WARZYN

February 21, 1992

Ms. Theresa Evanson
Wisconsin Department of Natural Resources
Environmental Response and Repair Section
Bureau of Solid and Hazardous Waste Management
101 South Webster Street, GEF II, SW/3
Madison, Wisconsin 53707

Re: Operation and Maintenance Summary - January 1992
Landfill Gas and Leachate Extraction System
Refuse Hideaway Landfill - Middleton, Wisconsin
Project No. 1529206

Dear Ms. Evanson:

Operation and Maintenance activities performed during this reporting period included the following:

Leachate/condensate hauled (by Al's Modern Sewer Service) to the Madison Metropolitan Sewerage District Treatment Plant as follows:

January 6, 1992	5,000 gallons
January 8, 1992	10,000 gallons
January 14, 1992	5,000 gallons
January 15, 1992	5,000 gallons
January 17, 1992	5,000 gallons
January 20, 1992	5,000 gallons
January 27, 1992	5,000 gallons
January Total:	40,000 gallons
Total to Date:	150,500 gallons

Monitoring of the Landfill Gas and Leachate Extraction System was performed on the following dates:

January 6, 1992
January 7, 1992
January 22, 1992
January 23, 1992
January 30, 1992

The 4 vacuum switches installed as part of the gas extraction system were operational by January 22, 1992.

THE PERFECT BALANCE
BETWEEN TECHNOLOGY
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MADISON
ONE SCIENCE COURT
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MADISON, WI 53705
(608) 231-4747
FAX (608) 273-2513

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Terra repaired a pipe support at the flare inlet piping which had failed due to a sheared bolt.

John Gwinn of Linklater Company visited the site twice during January. During one visit he made changes to the paper speed of the temperature recorder. A new gear was installed to slow the paper advancement to 1 in. per 2 hrs, which will result in paper replacement cost savings. On his second visit, John reprogrammed the Honeywell Control Unit to improve the flare's performance. The new settings will be included in February's Summary.

General maintenance of the system this month included replacement of alarm warning light bulbs (panel and exterior), and blower bearing lubrication.

The leachate/condensate tank was sampled January 22, 1992 for the following parameters:

- oil and grease
- cyanide
- CBOD
- TKN
- total suspended solids and pH
- hex. chromium
- metals - Al, Cd, Cr (tot.), Cu, Pb, Hg, Ni, Se, Zn, and Ag

In accordance with the MMSD discharge agreement, TCLP analysis was not required.

The enclosed tables provide a summary of data collected. Please call should you have questions or comments.

Sincerely,

WARZYN INC.

Dean R. Free
Project Engineer

Jan C. Kucher, P.E.
Project Manager

DRF/ms/JCK/DFK
[mad-102-261]
1529206/197

Enclosure: Gas Well Monitoring Table
Leachate Head Monitoring Table
Gas Probe Monitoring Table
System Alarm Log
Flare Monitoring Table

GAS WELL MONITORING TABLE

Date: 1/22/92

Temperature: 38°F @ 5:00 p.m.

Barometric Pressure: 29.57" Hg Falling

Monitored by: J. Faeth

Gas Detector Model No.: 1936
Serial No.: 905480
Date Last Calibrated: 1/22/92

Well[1]	Well Pressure (in. WC)	CH_4[2] (%)	0_2[3] (%)	Valve Setting (fraction Open)	Gas Velocity (fpm)	Gas Flow[4] (cfm)	Gas Flow Temperature (°F)
GW1	-1.2	10	0	4/13	500	22.5	45.8
GW2	-1.7	27.5	0	4/13	700	31.5	48.2
GW3	-3.5	47.5	0	5/9	1700	76.5	42.4
GW4	-4.8	57.5	0	5/9	900	40.5	66.3
GW5	-2.7	57.5	0	5/9	1000	45.0	40.6
W6	-2.6	35.0	0	3/9	1000	45.0	41.1
GW7	-8.0	57.5	0	4/9	1100	49.5	43.3
GW8(P)	-6.6	60.0	0	3.5/9	1400	63.0	101.8
GW9(P)	-5.0	57.5	0	3.5/9	1100	49.5	114.4
GW10	-2.8	45.0	0	5.5/9	2200	99.0	92.3
GW11(P)	-4.8	57.5	0	4.5/9	2500	112.5	110.3
GW12	-3.2	52.5	0	4.5/9	2000	90.0	103.6
GW13	-3.2	55.0	0	5/9	1200	54.0	85.8

Notes:

(1) Wells with leachate extraction pumps and controls installed are indicated with a "(P)".
(2) Percent combustibles by volume, primarily composed of CH_4 (methane).
(3) Oxygen detections under evaluation, may be due to monitoring equipment malfunction, climatic changes, and/or depletion of methane stores and excessive active gas extraction.
(4) Gas flow calculated by multiplying velocity by 0.045 sq. ft (inside cross sectional area of 3-in. dia. pipe).

DRF/ms/JCK
[mad-404-068]
1529206/197

LEACHATE HEAD MONITORING TABLE

	Leachate Head (ft)[4]							
	December 31, 1991				January 23, 1992			
Well	East Riser	West Riser	North Riser	South Riser	East Riser	West Riser	North Riser	South Riser
GW1	1.1	1.3			1.1	1.3		
GW2	3.1	3.1			3.1	3.1		
GW3	4.3	4.0			4.2	3.9		
GW4	(3)	(3)			(3)	(3)		
GW5	4.2	(3)			(3)	(3)		
GW6	<0.3	<0.3			(3)	(3)		
GW7	(3)	(3)			(3)	(3)		
GW8(P)	(3)	(3)			(3)	(3)		
GW9(P)			(3)	(3)			(3)	(3)
GW10			5.8	5.8			6.4	6.0
GW11(P)	7.1	(3)			8.1	(3)		
GW12	(3)	9.5			(3)	11.0		
GW13	(3)	(3)			(3)	(3)		

NOTES

(1) Wells with leachate extraction pumps and controls installed are indicated with a "(P)".
(2) Leachate extraction system started 8/15/91.
(3) Leachate head not measurable due to unidentified riser pipe blockage.
(4) Leachate head measured in 1-in. riser pipes at wells.
Riser pipes are identified as East, West, North or South to indicate location of riser pipe with respect to the well pipe.

DRF/ms/JCK
[mad-404-068a
1529206/197

GAS PROBE MONITORING TABLE

1/22/91 Barometric Pressure: 29.57 in. Hg (Falling) at 5:00 p.m.

Probe	Pressure (in. WC)	CH_4(1) (%)	CH_4(2) (% LEL)	0_2 (%)
G1-s	0	0	0	21
G1-d	0	0	0	21
G6	-0.1	0	0	21
G8	0	0	0	20.5
G9	-0.1	0	0	13
G10	+2.0	0	0	18
GP11-s	-0.1	0	0	20
GP11-d	-0.1	0	0	21
Speedway Buildings	--	0	0	21

1/23/91 Barometric Pressure: 29.37 in. Hg (Rising) at 2:00 p.m.

GPW1-s	0	0	0	19.5
GPW1-m	0	0	0	19
GPW1-d	0	0	0	19

Notes

(1) Percent combustibles by volume, primarily composed of methane (CH_4).
(2) Percent of the Lower Explosive Limit of methane which is 5% by volume.

DRF/ms/JFK
[mad-404-068b]
1529206/197

SYSTEM ALARM LOG

Alarm Dates	Alarm Cause	Solution
January 3, 4, 5, and 6, 1992	Short Power Failures	(1)

Notes:

(1) Gas extraction system restarted January 4 and January 7, 1992, respectively, as instructed in the O&M Manual.

DRF/ms/JCK
[mad-404-068c]
1529206/197

FLARE MONITORING TABLE

January 1992
Ground Flare Inlet Sample Port

Date	Pressure (in. WC)	Methane (%)	Oxygen (%)	Flow (cfm)	Flow[(1)] (scfm)	Manual Valve Setting (fraction open)	Gas Temperature (°F)
1/22/92	+3.2	50	0	380	387	1.5/5	65
1/30/92	+3.4	47.5	0	390	397	1.5/5	65

Notes:

(1) Flows have been converted to standard conditions using a measured gas temperature of 65°F for 1/22/92, an estimated temperature of 65°F for 1/30/92, standard temperature of 70°F (530°R) and standard pressure of 406.9 in. H_2O, respectively.

DRF/ms/JCK
[mad-404-068d]
1529206/197

WARZYN

COPY

March 11, 1992

Ms. Theresa Evanson
Wisconsin Department of Natural Resources
Environmental Response and Repair Section
Bureau of Solid and Hazardous Waste Management
101 South Webster Street, GEF II, SW/3
Madison, Wisconsin 53707

Re: Operation and Maintenance Summary - February 1992
Landfill Gas and Leachate Extraction System
Refuse Hideaway Landfill - Middleton, Wisconsin
Project No. 1529206

Dear Ms. Evanson:

Operation and Maintenance activities performed during this reporting period included the following:

Leachate/condensate hauled (by Al's Modern Sewer Service) to the Madison Metropolitan Sewerage District Treatment Plant as follows:

February 4, 1992	5,000 gallons
February 10, 1992	5,000 gallons
February 17, 1992	5,000 gallons
February 26, 1992	5,000 gallons
February Total:	20,000 gallons
Total to Date:	170,500 gallons

Monitoring of the Landfill Gas and Leachate Extraction System was performed on the following dates:

February 6, 1992
February 13, 1992
February 19, 1992
February 27, 1992

General maintenance of the system this month included replacement of one wellhead sample port, lubricant application to bolts on flare control panel(to prevent corrosion), and lubrication of blower bearings.

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MADISON
ONE SCIENCE COURT
P.O. BOX 5385
MADISON, WI 53705
(608) 231-4747
FAX (608) 273-2513

WARZYN

The enclosed tables provide a summary of data collected. Please call should you have questions or comments.

Sincerely,

WARZYN INC.

Dean R. Free
Project Engineer

Jan C. Kucher, P.E.
Project Manager

DRF/ms/JCK/DFK
[mad-103-187]
1529206/197

Enclosure: Gas Well Monitoring Table
Leachate Head Monitoring Table
Gas Probe Monitoring Table
System Alarm Log
Flare Monitoring Table

GAS WELL MONITORING TABLE

Date: 2/27/92

Temperature: 42°F @ 11:00 p.m.

Barometric Pressure: 29.83" Hg Rising

Monitored by: J. Faeth

Gas Detector Model No.: 1939, #6
Serial No.: 905480
Date Last Calibrated: 2/26/92

Well[1]	Well Pressure (in. WC)	CH_4[2] (%)	0_2 (%)	Valve Setting (fraction Open)	Gas Velocity (fpm)	Gas Flow[3] (cfm)	Gas Temperature (°F)
GW1	-1.3	27.5	0	2/13	250	11.2	57.0
GW2	-1.6	10.0	0	2/13	1500	67.5	55.0
GW3	-4.8	42.5	0	5/9	1900	85.5	62.9
GW4	-6.9	57.5	0	5/9	2100	94.5	68.5
GW5	-5.0	57.5	0	5/9	2000	90.0	77.9
GW6	-2.4	35.0	0	3/9	1000	45.0	66.3
GW7	-8.8	55.0	0	4/9	1600	72.0	93.5
GW8(P)	-5.6	55.0	0	3.5/9	1000	45.0	103.6
GW9(P)	-5.5	55.0	0	3.5/9	2400	108.0	100.4
GW10	-4.0	40.0	0	5.5/9	1000	45.0	93.3
GW11(P)	-6.0	57.5	0	4.5/9	2000	90.0	107.6
GW12	-4.4	50.0	0	4.5/9	2100	94.5	103.8
GW13	-4.6	52.5	0	5/9	2000	90.0	85.8

Notes:

(1) Wells with leachate extraction pumps and controls installed are indicated with a "(P)".
(2) Percent combustibles by volume, primarily composed of CH_4 (methane).
(3) Gas flow calculated by multiplying velocity by 0.045 sq. ft (inside cross sectional area of 3-in. dia. pipe).

DRF/ms/JCK/DFK
[mad-404-038]
1529206/197

LEACHATE HEAD MONITORING TABLE

	Leachate Head (ft)[4]							
	January 23, 1992				February 27, 1992			
Well	East Riser	West Riser	North Riser	South Riser	East Riser	West Riser	North Riser	South Riser
GW1	1.1	1.3			1.2	1.3		
GW2	3.1	3.1			3.2	3.1		
GW3	4.2	3.9			4.2	3.9		
GW4	(3)	(3)			(3)	(3)		
GW5	(3)	(3)			(3)	(3)		
GW6	(3)	(3)			(3)	(3)		
GW7	(3)	(3)			(3)	(3)		
GW8(P)	(3)	(3)			(3)	(3)		
GW9(P)			(3)	(3)			(3)	(3)
GW10			6.4	6.0			6.1	5.9
GW11(P)	8.1	(3)			6.7	(3)		
GW12	(3)	11.0			(3)	(3)		
GW13	(3)	(3)			(3)	(3)		

NOTES

(1) Wells with leachate extraction pumps and controls installed are indicated with a "(P)".
(2) Leachate extraction system started 8/15/91.
(3) Leachate head not measurable due to unidentified riser pipe blockage.
(4) Leachate head measured in 1-in. riser pipes at wells.
Riser pipes are identified as East, West, North or South to indicate location of riser pipe with respect to the well pipe.

DRF/ms/JCK/DFK
[mad-404-038a]
1529206/197

GAS PROBE MONITORING TABLE

2/27/92 Barometric Pressure: 29.83 in. Hg (Rising) at 11:00 a.m.

Probe	Pressure (in. WC)	CH_4(1) (%)	CH_4(2) (% LEL)	0_2 (%)
G1-s	-0.1	0	0	21
G1-d	-0.1	0	0	21
G6	-0.1	0	0	21
G8	0	0	0	20.5
G9	-0.1	0	0	21
G10	-0.6	0	0	17.5
GP11-s	-0.1	0	0	20
GP11-d	-0.2	0	0	21
Speedway Buildings	--	0	0	21
GPW1-s	-0.1	0	0	19.5
GPW1-m	0	0	0	19.5
GPW1-d	0	0	0	19.5

Notes

(1) Percent combustibles by volume, primarily composed of methane (CH_4).
(2) Percent of the Lower Explosive Limit of methane which is 5% by volume.

DRF/ms/JCK/DFK
[mad-404-038b]
1529206/197

SYSTEM ALARM LOG
February 1992

Alarm Dates	Alarm Cause	Solution

[The Refuse Hideaway Gas and Leachate Extraction System remained in operation 100% of the time during the month of February, 1992 (no alarms were transmitted).]

DRF/ms/JCK/DFK
[mad-404-038c]
1529206/197

FLARE MONITORING TABLE

February 1992
Ground Flare Inlet Sample Port

Date	Pressure (in. WC)	Methane (%)	Oxygen (%)	Flow (cfm)	Flow[(1)] (scfm)	Manual Valve Setting (fraction open)	Gas Temperature (°F)
2/6/92	+3.5	47.5	0	400	412	1.5/5	59.0
2/13/92	+4.8	45.0	0	470	486	1.5/5	59.0
2/19/92	+3.0	50.0	0	370	380	1.5/5	60.4
2/27/92	+3.3	47.5	0	390	400	1.5/5	61.3

Notes:

(1) Flows have been converted to standard conditions using a standard temperature of 70°F (530°R), and standard pressure of 406.9 in. H_2O.

