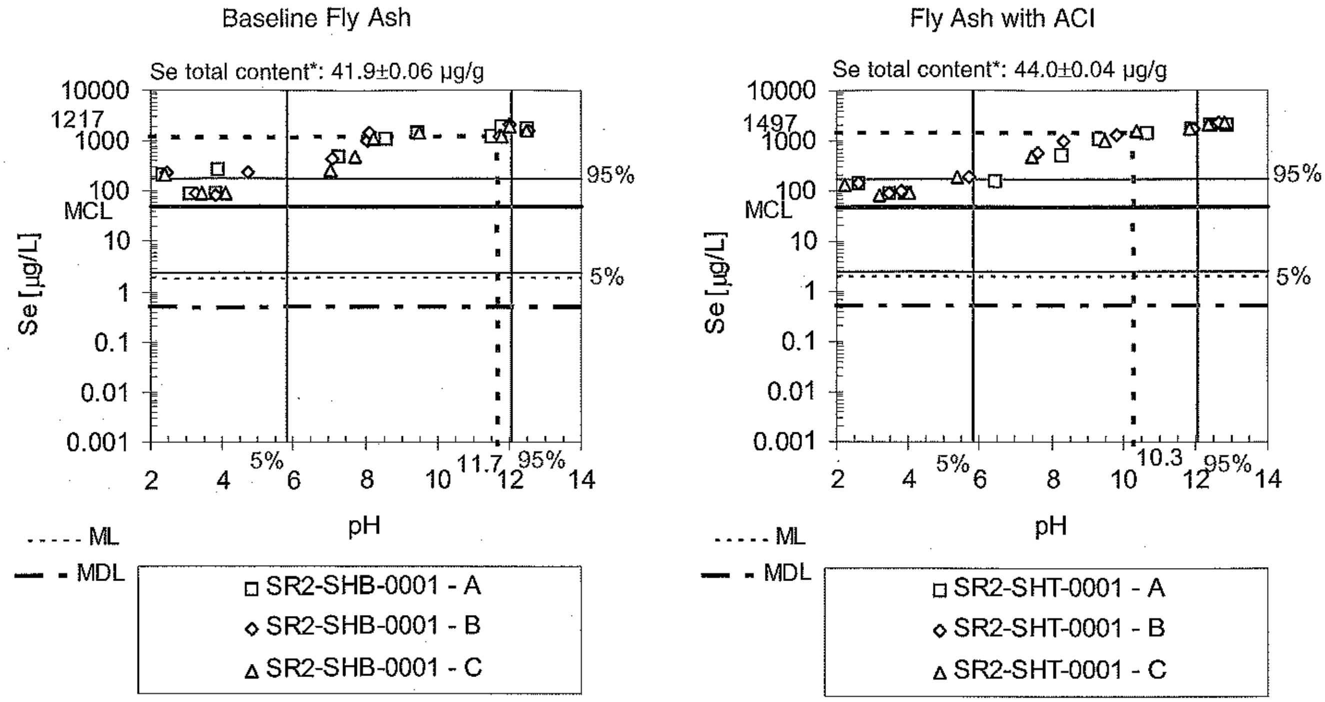


Figure F-6. Arsenic Release (top) and Spike Recoveries (bottom) as a Function of LS Ratio for the Baseline Fly Ash and the Fly Ash with Enhanced Hg Control.

Selenium Release as a Function of pH



*Total content as determined by digestion using method 3052.

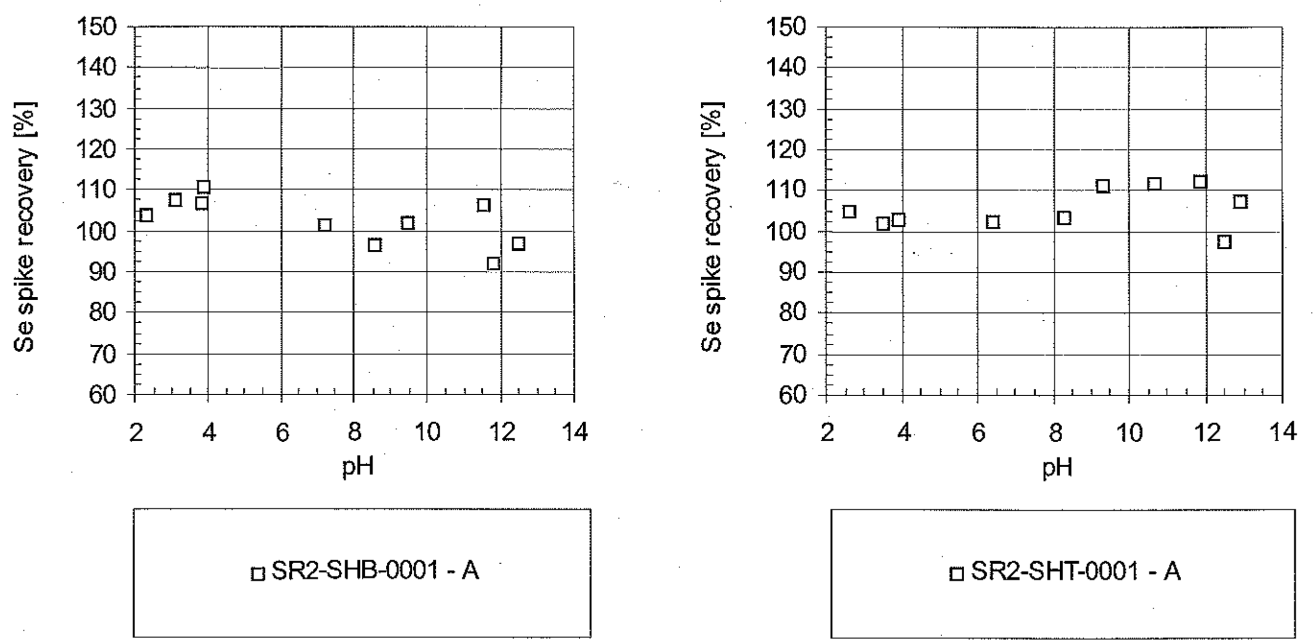


Figure F-7. Selenium Release (top) and Spike Recoveries (bottom) as a Function of pH for the Baseline Fly Ash and the Fly Ash with Enhanced Hg Control. 5th and 95th percentiles of selenium concentrations observed in typical combustion waste landfill leachate are shown for comparison.

Selenium Release as a Function of LS Ratio

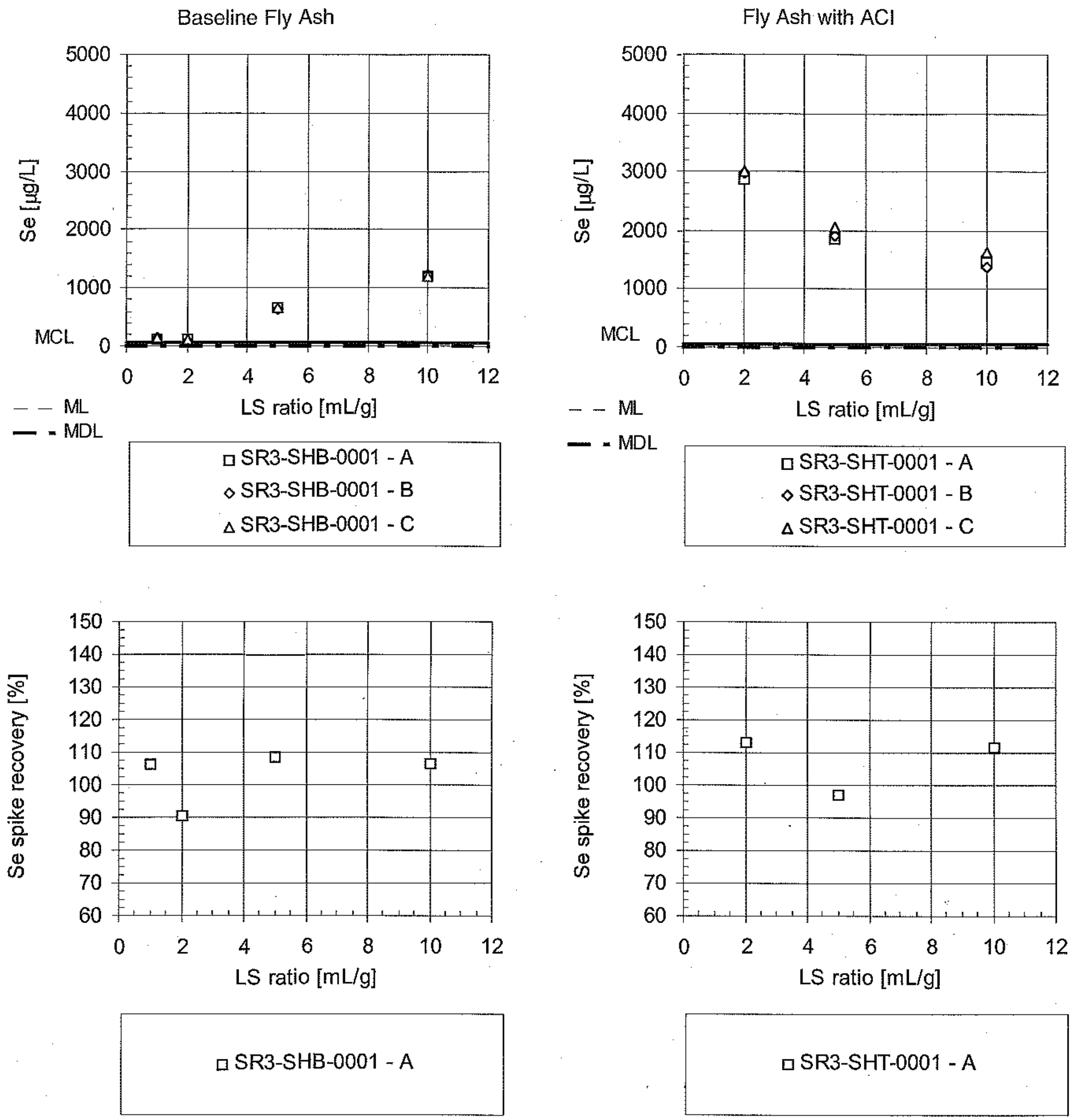
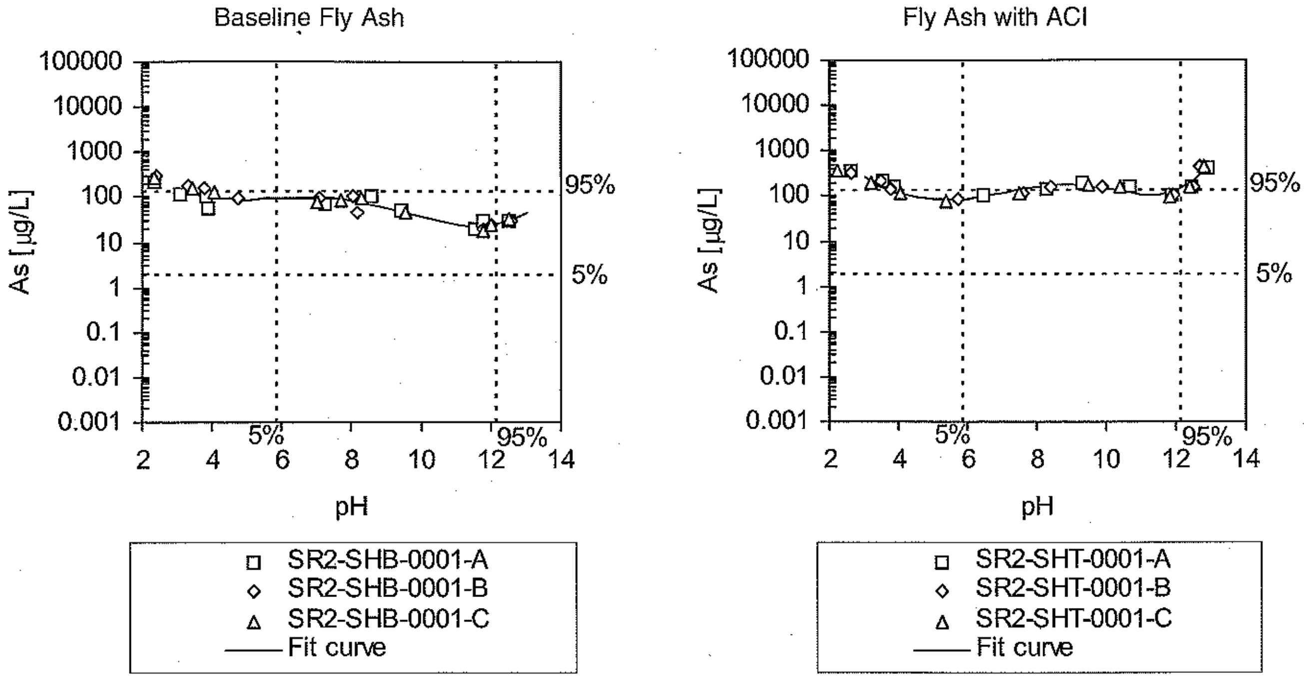


Figure F-8. Selenium Release (top) and Spike Recoveries (bottom) as a Function of LS Ratio for the Baseline Fly Ash and the Fly Ash with Enhanced Hg Control.

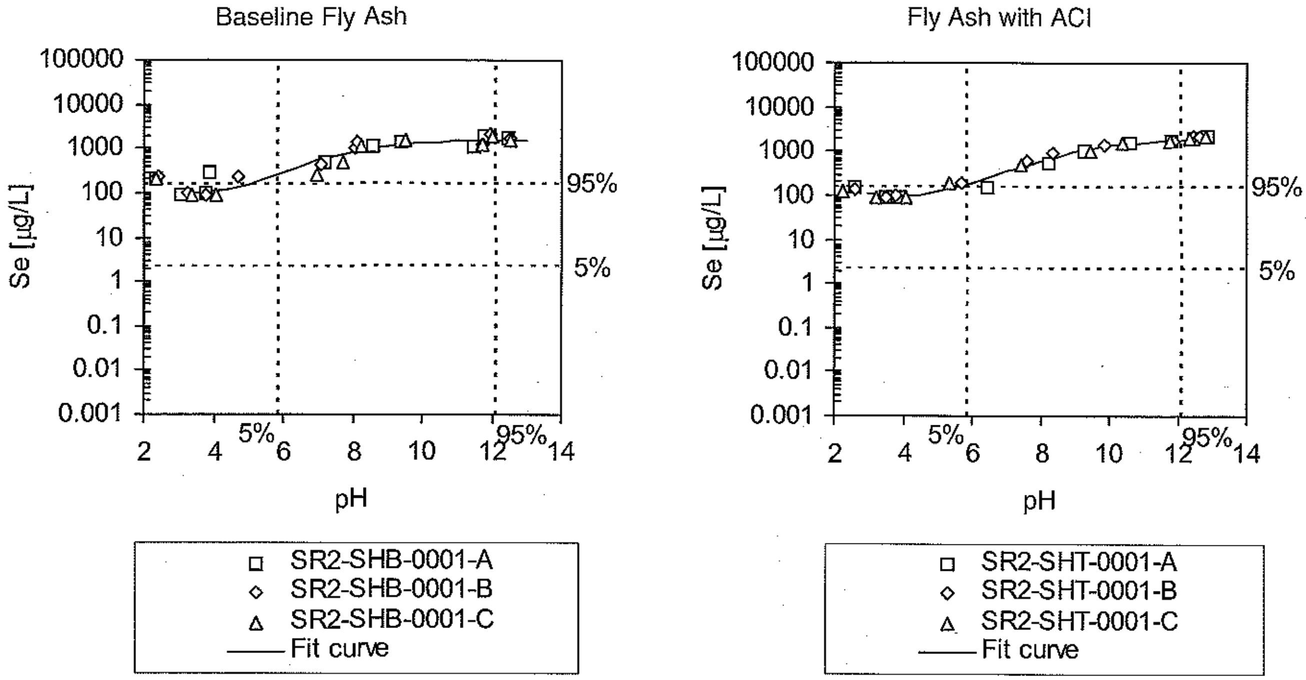
Arsenic Solubility



Material	log As (µg/L)			pH range of validity	R^2	Number of points
SHB	0.0000 pH^5	0.0011 pH^4	-0.0428 pH^3	3-12.5	0.96	33
	0.4859 pH^2	-2.2393 pH	5.6031			
SHT	0.0003 pH^5	-0.0106 pH^4	0.1194 pH^3	3-13	0.92	33
	-0.5142 pH^2	0.4220 pH	3.3432			

Figure F-9. Regression Curves of Experimental Data of Arsenic Solubility as a Function of pH.

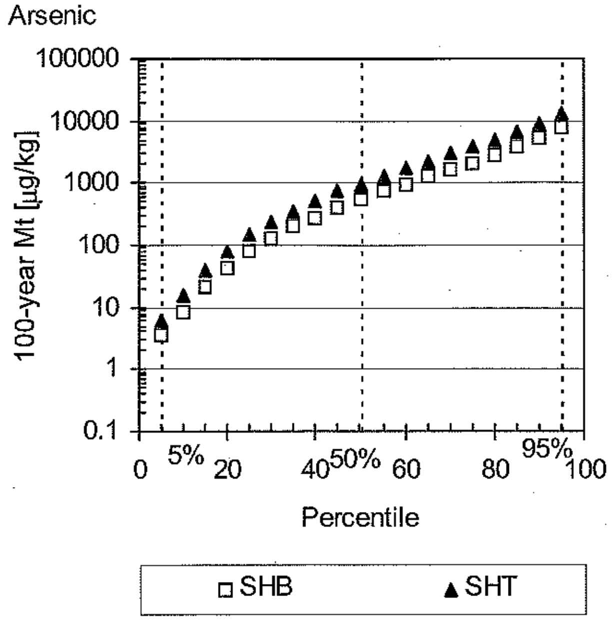
Selenium Solubility



Material	log Se (µg/L)			pH range of validity	R^2	Number of points
SHB	-0.0001 pH^5	0.0061 pH^4	-0.1107 pH^3	3-12.5	0.93	33
	0.9490 pH^2	-3.5922 pH	6.8613			
SHT	0.0001 pH^5	-0.0020 pH^4	0.0141 pH^3	3-13	0.98	33
	0.0589 pH^2	-0.6849 pH	3.3216			

Figure F10. Regression Curves of Experimental Data of Selenium Solubility as a Function of pH.

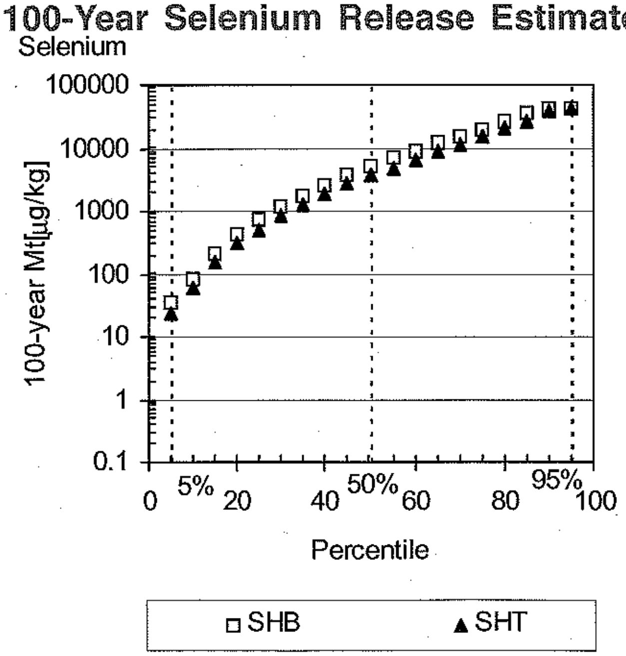
100-Year Arsenic Release Estimates



	SHB		SHT	
	µg/kg	%	µg/kg	%
Mt min	0.8	0.003	2.7	0.01
Mt - 5%	3.6	0.014	6.1	0.02
Mt - 50%	546	2.1	968	3.7
Mt - 95%	7922	30.6	13374	51.4
Mean Mt	1749	6.8	3013	11.6
Mt max	18969	73.2	26000	100.0

Figure F-11. 100-Year Arsenic Release Estimates as a Function of the Cumulative Probability for the Scenario of Disposal in a Combustion Waste Landfill.

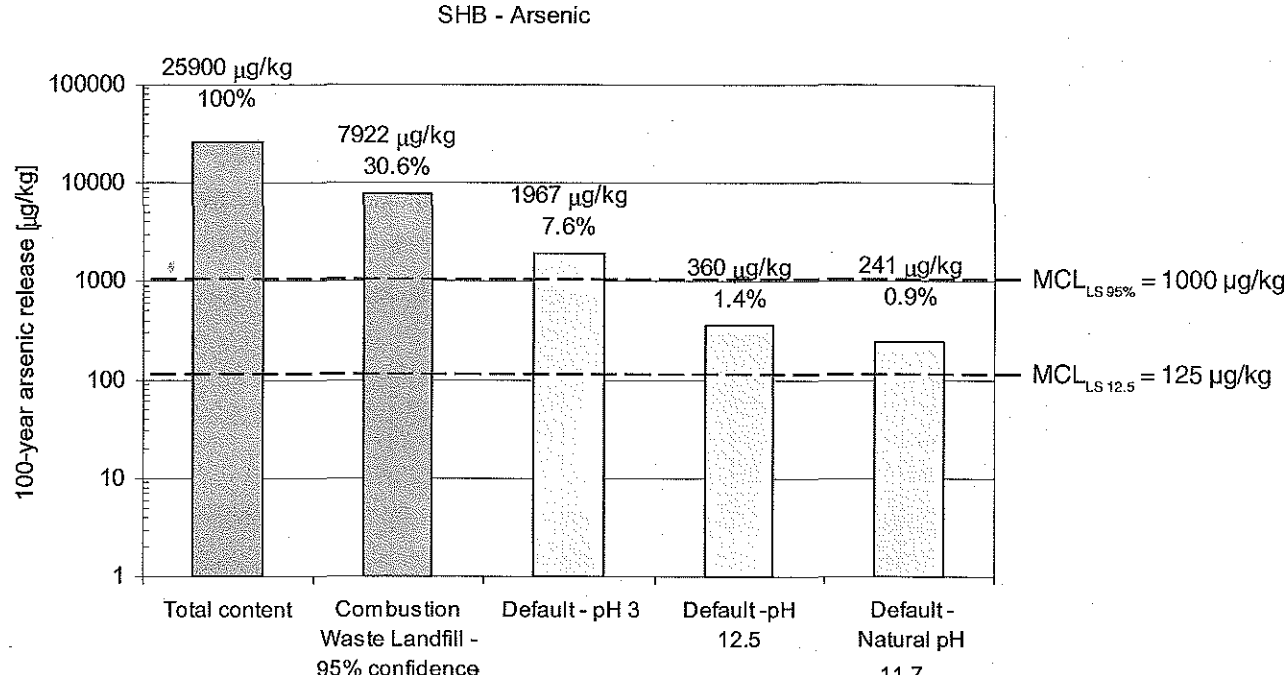
100-Year Selenium Release Estimates



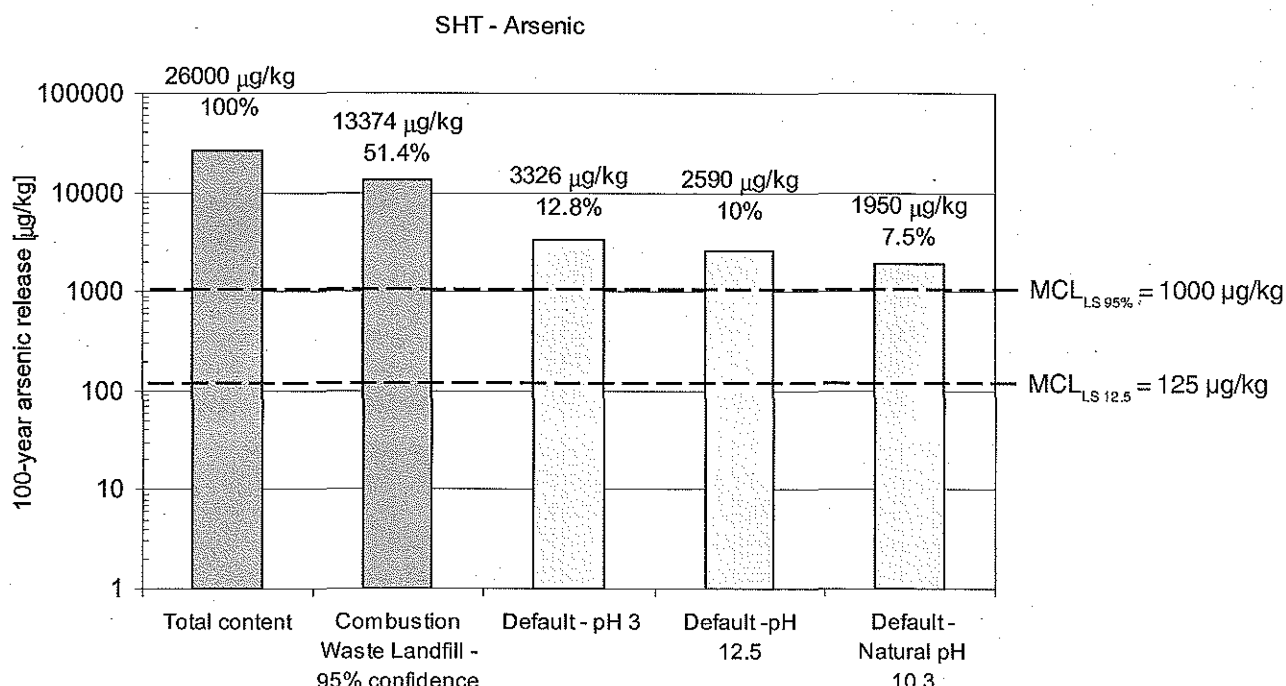
	SHB		SHT	
	µg/kg	%	µg/kg	%
Mt min	6.6	0.02	4.7	0.01
Mt - 5%	34.5	0.08	24.3	0.06
Mt - 50%	5011	12.0	3650	8.3
Mt - 95%	41900	100.0	44000	100.0
Mean Mt	17623	42.1	14240	32.4
Mt max	41900	100.0	44000	100.0

Figure F-12. 100-Year Selenium Release Estimates as a Function of the Cumulative Probability for the Scenario of Disposal in a Combustion Waste Landfill.

