

SAWBU

Con 12-1-1
Doc # 65173



May 16, 2011

Mr. Matthew Phoenix, P.E.
IDNR – Land Quality Bureau
Wallace State Office Building
502 East 9th Street
Des Moines, Iowa 50319-0034

**RE: Marshall County Sanitary Landfill – Area A
Spring 2011 Groundwater Quality Sampling Results**

64-SDP-6-92C

Mr. Phoenix:

Attached find one (1) copy of the Spring 2011 Groundwater Quality Sampling Results and Field Data Forms (IDNR Form 542-1322) for the CLOSED Marshall County Landfill Area A.

Sincerely,
HLW ENGINEERING GROUP

A handwritten signature in black ink, appearing to read 'Todd Whipple', is written over a horizontal line.

Todd Whipple, CPG
Project Manager

cc: Joe Robertson, Manager

17171 10/17/11 PM 1:30

**MARSHALL COUNTY SANITARY LANDFILL
PERMIT # 64-SDP-6-92C**

4/4/2011

Sampled by: T. Whipple

Weather conditions: Overcast, windy, 45 degrees

IDNR Form 542-1322

MW-201 (up)

TOC	1002.67	2" dia.	Date	Time	Depth	Elevation	Gallons	# of Vol.	Purged Dry?
Well Depth	27.47	Before purging	4/4/2011	14:03	7.40	995.27	10	3.1	no
Capped	YES	After purging	4/4/2011	14:16	19.80	982.87			
Standing Water	NO	Top of Screen July 1991				985.17			
Litter	NO	4/4/2011				-2.30	feet above (+) or below (-) top screen		
Level Tape	Solinst	Bottom of Well July 1991				975.17			
Equipment	Disposable Bailer	Bottom of Well	4/4/2011		27.10	975.57			
		4/4/2011				0.40	feet sedimentation		
		Recovery	4/4/2011			1002.67			
		Recovery	4/4/2011	N/A		1002.67			
		Recovery	4/4/2011	N/A		1002.67			
		Recovery	4/4/2011	N/A		1002.67			
		Before Sampling	4/4/2011	14:16	19.80	982.87	pH	Conductivity	Temp.(C)
							7.8	699	10

IDNR Form 542-1322

MW-205 (dg)

TOC	986.54	2" dia.	Date	Time	Depth	Elevation	Gallons	# of Vol.	Purged Dry?
Well Depth	27.69	Before purging	4/5/2011	8:10	13.90	972.64	7.5	3.3	no
Capped	YES	After purging	4/5/2011	8:18	25.80	960.74			
Standing Water	NO	Top of Screen August 1991				968.85			
Litter	NO	4/5/2011				-8.11	feet above (+) or below (-) top screen		
Level Tape	Solinst	Bottom of Well August 1991				958.85			
Equipment	Disposable Bailer	Bottom of Well	4/5/2011		27.20	959.34			
		4/5/2011				0.49	feet sedimentation		
		Recovery	4/5/2011			986.54			
		Recovery	4/5/2011	N/A		986.54			
		Recovery	4/5/2011	N/A		986.54			
		Recovery	4/5/2011	N/A		986.54			
		Before Sampling	4/5/2011	8:18	25.80	960.74	pH	Conductivity	Temp.(C)
							7.3	1460	11

IDNR Form 542-1322

MW-212 (dg)

TOC	955.38	2" dia.	Date	Time	Depth	Elevation	Gallons	# of Vol.	Purged Dry?
Well Depth	27.20	Before purging	4/4/2011	14:30	10.70	944.68	10	3.7	no
Capped	YES	After purging	4/4/2011	14:43		955.38			
Standing Water	NO	Top of Screen August 1991				938.20			
Litter	NO	4/4/2011				17.18	feet above (+) or below (-) top screen		
Level Tape	Solinst	Bottom of Well August 1991				928.20			
Equipment	Disposable Bailer	Bottom of Well	4/4/2011		27.10	928.28			
		4/4/2011				0.08	feet sedimentation		
		Recovery	4/4/2011			955.38			
		Recovery	4/4/2011	N/A		955.38			
		Recovery	4/4/2011	N/A		955.38			
		Recovery	4/4/2011	N/A		955.38			
		Before Sampling	4/4/2011	14:43		955.38	pH	Conductivity	Temp.(C)
							7.6	938	10

IDNR Form 542-1322

MW-213 (dg)