DRF/ms/JCK/DFK
[mad-404-038d]
1529206/197

WARZYN

April 15, 1992

Ms. Theresa Evanson
Wisconsin Department of Natural Resources
Environmental Response and Repair Section
Bureau of Solid and Hazardous Waste Management
101 South Webster Street, GEF II, SW/3
Madison, Wisconsin 53707

Re: Operation and Maintenance Summary - March 1992
Landfill Gas and Leachate Extraction System
Refuse Hideaway Landfill - Middleton, Wisconsin
Project No. 1529206

Dear Ms. Evanson:

Operation and Maintenance activities performed during this reporting period included the following:

Leachate/condensate hauled (by Al's Modern Sewer Service) to the Madison Metropolitan Sewerage District Treatment Plant as follows:

March 10, 1992	10,000 gallons
March 11, 1992	5,000 gallons
March 12, 1992	5,000 gallons
March 13, 1992	5,000 gallons
March 31, 1992	10,000 gallons
March Total:	35,000 gallons
Total to Date:	205,500 gallons

Monitoring of the Landfill Gas and Leachate Extraction System was performed on the following dates:

March 5, 1992
March 12, 1992
March 19, 1992
March 31, 1992

General maintenance of the system this month included replacement of a sheared bolt of a pipe support at flare inlet piping, and lubricant application to padlocks and to bolts on the flare control panel(to prevent corrosion).

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MADISON
ONE SCIENCE COURT
P.O. BOX 5385
MADISON, WI 53705
(608) 231-4747
FAX (608) 273-2513

WARZYN

The enclosed tables provide a summary of data collected. Please call should you have questions or comments.

Sincerely,

WARZYN INC.

Jan C. Kucher, P.E.
Project Manager

Dean R. Free
Project Engineer

DRF/ms/JCK/DFK
[mad-104-250]
1529206/197

Enclosure: Gas Well Monitoring Table
Leachate Head Monitoring Table
Gas Probe Monitoring Table
System Alarm Log
Flare Monitoring Table

GAS WELL MONITORING TABLE

Date: 3/31/92

Temperature: 41°F @ 5:00 p.m.

Barometric Pressure: 29.86" Rising

Monitored by: J. Faeth

Gas Detector Model No.: 1939, #6
Serial No.: 905480
Date Last Calibrated: 3/30/92

Well[1]	Well Pressure (in. WC)	CH_4[2] (%)	0_2 (%)	Valve Setting (fraction Open)	Gas Velocity (fpm)	Gas Flow[3] (cfm)	Gas Temperature (°F)
GW1	-0.9	25.0	0	2/13	100	4.5	48.5
GW2	-1.2	22.0	0	2/13	200	9.0	51.9
GW3	-4.1	45.0	0	5/9	1500	67.5	62.9
GW4	-6.0	60.0	0	5/9	1000	45.0	66.0
GW5	-4.0	57.5	0	5/9	900	40.5	77.5
GW5	-2.2	35.0	0	3/9	900	40.5	65.3
GW7	-9.1	55.0	0	4/9	950	42.8	89.7
GW8(1)	-5.9	57.5	0	3.5/9	950	42.8	100.1
GW9(1)	-6.2	57.5	0	3.5/9	850	38.3	114.4
GW10	-4.2	40.0	0	3.5/9	1100	49.5	91.4
GW11(1)	-6.4	58.0	0	4.5/9	500	22.5	100.0
GW12	-4.7	50.0	0	4.5/9	1050	47.3	102.3
GW13	-5.0	52.5	0	5/9	900	40.5	77.7

Notes:

(1) Wells with leachate extraction pumps and controls.
(2) Percent combustibles by volume, primarily composed of CH_4 (methane).
(3) Gas velocity (fpm) is converted to gas flow (cfm) by multiplying by .045 sq ft for 3" diameter PVC pipe.

DRF/ms/JCK/DFK
[mad-405-287]
1529206/197

LEACHATE HEAD MONITORING TABLE

Leachate Head (ft)[4]

Well	February 27, 1992 East Riser	West Riser	North Riser	South Riser	March 31, 1992 East Riser	West Riser	North Riser	South Riser
GW1	1.2	1.3			1.5	1.3		
GW2	3.2	3.1			3.1	3.1		
GW3	4.2	3.9			4.1	3.9		
GW4	(3)	(3)			(3)	(3)		
GW5	(3)	(3)			(3)	(3)		
GW6	(3)	(3)			(3)	(3)		
GW7	(3)	(3)			(3)	(3)		
GW8(P)	(3)	(3)			(3)	(3)		
GW9(P)			(3)	(3)			(3)	(3)
GW10			6.1	5.9			6.3	5.9
GW11(P)	6.7	(3)			6.7	(3)		
GW12	(3)	(3)			(3)	(3)		
GW13	(3)	(3)			(3)	(3)		

NOTES

(1) Wells with leachate extraction pumps and controls installed are indicated with a "(P)".
(2) Leachate extraction system started 8/15/91.
(3) Leachate head not measurable due to unidentified riser pipe blockage.
(4) Leachate head measured in 1-in. riser pipes at wells.
Riser pipes are identified as East, West, North or South to indicate location of riser pipe with respect to the well pipe.

DRF/ms/JCK/DFK
[mad-405-287a]
1529206/197

GAS PROBE MONITORING TABLE

March 1992

3/31/92 Barometric Pressure: 29.86 in. Hg (Rising) at 5:00 p.m.

Probe	Pressure (in. WC)	CH_4 (1) (%)	CH_4 (2) (% LEL)	0_2 (%)
G1-s	-0.1	0	0	21
G1-d	-0.1	0	0	21
G6	-0.1	0	0	21
G8	0	0	0	20
G9	0	0	0	20
G10	+0.8	0	0	20.5
GP11-s	-0.2	0	0	20.5
GP11-d	-0.2	0	0	21
Speedway Buildings	--	0	0	21
GPW1-s	-0.1	0	0	20
GPW1-m	-0.1	0	0	18
GPW1-d	-0.2	0	0	20

Notes

(1) Percent combustibles by volume, primarily composed of methane (CH_4).
(2) Percent of the Lower Explosive Limit of methane which is 5% by volume.

DRF/ms/JCK/DFK
[mad-405-287b]
1529206/197

SYSTEM ALARM LOG

March 1992

Alarm Dates	Alarm Cause	Solution
3/11/92	Power Failure	System Restarted

DRF/ms/JCK/DFK
[mad-405-287c]
1529206/197

FLARE MONITORING TABLE

Ground Flare Inlet Sample Port
March 1992

Date	Pressure (in. WC)	Methane (%)	Oxygen (%)	Flow (cfm)	Flow[(1)] (scfm)	Manual Valve Setting (fraction open)	Gas Temperature (°F)
3/5/92	+3.4	47.5	0	395	401	1.5/5	66.0
3/19/92	+3.2	47.5	0	380	385	1.5/5	66.9
3/31/92	+3.5	47.5	0	400	404	1.5/5	68.7

Notes:

(1) Flows have been converted to standard conditions using a standard temperature of 70°F (530°R), and standard pressure of 406.9 in. H_2O.

DRF/ms/JCK/DFK
[mad-405-287d]
1529206/197

WARZYN

May 21, 1992

Ms. Theresa Evanson
Wisconsin Department of Natural Resources
Environmental Response and Repair Section
Bureau of Solid and Hazardous Waste Management
101 South Webster Street, GEF II, SW/3
Madison, Wisconsin 53707

Re: Operation and Maintenance Summary - April 1992
Landfill Gas and Leachate Extraction System
Refuse Hideaway Landfill - Middleton, Wisconsin
Project No. 1529206

Dear Ms. Evanson:

Operation and Maintenance activities performed during this reporting period included the following:

Leachate/condensate was hauled (by Al's Modern Sewer Service) to the Madison Metropolitan Sewerage District Treatment Plant as follows:

April 20, 1992	15,000 gallons
April 21, 1992	5,000 gallons
April 23, 1992	10,000 gallons
April 25, 1992	5,000 gallons
April Total:	35,000 gallons
Total to Date:	240,500 gallons

Monitoring of the Landfill Gas and Leachate Extraction System was performed on the following dates:

April 5, 1992
April 20, 1992
April 30, 1992
May 1, 1992

Gas well monitoring results for methane and oxygen were lower than typically measured. This is likely due to instrument error.

THE PERFECT BALANCE
BETWEEN TECHNOLOGY
AND CREATIVITY.

MADISON
ONE SCIENCE COURT
P.O. BOX 5385
MADISON, WI 53705
(608) 231-4747
FAX (608) 273-2513

WARZYN

On April 30, Staff Electric installed a coil at each well pump control panel (GW8, GW9, and GW11). The coils were provided by Coyote Manufacturing to allow for correct operation of the elapsed hour meters at each panel. The hour meters now operate only when the pumps operate.

The kaye ADAS dialog was provided during system construction and has not been utilized. Please provide direction regarding storage (currently stored in our office).

The leachate storage tank was sampled April 20 for parameters required by MMSD for the second quarter of 1992 (Part I Section 1 - metals).

The enclosed tables provide a summary of data collected. Please call should you have questions or comments.

Sincerely,

WARZYN INC.

Jan C. Kucher, P.E.
Project Manager

Dean R. Free
Project Engineer

DRF/cah/JCK/DFK
[mad-105-222]
1529206/197

Enclosure: Gas Well Monitoring Table
Leachate Head Monitoring Table
Gas Probe Monitoring Table
System Alarm Log
Flare Monitoring Table

GAS WELL MONITORING TABLE

Date: 5/1/92

Temperature: 74°F

Barometric Pressure: 29.63" Hg Falling

Monitored by: D. Free

Gas Detector Model No.: 1939
Unit No.: 2
Date Last Calibrated: 4/31/92

Well[1]	Well Pressure (in. WC)	CH_4[2] (%)	0_2 (%)	Valve Setting (fraction Open)	Gas Velocity (fpm)	Gas Flow[3] (cfm)	Gas Temperature (°F)
GW1	-7.0	21.0	0	2/13	<300	<13.5	70.3
GW2	-6.6	18.0	0	2/13	<300	<13.5	70.5
GW3	-5.9	35.0	3	5/9	1600	72.0	65.6
GW4	-6.2	38.0	4	5/9	800	36.0	71.4
GW5	-6.0	40.0	3	5/9	750	34.0	81.3
GW6	-10.0	34.0	0	3/9	350	16.0	71.7
GW7	-12.0	34.0	4	4/9	510	23.0	75.4
GW8(1)	-13.0	34.0	4	3.5/9	710	32.0	107.9
GW9(1)	-10.0	34.0	5	3.5/9	660	30.0	108.9
GW10	-6.7	28.0	3	3.5/9	1050	47.0	95.4
GW11(1)	-6.1	35.0	5	4.5/9	500	23.0	113.4
GW12	-5.8	35.0	4	4.5/9	1200	54.0	103.4
GW13	-5.9	35.0	4	5/9	950	43.0	88.8

Notes:

(1) Wells with leachate extraction pumps and controls.
(2) Percent combustibles by volume, primarily composed of CH_4 (methane).
(3) Gas velocity (fpm) is converted to gas flow (cfm) by multiplying by .045 sq ft for 3" diameter PVC pipe.

DRF/cah/JCK
[mad-405-234]
1529206/197

LEACHATE HEAD MONITORING TABLE

Leachate Head (ft)[4]

Well	March 31, 1992 East Riser	March 31, 1992 West Riser	March 31, 1992 North Riser	March 31, 1992 South Riser	May 1, 1992 East Riser	May 1, 1992 West Riser	May 1, 1992 North Riser	May 1, 1992 South Riser
GW1	1.5	1.3			1.7	1.9		
GW2	3.1	3.1			2.9	3.0		
GW3	4.1	3.9			4.8	NA		
GW4	(3)	(3)			(3)	(3)		
GW5	(3)	(3)			(3)	(3)		
GW6	(3)	(3)			(3)	(3)		
GW7	(3)	(3)			(3)	(3)		
GW8(P)	(3)	(3)			(3)	(3)		
GW9(P)			(3)	(3)			(3)	(3)
GW10			6.3	5.9			6.6	(3)
GW11(P)	6.7	(3)			5.8	(3)		
GW12	(3)	(3)			(3)	(3)		
GW13	(3)	(3)			(3)	(3)		

NOTES

(1) Wells with leachate extraction pumps and controls installed are indicated with a "(P)".
(2) Leachate extraction system started 8/15/91.
(3) Leachate head not measurable due to unidentified riser pipe blockage.
(4) Leachate head measured in 1-in. riser pipes at wells.
Riser pipes are identified as East, West, North or South to indicate location of riser pipe with respect to the well pipe.

DRF/ms/JCK
[mad-405-234a]
1529206/197

GAS PROBE MONITORING TABLE

April 1992

4/30/92 Barometric Pressure: 29.90 in. Hg (Falling) at 3:00 p.m.

Probe	Pressure (in. WC)	CH_4(1) (%)	CH_4(2) (% LEL)	0_2 (%)
G1-s	-0.1	0	0	20
G1-d	0	0	0	21
G6	-0.2	0	0	21
G8	0	0	0	20.5
G9	-0.05	0	0	21
G10	+0.3	0	0	21
GP11-s	-0.1	0	0	19
GP11-d	-0.1	0	0	18
Speedway Buildings	--	0	0	21
GPW1-s	-0.2	0	0	20
GPW1-m	+0.3	0	0	21
GPW1-d	+0.4	0	0	19.5

Notes

(1) Percent combustibles by volume, primarily composed of methane (CH_4).
(2) Percent of the Lower Explosive Limit of methane which is 5% by volume.

DRF/ms/JCK
[mad-405-234b]
1529206/197

SYSTEM ALARM LOG

April 1992

Alarm Dates	Alarm Cause	Solution
4/5/92	Power Failure	System Restarted
4/19/92	High level in Leachate Tank	Tank pumped

DRF/ms/JCK
[mad-405-234c]
1529206/197

FLARE MONITORING TABLE

Ground Flare Inlet Sample Port
April 1992

Date	Pressure (in. WC)	Methane (%)	Oxygen (%)	Flow (cfm)	Flow[(1)] (scfm)	Manual Valve Setting (fraction open)	Gas Temperature (°F)
4/20/92	+3.1	47	0	375	374	1.5/5	76.0
4/30/92	+3.2	43	0	380	373	1.5/5	84.5

Notes:

(1) Flows have been converted to standard conditions using a standard temperature of 70°F (530°R), and standard pressure of 406.9 in. H_2O.

DRF/ms/JCK
[mad-405-234d]
1529206/197

WARZYN

June 16, 1992

Ms. Theresa Evanson
Wisconsin Department of Natural Resources
Environmental Response and Repair Section
Bureau of Solid and Hazardous Waste Management
101 South Webster Street, GEF II, SW/3
Madison, Wisconsin 53707

Re: Operation and Maintenance Summary - May 1992
Landfill Gas and Leachate Extraction System
Refuse Hideaway Landfill - Middleton, Wisconsin
Project No. 1529206

Dear Ms. Evanson:

Operation and Maintenance activities performed during this reporting period are included. Please note that monthly monitoring was performed on June 1 and 2 due to scheduling conflicts.

Leachate/condensate was hauled (by Al's Modern Sewer Service) to the Madison Metropolitan Sewerage District Treatment Plant as follows:

May 9, 1992	5,000 gallons
Total to Date:	245,500 gallons

Monitoring of the Landfill Gas and Leachate Extraction System was performed on the following dates:

May 8, 1992
May 14, 1992
May 18, 1992
May 19, 1992
June 1, 1992
June 2, 1992

On May 28, Staff Electric installed a new hour meter at well pump control panel GW11. The hour meter had malfunctioned and was replaced under warranty.

Recommended maintenance and repair tasks which will add to system efficiency or safety are as follows:

- Install bolt-on shutters on flare burner (spacers to be provided by Linklater Corporation) and tack weld.
- Tighten, or replace, belts on blower.

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FAX (608) 273-2513

WARZYN

- Trouble-shoot leachate extraction system malfunction at well GW9.
- Replace padlock hasp on door at blower building.
- Install analog temperature gauges on blower and flare piping.
- Install 1½-in. dia leachate head sample port in blind flange at top of well pipe at all gas-only extraction wells.
- Inspect and if necessary remove sediment build-up in manhole for the tank loadout pad drain.
- Replace cracked flange at top of gas/leachate extraction well GW11.
- Gas probe G-1D requires replacement of a ¼-in. PVC labcock valve (barb x barb).