100-Year Arsenic Release Estimates



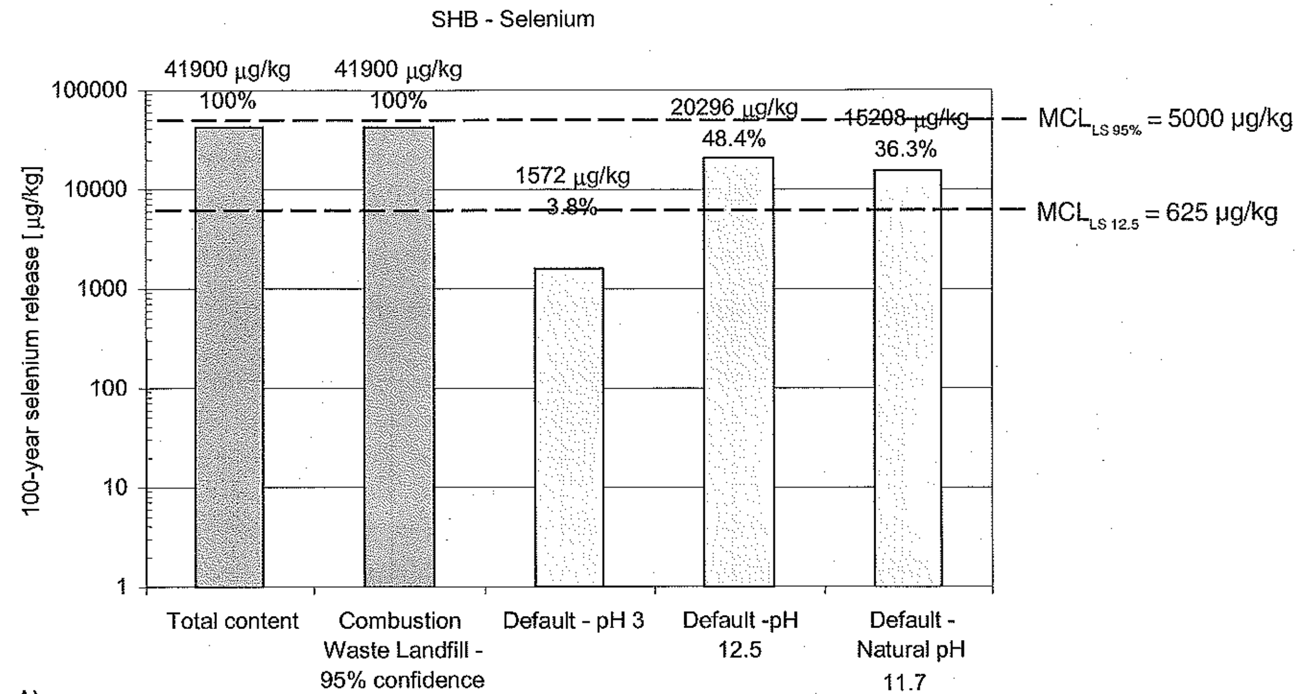
A)



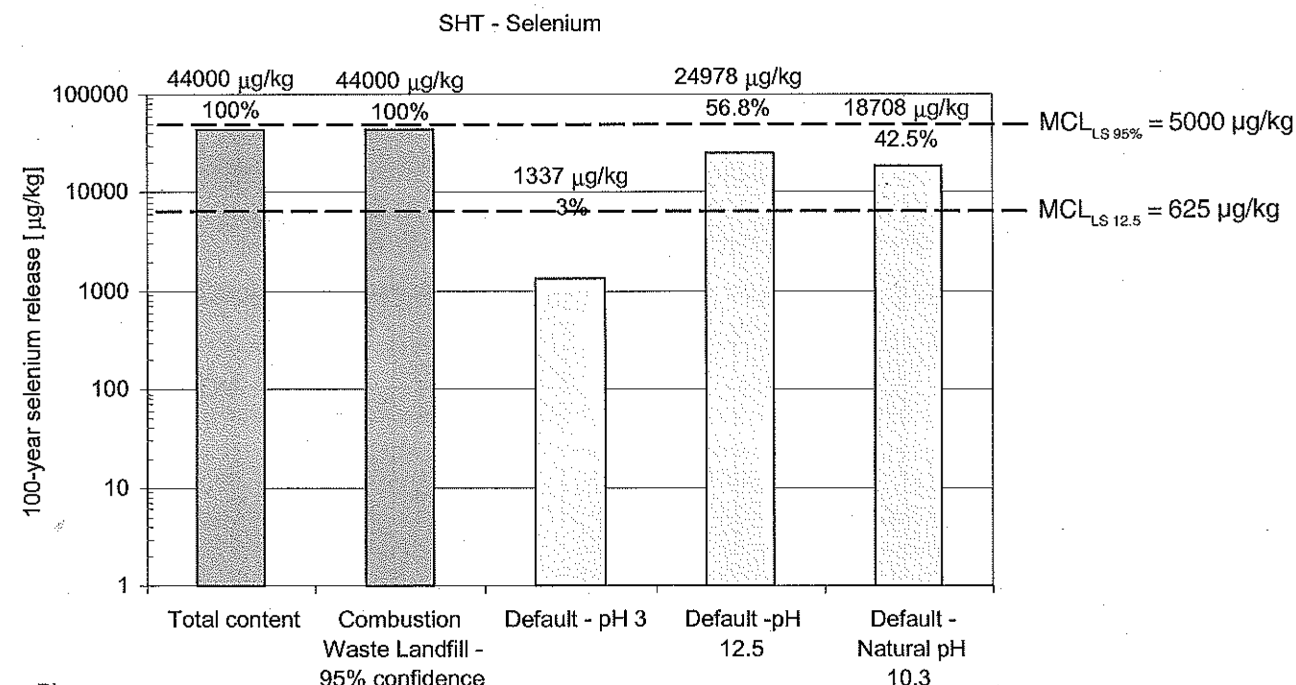
B)

Figure F-13. 100-Year Arsenic Release Estimates from A) Baseline Fly Ash and B) Fly Ash with ACI. Release estimates for percolation controlled scenario are compared to release estimate based on total content. The amount of the arsenic that would be released if the release concentration was at the MCL is also shown for comparison ($LS_{default\ scenario}$ = 12.5 L/kg and $LS_{95\%}$ = 100 L/kg).

100-Year Selenium Release Estimates



A)



B)

Figure F-14. 100-year Selenium Release Estimates from A) Baseline Fly Ash and B) Fly Ash with ACI. Release estimates for percolation controlled scenario are compared to release estimate based on total content. The amount of the selenium that would be released if the release concentration was at the MCL is also shown for comparison ($LS_{default\ scenario}$ = 12.5 L/kg and $LS_{95\%}$ = 100 L/kg).

Comments

Figure F-3:

- The fly ash from the test case had similar total Hg content to that from the baseline case.
- Hg release is greater in baseline than test case, but both were below MCL.

Figure F-5:

- The fly ash from the test case had similar total As content than that from the baseline case.
- The laboratory measurements fit within the 5–95% confidence intervals of the field observations.
- Arsenic release is less in baseline than test case, but both are about 10 times greater than the MCL. Arsenic release at pH higher than 9 is much greater for the test case than the baseline case.

Figure F-6:

- Initial landfill leachate As concentrations will likely be about 20–30 μg/L for the baseline case but at least 100 μg/L for the test case.

Figure F–7:

- The fly ash from the test case had similar total Se content to that from the baseline case.
- Se release is similar in baseline and test cases, but significantly above MCL for both cases. The observed concentrations are greater than reported in the EPA database but consistent with the EPRI database.

Figure F-8:

- Initial landfill leachate Se concentrations are expected to be around 200 μg/L for the baseline case and increasing with increasing LS ratio, but the initial concentrations for the test case are expected to be around 3000 μg/L and decreasing with increasing LS ratio.

Figures F-11 and F-12:

- The fly ash from the test case would result in As release greater than expected from the baseline case, with a 95% probability to be less than 13,375 and 7,925 μg/kg, respectively.
- The fly ash from the test case would result in Se release less than expected from the baseline case. At the 95th percentile the total content of Se will be released (41,900 and 44,000 μg/kg, respectively, for the baseline case and the test case).
- 10–100% of the Se can be anticipated to be leached from the fly ash for both cases under the projected landfill conditions.

Figure-13:

- Greater As release would be expected for the test case compared to the baseline case, for all scenarios examined.
- For all scenarios examined, Arsenic release from the test case fly ash would be greater than the amount that would be released if the release concentration was at the MCL.

Figure F-14:

- At the 95th percentile, Se release estimate exceeds total content for both the baseline and the test cases. This is not physically possible. However, this result indicates that there is 5% possibility that 100% of the total Se content would be released.
- For all scenarios examined, Se release would most likely be greater than the amount that would be released if the release concentration was at the MCL.

Appendix G
Facility C Fly Ashes

List of Figures

pH Titration Curves

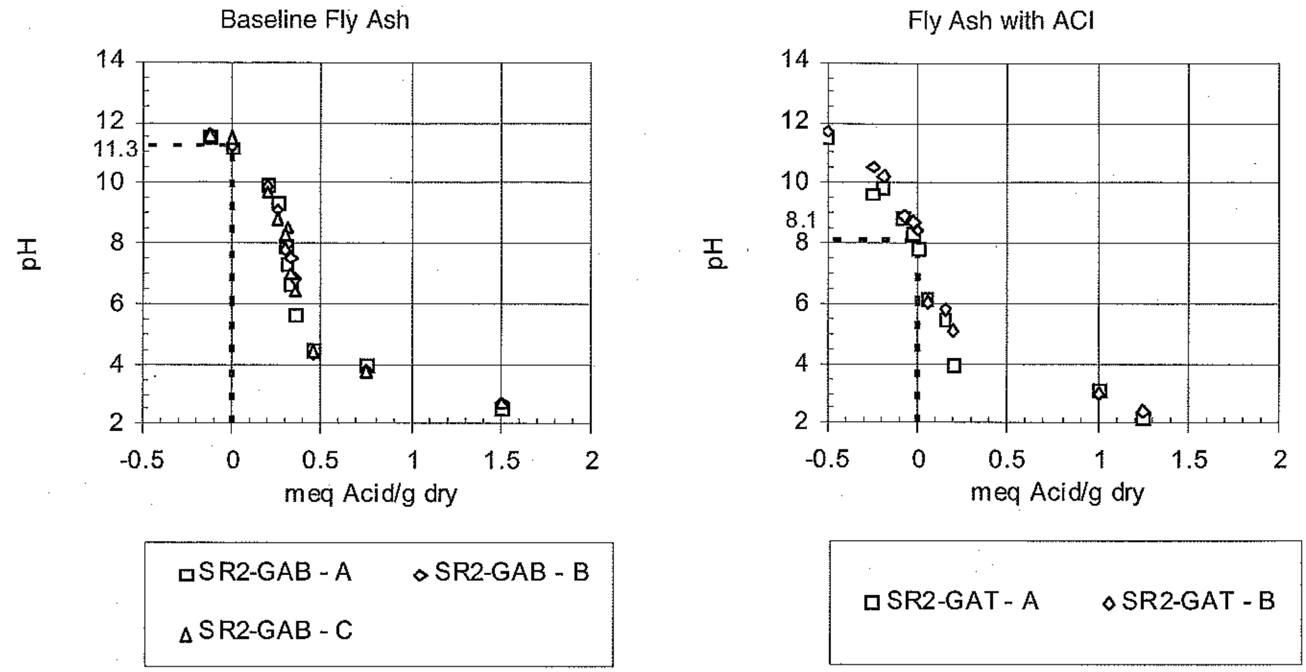


Figure G-1. pH Titration Curves for the Baseline Fly Ash and the Fly Ash with Enhanced Hg Control.

pH as a Function of LS Ratio

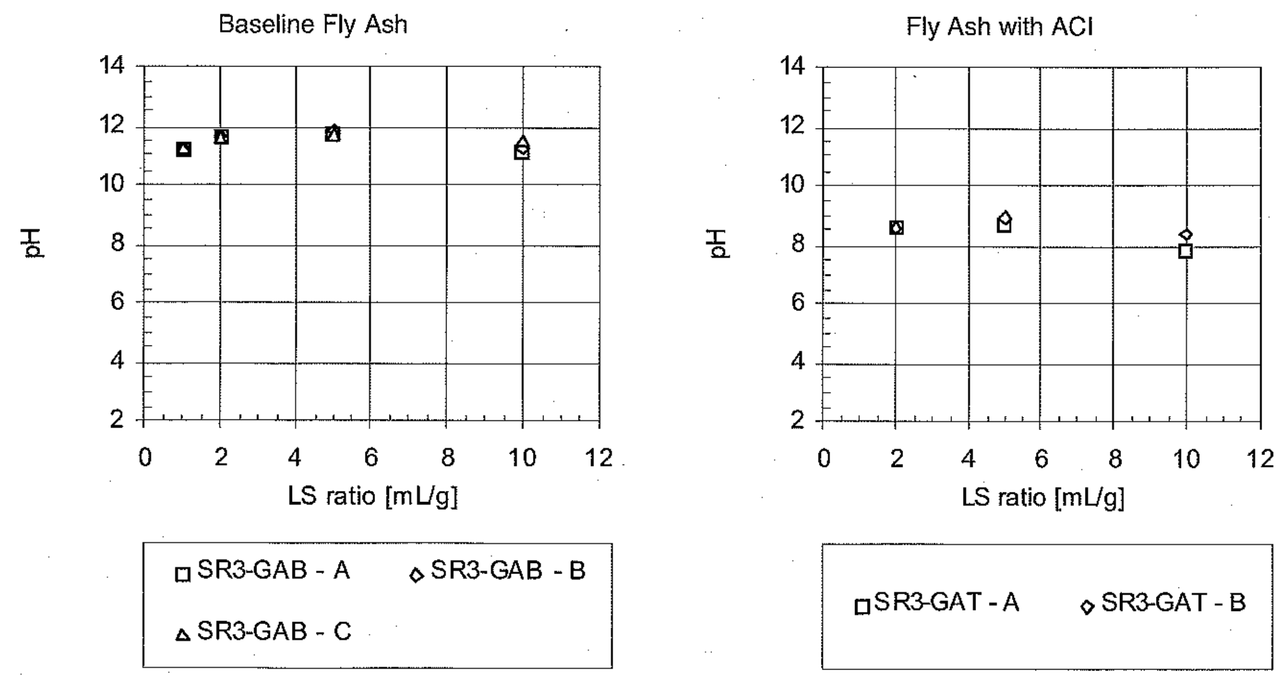


Figure G-2. pH as a Function of LS Ratio for the Baseline Fly Ash and the Fly Ash with Enhanced Hg Control.

Mercury Release as a Function of pH

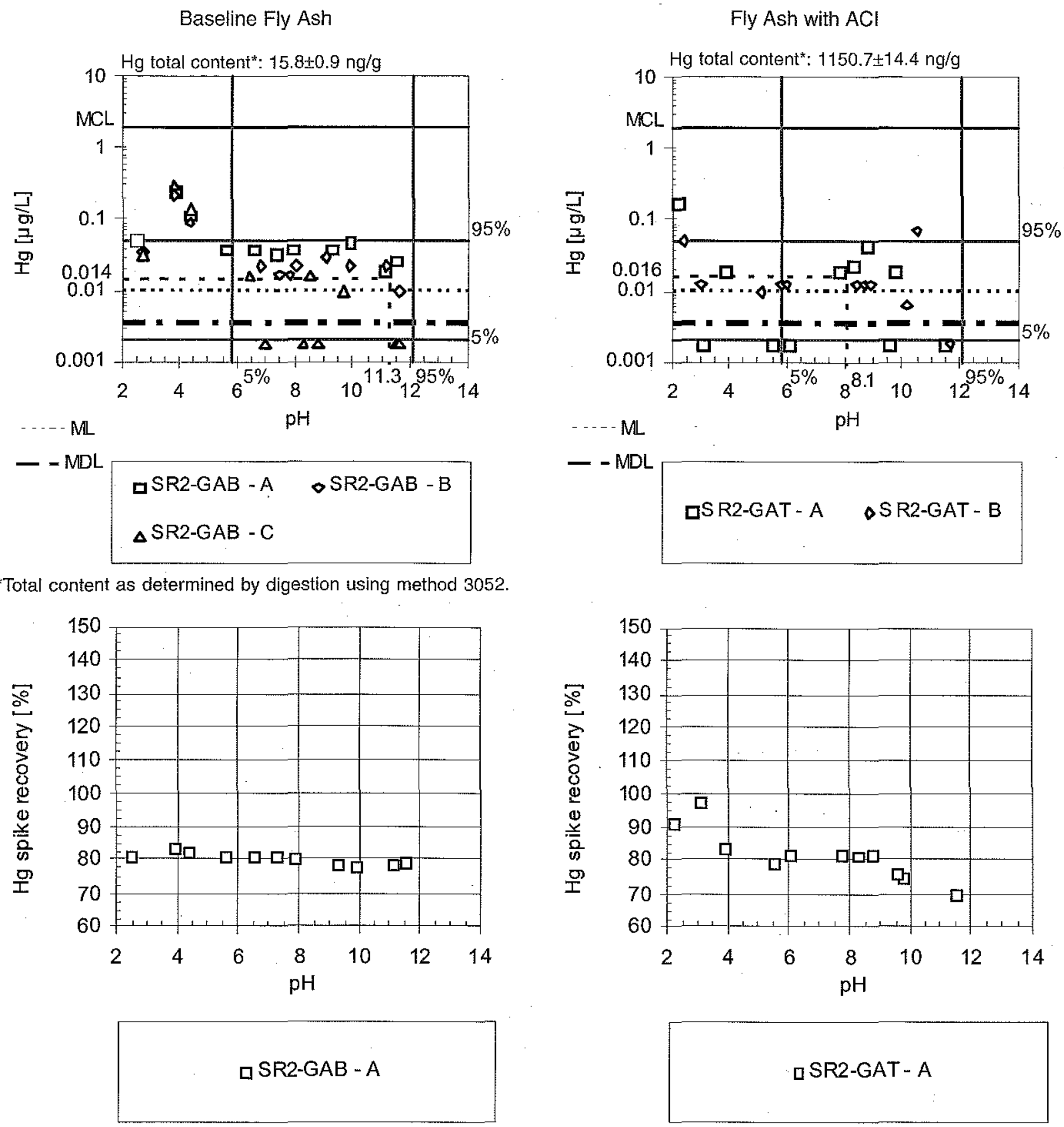


Figure G-3. Mercury Release (top) and Spike Recoveries (bottom) as a Function of pH for the Baseline Fly Ash and the Fly Ash with Enhanced Hg Control. 5th and 95th percentiles of mercury concentrations observed in typical combustion waste landfill leachate are shown for comparison.

Mercury Release as a Function of LS Ratio

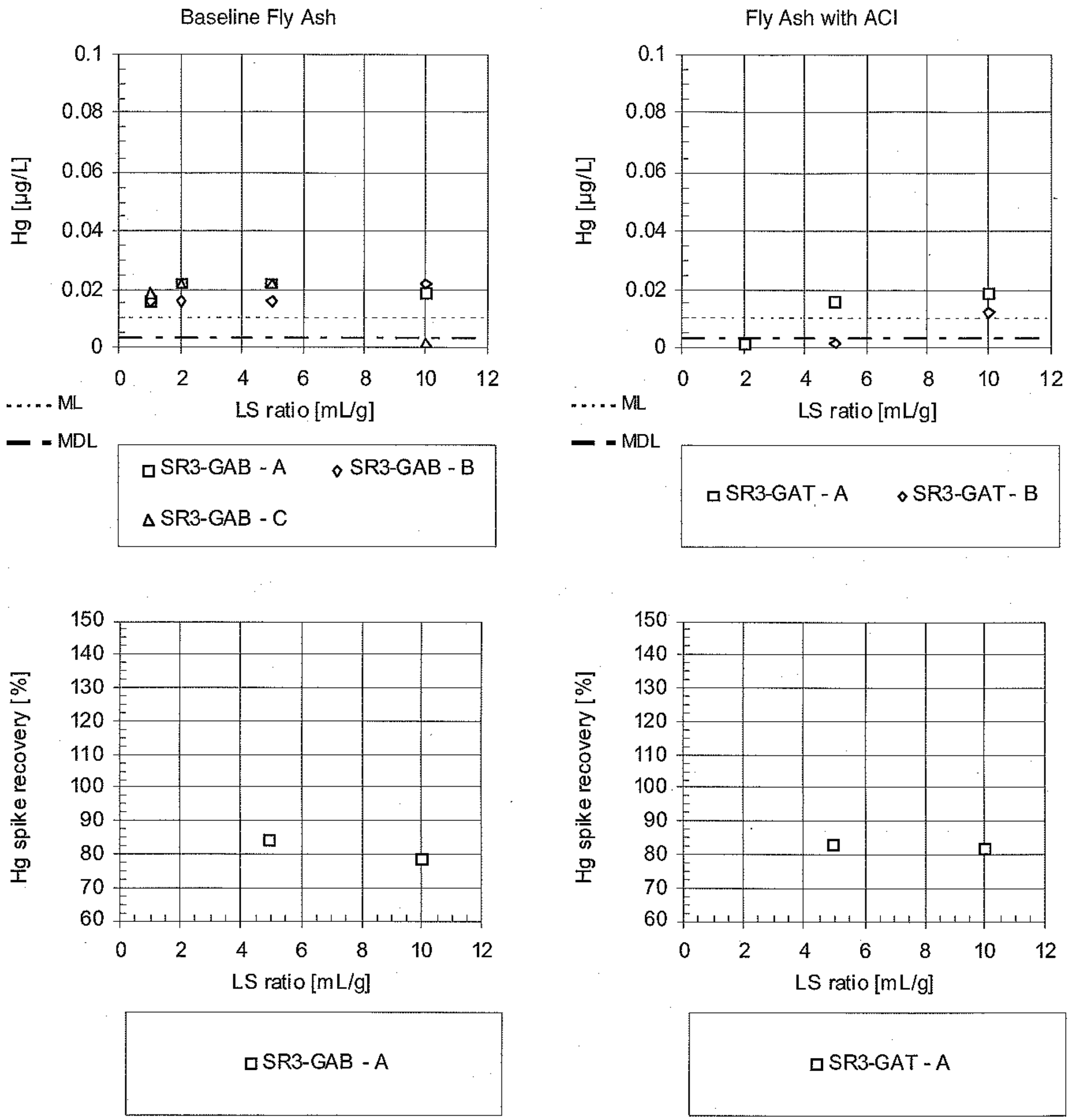
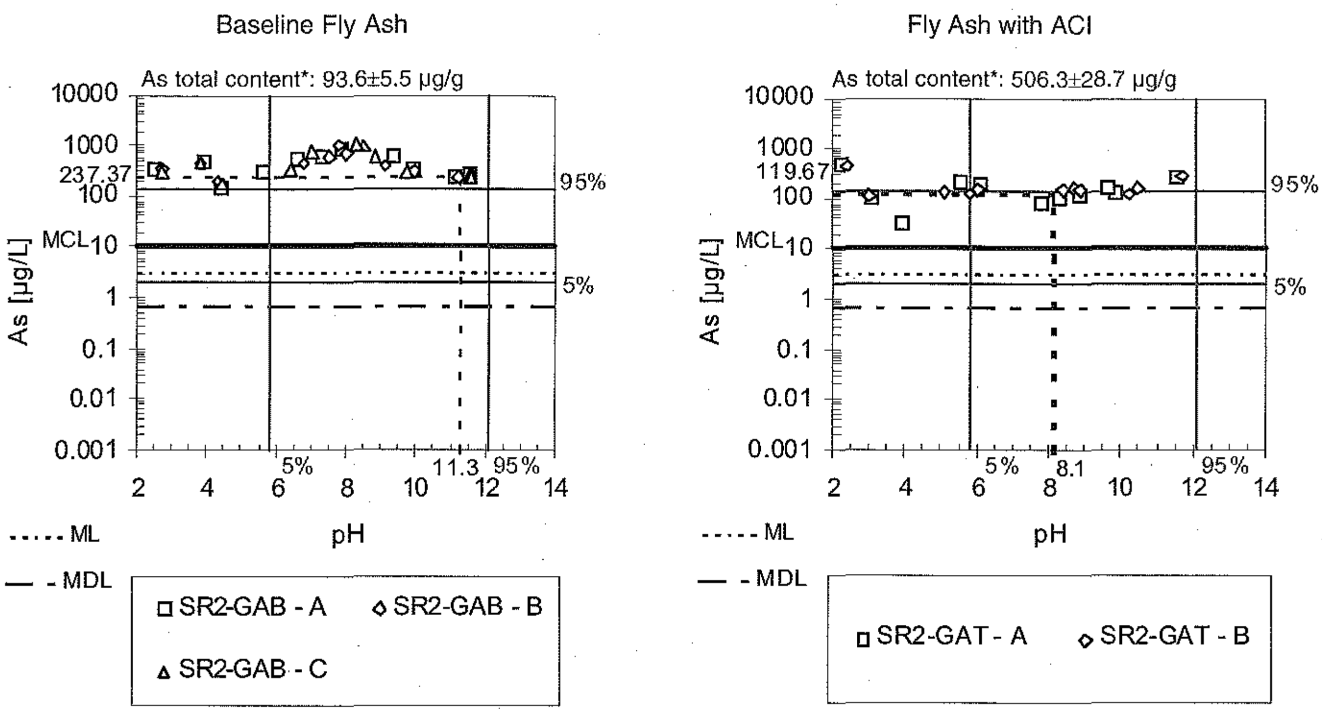


Figure G-4. Mercury Release (top) and Spike Recoveries (bottom) as a Function of LS Ratio for the Baseline Fly Ash and the Fly Ash with Enhanced Hg Control.

