ERAS ECO Ltd.

Annual Environmental Report 2008

ERAS ECO Limited

Foxhole, Youghal, Co. Cork
County Cork

Waste licence number:
W0211-01

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Table of Contents

List of Tables

List of Figures

List of Appendices

1 Introduction

ERAS ECO Ltd. is a Sludge Drying and Waste Recovery/ Transfer facility located in, Foxhole, Youghal, Co. Cork. ERAS ECO Ltd. operates in accordance with the company's' waste licence (waste licence number W0211-01). ERAS ECO Ltd. has prepared this Annual Environmental Report in accordance with the terms W0211-01, in particular Condition 11.9. This Annual Environmental Report covers the twelve month period from January 2008 to December 2008.

During 2008 AVR Environmental Solutions Ltd. changed ownership and company name. The company ERAS ECO Ltd. is now solely owned by SWS Energy. In this AER the company is referred to as ERAS ECO Limited. The change of ownership and company name was documented to the agency during 2008. A Certification of Incorporation is provided in Appendix A of this report.

2 Company Description

2.1 Company Description and Site Activities

ERAS ECO Ltd. is an innovative waste management company specialised in treatment of WWTP sludge's and recovery of valuable recyclable materials. The company, which is now solely owned by SWS Energy was set up to compensate for the lack of facilities in Ireland capable of operating under the guidelines of recently published environmental legislation.

SWS Energy Ltd. is a leading energy company with headquarters located at Shinagh House, Bandon, West Cork, Ireland. SWS Energy Ltd. consists of specialist services in wind, forestry, and bioenergy with in house expertise in engineering, grid, legal, financial and environmental management.

The company consists of a Waste Recovery/Transfer and Sludge Drying Facility. The location of the Facility is on a 3.5 acre brown field site, close to the Youghal Landfill and Civic Amenity Centre (Waste Licence Reg. No. W0068-02). A maximum 70,000 tonnes per annum (tpa) of commercial and industrial non-hazardous waste will be managed in the Waste Recovery/Transfer Facility. The Sludge Drying Facility will treat a maximum 30,000 tpa of non-hazardous treated sewage sludge and industrial sludge from municipal or industrial waste water treatment plants.

The Waste Recovery/Transfer facility is used for the recovery and transfer of solid, non-hazardous commercial and industrial waste. Such waste consists of cardboard, paper, plastic, metals, wood, glass, electrical and electronic equipment and wood. Operations include waste inspection, segregation, recovery, storage and transfer into vehicles for removal off-site. Other activities to be carried out include baling, compacting and shredding.

The Sludge Drying Facility treats sludge from industrial, pharmaceutical and municipal sources. Sludge accepted on-site will have a minimum dry solids content of 10%. Effluent from the sludge drying plant is treated in the on-site waste water treatment plant (WWTP) prior to discharge to the Sanitary Authority sewer. The licensee may accept leachate from the nearby Youghal Landfill to be treated in the on-site WWTP, subject to agreement in advance by the Agency and the Sanitary Authority.

The licence and the Environmental Management System in place sets out in detail the conditions under which ERAS ECO Ltd. will operate and manage this facility.

2.2 Environmental Policy (ERAS ECO Ltd.)

ERAS ECO Ltd	Environmental Policy	*Document Number*; ERAS-DS- 008
		Revision 01

Eras Eco Ltd. operates a non hazardous waste transfer station for waste sludge, C&I waste and storage. The group recognises it's environmental and occupational health & safety responsibilities to its staff, shareholders, customers and the general public and is committed to the continual improvement of the operating environment of its facility.

To this end it shall maintain a documented Environmental Management System which is implemented in line with ISO 14001:2004 and complies with all regulatory and legislative requirements pertinent to its industry, local operating environment and customer requirements.

The organisation's objectives include the following:

- Communicating it's policies both internally and externally
- Ensuring that all employees are aware of their obligations
- Commitment to continual improvement in environmental, quality, occupational health & safety and performance.
- Using the input of staff, customers, shareholders, government, local authorities, interested third parties and the general public
- Awareness and training on quality, occupational health & safety and environmental issues
- Creating a better environment for all, through promotion of reducing, recycling and reuse of waste, the optimum usage of resources and the elimination of polluting releases to the environment
- Compliance with all pertinent applicable regulations and legislation
- Prevention of pollution
- Provision of a competitive, cost effective and on time service

The above policy is supported by the management of the organisation who shall commit the necessary resources in ensuring that the objectives and targets can be achieved. This policy shall be made available to the public.

Facility Manager Billy Leary

Date: 12/9/08

Figure 2-1 ERAS ECO Ltd. - Environmental Policy

2.3 Company Management and Organisational Chart

In the first six months of 2008, the staffing levels at ERAS ECO Ltd. continued at 2007 levels (i.e. 21), however since July 2008 the staff numbers has reduced. This reduction has coincided with a decrease in the C&I operations. At present ten persons are directly employed at ERAS ECO Ltd. There are also a large number of contractors / suppliers carrying out various activities on an ongoing basis onsite.

ERAS ECO Ltd. contributes to the local economy with the direct/indirect employment and to a wider scale through promotion of reducing, recycling and reuse of waste and the optimum usage of resources.

As part of the company's environmental policy, management is committed to continual improvement in environmental, quality, occupational health & safety and performance.

Management will ensure that necessary resources are available to comply with all objectives stated in our environmental policy.

See below organisational flow diagram of ERAS ECO Ltd.:

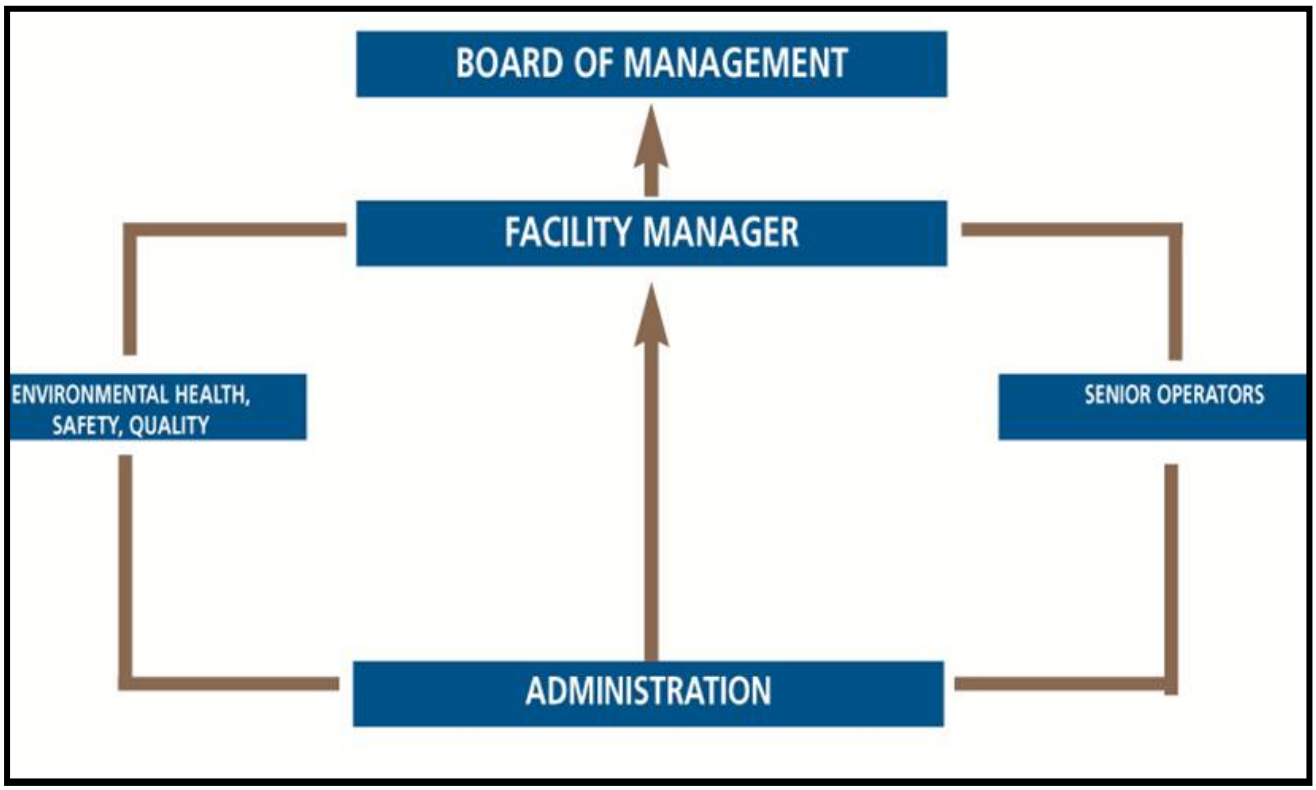

Figure 2-2 ERAS ECO Ltd. Organisational Chart

3 Summary Information

In accordance with Schedule E of ERAS ECO Ltd. waste license (W0211-01) the following summary information is provided:

- Waste management
- Emissions to sewer
- Stormwater Emissions
- Emissions to air
- Noise monitoring
- Groundwater monitoring

3.1 Waste Management

As per condition 11.10 of Waste License W0211-01, a full record of all incoming /outgoing waste is kept and updated on a monthly basis.

