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LANDFILL LEACHATE QUANTITATIVE ANALYSIS

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SpillFix[®]

The Threat Stops Here.



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LANDFILL LEACHATE QUANTITATIVE ANALYSIS REPORTS



Landfill leachate occurs as a result of water flowing through waste landfills' especially uncontrolled landfills which are not capped properly. It is common to find soluble zinc, phenols, cyanide, and ammonium in landfill leachates.

**a) RCRA Metals in TCLP Leachate Solution by EPA 6020
Quantitative Analysis Report
Inductively Coupled Plasma - Mass Spectrometry**

Sample Preparation: 10 grams of sample were tumbled with 200 mL of extraction fluid #1 for 18 hours. The entire leachate was then filtered through Whatman #41 filter paper. 10 grams were further filtered through a 0.45 μ m filter into a plastic bottle. 2 mL of nitric acid were added and then internal standard was added. The samples were diluted to a final mass of 100 grams.

b) Quality Control Summary

**c) CCR Metals by SOP 7040, Rev 10
Quantitative Analysis Report
Inductively Coupled Plasma - Mass Spectrometry**

Sample Preparation: 0.2 grams of sample were digested in 1 mL of nitric acid and 3 mL of hydrochloric acid for 1 hour on a HotBlock set at 110°C. The samples were allowed to cool, internal standards were added, and then the digestates were diluted to a final mass of 100 grams. The samples mostly dissolved.

d) Quality Control Summary

Spillfix is well below the acceptable EPA leachate testing limits for landfill disposal as specified under:

- Toxicity characteristic leaching procedure (TCLP)
- Total Threshold Limit Concentration (TTLC)
- Soluble Threshold Limit Concentration (STLC)

(See following test results)

a) QUANTITATIVE ANALYSIS REPORT

RCRA Metals in TCLP Leachate Solution by EPA 6020 Inductively Coupled Plasma - Mass Spectrometry

Sample Preparation: 10 grams of sample were tumbled with 200 mL of extraction fluid #1 for 18 hours. The entire leachate was then filtered through Whatman #41 filter paper. 10 grams were further filtered through a 0.45 µm filter into a plastic bottle. 2 mL of nitric acid were added and then internal standard was added. The samples were diluted to a final mass of 100 grams.

Leachate Metals Concentration - Parts Per Million (mg/L)

* Exceeds TCLP Limit

	SpillFix 7lb Bag	Detection Limit	TCLP Limit
Arsenic	ND	0.003	5
Barium	0.054	0.02	100
Cadmium	ND	0.0003	1
Chromium	ND	0.002	5
Lead	ND	0.0005	5
Mercury	ND	0.0009	0.2
Selenium	ND	0.02	5
Silver	ND	0.0001	5

(1) Chromium is reported above as total chromium in sample leachate.

(2) Detection Limit is the background equivalent concentration in the Leachate Blank.

b) QUALITY CONTROL SUMMARY



Analyte	Sample Matrix SpillFix 7lb Bag TCLP Leachate						
	Sample Result	Duplicate Result	Average Result	Sample RPD	Spike Conc	Spike Result	Spike % Rec
Arsenic	ND	ND	ND	NA	1	0.94	94
Barium	0.0539	0.0546	0.0543	NA	1	1.09	104
Cadmium	ND	ND	ND	NA	1	0.92	92
Chromium	ND	ND	ND	NA	1	1.01	101
Lead	ND	ND	ND	NA	1	0.90	90
Mercury	ND	ND	ND	NA	0.1	0.09	88
Selenium	ND	ND	ND	NA	10	9.07	91
Silver	ND	ND	ND	NA	1	0.92	92

b) QUALITY CONTROL SUMMARY (cont.)

