

Dust / Landfill Gas / Leachate Monitoring Results 2004 & 2005

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Article 14(2)(b)(ii) Further Information

Particulars and Evidence

For

Greenstar Ltd

Waste Licence Application No. 53-3

Article 12 Compliance

Environmental Monitoring Information 2004 & 2005

Prepared By: -

O' Callaghan Moran & Associates, Granary House, Rutland Street, Cork.

27th July 2005

TABLE OF CONTENTS

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	INTRODUCTION	
2.	RESPONSES	2

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1. INTRODUCTION

In accordance with the Notice issued in accordance with Article 14(2)(b)(ii) of the Waste Management Licensing Regulations, and specifically requests (3), (4) and (5) of Article 12 of that request, Greenstar Limited (Greenstar) has prepared the following information in relation to the application for the review of a Waste Licence, at Fassaroe Bray, Co. Wicklow (Waste Licence Register 53-3).

Section 2 contains the responses to the requests by the Agency for dust, leachate and landfill gas monitoring carried out during 2004 & 2005. For ease of interpretation each of the requests are presented in italics followed by Greenstar's response.

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2. RESPONSES

1. Submit dust monitoring results for 2004 and 2005 including a full interpretation of the obtained results.

The licence requires dust monitoring to be completed three times annually. Twice during the period May to September and once outside this time. No dust monitoring has been completed as yet for 2005. The dust levels recorded during 2004 are presented on Table 1.

2. Submit landfill gas monitoring results for 2004 and 2005 including a full interpretation of the obtained results.

The landfill gas monitoring is conducted monthly. The programme includes measurements of methane, carbon dioxide, oxygen and atmospheric pressure. The monitoring locations specified in the Licence include seven landfill gas wells (GS-05, GS-06, GS-07, GS-08, GS-09, GS-10 and GS-11), the four groundwater monitoring wells (BH-2, BH-5, BH-6 and BH-7) and two of the leachate boreholes (L-01, L-02). Leachate monitoring location L-03 is also included in the monitoring programme. The results are reported in the quarterly reports, which includes an interpretation of the data.

The results for 2004 and the monitoring in 2005 completed to date along with an interpretation of the data are presented below.

Dust Monitoring Fassaroe 2004

Table 1

Location Number	ocation Number WLA Licence Dust Deposition Limit		Aug-Sept 04	Nov-Dec 04	Dec-Jan 04	
	(mg/m2/day)	Dust (mg/m2/day)	Dust (mg/m2/day)	Dust (mg/m2/day)	Dust (mg/m2/day)	
DS-1	350	Gauge Contaminated	1690 (366 mg organic, 1324 mg inorganic)	82 (40 mg organic, 42 mg inorganic)	202 (47 mg organic, 155 mg inorganic)	
DS-2	350	332 (80 mg organic, 252 mg inorganic)	488 (132 mg organic, 356 mg morganic)	135 (22 mg organic, 113 mg inorganic)	359 (58 mg organic, 301 mg inorganic)	
DS-3	350	Gauge Contaminated	368 (112 mg organic, 256 mg inorganic)	167 (47 mg organic, 120 mg inorganic)	272 (99mg organic, 173 mg inorganic)	
DS-4	350	Gauge Damaged	3220 (324 mg organic, 896 mg inorganic)	2555 (364 mg organic, 2191 mg inorganic)	Gauge Damaged	

Landfill Gas Monitoring Q1 2004

LANDFII	L GAS MON	ITORING	FOL	M			Baselir	ie i i kalenda	Ambient x
Site Nam	e: Greenstar	Materials	Reco	overy Ltd		Site	Address:	Fassaroe, Bra	y, Co. Wicklow
Fassaroe D			н						
Operator:	GREENSTAR	L				Natio	onal Grid	Reference: E	E3242, N2179
	s: Operational					Date	: 27/01/20)04	The state of the s
Instrumer			Norn	Rang	e:				
Gas Data I	LMSx		0 - 10						
	g Personnel:					ther:			
OCM					Scatte	red showers	s, windy		
				Res	ults				
Sample	Borehole/	Tempera	iture	CH ₄	C	O_2	O ₂	Barometric	Comment
Station	spike/other	°C		(% v/v)	(%	v/v)	(% v/v)	Pressure	
Number				0.0				(mb)	
GS-01	Borehole	5.6	5.6		4.2		13.2	1021	
GS-05	Borehole	5.2	5.2		l	.9	d\$5.8	1021	
GS-06	Borehole	5.1		0.0	7.9 on its for		11.5	1021	
GS-07	Borehole	5.0		0.0	n Pirio	.0	9.5	1021	
GS-08	Borehole	5.5		0.000000		.1	17.2	1021	
GS-09	Borehole	5.6		0.0	7	.9	11.5	1021	
GS-11	Borehole	6.3	Cons	0.0	12	2.4	7.0	1019	
BH-2	Borehole	5.0		0.0		.1	17.9	1021	
BH-5	Borehole	7.2		0.0	0	.1	17.8	1021	
BH-6	Borehole	5.1		0.0	0	.4	17.7	1021	
BH-7	Borehole	5.0		0.0	0	.6	17.0	1020	
L-01	Borehole	5.8		0.0	3	.6	14.4	1020	The state of the s