The enclosed tables provide a summary of data collected. Please call should you have questions or comments.

Sincerely,

WARZYN INC.

Jan C. Kucher, P.E.
Project Manager

Dean R. Free
Project Engineer

DRF/ms/JCK/DFK
[mad-106-263]
1529206/197

Enclosure: Gas Well Monitoring Table
Leachate Head Monitoring Table
Gas Probe Monitoring Table
System Alarm Log
Flare Monitoring Table

GAS WELL MONITORING TABLE

Date: 6/1/92

Temperature: 73°F

Barometric Pressure: 30.15" Hg Falling

Monitored by: D. Free

Gas Detector Model No.: 1939
Unit No.: 6
Date Last Calibrated: 6/1/92

Well[1]	Well Pressure (in. WC)	CH_4[2] (%)	O_2 (%)	Valve Setting (fraction Open)	Gas Velocity (fpm)	Gas Flow[3] (cfm)	Gas Temperature (°F)
GW1	-7.0	31.0	0	2/13	<200	<9.0	82.4
GW2	-7.0	16.0	0	2/13	<200	<9.0	84.7
GW3	-6.4	41.0	0	5/9	1600	72.0	67.6
GW4	-6.4	52.0	0	5/9	600	27.0	74.1
GW5	-6.3	54.0	0	5/9	700	32.0	80.6
GW6	-11.8	30.0	0	3/9	500	22.5	75.5
GW7	-11.1	51.0	0	4/9	1100	49.5	93.3
GW8(1)	-11.9	52.0	0	3.5/9	700	32.0	104.3
GW9(1)	-11.8	53.0	0	3.5/9	600	27.0	118.4
GW10	-6.7	40.0	0	3.5/9	1100	49.5	95.7
GW11(1)	-6.0	53.0	0	4.5/9	(4)	(4)	114.9
GW12	-5.7	48.0	0	4.5/9	1300	58.5	103.2
GW13	-6.0	51.0	0	5/9	900	40.5	90.1

Notes:

(1) Wells with leachate extraction pumps and controls.
(2) Percent combustibles by volume, primarily composed of CH_4 (methane).
(3) Gas velocity (fpm) is converted to gas flow (cfm) by multiplying by .045 sq ft for 3" diameter PVC pipe.
(4) Velometer did not respond during gas velocity measurement at well GW11 possibly due to high gas moisture content.

DRF/ms/JCK
[mad-405-192a]
1529206/197

LEACHATE HEAD MONITORING TABLE

	Leachate Head (ft)[4]							
	May 1, 1992				June 2, 1992			
Well	East Riser	West Riser	North Riser	South Riser	East Riser	West Riser	North Riser	South Riser
GW1	1.7	1.9			1.5	1.4		
GW2	2.9	3.0			3.2	3.1		
GW3	4.8	NA			4.4	3.8		
GW4	(3)	(3)			(3)	(3)		
GW5	(3)	(3)			(3)	(3)		
GW6	(3)	(3)			(3)	(3)		
GW7	(3)	(3)			(3)	(3)		
GW8(P)	(3)	(3)			(3)	(3)		
GW9(P)			(3)	(3)			(3)	(3)
GW10			6.6	(3)			6.8	(3)
GW11(P)	5.8	(3)			6.0	(3)		
GW12	(3)	(3)			(3)	(3)		
GW13	(3)	(3)			(3)	(3)		

NOTES

(1) Wells with leachate extraction pumps and controls installed are indicated with a "(P)".
(2) Leachate extraction system started 8/15/91.
(3) Leachate head not measurable due to unidentified riser pipe blockage.
(4) Leachate head measured in 1-in. riser pipes at wells.
Riser pipes are identified as East, West, North or South to indicate location of riser pipe with respect to the well pipe.

DRF/ms/JCK
[mad-405-192]
1529206/197

GAS PROBE MONITORING TABLE

May 1992

6/02/92 Barometric Pressure: 30.15 in. Hg (Falling) at 11:00 a.m.

Probe	Pressure (in. WC)	CH_4(1) (%)	CH_4(2) (% LEL)	O_2 (%)
G1-s	0	0	0	19.0
G1-d	0	0	0	18.0
G6	-0.2	0	0	18.5
G8	0	0	0	21.0
G9	0	0	0	21.0
G10	0	0	0	21.0
GP11-s	-0.2	7	100	0
GP11-d	-0.2	22	100	0
Speedway Buildings	--	0	0	21.0
GPW1-s	0	0	0	21.0
GPW1-m	+0.4	0	0	21.0
GPW1-d	+0.4	0	0	20.5

Notes

(1) Percent combustibles by volume, primarily composed of methane (CH_4).
(2) Percent of the Lower Explosive Limit of methane which is 5% by volume.

DRF/ms/JCK
[mad-405-192d]
1529206/197

SYSTEM ALARM LOG

May 1992

Alarm Dates	Alarm Cause	Solution
5/17/92	Power Failure or Flame Failure	System Restarted

DRF/ms/JCK
[mad-405-192c]
1529206/197

FLARE MONITORING TABLE

Ground Flare Inlet Sample Port
May 1992

Date	Pressure (in. WC)	Methane (%)	Oxygen (%)	Flow (cfm)	Flow[(1)] (scfm)	Manual Valve Setting (fraction open)	Gas Temperature (°F)
5/8/92	+3.5	50	0	395	398	1.5/5	-
5/14/92	+3.6	49	0	400	394	1.5/5	82.7
5/19/92	+3.4	50	0	390	376	1.5/5	94.4
6/1/92	+3.2	47	0	380	366	1.5/5	95.3

Notes:

(1) Flows have been converted to standard conditions using a standard temperature of 70°F (530°R), and standard pressure of 406.9 in. H_2O.

DRF/ms/JCK
[mad-405-192b]
1529206/197

WARZYN

July 10, 1992

Ms. Theresa Evanson
Wisconsin Department of Natural Resources
Environmental Response and Repair Section
Bureau of Solid and Hazardous Waste Management
101 South Webster Street, GEF II, SW/3
Madison, Wisconsin 53707

Re: Operation and Maintenance Summary - June 1992
Landfill Gas and Leachate Extraction System
Refuse Hideaway Landfill - Middleton, Wisconsin
Project No. 1529206

Dear Ms. Evanson:

Operation and Maintenance activities performed during this reporting period are included. Warzyn met with ECRS personnel on-site June 16 and June 24, 1992. The meetings were intended to provide information necessary for the transition of Operation and Maintenance responsibilities from Warzyn to ECRS. This report concludes Warzyn's O & M responsibilities.

Leachate/condensate was hauled (by Al's Modern Sewer Service) to the Madison Metropolitan Sewerage District Treatment Plant as follows:

June 3, 1992	5,000 gallons
June 18, 1992	5,000 gallons
Total to Date: (from 8-23-91)	255,500 gallons

Monitoring of the Landfill Gas and Leachate Extraction System was performed on the following dates:

June 8, 1992
June 16, 1992
June 25, 1992

The autodialer (verbatim) battery may require replacement since its ability to hold a charge is questionable.

Monitoring of gas probe GP-11 (located at the southwest corner of the landfill has indicated a high methane content of 36%, by volume.

The enclosed tables provide a summary of data collected. Please call should you have questions or comments.

Sincerely,

WARZYN INC.

Jan C. Kucher, P.E.
Project Manager

Dean R. Free
Project Engineer

DRF/ccf/JCK/JDB
[mad-107-153]
1529206/197

Enclosure: Gas Well Monitoring Table
Leachate Head Monitoring Table
Gas Probe Monitoring Table
System Alarm Log
Flare Monitoring Table

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GAS WELL MONITORING TABLE

Date: 6/25/92

Temperature: 55°F @ 6:00 am, 76° @ 6:00 pm

Barometric Pressure: 29.77" Hg steady, 29.74" Hg

Monitored by: D. Free

Gas Detector Model No.: 1939
Unit No.: 6
Date Last Calibrated: 6/25/92

Well[1]	Well Pressure (in. WC)	CH_4[2] (%)	0_2 (%)	Valve Setting (fraction Open)[3]	Gas Velocity (fpm)	Gas Flow[4] (cfm)	Gas Temperature (°F)
GW1	-0.8	29.0	0	0	<200	<9	81.5
GW2	-0.9	40.0	0	2/13	<200	<9	82.4
GW3	-4.9	50.0	0	5/9	1750	79	68.3
GW4	-7.7	52.0	0	5/9	620	28	77.0
GW5	-7.4	52.0	0	7/9	605	27	85.4
GW6	-2.1	46.0	0	2.5/9	550	25	78.4
GW7	-11.5	50.0	0	4.1/9	1100	50	93.9
GW8(1)	-11.9	50.0	0	4/9	800	36	105.8
GW9(1)	-13.0	52.0	0	4.2/9	500	23	117.6
GW10	-5.1	40.0	0	5/9	1200	54	96.9
GW11(1)	-7.8	55.0	0	5/9	440	20	114.2
GW12	-5.8	48.0	0	5/9	1200	54	115.0
GW13	-6.7	51.0	0	6.2/9	1000	45	90.6

Reminder: Valve handles at wells GW1 and GW2 are mounted backwards. A full-open handle position actually indicates that the valve is closed.

Notes:

(1) Wells with leachate extraction pumps and controls.
(2) Percent combustibles by volume, primarily composed of CH_4 (methane).
(3) Valve setting recorded indicates position after monitoring and adjustments performed.
(4) Gas velocity (fpm) is converted to gas flow (cfm) by multiplying by .045 sq ft for 3" diameter PVC pipe.

DRF/ccf/JCK/JDB
[mad-405-027]
1529206/197

LEACHATE HEAD MONITORING TABLE

Leachate Head (ft)[4]

Well	June 2, 1992 East Riser	June 2, 1992 West Riser	June 2, 1992 North Riser	June 2, 1992 South Riser	June 25, 1992 East Riser	June 25, 1992 West Riser	June 25, 1992 North Riser	June 25, 1992 South Riser
GW1	1.5	1.4			1.5	1.4		
GW2	3.2	3.1			3.3	3.4		
GW3	4.4	3.8			4.3	3.7		
GW4	(3)	(3)			(3)	(3)		
GW5	(3)	(3)			(3)	(3)		
GW6	(3)	(3)			(3)	(3)		
GW7	(3)	(3)			(3)	(3)		
GW8(P)	(3)	(3)			(3)	(3)		
GW9(P)			(3)	(3)			(3)	(3)
GW10			6.8	(3)			6.8	(3)
GW11(P)	6.0	(3)			6.1	(3)		
GW12	(3)	(3)			(3)	(3)		
GW13	(3)	(3)			(3)	(3)		

NOTES

(1) Wells with leachate extraction pumps and controls installed are indicated with a "(P)".
(2) Leachate extraction system started 8/15/91.
(3) Leachate head not measurable due to unidentified riser pipe blockage.
(4) Leachate head measured in 1-in. riser pipes at wells.
Riser pipes are identified as East, West, North or South to indicate location of riser pipe with respect to the well pipe.

DRF/ccf/JCK/JDB
[mad-405-027a]
1529206/197

GAS PROBE MONITORING TABLE

June 1992

6/25/92 Barometric Pressure: 29.77 in. Hg (Steady) at 6:00 a.m.

Probe	Pressure (in. WC)	CH_4(1) (%)	CH_4(2) (% LEL)	0_2 (%)
G1-s	-0.10	0	0	21.0
G1-d	-0.05	0	0	21.0
G6	-0.05	0	0	19.5
G8	0	0	0	20.5
G9	-0.05	0	0	20.5
G10	-0.40	0	0	20.0
GP11-s	0	24	100	0
GP11-d	0	36	100	0
Speedway Buildings	--	0	0	21.0
GPW1-s	-0.05	0	0	20.0
GPW1-m	-0.10	0	0	20.5
GPW1-d	-0.10	0	0	19.0

NOTES:

(1) Percent combustibles by volume, primarily composed of methane (CH_4).
(2) Percent of the Lower Explosive Limit of methane which is 5% by volume.

DRF/ccf/JCK/JDB
[mad-405-027b]
1529206/197

SYSTEM ALARM LOG

June 1992

Initial Alarm Dates	Alarm Cause	Solution
6/13/92	Power Failure	System Restarted 6/16/92
6/18/92	Power Failure	System Restarted 6/22/92

DRF/ccf/JCK/JDB
[mad-405-027c]
1529206/197

FLARE MONITORING TABLE

Ground Flare Inlet Sample Port
June 1992

Date	Pressure (in. WC)	Methane (%)	Oxygen (%)	Flow (cfm)	Flow[(1)] (scfm)	Manual Valve Setting (fraction open)	Gas Temperature (°F)
6/08/92	+4.0	41	0	425	411	2/5	93.2
6/16/92	+4.3	55	0	440	416	2/5	90.5
6/25/92	+4.1	48	0	430	403	3/5	95.1

NOTES:

(1) Flows have been converted to standard conditions using a standard temperature of 60°F (520°R) and pressure of 406.9 in. H_2O.

DRF/ccf/JCK/JDB
[mad-405-027d]
1529206/197

ECRS
Environmental
Construction &
Remediation
Services, Inc.

August 20, 1992

Mr. Theresa Evanson
Wisconsin Department of Natural Resources
Environmental Response and Repair Section
Bureau of Solid and Hazardous Waste Management
101 South Webster Street, GEF II, SW/3
Madison, Wisconsin 53707

Re: Operation and Maintenance Summary - July 1992
Landfill Gas and Leachate Extraction System
Refuse Hideaway Landfill - Middleton, Wisconsin
Project No. 60024.00

Dear Ms. Evanson:

This letter contains a summary of the operation and maintenance activities performed by Environmental Construction and Remediation Services, Inc. (ECRS), from June 30 to July 31, 1992, at the Refuse Hideaway Landfill.

Scheduled Leachate Loadout

Leachate/Condensate was pumped and transported by Als Modern Sewer Service to the Madison Metropolitan Sewage District Treatment Plant. The hauling dates and quantities are as follows:

July 8, 1992	5,000 gallons
July 9, 1992	5,000 gallons
July 20, 1992	10,000 gallons
July 24, 1992	5,000 gallons
July Total:	25,000 gallons

We have requested Als to measure the depth to leachate prior to and after pumping the holding tank to obtain actual volumes of leachate removed. We will begin reporting these volumes when available.

refusehd:reports\99-july.kjs

Weekly/Monthly Monitoring Schedule

Weekly/Monthly monitoring of the landfill gas and leachate extraction system was performed on the following dates:

June 30, 1992 - weekly
July 8, 1992 - weekly
July 16, 1992 - weekly
July 24, 1992 - weekly/monthly
July 29, 1992 - weekly

Summary tables for weekly and monthly monitoring schedules are attached. Specific site observations are discussed in the following section.

Observations and Discussion

The Verbatim System alarm notified ECRS of a shutdown on July 2, due to a loss of electrical power. The system was restarted on July 3.

On July 16, the system was not operating upon arrival for weekly monitoring, but the Verbatim System had not notified us of an alarm condition. Based on the temperature recorder chart paper, it was estimated that the system had been shutdown for approximately 100 hours (since approximately 1 p.m., Monday). It has not yet been determined why the Verbatim System failed to indicate an alarm condition. We are currently monitoring the system to determine if a problem exists in the Verbatim System or if we did not re-arm the system properly after our July 8 monitoring.

During monthly monitoring, relatively strong landfill gas odors were detected at the northwest corner of the landfill. The specific source of the odor was not determined.

Leachate head levels could not be obtained at several wells due to blockage of the 1-inch riser pipes (see Table 5). The overhead cyclone fence obstructed the removal of the well flange to obtain levels. Our proposal to modify wells with access ports to monitor leachate head, will alleviate access problems and eliminate degradation of the flange gasket through repeated removal.

The sampling port (¼-inch PVC ball valve) on Gas Well 11 was replaced on July 29, after it was broken on July 24, 1992.

If you have any questions or comments, please feel free to call.

Sincerely,

ENVIRONMENTAL CONSTRUCTION AND REMEDIATION SERVICES, INC.