Arsenic Release as a Function of pH



*Total content as determined by digestion using method 3052.

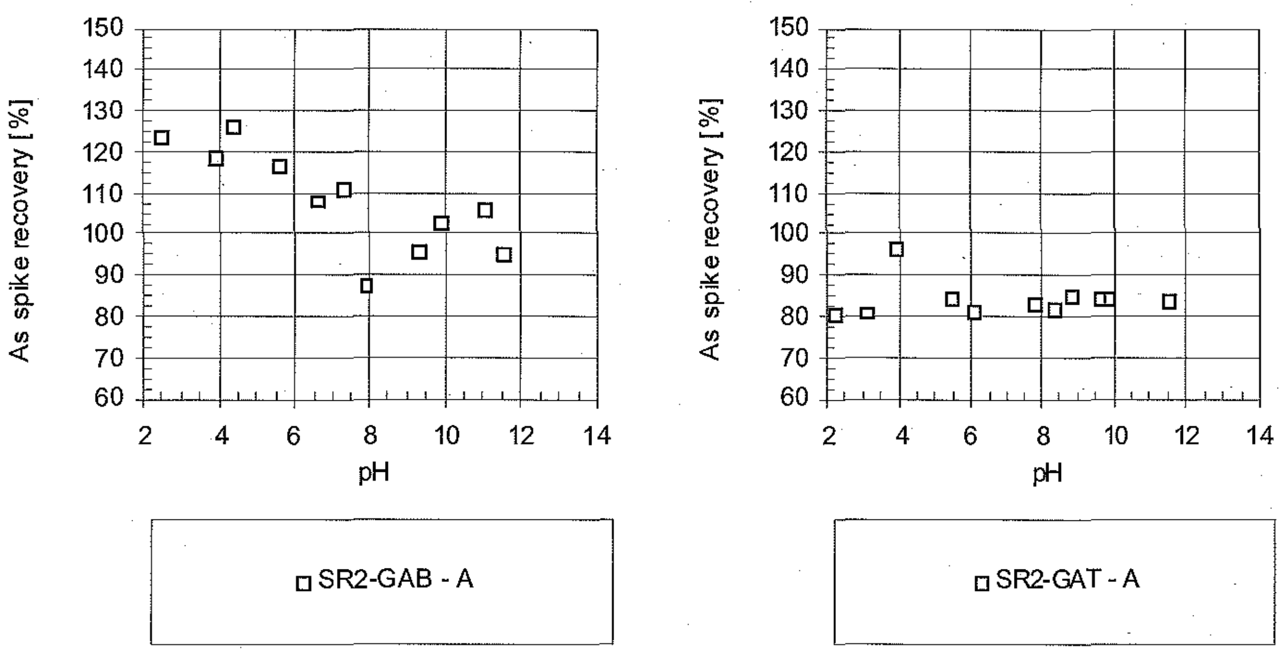


Figure G-5. Arsenic Release (top) and Spike Recoveries (bottom) as a Function of pH for the Baseline Fly Ash and the Fly Ash with Enhanced Hg Control. 5th and 95th percentiles of arsenic concentrations observed in typical combustion waste landfill leachate are shown for comparison.

Arsenic Release as a Function of LS Ratio

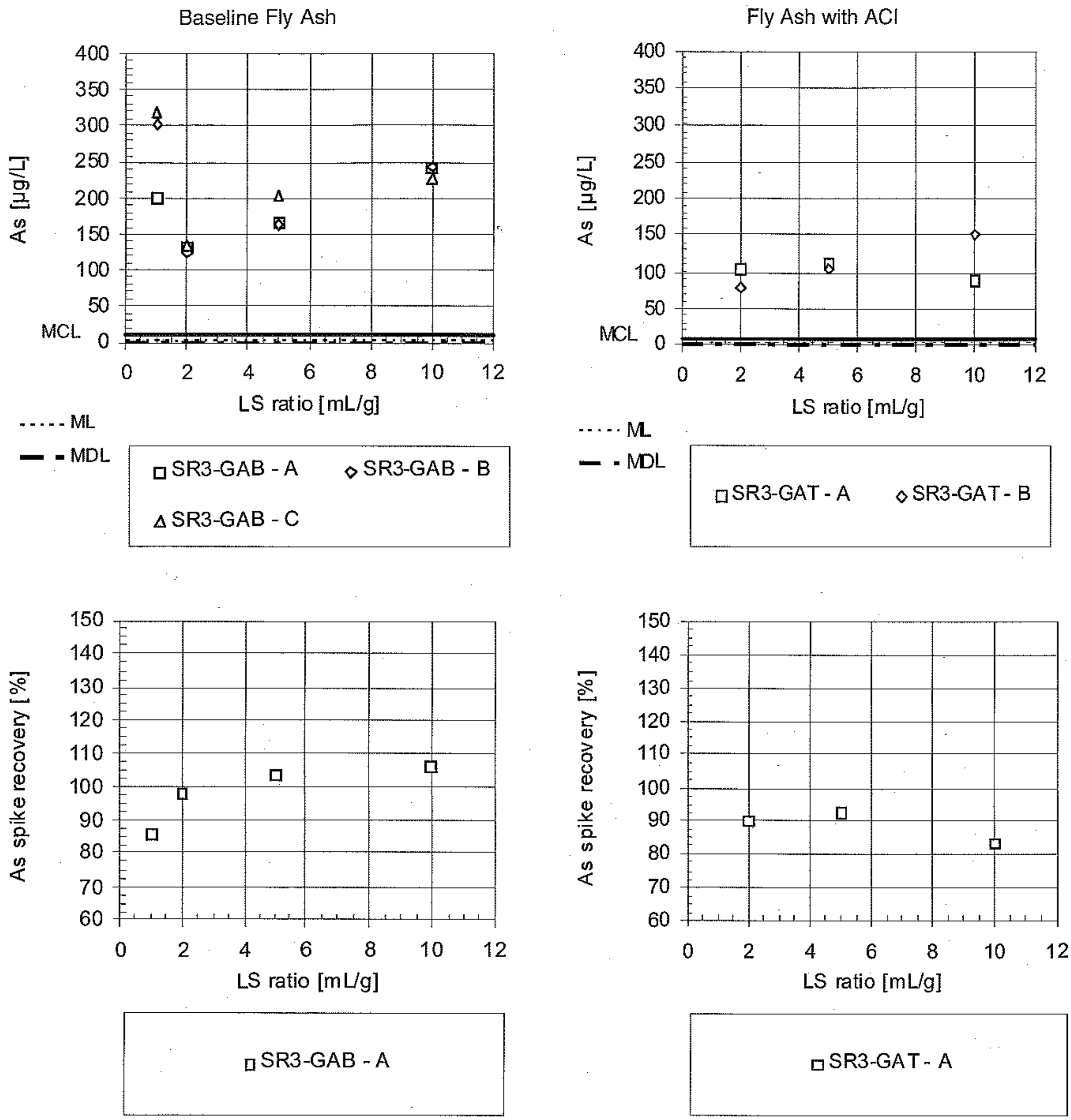


Figure G-6. Arsenic Release (top) and Spike Recoveries (bottom) as a Function of LS Ratio for the Baseline Fly Ash and the Fly Ash with Enhanced Hg Control.

Selenium Release as a Function of pH

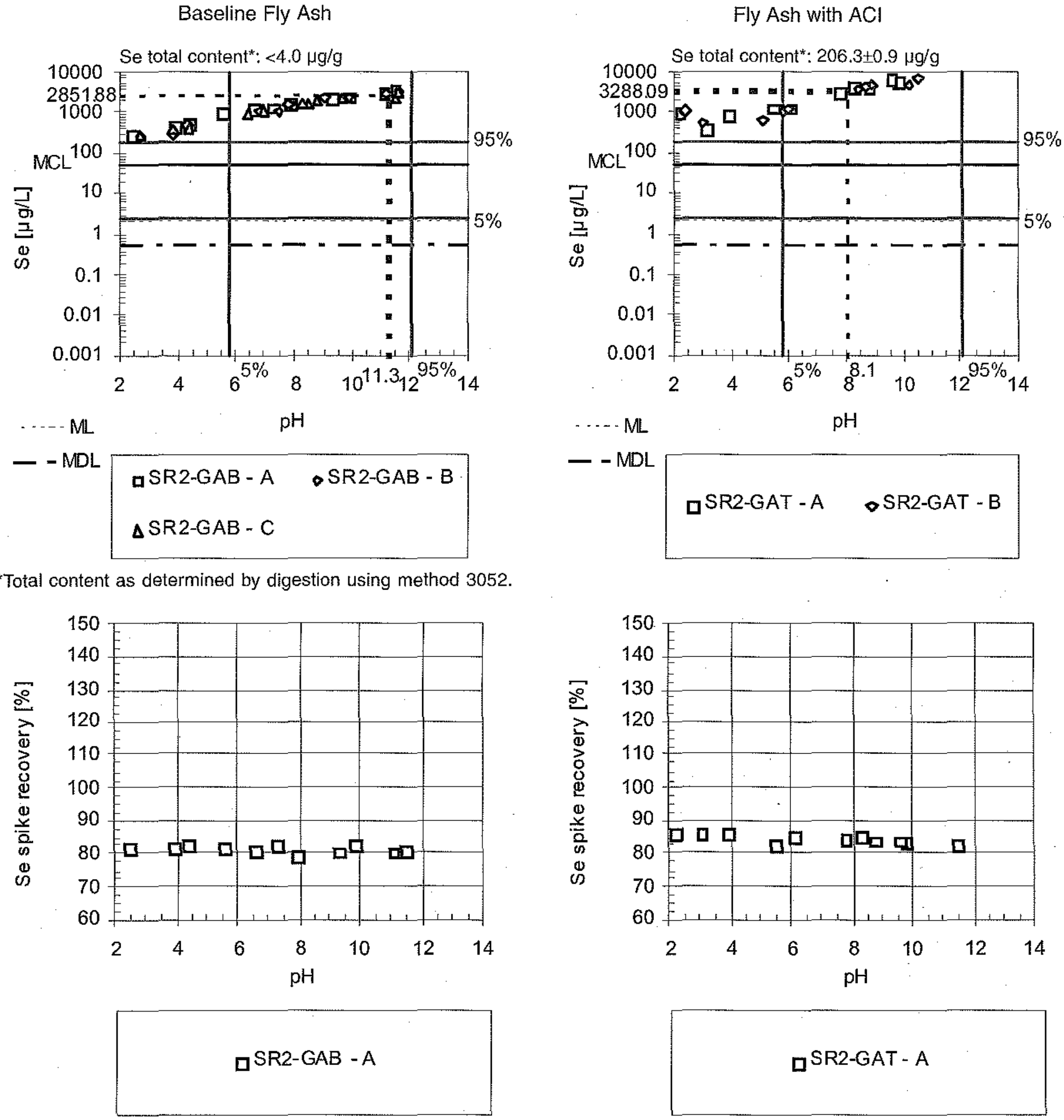


Figure G-7. Selenium Release (top) and Spike Recoveries (bottom) as a Function of pH for the Baseline Fly Ash and the Fly Ash with Enhanced Hg Control. 5th and 95th percentiles of selenium concentrations observed in typical combustion waste landfill leachate are shown for comparison.

Selenium Release as a Function of LS Ratio

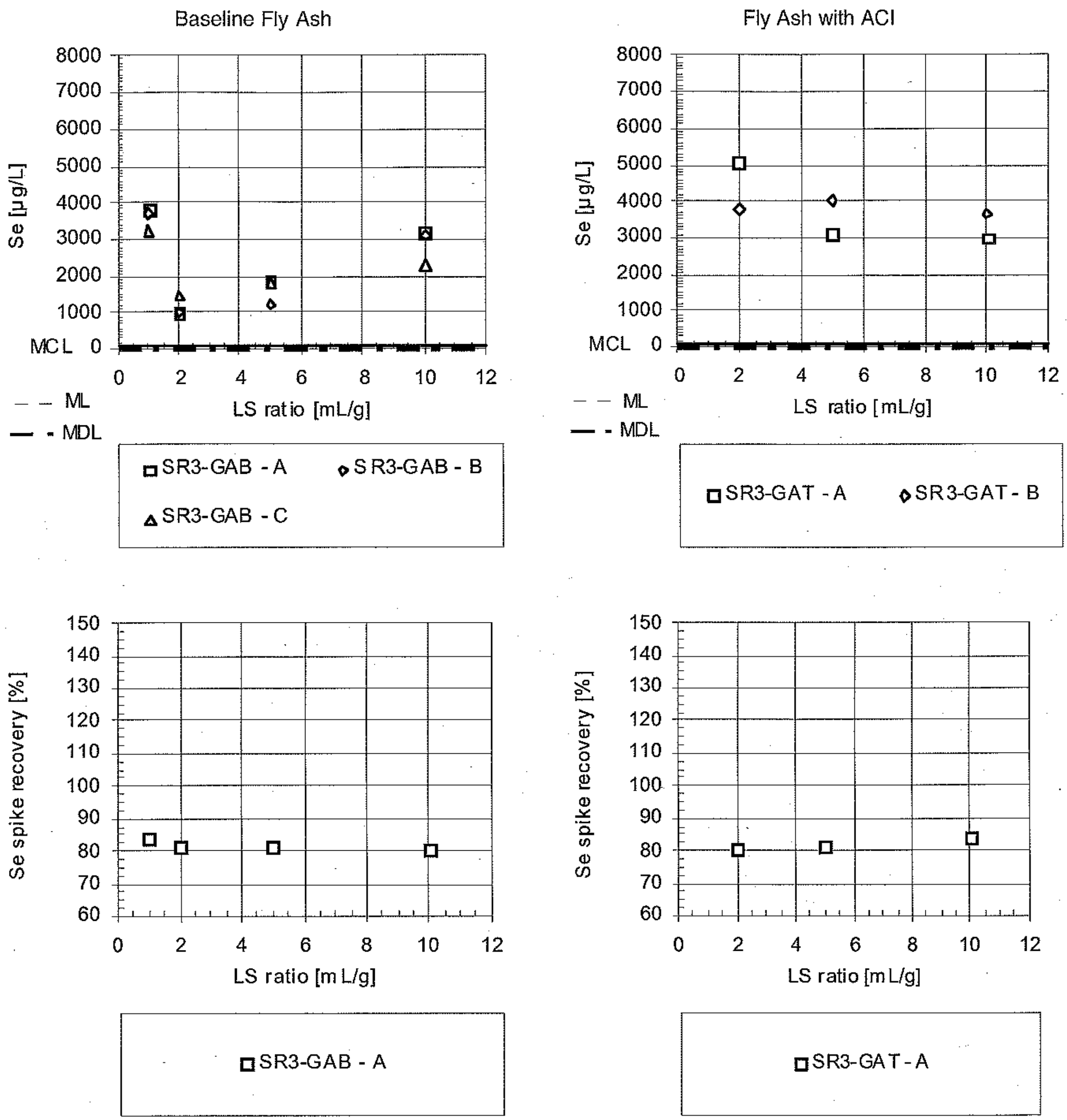
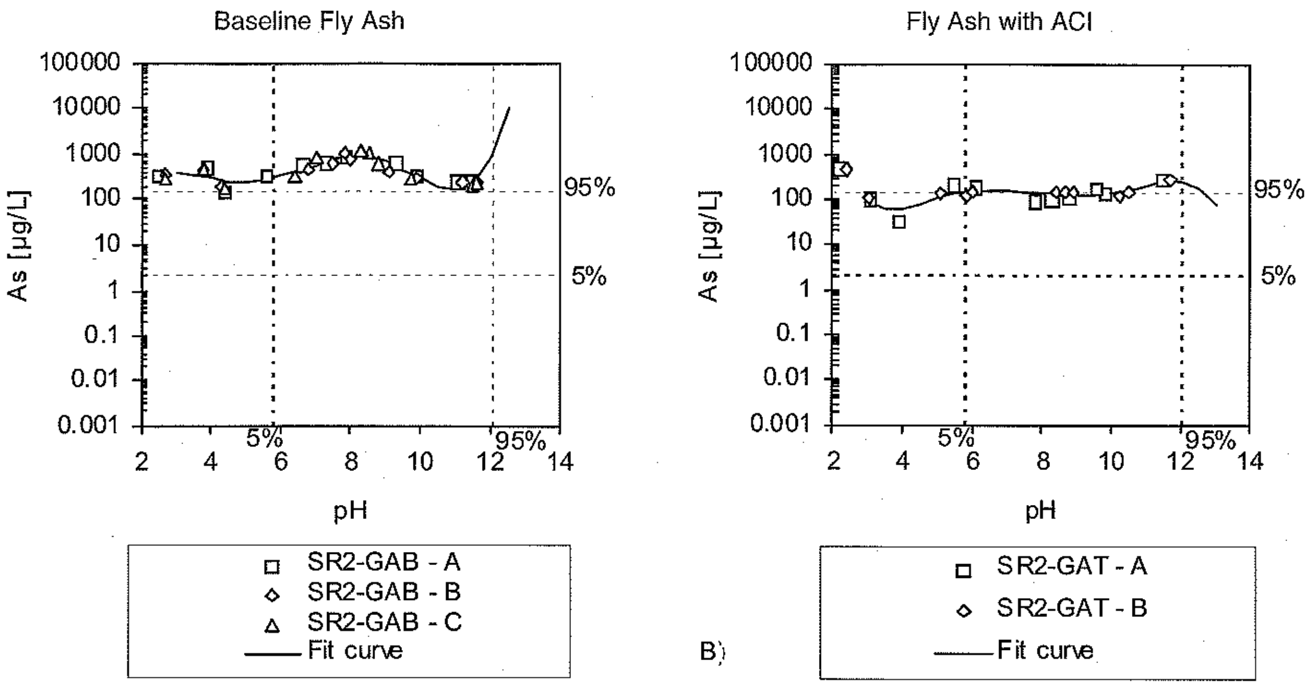


Figure G-8. Selenium Release (top) and Spike Recoveries (bottom) as a Function of LS Ratio for the Baseline Fly Ash and the Fly Ash with Enhanced Hg Control.

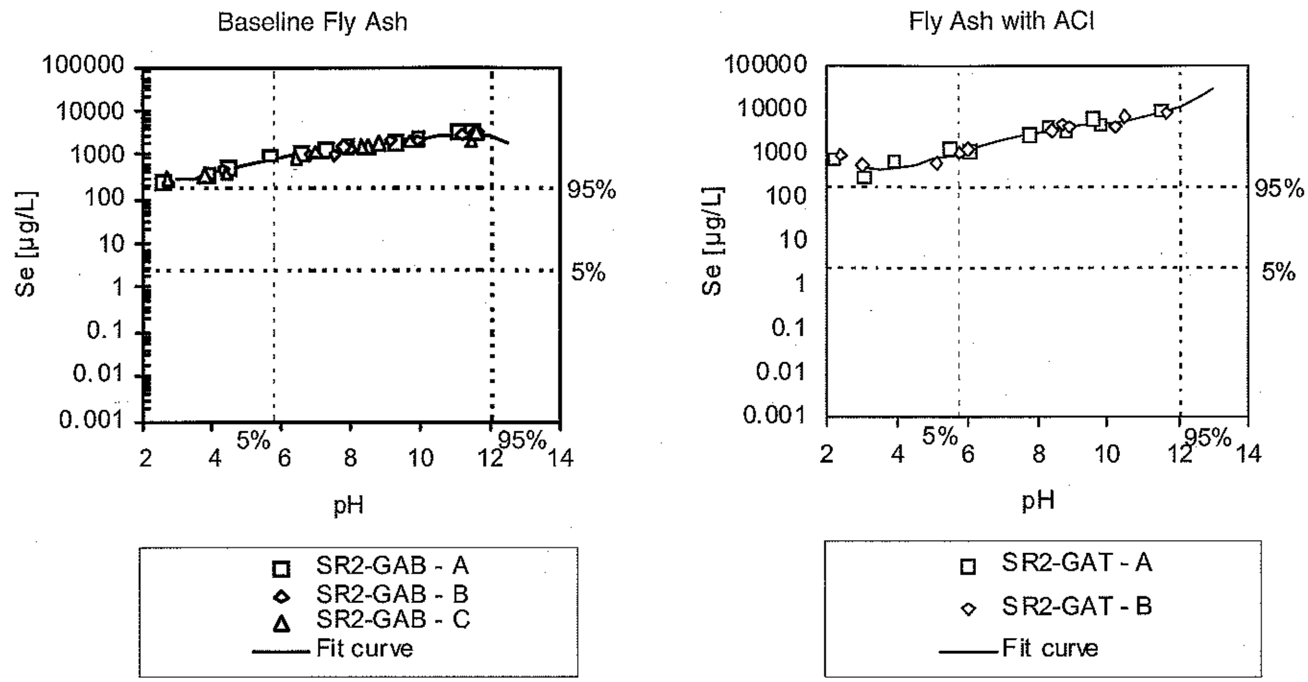
Arsenic Solubility



Material	log As (µg/L)			pH range of validity	R^2	Number of points
GAB	0.0012 pH^5	-0.0416 pH^4	0.5236 pH^3	3-12.5	0.78	33
	-3.0400 pH^2	8.0912 pH	-5.3943			
GAT	-0.0008 pH^5	0.0304 pH^4	-0.4500 pH^3	3-12.5	0.75	22
	3.1407 pH^2	-10.1848 pH	14.1412			

Figure G-9. Regression Curves of Experimental Data of Arsenic Solubility as a Function of pH.

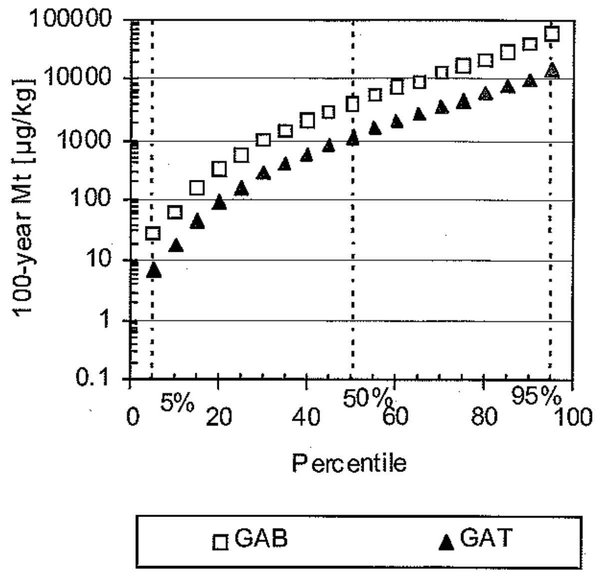
Selenium Solubility



Material	log Se (µg/L)			pH range of validity	R^2	Number of points
GAB	-0.0003 pH^5	0.0092 pH^4	-0.1259 pH^3	3-12.5	0.98	33
	0.8035 pH^2	-2.2208 pH	4.5849			
GAT	-0.00002 pH^5	0.0021 pH^4	-0.0530 pH^3	3-12.5	0.96	22
	0.5431 pH^2	-2.2226 pH	5.8084			

Figure G-10. Regression Curves of Experimental Data of Selenium Solubility as a Function of pH.

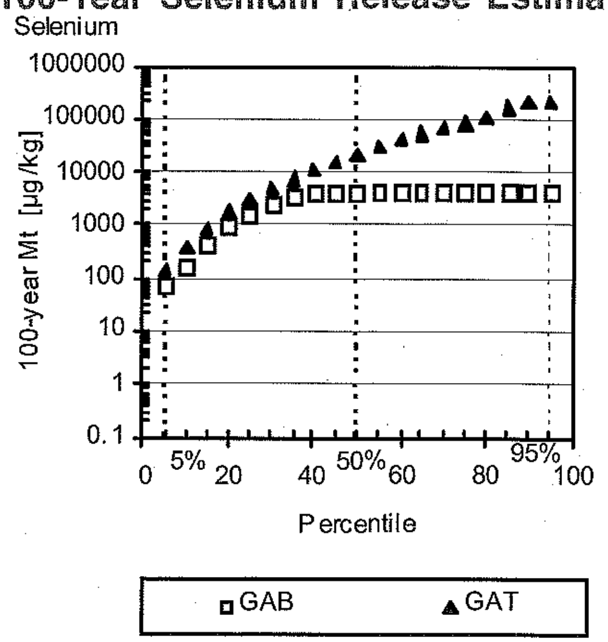
100-Year Arsenic Release Estimates



	GAB µg/kg	GAB %	GAT µg/kg	GAT %
Mt min	5.8	0.0062	4.1	0.0008
Mt - 5%	27.5	0.0294	7.0	0.0014
Mt - 50%	4086	4.4	1142	0.2
Mt - 95%	59706	63.8	15411	3.0
Mean Mt	13789	14.7	3485	0.7
Mt max	93600	100.0	48499	9.6

Figure G-11. 100-Year Arsenic Release Estimates as a Function of the Cumulative Probability for the Scenario of Disposal in a Combustion Waste Landfill.