Borehole

L-02

Not Accessible -

Covered by Retaining Wall

Results Sample Borehole/ Temperature CH ₄ CO ₂ O ₂ Barometric Comment Station spike/other °C (% v/v) (% v/v) (% v/v) Pressure	LANDFII	LL GAS MON	ITORING FORI	VI de la companya de	Ba	seline	Ar	nbient x			
National Grid Reference: E3242, N2179			laterials Recovery	y Ltd. –	Site Addr	ess: Fassar					
Date 26/02/2004				****							
Normal Analytical Range:	Operator:	GREENSTAR	L		National Grid Reference: E3242, N2179						
Sas Data LMSx	Site Status	s: Operational			Date: 26/02/2004						
Nonitoring Personnel: Overcast, dry, cold	Instrumer	nt used:	Normal Ar	nalytical F	Range:						
Number Station Spike/other Spike/other	Gas Data I	LMSx	0 – 100%								
Number Sample Sometime Station Spike/other Station Spike/other Station Spike/other Station Spike/other Station Spike/other Station Spike/other Station Station Spike/other Station Station Spike/other Station Station Spike/other Station Spike/other Station Station Station Spike/other Station S	Monitorin	g Personnel:			Weather:						
Sample Station Spike/other Station Spike/other	OCM				Overcast, dr	y, cold					
Station Number spike/other °C (% v/v) (% v/v) (% v/v) Pressure (mb) GS-01 Borehole 5.8 0.0 2.2 17.2 1014 GS-05 Borehole 5.4 0.0 3.8 14.5 1014 GS-06 Borehole 5.5 0.0 7.8% 11.5 1014 GS-07 Borehole 5.7 0.0 7.9 11.5 1013 GS-08 Borehole 5.7 0.0 7.9 11.5 1013 GS-09 Borehole 5.9 7.9 11.5 1012 GS-11 Borehole 6.4 0.0 13.0 4.6 1012 BH-2 Borehole 5.2 0.0 0.0 17.2 1016 BH-5 Borehole 7.3 0.0 2.8 14.0 1014 BH-6 Borehole 5.2 0.0 0.6 16.9 1014 BH-7 Borehole 5.2 0.0				Res	ults		_				
Number (mb) GS-01 Borehole 5.8 0.0 2.2 17.2 1014 GS-05 Borehole 5.4 0.0 3.8 14.5 1014 GS-06 Borehole 5.5 0.0 7.8 kg/d 11.5 1014 GS-07 Borehole 5.7 0.0 kg/d 7.9 11.5 1013 GS-08 Borehole 5.7 0.0 kg/d 7.9 11.5 1013 GS-09 Borehole 5.9 0.0 9.3 7.5 1012 GS-11 Borehole 6.4 0.0 13.0 4.6 1012 BH-2 Borehole 5.2 0.0 0.0 17.2 1016 BH-5 Borehole 7.3 0.0 2.8 14.0 1014 BH-6 Borehole 5.2 0.0 0.6 16.9 1014 BH-7 Borehole 5.2 0.0 0.6 16.9 1014	Sample	Borehole/	Temperature	CH ₄	CO ₂	O ₂	Barometric	Comment			
GS-01 Borehole 5.8 0.0 2.2 17.2 1014 GS-05 Borehole 5.4 0.0 3.8 14.5 1014 GS-06 Borehole 5.5 0.0 7.8 11.5 1014 GS-07 Borehole 5.7 0.0 7.9 11.5 1013 GS-08 Borehole 5.9 5.0 9.3 7.5 1012 GS-11 Borehole 6.4	Station	spike/other	°C	(% v/v)	(% v/v)	(% v/v)	Pressure				
GS-05 Borehole 5.4 0.0 3.8 14.5 1014 GS-06 Borehole 5.5 0.0 7.8 11.5 1014 GS-07 Borehole Borehole Borehole 5.7 0.0 7.9 11.5 1013 GS-08 Borehole 5.9 1012 1013 GS-09 Borehole 5.9 1012 1012 GS-11 Borehole 6.4 0.0 13.0 4.6 1012 BH-2 Borehole 5.2 0.0 0.0 17.2 1016 BH-5 Borehole 7.3 0.0 2.8 14.0 1014 BH-6 Borehole 5.2 0.0 0.4 17.0 1014 BH-7 Borehole 5.2 0.0 0.6 16.9 1014	Number						(mb)				
GS-06 Borehole 5.5 0.0 7.8 cm / per legal 11.5 1014 GS-07 Borehole Borehole Borehole Borehole Borehole Destroyed GS-08 Borehole 5.7 0.0 destroyed 7.9 11.5 1013 GS-09 Borehole 5.9 10.0 destroyed 9.3 7.5 1012 GS-11 Borehole 6.4 0.0 13.0 4.6 1012 BH-2 Borehole 5.2 0.0 0.0 17.2 1016 BH-5 Borehole 7.3 0.0 2.8 14.0 1014 BH-6 Borehole 5.3 0.0 0.4 17.0 1014 BH-7 Borehole 5.2 0.0 0.6 16.9 1014	GS-01	Borehole	5.8	0.0	2.2		1014				
GS-06 Borehole 5.5 0.0 7.8 cm / per legal 11.5 1014 GS-07 Borehole Borehole Borehole Borehole Borehole Destroyed GS-08 Borehole 5.7 0.0 destroyed 7.9 11.5 1013 GS-09 Borehole 5.9 10.0 destroyed 9.3 7.5 1012 GS-11 Borehole 6.4 0.0 13.0 4.6 1012 BH-2 Borehole 5.2 0.0 0.0 17.2 1016 BH-5 Borehole 7.3 0.0 2.8 14.0 1014 BH-6 Borehole 5.3 0.0 0.4 17.0 1014 BH-7 Borehole 5.2 0.0 0.6 16.9 1014	GS-05	Borehole	5.4			14.5	1014				
GS-09 Borehole 5.9 7.5 1012 GS-11 Borehole 6.4 7.3 0.0 13.0 4.6 1012 BH-2 Borehole 5.2 0.0 0.0 17.2 1016 BH-5 Borehole 7.3 0.0 2.8 14.0 1014 BH-6 Borehole 5.2 0.0 0.4 17.0 1014 BH-7 Borehole 5.2 0.0 0.6 16.9 1014	GS-06	Borehole	5.5	0.0	7.814.	11.5	1014	7 10 000 1000 1000 1000			
GS-09 Borehole 5.9 7.5 1012 GS-11 Borehole 6.4 7.3 0.0 13.0 4.6 1012 BH-2 Borehole 5.2 0.0 0.0 17.2 1016 BH-5 Borehole 7.3 0.0 2.8 14.0 1014 BH-6 Borehole 5.2 0.0 0.4 17.0 1014 BH-7 Borehole 5.2 0.0 0.6 16.9 1014	GS-07	Borehole		. 3	Purpolities	1					
GS-09 Borehole 5.9 6.00 9.3 7.5 1012 GS-11 Borehole 6.4 0.0 13.0 4.6 1012 BH-2 Borehole 5.2 0.0 0.0 17.2 1016 BH-5 Borehole 7.3 0.0 2.8 14.0 1014 BH-6 Borehole 5.3 0.0 0.4 17.0 1014 BH-7 Borehole 5.2 0.0 0.6 16.9 1014	GS-08	Borehole		initial	7.9	11.5	1013	Destroyed			
GS-11 Borehole 6.4 0.0 13.0 4.6 1012 BH-2 Borehole 5.2 0.0 0.0 17.2 1016 BH-5 Borehole 7.3 0.0 2.8 14.0 1014 BH-6 Borehole 5.3 0.0 0.4 17.0 1014 BH-7 Borehole 5.2 0.0 0.6 16.9 1014	GS-09	Borehole	5.9	\$ CO.0	9.3	7.5	1012	V-5-11044-4-4-4			
BH-2 Borehole 5.2 0.0 0.0 17.2 1016 BH-5 Borehole 7.3 0.0 2.8 14.0 1014 BH-6 Borehole 5.3 0.0 0.4 17.0 1014 BH-7 Borehole 5.2 0.0 0.6 16.9 1014		Borehole	6.4 conser		13.0	4.6	1012				
BH-6 Borehole 5.3 0.0 0.4 17.0 1014 BH-7 Borehole 5.2 0.0 0.6 16.9 1014	BH-2	Borehole	5.2		0.0	17.2	1016				
BH-7 Borehole 5.2 0.0 0.6 16.9 1014											
L-01 Borehole 6.0 0.0 14.0 0.2 1014											
	L-01	Borehole	6.0	0.0	14.0	0.2	1014				

Borehole

5.9

L-02

0.0

11.0

4.9

1013

LANDFIL	L GAS MON	ITORING FORM	M	Ba	seline	Ar	nbient x				
		laterials Recovery		administration of the property							
Fassaroe D	Depot										
Operator:	GREENSTAR			National Grid Reference: E3242, N2179							
	s: Operational			Date: 29/03/2004							
Instrumer		Normal An	alytical F	Range:							
Gas Data I	WALL TO THE TOTAL THE TOTAL TO THE TOTAL TOT	0 – 100%									
	g Personnel:			Weather:							
OCM				Clear, dry, s	unny						
			Res	sults							
Sample	Borehole/	Temperature	CH ₄	CO ₂	O ₂	Barometric	Comment				
Station	spike/other	°C	(% v/v)	(% v/v)	(% v/v)	Pressure					
Number						(mb)					
GS-01	Borehole	7.6	0.0	0.5	16.8	1023					
GS-05	Borehole	7.2	0.0	2.2	15,9	1022					
GS-06	Borehole	7.1	0.0	5.7 all	13.4	1022					
GS-07	Borehole			A Purpose for For			Borehole Destroyed				
GS-08	Borehole	7.5	0.0 pools	wine 11	5.3	1023					
GS-09	Borehole	7.6	\$0,000	2.1	17.2	1022					
GS-11	Borehole	8.3	0.0 o	12	7.0	1022					
BH-2	Borehole	8.0	0.0	0.1	17.5	1022					
BH-5	Borehole	7.2	0.0	0.1	17.0	1022					
BH-6	Borehole	7.1	0.0	0.1	17.5	1022					
ВН-7	Borehole	7.0	0.0	0.0	18.1	1022					
L - 01	Borehole	7.8	0.0	6.5	16.3	1022					
L-02	Borehole	7.8	0.0	6.5	16.3	1022					

Methane was not detected in any of the monitoring locations over the three monitoring events. In January, carbon dioxide was detected above the carbon dioxide emission trigger level of 1.5% v/v at three boreholes located outside the waste body GS-01 (4.2% v/v), GS-05 (2.9% v/v) and GS-06 (7.9% v/v). Carbon dioxide was not detected above the trigger level for the other four boreholes located outside the waste body (BH-2, BH-5, BH-6 and BH-7). The highest carbon dioxide reading within the waste body was at GS-11 (12.4% v/v).