The main on site waste activities are summarized as follows:

- Non hazardous industrial or municipal WWTP Sludge are inspected, accepted (or rejected if non-compliance with waste acceptance criteria), dried and exported as a fuel.
- Non hazardous waste from Commercial and Industrial (mainly Dry Recyclables) are accepted (or rejected if non-compliance with waste acceptance criteria), segregated, consolidated, shredded and baled.
- Non-hazardous grade A wood is shredded and used onsite as a fuel for the onsite boiler, improving our self-sufficiency capability.
- Waste storage

All incoming/ outgoing waste is recorded by means of an integrated weighbridge and software system.

ERAS ECO Ltd. operates with stringent waste acceptance criteria and in-house standard operational procedures for waste acceptance.

3.1.1 Incoming wastes

The total amount of sludge accepted during 2007 and 2008 is provided in Table 3-1 below.

Table 3-1 Total sludge accepted in ERAS ECO Ltd. during 2007 and 2008

EWC	Description	Total Weight (Tonnes) 2007 Note 1	Total Weight (Tonnes) 2008 Note 2
07 05 12	Sludge	1,910.84	4505

Note 1 Total weight figure for 2007 includes both sludge waste accepted during sludge drying facility commissioning period (March 2007 to May 2007 inclusive) and sludge accepted during operational phase (June 2007 to December 2007 inclusive).
Note 2 The total weight figure for 2008 includes sludge waste accepted from January 2008 to December 2008.

The total commercial and industrial (C&I) waste accepted during 2007 and 2008 is outlined in Table 3-2.

Table 3-2 Total C&I (dry recyclables) accepted in ERAS ECO Ltd. during 2007 and 2008.

EWC	Description	Total Weight (Tonnes) 2007 note1	Total Weight (Tonnes) 2008 note2
150101	Cardboard or paper packaging	40.708	200.04
150102	Plastic Packaging	12.541	111.16
150103	Timber packaging	5.268	300.42
150104	Metal packaging	0.000	1.00
150106	Mixed packaging	12.90	798.52
191212	Mixed Waste from waste management	0.000	6.28
200101	Paper (separately collected)	0.442	0.81

Note 1: Waste accepted relates to commissioning period as Waste Recovery/ Transfer Facility entered into commercial operation in Quarter 1 2008

Note 2:Waste accepted relates to wastes accepted from January 2008 to December 2008.

A copy of the EPA Waste Survey 2008 submitted to the EPA is enclosed in Appendix B

A copy of the PRTR Returns for 2008 is enclosed in Appendix C.

3.1.2 Outgoing Waste

Table 3-3 Provides a summary of all Outgoing wastes during 2008

EWC [1]	Description	Weight (kg)	Via	Waste Licence/ Collection Permit/ Waste Permit	Final Outlet	Waste Licence/ Waste Permit / TFS Registration No.	Recovery [2]/ Disposal [3]
20 03 01	Landfill waste	230,660 kgs	O'Brien Skip Hire Ballyrussel, Midleton, Co Cork	CK WMC 104/02	Youghal Landfill, Foxhole, Youghal County Cork	W0068-02	D1
03 01 05	Wood waste	1,580 kgs	O'Brien Skip Hire Ballyrussel, Midleton, Co Cork	CK WMC 104/02	O'Brien Skip Hire, Ballyrussel, Midleton , Co Cork	CK (S) 441/07	R3
19 08 12	Dried sludge	643,820 kgs	AVR Safeway Corrin, Fermoy, Co Cork & South Coast Transport	W 0050-02 CK WMC 07/01	Remondis, Luenen, Germany	21/Fo/Tho -G 61/93	R1
			A Quick Sharp Ballybeg, Littleton, Thurles, Co Tipperary	CK MWC 129/02	Lagan Cement Limited, Killaskillen, Kinnegan, County Meath	IPPC Licence Reference: P0487-05	
		76,320 kgs	Yawl Haulage Foxhall, Youghal, Co Cork	CK WMC 495/07			
10 01 01	Ash boiler	25,520 kgs	AVR Safeway Corrin, Fermoy, C Cork & South Coast Transport	W 0050-02 CK WMC 07/01	Youghal Landfill Foxhole Youghal County Cork	EPA waste licence W0068-02	D1
15 01 01	Paper & cardboard packaging	359,900 kgs	Marwin Environmental Rubicon Centre, CIT Campus Bishopstown Cork	Transport Company. Toner transport and Logistics, Rathcoole, Co Dublin. CK IRE/G027/08	Van Gansewinkel	IRE/G027/08	R3
					PT Indah Kiat Pulp & Paper, Plaza BII, Menara 2 Lt 7, Jl MH Thamrin No. 51, 10350, Jakarta, INDONESIA		
15 01 02	Plastic Note 4	159,500 kgs	Waste Recovery Services (Fermoy) Ltd, Cullenagh, Fermoy, C Cork	CK WMC 92/01	Leinster Environmental, Clermont Business Park, Haggardstown, Dundalk, Co. Louth.	WP 2004/30	R5
			Alternative Waste	Transport	Alternative	IRE/G009/08	

EWC [1]	Description	Weight (kg)	Via	Waste Licence/ Collection Permit/ Waste Permit	Final Outlet	Waste Licence/ Waste Permit / TFS Registration No.	Recovery [2]/ Disposal [3]
			Solutions Ltd. Unit 2 Britannia Business Park, Point Pleasant Industrial Estate, Wallsend, Tyne & Wear, NE28 6HA, UK	Company: Surefrieght Ltd, Unit 4, shepards Drive, Carbane Industrial Estate, Newry, Co Down, BT35 6JQ? CK WMC 191/03	Waste Solutions Ltd. Unit 2 Britannia Business Park, Point Pleasant Industrial Estate, Wallsend, Tyne & Wear, NE28 6HA, UK		
			Marwin Environmental Rubicon Centre, CIT Campus Bishopstown	Transport Company. Toner transport and Logistics, Rathcoole, Co Dublin. CK WMC 268/04	PT Indah Kiat Pulp & Paper, Plaza BII, Menara 2 Lt 7, Jl MH Thamrin No. 51, 10350, Jakarta, INDONESIA	CK WMC 268/04 IRE/G027/08	
15 01 04	Metal packaging (cans)	20,400 kgs	Cork Metal Company Ltd, Dublin Hill Cork	CK WMC 26/01	Cork Metal Company Ltd, Dublin Hill Cork	CK (S) 204/05 CK (S) 279/06	R4
20 01 01	Paper	288,960 kgs	Marwin Environmental Rubicon Centre, CIT Campus Bishopstown	Transport Company. Toner transport and Logistics, Rathcoole, Co Dublin. CK WMC 268/04	PT Indah Kiat Pulp & Paper, Plaza BII, Menara 2 Lt 7, Jl MH Thamrin No. 51, 10350, Jakarta, INDONESIA	IRE/G027/08	R3

Note 1: European Waste Catalogue Code (asterisk denotes hazardous waste)
Note2: R1 Use as a fuel to generate energy; R3 Recycling/ Reclamation of organic substances which are not used as solvents (including Composting); R4 recycling/reclamation of metal and metals compounds; R5 recycling/reclamation of other inorganic materials.
Note 3: D1 deposit into landfill,
Note4 Plastic includes: Baled Hard Plastic, PET Bottles, Plastic Clear, Plastic Coloured, Plastic Film Clear, Plastic Film Coloured, light Plastic mixed, PP Big Bags.

3.1.3 Waste Monitoring 2008

As per schedule C.4 Waste Monitoring, a Boiler Ash sample and a dried sludge sample were sent for analysis during 2008. A boiler ash sample was collected on the 20th August 2008 from an outgoing load and sent to ELS Environmental Laboratory for metals analysis. A dried sludge sample was collected on 18th July 2008 from an outgoing load and sent to ELS Environmental Laboratory for metals, nitrogen and phosphorous analysis.

Table 3-4 below summarises the annual waste monitoring carried out, as per Schedule C.4 of the Waste License W0211-01.

Certificates of Results are provided in Appendix D.

Table 3-4 Annual Waste Monitoring 2008

EWC Code	Description	Sampling date	Laboratory	Analysis
100101	Ash	20/08/2008	Alcontrol	Metals
190812	Dried Sludge	18/07/2008	Alcontrol	Metals, P, N Total Nitrogen

3.2 Emissions to Sanitary Sewer (Emission point Reference SE1)

This section provides information relating to annual emissions to sewer (**Ref: emission point SE1**). Effluent from the sludge drying plant and Waste /Transfer Facility is treated in the on-site waste water treatment plant (WWTP) designed and installed by EPS Pumping and Treatment Systems Ltd. prior to discharge to the Sanitary Authority sewer (Youghal Town Council).

Washwater from the wheelwash is also treated in the on-site waste water treatment plant. The Sanitary effluent from the administration building is treated in a Puraflo peat filter sewage treatment system, which was installed by Bord na Mona on 2007, prior to discharge to the Sanitary Authority Sewer.