100-Year Selenium Release Estimates



	GAB µg/kg	GAB %	GAT µg/kg	GAT %
Mt min	24.8	0.6	31.1	0.02
Mt - 5%	69.6	1.7	142.5	0.1
Mt - 50%	4000	100.0	21033	10.2
Mt - 95%	4000	100.0	206300	100.0
Mean Mt	4000	100.0	78816	38.2
Mt max	4000	100.0	206300	100.0

Figure G-12. 100-Year Selenium Release Estimates as a Function of the Cumulative Probability for the Scenario of Disposal in a Combustion Waste Landfill.

100-Year Arsenic Release Estimates

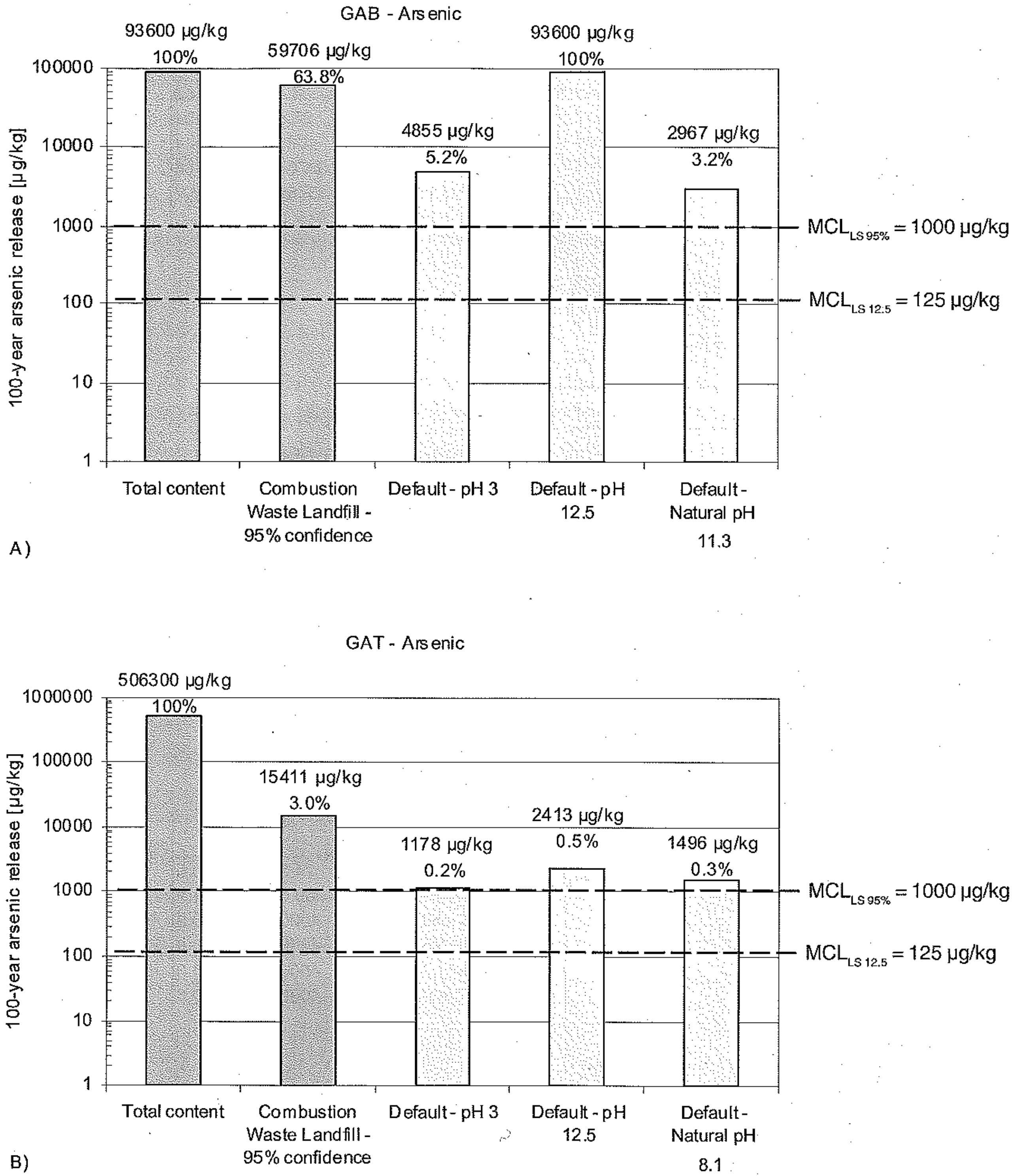
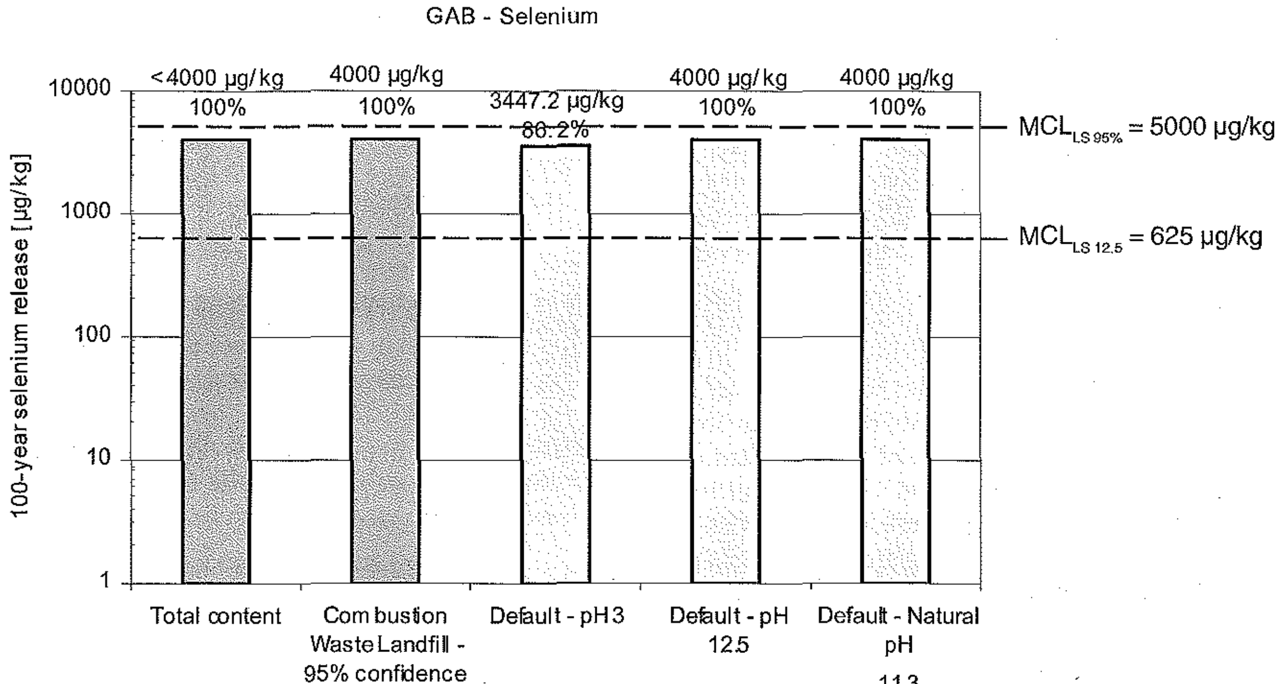
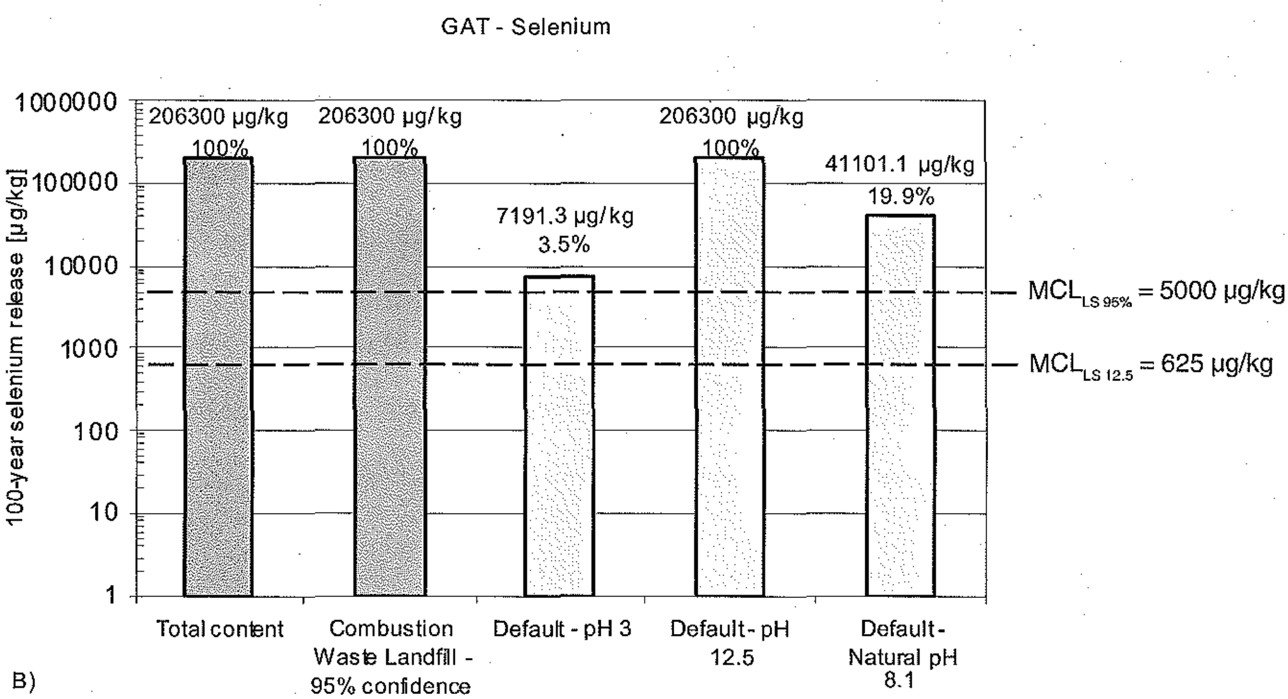


Figure G-13. 100-Year Arsenic Release Estimates from A) Baseline Fly Ash and B) Fly Ash with ACI. Release estimates for percolation controlled scenario are compared to release estimate based on total content. The amount of the arsenic that would be released if the release concentration was at the MCL is also shown for comparison ($LS_{default\ scenario}$ = 12.5 L/kg and $LS_{95\%}$ = 100 L/kg).

100-Year Selenium Release Estimates



A)



B)

Figure G-14. 100-year Selenium Release Estimates from A) Baseline Fly Ash and B) Fly Ash with ACI. Release estimates for percolation controlled scenario are compared to release estimate based on total content. The amount of the selenium that would be released if the release concentration was at the MCL is also shown for comparison ($LS_{default\ scenario}$ = 12.5 L/kg and $LS_{95\%}$ = 100 L/kg).

Comments

Figure G-1:

- All extract Hg concentrations are well below levels of potential concern.

Figure G-5:

- Arsenics extract concentrations for the baseline case peak between pH 7 and 9, with maximum concentrations significantly greater than the range reported for field landfill leachates in the EPA database but consistent with the range of concentrations for field landfill leachates reported in the EPRI database.
- Arsenic extract concentrations for the test case indicate somewhat lower concentrations than for the baseline case over the range of pH examined, even though the test case as around 5 times as much total As as the baseline case. These results also suggest different chemistry controlling the aqueous-solid equilibrium for the two cases.

Figure G-7:

- Se extract concentrations as a function of pH exhibit similar behavior for the baseline and test cases, even though the test case has greater than 50 times the amount of total As than the baseline case.

Figure G-8:

- Initial leachate concentrations for Se are likely to be ca. 1000–4000 μg/L (at LS=2), which is much greater than reported in the EPA database but consistent with values reported in the EPRI database for landfill leachates.

Figures G-11and G-12:

- A much greater percentage and quantity of As can be anticipated to be released from the baseline case than for the test case under the scenarios examined.

Figure G13:

- Arsenic release from the base case warrants further examination.

Figure G-14:

- Se release from the test case warrants further examination.

Appendix H
St. Clair Fly Ashes

List of Figures

pH Titration Curves

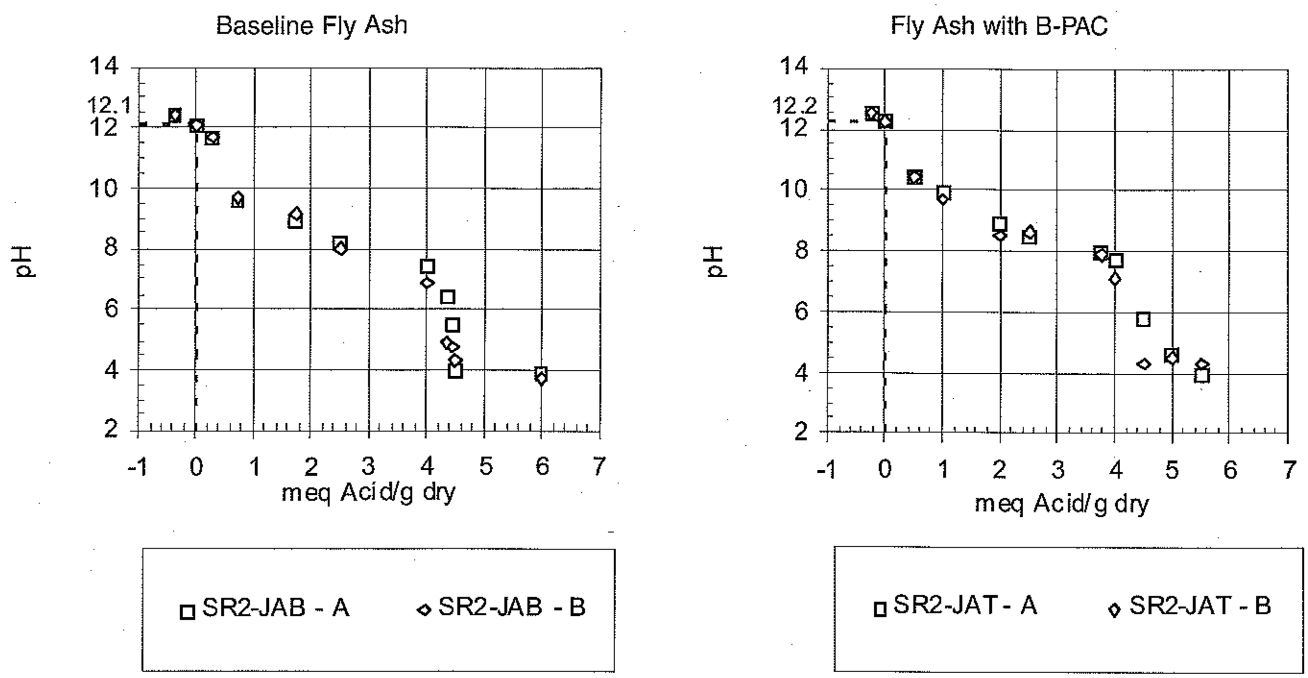


Figure H-1. pH Titration Curves for the Baseline Fly Ash and the Fly Ash with Enhanced Hg Control.

pH as a Function of LS Ratio

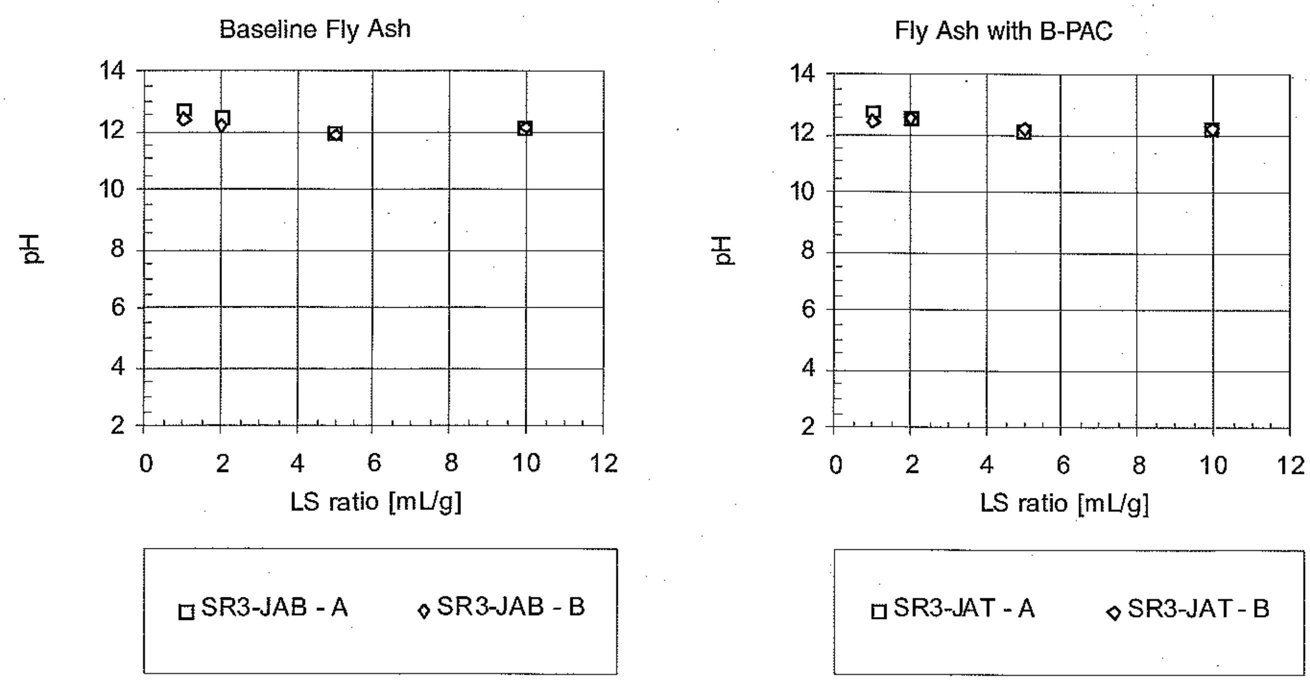


Figure H-2. pH as a Function of LS Ratio for the Baseline Fly Ash and the Fly Ash with Enhanced Hg Control.

Mercury Release as a Function of pH

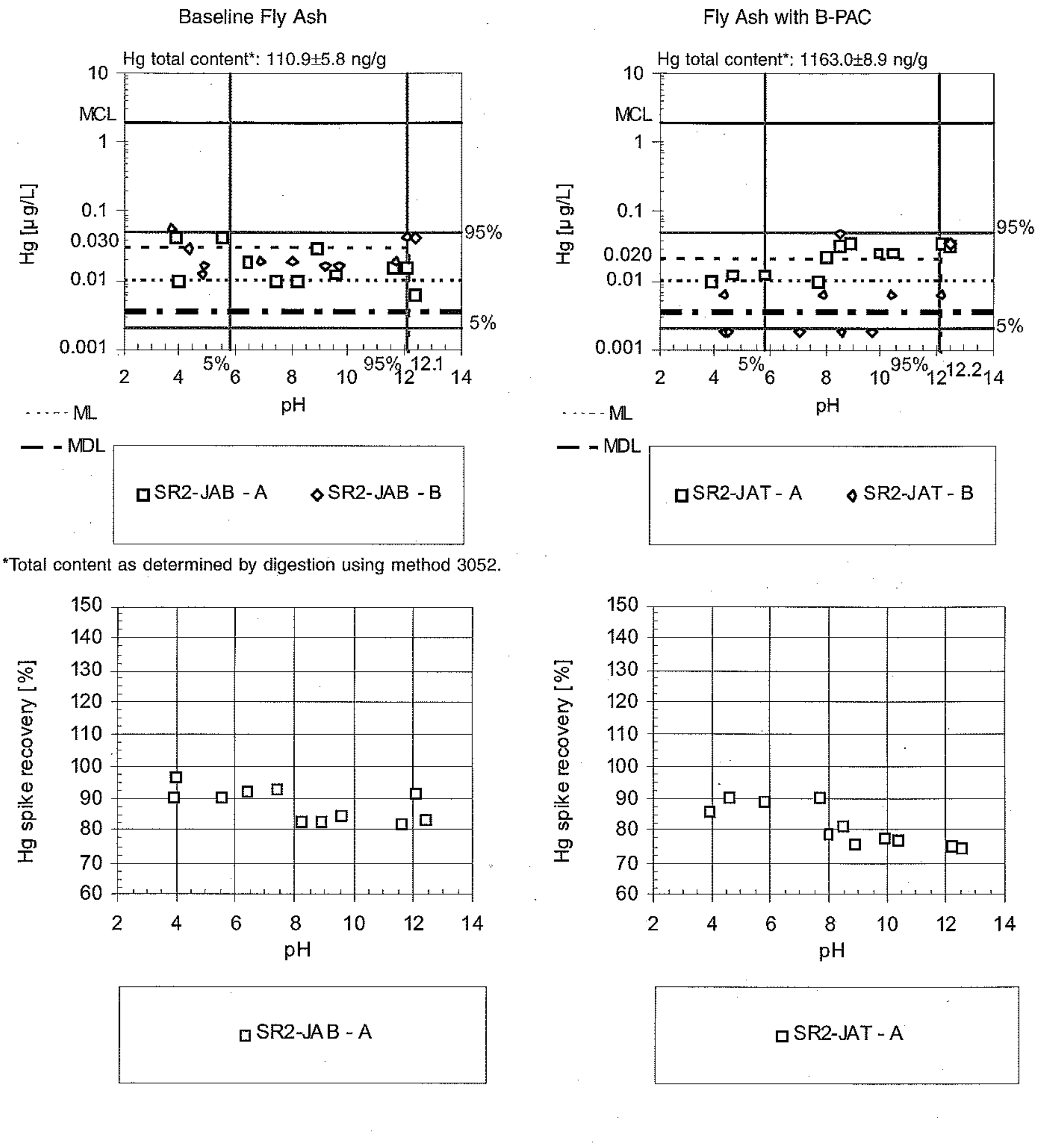


Figure H-3. Mercury Release (top) and Spike Recoveries (bottom) as a Function of pH for the Baseline Fly Ash and the Fly Ash with Enhanced Hg Control. 5th and 95th percentiles of mercury concentrations observed in typical combustion waste landfill leachate are shown for comparison.