Carbon dioxide was detected in all the monitoring locations in February, with the exception of BH-2, which is consistent with previous monitoring events. The levels measured in BH-5 (3.8% v/v), which is outside the waste body, were above the levels measured in the previous month. The results for GS-01 (2.2% v/v), GS-05 (3.8% v/v) and GS-06 (7.8% v/v) were above the trigger level of 1.5% v/v, at levels consistent with previous monitoring events.

Only two (2) of the seven (7) boreholes located outside the waste body exceeded the trigger value for carbon dioxide in March. These were GS-05 (2.2 % v/v) and GS-06 (5.7% v/v). These results are similar to results for March 2003, which showed carbon dioxide levels at GS-05 and GS-06 of 2.1% v/v and 6.7 % v/v respectively. In general, carbon dioxide levels for March were lower than previous quarters.

OCM conducted gas monitoring in the transfer station building and the site offices during all three monitoring events. The monitoring did not detect the presence of carbon dioxide or methane in any of the buildings.

Carbon dioxide levels exceeded the trigger limit of 1.5% in the 1st quarter of 2004 on 9 occasions. Of the 21 gas measurements taken in the 7 monitoring locations located outside the fill area (GS-1, GS-5, GS-6, BH-2, BH-5, BH-6 and BH-7) there was 56.5 % compliance with the trigger limits.

Carbon dioxide levels measured in the monitoring locations in the fill (GS-07, GS-08, GS-09, GS-11, L-01 and L-02) ranged from 2 to 13% over the monitoring period, with the highest level (13% v/v) detected in GS-11.

Landfill Gas Monitoring Q2 2004

LANDELL	L GAS MONITO	RIN	GFORM	1 (×3.59)	Bas	elin		Ambient x
Site Nam	e: Greenstar Mate	erial	s Recovery Ltd	. – Site	Addre	ss: I	assaroe, Bray	, Co. Wicklow
Fassaroe D	epot							
Operator:	GREENSTAR		4	Nati	ional G	Frid	Reference: E.	3242, N2179
!	s: Operational			Date	e: 21/0	4/200	04	
Instrumen			Normal Analyt	ical Rang	ge:			
Gas Data L	LMSx		0 – 100%					
	g Personnel:				ather:			
OCM				Scatt	ered sho	wers,	windy	
			Res	ults				
Sample	Borehole/		CH ₄	CO ₂	O ₂		Barometric	Comment
Station	spike/other		(% v/v)	(% v/v)	(% v	/v)	Pressure	
Number							(mb)	
GS-01	Borehole		0.0	0.1	17.	~	995	
GS-05	Borehole		0.0		2017 94.	2	991	
GS-06	Borehole		0.0	6.6 direct to	12.0	0	991	
GS-07	Borehole		0.0	n 6.6	12.0	0	991	
GS-08	Borehole		0.0 CONTRACTOR	2.2	17.2	2	991	
GS-09	Borehole		0.00	2.3	14.6	0	991	
GS-11	Borehole		Car 0.0	0.0	17.	1	991	
BH-2	Borehole		0.0	0.0	17.	3	997	
BH-5	Borehole		0.0	0.0	17.	3	996	
BH-6	Borehole		0.0	0.0	17.4	4	989	
BH-7	Borehole		0.0	0.1	17.	1	996	
L-01	Borehole		0.0	1.5	16.3	3	991	
L-02	Borehole	-						Inaccessible – Covered by Retaining Wall
L-03	Borehole		0.5	19	0.1		995	Installed same day.

LANDFIL	L GAS MONITO	RING	FORM	Ba	seline	A	nbient x				
Harrier Title State State	: Greenstar Mater			The second secon		oe, Bray, Co.					
Fassaroe De	epot					· • •					
Operator:	GREENSTAR			National Grid Reference: E3242, N2179							
Site Status	: Operational			Date: 24/05/2004							
Instrument	t used:	Nor	mal Analytical F	Range:							
Gas Data L	MSx	0 –	100%								
_	g Personnel:			Weather:							
OCM				Overcast, dr	y, cold						
			Res	ults							
Sample	Borehole/		CH₄	CO ₂	O ₂	Barometric	Comment				
Station	spike/other		(% v/v)	(% v/v)	(% v/v)	Pressure					
Number						(mb)					
GS-01	Borehole		0.0	4.7	11.1	1026					
GS-05	Borehole		0.0	1.2	15.5	1026					
GS-06	Borehole		0.0	7.14. at	10.8	1026					
GS-07	Borehole		0.0	TIPOS 10	7.0	1026					
GS-08	Borehole		0.0 cito	5 11	7.1	1026					
GS-09	Borehole		O.O. Tright	5	10.7	1026					
GS-11	Borehole		6.0	3.4	14.0	1026	To the state of th				
BH-2	Borehole		Carres 0.0	0.0	16.9	1026					
BH-5	Borehole		0.0	0.1	17.4	1026					
BH-6	Borehole		0.0	2.1	16.3	1026					
BH-7	Borehole		0.0	0.7	15.8	1026					
L-01	Borehole		0.0	7.8	7.8	1026					
L-02	Borehole		·			1026	Inaccessible – Cover by Retaining Wall				
L-03	Borehole		0.5	19.0	0.1	1026					

	L GAS MONITO			The state of the s	seline -		mbient x				
	: Greenstar Mate	riais R	ecovery Ltd. –	Site Addr	ess: Fassai	roe, Bray, Co.	Wicklow				
Fassaroe D	GREENSTAR			National Crid Potoronae E22/2 N2170							
Operator:	GREENSTAR			National Grid Reference: E3242, N2179							
Site Status	: Operational			Date: 10/06/2004							
Instrumen	t used:	Nor	mal Analytical	Range:							
Gas Data L	MSx	100%									
Monitoring	g Personnel:			Weather:							
OCM				Clear, dry, s	unny						
			Re	sults							
Sample	Borehole/		CH ₄	CO ₂	O ₂	Barometric	Comment				
Station	spike/other		(% v/v)	(% v/v)	(% v/v)	Pressure					
Number						(mb)					
GS-01	Borehole		0.0	5.0	11.2	1008					
GS-05	Borehole		0.0	4.2	12,3°	1008					
GS-06	Borehole		0.0	7.4 nly		1008					
GS-07	Borehole		0.0	Dura Jing	7.7	1008					
GS-08	Borehole		0.0 وِنْ نم ^ي م	ONITE I TO			Inaccessible – Site Operations				
GS-09	Borehole		0.Qo gandida	7.7	8.8	1008					
GS-11	Borehole		Q.O	18.0	3.1	1008					
BH-2	Borehole		0.0	0.0	16.4	1008					
BH-5	Borehole		0.0	11.0	5.8	1008					
BH-6	Borehole		0.0	3.6	14.7	1007					
BH-7	Borehole		0.0	0.4	15.9	1008					
L-01	Borehole		0.0	7.1	10.8	1008					
L-02	Borehole						Inaccessible – Covered by Retaining Wall				
T 00	T) 1 1	<u> </u>		140	1.2	1000	by Retaining Wall				
L-03	Borehole	1	2.3	14.0	4.2	1008					

Methane was detected in the newly installed leachate monitoring well (L-03) during the three monitoring events. The levels measured were 0.5% v/v for both April and May and 2.3% v/v for June.