The main source of the trade effluent originates from the sludge drying process, as the condensate water from the process is discharged and treated in the WWTP. A Surface Water monitoring report summarising all monitoring results for 2008 was prepared and submitted to the EPA. A full copy of this report is provided in Appendix E.
Table 3-5 below outlines the monitoring requirements for emission point SE1 as stipulation by Schedule C3.1

Table 3-5 Monitoring Frequency and Analysis methodology SE1

Monitoring Frequency	Parameter	Analysis Method	Emission Limit Value Note 1
Continuous	Flow	On-line flow meter with recorded	Maximum in any one day: 170 m^3/day Max rate per hour 7m^3/hour
Weekly	Temperature	Temperature probe (on-line continuous daily readings available)	25^{0}C (max)
	pH	pH electrode/meter (on-line continuous daily readings available)	6.0-8.5 (ph units)
	COD	Standard Method	125 mg/l
	Suspended Solids	Gravimetric	35 mg/l
Monthly	BOD	Standard Method	20 mg/l
Quarterly	Total Nitrogen (as N)	Standard Method	10 mg/l
	Sulphate	Standard Method	100mg/l
	VOC	Standard Method	50ug/l
	Semi VOC	Standard Method	50ug/l
	Faecal Coliforms	Standard Method	<250FC/100mls
Biannually	Total Phosphorus (p)	Standard Method	1.0
	Cyanide	Standard Method	0.01mg/l
	Mercury	Standard Method	
Annually	Lead	Atomic Absorption/ ICP	5ug/l
	Zinc		100 ug/l
	Copper		30ug/l
	Cadmium (total)		5 ug/l
	Arsenic (total)		20 ug/l
	Chromium		15ug/l
	Nickel		25ug/l

Note 1 Source B.4 Emission to Sewer Waste Licence NO: W0211-01

3.2.1 Flow

Volume flow is monitored hourly using an online probe. Graphs showing the monthly hourly and daily flow are provided in Appendix E. No daily flow during 2008 exceeded the 170 m^3 /day emission limit value. The average total daily flow for each month during 2008 is provided in Table 3-6.

Flow readings at SE1 are taken hourly. It was noted that during 2008 a default value of 17.64 m^3/hr was recorded on a number of occasions. This reading is an error reading and does not reflect actual flow at SE1.

Table 3-6 Average Total daily Flow per month during 2008.

Month	Total Average Flow (m^3/day)	Emission Limit Value (m^3/day)
January	23.09	170
February	38.73	170
March	18.78	170
April	26.38	170
May	29.25	170
June	24.9	170
July	24.5	170
August	26.6	170
September	22.64	170
October	25.37	170
November	27.83	170
December	18.64	170

At present, there is one sludge dryer in operation (15,000 tonnes sludge capacity). A second dryer will be installed in the near future, depending on sludge availability. The flow limits in The Waste License W0211-01 are based on two sludge dryers (30,000 tonnes sludge capacity).

3.2.2 *Weekly Monitoring*

COD, pH and Suspended Solids are monitored on a weekly basis by an external laboratory, Environmental Laboratory Services and Alcontrol Laboratories.

Table 3-7 summarises the results of weekly monitoring during 2008.

Any result highlighted in bold exceeded the emission limit value. Temperature is monitored continuously using an online probe. The temperature from the online probe for the date the weekly sample was collection is reported.

Table 3-7 SE1 Weekly Results

Week	Date of monitoring	COD note 1	pH note 1	Temp	SS note 1
	Units	**mg/l**	**ph units**	**°C**	**mg/l**
	Emission Limits	**125**	**6-8.5**	**25°C**	**35**
1	**04/01/2008**	**302**	6.6	6.4	24
2	**11/01/2008**	**253**	7.7	2.5	**40**
3	**18/01/2008**	**500**	7.9	11.9	29
4	**25/01/2008**	**512**	8.3	11.9	30
5	**31/01/2008**	**533**	7.5	6.95	32
6	**07/02/2008**	**420**	8.2	11.9	11
7	**15/02/2008**	**501**	8.1	5.03	14
8	**21/02/2008**	**444**	6.8	6.9	12
9	**28/02/2008**	**426**	6.7	8.3	6
10	**08/03/2008**	**300**	6.1	6.6	**43**
11	**17/03/2008**	**291**	7.1	5.7	17
12	**20/03/2008**	94	7	6.1	17
13	**27/03/2008**	**436**	6.9	8	<1
14	**08/04/2008**	**328**	7.2	8.25	6
15	**11/04/2008**	**552**	7.08	8.35	17
16	**17/04/2008**	**636**	6.6	8.2	33
17	**24/04/2008**	**565**	6.58	10.5	13
18	**02/05/2008**	**461**	7.2	11.7	5
19	**09/05/2008**	**556**	8.5	14.6	1
20	**16/05/2008**	**380**	8.5	13.6	3
21	**22/05/2008**	**469**	7.3	14.5	2
22	**26/05/2008**	**319**	7.6	13.23	20
23	**06/06/2008**	**315**	7.6	16.5	<1
24	**12/06/2008**	**333**	7.2	16	21
25	**19/06/2008**	**234**	8.1	16.5	20
26	**26/06/2008**	**227**	7.8	15.8	12
27	**04/07/2008**	**275**	7.29	14.2	<10
28	**11/07/2008**	**284**	6.99	16.8	<10
29	**18/07/2008**	**403**	6.77	18.24	**87**
30	**23/07/2008**	**251**	**5.8**	16.5	18
31	**31/07/2008**	**513**	7	16.3	19

Week	Date of monitoring	COD note 1	pH note 1	Temp	SS note 1
	Units	mg/l	ph units	°C	mg/l
	Emission Limits	125	6-8.5	25°C	35
32	08/08/2008	**507**	7.9	19.8	22
33	14/08/2008	**250**	6.43	15.9	21
34	22/08/2008	**153**	6.99	16.8	26
35	26/08/2008	103	**5.73**	15.6	24
36	04/09/2008	**135**	7.1	15.9	27
37	08/09/2008	78	7.38	12.5	21
38	18/09/2008	**144**	7.69	14.8	20
39	25/09/2008	34	7.06	14.5	**40**
40	01/10/2008	50	7.15	11.5	28
41	09/10/2008	**260**	7.3	12.7	17
42	17/10/2008	**153**	7.3	12.6	23
43	22/10/2008	91	7.5	10.6	7.5
44	31/10/2008	80	6.65	7.9	35
45	06/11/2008	**230**	8.2	8.9	**42**
46	14/11/2008	106	7.7	10.1	23
47	19/11/2008	**229**note 1	7.96note1	10.4	32.0note 1
48	26/11/2008	**435**	8.1	9.7	35
49	05/12/2008	108	8.37	6.38	**47**
50	09/12/2008	103	8.33	2.04	**46**
51	18/12/2008	**252**	8.12	7.06	42
52	22/12/2008	**210**	7.9	9.08	23

Note 1 Due to a clerical error data was not received for week 47, 19/11/2008 for COD, pH and suspended solids. An EPA split sample was taken at this date and a different laboratory was used and failed to carry out analysis of sample for these parameters.

Note 2 Any result highlighted in bold exceeded the emission limit value.

3.2.3 Chemical Oxygen Demand

The concentration of COD exceeded the emission limit values during Q1-Q3, however a reduction in COD concentration was observed during Q4 of 2008. Improvements within the onsite WWTP is an ongoing objective within ERAS ECO Ltd. in order to meet emission limits values. These works are outlined in the Section 5 – Management of the facility.

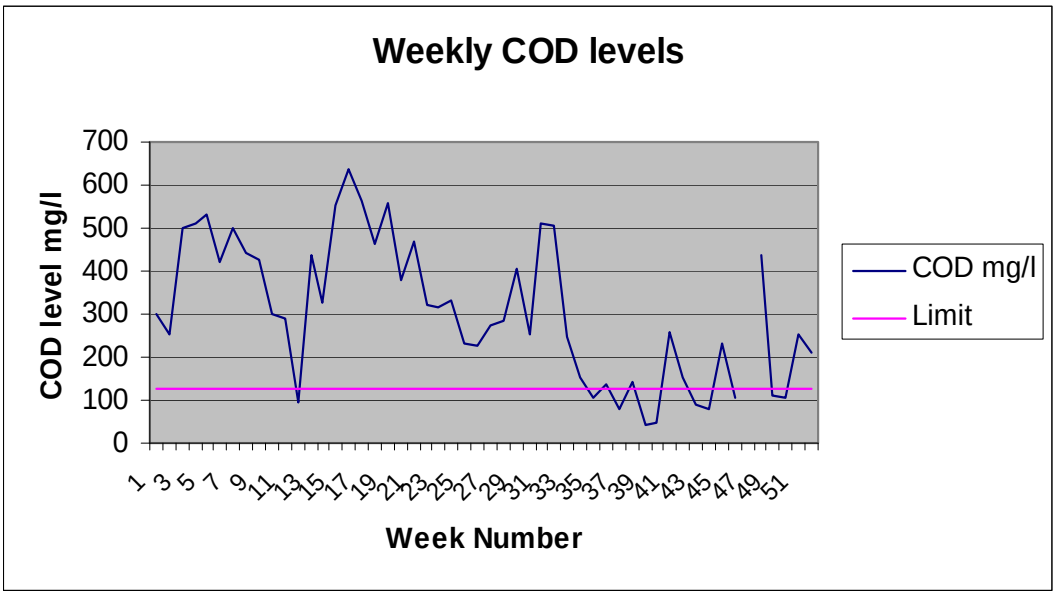

Figure 3-1 Chemical Oxygen Demand 2008

3.2.4 pH

Two pH exceedences were observed in the weekly 24h composite samples during 2008 (23rd July 2008 and 26th of August 2008, pH 5.8 and pH 5.73 respectively).