Mercury Release as a Function of LS Ratio

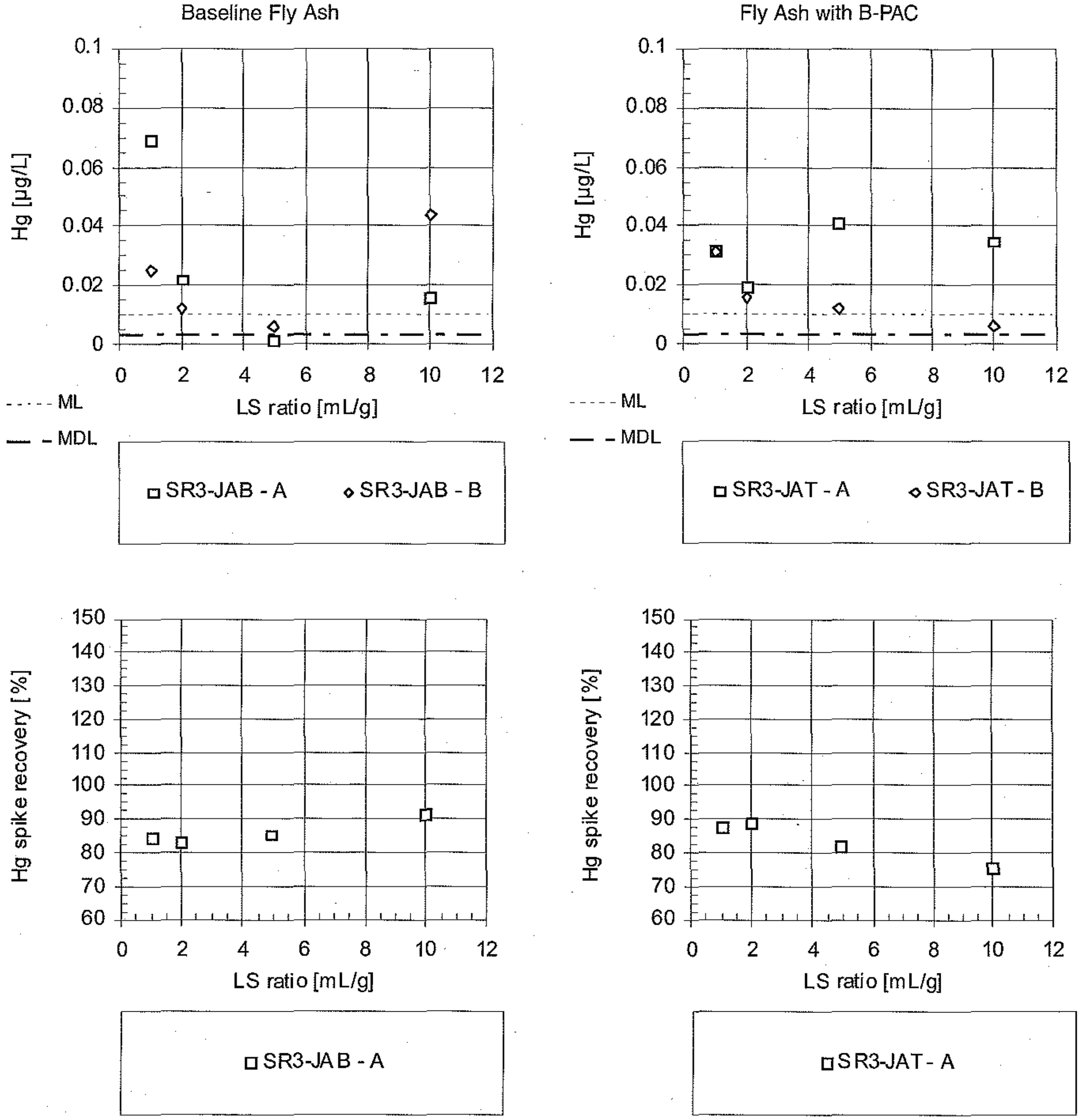
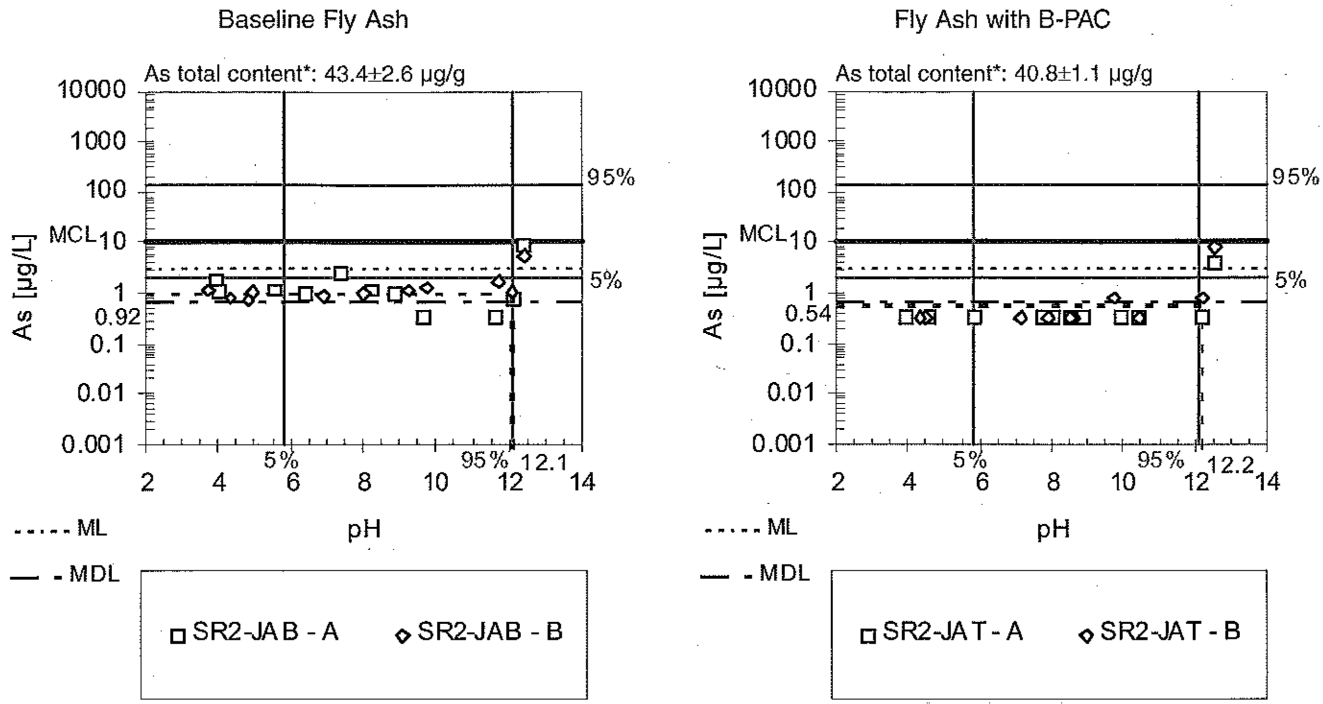


Figure H-4. Mercury Release (top) and Spike Recoveries (bottom) as a Function of LS Ratio for the Baseline Fly Ash and the Fly Ash with Enhanced Hg Control.

Arsenic Release as a Function of pH



*Total content as determined by digestion using method 3052.

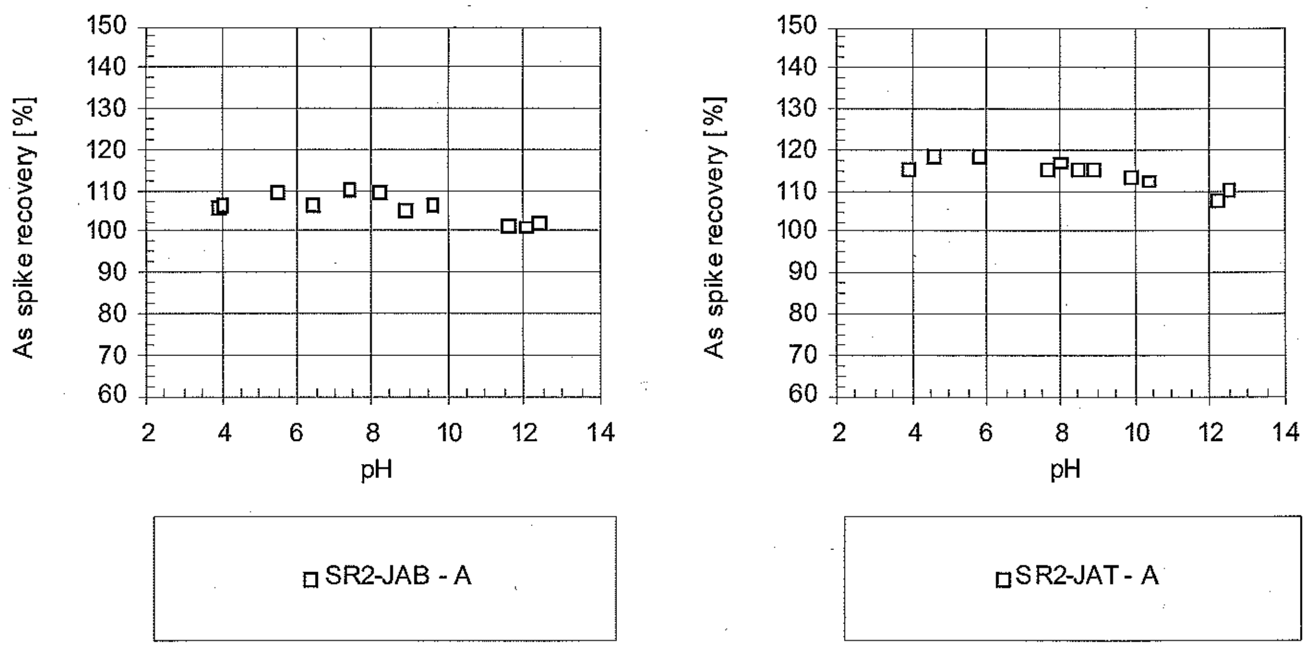


Figure H-5. Arsenic Release (top) and Spike Recoveries (bottom) as a Function of pH for the Baseline Fly Ash and the Fly Ash with Enhanced Hg Control. 5th and 95th percentiles of arsenic concentrations observed in typical combustion waste landfill leachate are shown for comparison.

Arsenic Release as a Function of LS Ratio

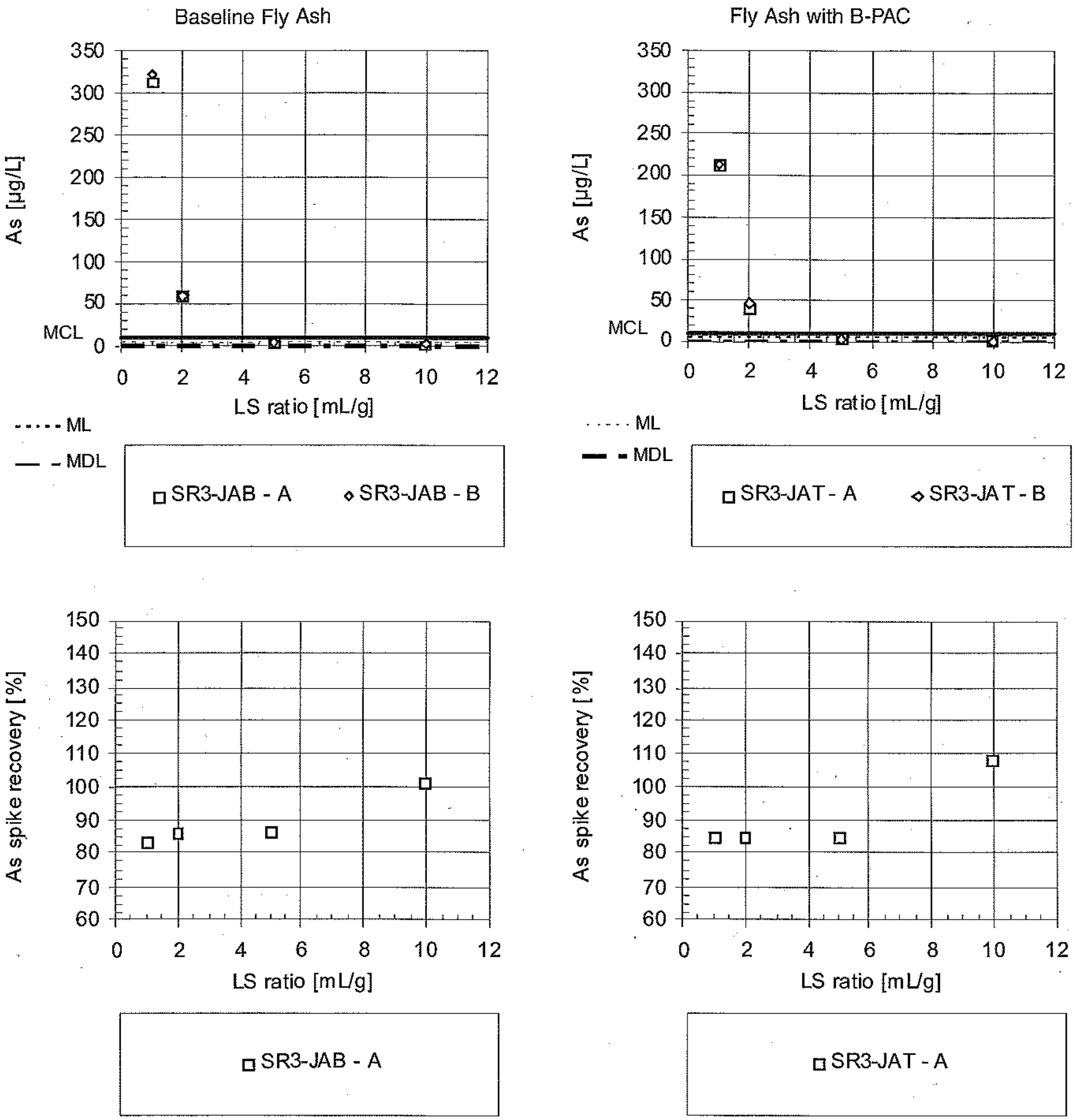


Figure H-6. Arsenic Release (top) and Spike Recoveries (bottom) as a Function of LS Ratio for the Baseline Fly Ash and the Fly Ash with Enhanced Hg Control.

Selenium Release as a Function of pH

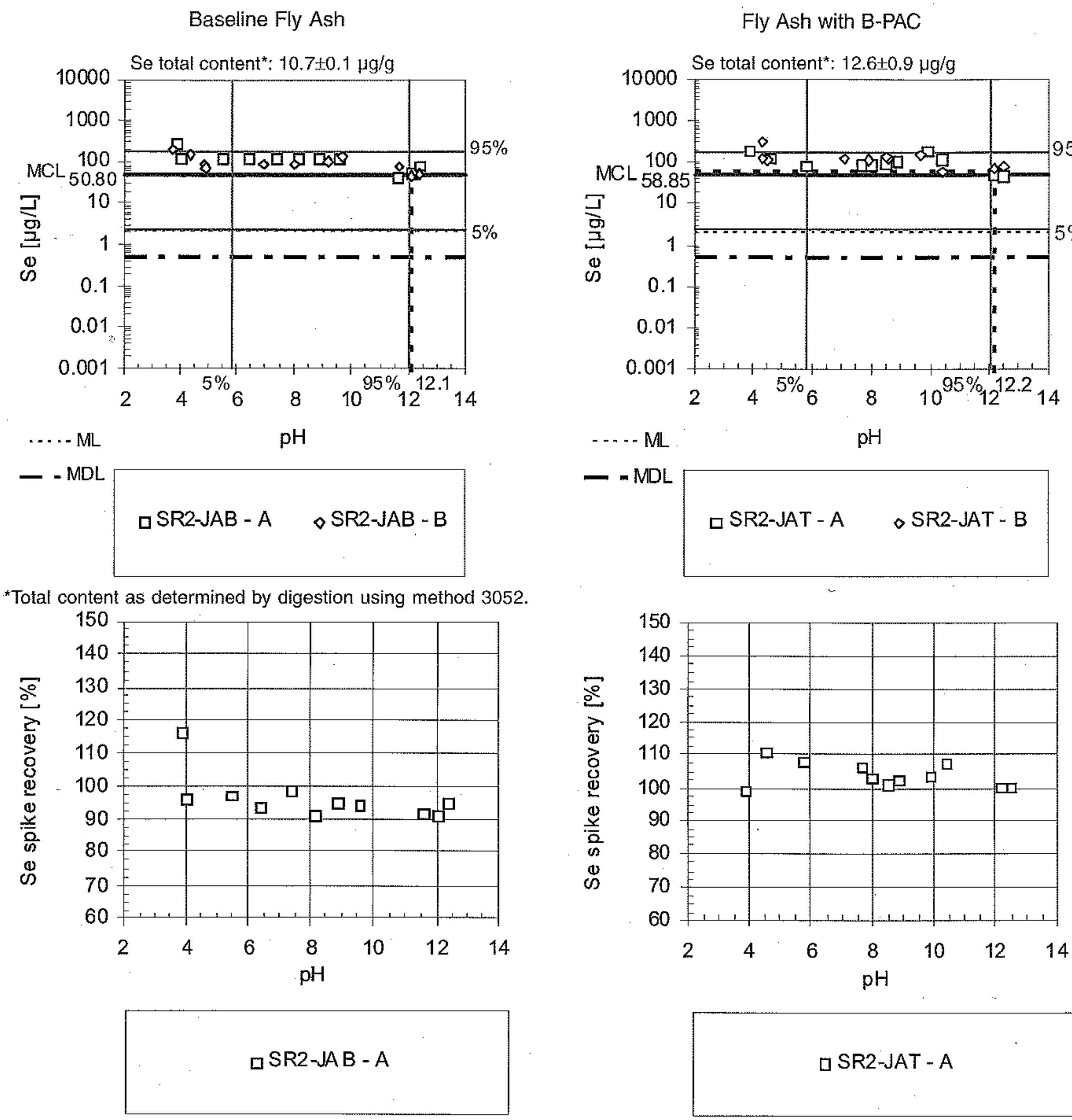


Figure H-7. Selenium Release (top) and Spike Recoveries (bottom) as a Function of pH for the Baseline Fly Ash and the Fly Ash with Enhanced Hg Control. 5th and 95th percentiles of selenium concentrations observed in typical combustion waste landfill leachate are shown for comparison.

Selenium Release as a Function of LS Ratio

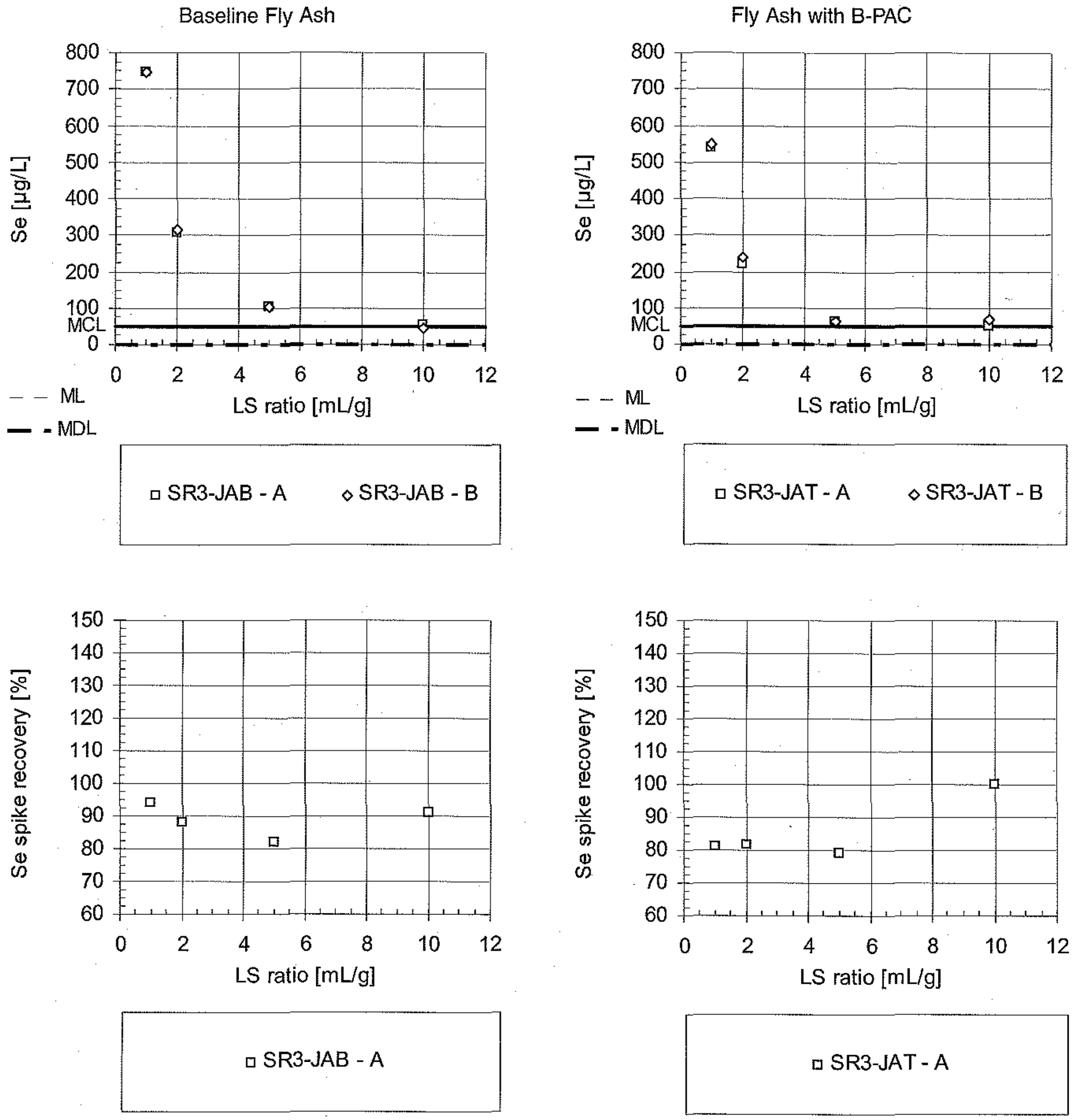
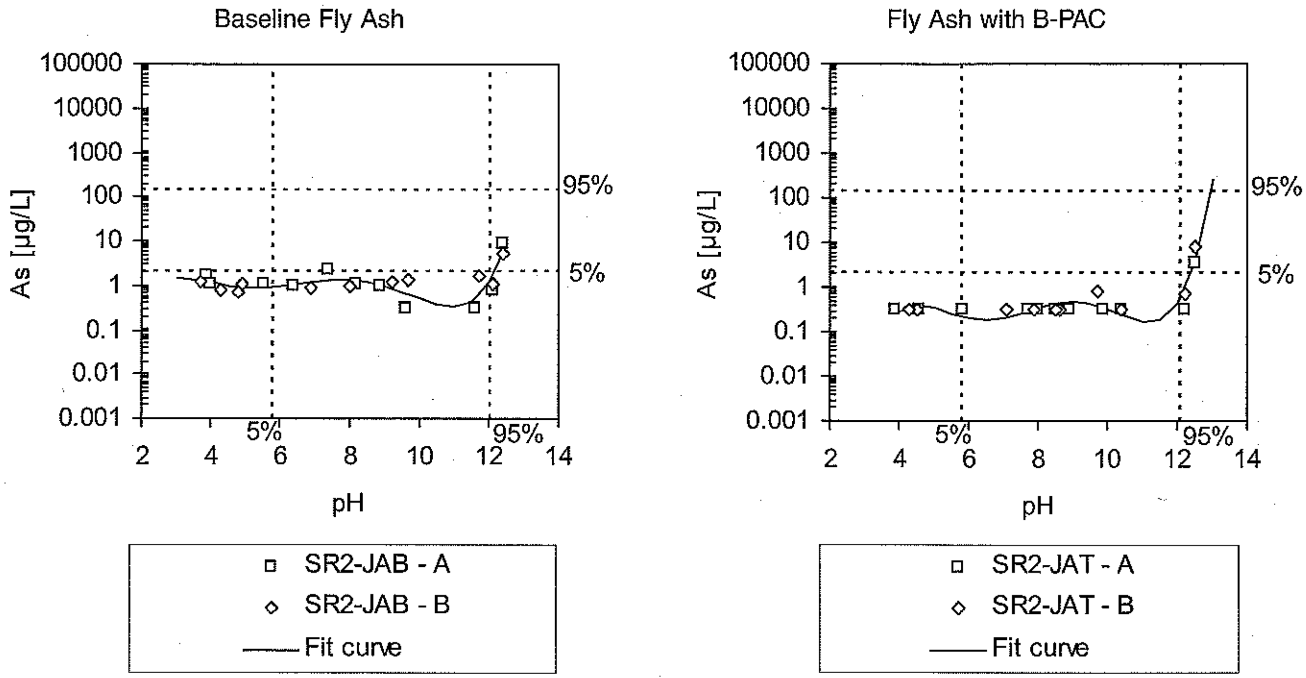


Figure H-8. Selenium Release (top) and Spike Recoveries (bottom) as a Function of LS Ratio for the Baseline Fly Ash and the Fly Ash with Enhanced Hg Control.

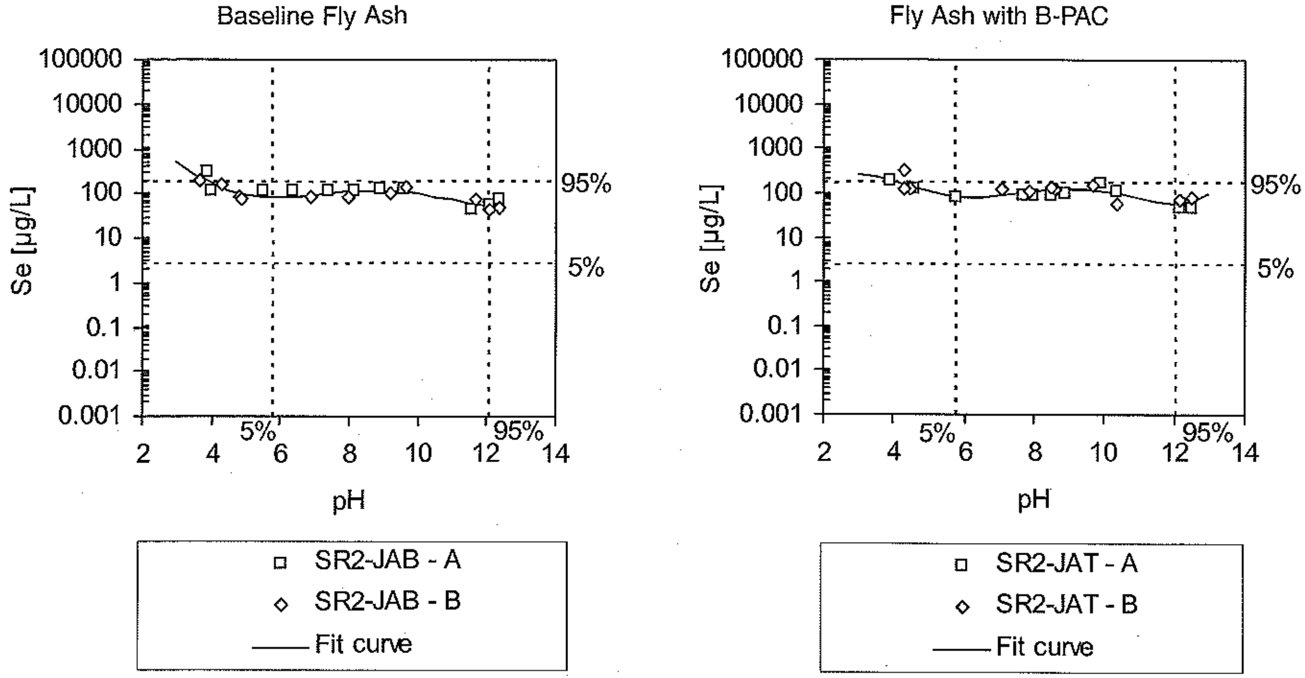
Arsenic Solubility



Material	log As (µg/L)			pH range of validity	R^2	Number of points
JAB	0.0010 pH^5	-0.0324 pH^4	0.4137 pH^3	3-12.5	0.62	22
	-2.4547 pH^2	6.7105 pH	-6.6563			
JAT	0.0025 pH^5	-0.0973 pH^4	1.4698 pH^3	4-12.5	0.81	22
	-10.6792 pH^2	37.2419 pH	-50.3673			

Figure H-9. Regression Curves of Experimental Data of Arsenic Solubility as a Function of pH.