Methane was not detected in any of the other monitoring locations in the reporting period. The levels recorded do not constitute an exceedance of the emission limits for gas as L-03 is located within the waste body.

In April, carbon dioxide was detected above the trigger level of 1.5% v/v at two boreholes located outside the waste body GS-05 (2.3% v/v) and GS-06 (6.6% v/v), which is consistent with previous monitoring events. Carbon dioxide was not detected above the trigger level in the other four boreholes located outside the waste body (BH-2, BH-5, BH-6 and BH-7). The highest carbon dioxide reading within the waste body was at L-03 (19% v/v).

Carbon dioxide was detected in all the monitoring locations in May, with the exception of BH-2. The results for GS-01 (4.7% v/v), GS-05 (1.2% v/v), GS-06 (7.1% v/v) and BH-6 (2.1% v/v) were above the trigger level of 1.5% v/v, at levels consistent with previous monitoring events.

The trigger level was exceeded in five (5) of the seven (7) boreholes located outside the waste body in June. These were GS-01 (5 % v/v), GS-05 (4.2% v/v), GS-06 (7.4% v/v), BH-5 (11% v/v) and BH-6 (3.6% v/v).

OCM conducted gas monitoring in the transfer station building and the site offices during all three monitoring events. The monitoring did not detect the presence of carbon dioxide or methane in any of the buildings.

Carbon dioxide levels exceeded the trigger limit of 1.5% in the 2nd quarter of 2004 on 11 occasions. Of the 21 gas measurements taken in the 7 monitoring locations located outside the fill area (GS-1, GS-5, GS-6, BH-2, BH-5, BH-6 and BH-7) there was 52.3% compliance with the trigger limits.

Carbon dioxide levels measured in the monitoring locations in the fill (GS-07, GS-08, GS-09, GS-11, L-01 and L-02) ranged from 0 to 19% v/v over the monitoring period, with the highest level (19% v/v) detected in L-03.

Landfill Gas Monitoring Q3 2004

LANDFIL	L GAS MONITO	RIN	G FORM			Baselin	e take in	Ambient x
Site Nam	e: Greenstar Mat	erial	s Recovery Ltd	. –	Site	Address:]	Fassaroe, Bray	, Co. Wicklow
Fassaroe D	Depot							
Operator:	GREENSTAR				Natio	onal Grid	Reference: E3	3242, N2179
	s: Operational		_			: 08/07/20	04	
Instrumen			Normal Analyt	ical	Range	e:		
Gas Data I			0 – 100%					
	g Personnel:				Wea			
OCM					Scatte	red showers	, windy	
			Res	ults				
Sample	Borehole/		CH ₄	C	O_2	O ₂	Barometric	Comment
Station	spike/other		(% v/v)	(%	v/v)	(% v/v)	Pressure	
Number							(mb)	
GS-01	Borehole		0.0	4	.2	11.4 _e .	1010	
GS-05	Borehole		0.0		.8	43.7	1010	
GS-06	Borehole		0.0	8	5 of to	9.8	1010	
GS-07	Borehole		0.0	15,00	.4	14.7	1010	
GS-08	Borehole		O.Q. odyidi.					Inaccessible -covered by mixed
GS-09	Borehole		0.00	6	.7	8.6	1010	
GS-11	Borehole		Cours 0.0		2.0	8.3	1010	
BH-2	Borehole		0.0	0	0.0	16.0	1010	
BH-5	Borehole		0.0		.7	15.7	1010	
BH-6	Borehole		0.0		.2	14.0	1010	
BH-7	Borehole		0.0		.1	16.1	1010	
L-01	Borehole		0.3	6	.2	10.2	1010	
L-02	Borehole	-						Inaccessible – Covered by Retaining Wall
L-03	Borehole						- n-y-44-1-49 (Hill	Inaccessible- Covered by C&D

LANDRII	L GAS MONITO	DRING	FORM	Pa	seline	A	nbient x			
	: Greenstar Mater					oe, Bray, Co.	man and the second seco			
Fassaroe D	epot					·				
Operator:	GREENSTAR		E-Tr-SA SIFA AND	National Grid Reference: E3242, N2179						
Site Status	: Operational			Date: 06/08/2004						
Instrumen	t used:	Nor	mal Analytical	Range:			- 10 (A 10)(A 10 (A 10 (A 10 (A 10 (A 10 (A 10)(A 10 (A 10 (A 10 (A 10)(A 10 (A 10 (A 10 (A 10 (A 10 (A 10)(A 10 (A 10)(A 10)(A 10 (A 10)(A 10)(A 10 (A 10)(A 10)(
Gas Data L	MSx	0 –	100%							
Monitoring	g Personnel:	······································		Weather:			***************************************			
OCM				Overcast, dr	y					
			Re	sults						
Sample	Borehole/		CH ₄	CO ₂	O ₂	Barometric	Comment			
Station	spike/other		(% v/v)	(% v/v)	(% v/v)	Pressure				
Number						(mb)				
GS-01	Borehole		0	0.4	15.6	1008				
GS-05	Borehole		0	4.1	12,\$	1008				
GS-06	Borehole		0	11.0	3°7.6	1010				
GS-07	Borehole			Outposes office of the second	.		Headworks Damaged			
GS-08	Borehole		0 %	or let 0	15.6	1010				
GS-09	Borehole		Qor Wrigh	1.7	13.4	1010	**************************************			
GS-11	Borehole		Consent of cox			e de la comencia del la comencia de la comencia del la comencia de la comencia del la comencia de la comencia d	Inaccessible - Coved C&D			
BH-2	Borehole		0	0	15.7	1010				
BH-5	Borehole					***************************************	Headworks Damaged			
BH-6	Borehole		0	1.3	15.6	1010				
BH-7	Borehole		0	0.2	15.5	1010				
L-01	Borehole		0	0.7	14.2	1010	**************************************			
L-02	Borehole					a di da m	Inaccessible – Covere by Retaining Wall			
L-03	Borehole						Inaccessible – Coved			

<u> </u>	GAS MONITO			Baseline Ambient x - Site Address: Fassaroe, Bray, Co. Wicklow						
Site Name: Fassaroe Dej	Greenstar Mater	iais Rec	overy Lia. –	Site Addi	ess: rassar	oe, Bray, Co.	WICKIOW			
	REENSTAR			National Grid Reference: F3242 N2170						
operator. O	IXLLIND I AIX			National Grid Reference: E3242, N2179						
Site Status:	Operational			Date: 03/0	09/2004					
Instrument	used:	Norm	al Analytical	Range:						
Gas Data LN	IS x	0 - 10	0%							
Monitoring	Personnel:			Weather:						
OCM				Clear, dry, s	unny					
			Re	esults						
Sample	Borehole/		CH ₄	CO ₂	O ₂	Barometric	Comment			
Station	spike/other		(% v/v)	(% v/v)	(% v/v)	Pressure				
Number			······································			(mb)				
GS-01	Borehole		0	2.0	11.7					
GS-05	Borehole		0	4.2	10.2					
GS-06	Borehole		0	7.9 nly	9.2					
GS-07	Borehole			of purpositied for			Headworks			
GS-08	Borehole		0	0.0	11.9		Damaged			
GS-09	Borehole		O coldings	4.7	8.2					
GS-11	Borehole		Consentation			<u> </u>	Inaccessible –			
			Cour	-	12.2		Coved C&D			
BH-2	Borehole		0	2.0	13.2					
BH-5	Borehole						Headworks			
							Damaged			
BH-6	Borehole		0	2.4	12.4					
BH-7	Borehole		0	0.0	13.1					
L-01	Borehole		0	1.3	10.7	, ,				
L-02	Borehole						Inaccessible – Covered by Retaining Wal			
L-03	Borehole						Inaccessible – Coved C&D			

Methane was detected in leachate monitoring well L-01 (0.3% v/v) in July, but was not detected in August or September. Methane was not detected in any of the other monitoring locations in the reporting period. The levels recorded do not constitute an exceedance of the emission limits for gas as L-01 is located within the waste body.