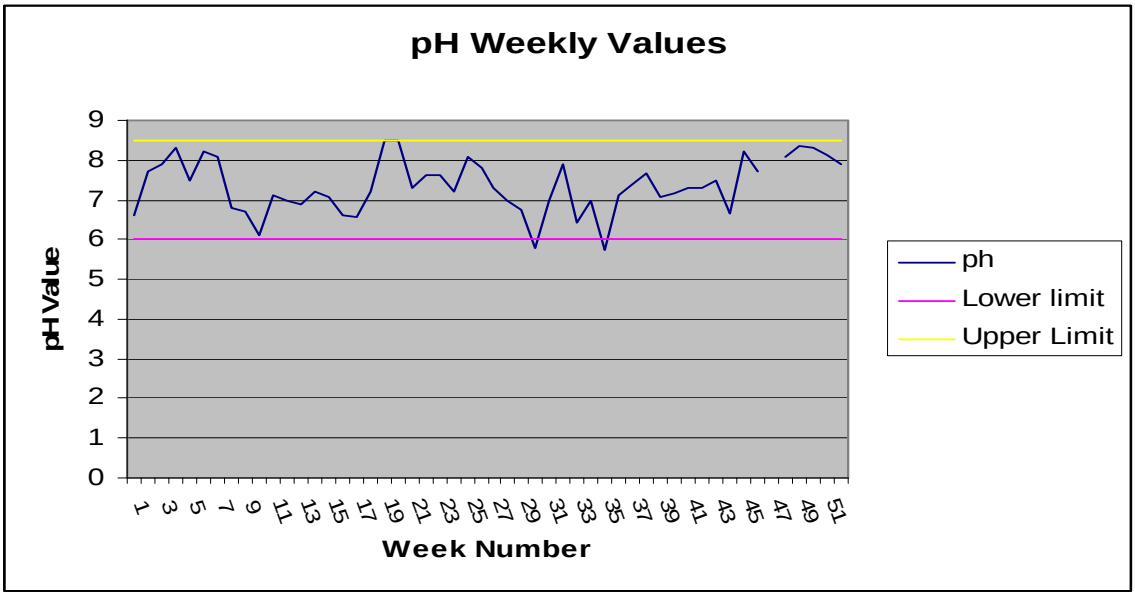

Figure 3-2 SE1-pH 2008

3.2.5 Temperature

Temperature was found in compliance at all times with the waste license emission limit values during 2008.

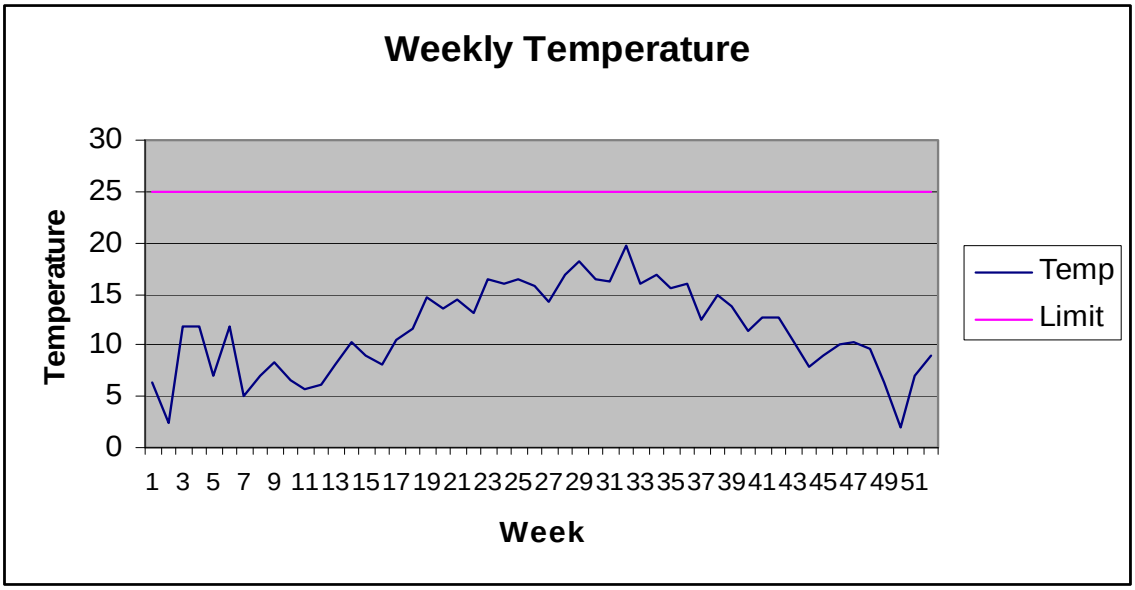

Figure 3-3 SE1-Temperature 2008

3.2.6 Suspended Solids

Suspended Solids is monitored on weekly basis. Seven suspended solids exceedences were observed during 2008: 11/01/2008 40mg/l, 08/03/2008-43mg/l, 18/07/2008 87mg/l, 25/09/2008 40mg/l, 06/11/2008 42mg/l, 05/12/2009 47mg/l and 09/12/2008 46mg/l.

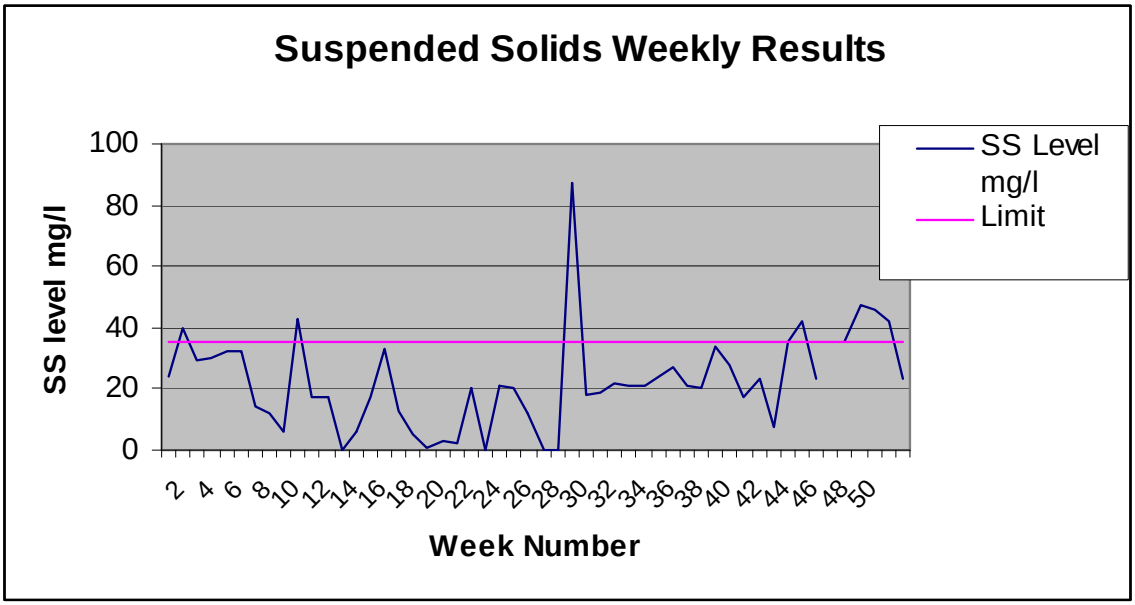

Figure 3-4 Suspended Solids

3.2.7 Biological Oxygen Demand

Biological Oxygen Demand is monitored on a monthly basis in accordance with the requirements of the licence. Table 3-8 below summarises all results for BOD during 2008. Certificates of Analysis are provided in the final SE 2008 report (Appendix E).

Table 3-8 Monthly monitoring results – Biological Oxygen Demand

Month	Date of monitoring	Units	Emission Limit value	Result
Jan	31/01/2008	mg/l	20	**198**
Feb	28/02/2008	mg/l	20	**513**
Mar	27/03/2008	mg/l	20	<3
Apr	24/04/2008	mg/l	20	<3
May	22/05/2008	mg/l	20	3
Jun	26/06/2008	mg/l	20	4
Jul	23/07/2008	mg/l	20	<2
Aug	26/08/2008	mg/l	20	7
Sep	25/09/2008	mg/l	20	<2
Oct	31/10/2008	mg/l	20	**64**
Nov	19/11/2008	mg/l	20	**201**
Dec	18/12/2008	mg/l	20	2