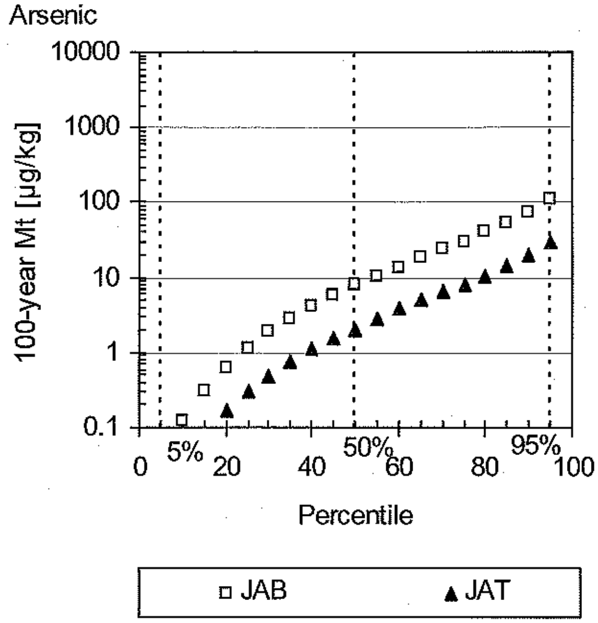
Selenium Solubility



Material	log Se (µg/L)			pH range of validity	R^2	Number of points
JAB	0.0002 pH^5	-0.0070 pH^4	0.0761 pH^3	3-12.5	0.75	22
	-0.2648 pH^2	-0.3724 pH	4.6460			
JAT	0.0005 pH^5	-0.0201 pH^4	0.2890 pH^3	3-12.5	0.61	22
	-1.9155 pH^2	5.6877 pH	-3.7128			

Figure H-10. Regression Curves of Experimental Data of Selenium Solubility as a Function of pH.

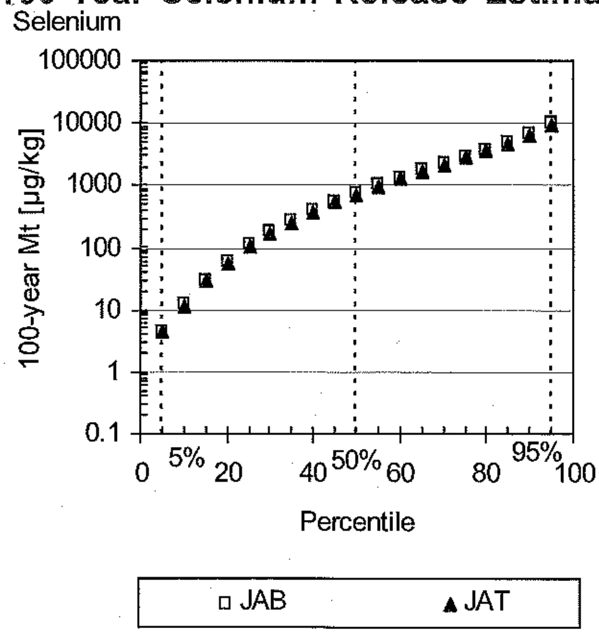
100-Year Arsenic Release Estimates



	JAB µg/kg	%	JAT µg/kg	%
Mt min	0.01	0.00003	0.01	0.00001
Mt - 5%	0.05	0.0001	0.01	0.00003
Mt - 50%	8	0.02	2	0.01
Mt - 95%	110	0.3	29	0.1
Mean Mt	25	0.1	7	0.02
Mt max	836	1.9	346	0.8

Figure H-11. 100-Year Arsenic Release Estimates as a Function of the Cumulative Probability for the Scenario of Disposal in a Combustion Waste Landfill.

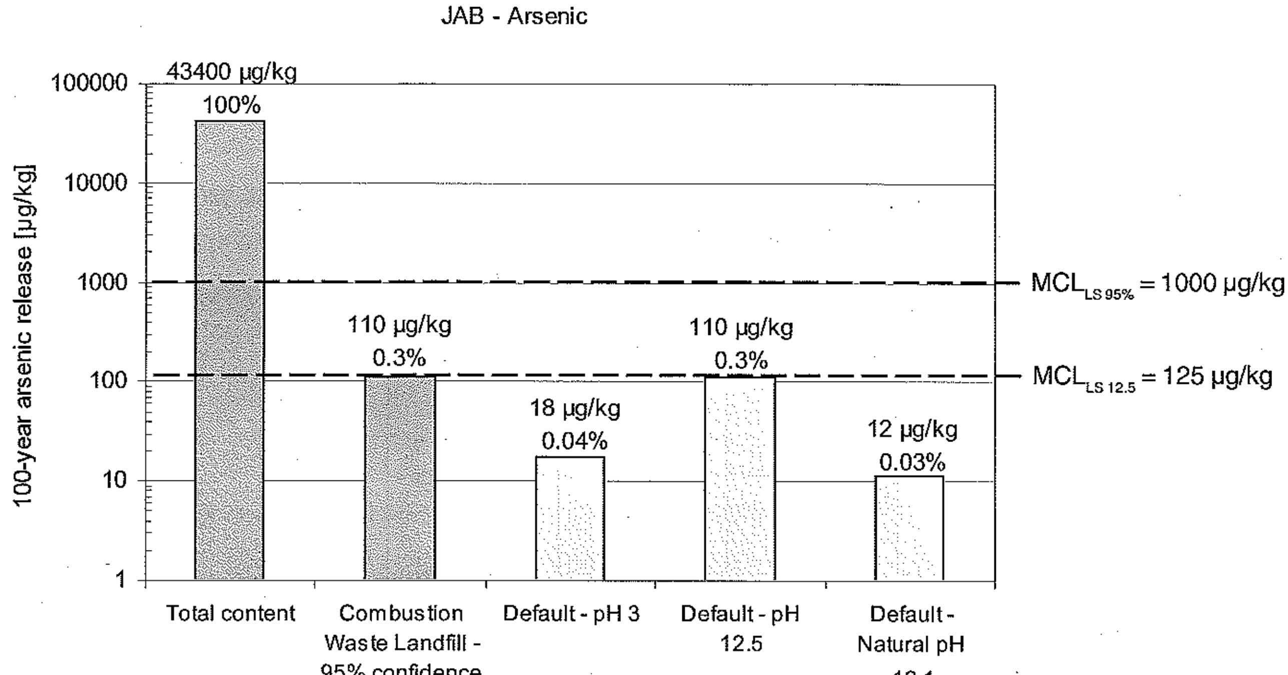
100-Year Selenium Release Estimates



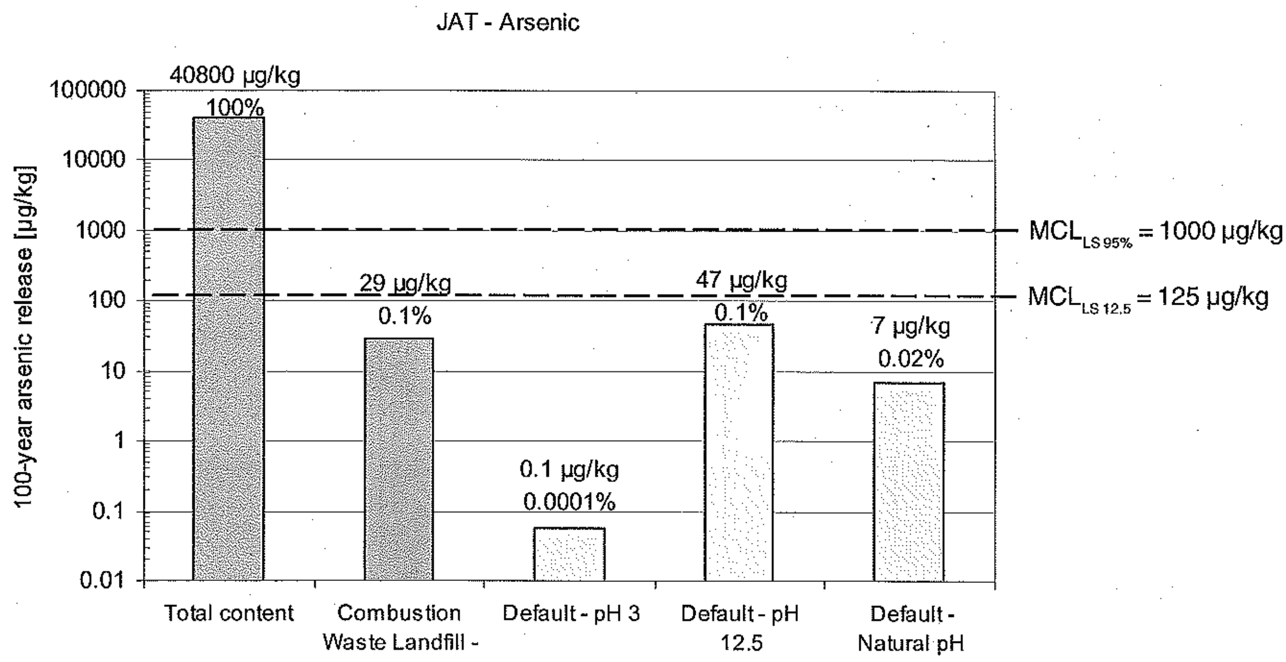
	JAB µg/kg	%	JAT µg/kg	%
Mt min	1.8	0.02	1.9	0.01
Mt - 5%	4.5	0.04	4.3	0.03
Mt - 50%	748	7.0	710	5.6
Mt - 95%	10028	93.7	9602	76.2
Mean Mt	2270	21.2	2172	17.2
Mt max	10700	100.0	12600	100.0

Figure H-12. 100-Year Selenium Release Estimates as a Function of the Cumulative Probability for the Scenario of Disposal in a Combustion Waste Landfill.

100-Year Arsenic Release Estimates



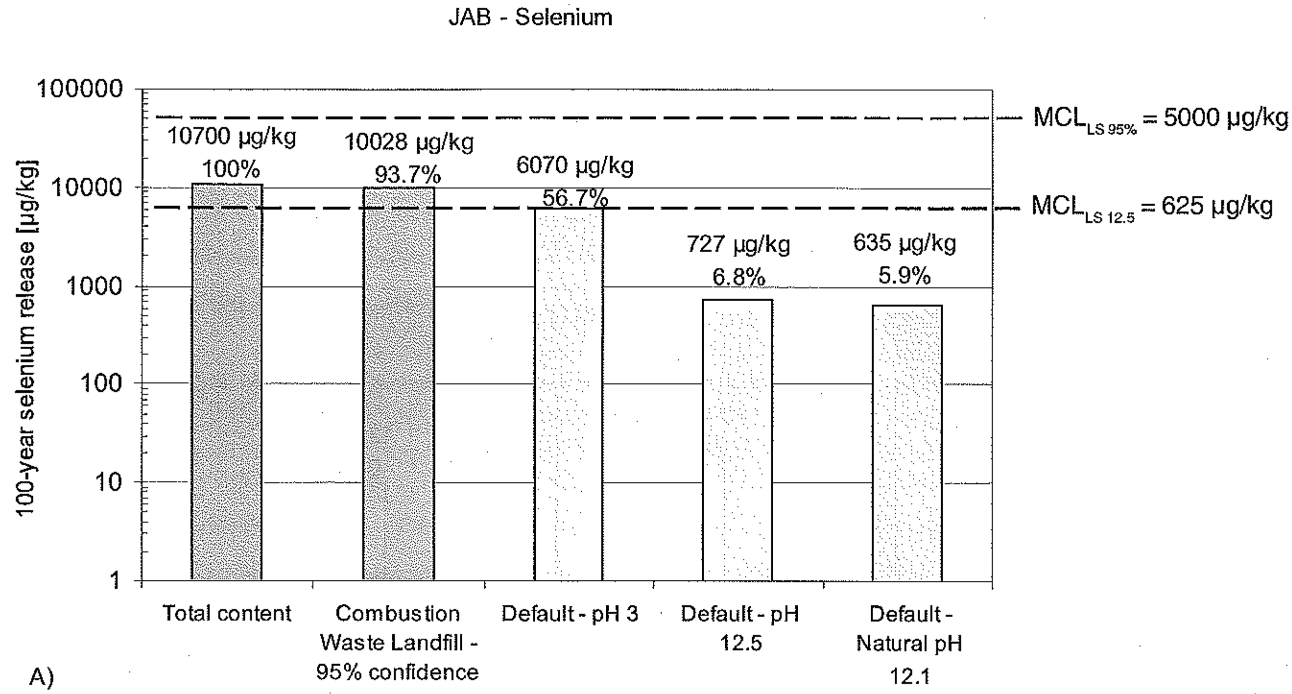
A)



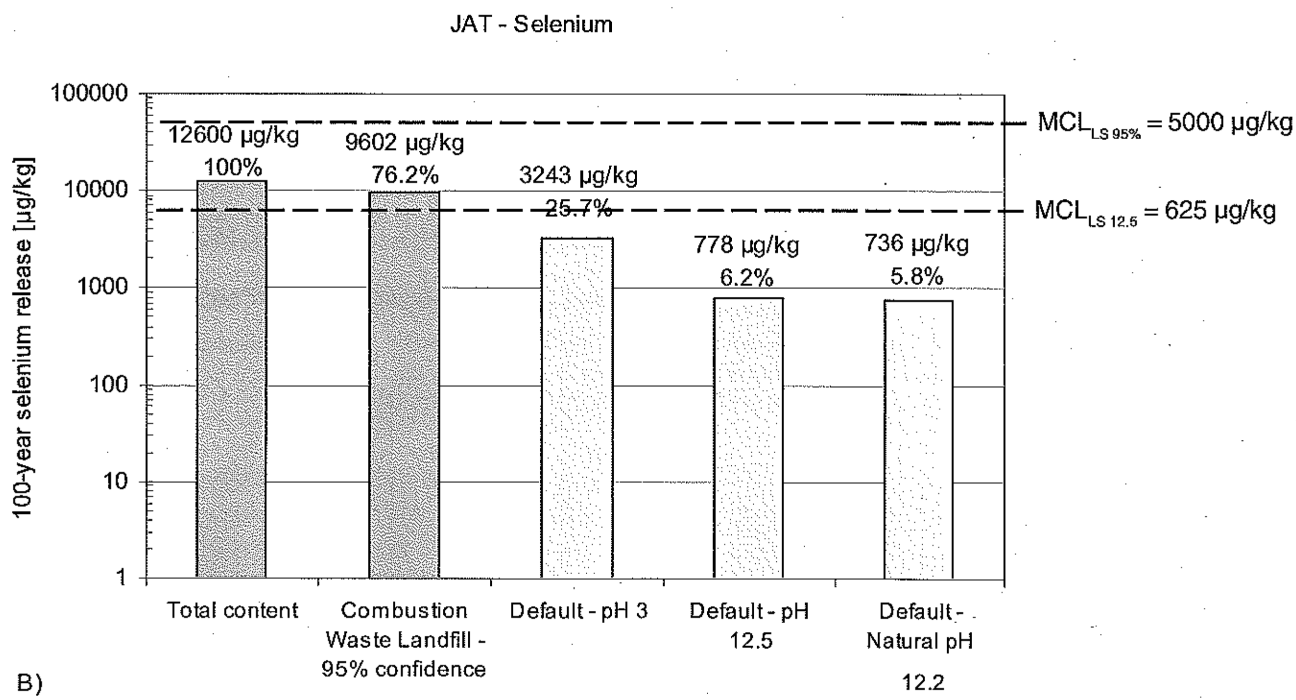
B)

Figure H-13. 100-Year Arsenic Release Estimates from A) Baseline Fly Ash and B) Fly Ash with B-PAC. Release estimates for percolation controlled scenario are compared to release estimate based on total content. The amount of the arsenic that would be released if the release concentration was at the MCL is also shown for comparison ($LS_{default\ scenario}$ = 12.5 L/kg and $LS_{95\%}$ = 100 L/kg).

100-Year Selenium Release Estimates



A)



B)

Figure H-14. 100-year Selenium Release Estimates from A) Baseline Fly Ash and B) Fly Ash with B-PAC. Release estimates for percolation controlled scenario are compared to release estimate based on total content. The amount of the selenium that would be released if the release concentration was at the MCL is also shown for comparison ($LS_{default\ scenario}$ = 12.5 L/kg and $LS_{95\%}$ = 100 L/kg).

Comments

Figure H-3:

- All extract concentrations for Hg are well below levels of potential concern.
- Scatter in the extract concentrations for the cased with enhanced Hg control most likely results from the material heterogeneity associated with addition of particulate activated carbon.

Figure H-5:

- All extract concentrations for As are well below levels of potential concern.

Figure H-6:

- Initial As leachate concentrations from landfills are expected to be substantially greater (i.e., equal to 50 µg/L at LS=2) than indicated by SR002 (LS=10) because of other ionic species at higher concentrations present at low LS ratio typical of landfill scenarios. These anticipated concentrations are consistent with landfill leachate concentrations reported in the EPRI database.

Figure H-7:

- Extract concentrations of selenium are greater than the MCL but within the range reported in the EPA and EPRI databases.

Figure H-8:

- Initial Se leachate concentrations from landfills are expected to be substantially greater (i.e., more than 200–300 :g/L at LS=2) than indicated by SR002 (LS=10) because of other ionic species at higher concentrations present at low LS ratio typical of landfill scenarios. These anticipated concentrations are consistent with landfill leachate concentrations reported in the EPRI database.

Figures H-11 and H-12:

- A much greater percentage and quantity of As can be anticipated to be released from the baseline case than for the test case under the scenarios examined.

Figure H-13:

- For the three default scenarios considered and the 95% probability scenario, arsenic release would most likely be less than the amount that would be released if the release concentration was at the MCL.

Figure H-14:

- For the 95% probability scenario, selenium release from baseline and test cases would be greater than the amount that would be released if the release concentration was at the MCL.
- For the default scenario corresponding to disposal in a monofill (leachate pH controlled by the material being disposed) and the default scenario corresponding to the "extreme" pH of 12.5, no significant difference in selenium release between the baseline and test cases would be expected.
- For the default scenario corresponding to the "extreme" pH of 3, selenium release is expected to be greater for the baseline case than the test case. In both cases, selenium release would be at or greater than the amount that would be released if the release concentration was at the MCL.
- Se release from the baseline and test cases warrants further examination.

Appendix I
Facility L Fly Ashes

List of Figures

Figure **Page**

pH Titration Curves

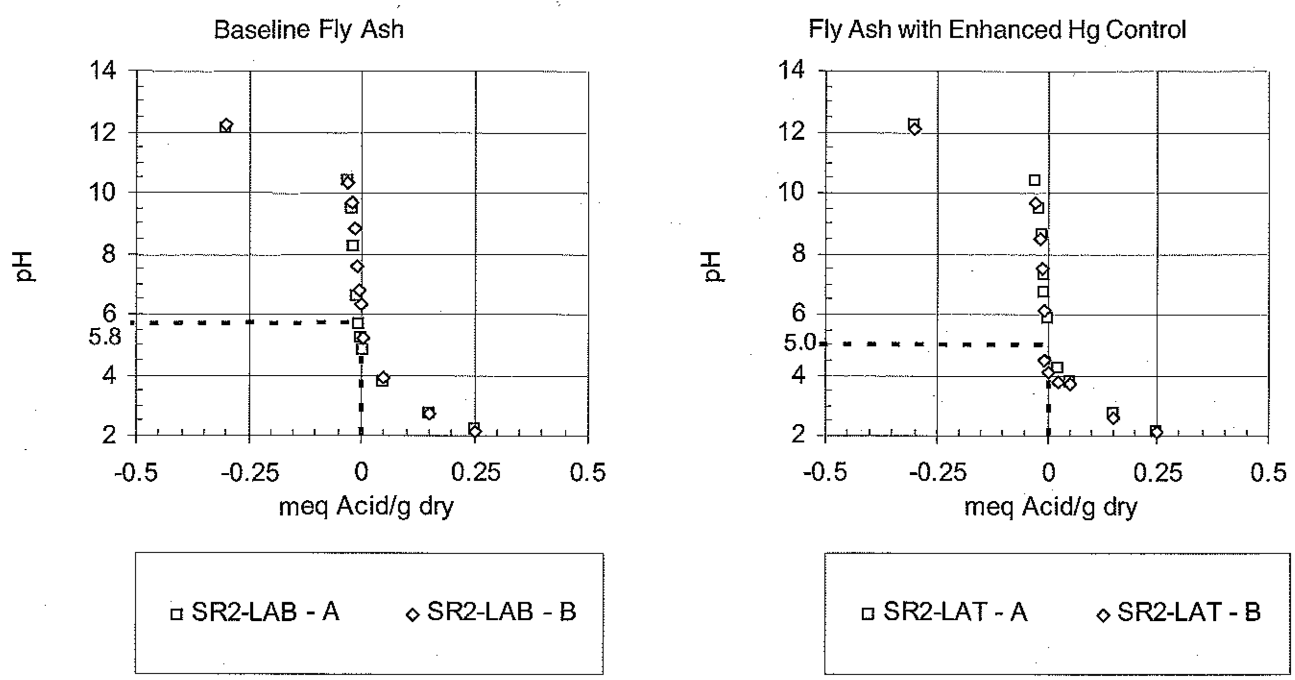


Figure I-1. pH Titration Curves for the Baseline Fly Ash and the Fly Ash with Enhanced Hg Control.

pH as a Function of LS Ratio

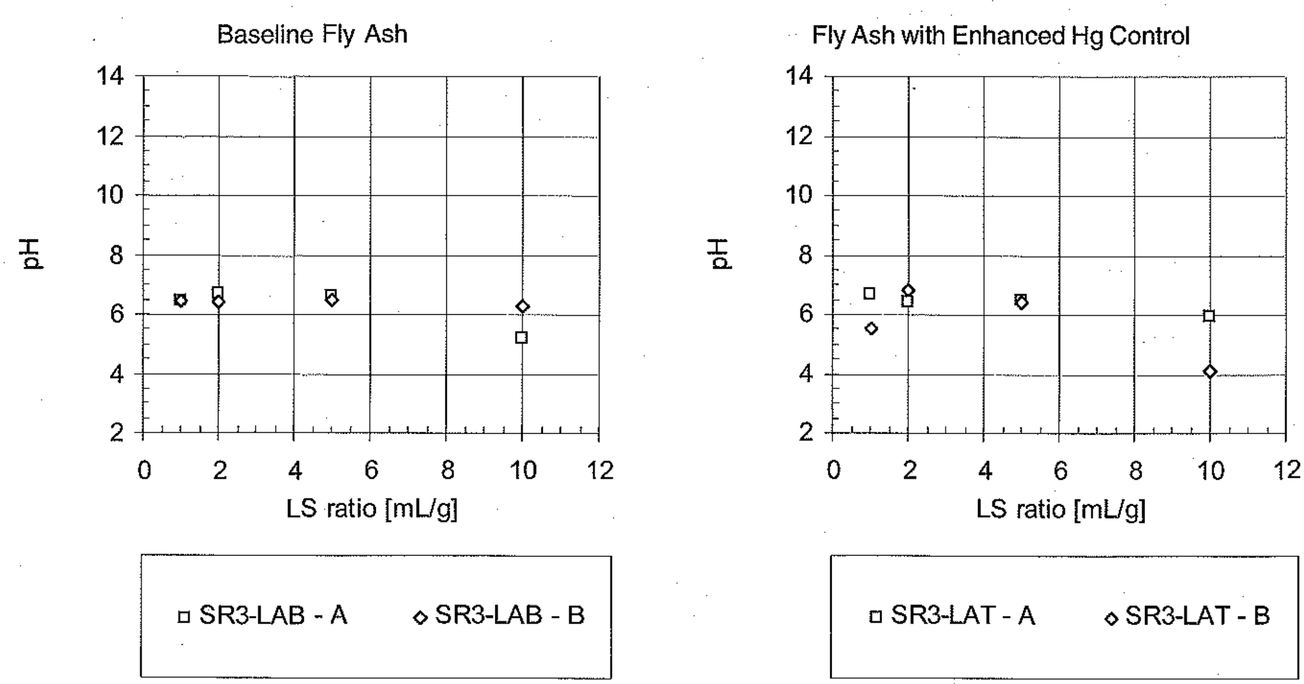
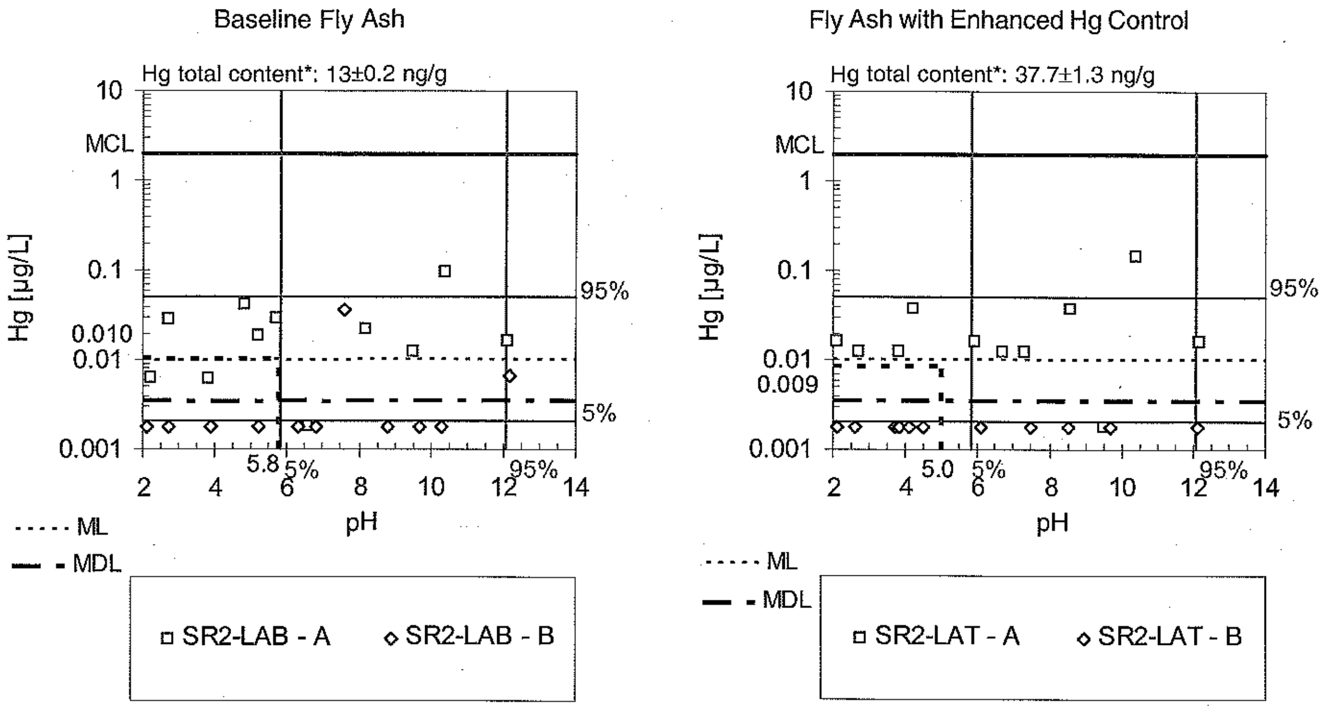


Figure I-2. pH as a Function of LS Ratio for the Baseline Fly Ash and the Fly Ash with Enhanced Hg Control.