Kirk J. Solberg
Site Supervisor

Brian J. Hegge
Technical Manager

KJS/BJH:kjt

Enclosures: As stated.

TABLE 1

REFUSE HIDEAWAY LANDFILL
MONTHLY GAS EXTRACTION WELLS MONITORING INFORMATION

Date: July 24, 1992
Temperature: 76° at 2 p.m.
Barometric pressure: 30.19 inches Hg, rising
Monitored by: K. Solberg
Gas Detector Model No.: GA 1.1
Gas Detector Serial No.: 381
Date last calibrated: Factory calibrated (June 1992)

Well [1]	Well Pressure (in. W.C.)	Header Pressure (in. W.C.)	CH_4[2] (%)	O_2 (%)	Valve Setting (fraction open)	Gas Velocity (fpm)	Gas[3] Flow (cfm)	Gas Temperature (°F)
GW 1[4]	0	-10	27.2	8.7	13/13	60	2.7	75
GW 2	-1	-8	23.2	1.1	10/13	25	1.1	78
GW 3	-5	-7	44.2	0.8	5/9	2450	110.3	72
GW 4	-8	-8	49.7	0.7	5/9	800	36.0	75
GW 5	-8	-8	53.2	0.9	7/9	1100	49.5	83
GW 6	-2	-13	44.9	1.1	2.5/9	600	27.0	77
GW 7	-10	-13	52.1	0.8	5/9	1750	78.8	86
GW 8[1]	-10	-13	53.5	0.8	4/9	1100	49.5	103
GW 9[1]	-12	-13	53.0	0.9	2/3	750	33.8	117
GW 10	-4	-7	40.4	0.8	5/9	1500	67.5	96
GW 11[1]	-6.5	-6.5	53.8	0.9	5/9	600	27.0	110
GW 12	0	-6	48.1	0.8	5/9	2000	90.0	102
GW 13	0	-7	51.8	0.9	7/9	1500	67.5	87

Notes:

(1) Wells with leachate extraction pump and controls.
(2) Percent combustibles by volume, primarily composed of CH_4 (methane).
(3) Gas flow (cfm) is calculated by multiplying the gas velocity (fpm) by 0.045 ft^2 for 3-inch diameter PVC pipe.
(4) Gas readings obtained on July 29, 1992, after equipment malfunction (battery failure) on July 24.

TABLE 2

REFUSE HIDEAWAY LANDFILL
MONTHLY GAS PROBE MONITORING INFORMATION

Date: July 24, 1992
Temperature: 76° at 2 p.m.
Barometric pressure: 30.19 inches Hg, rising
Monitored by: K. Solberg
Gas Detector Model No.: GA 1.1
Gas Detector Serial No.: 381
Date last calibrated: Factory calibrated (June 1992)

Probe	Pressure in W.C.	CH_4 (%)	CH_4[1] (% LEL)	O_2 (%)
G1-s	0	0	0	19.5
G1-d	0	0	0	20.0
G6	0	0	0	20.1
G8	0	0	0	20.5
G9	0	0	0	20.8
G10	-0.5	0	0	21.0
G11-s	0	32.3	(2)	1.6
G11-d	0	21.9	(2)	0.8
GPW1-d	-0.5	0	0	19.1
GPW1-s	0	0	0	19.3
GP1-m	-0.5	0	0	20.7
Speedway[3] Buildings	NA	0	0	20.3

Notes:

(1) Percent of lower explosive limit of CH_4 (100% LEL = 5% CH_4 by volume).
(2) Greater than 100% of the LEL.
(3) Readings obtained from the northeast corner of the interior of the scale house.
NA Not applicable.

TABLE 3

REFUSE HIDEAWAY LANDFILL
SUMMARY OF WEEKLY MONITORING INFORMATION
June 30-July 31, 1992

	June 30, 1992				July 8, 1992				July 16, 1992				July 24, 1992				July 29, 1992			
Description	Valve Setting	Pressure (in. W.C.)	CH_4[2] (%)	O_2 (%)	Valve Setting	Pressure (in. W.C.)	CH_4[2] (%)	O_2 (%)	Valve Setting	Pressure (in. W.C.)	CH_4[2] (%)	O_2 (%)	Valve Setting	Pressure (in. W.C.)	CH_4[2] (%)	O_2 (%)	Valve Setting	Pressure (in. W.C.)	CH_4[2] (%)	O_2 (%)
Branch Monitoring Station																				
North Branch	7/13	-8	46.7	0.4	8/13	-7	46.7	0.9	8/13	-5.5	52.5	1.1	8/13	-8	46.6	1.1	8/13	-8	47.2	0.8
Central Branch	7/13	-12	49.5	1.0	8/13	-12	48.5	1.1	8/13	-10.5	53.4	1.1	8/13	-14	49.0	1.0	8/13	-13.5	48.9	0.9
South Branch	7/13	-10	48.1	0.8	8/13	-10	45.8	0.9	8/13	-8	53.1	1.0	8/13	-11	47.0	0.9	8/13	-11	46.8	0.7
Blower Inlet Pipe																				
Inlet Port A		-20	48.1	0.8		-19	46.6	1.1		-19	53.2	1.0		-21	47.0	1.2		-20	47.6	0.8
Inlet Port B						-20	46.2	1.1		-20	53.3	1.1		-22	47.2	1.1		-21	47.5	0.9
Outlet Port A						+15	54.0	1.1		+17	53.2	1.1		+15	47.6	1.0		+15	47.5	0.9
Flare Inlet Pipe																				
Sample Port A		+13	48.0	0.8		+13	(1)	(1)		+14	53.1	1.1		+13	48.1	1.0		+13	47.7	0.9
Sample Port B		+5	48.4	0.7		+5	(1)	(1)		+5	53.2	1.0		+5.5	48.5	0.9		+5.5	47.5	0.9
Sample Port C		+3	48.3	0.7		+4	(1)	(1)		+4	53.4	1.0		+3.5	49.0	1.0		+4	47.3	0.9

Notes:

(1) Equipment malfunction (battery failure).
(2) Percent combustibles by volume, primarily composed of CH_4 (methane).
Shaded areas do not have reportable information.

TABLE 4

REFUSE HIDEAWAY LANDFILL
MONTHLY FLARE MONITORING INFORMATION
July 24, 1992

Location	Pressure (inch W.C.)	CH_4[(1)] (%)	O_2 (%)	Gas Velocity (fpm)	Flow[(2)] (cfm)	Flow[(3)] (scfm)	Gas Temperature (°F)	Valve Setting (fraction open)
Port A	+13	48.1	1.0	3,750	694	689	96.0	NA
Port B	+5.5	48.5	0.9	4,000	740	721	96.2	1/2
Port C	+3.5	49.0	1.0	NA	NA	NA	NA	NA

Notes:

(1) Percent combustibles by volume, primarily composed of CH_4 (methane).
(2) Gas velocity is converted to gas flow by multiplying FPM x 0.185 @ 6-inch HDPE.
(3) Flows have been converted to standard conditions of 70°F and 406.9 inches water.
NA Not available or not applicable.

TABLE 5

REFUSE HIDEAWAY LANDFILL
MONTHLY LEACHATE HEAD MONITORING INFORMATION
July 27, 1992

Well	LEACHATE HEAD [3] (ft)				Current Pump Hours		Previous Pump Hours		Elapsed Pump Hours	
	East Riser	West Riser	North Riser	South Riser	Total Hours	Time[4]	Total Hours	Time[4]	Total Hours	Pump Hours
GW 1	0.7	1.6								
GW 2	3.1	4.0								
GW 3	4.2	3.2								
GW 4	(2)	(2)								
GW 5	(2)	(2)								
GW 6	2.8	3.4								
GW 7	(2)	2.8								
GW 8[1]	(2)	(2)			4752.3	1141	NA	NA	NA	NA
GW 9[1]			39.4	19.4	5047.6	1145	NA	NA	NA	NA
GW 10			6.0	25.1						
GW 11[1]	5.0	33.6 ⊛			203.2	1146	NA	NA	NA	NA
GW 12	11.4	(2)								
GW 13	10.0	43.0 ⊛								

Notes:

⊛ Likely blocked.

(1) Wells with leachate extraction pumps and controls.
(2) Leachate head not measurable due to blockage in riser pipe.
(3) Leachate head measured in 1-inch riser at wells. Riser pipes are identified as east, west, north, or south to indication location of riser pipe with respect to the well pipe.
(4) Time of hour meter reading was recorded and is denoted in parenthesis.
NA Previous pump hour readings were not available.
Shaded areas do not have reportable information.

TABLE 6

REFUSE HIDEAWAY LANDFILL
MONTHLY SUMMARY OF SYSTEM ALARM LOG
June 30-July 31, 1992

Alarm Dates	Alarm Cause	Solution
07/02/92	power failure	system restarted
07/16/92 [1]	unknown	system restarted

Notes:

[1] Blower and flare were down upon arrival on July 16, 1992. No alarm from Verbatim was received. Estimate that blower and flare went down July 13, 1992, based on temperature recorder chart paper. It has not been determined why alarm was not received.

ECRS
Environmental
Construction &
Remediation
Services, Inc.

October 12, 1992

Ms. Theresa Evanson
Wisconsin Department of Natural Resources
Environmental Response and Repair Section
Bureau of Solid and Hazardous Waste Management
101 South Webster Street, GEF II, SW/3
Madison, Wisconsin 53707

Re: Operation and Maintenance Summary - August 1992
Landfill Gas and Leachate Extraction System
Refuse Hideaway Landfill - Middleton, Wisconsin
Project No. 60024.00

Dear Ms. Evanson:

This letter summarizes operation and maintenance activities performed by Environmental Construction and Remediation Services, Inc. (ECRS), during the month of August, 1992, at the Refuse Hideaway Landfill. Specific tasks are discussed in the following sections.

SCHEDULED LEACHATE LOADOUT

Leachate/Condensate was pumped and transported by Al's Modern Sewer Service to the Madison Metropolitan Sewage District Treatment Plant. The hauling dates and quantities are as follows:

	Invoiced Volume	Measured Volume
August 2, 1992	5,000 gallons	not provided
August 18, 1992	5,000 gallons	4,238

The measured volume was calculated by measuring the depth of leachate in the tank before and after pumping the tank.

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WEEKLY/MONTHLY MONITORING SCHEDULE

Weekly/Monthly monitoring of the landfill gas and leachate extraction system was performed on the following dates:

August 5, 1992	Weekly
August 12, 1992	Weekly
August 20, 1992	Weekly
August 26, 1992	Weekly
August 31, 1992	Weekly/Monthly

Summary tables for weekly and monthly monitoring schedules are attached. Specific site observations are discussed in the following section:

OBSERVATION AND DISCUSSION

Upon arrival for weekly monitoring on August 5, 1992, the blower and flare were shutdown. The red alarm light on the control panel was not on. It was determined that the blower/flare had been down for approximately 64 hours based on the temperature chart recorder. The Verbatim System had not phoned an alarm condition. The system was restarted and manually shutdown to check the Verbatim System. The alarm was acknowledged and the system restarted.

Based upon our discussions concerning battery malfunctions, we replaced the battery on Friday, September 11. The Verbatim System has been operating correctly since, and the problem with the dialer appears to have been solved.

The Verbatim System notified a general alarm condition at 3:20 a.m., August 26, 1992, and the system was restarted at 9:30 a.m. the same day. The temperature recorder's paper was replaced on August 26, 1992.

A review of the gas velocities measured during monthly monitoring, indicated our anemometer was malfunctioning in the high range. The field readings of greater than 6,000 feet per minute (fpm) were not within realistic ranges for the system. Gas velocity readings were repeated at the blower/flare on September 3, 1992, after discussing measurement techniques with the instrument manufacturer. The gas velocities obtained September 3 from the blower/flare are reported and gas velocity values obtained at the well heads on August 31 are flagged appropriately.

August monthly monitoring of Gas Well Number 1 (GW1) detected elevated oxygen concentration at the gas well. Closing the butterfly valve to reduce the well vacuum (valve setting 0/13) resulted in an increase in negative pressure on the gas well. Since this reaction is contradictory to the operating principals of the valve, the valve was returned to its original open position.

During September monthly monitoring, we determined that the butterfly valve at GW1 had been installed so that the valve handle indicates an open position (valve setting 13/13) when the valve is actually closed. We have adjusted the valve to a slightly open position (valve setting 1/13) and will continue to closely monitor the well to determine if this action affects the oxygen concentration.

Gas probe monitoring data indicates that gas probe GP11-s and GP11-d, located at the facility's southwestern property boundary, continue to show elevated methane levels. Both the shallow and deep probes at this location have methane concentrations in excess of 25% of the lower explosive level. We will evaluate existing site data to determine options which may be available to further control this migration.

We contacted the Madison Metropolitan Sewage District (MMSD) to extend the wastewater discharge permit and have received the new permit. The permit is enclosed for your records.

If you have any questions or comments, please feel free to call.

Sincerely,

ENVIRONMENTAL CONSTRUCTION AND REMEDIATION SERVICES, INC.

Kirk J. Solberg
Site Supervisor

Brian J. Hegge
Technical Manager

KJS/BJH:kjt

Enclosures: As Stated

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TABLE 1

REFUSE HIDEAWAY LANDFILL
MONTHLY GAS EXTRACTION WELLS MONITORING INFORMATION

Date: August 31, 1992
Temperature: 68° at 1 p.m.
Barometric pressure: 30.16 inches Hg, rising
Monitored by: K. Solberg
Gas Detector Model No.: GA 1.1
Gas Detector Serial No.: 381
Date last calibrated: Factory calibrated (June 1992)
2.5% CH_4 Read 1.8% on 08/31/91

Well [1]	Well Pressure (in. W.C.)	Header Pressure (in. W.C.)	CH_4[2] (%)	O_2 (%)	Valve Setting (fraction open)	Gas Velocity (fpm)	Gas[4] Flow (cfm)	Gas Temperature (°F)
GW 1	-0.5	-9.0	19.7	11.7	13/13[5]	10	0.45	71.9
GW 2	-1.0	-7.5	13.0	1.1	6/13	40	1.8	70.8
GW 3	-5	-7.5	37.2	1.3	5/9	>6000[3]	270[3]	69.6
GW 4	-8	-8	43.2	2.0	5/9	4500[3]	203[3]	80.9
GW 5	-8	-8	51.7	1.2	7/9	4100[3]	185[3]	86.3
GW 6	-2	-13.5	30.3	1.5	2/9	3000[3]	135[3]	75.5
GW 7	-11	-13	49.3	1.5	4/9	>6000[3]	270[3]	92.8
GW 8[1]	-11	-13	53.5	1.2	4/9	4100[3]	185[3]	104.7
GW 9[1]	-12.5	-13	52.0	1.2	4/9	3400[3]	153[3]	117.1
GW 10	-4	-7	39.0	1.2	6/9	5500[3]	248[3]	96.6
GW 11[1]	-6.5	-6.5	52.1	1.3	5/9	2500[3]	113[3]	111.2
GW 12	-4.5	-6.0	44.2	1.3	5/9	>6000[3]	270[3]	102.5
GW 13	-5.5	-6	50.0	1.2	6.5/9	5900[3]	266[3]	89.4

Notes:

(1) Wells with leachate extraction pump and controls.
(2) Percent combustibles by volume, primarily composed of CH_4 (methane).
(3) Gas velocity readings are questionable due to possible monitoring equipment malfunction when measuring high range flows.
(4) Gas flow (cfm) is calculated by multiplying the gas velocity (fpm) by 0.045 ft^2 for 3-inch diameter PVC pipe.
(5) During September monitoring, it was determined that the position (13/13) closes the butterfly valve. See letter text for discussion.