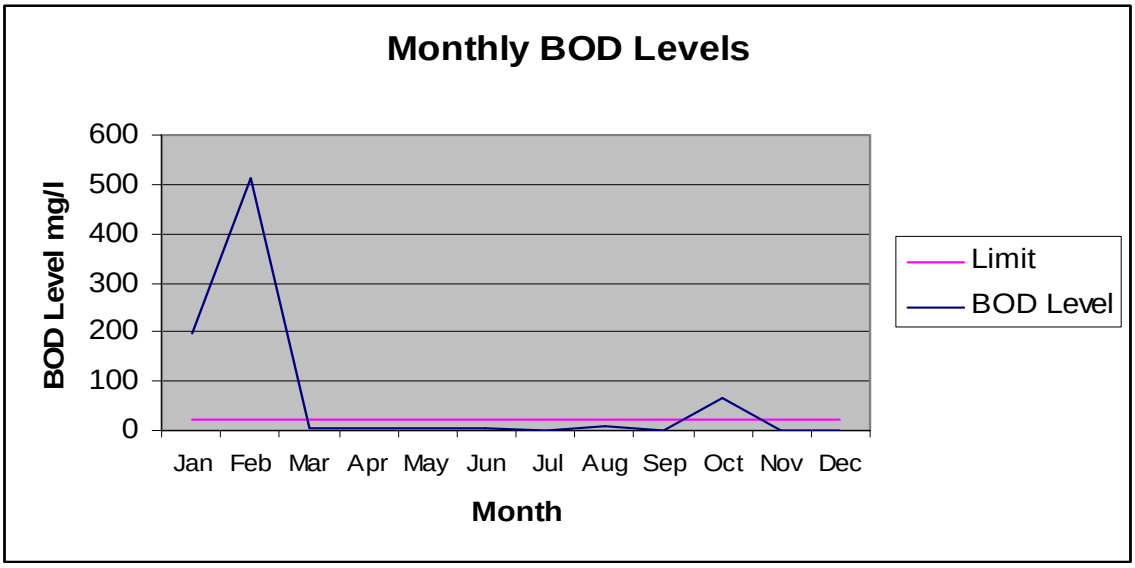

Figure 3-5 Biological Oxygen Demand-2008

Four BOD exceedences were observed during 2008:

- 31/01/2008 198mg/l
- 28/02/2008 513mg/l
- 31/10/2008 64mg/l

- 19/11/2008 201mg/l

These exceedences are probably caused by the shortened lifetime of the carbon filter due to oversaturation caused by high level of particulates recirculating from the backwash back into the system (initial design issue). The WWTP has been modified to avoid continuous oversaturation of the filters and this has been reflected in a prolonged life of the carbon, and BOD compliance.

The exceedences following this modification observed on 31/10/08 and 19/11/2008 of BOD level 64mg/l and 201mg/l coincided with end of life of GAC carbon filter.

3.2.8 Quarterly Monitoring (Q1, Q2, Q3 and Q4):

Table 3-9 outlines monitoring results for parameters monitored on a quarterly basis.

Quarterly monitoring was carried out on following dates:

- Q1 27/03/2008
- Q2 26/06/2008
- Q3 26/09/2008
- Q4 18/12/2008

Table 3-9 Quarterly Monitoring Results

Year/Quarter	Date	Parameter	Units	Emission Limit	Result
2008/Q1	27/03/2008	Total Nitrogen	mg/l	10	35
		Sulphate	mg/l	100	**524**
		VOC	ug/l	50	**285.5**
		Semi VOC	ug/l	50	<50
		Faecal Coliforms	FC/100mls	<250	<1
Year/Quarter	**Date**	**Parameter**	**Units**	**Emission Limit**	**Result**
2008/Q2	26/06/2008	Total Nitrogen	mg/l	10	42
		Sulphate	mg/l	100	**3014**
		VOC	ug/l	50	ND
		Semi VOC	ug/l	50	ND
		Faecal Coliforms	FC/100mls	<250	0
Year/Quarter	**Date**	**Parameter**	**Units**	**Emission Limit**	**Result**
2008/Q3	26/09/2008	Total Nitrogen	mg/l	10	19
		Sulphate	mg/l	100	**219**
		VOC	ug/l	50	**62.5**
		Semi VOC	ug/l	50	ND
		Faecal Coliforms	FC/100mls	<250	0
Year/Quarter	**Date**	**Parameter**	**Units**	**Emission Limit**	**Result**
EPA Split Sample	01/10/2008	Total Nitrogen	mg/l	10	16
		Sulphate	mg/l	100	**172**
		VOC	ug/l	50	21.65
		Semi VOC	ug/l	50	ND
		Faecal Coliforms	FC/100mls	<250	0
Year/Quarter	**Date**	**Parameter**	**Units**	**Emission Limit**	**Result**
2008/Q4	18/12/2008	Total Nitrogen	mg/l	10	10
		Sulphate	mg/l	100	**149**
		VOC	ug/l	50	ND
		Semi VOC	ug/l	50	ND
		Faecal Coliforms	FC/100mls	<250	0

ND: Not detected

Total Nitrogen results were above the license limits in the first three quarterly results and within limit value for Q4 2008. Chlorination breakpoint treatment has resulted in reduced levels of effluent ammonia, and therefore total Nitrogen – this is evident from Q4 results.

Faecal Coliforms results were within the emission limit values during 2008.

All Semi VOC results were within the license emission limit values.

Sulphate levels were above the license limit values during all quarterly monitoring. Ongoing investigations have established that these exceedences are to some extent related to intrinsic sulphate levels caused by the use of sulphuric acid for inline pH adjustment. Sulphuric acid 50% was substituted with hydrochloric acid 36% (September '08) and a significant decrease in sulphate levels has resulted (levels reducing from 3014ppm in Q2 to 149ppm in Q4). A summary of the plan of action taken and status of SE1 environmental objectives and targets is provided in Section 5 of this report- Objective 1 2008.

Q1 VOC results were above the licence limits. A new filter unit was put in place in March 2008 to reduce VOC concentrations in the final effluent. Reduced VOC concentrations were observed for Q2, Q3 and Q4.

3.2.9 Ammonia Testing during 2008

Ammonia levels are measured daily onsite, and have shown noticeable improvement in line with the scope of works undertaken. Current daily onsite ammonia levels are within compliance limits as are the two most recent split sample results of the Agency (see Table 3-10).

At three stages throughout the year the limit value of 0.5mg/l was exceeded; the exceedances occurred in February, October and December.

Table 3-10 Ammonia Testing during 2008

Date	Result mg/l	Limit value mg/l	Reference
19/02/2008	**82.7**	0.5	EPA Sample result reference 280372/1
26/06/2008	<0.007	0.5	ELS Report no: 10769
01/10/2008	**18.2**	0.5	ELS report no: 11699
01/10/2008	<0.02	0.5	EPA Sample results reference 281890
19/11/2008	<0.02	0.5	EPA Sample results reference 282192/1
18/12/2008	**4.11**	0.5	ELS Report No: 12652
22/12/2008	**13.2**	0.5	ELS Report No: 12688

It should be noted that external laboratory results for these split samples does not show compliance with ammonia limits and are therefore at odds with the agency and in-house results. Clarification has been sought from the external laboratories to ascertain the cause of this discrepancy.

3.2.10 Biannual Monitoring (B1 and B2):

Biannual monitoring was carried out in June and December 2008 with the EPA split also analysed for the parameters. Parameters analysed include Total Phosphate, Cyanide and Mercury. B1 and B2 Cyanide result (0.03mg/l) was above the waste license limit value (0.01mg/l). Table 3-11 below summarises biannual monitoring results. Certificates of Analysis are provided in Appendix E.

Table 3-11 Biannual Monitoring results 2008

Monitoring period	Date of Sample Collection	Parameter	Units	Emission Limit Value	Result
Sample B1	26/06/2008	Total Phosphate	mg/l	NA	0.009
		Cyanide	mg/l	0.01	**0.03**
		Mercury	ug/l	NA	<0.2
Monitoring period	**Date of Sample Collection**	**Parameter**	**Units**	**Emission Limit Value**	**Result**
Sample B2	18/12/2008	Total Phosphate	mg/l	NA	0.081
		Cyanide	mg/l	0.01	<0.005
		Mercury	ug/l	NA	<0.02

3.2.11 Annual Monitoring

Annual monitoring of the Heavy Metals is required for the compliance of the waste licence. Copper, Chromium and Nickel were found to be above emission limit values for a sample collected on the 30th September 2008. A repeat analysis of the heavy metals was carried out in December 2008 and all emission values were well within emission limits.

Table 3-12 Annual Monitoring Results 2008

Year	Date	Parameter	Units	Emission Limit	Result
2008	30/09/2008	Pb	ug/l	5	0.8
		Zn	ug/l	100	59.4
		Cu	ug/l	30	**54.2**
		Cd	ug/l	5	<0.1
		As	ug/l	20	1
		Cr	ug/l	15	**78.4**
		Ni	ug/l	25	**76.1**
Year	**Date**	**Parameter**	**Units**	**Emission Limit**	**Result**
2008	18/12/2008	Pb	ug/l	5	<0.3
		Zn	ug/l	100	<1.0
		Cu	ug/l	30	0.012
		Cd	ug/l	5	<0.1
		As	ug/l	20	0.3
		Cr	ug/l	15	1.1
		Ni	ug/l	25	2.6

Appendix E Emissions to Sewer- SE1 Report 2008 outlines all weekly, monthly, quarterly, biannual and annual results**.**

3.2.12 Toxicity Testing

A sample of effluent was taken for toxicological analysis on the 18th December 2008. Analysis was carried out by Shannon Aquatic Toxicity Services. A summary of results are provided in Table 3-13. A full copy of the report is provided in Appendix F of this report.

Table 3-13 Summary of Toxicity report

Test Parameter	Toxic units
48 hLC 50 to Tisbe Battagliai (Marine Copepod)	<3.1
72 h IC50 to Skeletonema costatum (Marine Algae)	<3.01
5 min EC50 to Vibrio Fischeri (Marine Bacterium)	<2.2
15 min EC50 to Vibrio Fischeri (Marine Bacterium)	<.2.2

This reported indicates that the sample of effluent tested is not toxic for the range of species monitored.