Mercury Release as a Function of pH



*Total content as determined by digestion using method 3052.

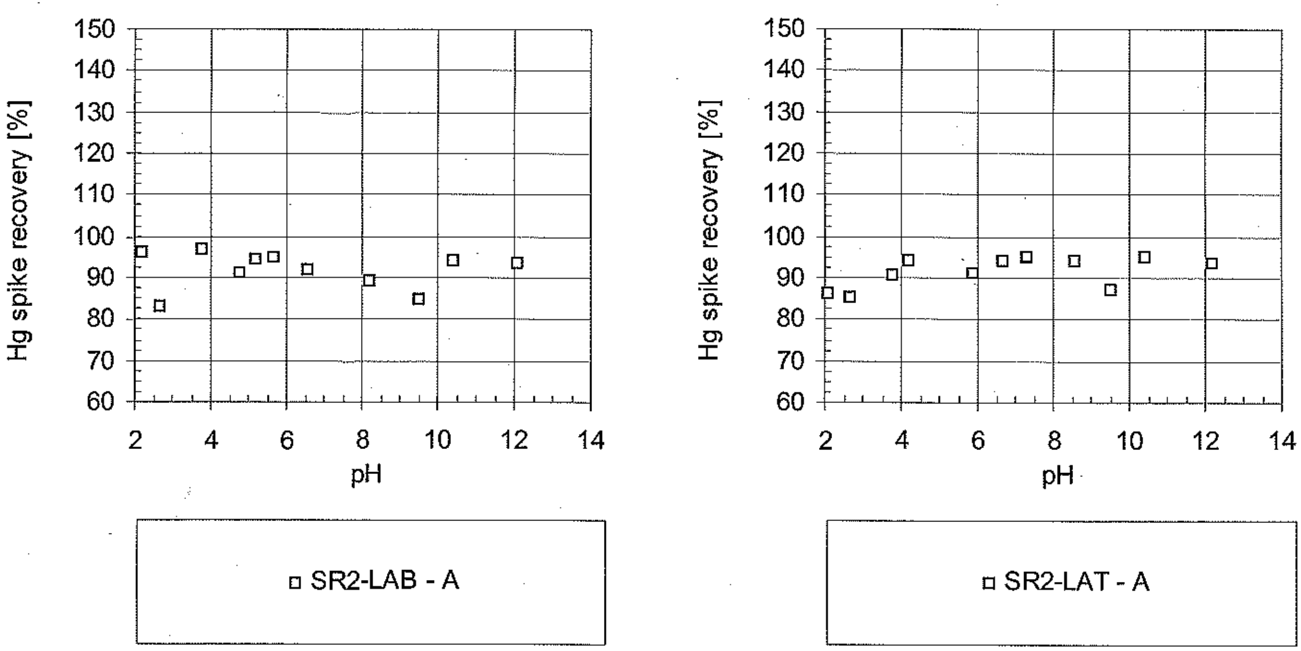


Figure I-3. Mercury Release (top) and Spike Recoveries (bottom) as a Function of pH for the Baseline Fly Ash and the Fly Ash with Enhanced Hg Control. 5th and 95th percentiles of mercury concentrations observed in typical combustion waste landfill leachate are shown for comparison.

Mercury Release as a Function of LS Ratio

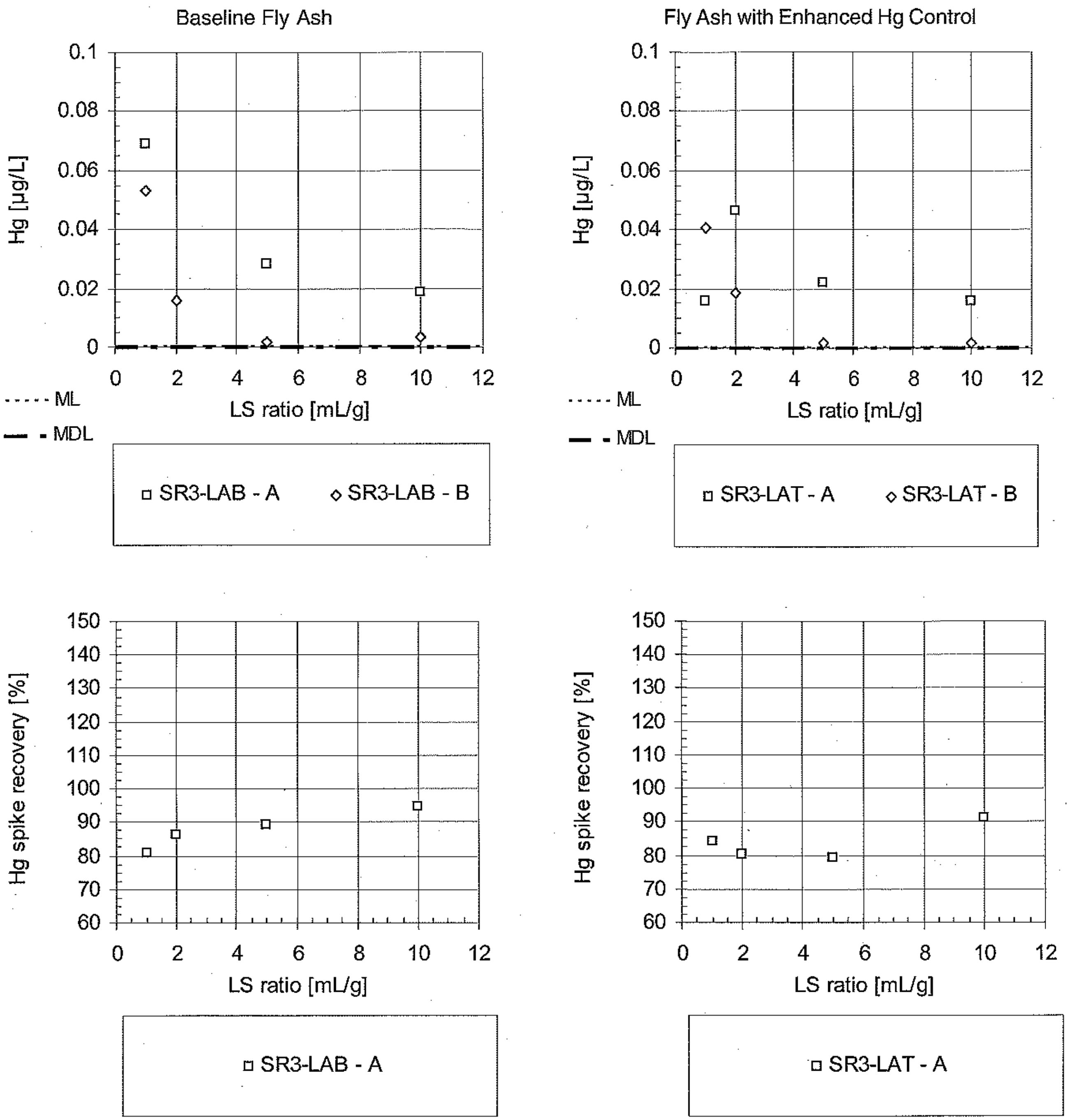


Figure I-4. Mercury Release (top) and Spike Recoveries (bottom) as a Function of LS Ratio for the Baseline Fly Ash and the Fly Ash with Enhanced Hg Control.

Arsenic Release as a Function of pH

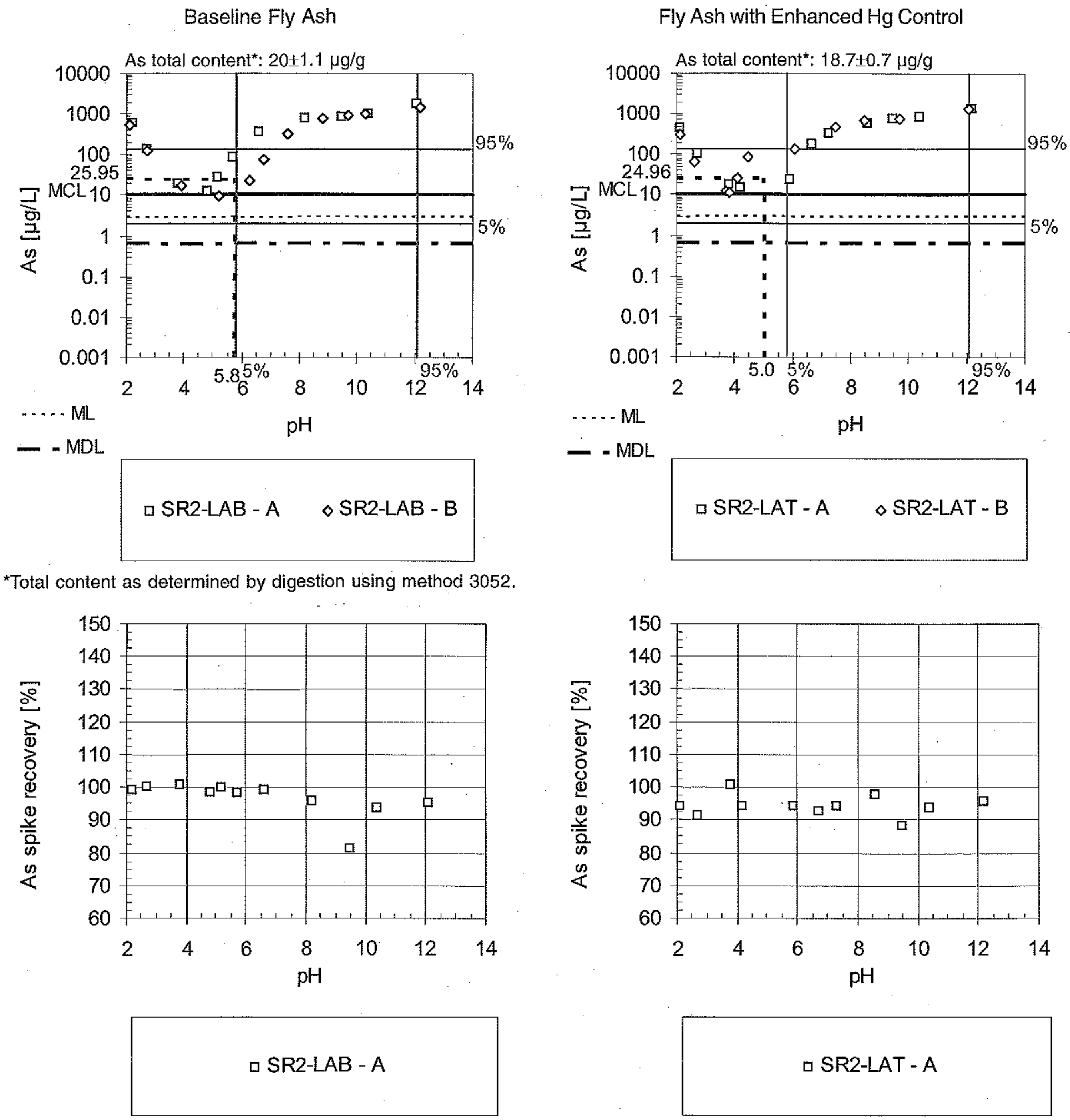


Figure I-5. Arsenic Release (top) and Spike Recoveries (bottom) as a Function of pH for the Baseline Fly Ash and the Fly Ash with Enhanced Hg Control. 5th and 95th percentiles of arsenic concentrations observed in typical combustion waste landfill leachate are shown for comparison.

Arsenic Release as a Function of LS Ratio

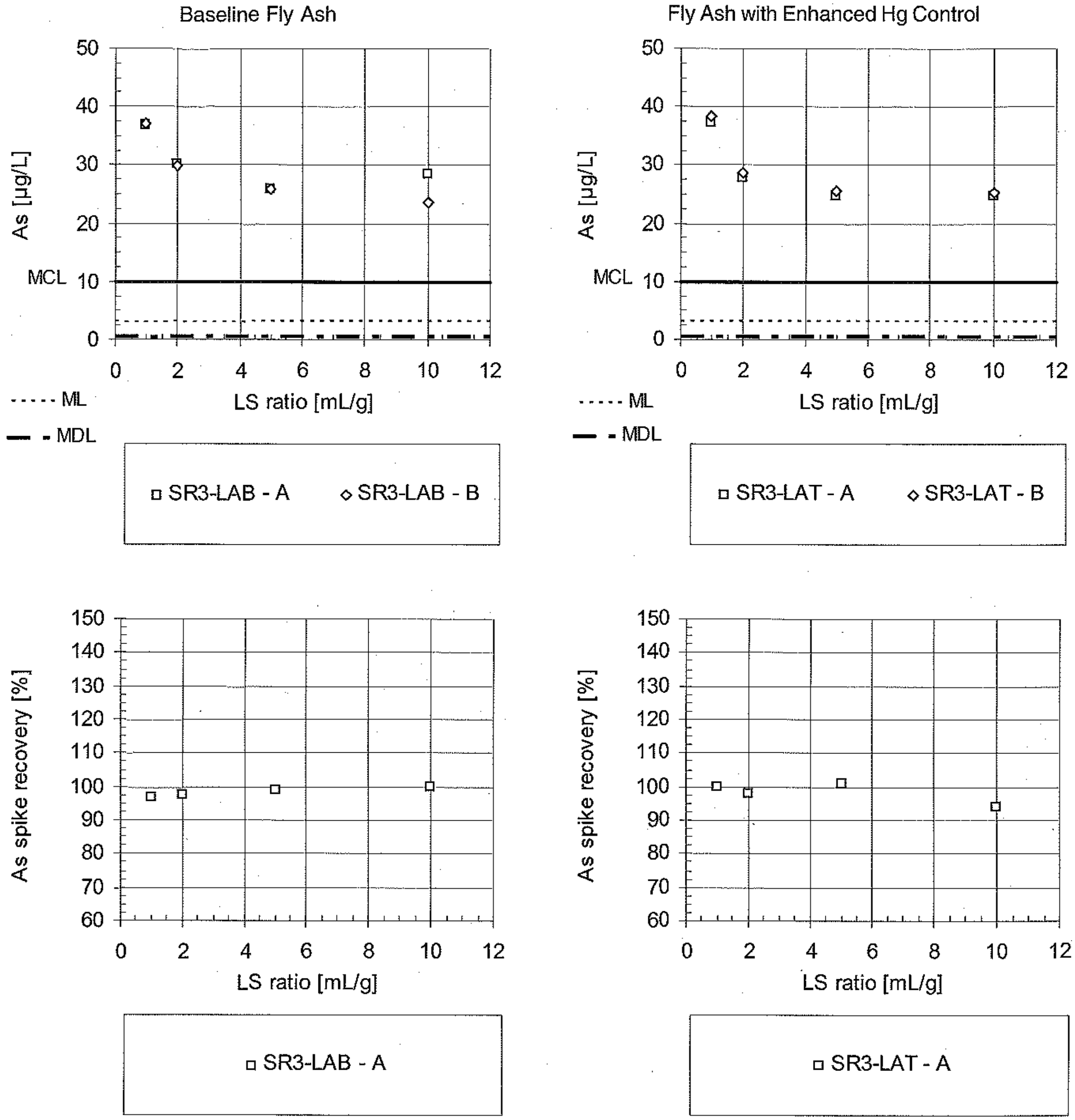
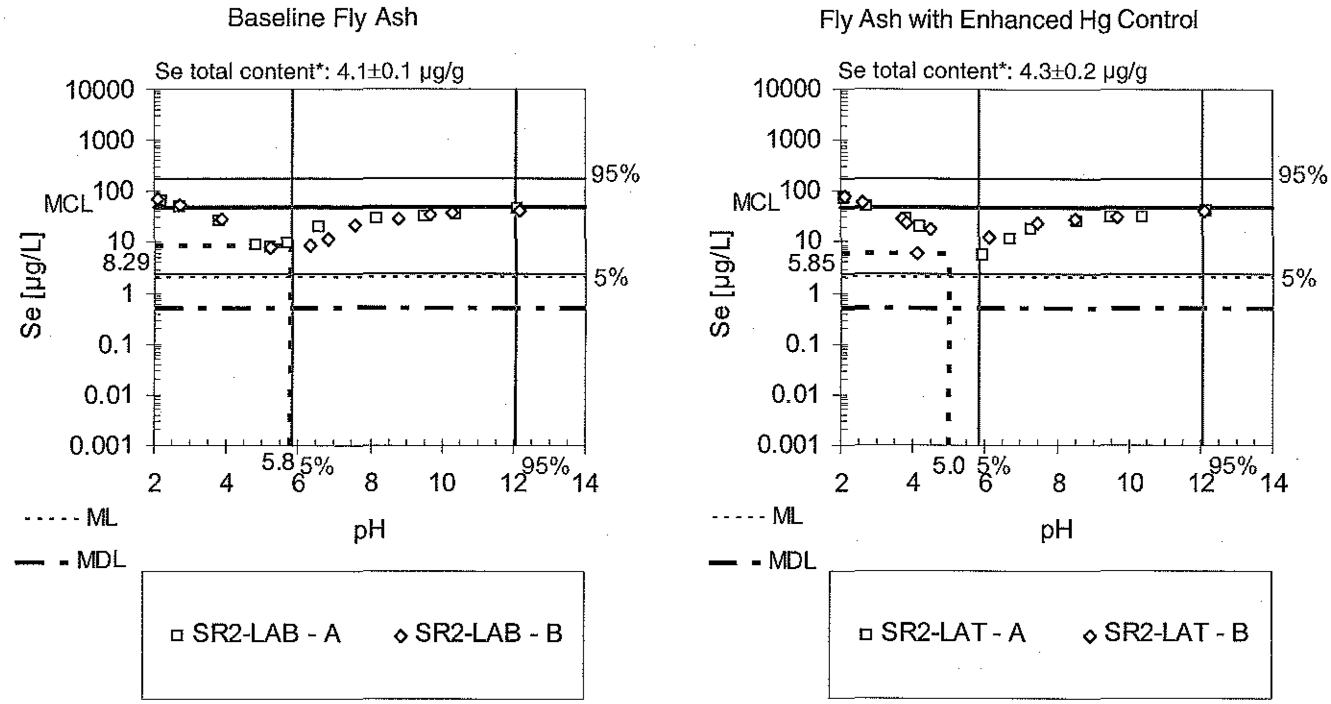


Figure I-6. Arsenic Release (top) and Spike Recoveries (bottom) as a Function of LS Ratio for the Baseline Fly Ash and the Fly Ash with Enhanced Hg Control.

Selenium Release as a Function of pH



*Total content as determined by digestion using method 3052.

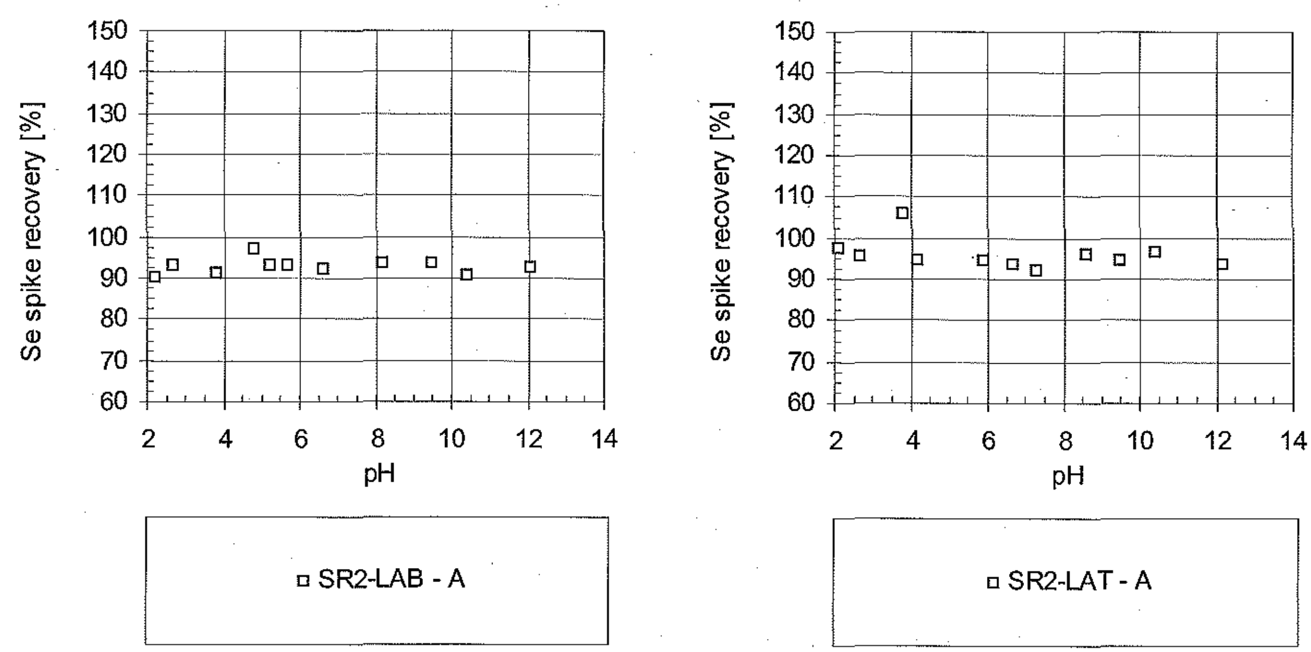


Figure I-7. Selenium Release (top) and Spike Recoveries (bottom) as a Function of pH for the Baseline Fly Ash and the Fly Ash with Enhanced Hg Control. 5th and 95th percentiles of selenium concentrations observed in typical combustion waste landfill leachate are shown for comparison.