In July, carbon dioxide was detected above the trigger level of 1.5% v/v at four boreholes located outside the waste body GS-1 (4.2% v/v), GS-05 (2.8% v/v), GS-06 (8.5% v/v) and BH-6 (4.2% v/v) which is consistent with previous monitoring events. Carbon dioxide was not detected above the trigger level in the other three boreholes located outside the waste body (BH-2, BH-5 and BH-7).

Carbon dioxide was detected in all the monitoring locations in August, with the exception of GS-08 and BH-2. The results for GS-05 (4.1% v/v), GS-06 (11% v/v) and GS-09 (1.7% v/v) were above the trigger level of 1.5% v/v, at levels consistent with previous monitoring events. The trigger level was exceeded in five (5) of the six (6) monitored boreholes located outside the waste body in September. These were GS-01 (2% v/v), GS-05 (4.2% v/v), GS-06 (7.9% v/v), BH-2 (2%v/v) and BH-6 (2.4% v/v).

OCM conducted gas monitoring in the transfer station building and the site offices during all three monitoring events. The monitoring did not detect the presence of carbon dioxide or methane in any of the buildings.

Carbon dioxide levels exceeded the trigger limit of 1.5% in the 3rd quarter of 2004 on 12 occasions. Of the 19 gas measurements taken in the 7 monitoring locations located outside the fill area (GS-1, GS-5, GS-6, BH-2, BH-5, BH-6 and BH-7) there was 36.8% compliance with the trigger limits.

Carbon dioxide levels measured in the monitoring locations in the fill (GS-07, GS-08, GS-09, GS-11 and L-01) ranged from 0 to 12% v/v over the monitoring period, with the highest level (12% v/v) detected in GS-11 in July. These levels are consistent with previous monitoring events.

Landfill Gas Monitoring Q4 2004

LANDFIL	L GAS MONITOR	ING FORM		Baselin	(Carana)	Ambient x
Site Name	e: Greenstar Materi	als Recovery Ltd	. – Site			, Co. Wicklow
Fassaroe De	-	- 100 - 04 Allino - 0- 04 - 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0				
Operator:	GREENSTAR		Nati	onal Grid	Reference: E	3242, N2179
Site Status	: Operational	**************************************	Date	e: 01/10/20	004	william
Instrumen	t used:	Normal Analy	tical Rang	ge:		A = 7.41HU1994
Gas Data L	MSx	0 - 100%				
Monitoring	g Personnel:	I AMPRICA II	Wea	ther:		
OCM				Dry		
		Res	sults			
Sample	Borehole/	CH ₄	CO ₂	O ₂	Barometric	Comment
Station Number	spike/other	(% v/v)	(% v/v)	(% v/v)	Pressure (mb)	
GS-01	Borehole		3.7	net 115e.		Headworks Damaged
GS-05	Borehole	0.0	6.0	8.9	1010	
GS-06	Borehole	0.0	2000	14.7	1010	
GS-07	Borehole	ede ci	n Priver			Headworks Damaged
GS-08	Borehole	Foritright	11.0	8.3	1010	
GS-09	Borehole	O.O SOLVIER	9.0	7.4	1008	
GS-11	Borehole	Const			1 4 4 4 5 4 5 5 5 5 5 5 5 5 5 5 5 5 5 5	Headworks Damaged
BH-2	Borehole	0.0	0.5	15.7	1008	
BH-5	Borehole			V 8' 110	· do	Headworks Damaged
BH-6	Borehole					Removed pending relocation
BH-7	Borehole	0.0	3.0	13.7	1008	
L-01	Borehole	0.0	1.0	16.0	1008	
L-02	Borehole	-				Inaccessible – Covered by Retaining Wall
L-03	Borehole					Inaccessible- Covered by C&D

	VIN T-1-V		T T T T T T T T T T T T T T T T T T T			and the second second					
		L GAS MONITO				seline 7		mbient x			
		e: Greenstar Mater	iais K	ecovery Ltd. –	Site Addr	ess: rassar	oe, Bray, Co.	Wicklow			
	saroe D				National Grid Reference: E3242, N2179						
Ope	erator:	GREENSTAR									
Site	Status	s: Operational			Date : 02/1	1/2004					
Inst	rumen	ıt used:	Noi	mal Analytical l	Range:						
Gas	Data L	LMSx	0 –	100%							
Mor	nitorin	g Personnel:			Weather:			99-00-00-00-00-00-00-00-00-00-00-00-00-0			
OCI	M				Overcast, dr	y					
				Res	ults						
Sar	mple	Borehole/	T.	CH ₄	CO ₂	O ₂	Barometric	Comment			
	tion	spike/other		(% v/v)	(% v/v)	(% v/v)	Pressure				
Nu	mber	•					(mb)				
GS	S-01	Borehole									
GS	S-05	Borehole		0.0	2.3	14.5	1018				
GS	S-06	Borehole		0.0	0.014	17.4	1020				
GS	S-07	Borehole			Surpose required for a		A CONTRACTOR OF THE CONTRACTOR	Headworks Damaged			
GS	S-08	Borehole		0.0 godina	8.9	12.0	1020	Dumagou			
GS	S-09	Borehole		Fol Aire				Inaccessible – Coved C&D			
GS	S-11	Borehole		Consent of cold				Inaccessible – Coved C&D			
Bl	H - 2	Borehole		0.0	0.0	17.0	1018				
Bl	H-5	Borehole						Headworks			
								Damaged			
Bl	H-6	Borehole						Removed pending			
								relocation			
***************************************	H-7	Borehole		0.0	1.0	16.0					
L	-01	Borehole		0.0	1.5	16.3					
L.	-02	Borehole						Inaccessible – Covered by Retaining Wall			
	02	D 1 1						Inaccessible – Coved			
	-03	Borehole						C&D			

LANDFILI	L GAS MONITO	DRING	FORM	Ba	ıseline	Ar	nbient x			
	Greenstar Mater	ials R	ecovery Ltd	Site Add	ress: Fassai	roe, Bray, Co.	Wicklow			
Fassaroe De	_									
Operator: (GREENSTAR			National Grid Reference: E3242, N2179						
Site Status:	Operational			Date: 02/12/2004						
Instrument	used:	Nor	mal Analytical	Range:	100 10 A A A A A A A A A A A A A A A A A					
Gas Data LI	Gas Data LMSx 0 – 100%									
Monitoring	Personnel:			Weather:						
OCM			Cold, Dry							
			R	esults						
Sample	Borehole/		CH ₄	CO ₂	O ₂	Barometric	Comment			
Station	spike/other		(% v/v)	(% v/v)	(% v/v)	Pressure				
Number						(mb)				
GS-01	Borehole						Headworks			
CC 05	D1 1 -		0.0	2.2	176	1010	Damaged			
GS-05	Borehole		0.0	3.3	1753	1019				
GS-06	Borehole		0.0	9.400 9.400	11.5	1017				
GS-07	Borehole			Difforited	***************************************		Headworks			
GS-08	Borehole			etiph per 1			Damaged			
G2-08	Borenole		or instru	at of			Headworks Damaged			
GS-09	Borehole		* of cody.				Inaccessible –			
GS-11	Borehole		Catsentor				Coved C&D Inaccessible – Coved			
GS-11	Dorenoic		Cotte		-		C&D			
BH-2	Borehole		0.0	0.4	21.0	1020				
BH-5	Borehole						Headworks			
							Damaged			
BH-6	Borehole						Removed pending			
						1000	relocation			
BH-7	Borehole		0.0	0.5	20.4	1020				
L-01	Borehole		0.5	11.0	6.0	1019	***************************************			
L-02	Borehole		190 - 190 -				Inaccessible – Covered by Retaining Wall			
L-03	Borehole						Inaccessible – Coved			
T-02	Dotoliole						C&D			

Methane was detected in leachate monitoring well L-01 (0.5% v/v) in December, but was not detected in October or November. Methane was not detected in any of the other monitoring locations in the reporting period. The levels recorded do not constitute an exceedance of the emission limits for gas as L-01 is located within the waste body.