3.2.13 Mass Emissions

Flows (See Table 3-6. Average Total Daily Flow 2008) and results were averaged to provide information on annual emission figures for the licensed parameters. Table 3-14 below summarises the mass emissions to the sewer 2008.

Table 3-14 SE 1 Mass Emissions 2009

Parameter	ELV Mass Emission	Average Mass Emission
COD	7756.3	2837.06
SS	2171.8	224.04
BOD	1241	1156.05
Total Nitrogen	620.5	227.48
Sulphate	6205	7603.84
VOC	3102.5	6.89
Semi VOC	3102.5	0.93
Faecal Coliforms	15513	1.86
Total Phosphate	62.05	0.46
Cyanide	0.6205	0.22
Pb	310.25	0.05
Zn	6205	2.82
Cu	1861.5	2.53
Cd	310.25	0.01
As	1241	0.06
Cr	930.75	3.71
Ni	1551.3	3.67

Note1: Calculations based on total days January 2008 -December 2008 (365 days) and maximum discharge limit: 170m^3/day (Schedule B.4 of Waste License W0211-01)
Note2: Results based on average flow
Note 3: Calculations based on 3973 drying hours

As part of onsite continual improvement and corrective action procedures, ERAS ECO Ltd. commenced a scope of work to identify the source of the problem and initiate corrective actions to address the same. This has resulted in a number of alterations to the onsite Waste Water Treatment Plant which are detailed below:

- Installation of an aeration system in the balance tank (130 m^3).
- Installation of a Granular Activated Carbon (GAC) filter unit by EPS on the basis on the findings of pilot scale condensate tests by Celtic Water.
- Larger dosing pumps for sodium hydroxide were installed to enable pH correction to an upper level of 11.6 pH units to facilitate improved aeration. Subsequent dosing with greater amounts of sulphuric acid reducing inline pH to an optimum level of 7-8.8 pH units to optimise a absorption in the activated carbon unit
- A high molecular weight flocculant was added to the plant to facilitate improved suspended solids removal, and aid COD reduction via downstream filtration.
- Installation of new inline mixers to aid contact between effluent and floculant/ co-agulant.
- Installation of a mixing tank inline together an increase of sodium hypochlorite dosing rate.

All improvement works carried out in the WWTP in different stages during 2007 and 2008 by EPS and Celtic Water are outlined in the Section 4 of Appendix E.

In the past year, ERAS ECO Ltd. has experienced a reduction in the overall/ total Mass Emmissions. The above measures have positively improved the final effluent discharge at SE1. ERAS ECO Ltd. are committed to continual improvement works to ensure demonstration of compliance with emission limits.

To build upon ongoing improvements over the last year and a half, ERAS ECO Ltd. has outlined further projects/works that will aid the company meet its discharge emission limits. To this end a programme for continual improvement is included in the site's Environmental Objectives and Targets indicating targets, timelines and works the company is committed to achieving.

As part of our commitment to continual improvements in environmental performance, a water quality survey was conducted to investigate the effects of the discharging effluent on the environment. It was concluded from the study that **the impact of the effluent discharge on the immediate or surrounding environment is negligible**. The water quality study report is enclosed in Appendix G**.**

3.3 Emissions to the Air

ERAS ECO Ltd. operates two licensed emission points to the atmosphere namely:

- A1-Boiler
- A2-Biofilter

3.3.1 Emission Point Reference No.: A1 Boiler

The sludge drying process (non-contact drying process) utilises 12 bar steam generated by the onsite biomass boiler. The start-up procedure for the boiler uses light fuel oil which raises the furnace temperature to approximately 400ºC. Upon reaching this temperature the system is manually switched to woodchip. This results in the furnace reaching temperatures above 600 ºC. The flue gas generated is treated through a cyclone and a bag filter, prior to emission at reference point A1 (boiler stack).

As per Schedule C.1.2 Monitoring of Emissions to Air, quarterly monitoring was carried out during 2008 and results are summarised in Table 3-1. Any results highlighted in bold exceeded emission limit value. Monitoring of Emissions to Air Reports (Emission Point A1-Boiler) is provided in Appendix H.

Table 3-15 Air Results 2008: Emission Point A1 Boiler

			Monitoring period	Q1 2008	Q2 2008	Q3 2008	Q4 2008
Substance to be monitored	**License Emission Limit**	**UNITS**	**Date of monitoring**	05/03/08	01/05/08	16/09/08	05/11/08
NOx	250	mg/Nm^3		**247**[note 2]	137	217	210
CO	150	mg/Nm^3		4.2	22	19	19
Particulates	20	mg/Nm^3		5.85	1.69	2.1	1.8
SOx	--	mg/Nm^3		<3.86	<5	<5	<5
Airflow	11,600	Nm^3/hr		3,356	2,239	2,545	3,914

Note 1: Normalised to 273K, 101.3 kPa and 11% O_2 reference.

Note 2.: in 2008, there was one exceedance to Schedule B1. The exceedance was only 24 mg/Nm3 greater than the limits for Nitrous Oxides. Each subsequent monitoring result was in compliance, thus suggesting that the levels are now under control.

Table 3-16 below summarises the annual mass emissions (Emission Point ref. A1-Boiler) to the air 2008. These figures are based on average values (Q1-Q4) of the parameters monitored and the actual number of sludge drying hours in 2008 (3973 hours).

Table 3-16 Mass Emissions to the Air (A1-Boiler) 2007 & 2008.

Parameter	Units	License Emission Limit Mass emissions[1,2]	Mass Emissions 2007[1,3]	Mass Emissions 2008
NOx	Kg/year	14,894.40	1,499.19	7,501
CO	Kg/year	8,936.64	106.81	697.27
Particulates	Kg/year	1,191.55	64.32	84.13
SOx	Kg/year	Not Specified	415.04	185.65

Note 1: Normalised to 273K, 101.3 kPa and 11% O_2 reference.
Note 2: 2007 - Calculations based on total days June 2007-December 2007 (214 days), emission limits and airflow emission limit (as per schedule B.1 of Waste license W0211-01)
Note 3: Calculations based on drying hours January- December 2008 (3973 drying hours)
Note 4: Calculations based on average of Quarterly results

3.3.2 Emission Point Reference No.: A2 Biofilter

As per condition 6.8.3 of Waste License W0211-01, the sludge storage bin (Ref: HST2) is vented to the onsite biofilter for odour abatement.

As per condition 6.8.4 and 6.8.5 of Waste License W0211-01, gaseous emissions from the condensate (cooling) tower and from the WWTP are treated in the onsite biofilter.

The odour abatement system (A2-Biofilter) was installed and commissioned in May 2007 by Bord na Mona.

Controls are also carried out regularly by ERAS ECO Ltd. personnel. Monthly biofilter pH water return results summarised in Table 3-17.

Table 3-17 Monthly pH results Biofilter 2008

pH return water - Biofilter A2				
Month	**Parameter**	**Units**	**Result**	**Comments**
January	pH	pH units	7.38	Clear
February	pH	pH units	7.14	Clear
March	pH	pH units	7.22	Clear
April	pH	pH units	7.16	Clear
May	pH	pH units	7.31	Clear
June	pH	pH units	7.28	Clear
July	pH	pH units	7.14	Clear
August	pH	pH units	7.24	Clear
September	pH	pH units	7.19	Clear
October	pH	pH units	7.37	Clear
November	pH	pH units	7.22	Clear
December	pH	pH units	7.18	Clear

As per Schedule C.1.2 Monitoring of Emissions to Air, Biannual and weekly monitoring was carried out during 2008. Biannual biofilter stack monitoring was carried out twice during 2008. A summary of the biannual and weekly monitoring are provided in Table 3-18 and Table 3-19 respectively. A copy of the biannual reports is provided in Appendix I of this report.

Table 3-18 Biannual Emissions to the Air Results 2008. Emission Point Ref. A2

Parameter	Units	Emission Limit	Result B1 01/05/2008	Result B2 05/11/2008
Airflow		No Limit Specified	1115	958
Ammonia	ppm		<0.5	<0.5
Organics (VOC)	mg/Nm3		<0.014	4.0
Hydrogen Sulphide	ppm		1.4	0.1
Amines	mg/Nm3		<0.048	0.44
Mercaptans	ppm		1.5	0.4

Table 3-19 Weekly Emissions to the Air Results 2008. Emission Point Ref. A2

Date	Parameter	Units	Result	Emission limit	Airflow (m^3/h)
03/01/08	Mercaptons	Ppm	<0.5	NA	1131
11/01/08	Mercaptons	Ppm	<0.5	NA	1100
17/01/08	Mercaptons	Ppm	<0.5	NA	1000
24/01/08	Mercaptons	Ppm	<0.5	NA	1108.37
08/02/08	Mercaptons	Ppm	<0.5	NA	1312
15/02/08	Mercaptons	Ppm	<0.5	NA	Administration error – no result recorded
22/02/08	Mercaptons	Ppm	<0.5	NA	1300
29/02/08	Mercaptons	Ppm	-	NA	Administration error – no result recorded
04/03/08	Mercaptons	Ppm	<0.5	NA	1278
13/03/08	Mercaptons	Ppm	<0.5	NA	Administration error – no result recorded
20/03/08	Mercaptons	Ppm	<0.5	NA	1154
26/03/08	Mercaptons	Ppm	<0.5	NA	1199.57
31-4/03-4/08	Mercaptons	Ppm	-	NA	Administration error – no result recorded
08/04/08	Mercaptons	Ppm	<0.5	NA	1233
20/04/08	Mercaptons	Ppm	- NA Administration error – no result recorded		
25/04/08	Mercaptons	Ppm	- NA Administration error – no result recorded		
01/05/08	Mercaptons	Ppm	<1.5	NA	1200
09/05/08	Mercaptons	Ppm	<0.5	NA	1017
14/05/08	Mercaptons	Ppm	<0.5	NA	1137
20/05/08	Mercaptons	Ppm	<0.5	NA	1131
26/05/08	Mercaptons	Ppm	<0.5	NA	1200
06/06/08	Mercaptons	Ppm	<0.5	NA	1140
10/06/08	Mercaptons	Ppm	<0.5	NA	1176.2
20/06/08	Mercaptons	Ppm	<0.5	NA	1233
25/06/08	Mercaptons	Ppm	<0.5	NA	1221
03/07/08	Mercaptons	Ppm	<0.5	NA	1199