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TABLE 2

REFUSE HIDEAWAY LANDFILL
MONTHLY GAS PROBE MONITORING INFORMATION

Date: August 31, 1992
Temperature: 53° at 7 a.m.
Barometric pressure: 30.12 inches Hg, rising
Monitored by: K. Solberg
Gas Detector Model No.: GA 1.1
Gas Detector Serial No.: 381
Date last calibrated: Factory calibrated (June 1992)
2.5% CH_4 Read 1.8% on 08/31/92

Probe	Pressure in W.C.	CH_4 (%)	CH_4[1] (% LEL)	O_2 (%)
G1-s	0	0	0	20.4
G1-d	0	0	0	20.5
G6	0	0	0	20.2
G8	0	0	0	21.1
G9	0	0	0	21.1
G10	-1	0	0	20.9
GP11-s	0	1.8	36	15.7
GP11-d	0	24.0	(2)	4.0
GPW1-s	0	0	0	18.8
GPW-1m	-1	0	0	20.6
GPW1-d	-1	0	0	19.1
Speedway Buildings	NA	0 0	0 0	20.4 20.7

Notes:

(1) Percent of lower explosive limit of CH_4 (100% LEL = 5% CH_4 by volume).
(2) Greater than 100% of the LEL.
(3) Readings obtained from the northeast corner of the scalehouse and the workshop.

TABLE 3

REFUSE HIDEAWAY LANDFILL
MONTHLY FLARE MONITORING INFORMATION
August 31, 1992

Location	Pressure (inch W.C.)	CH_4[1] (%)	O_2 (%)	Gas[4] Velocity (fpm)	Flow[2] (cfm)	Flow[3] (scfm)	Gas Temperature (°F)	Valve Setting (fraction open)
Port A	+13	46.6	1.0	2,100	389	385	96.0	NA
Port B	+5	51.6	1.0	1,750	322	313	96.2	1/2
Port C	+3.5	52.9	1.0	1,750	322	313	93.2	NA

Notes:

(1) Percent combustibles by volume, primarily composed of CH_4 (methane).
(2) Gas velocity is converted to gas flow by multiplying FPM x 0.185 @ 6-inch HDPE.
(3) Flows have been converted to standard conditions of 70°F and 406.9 inches water.
(4) Gas velocity was monitored on September 3, 1992, after review of data from August 31, 1992, indicated unusually high values.
NA Not available or not applicable.

TABLE 4

REFUSE HIDEAWAY LANDFILL
MONTHLY LEACHATE HEAD MONITORING INFORMATION
August 31, 1992

Well	LEACHATE HEAD [3] (ft)				Current Pump Hours		Previous Pump Hours		Elapsed Pump Hours	
	East Riser	West Riser	North Riser	South Riser	Total Hours	Time[4]	Total Hours	Time[4]	Total Hours	Pump Hours
GW 1	1.5	1.6								
GW 2	3.9	3.0								
GW 3	4.2	3.7								
GW 4	22.4[2]	30.2[2]								
GW 5	42.8[2]	43.6[2]								
GW 6	3.2	3.3								
GW 7	35.2[2]	3.1								
GW 8[1]	39.5[2]	40.5[2]			4769.1	11:59	4752.3	11:41	840	16.8
GW 9[1]			17.5	28.0[2]	5823.7	11:53	5047.6	11:45	840	776.1
GW 10			7.2	35.5[2]						
GW 11[1]	7.1	35.5[2]			250.6	11:45	203.2	11:46	840	47.4
GW 12	40.0[2]	40.5[2]								
GW 13	31.3[2]	30.4[2]								

Notes:

(1) Wells with leachate extraction pumps and controls.
(2) Leachate head not measurable due to blockage in riser pipe. These risers appear to be kinked or pinched at the depth reported.
(3) Leachate head measured in 1-inch riser at wells. Riser pipes are identified as east, west, north, or south to indication location of riser pipe with respect to the well pipe.
(4) Times that hour meter readings were recorded on were July 27 and August 31, 1992.

Shaded areas do not have reportable information.

TABLE 5

REFUSE HIDEAWAY LANDFILL
MONTHLY SUMMARY OF SYSTEM ALARM LOG
August 1-August 31, 1992

Alarm Dates	Alarm Cause	Solution
08/05/92[1]	power failure	restart
08/26/92	power failure	restart

Notes:

[1] Blower and flare were down upon arrival on August 5, 1992. No alarm from Verbatim was received. Estimate that blower and flare went down August 3, 1992, based on temperature recorder chart paper. It has not been determined why alarm was not received.

TABLE 6

REFUSE HIDEAWAY LANDFILL
SUMMARY OF WEEKLY MONITORING INFORMATION
August 1-31, 1992

Description	August 5, 1992				August 12, 1992				August 20, 1992				August 26, 1992				August 31, 1992			
	Valve Setting	Pressure (in. W.C.)	CH_4[(1)] (%)	O_2 (%)	Valve Setting	Pressure (in. W.C.)	CH_4[(1)] (%)	O_2 (%)	Valve Setting	Pressure (in. W.C.)	CH_4[(1)] (%)	O_2 (%)	Valve Setting	Pressure (in. W.C.)	CH_4[(1)] (%)	O_2 (%)	Valve Setting	Pressure (in. W.C.)	CH_4[(1)] (%)	O_2 (%)
Branch Monitoring Station																				
North Branch	8/13	-6	55.0	0.8	8/13	-8	47.0	1.1	8/13	-8	46.1	0.8	8/13	-6	55.6	0.5	8/13	-8	46.8	1.1
Central Branch	8/13	-11	54.7	0.8	8/13	-13.5	49.2	1.0	8/13	-14	47.9	0.9	8/13	-11	55.5	0.4	8/13	-14	48.9	1.1
South Branch	8/13	-8.5	54.6	0.7	8/13	-11	46.2	1.1	8/13	-11	43.0	0.8	8/13	-.8	55.3	0.4	8/13	-10.5	45.1	1.1
Blower Inlet Pipe																				
Inlet Port A		-19	55.0	0.7		-20	47.0	1.3		-21	45.7	0.9		-19	55.4	0.4		-21	49.3	1.2
Inlet Port B		-20	54.8	0.7		-21.5	45.0	1.9		-22	45.3	0.8		-20	55.4	0.4		-21.5	53.0	1.1
Outlet Port A		+17	55.4	0.7		+15	49.0	0.8		+16	45.6	0.8		+17	55.3	0.4		+15	55.0	1.1
Flare Inlet Pipe																				
Sample Port A		+14	55.4	0.7		+13	47.1	1.0		+13	45.7	0.9		+14	55.6	0.5		+13	46.6	1.0
Sample Port B		+5.5	55.1	0.7		+5.5	46.7	0.9		+5	45.5	0.9		+5.5	55.7	0.4		+5	51.6	1.0
Sample Port C		+4	54.8	0.7		+3.5	48.4	0.9		+3.5	45.4	0.9		+3.5	55.9	0.4		+3.5	52.9	1.0

Notes:

(1) Percent combustibles by volume, primarily composed of CH_4 (methane).
Shaded areas do not have reportable information.

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ECRS
Environmental
Construction &
Remediation
Services, Inc.

October 15, 1992

Ms. Theresa A. Evanson
Wisconsin Department of Natural Resources
Environmental Response and Repair Section
Bureau of Solid and Hazardous Waste Management
101 South Webster Street, GEF II, SW/3
P.O. Box 7921
Madison, Wisconsin 53707

Re: Refuse Hideaway Landfill, Middleton, Wisconsin
Leachate Head Revisions To August, 1992 Monthly Monitoring Report

Dear Ms. Evanson:

Enclosed is a revised Table 4 for the August monthly leachate head monitoring information. The previously submitted Table 4 contained depth to leachate measurements rather than leachate head measurements. Please substitute this table into the August 1992 monthly monitoring report, and accept our apologies for the inconvenience.

We have completed retrofitting the wells with access ports that will allow measurement of leachate head within the well. We will include the leachate head measurements in our September monthly report along with depth to leachate and total depths of the gas wells. The submission of this additional information will alleviate any future misinterpretation of data.

If you have any additional questions concerning the leachate head information, please feel free to contact us.

Sincerely,

ENVIRONMENTAL CONSTRUCTION AND REMEDIATION SERVICES, INC.

Brian Hegge
Technical Manager

Enclosures: As Stated

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ECRS
Environmental
Construction &
Remediation
Services, Inc.

November 3, 1992

Ms. Theresa Evanson
Wisconsin Department of Natural Resources
Environmental Response and Repair Section
Bureau of Solid and Hazardous Waste Management
101 South Webster Street, GEF II, SE/3
Madison, Wisconsin 53707

Re: Operation and Maintenance Summary - September 1992
Landfill Gas and Leachate Extraction System
Refuse Hideaway Landfill - Middleton, Wisconsin
Project No. 60024.00

Dear Ms. Evanson:

This letter summarizes operation and maintenance (O&M) activities performed by Environmental Construction and Remediation Services, Inc. (ECRS), during the month of September, 1992, at the Refuse Hideaway Landfill. Specific tasks are discussed in the following sections:

SCHEDULED LEACHATE LOADOUT

Leachate/Condensate was pumped and transported by Al's Modern Sewer Service to the Madison Metropolitan Sewage District Treatment facility. The hauling dates and quantities are as follows:

	Invoiced Volume (gals)	Measured Volume (gals)
September 17, 1992	15,000	12,600 (estimate)
September 18, 1992	5,000	4,200 (estimate)
September 25, 1992	5,000	4,277
October 1, 1992	5,000	4,007

The quantity of leachate removed from the holding tank was estimated on September 17 and 18, 1992. The leachate level (20,084 gallons) was measured on September 17, 1992, after one (1) truckload had been pumped from the holding tank. Two (2) additional truckloads were removed on September 17 and one (1) truckload was removed on September 18. After

8383 Greenway Boulevard, Suite 200, Middleton, WI 53562 (608) 836-9020 FAX (608) 836-4450

the fourth (4) and final load on September 18, the volume in the tank was 7,406 gallons. Therefore, the measured volume removed from the second to the fourth load was 12,678 gallons or approximately 4,200 gallons per truckload.

WEEKLY/MONTHLY MONITORING SCHEDULE

Weekly/Monthly monitoring of the landfill gas and leachate extraction system was performed on the following dates:

September 11, 1992	Weekly
September 15, 1992	Weekly
September 27, 1992	Weekly
October 2, 1992	Weekly/Monthly

Summary tables for weekly and monthly monitoring schedules are attached. Specific site observations are discussed in the following section:

OBSERVATIONS AND DISCUSSION

ECRS was contacted by Dames & Moore on September 2, 1992, and informed that electrical power to the landfill was to be disconnected prior to trenching activities. The Verbatim Alarm System was disconnected and the gas extraction system shutdown on September 3 prior to electrical service interruption. The gas extraction system was re-started on September 4.

The Verbatim System alerted a general alarm condition at 7:30 p.m. on September 10, 1992. The system was re-started on September 11, 1992. It could not be ascertained what caused the general alarm condition.

The Verbatim System battery was replaced on September 11, 1992.

The quarterly leachate sample was collected on September 11, 1992, and submitted to Mid-State Associates for laboratory analysis. The analytical results were forwarded to the Madison Metropolitan Sewage District (MMSD) on October 26, 1992, and copied to DNR.

ECRS was alerted of a high leachate alarm on September 16, 1992. ECRS arrived on-site on September 17, to re-set the alarm. Four (4) tanker loads of leachate were removed from September 17-18 (approximately 16,800 gallons as discussed in the previous section). The

high leachate alarm did not shutdown the blower or flare. The alarm condition occurred after heavy rains earlier in the week.

ECRS was alerted of a general alarm condition at 3:45 a.m. on September 18 due to a power failure. The system was re-started at 8 a.m. that same day.

Thirteen (13) gas wells were retro-fitted with access ports (1-inch threaded nipple and cap) on October 1, 1992. The access ports were installed at approximately the same elevation as the 1-inch leachate head riser pipes on the gas wells. Retro-fitting was performed to allow for accurate and consistent depth to leachate readings at each well. The depths to leachate and the depth of each well are shown on Table 4. Total well depths were obtained from well installation logs contained in O & M manuals.

ECRS previously reported in the Operation and Maintenance Summary for August 1992 that Gas Well No. 1 (GW-1) had elevated oxygen levels (11.7%) and decreased methane levels (19.7%). September monthly monitoring continues to indicate elevated oxygen concentration (19.2%) and reduced methane concentration (3.5%). Additionally, GW-2 has a reduced methane level (12%), although the oxygen content remains low. Since the September readings were recorded, we have shut of GW-1 and GW-2 while we attempt to isolate the source of air intrusion and make the necessary adjustments.

If you have any questions or comments, please feel free to call.

Sincerely,

ENVIRONMENTAL CONSTRUCTION AND REMEDIATION SERVICES, INC.

Kirk J. Solberg
Site Supervisor

Brian J. Hegge
Technical Manager

KJS/BJH:kjt

Enclosure

refuse:reports\95-sep.kjs

TABLE 1

REFUSE HIDEAWAY LANDFILL
MONTHLY GAS EXTRACTION WELLS MONITORING INFORMATION

Date: October 2, 1992
Temperature: 68° at 1230 p.m.
Barometric pressure: 29.94 inches Hg
Monitored by: K. Solberg
Gas Detector Model No.: GA 1.1
Gas Detector Serial No.: 381
Date last calibrated: Factory calibrated (June 1992); Calibration Check October 2, 1992[4]

Well	Well Pressure (in. W.C.)	Header Pressure (in. W.C.)	CH_4[2] (%)	O_2 (%)	Valve Setting (fraction open)	Gas Velocity (fpm)	Gas[3] Flow (cfm)	Gas Temperature (°F)
GW 1	-1	-9	3.5	19.2	1/13	<10	<.45	75.7
GW 2	-1	-9	12.0	1.2	4/13	25	1.1	76.6
GW 3	-5	-8	38.7	1.1	4/9	1600	72	70.0
GW 4	-8	-8	50.9	1.1	5/9	600	27	81.0
GW 5	-8	-8	53.0	1.1	8/9	600	27	85.0
GW 6	-2	-13.5	32.0	0.9	2/9	825	37	73.2
GW 7	-10	-11	51.9	1.0	6/9	1100	50	91.5
GW 8[1]	-10	-12	52.8	1.0	4/9	600	27	103.8
GW 9[1]	-11.5	-12	53.2	1.1	4/9	600	27	113.1
GW 10	-3.5	-7.5	39.1	1.1	4/9	800	36	96.0
GW 11[1]	-7	-7	53.5	1.0	5/9	500	23	108.3
GW 12	-7	-5	47.8	1.1	5/9	1250	56	101.1
GW 13	-6	-7	50.4	1.1	7.5/9	1000	45	88.1

Notes:

(1) Wells with leachate extraction pump and controls.
(2) Percent CH_4 (methane).
(3) Gas flow (cfm) is calculated by multiplying the gas velocity (fpm) by 0.045 ft^2 for 3-inch diameter PVC pipe.
(4) Calibration check: 2% CH_4 Read 1.8% CH_4
15% CO_2 Balance N_2 Read 14.2% CO_2; 0.8% O_2
99% CH_4 Read 95.2% CH_4; 0.8% O_2; 0.0% CO_2

TABLE 2

REFUSE HIDEAWAY LANDFILL
MONTHLY GAS PROBE MONITORING INFORMATION

Date: October 2, 1992
Temperature: 60° at 9 a.m.
Barometric pressure: 29.94 inches Hg
Monitored by: K. Solberg
Gas Detector Model No.: GA 1.1
Gas Detector Serial No.: 381
Date last calibrated: Factory calibrated (June 1992); Calibrated check October 2, 1992[5]

Probe	Pressure in W.C.	CH_4 (%)	CH_4[1] (% LEL)	O_2 (%)
G1-s	0	0	0	20.1
G1-d	0	0	0	21.0
G-6	0	0	0	19.8
G-8	0	0	0	20.7
G-9	0	0	0	20.5
G-10	+0.5	0	0	20.2
G-11s	0	12.4	(2)	0.9
G-11d	0	23.0	(2)	1.7
GPW-1s	0	0	0	18.0
GPW-1m	0	0	0	19.3
GPW-1d	0	0	0	18.1
Speedway[3] Buildings	NA	0	0	20.2
Speedway[4] Buildings	NA	0	0	20.2

Notes:

(1) Percent of lower explosive limit of CH_4 (100% LEL = 5% CH_4 by volume).
(2) Greater than 100% of the LEL.
(3) Readings obtained from the northeast corner of the interior of the scale house.
(4) Readings obtained from the northwest corner of garage.
(5) Calibration check data on previous page.
NA Not applicable.