In October, carbon dioxide was detected above the trigger level of 1.5% v/v at three boreholes located outside the waste body GS-05 (6.0% v/v), GS-06 (2.0% v/v), and BH-7 (3.0% v/v) which is consistent with previous monitoring events. Carbon dioxide was not detected above the trigger level in the other borehole located outside the waste body (BH-2).

Carbon dioxide was detected in four of the six monitoring locations in November. The results for BH-02 and BH-07 which are located outside the waste body were below the trigger level of 1.5% v/v at slightly lower levels than previously recorded. The trigger level was exceeded in one (1) of the three (3) monitored boreholes located outside the waste body in November (GS-05, 2.3%v/v).

The December event showed levels consistent with the previous two monitoring events. Levels outside the waste body were above the trigger levels GS-05 (3.3% v/v) but below in both BH-02 (0.4%v/v) and BH-07 (0.5% v/v).

OCM conducted gas monitoring in the transfer station building and the site offices during all three monitoring events. The monitoring did not detect the presence of carbon dioxide or methane in any of the buildings.

Carbon dioxide levels exceeded the trigger limit of 1.5% in the 4th quarter of 2004 on 11 occasions. Of the 12 gas measurements taken in the 4 available monitoring locations located outside the fill area (GS-5, GS-6, BH-2, and BH-7) there was 50% compliance with the trigger limits. Carbon dioxide levels measured in the monitoring locations in the fill (GS-08, GS-09 and L-01) ranged from 1.0 to 11.0% v/v over the monitoring period, with the highest level (11% v/v) detected in GS-08 in October. These levels are consistent with previous monitoring events.

Landfill Gas Monitoring Q1 2005

LANDFII	L GAS MONITO	DRIN	G FORM			Baselir	ie	Ambient x	
ĺ	e: Greenstar Ma	terial	s Recovery Lte	d. –	Site	Address:	Fassaroe, Bray	, Co. Wicklow	
Fassaroe D	*								
Operator: 	GREENSTAR				National Grid Reference: E3242, N2179				
Site Status	s: Operational				Date	: 06/01/20	005		
Instrumen	ıt used:		Normal Analy	tical	Rang	e:	771.00		
Gas Data I	Gas Data LMSx 0 – 100%								
Monitorin	g Personnel:				Wea	ther:			
OCM				Wind	y; Dry				
			Re	sults					
Sample	Borehole/		CH ₄		CO ₂	O ₂	Barometric	Comment	
Station	spike/other		(% v/v)	(%	v/v)	(% v/v)	Pressure		
Number							(mb)		
GS-01	Borehole					of USE.		Headworks Damaged	
GS-05	Borehole		0.0	2	2.3	18.9	1018		
GS-06	Borehole		0.0		120 to	15.3	1018		
GS-07	Borehole		ූර්	Joh Port	122 odly			Headworks Damaged	
GS-08	Borehole		tor wigh					Headworks Damaged	
GS-09	Borehole		Consend conditient					Headworks Damaged	
GS-11	Borehole		College			1		Headworks Damaged	
BH-2	Borehole		0.0).2	20.9	1018		
BH-5	Borehole		- AMPANIA				7.75 Marinio	Headworks Damaged	
BH-6	Borehole							Removed pending relocation	
BH-7	Borehole		0.0	().4	20.5	1019	- Principal de la companya de la com	
L-01	Borehole		0.0		1.4	15.9	1019		
L-02	Borehole	-				**************************************		Inaccessible – Covered by Retaining Wall	
L-03	Borehole		PANTH - 11/1/201	<u> </u>				Headworks Damaged	

LANDFIL	L GAS MONITO	RING	FORM	Ba	seline		mbient x			
Site Name	: Greenstar Mater	ials Re	covery Ltd	Site Address: Fassaroe, Bray, Co. Wicklow						
Fassaroe D				1						
Operator:	GREENSTAR			National Grid Reference: E3242, N2179						
Site Status	Site Status: Operational				2/2005	90 - 8	The state of the s			
Instrumen	Instrument used: Normal Analytica									
Gas Data L	MSx	0-1	00%							
Monitoring	g Personnel:	•		Weather:						
OCM				Overcast, dr	у					
		·	Re	sults						
Sample	Borehole/		CH ₄	CO ₂	O ₂	Barometric	Comment			
Station	spike/other		(% v/v)	(% v/v)	(% v/v)	Pressure				
Number						(mb)				
GS-01	Borehole						Replaced by BH- 5			
GS-05	Borehole		0.0	3.5	18.0	1025				
GS-06	Borehole		0.0	6.714	15.2	1025				
GS-07	Borehole			Durpose of for			Removed pending relocation			
GS-08	Borehole		egid eger (What ,			Removed pending relocation			
GS-09	Borehole		0.0 ringh	7.5	8.8	1025				
GS-11	Borehole		CONTRACTOR				Inaccessible – Coved			
BH-2	Borehole		Corre 0.0	0.2	21.0	1025				
BH-5	Borehole		0.0	0.0	21	1025	Newly Installed			
ВН-6	Borehole					M-01-19-5	Removed pending relocation			
BH-7	Borehole		0.0	0.2	20.7	1025				
L-01	Borehole		0.0	1.5	16.3	1025				
L-02	Borehole		VVIII 1804 19				Inaccessible – Covered by Retaining Wall			
L-03	Borehole		- 10 - 10 - 10 - 10 - 10 - 10 - 10 - 10				Headworks Damaged			

	L GAS MONITO				seline		mbient x			
	: Greenstar Mater	rials Reco	overy Ltd. –	Site Address: Fassaroe, Bray, Co. Wicklow						
Fassaroe De				76.7	a	77.6.4.5	310150			
Operator: (GREENSTAR			National Grid Reference: E3242, N2179						
Site Status:	: Operational			Date : 01/03/2005						
Instrument	t used:	Norma	al Analytical	Range:			***************************************			
Gas Data L	Gas Data LMSx 0 – 100%)%							
Monitoring Personnel:				Weather:						
OCM				Cold, Dry	<u>.</u>	!				
			Re	sults						
Sample	Borehole/		CH ₄	CO ₂	O ₂	Barometric	Comment			
Station	spike/other		(% v/v)	(% v/v)	(% v/v)	Pressure				
Number						(mb)				
GS-05	Borehole		0.0	4.1	12.1	1007				
GS-06	Borehole		0.0	6.3	15.2	1007				
GS-07	Borehole		0.0	12 only	10 8.6	1008	**************************************			
GS-08	Borehole		0.0	12 of	10.1	1008				
GS-09	Borehole		0.0 es	onner 9.4	9.7	1009				
GS-10	Borehole		2.5 colytics 0,00 colytics	18	0.0	1008	Newly Installed into Waste			
GS-11	Borehole		0,01	13	6.2	1008				
BH-2	Borehole		0.0	0.1	20.9	1008				
BH-5	Borehole		0.0	5.7	14.6	1007	**************************************			
BH-6	Borehole		0.0	2.1	17.7	1008				
BH-7	Borehole		0.0	0.3	20.5	1008	Publications			
L-01	Borehole		0.0	9.7	5.1	1008				
L-02	Borehole		0.0	7.5	8.8	1008				
L-03	Borehole		0.2	14	0.5	1008				

Methane was detected in gas monitoring well GS-10 (2.5% v/v) and leachate monitoring well L-03 (0.2% v/v) in March. Methane was not detected in any of the other monitoring locations in the reporting period. The levels recorded do not constitute an exceedance of the emission limits, as GS-10 is located within the waste body.