11/07/08	Mercaptons	Ppm	<0.5	NA	1221
18/07/08	Mercaptons	Ppm	<0.5	NA	1239
25/07/08	Mercaptons	Ppm	<0.5	NA	1402
30/07/08	Mercaptons	Ppm	<0.5	NA	1402
05/08/08	Mercaptons	Ppm	<0.5	NA	1357
15/08/08	Mercaptons	Ppm	<0.5	NA	137
21/08/08	Mercaptons	Ppm	<0.5	NA	1221.45
26/08/08	Mercaptons	Ppm	<0.5	NA	1368
05/09/08	Mercaptons	Ppm	- NA Administration error – no result recorded		
12/09/08	Mercaptons	Ppm	<0.5	NA	1334
17/09/08	Mercaptons	Ppm	<0.5	NA	1188
26/09/08	Mercaptons	Ppm	<0.5	NA	1301
01/10/08	Mercaptons	Ppm	<0.5	NA	1100
08/10/08	Mercaptons	Ppm	<0.5	NA	1180
14/10/08	Mercaptons	Ppm	<0.5	NA	Administration error – no result recorded
21/10/08	Mercaptons	Ppm	<0.5	NA	1200
28/10/08	Mercaptons	Ppm	<0.5	NA	1131
03/11/08	Mercaptons	Ppm	<0.5	NA	Administration error – no result recorded
14/11/08	Mercaptons	Ppm	<0.5	NA	1017
21/11/08	Mercaptons	Ppm	<0.5	NA	1300
25/11/08	Mercaptons	Ppm	<0.5	NA	1278
05/12/08	Mercaptons	Ppm	<0.5	NA	1198
10/12/08	Mercaptons	Ppm	<0.5	NA	1001
16/12/08	Mercaptons	Ppm	<0.5	NA	1018
22/12/08	Mercaptons	Ppm	<0.5	NA	1119.67

In accordance with C1.1.Bord na Mona personnel have also carried out periodically maintenance visits during 2008 to set up airflows and check the biofilter performance and media. A brief summary of the results is included in Table 3-20 below, while a full copy of this health check report is provided in Appendix J of this report.

Table 3-20 Inlet and Outlet Concentrations at A2 Biofilter

	INLET	OUTLET	% REMOVAL
Hydrogen Sulphide	6.2 ppm	0.37 ppm	~ 94 %
Ammonia	~ 116 ppm	ND	>99 %
Dimethylsulphide	~ 4 ppm	0.5 ppm	~ 80 %
Mercaptans	~ 1 ppm	ND	>99 %

*** ND = None Detected**

As can be seen from the results, in Table 3-20, the unit is currently removing >99% of Ammonia and Mercaptans from the inlet air, removal efficiencies were lower for Hydrogen Sulphide (H_2S), and Dimethylsulphide (DMS).

Table 3-21 below summarises the annual mass emissions (Emission Point ref. A2- Biofilter) to the air during 2008. These figures are based on the values obtained in the biannual monitoring, the average

values of the weekly parameters monitored and the average of flows recorded during 2008. The biofilter calculations are based on total of number drying hours from Jan 2008 to December 2008 (3973hours).

Table 3-21 Mass Emissions to the Air Results 2008. Emission Ref. Point A2

Parameter	Units	Mass Emissions 2008[1,2]
Ammonia	Kg/year	2.11
Organics (VOC)	Kg/year	15.25
Hydrogen Sulphide	Kg/year	4.85
Amines	Kg/year	1.68
Mercaptans	Kg/year	9.54

Note 1: Based on average airflow recorded during 2008 (1,318Nm3/h) and 3,973 Drying Hours
Note 2: Calculations based on: H2S molecular weight (34.082 g/mol) / 1ppm NH3= 19.03 mg NH3/m^3 / 1ppm methylmercaptan = 48.11 mg methylmercaptan/ m^3

3.4 Stormwater Emissions SW1

ERAS ECO Ltd. stormwater is discharged into the Blackwater estuary via a non-return valve. Two silt / oil interceptors (Class 1 and designed in accordance I.S. EN 858) together with a pH controlled storm water tank are installed on site before the final storm/surface water outlet pipe to retain any potential spillages that could occur onsite.

As per Schedule C.2.2 Monitoring of Stormwater Emissions, quarterly monitoring and daily visual inspections were carried out during 2008.

A summary of all daily 2008 storm/surface water visual inspections are enclosed in Appendix K.

Quarterly Storm/ surface water monitoring in Emission Point Ref SW1 was carried out twice during 2008. A copy of the surface water monitoring report is provided in Appendix L.

All Conductivity, pH, Temperature and Total Suspended Solids results (Q3 and Q4 surface/ storm water monitoring, Emission point Reference SW1) are outlined in the Table 3-22 below:

Table 3-22 Quarterly Stormwater Results 2008- Emission Reference Point SW1

Parameters	Units	SW1 Q1 (31/03/2008)	SW1 Q2 (19/06/2008)	SW1 Q3 (14/08/2008)	SW1 Q4 (23/10/2008)	W211-01 License Limits
Temperature	ºC	10	17.3	17.3	12.8	-
pH	pH units	7.5	7.6	8.3	8.0	-
Conductivity	uS/cm	234	689	657	327	-
Total Suspended Solids	mg/l	<1	6	26	<1	-
Visual Inspection	-	Clear, no odour, No oil in water	Clear, no odour, No oil in water	Clear, no odour, No oil in water	Clear, no odour, No oil in water	-

All parameters analysed during 2008 are within acceptable levels for storm/surface water.

No storm water was sent off-site for treatment during 2008. No contamination was found in outlet surface/ stormwater discharge during 2008 (Emission Point Reference SW1).

3.5 Noise Emissions

As per condition 4.5 of Waste License W0211-01, "Noise from the facility shall not give rise to sound pressure levels (Leq,T) measured at the boundary of the facility or at the noise sensitive locations which exceed the limit values".

As per Schedule B.5 of Waste License W0211-01, Noise Daytime limit values $L_{eq\ (30\ min)}$ are 55 dB(A) and Noise Night-time limit values are 45dB(A)

As per Schedule B.5 of Waste License W0211-01, "No clearly audible tonal component or impulsive component in the noise emission from the activity at any noise sensitive location"

As per condition 6.19 and Schedule C.5 of Waste License W0211-01, daytime annual environmental noise monitoring was carried out on 05/11/2008, while night-time monitoring took place on 12/11/2008. The complete noise monitoring report is enclosed in Appendix M.

As explained in the annual noise report 2008:

Summary of Noise Measurement Comments:

- **NM01**: Daytime LA90 30 min levels recorded here were 44 dB, while the Nighttime LA90 30 min levels measured 43 dB. Both levels are below the specified limits in W0211-01.

  ''There was constant activity at the landfill entrance adjacent to this monitoring point. i.e. Lorries, dumpers, cars etc. There was also intermittent traffic on the road leading into the landfill, movements on the N25 and other local access routes. The only noise audible from ERAS was a low hum from the treatment plant aerator.''

- **NM02**: Daytime LA90 30 min levels recorded here were 43 dB, while the Nighttime LA90 30 min levels measured 41 dB. Both levels are below the specified limits in W0211-01.

  ''There were constant emissions audible from the heat exchange plant 30m from this point but they were not tonal. No other on site noise was audible. Distant traffic was contributing interference to the survey.''

- **NM03**: Daytime LA90 30 min levels recorded here were 42 dB, while the Nighttime LA90 30 min levels measured 33 dB. Both levels are below the specified limits in W0211-01.

  ''NM03: No noise from ERAS was audible at this point. Background traffic movements were the main source of noise at this point. Beeping from a tanker on the opposite side of the site could be heard here but was very low.''

- **NSL1**: Daytime LA90 30 min levels recorded here were 42 dB, while the Nighttime LA90 30 min levels measured 36 dB. Both levels are below the specified limits in W0211-01.

  ''The main source of noise at this point was attributed to traffic movements on both the N25 and the adjacent secondary route.''

Conclusions of Noise Report:

- ''ERAS ECO Ltd was also determined in compliance with licence conditions at the three boundary locations for both day and night time surveys.''
- ''There was a tonal noise determined on site from the treatment plant aerators; however this was not of audible significance and was not detected at any of the other monitoring points on or off site.''
- ''Overall, noise measurements were satisfactory, all relevant conditions of the waste licence W0211-01 were met, and no noise issues requiring attention were noted.''