TOC	950.9	2" dia.	Date	Time	Depth	Elevation	Gallons	# of Vol.	Purged Dry?
Well Depth	35.00	Before purging	4/5/2011	7:45	28.50	922.40	5	4.7	no
Capped	YES	After purging	4/5/2011	7:52	34.40	916.50			
Standing Water	NO	Top of Screen March 1993				930.90			
Litter	NO		4/5/2011			-14.40	feet above (+) or below (-) top screen		
Level Tape	Solinst	Bottom of Well March 1993				915.90			
Equipment	Disposable Bailer	Bottom of Well	4/5/2011		35.10	915.80			
			4/5/2011			-0.10	feet sedimentation		
		Recovery	4/5/2011			950.90			
		Recovery	4/5/2011	N/A		950.90			
		Recovery	4/5/2011	N/A		950.90			
		Recovery	4/5/2011	N/A		950.90	pH	Conductivity	Temp.(C)
		Before Sampling	4/5/2011	7:52	34.40	916.50	7.6	1260	11

IDNR Form 542-1322

MW-214 (dg)

TOC	956.4	2" dia.	Date	Time	Depth	Elevation	Gallons	# of Vol.	Purged Dry?
Well Depth	21.40	Before purging	4/5/2011	8:30	9.30	947.10	6	3.0	no
Capped	YES	After purging	4/5/2011	8:38	17.60	938.80			
Standing Water	NO	Top of Screen October 1995				945.00			
Litter	NO		4/5/2011			-6.20	feet above (+) or below (-) top screen		
Level Tape	Solinst	Bottom of Well October 1995				935.00			
Equipment	Disposable Bailer	Bottom of Well	4/5/2011		20.90	935.50			
			4/5/2011			0.50	feet sedimentation		
		Recovery	4/5/2011			956.40			
		Recovery	4/5/2011	N/A		956.40			
		Recovery	4/5/2011	N/A		956.40			
		Recovery	4/5/2011	N/A		956.40	pH	Conductivity	Temp.(C)
		Before Sampling	4/5/2011	8:38	17.60	938.80	7.7	706	9

MARSHALL COUNTY SANITARY LANDFILL

PERMIT # 64-SDP-6-92C

4/4/2011

Sampled by: T. Whipple

Weather conditions: Overcast, windy, 45 degrees

IDNR Form 542-1324

SW-1

Date	Time	Type	Flowing	Quantity	Discolored	Odor	Litter
4/4/2011	15:00	tile outlet	slight	250 ml per 3 sec = 1.3 gpm	No	No	No

pH	Conductivity	Temp.(C)	Turbidity (NTU)
7.7	762	6	NT

ANALYTICAL REPORT

April 26, 2011

Page 1 of 7

Work Order: 11D0324

Report To

Todd Whipple
HLW Engineering
PO Box 314
Story City, IA 50248

Work Order Information

Date Received: 04/06/2011 11:00AM
Collector: TDW
Phone: (515) 733-4144
PO Number: April Sampling