In January, carbon dioxide was detected above the trigger level of 1.5% v/v at two boreholes located outside the waste body GS-05 (2.3% v/v) and GS-06 (7.2% v/v) which is consistent with previous monitoring events. Carbon dioxide was not detected above the trigger level in the other boreholes located outside the waste body (BH-2 and BH7). Due to damage to the wells monitoring was not possible at locations GS-01, GS-07, GS-08, GS-09, GS-11, BH-05, BH-06, L-02 and L-03 in January.

Carbon dioxide was detected above the trigger level in two of the five monitoring locations outside the waste body in February. The results for BH-02, BH-05 and BH-07 which are located outside the waste body were below the trigger level of 1.5% v/v at slightly lower levels than previously recorded. The trigger level was exceeded at locations GS-05 (3.5% v/v) and GS-06 (6.7% v/v). Monitoring was not possible at locations GS-07, GS-08, GS-11, BH-06, L-02 and L-03 in February.

In March, all of the landfill gas monitoring boreholes were in place. Four of the monitoring wells located outside the waste body (GS-05, GS-06, BH-05 and BH-06) had carbon dioxide levels above the trigger level. Higher than normal carbon dioxide levels were also recorded in the waste body (3-6% v/v higher on average) especially in the newly installed wells, GS-07, GS-08, GS-10, GS-11, BH-05 and BH-06.

OCM conducted gas monitoring in the transfer station building and the site offices during all three monitoring events. The monitoring did not detect the presence of carbon dioxide or methane in any of the buildings.

Carbon dioxide levels exceeded the trigger limit of 1.5% v/v in the 1st quarter of 2005 on 8 occasions. Of the 15 gas measurements taken in the 6 monitoring locations located outside the fill area (GS-05, GS-06, BH-2, BH-05, BH-06 and BH-7) there was 53% compliance with the trigger limits. Carbon dioxide levels measured in the monitoring locations in the fill (GS-07, GS-08, GS-09, GS-10, GS-11, L-01, L-02 and L-03) ranged from 1.5 to 18.0% v/v over the monitoring period, with the highest level (18% v/v) detected in GS-10 in March.

Landfill Gas Monitoring Q2 2005

H A BIED DIE II					and the same and the	District Ing A street -			
	L GAS MONIT	aterials Recovery	7 I td _	Baseline Ambient x Site Address: Fassaroe, Bray, Co. Wicklow					
Fassaroe D			, Lu.	oite Audiess.	r assaroc, Bray	, co. wickiow			
	GREENSTAR			National Grid Reference: E3242, N2179					
Орегатог.	ORELINS 17 III			Ivational GIR	Reference. E.	<i>72</i> 42, 1\2179			
Site Status	s: Operational			Date: 05/04/20	005	······································			
Instrumen	t used:	Normal A	Analytical R	Range:	(** **********************************	***************************************			
Gas Data L	LMSx	0 – 100%							
Monitorin	g Personnel:			Weather:					
OCM				Overcast with	some showers				
	Results								
Sample	Borehole/	CH ₄	CO ₂	O ₂	Barometric	Comment			
Station	spike/other	(% v/v)	(% v/v)	(% v/v)	Pressure				
Number					(mb)				
GS-01	Borehole	0.0	0.1	20.9	1025				
GS-05	Borehole	0.0	3.1	16.2	1025				
GS-06	Borehole	0.0	5.8	14.2	1025	1.0			
GS-07	Borehole	0.0	20 A De rech	17.3	1025				
GS-08	Borehole	0.0	115Ph 9.5	18.9	1025				
GS-09	Borehole	0.0	0.0	17.9	1025				
GS-10	Borehole	1. Arsen	0.0	16.2	1025				
GS-11	Borehole	0.0	4.2	16.5	1025				
BH-2	Borehole	0.0	0.2	19.8	1025	The state of the s			
BH-5	Borehole	0.0	0.1	20.2	1025				
ВН-6	Borehole	0.0	0.1	20.4	1025	L TO THE METERS OF SECTION AND SECTION AND SECTION ASSESSMENT OF SECTION ASSESSMENT ASSESSMENT OF SECTION ASSESSMENT OF SECTION ASSESSMENT ASSESSMENT ASSE			
BH-7	Borehole	0.0	0.3	19.7	1025				
L-01	Borehole	1.0	12.0	4.8	1025				
L-02	Borehole	-	Ma	-	-	Inaccessible			

Borehole

0.0

L-03

0.0

20.4

1028

ANNUAL PROPERTY OF THE PROPERT			7.5.4.1.12.20.44.5. HIPTOTICS.	7. S. T					
	L GAS MONITO			Baseline		nbient x			
		rials Recovery Lto	i. – Site Ad	dress: Fassa	roe, Bray, Co.	Wicklow			
Fassaroe D	-								
Operator:	GREENSTAR		Nationa	al Grid Refe	rence: E3242,	N2179			
	771 TO THE PROPERTY WAS A SEC.	. SERVICOMENTO.				W-701002			
Site Status	s: Operational		Date : 0	Date: 03/05/2005					
Instrumen	it used:	ical Range:							
Gas Data L	LMSx	0 – 100%							
Monitorin	g Personnel:		Weathe	er:		1-10-10			
OCM			Overcast,	dry					
			Results						
Sample	Borehole/	CH ₄	CO ₂	O ₂	Barometric	Comment			
Station	spike/other	(% v/v)	(% v/v)	(% v/v)	Pressure				
Number					(mb)				
GS-01	Borehole	0.0	0.0	17.6	1008				
GS-05	Borehole	0.0	1.9	14.45	1008				
GS-06	Borehole	0.0	5.2	A. 20.3	1008				
GS-07	Borehole	0.0	0.0000	20.8	1025	1-00/100			
GS-08	Borehole	8.7	gection 126	0.0	1008				
GS-09	Borehole	0.0	right 0.0	20.8	1008				
GS-10	Borehole	- of con	-	-	-	Not able to open head works			
GS-11	Borehole	0.0	0.0	20.5	1008				
BH-2	Borehole	0.0	0.1	20.5	1008				
BH-5	Borehole	0.0	0.2	20.5	1008				
BH-6	Borehole	0.0	0.1	20.1	1008	an Andrew Level			
BH-7	Borehole	0.0	0.5	20.0	1008	C = 84 + 0 A = 0.			
L-01	Borehole	0.0	0.0	20.6	1040	1 74 74 74 74 74 74 74 74 74 74 74 74 74			
L-02	Borehole	-	-	<u> </u>	-	Inaccessible			
L-03	Borehole	0.0	0.0	20.5	1008	, ,			