Selenium Release as a Function of LS Ratio

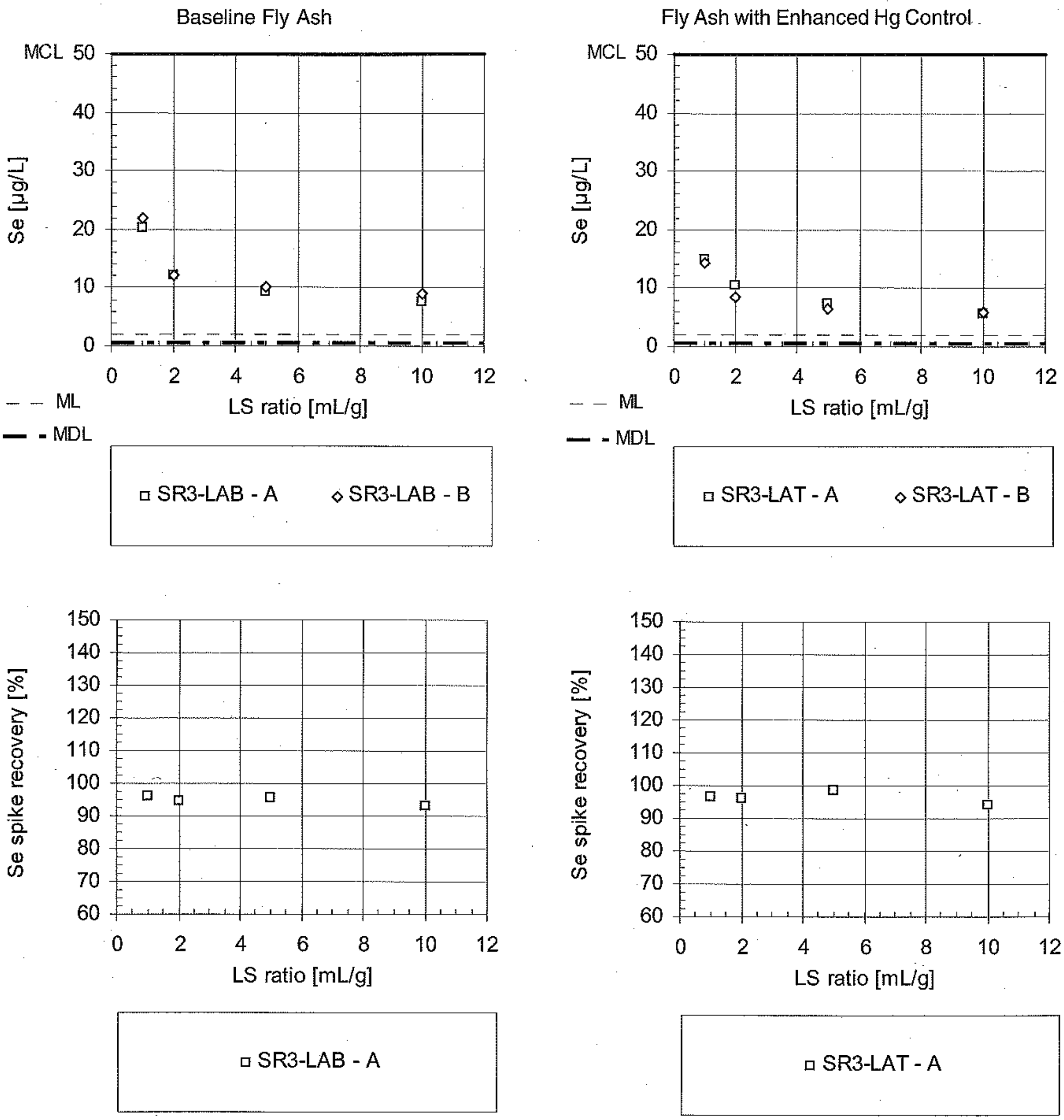
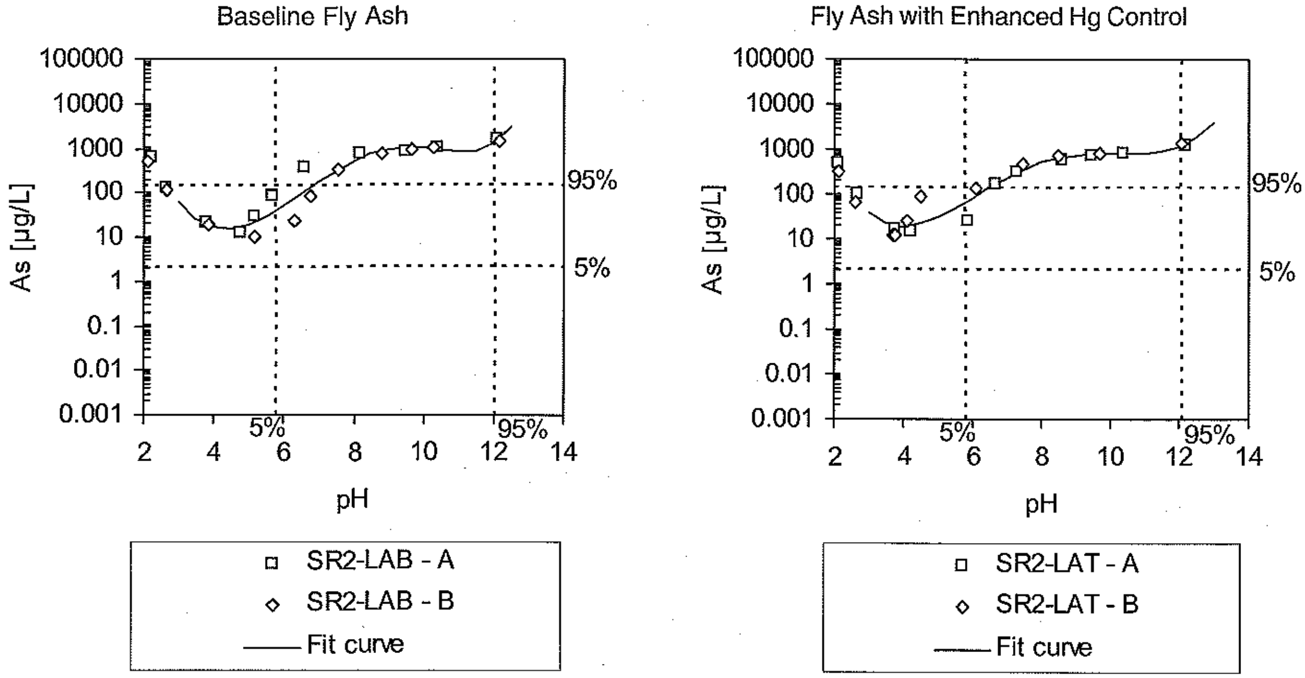


Figure I-8. Selenium Release (top) and Spike Recoveries (bottom) as a Function of LS Ratio for the Baseline Fly Ash and the Fly Ash with Enhanced Hg Control.

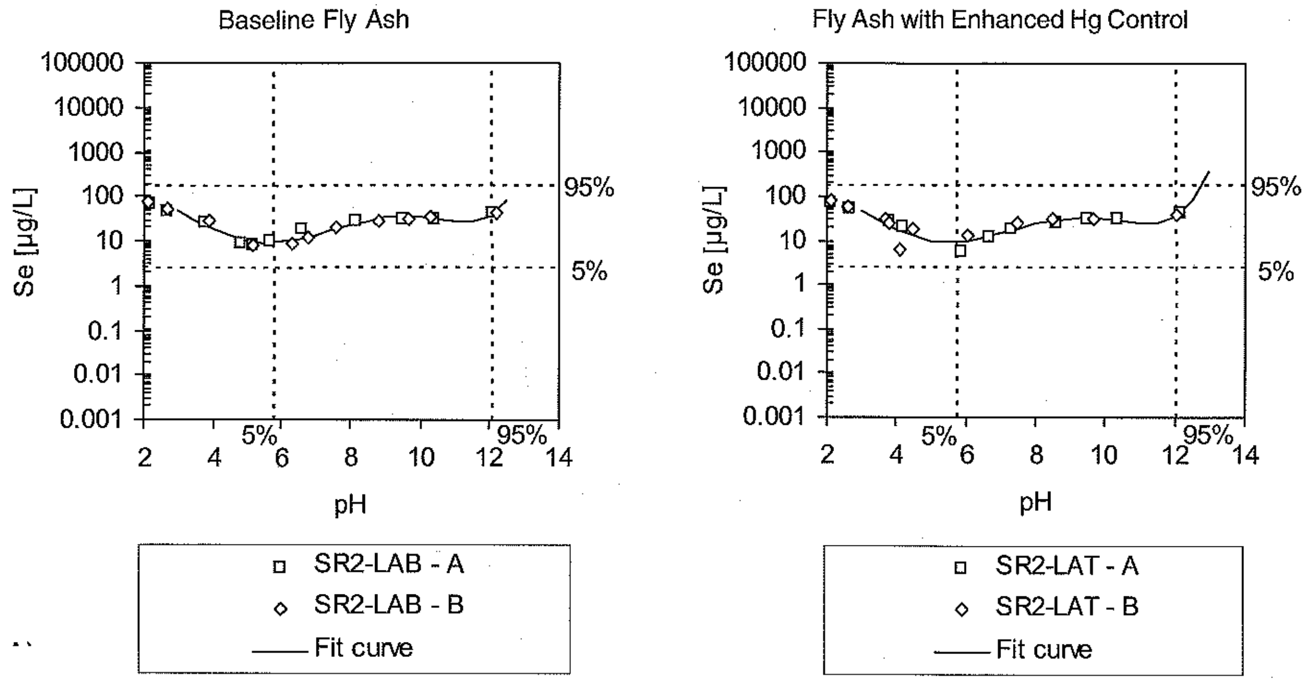
Arsenic Solubility



Material	log As (µg/L)			pH range of validity	R^2	Number of points
LAB	0.0004 pH^5	-0.0120 pH^4	0.0966 pH^3	3-12.5	0.92	22
	0.0151 pH^2	-2.4406 pH	7.2162			
LAT	0.0000 pH^5	0.0040 pH^4	-0.1157 pH^3	3-12.5	0.92	22
	1.2681 pH^2	-5.5708 pH	9.6784			

Figure I-9. Regression Curves of Experimental Data of Arsenic Solubility as a Function of pH.

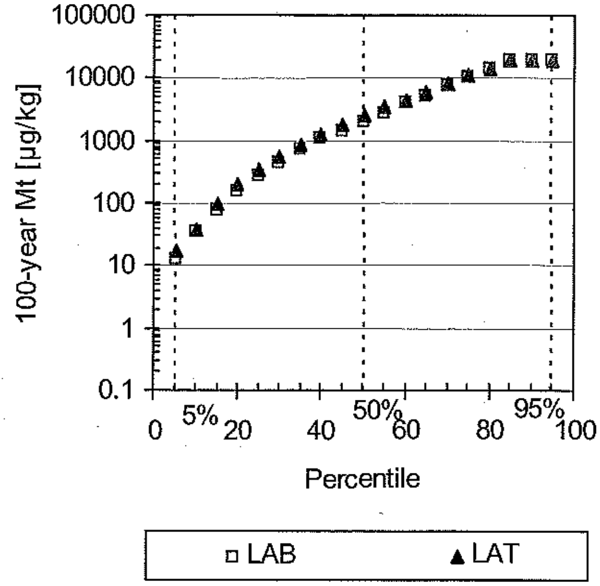
Selenium Solubility



Material	log Se (µg/L)			pH range of validity	R^2	Number of points
LAB	0.0007 pH^5	-0.0239 pH^4	0.3133 pH^3	3-12.5	0.94	22
	-1.8284 pH^2	4.4667 pH	-1.9621			
LAT	0.0007 pH^5	-0.0230 pH^4	0.2978 pH^3	3-12.5	0.81	22
	-1.7038 pH^2	4.0275 pH	-1.4335			

Figure I-10. Regression Curves of Experimental Data of Selenium Solubility as a Function of pH.

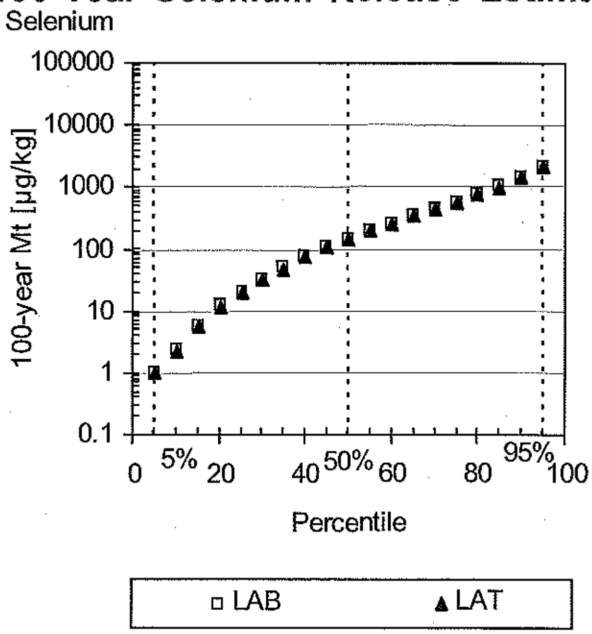
100-Year Arsenic Release Estimates



	LAB µg/kg	%	LAT µg/kg	%
Mt min	0.83	0.00413	1.50	0.00800
Mt - 5%	13.36	0.0668	17.38	0.09296
Mt - 50%	2049	10.25	2471	13.22
Mt - 95%	20000	100.0	18700	100.0
Mean Mt	10541	52.7	10090	53.96
Mt max	20000	100.0	18700	100.0

Figure I-11. 100-Year Arsenic Release Estimates as a Function of the Cumulative Probability for the Scenario of Disposal in a Combustion Waste Landfill.

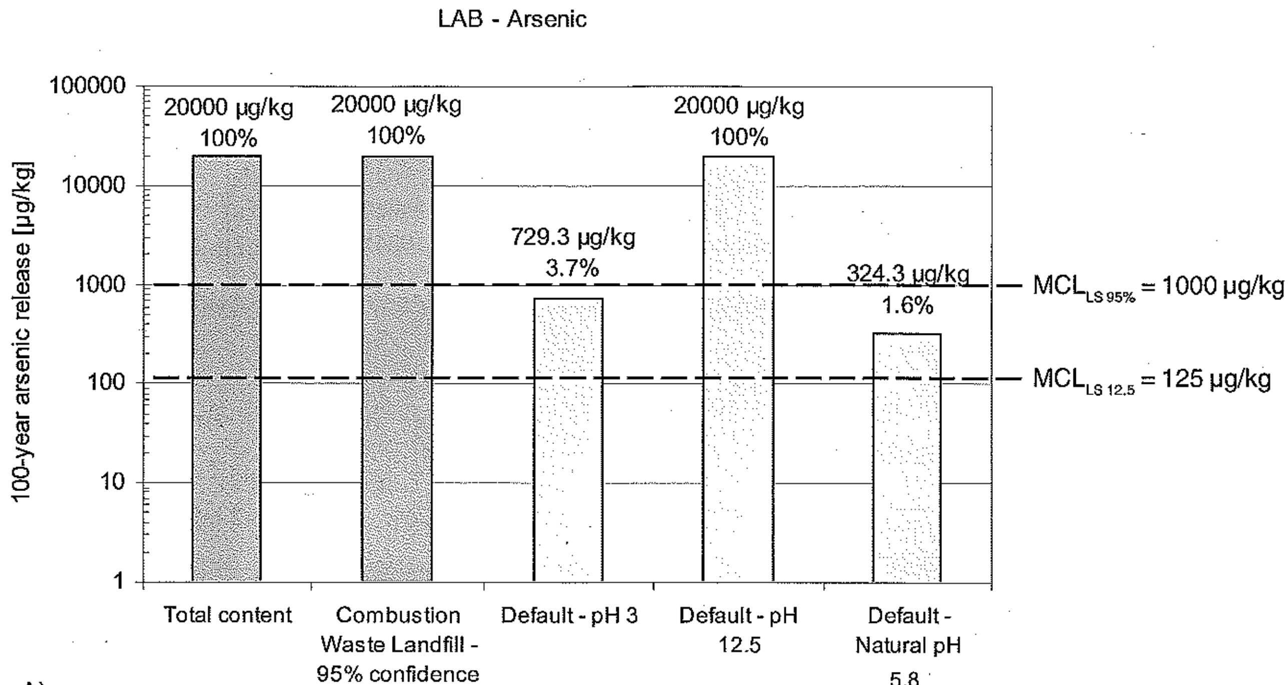
100-Year Selenium Release Estimates



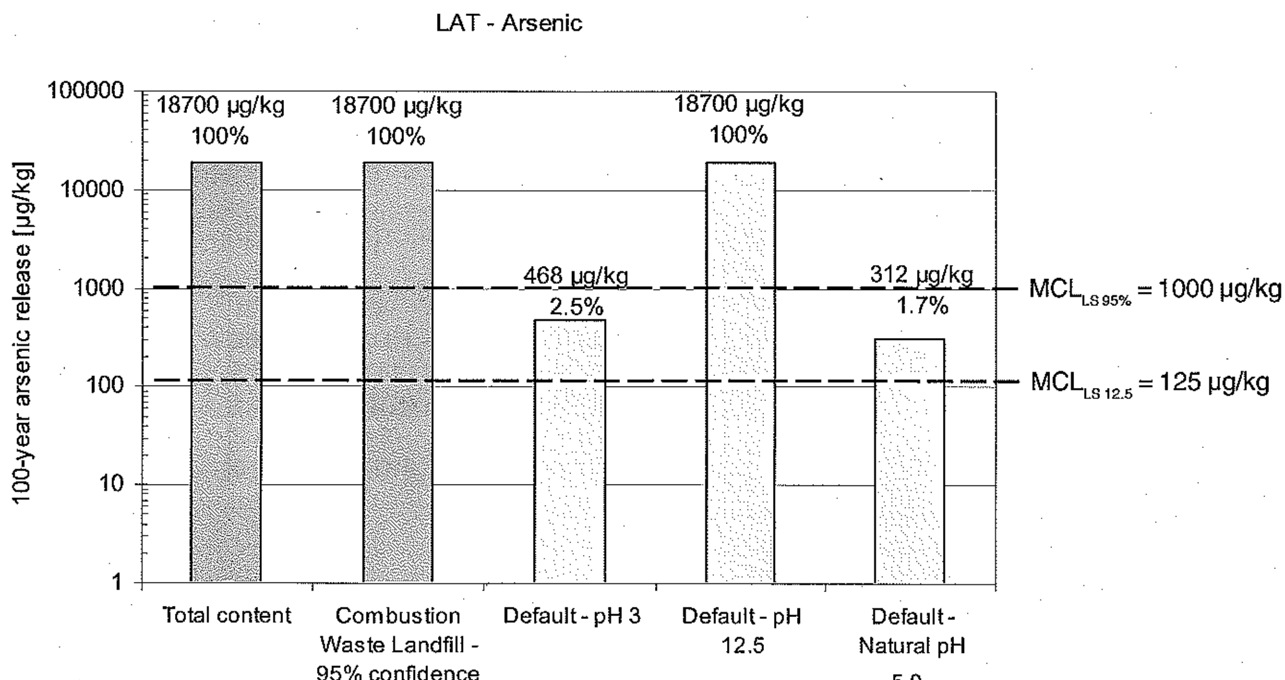
	LAB µg/kg	%	LAT µg/kg	%
Mt min	0.3	0.01	0.3	0.007
Mt - 5%	1.0	0.02	1.0	0.02
Mt - 50%	143	3.5	141	3.3
Mt - 95%	2113	51.5	2041	47.5
Mean Mt	484	11.8	466	10.8
Mt max	4100	100.0	4300	100.0

Figure I-12. 100-Year Selenium Release Estimates as a Function of the Cumulative Probability for the Scenario of Disposal in a Combustion Waste Landfill.

100-Year Arsenic Release Estimates



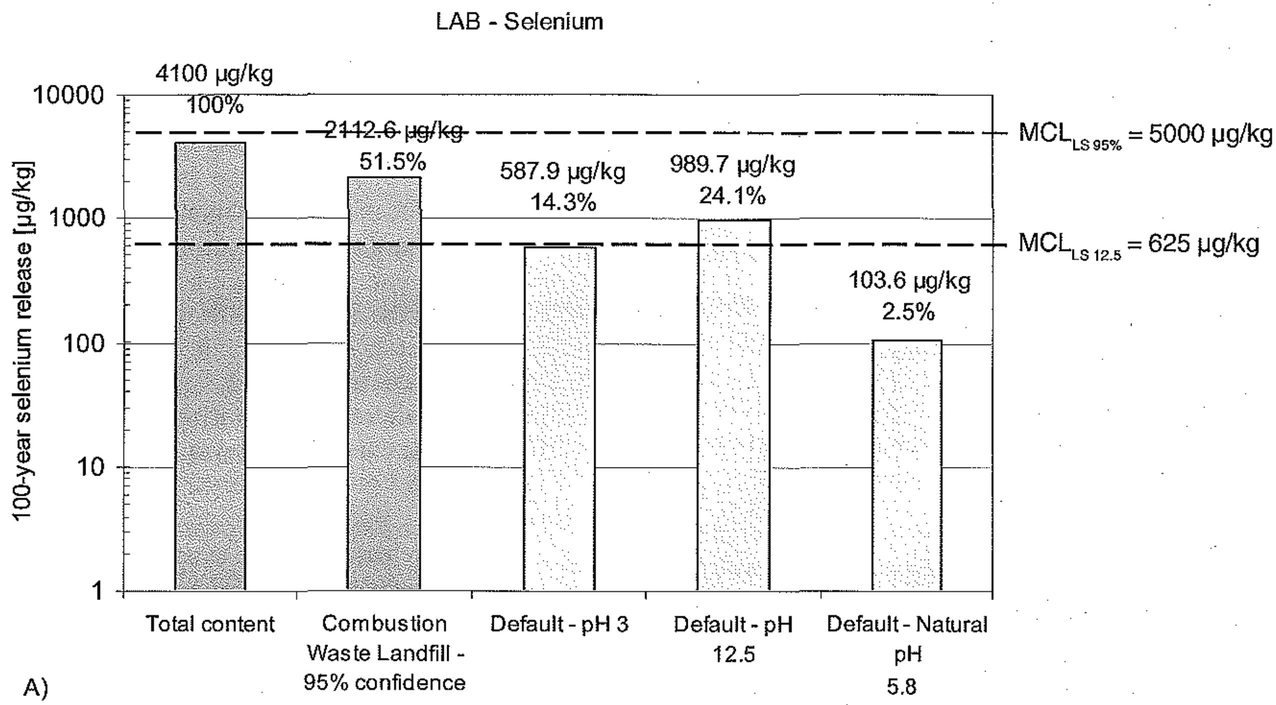
A)



B)

Figure I-13. 100-Year Arsenic Release Estimates from A) Baseline Fly Ash and B) Fly Ash with Enhanced Hg Control. Release estimates for percolation controlled scenario are compared to release estimate based on total content. The amount of the arsenic that would be released if the release concentration was at the MCL is also shown for comparison ($LS_{default\ scenario}$ = 12.5 L/kg and $LS_{95\%}$ = 100 L/kg).

100-Year Selenium Release Estimates



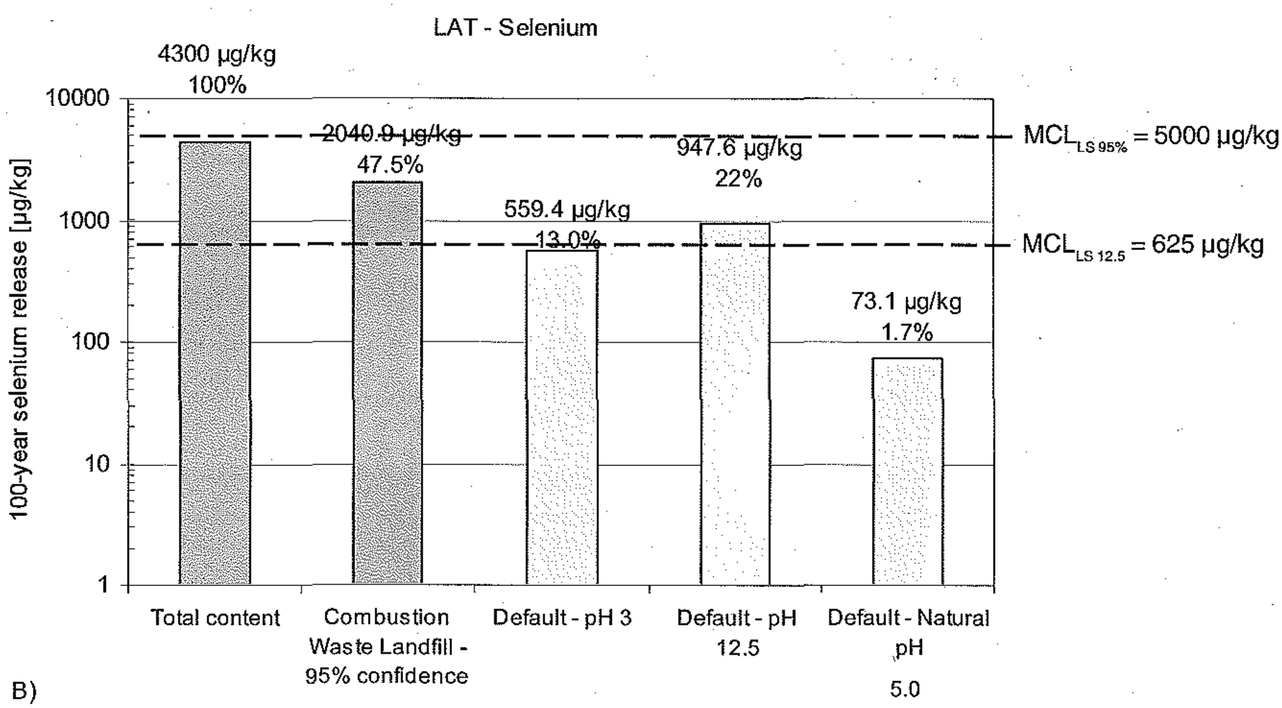


Figure I-14. 100-year Selenium Release Estimates from A) Baseline Fly Ash and B) Fly Ash with Enhanced Hg Control. Release estimates for percolation controlled scenario are compared to release estimate based on total content. The amount of the selenium that would be released if the release concentration was at the MCL is also shown for comparison ($LS_{default\ scenario}$ = 12.5 L/kg and $LS_{95\%}$ = 100 L/kg).

Comments

Figure I-3:

- Fly ash from the test case had greater total Hg content than the fly ash from the baseline case (by about 3 times).
- Hg release is low (but poor replication) for both baseline and test cases.

Figure I-5:

- The fly ash from the test case had lower total As content than that from the baseline case (by about 4.5 times).
- Arsenic release was close to or exceeded the MCL (10 µg/L) for both the baseline and the test cases for all pH conditions.

Figure I-7:

- Fly ash from the test case had greater total Se content than the fly ash from the baseline case (by about 4.5 times).
- Selenium release from both the baseline and the test cases was close to the MCL (50 µg/L) for most pH conditions.

Figures I-11 and I-12:

- The fly ash from the test case would result in similar As release than expected from the baseline case, with a 95% probability to be less than 18700 and 20000 µg/kg, respectively.
- The fly ash from the test case would result in similar Se release than expected from the baseline case, with a 95% probability to be less than 2115 and 2045 µg/kg, respectively.

Figure I-13:

- For the 95% probability scenario, arsenic release from both cases would exceed the amount that would be released if the release concentration was at the MCL.
- For two of the three default scenarios considered (i.e., pH 3 and natural pH), arsenic release would most likely be less than the amount that would be released if the release concentration was at the MCL. However, for the default scenario at pH 12.5, arsenic release would most likely exceed the amount that would be released if the release concentration was at the MCL.

Figure I-14:

- Similar Se release would be expected for the test case compared to the baseline case for all scenarios examined.
- For the 95% probability scenario, selenium release from both cases would be less than the amount that would be released if the release concentration was at the MCL and the LS ratio was the resultant LS ratio for the 95% case (i.e., around 100 L/kg). However, selenium release would be greater than the amount that would be released if the release concentration was at the MCL and the LS ratio was the LS ratio of the default scenario considered (i.e., 12.5 L/kg).