Project : Marshall Sanitary Landfill - Spring

Project Number: 6003

Analyte	Result	MRL	Batch	Method	Analyst	Analyzed	Qualifier
11D0324-01 MW-201				Matrix:Water		Collected: 04/04/11 14:16	
Chloride	<10 mg/l	10	1D11917	USGS I-1184-85	LJG	04/19/11 8:52	
Chemical Oxygen Demand	<10 mg/l	10	1D10805	EPA 410.4	SAI	04/08/11 17:41	
Nitrogen, Ammonia	<1.0 mg/l	1.0	1D11508	SM 4500-NH3 F	SAI	04/15/11 16:19	
Iron, dissolved	<0.100 mg/l	0.100	1D10825	EPA 6010B	SAA	04/25/11 12:56	
11D0324-02 MW-213				Matrix:Water		Collected: 04/05/11 07:52	
Chloride	15 mg/l	10	1D11917	USGS I-1184-85	LJG	04/19/11 8:52	
Chemical Oxygen Demand	<10 mg/l	10	1D10805	EPA 410.4	SAI	04/08/11 17:41	
Nitrogen, Ammonia	<1.0 mg/l	1.0	1D11508	SM 4500-NH3 F	SAI	04/15/11 16:19	
Iron, dissolved	<0.100 mg/l	0.100	1D10825	EPA 6010B	SAA	04/25/11 13:04	
11D0324-03 MW-214				Matrix:Water		Collected: 04/05/11 08:38	
Benzene	<1.0 ug/l	1.0	1D10830	EPA 8260B	TVK	04/08/11 15:21	
Trichloroethylene	<1.0 ug/l	1.0	1D10830	EPA 8260B	TVK	04/08/11 15:21	
Surrogate: Dibromofluoromethane	103 %			73-138	TVK	04/08/11 15:21	
Surrogate: 1,2-Dichloroethane-d4	106 %			70-128	TVK	04/08/11 15:21	
Surrogate: Toluene-d8	97.4 %			87-114	TVK	04/08/11 15:21	
Surrogate: 4-Bromofluorobenzene	91.8 %			83-117	TVK	04/08/11 15:21	
Chloride	<10 mg/l	10	1D11917	USGS I-1184-85	LJG	04/19/11 8:52	
Chemical Oxygen Demand	<10 mg/l	10	1D10805	EPA 410.4	SAI	04/08/11 17:41	
Nitrogen, Ammonia	<1.0 mg/l	1.0	1D11508	SM 4500-NH3 F	SAI	04/15/11 16:19	
Iron, dissolved	<0.100 mg/l	0.100	1D10825	EPA 6010B	SAA	04/25/11 13:07	
11D0324-04 MW-212				Matrix:Water		Collected: 04/04/11 14:45	
Chloride	12 mg/l	10	1D11917	USGS I-1184-85	LJG	04/19/11 8:52	
Chemical Oxygen Demand	<10 mg/l	10	1D10805	EPA 410.4	SAI	04/08/11 17:41	
Nitrogen, Ammonia	<1.0 mg/l	1.0	1D11508	SM 4500-NH3 F	SAI	04/15/11 16:19	
Iron, dissolved	<0.100 mg/l	0.100	1D10825	EPA 6010B	SAA	04/25/11 13:11	

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HLW Engineering
PO Box 314
Story City, IA 50248

April 26, 2011

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Work Order: 11D0324

Analyte	Result	MRL	Batch	Method	Analyst	Analyzed	Qualifier
11D0324-05 MW-205				Matrix: Water		Collected: 04/05/11 08:18	
Benzene	5.8 ug/l	1.0	1D10830	EPA 8260B	TVK	04/08/11 16:02	
Trichloroethylene	7.1 ug/l	1.0	1D10830	EPA 8260B	TVK	04/08/11 16:02	
Surrogate: Dibromofluoromethane	106 %			73-138	TVK	04/08/11 16:02	
Surrogate: 1,2-Dichloroethane-d4	106 %			70-128	TVK	04/08/11 16:02	
Surrogate: Toluene-d8	95.0 %			87-114	TVK	04/08/11 16:02	
Surrogate: 4-Bromofluorobenzene	92.5 %			83-117	TVK	04/08/11 16:02	
Chloride	43 mg/l	10	1D11917	USGS I-1184-85	LJG	04/19/11 8:52	
Chemical Oxygen Demand	40 mg/l	10	1D10805	EPA 410.4	SAI	04/08/11 17:41	
Nitrogen, Ammonia	<1.0 mg/l	1.0	1D11508	SM 4500-NH3 F	SAI	04/15/11 16:19	
Iron, dissolved	16.8 mg/l	0.100	1D10825	EPA 6010B	SAA	04/25/11 13:14	
11D0324-06 SW-1				Matrix: Water		Collected: 04/04/11 15:00	
Chloride	29 mg/l	10	1D10712	USGS I-1184-85	LJG	04/07/11 8:39	
Chemical Oxygen Demand	<10 mg/l	10	1D10805	EPA 410.4	SAI	04/08/11 17:41	
Nitrogen, Ammonia	<1.0 mg/l	1.0	1D11508	SM 4500-NH3 F	SAI	04/15/11 16:19	
Iron, dissolved	<0.100 mg/l	0.100	1D10825	EPA 6010B	SAA	04/25/11 13:17	
11D0324-07 Duplicate				Matrix: Water		Collected: 04/04/11 14:45	
Chloride	10 mg/l	10	1D10712	USGS I-1184-85	LJG	04/07/11 8:39	
Chemical Oxygen Demand	<10 mg/l	10	1D10805	EPA 410.4	SAI	04/08/11 17:41	
Nitrogen, Ammonia	<1.0 mg/l	1.0	1D11508	SM 4500-NH3 F	SAI	04/15/11 16:19	
Iron, dissolved	<0.100 mg/l	0.100	1D10825	EPA 6010B	SAA	04/25/11 13:29	

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PO Box 314
Story City, IA 50248