B V WALLEST B.								
	L GAS MONITO · Greenstar Mate	DRING FORM rials Recovery Ltd		Baseline dress: Fassa	roe, Bray, Co.	nbient x Wicklow		
Fassaroe D		ilais Recovery Liu	– Site At	iui 655. 1 a55a	ioc, Diay, Co.	W ICKIUW		
	GREENSTAR		Nation	National Grid Reference: E3242, N2179				
*						- · · ·		
Site Status	: Operational		Date: 0	3/06/2005	W. D. dans.			
Instrumen		Normal Analyt	ical Range:		West, 41, 11, 12			
Gas Data L	MSx	0 – 100%	_					
Monitorin	g Personnel:	***************************************	Weath	er:		TV 4 M CONTINUE		
OCM			Bright ar	d sunny				
			Results					
Sample	Borehole/	CH ₄	CO ₂	O ₂	Barometric	Comment		
Station	spike/other	(% v/v)	(% v/v)	(% v/v)	Pressure			
Number					(mb)			
GS-01	Borehole	0.0	0.0	16.5	1036			
GS-05	Borehole	0.0	1.8	15.2 ³⁶	1036			
GS-06	Borehole	0.0	5.9	3. 2011 17.8	1036			
GS-07	Borehole	0.0	0.00%	19.6	1036	Trickellen Land		
GS-08	Borehole	8.7	Decito 4 to 0	11.6	1036			
GS-09	Borehole	0.0	tight 0.0	18.8	1036	, , , , , , ,		
GS-10	Borehole	- utilities	-	_	-	Not able to open head works		
GS-11	Borehole	0.0	0.0	18.6	1036			
BH-2	Borehole	0.0	0.2	21.5	1036			
BH-5	Borehole	0.0	0.4	19.8	1036			
ВН-6	Borehole	0.0	0.1	19.6	1036			
BH-7	Borehole	0.0	0.4	21.1	1036			
L-01	Borehole	0.0	0.0	14.1	1036			
L-02	Borehole	-	——————————————————————————————————————	-	-	Inaccessible		
L-03	Borehole	0.0	0.0	20.6	1036			

Methane was detected in gas monitoring well GS-10 in April (1.1% v/v) in GS 8 in May and June (8.7% v/v and 8.9% v/v) and in leachate monitoring well L-01 (1.0% v/v) in April. Methane was not detected in any of the other monitoring locations in the reporting period. GS-08, GS-10 and L-01 are located within the fill area. Methane was not detected in any of the wells outside the fill area.

In April, carbon dioxide was detected above the trigger level of 1.5% v/v at two boreholes located outside the waste body GS-05 (3.1% v/v) and GS-06 (5.8% v/v), which is consistent with previous monitoring events. Carbon dioxide was not detected above the trigger level in the other boreholes located outside the waste body.

In May carbon dioxide was detected above the trigger level of 1.5% v/v in two of the monitoring locations outside the waste body GS-05 (1.9% v/v) and GS-06 (5.2% v/v). Carbon dioxide was not detected above the trigger level in the other boreholes located outside the waste body. These levels whilst exceeding the trigger levels are lower than recorded in April. Monitoring was not possible at locations GS-10 and L-02 in May as these locations were not accessible.

In June carbon dioxide was detected above the trigger level of 1.5% v/v in two of the boreholes located outside the waste body GS-05 (1.8% v/v) and GS-06 (5.9% v/v). Carbon dioxide was not detected above the trigger level in the other boreholes located outside the waste body.

OCM conducted gas monitoring in the transfer station building and the site offices during all three monitoring events. The monitoring did not detect the presence of carbon dioxide or methane in any of the buildings.

Carbon dioxide levels exceeded the trigger limit of 1.5% v/v in the 1st quarter of 2005 on 6 occasions. Of the 18 gas measurements taken in the 6 monitoring locations located outside the fill area (GS-05, GS-06, BH-2, BH-05, BH-06 and BH-7) there was 56% compliance with the trigger limits. Carbon dioxide levels measured in the monitoring locations in the fill (GS-07, GS-08, GS-09, GS-10, GS-11, L-01, L-02 and L-03) ranged from 0.1 to 12.0% v/v over the monitoring period, with the highest level (18% v/v) detected in L-01 in April.

3. Submit leachate monitoring results for 2004 and 2005 including a full interpretation of the obtained results

The monitoring programme specifies monthly measurements of leachate levels and the once off analysis of leachate samples. Sufficient volumes of leachate have not been present in the monitoring wells to allow for the collection of representative samples to date. The results of the monitoring including an interpretation of the data is presented in the quarterly monitoring reports, and are summarised below.

Leachate Level Q1 2004

	Date	L-01	L-02
Leachate Level (m bgl)	27 Jan 2004	16.00	NDP*
	26 Feb 2004	15.90	7.10
	29 Mar 2004	15.92	7.05

^{*}NDP = No Detection Possible

The total depth of L-01 is 16.08 m bgl and L-02 is 75.7 m bgl. A bailer was used to dip both wells to confirm the dip meter readings. In L-01, leachate was measured at 16.00 m bgl in January and 15.90 m bgl in February and 15.92 m bgl in March. In L-02, leachate was encountered at a depth of 7.10 m bgl in February and 7.05 m bgl in March. L-02 was not accessible in January due to a retaining wall partially covering the access point. This wall was subsequently removed allowing for readings in February and March.

Leachate Level Q2 2004

	Date	L-01	L-02	L-03
Leachate Level (m bgl)	20 April 2004	16.00	_*	16.4
	24 May 2004	15.89	_*	16.5
	10 June 2004	15.91	_*	16.4

^{*}Well inaccessible

The total depth of L-01 is 16.08 m bgl, L-02 is 7.37 m bgl and L-03 is 17.00 m bgl. A bailer was used to dip the wells to confirm the dip meter readings. In L-01, the levels ranged from 16.00 m bgl in April and 15.89 m bgl in May to 15.91 m bgl in June. L-02 was not accessible during the monitoring period due to a retaining wall partially covering the access point. L-03 was installed in April to a depth of 17 m. The leachate level in the well was recorded at a mean level of 16.4 m over the three month monitoring period.

On the 24th February 2004, the Agency conducted monitoring at L-01 and L-02 but were unable to collect representative samples due to the lack of leachate in the wells. This is consistent with previous monitoring conducted at these locations.

Leachate Level Q3 2004

	Date	L-01	L-02	L-03
Leachate Level (m bgl)	08 July 2004	15.95	_*	_*
	06 August 2004	15.97	_*	_*
	03 September 2004	15.90	*	_*

^{*}Well inaccessible

The total depth of L-01 is 16.08 m bgl, L-02 is 7.37 m bgl and L-03 is 17.00 m bgl. A bailer was used to dip L-01 to confirm the dip meter reading. L-01, was effectively dry in July, August and September. L-02 was not accessible during the monitoring period due to a retaining wall partially covering the access point. L-03 was also inaccessible as it was covered by C&D waste.

Leachate Level Q4 2004

	Date Pur legar	L-01	L-02	L-03
Leachate Level (m bgl)	01 October 2004	15.90	_*	_*
	02 November 2004	15.94	_*	_*
	02 December 2004	15.89	_*	_*

^{*}Well inaccessible

The total depth of L-01 is 16.08 m bgl, L-02 is 7.37 m bgl and L-03 is 17.00 m bgl. A bailer was used to dip L-01 to confirm the dip meter reading. L-01, was effectively dry in October, November and December. L-02 was not accessible during the monitoring period due to a retaining wall partially covering the access point. L-03 was also inaccessible as the headworks were damaged.

Leachate Level Q1 2005

	Date	L-01	L-02	L-03
Leachate Level (m bgl)	6 th January 2005	15.90	_*	_*
	7 th February 2005	15.90	7.10	16.70
	1 st March 2005	15.98	7.10	16.74

^{*}Well inaccessible

The total depth of L-01 is 16.08 m bgl, L-02 is 7.37 m bgl and L-03 is 17.00 m bgl. A bailer was used to dip the wells to confirm the dip meter reading. There was insufficient liquid in the wells to collect a representative sample for analysis.

Leachate Level Q2 2004

1	Date	L-01	L-02	L-03
Leachate Level (m bgl)	5 th April 2005	15.93	_*	16.77
	3 rd May 2005	15.95	7.17	16.78
	3 rd June 2005	15.98	7.12	16.81

^{*}Well inaccessible

The total depth of L-01 is 16.08 m bgl, L-02 is 7.37 m bgl and L-03 is 17.00 m bgl. A bailer was used to dip the wells to confirm the dip meter reading. There was insufficient liquid in the wells to collect a representative sample for analysis.

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