

ENGINEERING TECTONICS, P.A.
ENGINEERS • GEOLOGISTS • HYDROLOGISTS

P.O. Box 11846, Winston-Salem, NC 27116 (919) 767-8807



August 14, 1990

North Carolina Department of Environment, Health and Natural Resources
Division of Health Services, Solid Waste Branch
P.O. Box 2091
Raleigh, North Carolina 27611

ATTN: Mr. Gray Stevens

Dear Mr. Stevens:

Enclosed you should find one copy of analytical results from three groundwater samples which were collected from the monitoring wells at the Alleghany County Sanitary Landfill on June 12, 1990.

Please note that Well 3 is the upgradient well at this site.

Should you need any additional information concerning the sample collection or analyses, please do not hesitate to contact me.

Sincerely,

ENGINEERING TECTONICS, P.A.

Julianne M. Braun

Julianne M. Braun
Hydrogeologic Technician

JMB/jg

enclosure

AnalytiKEM Inc.
28 Springdale Road
Cherry Hill, NJ 08003
609/751-1122
215/923-2068

TEST REPORT NO. A60320

June 27, 1990

Prepared for:

Engineering Tectonics
3845 North Patterson Avenue
Winston-Salem, NC 27105-2647

Attention: Julianne Braun

Project: Allegany Land

Date of Sample Receipt: June 12, 1990

NJ Certification No. NJ 04012
NY Certification No. NY 10815
SC Certification No. SC 94004
NC Certification No. NC 258
PA Certification No. PA 68-366

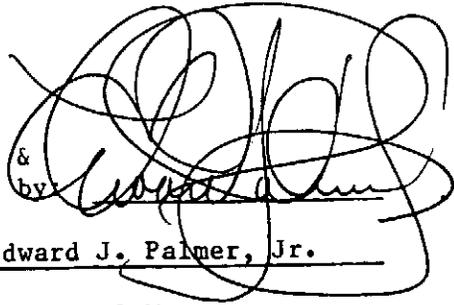
Reviewed & Approved by 
Name Edward J. Palmer, Jr.
Title Technical Manager

TABLE OF CONTENTS

	<u>Page</u>
I. Definition of Terms	1
II. Sample Designations	2
III. Methodology	3
IV. Analytical Results	4 - 5
V. Quality Control Data	6 - 7

I. Definition of Terms

<u>Term</u>	<u>Definition</u>
D	Detected; result must be greater than zero.
DI	Deionized Water
J	Compound was detected at levels below the practical quantitation limit. The level reported is approximate.
MS/MSD	Matrix Spike/Matrix Spike Duplicate
NA	Analysis not applicable to the sample matrix.
ND	Not Detected
NR	Not Requested
NTU	Nephelometric Turbidity Units
RPD	Relative Percent Difference
RSD	Relative Standard Deviation
TON	Threshold Odor Number
U	Compound was analyzed for but not detected. The preceding number is the practical quantitation limit for the compound.
ppb	Parts-per-billion; may be converted to ppm by dividing by 1,000.
ppm	Parts-per-million; may be converted to ppb by multiplying by 1,000.
ug/l	Micrograms of constituent per liter of sample; equivalent to parts-per-billion.
ug/kg	Micrograms of constituent per kilogram of sample; equivalent to parts-per-billion.
ug/kg dw	Micrograms of constituent per kilogram of sample reported on a dry weight basis.
CCC	Calibration Check Compound; used to verify the precision of a GC/MS calibration curve.
SPCC	System Performance Check Compound; used to verify the correct operation of a GC/MS instrument.
PQL	Practical Quantitation Limit; the minimum level at which compounds can be dependably quantitated.

Test Report No. A60320
Page 2

II. Sample Designations

<u>AnalytiKEM Designation</u>	<u>Client Designation</u>	<u>Matrix</u>	<u>Date Sampled</u>
A60320-1	Well 1	Aqueous	6/12/90
A60320-2	Well 2	Aqueous	6/12/90
A60320-3	Well 3	Aqueous	6/12/90

Test Report No. A60320

Page 3

III. Methodology

All analysis are performed in accordance with methodologies found in the following publications:

- . Federal Register, Vol. 49, No. 209, October 26, 1984.
- . Federal Register, Vol. 51, No. 114, June 13, 1986.
- . Test Methods for Evaluating Solid Waste, USEPA, SW-846, Second Edition, July 1982.
- . Test Methods for Evaluating Solid Waste, USEPA, SW-846, Third Edition, November 1986.
- . Standard Methods for the Examination of Water and Wastewater, American Public Health Association, 16th Edition, 1985.
- . Methods for Chemical Analysis of Water and Wastes, EPA-600/4-79-020, USEPA, March 1983.
- . Annual Book of ASTM Standards (1980 and 1983)
- . OI Corporation Model 524C TOC Analyzer Manual, January 1983.