TABLE 3

REFUSE HIDEAWAY LANDFILL
MONTHLY BRANCH AND FLARE MONITORING INFORMATION
October 2, 1992

	Pressure (in. W.C.)	CH_4[(1)] (%)	O_2 (%)	Gas Velocity (fpm)	Flow[(2)] (cfm)	Flow[(3)] (scfm)	Gas Temperature	Valve Setting (fraction open)
Branch Monitoring Station								
North Branch	-8.5	48.1	0.9	1,800	140	136.3	75.0	8/13
Central Branch	-13	46.9	0.9	1,490	116	111.5	75.0	8/13
South Branch	-10	43.0	0.8	1,750	137	133.2	70.0	8/13
Flare Inlet Pipe								
Port A	+13.5	46.0	0.9	2,000	370	366	94.0	N/A
Port B	+5.5	46.0	0.9	1,800	333	324	93.0	1/2
Port C	+4	46.0	0.9	1,850	342	331	93.3	N/A

Notes:

(1) Percent CH_4 (methane).
(2) Gas velocity is converted to gas flow by multiplying fpm x 0.185 @ 6-inch HDPE and fpm x 0.078 @ 4-inch PVC.
(3) Flows have been converted to standard conditions of 70°F and 406.9 inches water.
NA Not available or not applicable.

TABLE 4

REFUSE HIDEAWAY LANDFILL
MONTHLY LEACHATE HEAD MONITORING INFORMATION
October 1, 1992

Well[2]	LEACHATE HEAD (ft)[3]			Current Pump Hours		Previous Pump Hours		Elapsed Pump Hours	
	Gas Well[4] Depth	Depth to Leachate	Leachate Head	Total Hours	Time[5]	Total Hours	Time[5]	Total Hours	Pump Hours
GW 1	51.7	52.0	0						
GW 2	53.3	50.0	3.3						
GW 3	57	57.5	0						
GW 4	65	55.4	9.6						
GW 5	70	61.8	8.2						
GW 6	36	36.8	0						
GW 7	60	56.8	3.2						
GW 8[1]	69	51.2	17.8	4781.3	11:00	4769.1	11:59	745	12.2
GW 9[1]	66	49.0	17	6542.7	11:35	5823.7	11:53	744	719.0
GW 10	70	64.9	5.1						
GW 11[1]	65	62.5	2.5	273.9	11:30	250.6	11:45	744	23.3
GW 12	81	67.9	13.1						
GW 13	69	63.4	5.6						

43000 gpd

Notes:

10 gpm rated pumps

(1) Wells with leachate extraction pumps and controls.
(2) Thirteen (13) gas wells retro-fitted with threaded ports on riser.
(3) Measured from retro-fitted port on gas well riser.
(4) Gas well depths obtained from Construction Observation Report, November, 1990 and Operation and Maintenance Manual, November, 1991.
(5) Time of hour meter reading was recorded on August 31 and October 1, 1992.
Shaded areas do not have reportable information.

TABLE 5

REFUSE HIDEAWAY LANDFILL
MONTHLY SUMMARY OF SYSTEM ALARM LOG
September 1992

Alarm Dates	Alarm Cause	Solution
September 10, 1992	general alarm	restart Sept. 11, 1992
September 16, 1992	high leachate level in tank	Sept. 17, 1992 - pumped leachate. Reset alarm. Flare and blower did not shutdown.
September 18, 1992	power failure	restart blower Sept. 18, 1992

TABLE 6

REFUSE HIDEAWAY LANDFILL
SUMMARY OF WEEKLY MONITORING INFORMATION
September 1992

	September 11, 1992				September 15, 1992				September 27, 1992				October 2, 1992			
Description	Valve Setting	Pressure (in. W.C.)	CH_4[(1)] (%)	O_2 (%)	Valve Setting	Pressure (in. W.C.)	CH_4[(1)] (%)	O_2 (%)	Valve Setting	Pressure (in. W.C.)	CH_4[(1)] (%)	O_2 (%)	Valve Setting	Pressure (in. W.C.)	CH_4[(1)] (%)	O_2 (%)
Branch Monitoring Station																
North Branch	8/13	-8	51.9	0.8	8/13	-8	48.4	0.8	8/13	-7.5	48.5	0.8	8/13	-8.5	48.1	0.9
Central Branch	8/13	-13	54.0	0.7	8/13	-14	50.6	0.8	8/13	-14.5	49.2	0.9	8/13	-13	46.9	0.9
South Branch	8/13	-10	49.9	0.7	8/13	-11	44.9	0.8	8/13	-11.0	45.4	0.8	8/13	-10	43.0	0.8
Blower Inlet Pipe																
Inlet Port A		-20	51.9	0.7		-20	47.7	0.9		-21	48.0	0.8		-20	46.8	0.8
Inlet Port B		-21	51.7	0.7		-21.5	49.8	0.8		-22	47.7	0.8		-21	46.3	0.9
Outlet Port A		+15	51.8	0.7		+15	53.6	0.7		+15	47.8	0.8		+15	46.1	0.9
Flare Inlet Pipe																
Sample Port A		+13.5	52.0	0.7		+13	54.6	0.8		+13	47.7	0.8		+13.5	46.0	0.9
Sample Port B	1/2	+5.5	51.7	0.7	1/2	+5	56.8	0.8	1/2	+5	47.7	0.7	1/2	+5.5	46.0	0.9
Sample Port C		+4	51.8	0.7		+3.5	56.7	0.8		+4	47.7	0.8		+4	46.0	0.9

Notes:

(1) Percent CH_4 (methane).
Shaded areas do not have reportable information.

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ECRS
Environmental
Construction &
Remediation
Services, Inc.

December 4, 1992

Ms. Theresa Evanson
Wisconsin Department of Natural Resources
Environmental Response and Repair Section
Bureau of Solid and Hazardous Waste Management
101 S. Webster, GEF II, SE/3
Madison, Wisconsin 53707

Re: Operation and Maintenance Summary - October 1992
Landfill Gas and Leachate Extraction System
Refuse Hideaway Landfill - Middleton, Wisconsin
Project No. 60024.00

Dear Ms. Evanson:

This letter summarizes operation and maintenance (O&M) activities performed by Environmental Construction and Remediation Services, Inc. (ECRS), during the month of October, 1992 at the Refuse Hideaway Landfill. Specific tasks are discussed in the following sections.

SCHEDULED LEACHATE LOADOUT

Leachate/Condensate was pumped and transported by Al's Modern Sewer Service (Al's) to the Madison Metropolitan Sewage District (MMSD) Treatment Plant. The hauling dates and quantities are as follows:

	Invoiced Volume (gals)	Measured Volume (gals)
October 15	5000	Not Available
October 22	5000	4142
October 30	5000	4031

We have requested Al's to record the measured volume of leachate on the Disposal Tickets supplied to MMSD. We should expect to see slightly lower disposal costs with MMSD's next quarterly invoice.

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WEEKLY/MONTHLY MONITORING SCHEDULE

Weekly/monthly monitoring of the landfill gas and leachate extraction system was performed on the following dates.

October 10, 1992	Weekly
October 13, 1992	Weekly
October 21, 1992	Weekly
October 30, 1992	Weekly/Monthly

Summary tables for weekly and monthly monitoring schedules are attached. Specific site observations are discussed in the following section:

OBSERVATION AND DISCUSSION

The Verbatim system alerted a General Alarm Condition at 1:30 a.m. on October 17, 1992. The cause of the General Alarm could not be determined; however, high winds may have been a factor in the system shutdown. The system was restarted at 10:15 a.m. on October 17, 1992.

Gas Wells No. 1 and No. 2 (GW-1 and GW-2) were closed on November 3, 1992 after decreased methane and increased oxygen levels continued to be monitored. Although the valves were firmly closed, slight negative pressure (-1 to -2 in. w.c.) continues to be exerted on the wells, potentially due to valve wear (leakage).

Concurrent with shutting down GW-1 and GW-2, the vacuum in the southern branch was increased in an attempt to withdraw more gas from GW-5 and subsequently reduce methane levels detected at Gas Probe GP-11. The levels at GP-11 have decreased and volumes of gas extracted have increased as illustrated in the following table:

MONITORED GAS CONCENTRATIONS

	GP-11S		GP-11D	
DATE	% LEL	% CH_4	% LEL	% CH_4
October 2, 1992	>100	12.4	>100	23.0
October 30, 1992	0	0	>100	12.2
November 24, 1992	4.0	.2	4.0	.2

MONITORED WELL PRESSURE AND GAS FLOWS

	GW-3		GW-4		GW-5	
DATE	Well Pressure	Gas Flow	Well Pressure	Gas Flow	Well Pressure	Gas Flow
October 2, 1992	-5	72	-8	27	-8	27
October 30, 1992	-5	67.5	-8	40.5	-8	33.8
November 24, 1992	-8.5	135	-14	56.3	-14	49.5

(Well pressure reported as inches of water column and gas flow as CFM)

The decrease in methane detected at GP-11 appears to be the result of increasing the vacuum on the southern branch, which increased gas recovery. We will continue to monitor these wells to verify that the increase in flow and pressure does not induce oxygen into the landfill and that the reduced levels of methane in GP-11 are maintained.

We have scheduled cleanout of the leachate conveyance lines for mid-December. We will also be removing the leachate pumps for inspection. At that time, we will identify the pump run-on problem with GW-9.

If you have any questions or comments, please feel free to call.

Sincerely,

ENVIRONMENTAL CONSTRUCTION AND REMEDIATION SERVICES, INC.

Kirk J. Solberg
Site Supervisor

Brian Hegge
Project Manager

Enclosures: As Stated

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TABLE 1

REFUSE HIDEAWAY LANDFILL
MONTHLY GAS EXTRACTION WELLS MONITORING INFORMATION

Date: October 30, 1992
Temperature: 48° at 11 a.m.
Barometric pressure: 30.13 inches Hg
Monitored by: K. Solberg
Gas Detector Model No.: GA 1.1
Gas Detector Serial No.: 381
Date last calibrated: Factory calibrated (June 1992)
Calibration check: October 30, 1992[4]

Well [1]	Well Pressure (in. W.C.)	Header Pressure (in. W.C.)	CH_4[2] (%)	O_2 (%)	Valve Setting (fraction open)	Gas Velocity (fpm)	Gas[3] Flow (cfm)	Gas Temperature (°F)
GW-1	-1	-9	11.7	1.7	2/13	<10	<.45	51.0
GW-2	-2	-9	12.6	0.8	4/13	250	11.3	57.3
GW-3	-5	-8.5	40.8	0.3	4/9	1500	67.5	63.6
GW-4	-8	-8.5	50.3	0.5	5/9	900	40.5	73.9
GW-5	-8	-8.5	56.3	0.5	7/9	750	33.8	82.0
GW-6	-3	-14	24.4	0.5	2/9	750	33.8	68.7
GW-7	-12.5	-13.5	51.9	0.7	5/9	1200	54.0	88.5
GW-8[1]	-12	-13.5	55.8	0.6	4/9	1100	49.5	92.6
GW-9[1]	-13	-13.5	55.3	0.6	4/9	1100	49.5	110.6
GW-10	-3	-7.5	41.0	0.5	4/9	750	33.8	94.4
GW-11[1]	-7	-7	56.0	0.6	5/9	600	27.0	102.7
GW-12	-5	-7	46.1	0.5	5/9	1375	61.9	99.3
GW-13	-6.5	-7	52.4	0.6	7/9	900	40.5	86.7

Notes:

(1) Wells with leachate extraction pump and controls.
(2) Percent CH_4 (methane).
(3) Gas flow (cfm) is calculated by multiplying the gas velocity (fpm) by 0.045 ft^2 for 3-inch diameter PVC pipe.
(4) Calibration check: 99% CH_4 read 97.6% CH_4; 0.8% O_2
2.5% CH_4 read 2.2% CH_4; 0.0% O_2
15% CO_2 read 14.3% CO_2; 0.7% O_2

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TABLE 2

REFUSE HIDEAWAY LANDFILL
MONTHLY GAS PROBE MONITORING INFORMATION

Date: October 30, 1992
Temperature: 45° at 9:00 a.m.
Barometric pressure: 30.13 inches Hg, rising
Monitored by: K. Solberg
Gas Detector Model No.: GA 1.1
Gas Detector Serial No.: 381
Date last calibrated: Factory calibrated (June 1992)
Calibration check: October 30, 1992[5]

Probe	Pressure in W.C.	CH_4 (%)	CH_4[1] (% LEL)	O_2 (%)
G-1S	0	0	0	20.8
G-1D	0	0	0	20.8
G-6	0	0	0	20.7
G-8	0	0	0	20.7
G-9	0	0	0	20.1
G-10	0	0	0	20.7
GP-11S	0	0	0	19.2
GP-11D	0	12.2	(2)	0.2
GPW-1S	0	0	0	18.8
GPW-1M	0	0	0	21.2
GPW-1D	0	0	0	18.6
Speedway Bldg[4]	N/A	0	0	21.1
Speedway Bldg[4]	N/A	0	0	21.1

Notes:

(1) Percent of lower explosive limit of CH_4 (100% LEL = 5% CH_4 by volume).
(2) Greater than 100% of the LEL.
(3) Readings obtained from the northeast corner of the interior of the scale house.
(4) Readings obtained from work shop.
(5) See calibration check data on Table 1.
NA Not applicable.

TABLE 3

REFUSE HIDEAWAY LANDFILL
MONTHLY BRANCH AND FLARE MONITORING INFORMATION
October 30, 1992

	Pressure (in. W.C.)	CH_4[(1)] (%)	O_2 (%)	Gas Velocity (fpm)	Flow[(2)] (cfm)	Flow[(3)] (scfm)	Gas Temperature	Valve Setting (fraction open)
Branch Monitoring Station								
North Branch	-9	48.0	0.3	1,900	148	147	65.6	5/13
Central Branch	-14.5	46.2	0.3	1,500	117	115	64.5	5/13
South Branch	-11	42.7	0.3	1,750	137	137	56.1	5/13
Flare Inlet Pipe								
Port A	+13.5	45.9	0.3	2,000	370	377	80.7	N/A
Port B	+5.5	45.9	0.3	1,900	352	350	81.5	1/2
Port C	+4	46.0	0.4	1,600	296	297	77.0	N/A

Notes:

(1) Percent CH_4 (methane).
(2) Gas velocity is converted to gas flow by multiplying fpm x 0.185 @ 6-inch HDPE and fpm x 0.078 @ 4-inch PVC.
(3) Flows have been converted to standard conditions of 70°F and 406.9 inches water.
NA Not available or not applicable

TABLE 4

REFUSE HIDEAWAY LANDFILL
MONTHLY LEACHATE HEAD MONITORING INFORMATION
October 30, 1992

Well	LEACHATE HEAD [2] (ft)			Current Pump Hours		Previous Pump Hours		Elapsed Pump Hours	
	Gas Well Depth	Depth to Leachate	Leachate Head	Total Hours	Time[3]	Total Hours	Time[3]	Total Hours	Pump Hours
GW-1	51.7	49.9	1.8						
GW-2	53.3	48.5	4.8						
GW-3	57	57.0	0						
GW-4	65	55.7	9.3						
GW-5	70	61.5	8.5						
GW-6	36	36.5	0						
GW-7	60	55.6	4.4						
GW-8[1]	69	63.7	5.3	4792.5	12:15	4781.3	11:00	697	11.2
GW-9[1]	66	48.4	17.6	7187.4	12:10	6542.7	11:35	696.5	644.7
GW-10	70	65.9	4.1						
GW-11[1]	65	65 (dry)	0	291.5	12:05	273.9	11:30	696.5	17.6
GW-12	81	68.1	12.9						
GW-13	69	62.8	6.2						

Notes:

(1) Wells with leachate extraction pumps and controls.