Analyte	Sample Matrix	Laboratory Fortified Blank (LFB) TCLP Leachate		
	Blank Result	Spike Conc	Spike Result	Spike % Rec
Arsenic	ND		0.94	94
Barium	0.0225		1.07	105
Cadmium	ND		0.939	94
Chromium	ND		1.00	100
Lead	ND		0.90	90
Mercury	ND	0.1	0.0885	88
Selenium	ND		9.34	93
Silver	ND		0.937	94

c) CCR Metals by SOP 7040, Rev 10
Inductively Coupled Plasma - Mass Spectrometry

Sample Preparation: 0.2 grams of sample were digested in 1 mL of nitric acid and 3 mL of hydrochloric acid for 1 hour on a HotBlock set at 110°C. The samples were allowed to cool, internal standards were added, and then the digestates were diluted to a final mass of 100 grams. The samples mostly dissolved.

Total Metals Concentration -
Parts Per Million (mg/kg)

**** Exceeds TTLC Limits * May Exceed STLC

	SpillFix 7lb Bag	Detection Limit	10 X STLC Limits	TTLC Limits
Antimony	ND	0.08	150	500
Arsenic	ND	0.10	50	500
Barium	19.40	0.02	1000	10000
Beryllium	ND	0.07	7.5	75
Cadmium	0.019	0.01	10	100
Chromium	2.90	0.07	(Cr VI) 50 (Cr III) 5600	500 2500
Cobalt	0.48	0.01	800	8000
Copper	4.39	0.04	250	2500
Lead	0.60	0.02	50	1000
Mercury	ND	0.04	2	20
Molybdenum	0.09	0.02	3500	3500
Nickel	1.10	0.10	200	2000
Selenium	ND	0.80	50	500
Silver	ND	0.02	50	500
Thallium	0.23	0.10	70	700
Vanadium	2.60	0.10	240	2400
Zinc	15.40	0.20	2500	5000

(1) Chromium is reported above as total chromium in sample.

(2) 10 X STLC Limits are used for comparison due to the 1/10 dilution of the sample during leachate preparation.

d) QUALITY CONTROL SUMMARY

Analyte	Sample			SpillFix 7lb Bag Parts Per Million (mg/kg)			
	Sample Result	Duplicate Result	Average Result	Sample RPD	Spike Conc	Spike Result	Spike % Rec
Antimony	ND	ND	ND	NA	50	43.1	86
Arsenic	ND	ND	ND	NA	50	52.4	105
Barium	19.4	18.3	18.9	5.8	50	68.0	98
Beryllium	ND	ND	ND	NA	50	47.5	95
Cadmium	0.019	ND	ND	NA	50	51.0	102
Chromium	2.90	3.03	2.97	4.4	50	57.9	110
Cobalt	ND	ND	ND	0.2	50	50.5	100
Copper	ND	ND	ND	5.1	50	68.6	129*
Lead	0.596	0.644	0.620	7.7	50	47.9	95
Mercury	ND	ND	ND	NA	5	4.83	97
Molybdenum	0.090	0.091	0.091	NA	50	41.9	84
Nickel	1.05	1.40	1.23	NA	50	60.2	118
Selenium	ND	ND	ND	NA		50.6	101
Silver	ND	ND	ND	NA	50	50.1	100
Thallium	0.228	ND	NA	NA	50	49.8	99
Vanadium	2.56	2.40	2.48	6.5	50	67.9	131*
Zinc	15.4	12.9	14.2	17.7	50	66.4	105

*Spike recovery is outside expected range (compared to LFB) due to a probable sample matrix or solubility effect.



d) QUALITY CONTROL SUMMARY (cont.)



Analyte	Sample			
	Blank Result	Spike Conc	Spike Result	Spike % Rec
Antimony	ND	50	49.4	99
Arsenic	ND	50	47.7	95
Barium	ND	50	50.0	100
Beryllium	ND	50	47.8	96
Cadmium	ND	50	49.9	100
Chromium	ND	50	52.4	105
Cobalt	ND	50	49.0	98
Copper	ND	50	55.2	110
Lead	ND	50	47.8	96
Mercury	0.027	5	4.94	98
Molybdenum	ND	50	53.1	106
Nickel	0.112	50	54.9	110
Selenium	ND	500	465	93
Silver	0.017	50	50.7	101
Thallium	0.06	50	52.9	106
Vanadium	ND	50	49.5	99
Zinc	0.134	50	51.4	103

Always check with appropriate local authorities for disposal requirements.