April 26, 2011

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Work Order: 11D0324

Determination of Volatile Organic Compounds - Quality Control

Keystone Laboratories, Inc. - Newton

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1D10830 - EPA 5030B										
Blank (1D10830-BLK1)				Prepared & Analyzed: 04/08/11						
Surrogate: Dibromofluoromethane	53.6		ug/l	50.0000		107	73-138			
Surrogate: 1,2-Dichloroethane-d4	51.7		"	50.0000		103	70-128			
Surrogate: Toluene-d8	48.6		"	50.0000		97.3	87-114			
Surrogate: 4-Bromofluorobenzene	46.0		"	50.0000		92.0	83-117			
Benzene	ND	1.0	"							
Trichloroethylene	ND	1.0	"							
LCS (1D10830-BS1)				Prepared & Analyzed: 04/08/11						
Surrogate: Dibromofluoromethane	49.9		ug/l	50.0000		99.8	73-138			
Surrogate: 1,2-Dichloroethane-d4	49.8		"	50.0000		99.5	70-128			
Surrogate: Toluene-d8	50.6		"	50.0000		101	87-114			
Surrogate: 4-Bromofluorobenzene	50.6		"	50.0000		101	83-117			
Benzene	52.89	1.0	"	50.0000		106	73-135			
Trichloroethylene	52.23	1.0	"	50.0000		104	76-127			
Matrix Spike (1D10830-MS1)				Source: 11D0324-03	Prepared & Analyzed: 04/08/11					
Surrogate: Dibromofluoromethane	50.6		ug/l	50.0000		101	73-138			
Surrogate: 1,2-Dichloroethane-d4	48.7		"	50.0000		97.4	70-128			
Surrogate: Toluene-d8	48.7		"	50.0000		97.4	87-114			
Surrogate: 4-Bromofluorobenzene	50.9		"	50.0000		102	83-117			
Benzene	518.6	10.0	"	500.000	ND	104	69-138			
Trichloroethylene	507.0	10.0	"	500.000	ND	101	71-129			
Matrix Spike Dup (1D10830-MSD1)				Source: 11D0324-03	Prepared & Analyzed: 04/08/11					
Surrogate: Dibromofluoromethane	49.9		ug/l	50.0000		99.9	73-138			
Surrogate: 1,2-Dichloroethane-d4	50.4		"	50.0000		101	70-128			
Surrogate: Toluene-d8	49.9		"	50.0000		99.8	87-114			
Surrogate: 4-Bromofluorobenzene	53.2		"	50.0000		106	83-117			
Benzene	513.6	10.0	"	500.000	ND	103	69-138	0.969	17	
Trichloroethylene	492.3	10.0	"	500.000	ND	98.5	71-129	2.94	21	

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HLW Engineering
PO Box 314
Story City, IA 50248

April 26, 2011
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Work Order: 11D0324

Determination of Conventional Chemistry Parameters - Quality Control
Keystone Laboratories, Inc. - Newton

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1D10712 - Wet Chem Preparation										
Blank (1D10712-BLK1)				Prepared & Analyzed: 04/07/11						
Chloride	ND	10	mg/l							
Matrix Spike (1D10712-MS1)				Source: 11D0324-07 Prepared & Analyzed: 04/07/11						
Chloride	32.5	10	mg/l	20.0000	10.2	111	80-125			
Matrix Spike Dup (1D10712-MSD1)				Source: 11D0324-07 Prepared & Analyzed: 04/07/11						
Chloride	31.6	10	mg/l	20.0000	10.2	107	80-125	2.90	11	
Reference (1D10712-SRM1)				Prepared & Analyzed: 04/07/11						
Chloride	20.4	10	mg/l	20.0000		102	90-110			
Batch 1D10805 - Wet Chem Preparation										
Blank (1D10805-BLK1)				Prepared & Analyzed: 04/08/11						
Chemical Oxygen Demand	ND	10	mg/l							
LCS (1D10805-BS1)				Prepared & Analyzed: 04/08/11						
Chemical Oxygen Demand	69.9	10	mg/l	77.3250		90.5	87-115			
Matrix Spike (1D10805-MS1)				Source: 11D0324-01 Prepared & Analyzed: 04/08/11						
Chemical Oxygen Demand	137	40	mg/l	154.650	ND	88.9	60-140			
Matrix Spike Dup (1D10805-MSD1)				Source: 11D0324-01 Prepared & Analyzed: 04/08/11						
Chemical Oxygen Demand	161	40	mg/l	154.650	ND	104	60-140	15.8	26	
Batch 1D11508 - Wet Chem Preparation										
Blank (1D11508-BLK1)				Prepared & Analyzed: 04/15/11						
Nitrogen, Ammonia	ND	1.0	mg/l							