(2) Gas wells retro-fitted with threaded ports on riser October 1992. Leachate levels measured from Retro-fitted port on gas well riser. Gas well depths obtained from Construction Observations Report, November, 1990 and Operation and Maintenance Manual, November 1991.

(3) Time of hour meter reading was recorded on October 1 and October 30, 1992.

Shaded areas do not have reportable information.

TABLE 5

REFUSE HIDEAWAY LANDFILL
MONTHLY SUMMARY OF SYSTEM ALARM LOG
October 1992

Alarm Dates	Alarm Cause	Solution
October 17, 1992	General Alarm Possibly Wind	Restart October 17, 1992

TABLE 6

REFUSE HIDEAWAY LANDFILL
SUMMARY OF WEEKLY MONITORING INFORMATION
October 1992

	October 10, 1992				October 13, 1992				October 21, 1992				October 30, 1992			
Description	Valve Setting	Pressure (in. W.C.)	CH_4[(1)] (%)	O_2 (%)	Valve Setting	Pressure (in. W.C.)	CH_4[(1)] (%)	O_2 (%)	Valve Setting	Pressure (in. W.C.)	CH_4[(1)] (%)	O_2 (%)	Valve Setting	Pressure (in. W.C.)	CH_4[(1)] (%)	O_2 (%)
Branch Monitoring Station																
North Branch	8/13	-9	49.5	0.3	8/13	-9	50.7	0.2	8/13	-9	49.7	0.4	5/13	-9	48.0	0.3
Central Branch	8/13	-13	48.8	0.3	8/13	-13.5	50.3	0.1	8/13	-15	48.0	0.4	5/13	-14.5	46.2	0.3
South Branch	8/13	-11	45.5	0.1	8/13	-11	47.3	0.0	8/13	-11	44.6	0.5	5/13	-11	42.7	0.3
Blower Inlet Pipe																
Inlet Port A		-21	48.5	0.1		-21	50.1	0.2		-21.5	47.7	0.5		-21.5	46.0	0.3
Inlet Port B		-22	48.6	0.1		-22	50.3	0.2		-23	47.6	0.5		-22	45.3	0.4
Outlet Port A		+15	49.2	0.1		+15	50.2	0.2		+15	48.1	0.4		+15	45.8	0.3
Flare Inlet Pipe																
Sample Port A		+13	48.5	0.2		+13	50.0	0.3		+13.5	47.8	0.5		+13.5	45.9	0.3
Sample Port B	1/2	+5	48.8	0.2	1/2	+5	50.4	0.2	1/2	+5.5	48.0	0.4	1/2	+5.5	45.9	0.3
Sample Port C		+3.5	48.7	0.2		+4	50.4	0.2		+4	47.8	0.4		+4	46.0	0.4

Notes:

(1) Percent CH_4 (methane).
Shaded areas do not have reportable information.

ECRS
Environmental
Construction &
Remediation
Services, Inc.

2 04 93

February 3, 1993

Ms. Theresa Evanson
Wisconsin Department of Natural Resources
Environmental Response and Repair Section
Bureau of Solid and Hazardous Waste Management
101 South Webster Street, GEF II, SE/3
Madison, Wisconsin 53707

Re: Operation and Maintenance Summary - November 1992
Landfill Gas and Leachate Extraction System
Refuse Hideaway Landfill - Middleton, Wisconsin
Project No. 60024.00

Dear Ms. Evanson:

This letter summarizes operation and maintenance (O&M) activities performed by Environmental Construction and Remediation Services, Inc. (ECRS), during the month of November, 1992, at the Refuse Hideaway Landfill. Specific tasks are discussed in the following sections:

SCHEDULED LEACHATE LOADOUT

Leachate/Condensate was pumped and transported by Al's Modern Sewer Service to the Madison Metropolitan Sewage District Treatment facility. The hauling dates and quantities are as follows:

	Invoiced Volume (gals)	Measured Volume (gals)
November 13, 1992	5,000	4,360
November 28, 1992	5,000	5,149

WEEKLY/MONTHLY MONITORING SCHEDULE

Weekly/Monthly monitoring of the landfill gas and leachate extraction system was performed on the following dates:

November 3, 1992	Weekly
November 12, 1992	Weekly
November 17, 1992	Weekly
November 24, 1992	Weekly/Monthly
November 30, 1992	Weekly

ecrs\brian\94-nov.bjh

Ms. Theresa Evanson
WI Dept. of Natural Resources
Refuse Hideaway November Monthly Report

February 3, 1993
Project No. 60024.00

Summary tables for weekly and monthly monitoring schedules are attached. Specific site observations are discussed in the following section:

OBSERVATIONS AND DISCUSSION

The Verbatim System alerted a general alarm condition at 6:30 p.m. on November 1, 1992. The cause of the alarm was not determined; however, high winds may have may have caused the shutdown. The system was re-started on November 2, 1992, at 8:35 a.m.

Landfill gas odors were detected in the blower house on November 2, 1992, after the system had shutdown. Ambient air measurement indicated methane was present at a concentration of 54 percent of the LEL. It appears that landfill gas leaks from the blower after the 6-inch electronically activated butterfly valve downstream of the blower closes. The methane is under positive pressure from the gas wells.

Gas Wells GW-1 and GW-2 were closed on November 3, 1992, and the vacuum in the southern branch was increased in an attempt to withdraw more gas from GW-5. Methane levels detected at Gas Probe GP-11 have been reduced subsequently and the volume of gas extracted from GW-5 has increased (as reported in the October 1992 Monthly Report). We will continue to monitor these wells to verify that the increase in flow and pressure does not induce oxygen into the landfill and that the reduced levels of methane in GP-11 are maintained.

Landfill gas was detected seeping out of the landfill cover north of Gas Well GW-5.

We have reported carbon dioxide (CO_2) concentrations measured at the gas extraction wells in Table 1. Carbon dioxide concentrations provide valuable information in determining if air is being drawn into the well. By combining oxygen, methane and carbon dioxide values we can assume the remaining gas is nitrogen, which makes up 80 percent of the atmosphere. Therefore, by comparing gas data at GW-7, we can determine the following: 52.0 % CH_4 + 0.0 % O_2 + 38.0 % CO_2 = 90 % or 10 % nitrogen. Conclusion; the well is drawing a small amount of air through the cover into the landfill. If oxygen were present at a 80/20 relationship (same as atmosphere ratio), we could conclude that air is being drawn in through a break in the collection system.

Methane was detected at Gas Probe G-9 at 4.0 % of the LEL on November 24, 1992. This is the first time ECRS has detected methane at G-9.

Ms. Theresa Evanson
WI Dept. of Natural Resources
Refuse Hideaway November Monthly Report

February 3, 1993
Project No. 60024.00

The annual and quarterly leachate samples were collected on November 30, 1992, and submitted to Mid-State Associates for laboratory analysis. Analytical results have not yet been received.

If you have any questions or comments, please feel free to call.

Sincerely,

ENVIRONMENTAL CONSTRUCTION AND REMEDIATION SERVICES, INC.

Kirk Solberg/BJH
Kirk J. Solberg
Site Supervisor

Brian Hegge
Brian J. Hegge
Technical Manager

Enclosure: As Stated

ecrs\brian\94-nov.bjh

TABLE 1

REFUSE HIDEAWAY LANDFILL
MONTHLY GAS EXTRACTION WELLS MONITORING INFORMATION

Date: November 24, 1992
Temperature: 33° F at 10:00 a.m.
Barometric pressure: 30.10 inches Hg
Monitored by: K. Solberg
Gas Detector Model No.: GA 1.1
Gas Detector Serial No.: 381
Date last calibrated: Factory calibrated June 1992(4)

Well (1)	Well Pressure (inches W.C.)	Header Pressure (inches W.C.)	CH_4(2) (%)	O_2 (%)	CO_2 (%)	Valve Setting (fraction open)	Gas Velocity (fpm)	Gas(3) Flow (cfm)	Gas Temp (°F)
GW-1	-2.5	-15.5	11.9	4.9	17.6	0/13	0	0	35
GW-2	-3.5	-15	10.0	5.6	16.8	0/13	25	1.1	39
GW-3	-8.5	-14	37.0	0.3	32.3	4/9	3000	135	60.2
GW-4	-14	-14.5	54.8	0.4	38.5	6/9	1250	56.3	66
GW-5	-14	-14.5	56.6	1.0	41.9	7/9	1100	49.5	73.5
GW-6	-3.5	-15	22.0	0.5	26.5	3/9	800	36	62
GW-7	-13.5	-14.5	52.0	0.0	38.0	5/9	2000	90	87.4
GW-8(1)	-13	-14.5	56.0	0.9	41.2	5/9	1000	45	92.6
GW-9(1)	-14	-15	57.0	0.4	41.5	4/9	750	33.8	109.7
GW-10	-4	-8.5	38.9	0.2	32.8	4/9	1250	56.3	82
GW-11(1)	-8	-8	57.3	0.3	41.3	5/9	600	27	96.8
GW-12	-6.5	-8	52.3	0.1	37.8	5/9	2250	101.3	97.3
GW-13	-7.5	-8	53.0	0.5	39.9	7/9	1550	69.7	84

Notes:

(1) Wells with leachate extraction pump and controls.
(2) Percent CH_4 (methane).
(3) Gas flow (cfm) is calculated by multiplying the gas velocity (fpm) by 0.045 ft^2 for 3-inch diameter PVC pipe.
(4) Calibration checked November 24, 1992:
99% CH_4 read 98.6% CH_4
2.5% CH_4 read 2.3% CH_4
15% CO_2 read 14.5% CO_2

TABLE 2

REFUSE HIDEAWAY LANDFILL
MONTHLY GAS PROBE MONITORING INFORMATION

Date: November 24, 1992
Temperature: 33°F at 10:00 a.m.
Barometric pressure: 30.10 inches Hg
Monitored by: K. Solberg
Gas Detector Model No.: GA 1.1
Gas Detector Serial No.: 381
Date last calibrated: Factory calibrated June 1992 (4)

Probe	Pressure (inches W.C.)	CH_4 (%)	CH_4 (1) (% LEL)	O_2 (%)
G-1S	0	0	0	20.2
G-1D	0	0	0	20.2
G-6	0	0	0	20.1
G-8	0	0	0	19.9
G-9	0	0.2	4.0	20.0
G-10	-1.0	0	0	20.2
GP-11S	0	0.2	4.0	20.2
GP-11D	0	0.2	4.0	20.2
GPW-1S	0	0	0	18.6
GPW-1M	-0.5	0	0	20.1
GPW-1D	-1.0	0	0	21.1
Speedway Building (2)	N/A	0	0	20.1
Speedway Building (3)	N/A	0	0	20.1

Notes:

(1) Percent of lower explosive limit of CH_4 (100% LEL = 5% CH_4 by volume).
(2) Readings obtained from the northeast corner of the interior of the scale house.
(3) Readings obtained from interior of Mechanic's shop.
(4) See calibration data on Table 1.
NA Not applicable.

TABLE 3

REFUSE HIDEAWAY LANDFILL
MONTHLY BRANCH AND FLARE MONITORING INFORMATION
November 24, 1992

	Pressure (in. W.C.)	CH_4[(1)] (%)	O_2 (%)	Gas Velocity (fpm)	Flow[(2)] (cfm)	Flow[(3)] (scfm)	Gas Temp	Valve Setting (fraction open)
Branch Monitoring Station								
North Branch	-9.5	50	0.0	3000	234	236.9	54.6	6/13
Central Branch	-15.5	46.4	0.0	2250	175.5	175.3	53.6	6/13
South Branch	-16.5	44.4	0.1	(4)	(4)	(4)	47.6	6/13
Flare Inlet Pipe								
Port A	+13.5	47.7	0.0	3000	555	576.8	70.0	N/A
Port B	+5.5	47.2	0.0	3000	555	563.7	68.0	1/2
Port C	+3.5	47.5	0.0	3250	601.3	599.7	61.1	N/A

Notes:

(1) Percent CH_4 (methane).
(2) Gas velocity is converted to gas flow by multiplying fpm x 0.185 @ 6-inch HDPE and fpm x 0.078 @ 4-inch PVC.
(3) Flows have been converted to standard conditions of 70°F and 406.9 inches water.
(4) Velocity data not available due to instrument malfunction.
NA Not available or not applicable

TABLE 4

REFUSE HIDEAWAY LANDFILL
MONTHLY LEACHATE HEAD MONITORING INFORMATION
November 24, 1992

Well	LEACHATE HEAD [2] (ft)			Current Pump Hours		Previous Pump Hours		Elapsed Pump Hours	
	Gas Well Depth	Depth to Leachate	Leachate Head	Total Hours	Time[3]	Total Hours	Time[3]	Total Hours	Pump Hours
GW-1	51.7	49.8	1.9						
GW-2	53.3	66	0						
GW-3	57	59	0						
GW-4	65	54.9	10.1						
GW-5	70	60.4	9.6						
GW-6	36	37.7	0						
GW-7	60	55.9	4.1						
GW-8[1]	69	50.9	18.1	4796.4	12:38	4792.5	12:15	600	3.9
GW-9[1]	66	47.8	18.2	7785.7	13:00	7187.4	12:10	600	598.3
GW-10	70	65.9	4.1						
GW-11[1]	65	48.4	16.6	296.5	12:55	291.5	12:05	600	5.0
GW-12	81	66.7	14.3						
GW-13	69	62.9	6.1						

Notes:

(1) Wells with leachate extraction pumps and controls.
(2) Gas wells retro-fitted with threaded ports on risers October 1992. Leachate levels measured from retro-fitted port on gas well riser. Gas well depths obtained from Construction Observation Report, November, 1990 and Operation and Maintenance Manual, November 1991.
(3) Time of hour meter reading was recorded on October 30 and November 24, 1992.
NA Previous pump hour readings were not available.
Shaded areas do not have reportable information.

TABLE 5

REFUSE HIDEAWAY LANDFILL
MONTHLY SUMMARY OF SYSTEM ALARM LOG
November 24, 1992

Alarm Dates	Alarm Cause	Solution
November 1, 1992	Unknown(1)	Restarted 11/2/92

Notes:

(1) High winds may have caused system shutdown.

TABLE 6

REFUSE HIDEAWAY LANDFILL
SUMMARY OF WEEKLY MONITORING INFORMATION
November 1992

Description	November 3, 1992				November 12, 1992				November 17, 1992				November 24, 1992				November 30, 1992			
	Valve Setting	Pressure (in. W.C.)	CH_4 (1) (%)	O_2 (%)	Valve Setting	Pressure (in. W.C.)	CH_4 (1) (%)	O_2 (%)	Valve Setting	Pressure (in. W.C.)	CH_4 (1) (%)	O_2 (%)	Valve Setting	Pressure (in. W.C.)	CH_4 (1) (%)	O_2 (%)	Valve Setting	Pressure (in. W.C.)	CH_4 (1) (%)	O_2 (%)
Branch Monitoring Station																				
North Branch	5/13	-9	52.2	0.5	6/13	-9	48.5	0.5	6/13	-9.5	47.9	0.6	6/13	-9.5	50	0.0	6/13	-9.5	49.3	0.4
Central Branch	5/13	-14.5	51.1	0.4	6/13	-14	46.3	0.4	6/13	-15	44.4	0.7	6/13	-15.5	46.4	0.0	6/13	-15	45.6	0.4
South Branch	6/13	-16	51.0	0.0	6/13	-16	43.4	0.6	6/13	-17	42.5	0.5	6/13	-16.5	44.4	0.1	6/13	-17	45.1	0.4
Blower Inlet Pipe																				
Inlet Port A		-21	51.1	0.3		-20	46.9	0.2		-21.5	45.3	0.5		-21.5	46.8	0.0		-21	46.8	0.4
Inlet Port B		-22	50.9	0.3		-21	47.2	0.1		-22.5	45.5	0.5		-22	46.2	0.3		-22	45.1	1.1
Outlet Port A		+15	51.2	0.2		+16	47.5	0.1		+16	46.0	0.4		+16	47.4	0.0		+16	47.8	0.1
Flare Inlet Pipe																				
Sample Port A		+13	51.2	0.2		+14	47.4	0.3		+13.5	45.9	0.4		+13.5	47.7	0.0		+13.5	48.0	0.1
Sample Port B		+5.5	51.2	0.1		+5.5	47.7	0.2		+5.5	45.8	0.3		+5.5	47.2	0.0		+5.5	48.2	0.1
Sample Port C		+3.5	51.2	0.2		+4	47.7	0.1		+4	46.3	0.4		+3.5	47.5	0.0		+4	48.4	0.1

Notes:

(1) Percent CH_4 (methane) shaded areas do not have reportable information.