IV. Analytical Results

Metals

<u>Parameter</u>	<u>Method</u>		<u>Sample Designation</u>					
			<u>A60320-1</u>		<u>A60320-2</u>		<u>A60320-3</u>	
	<u>Blank</u>		<u>Well 1</u>		<u>Well 2</u>		<u>Well 3</u>	
Arsenic, total	10	U	10	U	10	U	10	U
Barium, total	200	U	47	J	17	J	31	J
Cadmium, total	10	U	10	U	10	U	10	U
Chromium, total	50	U	50	U	50	U	50	U
Copper, total	50	U	50	U	50	U	50	U
Iron, total	100	U	12,000		560		340	
Lead, total	50	U	50	U	50	U	50	U
Manganese, total	15	U	6,200		25		20	
Mercury, total	2.0	U	2.0	U	2.0	U	2.0	U
Selenium, total	10	U	10	U	10	U	10	U
Silver, total	40	U	40	U	40	U	40	U
Zinc, total	20	U	21		12	J	13	J
Units		(ug/l)		(ug/l)		(ug/l)		(ug/l)

IV. Analytical Results (Cont'd)

General Chemistry

<u>Parameter</u>	<u>Sample Designation</u>	
	<u>Method</u> <u>Blank</u>	<u>A60320-1</u> <u>Well 1</u>
Total Dissolved Solids	10,000 U	120,000
Nitrate-N	5.0 U	5.0 U
Sulfate	--	3,000
Chloride	--	15,000
Total Organic Halide	5.0 U	120
Fluoride	100 U	100 U
Chemical Oxygen Demand	--	68,000
Biochemical Oxygen Demand, 5-day	1,000 U	33,000
Total Organic Carbon, nonpurgeable	--	16,000
Units	(ug/l)	(ug/l)

<u>Parameter</u>	<u>Sample Designation</u>	
	<u>A60320-2</u> <u>Well 2</u>	<u>A60320-3</u> <u>Well 3</u>
Total Dissolved Solids	29,000; 37,000 *	10,000 U
Nitrate-N	5.0 U	5.0 U
Sulfate	3,000	2,600
Chloride	1,000 U	8,100
Total Organic Halide	5.0 U	5.0 U
Fluoride	100 U	100 U
Chemical Oxygen Demand	10,000 U	14,000
Biochemical Oxygen Demand, 5-day	3,000	3,000
Total Organic Carbon, nonpurgeable	1,000 U	1,100
Units	(ug/l)	(ug/l)

* Duplicate Analysis

Test Report No. A60320

Page 6

V. Quality Control DataMetalsAqueous Matrix Spike/Matrix Spike Duplicate Recovery Data

<u>Parameter</u>	<u>Sample Spiked</u>	<u>Amount of Spike</u>	<u>Recovery</u>	
			<u>MS</u>	<u>MSD</u>
Arsenic	A22078-3	100	83	96
Barium	A22081-5	300	81	75
Cadmium	A22081-5	300	86	74
Chromium	A22081-5	300	79	71
Chromium	DI Water	300	88	--
Copper	A22081-5	300	78	72
Copper	DI Water	300	91	--
Iron	A22082-1	300	86	88
Lead	A22081-5	300	78	72
Manganese	A22082-1	300	87	87
Mercury	A22078-3	20	86	96
Selenium	A22078-3	100	114	104
Silver	A22081-5	300	9	7
Silver	DI Water	300	11	--
Zinc	A22081-5	300	77	70
Units		(ug)	(%)	(%)

Test Report No. A60320

Page 7

V. Quality Control Data (Cont'd)General ChemistryAqueous Matrix Spike/Matrix Spike Duplicate Recovery Data

<u>Parameter</u>	<u>Sample Spiked</u>	<u>Amount of Spike</u>	<u>Recovery</u>	
			<u>MS</u>	<u>MSD</u>
Nitrate-N	A22130-2	50	85	27
Sulfate	A60320-3	800	87	90
Chloride	A60320-2	50	94	98
Fluoride	A60320-1	25	108	110
Chemical Oxygen Demand	A40083-1	126	120	109
Biochemical Oxygen Demand	DI Water	200	89	72
Total Organic Carbon	A60302-2	50	125	103
Total Organic Halogen	A60320-2	10	69	70
Units		(ug)	(%)	(%)

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Chain-of-Custody

454 South Anderson Road BTC 532
 Rock Hill, South Carolina 29730
 (803) 329-9690
 Fax: (803) 329-9689

ENGINEERING TECHNICS, P.A.

Project: ALLEGHENY LANDFILL

AnalytiKEM Contact: R. C. CANTOR

AMPLE DESIGNATION	DATE	MATRIX	40 ml vials	950 ml Org. Pres.	950 ml Unpres.	500 ml HNO ₃	500 ml H ₂ SO ₄	ml NaOH	ml HCL	500 ml H ₂ O / Ferric	PARAMETERS
ELL 1	6-12-90	AQUEOUS			3	1	1			1	As, Ba, Cd, Cr, Cu, Fe, Pb, Mn Hg, Se, Ag, Zn, CHLORIDE, FLUORIDE NITRATE, SULFATE TOC, TOX, BOD, COD TOTAL DISSOLVED SOLIDS
ELL 2	6-12-90	AQUEOUS			3	1	1			1	
ELL 3	6-12-90	AQUEOUS			3	1	1			1	

I. Measurements: _____

II. Field Conditions/Comments: _____

III. Special Instructions: ANALYZE EACH SAMPLE FOR ALL PARAMETERS
 (Detection Limits, Data Package, etc.)

Relinquished By:	Time/Date:	Received By:	Time/Date:
<i>James M. Brown</i>	6:30 PM / 6-12-90	<i>[Signature]</i>	6:30 6-12-90