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April 26, 2011
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Work Order: 11D0324

Determination of Conventional Chemistry Parameters - Quality Control

Keystone Laboratories, Inc. - Newton

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1D11508 - Wet Chem Preparation										
Blank (1D11508-BLK2)				Prepared & Analyzed: 04/15/11						
Nitrogen, Ammonia	ND	1.0	mg/l							
Matrix Spike (1D11508-MS1)				Source: 11D0324-01 Prepared & Analyzed: 04/15/11						
Nitrogen, Ammonia	10.0	2.0	mg/l	10.0000	ND	100	86-140			
Matrix Spike (1D11508-MS2)				Source: 11D0714-04 Prepared & Analyzed: 04/15/11						
Nitrogen, Ammonia	22.4	1.0	mg/l	5.00000	17.2	104	86-140			
Matrix Spike Dup (1D11508-MSD1)				Source: 11D0324-01 Prepared & Analyzed: 04/15/11						
Nitrogen, Ammonia	9.66	2.0	mg/l	10.0000	ND	96.6	86-140	3.46	10	
Matrix Spike Dup (1D11508-MSD2)				Source: 11D0714-04 Prepared & Analyzed: 04/15/11						
Nitrogen, Ammonia	22.8	1.0	mg/l	5.00000	17.2	112	86-140	1.77	10	
Batch 1D11917 - Wet Chem Preparation										
Blank (1D11917-BLK1)				Prepared & Analyzed: 04/19/01						
Chloride	ND	10	mg/l							
Matrix Spike (1D11917-MS1)				Source: 11D0395-01 Prepared & Analyzed: 04/19/01						
Chloride	27.9	10	mg/l	20.0000	7.74	101	80-125			
Matrix Spike Dup (1D11917-MSD1)				Source: 11D0395-01 Prepared & Analyzed: 04/19/01						
Chloride	28.8	10	mg/l	20.0000	7.74	105	80-125	3.25	11	
Reference (1D11917-SRM1)				Prepared & Analyzed: 04/19/01						
Chloride	49.8	10	mg/l	50.0000		99.7	90-110			

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Story City, IA 50248

April 26, 2011
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Work Order: 11D0324

Determination of Dissolved Metals - Quality Control

Keystone Laboratories, Inc. - Newton

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1D10825 - Dissolved Metal Prep										
Blank (1D10825-BLK1)				Prepared: 04/13/11 Analyzed: 04/25/11						
Iron, dissolved	ND	0.100	mg/l							
LCS (1D10825-BS1)				Prepared: 04/13/11 Analyzed: 04/25/11						
Iron, dissolved	0.970	0.100	mg/l	1.01010		96.0	80-120			
Matrix Spike (1D10825-MS1)				Source: 11D0324-01		Prepared: 04/13/11 Analyzed: 04/25/11				
Iron, dissolved	0.968	0.100	mg/l	1.01010	ND	95.8	75-125			
Matrix Spike Dup (1D10825-MSD1)				Source: 11D0324-01		Prepared: 04/13/11 Analyzed: 04/25/11				
Iron, dissolved	0.971	0.100	mg/l	1.01010	ND	96.1	75-125	0.281	20	

ND = Non Detect; REC= Recovery; RPD= Relative Percent Difference

Certified Analyses included in this Report

Method/Matrix	Analyte	Certifications
EPA 410.4 in Water	Chemical Oxygen Demand	KS-NT,NELAC,SIA1X
	Iron, dissolved	SIA1X,NELAC
EPA 6010B in Water	Benzene	KS-NT,NELAC,SIA1X
	Trichloroethylene	KS-NT,NELAC,SIA1X
SM 4500-NH3 F in Water	Nitrogen, Ammonia	SIA1X
	Chloride	SIA1X

Code	Description	Number	Expires
KS-KC	Kansas Department of Health and Environment-KC	E-10110	04/30/2011
KS-NT	Kansas Department of Health and Environment	E-10287	10/30/2011
NELAC	New Jersey Department of Environmental Protection	IA001	06/30/2011
SIA1X	Iowa Department of Natural Resources	95	02/01/2012

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April 26, 2011

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Work Order: 11D0324

End of Report

Sue Thompson

Keystone Laboratories, Inc.

Sue Thompson
Project Manager I