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ECRS
Environmental
Construction &
Remediation
Services, Inc.

February 17, 1993

Ms. Theresa Evanson
Wisconsin Department of Natural Resources
Environmental Response and Repair Section
Bureau of Solid and Hazardous Waste Management
101 South Webster Street, GEF II, SE/3
Madison, Wisconsin 53707

Re: Revision To - November 1992 Monthly Report
Landfill Gas and Leachate Extraction System
Refuse Hideaway Landfill - Middleton, Wisconsin
Project No. C6024.01

Dear Ms. Evanson:

It has come to my attention that Table 3, Monthly Branch and Flare Monitoring Information, contains an error in reported information. The flow information for the south branch should be deleted. No information was obtained due to an instrument malfunction. An updated Table 3 is enclosed.

We have since purchased an Alnor Velometer and therefore do not anticipate any future problems obtaining accurate flow information. This was the third Dwyer Velometer that has malfunctioned since we began monitoring at Refuse Hideaway.

If you have any questions or comments, please feel free to call. We apologize for any inconvenience this may have caused.

Sincerely,

ENVIRONMENTAL CONSTRUCTION AND REMEDIATION SERVICES, INC.

NOTE: TABLE 3 (revised) placed in NOV. 1992 monitoring report

Brian J. Hegge
Technical Manager

Enclosure: As Stated

ECRS\Refuse\91-02/16/93.bjh

ECRS
Environmental
Construction &
Remediation
Services, Inc.

February 17, 1993

Ms. Theresa Evanson
Wisconsin Department of Natural Resources
Environmental Response and Repair Section
Bureau of Solid and Hazardous Waste Management
101 South Webster Street, GEF II, SE/3
Madison, Wisconsin 53707

Re: Operation and Maintenance Summary - December 1992
Landfill Gas and Leachate Extraction System
Refuse Hideaway Landfill - Middleton, Wisconsin
Project No. C6024.01

Dear Ms. Evanson:

This letter summarizes operation and maintenance (O&M) activities performed by Environmental Construction and Remediation Services, Inc. (ECRS), during the month of December, 1992, at the Refuse Hideaway Landfill. Specific tasks are discussed in the following sections:

SCHEDULED LEACHATE LOADOUT

Leachate/Condensate was pumped and transported by Al's Modern Sewer Service to the Madison Metropolitan Sewage District Treatment facility. The hauling dates and quantities are as follows:

	Measured Volume (gals)
December 21, 1992	2,986

WEEKLY/MONTHLY MONITORING SCHEDULE

Weekly/Monthly monitoring of the landfill gas and leachate extraction system was performed on the following dates:

December 8, 1992	Weekly
December 16, 1992	Weekly
December 23, 1992	Weekly
December 30-31, 1992	Weekly/Monthly/Quarterly/Annual

Summary tables for weekly and monthly monitoring schedules are attached. Specific site observations are discussed in the following section:

2201 Vondron Road, Madison, WI 53704-6795 (608) 221-3556 FAX (608) 221-3991

OBSERVATIONS AND DISCUSSION

Landfill gas odors have continued to be detectable in the blower house. Ambient air measurements will be continued whenever the system is shutdown to obtain information on the level of methane that accumulates in the blower house. If landfill gas concentrations continue to exceed 20 percent of the LEL, it may be advisable to reinstall the electronically activated valve upstream of the blower. Moving this valve would prevent the gas under positive pressure from the landfill from leaking out of the blower.

Gas Wells GW-1 and GW-2 were closed on November 3, 1992, and the vacuum in the southern branch was increased to withdraw more gas from GW-5. We have not reopened the wells. We are continuing to monitor the southern branch wells to verify that increased pressure does not induce oxygen into the landfill and that the reduced levels of methane in GP-11 are maintained.

Methane was detected at Gas Probe G-9 at 4.0 % of the LEL on November 24, 1992. Methane was not detected at any gas probes during December monthly monitoring.

Landfill gas odors continue to be detectable near Gas Well GW-5. The monitoring valves were frozen on the flare inlet pipe on December 23, 1992 during weekly monitoring. No readings were obtainable.

The volume of leachate hauled to the wastewater treatment facility decreased substantially during the month of December. A total volume of 2,986 gallons was removed from the leachate tank.

The leachate conveyance line was cleaned out on December 23, 1992. The leachate pumps were removed from GW-8P, GW-9P and GW-11P and inspected. The discharge hoses inside the gas wells at GW-8P and GW-11P were kinked. Approximately 2 feet of hose at GW-8P and 6.5 feet of hose at GW-11P were removed and the pumps reset at the previous depths. A small hole was made in the discharge hose near the pump to allow liquids to drain out of the hose after the pump cycle. The flange at GW-11P is cracked and requires replacement. We will schedule this replacement to coincide with monthly monitoring.

The electrical connection to the leachate pump at GW-9P was shorted at the junction box. The short appears to have occurred when the pump was set in the well and the weight of the pump was supported by the electrical wiring and not the cable used to suspend the pump.

An obstruction consisting of nylon rope was discovered in the well at approximately 50 feet. This obstruction initially prevented the pump from being reset. We removed enough of the rope, prior to breaking, to reinstall the pump at its original depth. We could not determine how much rope remains in the well, or whether the rope will continue to cause an obstruction or possibly interfere with pump performance. The electrical connection was repaired by an electrician and the pump reinstalled. The hour meter was repaired to prevent continuous recording.

Quarterly and annual monitoring schedules were completed this month in addition to regularly scheduled monthly and weekly work tasks. Aside from the above discussions, no unusual circumstances were encountered.

If you have any questions or comments, please feel free to call.

Sincerely,

ENVIRONMENTAL CONSTRUCTION AND REMEDIATION SERVICES, INC.

Brian J. Hegge
Technical Manager

Enclosures: As Stated

ECRS\Refuse\92-Dec.bjh

TABLE 1

REFUSE HIDEAWAY LANDFILL
MONTHLY GAS EXTRACTION WELLS MONITORING INFORMATION

Date: December 30, 1992
Temperature: 35° F at 1:30 p.m.
Barometric pressure: 30.03 inches Hg
Monitored by: K. Solberg
Gas Detector Model No.: GA 1.1
Gas Detector Serial No.: 381
Date last calibrated: Factory calibrated June 1992(4)

Well (1)	Well Pressure (inches W.C.)	Header Pressure (inches W.C.)	CH_4(2) (%)	O_2 (%)	Valve Setting (fraction open)	Gas Velocity (fpm)	Gas(3) Flow (cfm)	Gas Temp (°F)
GW-1	-1	-15	12.0	1.0	shut	75	3.4	37.0
GW-2	-2	-15	11.1	1.5	shut	0	0	36.1
GW-3	-7	-14	37.8	0.4	4/9	3000	135	57.7
GW-4	-14	-14.5	49.2	0.3	5/9	1250	56.3	63.3
GW-5	-14	-14.5	55.7	0.4	7/9	900	40.5	73.0
GW-6	-3.5	-15	19.3	0.0	2/9	900	40.5	63.0
GW-7	-14	-15	52.5	0.0	5/9	1750	78.8	87.2
GW-8(1)	-14.5	-15	56.7	0.0	3/9	1000	45.0	93.0
GW-9(1)	-13.5	-14	56.8	0.5	6/9	750	33.8	108
GW-10	-3	-9	43.4	0.0	4/9	1250	56.3	90.0
GW-11(1)	-9	-9	57.3	0.0	5/9	500	22.5	93.0
GW-12	-6.5	-8	47.1	0.0	5/9	2000	90.0	96.6
GW-13	-8	-8	51.2	0.0	7/9	1500	67.5	82.0

Notes:

(1) Wells with leachate extraction pump and controls.
(2) Percent CH_4 (methane).
(3) Gas flow (cfm) is calculated by multiplying the gas velocity (fpm) by 0.045 ft^2 for 3-inch diameter PVC pipe.
(4) Calibration checked December 24, 1992:
    99% CH_4 read 98 % CH_4
    2.5% CH_4 read 2.3 % CH_4
    15% CO_2 read 14.3 % CO_2
(5) Carbon dioxide concentrations were not recorded during the December monthly.

TABLE 2

REFUSE HIDEAWAY LANDFILL
MONTHLY GAS PROBE MONITORING INFORMATION

Date: December 31, 1992
Temperature: 15°F at 8:30 a.m.
Barometric pressure: 30.17 inches Hg
Monitored by: K. Solberg
Gas Detector Model No.: GA 1.1
Gas Detector Serial No.: 381
Date last calibrated: Factory calibrated June 1992 (4)

Probe	Pressure (inches W.C.)	CH_4 (%)	CH_4 (1) (% LEL)	O_2 (%)
G-1S	0.0	0.0	0.0	20.5
G-1D	-0.5	0.0	0.0	20.1
G-6	0.0	0.0	0.0	19.7
G-8	0.0	0.0	0.0	18.7
G-9	0.0	0.0	0.0	18.7
G-10	-1.5	0.0	0.0	18.0
GP-11S	0.0	0.0	0.0	19.3
GP-11D	0.0	0.0	0.0	19.5
GPW-1S	0.0	0.0	0.0	21.8
GPW-1M	-1.5	0.0	0.0	21.8
GPW-1D	-1.5	0.0	0.0	22.1
Speedway Building (2)	NA	0.0	0.0	20.5
Speedway Building (3)	NA	0.0	0.0	20.3

Notes:

(1) Percent of lower explosive limit of CH_4 (100% LEL = 5% CH_4 by volume).
(2) Readings obtained from the northeast corner of the interior of the scale house.
(3) Readings obtained from interior of Mechanic's shop.
(4) See calibration data on Table 1.
NA Not applicable.

TABLE 3

REFUSE HIDEAWAY LANDFILL
MONTHLY BRANCH AND FLARE MONITORING INFORMATION
December 30, 1992

	Pressure (in. W.C.)	CH_4[(1)] (%)	O_2 (%)	Gas Velocity (fpm)	Flow[(2)] (cfm)	Flow[(3)] (scfm)	Gas Temp	Valve Setting (fraction open)
Branch Monitoring Station								
North Branch	-10	47.1	0.0	2750	214.5	220.3	45.3	6/13
Central Branch	-16	43.5	0.0	1750	136.5	137.7	46.5	6/13
South Branch	-18.5	43.8	0.0	2550	198.9	201.9	40.4	6/13
Flare Inlet Pipe								
Port A	+13.5	45.3	0.0	2250	416.3	443.5	55.2	N/A
Port B	+5	45.1	0.0	2450	453.3	468.9	60.5	1/2
Port C	+3.5	44.8	0.0	2600	481.0	499.5	56.6	N/A

Notes:

(1) Percent CH_4 (methane).
(2) Gas velocity is converted to gas flow by multiplying fpm x 0.185 @ 6-inch HDPE and fpm x 0.078 @ 4-inch PVC.
(3) Flows have been converted to standard conditions of 70°F and 406.9 inches water.
NA Not applicable.

TABLE 4

REFUSE HIDEAWAY LANDFILL
MONTHLY LEACHATE HEAD MONITORING INFORMATION
December 30, 1992

Well	LEACHATE HEAD [2] (ft)			Current Pump Hours		Previous Pump Hours		Elapsed Pump Hours	
	Gas Well Depth	Depth to Leachate	Leachate Head	Total Hours	Time[3]	Total Hours	Time[3]	Total Hours	Pump Hours
GW-1	51.7	49.3	2.4						
GW-2	53.3	48.8	4.5						
GW-3	57	56.5	0.5						
GW-4	65	53.8	11.2						
GW-5	70	59.5	10.5						
GW-6	36	36.5	Dry						
GW-7	60	55.4	4.6						
GW-8[1]	69	49.8	19.2	4959.8	10:00	4796.4	12:38	861	163.4
GW-9[1]	66	38.5	27.5	8476.4	(4)	7785.7	13:00	861	690.7
GW-10	70	65.2	4.8						
GW-11[1]	65	45.7	19.3	303.7	9:50	296.5	12:55	861	7.2
GW-12	81	53.0	28						
GW-13	69	61.6	7.4						

Wrong pump run on

meter reading — Time of Day — Clock hrs over last month — ~170 hrs of total pumping. 170 × 5 gal = 850.

Notes:

(1) Wells with leachate extraction pumps and controls.
(2) Gas wells retro-fitted with threaded ports on risers October 1992. Leachate levels measured from retro-fitted port on gas well riser. Gas well depths obtained from Construction Observation Report, November, 1990 and Operation and Maintenance Manual, November 1991.
(3) Time of hour meter reading was recorded on November 24 and December 30, 1992.
(4) Leachate pump was turned off December 23, 1992, after electrical short was discovered.
NA Previous pump hour readings were not available.
Shaded areas do not have reportable information.

TABLE 5

REFUSE HIDEAWAY LANDFILL
MONTHLY SUMMARY OF SYSTEM ALARM LOG
December 1992

Alarm Dates	Alarm Cause	Solution
None		

TABLE 6

REFUSE HIDEAWAY LANDFILL
SUMMARY OF WEEKLY MONITORING INFORMATION
December 1992

Description	December 8, 1992				December 16, 1992				December 23, 1992				December 30, 1992			
	Valve Setting	Pressure (in. W.C.)	CH_4 (1) (%)	O_2 (%)	Valve Setting	Pressure (in. W.C.)	CH_4 (1) (%)	O_2 (%)	Valve Setting	Pressure (in. W.C.)	CH_4 (1) (%)	O_2 (%)	Valve Setting	Pressure (in. W.C.)	CH_4 (1) (%)	O_2 (%)
Branch Monitoring Station																
North Branch	6/13	-10	51.7	0.3	6/13	-11	45.8	0.3	6/13	-11	47.3	0.1	6/13	-10	47.1	0.0
Central Branch	6/13	-16	48.5	0.3	6/13	-17	41.9	0.3	6/13	-15.5	44.8	0.1	6/13	-16	43.5	0.0
South Branch	6/13	-18	46.8	0.3	6/13	-18	41.5	0.4	6/13	-19	42.5	0.1	6/13	-18.5	43.8	0.0
Blower Inlet Pipe																
Inlet Port A		-22	49.1	0.3		-22.5	42.4	0.5		-22.5	44.3	0.2		-23	44.7	0.0
Inlet Port B		-23	48.7	0.3		-23.5	42.4	0.5		-23.5	44.4	0.2		-23.5	45.1	0.0
Outlet Port A		+16	50.1	0.0		+15	43.6	0.0		+15	45.5	0.0		+15	45.3	0.0
Flare Inlet Pipe																
Sample Port A		+13.5	49.9	0.2		+13	43.7	0.0		Monitoring valves frozen				+13	45.3	0.0
Sample Port B		+5	49.4	0.0		+5	43.3	0.0		Monitoring valves frozen				+5	45.1	0.0
Sample Port C		+3.5	49.5	0.0		+3.5	43.8	0.0		Monitoring valves frozen				+3.5	44.8	0.0

Notes:

(1) Percent CH_4 (methane).
Shaded areas do not have reportable information.

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