Table 3-23 below outlines noise emissions results for 2008. A full copy of the report is provided Appendix M.

Table 3-23 Annual Noise Monitoring Results 2008

Monitoring Points	Units	Leq Result-Daytime	Leq Result-Nighttime	L90 Result-Daytime	L90 Result-Nighttime
NM01	dB(A)	49	45	44	43
NM02	dB(A)	47	44	43	41
NM03	dB(A)	52	39	42	33
NSL1	dB(A)	58	46	42	36

(Daytime Leq (30min) Emission Limit Value: 55 dB(A); Nighttime Leq (30min) Emission Limit Value: 45 dB(A))

As stated in 2008 Annual noise survey in ERAS ECO Ltd. report (Appendix M): "Overall, noise levels recorded were SATISFACTORY. All relevant conditions of waste licence W0211-01 were met, and no noise issues requiring attention were noted."

3.6 Groundwater Monitoring

In accordance with condition 6.18.2 of Waste License W0211-01, an independent investigation into the potential for soil and groundwater contamination at ERAS ECO Ltd. site was carried out in 2007. This report was submitted as part of the Annual Environmental Report for 2007.

The results of the soil investigation carried out by Minerex and the proposal for dealing with any contamination were reported on 19th January 2007. Low concentrations of Diesel Range Organics are present in the stockpiled material from the area of concern. However no hydrocarbons were observed in the material nor were any PID values above background recorded.

As per condition 3.23 of Waste License W0211-01, three groundwater monitoring points were installed in 2007. Minerex installed and monitored the boreholes on 19/02/07, 08/03/07, 14/03/07 and 15/03/07.

The locations for the groundwater monitoring points are specified in schedule C.6 Ambient Monitoring (Groundwater monitoring) in the waste licence as follows:

- MW1 at E209704, N079731 (along the south-eastern boundary of site).
- MW2 at E209589, N079778 (along the western boundary of site).
- MW3 at E209641, N79805 (in the area which housed the diesel storage unit).

In accordance with condition 6.18.1 and Schedule C.6 Groundwater Monitoring, Groundwater monitoring was carried out biannually during 2008. Groundwater monitoring reports are enclosed in

Appendix N.

Table 3-24 below outlines groundwater monitoring results obtained during the site investigation and biannual groundwater monitoring 2008.

Table 3-24 Groundwater Monitoring Results obtained in site investigation (B1, 23tth June 08) and Groundwater B2 monitoring (B2, 13th November 08)

Parameter	Units	Results MW1BI (23/06/2008)	Results MW2 B1 (23/06/2008)	Results MW3 B1 (23/06/2008)	Results MW1 B2 (13/11/2008)	Results MW2 B2 (13/11/2008)	Results MW3 B2 (14/11/2008)	Interim EPA GW Limit Values
Mineral Oil	µg/l	<10	<10	<10	<10	<10	<10	10
Diesel Range Organics	µg/l	<10	<10	<10	<10	<10	<10	10
Petrol Range Organics C5-C9	µg/l	<10	<10	<10	<10	<10	<10	10
Petrol Range Organics C10-C12	µg/l	<10	<10	<10	<10	<10	<10	10
Benzene	µg/l	<10	<10	<10	<10	<10	<10	1
Toluene	µg/l	<10	<10	<10	<10	<10	<10	10
Ethylbenzene	µg/l	<10	<10	<10	<10	<10	<10	10
Total Xylene	µg/l	<10	<10	<10	<10	<10	<10	10
VOC	µg/l	<1	<1	<1	<1	<1	<1	-
SVOC	µg/l	<1	<1	<1	<1	<1	<1	-
Cd	µg/l	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	5
Co	µg/l	8	<1	<1	4	<1	<1	30
Iron	mg/l	204	<2	<2	5	<2	11	0.2
Mn	mg/l	0.773	0.05	0.001	0.265	0.007	0.008	0.05
Arsenic	µg/l	9	<1	<1	3	<1	<1	10
Chloride	mg/l	24	46	42	22	13	40	30
Nitrate (as NO_3)	mg/l	<0.3	3.9	26.7	<0.3	3.4	27.1	25
Conductivity (at 25°C)	µS/cm	979	754	722	1,077	0.448	0.728	1,000
pH	pH units	6.40	7.38	7.22	6.52	7.79	7.35	6.5-9.5
Ammonia (as N)	mg/l	0.9	<0.2	<0.2	0.7	<0.2	<0.2	0.15
COD	mg/l	28	<15	<15	46	<15	<15	-

The results of levelling and of recording water levels at the monitoring points suggested that groundwater flow is towards the south-eastern corner of the site under low tide conditions. However the direction of flow may change under high tide conditions.

The results of sampling and analysis show there to be no recorded hydrocarbon contamination present in the groundwater. The results of sampling show there to be high levels of iron and manganese, characteristic of groundwater in impure limestone bedrock. High values of phosphate suggest that the recharge area of the underlying aquifer, outside of the site, is subject to agricultural contamination. Slightly elevated conductivity at MW2 indicates an elevated amount of dissolved material in the water, most likely as a result of the proximity of the site to the sea.

Ammonia levels at MW1 were also found to be slightly elevated however this result is consistent with groundwater monitoring results obtained historically on this site prior to construction and operation of the ERAS ECO Ltd. facility.

3.7 Ambient Air Monitoring

3.7.1 Dust Deposition

In accordance with Schedule C.6 of Waste License W0211-01, ERAS ECO Ltd. carried out dust deposition monitoring during 2008. Dust Deposition monitoring was carried out three times during 2008. Dust Deposition Monitoring Reports are enclosed in Appendix O.

As per condition 4.6 of the Waste License, dust and particulate matter from the activity shall not give rise to deposition levels which exceed the limit value. Table 3-25 below outlines dust deposition monitoring carried out 2008.

Table 3-25 Dust Deposition Results 2008. Jan 2008- December 2008

Date	Location	Dust Deposition[1] mg/m2/day	ELV[1,2] mg/m2/day	Visual Comments
1st Dust Deposition Monitoring 18th March-17th April 2008	D1	85	350	In Compliance. Close to landfill entrance.
	D2	39	350	In Compliance. South West corner of the site. Next to a marshland and approx 300m from landfill site.
	D3	54	350	In Compliance. Next to adjacent Rd and NCT Centre trucks and passing cars at N corner. Construction in the Millenium Park across the stream
2nd Dust Deposition Monitoring 16thJuly-15thAug 2008	D1	59	350	In Compliance. N perimeter corner next to landfill entrance.
	D2	18	350	In Compliance. SE Corner
	D3	101	350	In Compliance. SW corner next to the foxhole rd and NCT Centre, trucks and cars to landfill passing at higher speed than in N corner.
3rd Dust Deposition Monitoring 22ndSept-22ndOct 2008	D1	129	350	In Compliance. N perimeter corner next to landfill entrance, and ongoing works at onsite WWTP.
	D2	61	350	In Compliance. SE Corner
	D3	133	350	In Compliance. SW corner next to the foxhole rd and NCT Centre, trucks and cars to landfill passing at higher speed than in N corner. Ongoing works in adjacent road.

Note1: 30 day composite sample (Bergerhoff Gauges)
Note 2: As per schedule B.2 of Waste License W0211-01, Dust Deposition Emission Limit Values: 350 mg/m2/day.

Dust deposition results during 2007 were found IN COMPLIANCE with the Waste license W211-01 (Schedule B.2 Dust Deposition Limits)

3.7.2 Odour monitoring

In accordance with condition 6.8.3 of Waste License W0211-01, the sludge storage bin (Ref: HST2) is vented to the onsite biofilter for odour abatement.

In accordance with 6.8.4 and 6.8.5 of Waste License W0211-01, gaseous emissions from the condensate (cooling) tower and from the WWTP are treated in the onsite biofilter.

The odour abatement system (A2-Biofilter) was installed and commissioned in May 2007 by Bord na Mona. Refer to previous section 3.2.10 of the AER 2008 document for biofilter summary of emissions to the air.

All sludge arriving onsite is stored in enclosed storage bins (HST1 and HST2) inside the sludge drying building. Doors are kept closed in the sludge reception area except when sludge deliveries arrive onsite.

All waste in the Waste Transfer Facility is stored inside the building, sorted and baled before dispatch. The plant presently operates 8 am to 6pm and doors are kept closed during these times (except time of incoming / outgoing loads). All doors remain closed throughout the night.

In accordance with schedule C.6 Ambient Air Monitoring, ERAS ECO Ltd. personnel carry out daily sniff test in the site boundaries and site entrance.

A summary of the daily sniff tests is enclosed in Appendix P.

In site inspection report reference: (04pos/W0211-01) the EPA requested ERAS ECO LTD to revise the procedure for odour monitoring to include wind direction and observations for each location and separate out each out observations for each point. Following feedback from EPA the odour monitoring procedure was updated during 2008.

3.8 Nuisance Monitoring

In accordance with condition 6.11 Nuisance Monitoring of Waste License W0211-01, vermin controls were put in place and the site is subject to regular inspection by an external contractor.

In accordance with condition 6.11, the site is inspected daily for litter and odour in accordance with in-house standard and operational procedures and site operators are trained in corrective actions in the event of litter and control odour measures. Please refer to previous section **3.7.2** for **odour monitoring**.

3.9 Trade effluent / Contaminated Stormwater

There was no trade effluent sent off site for treatment during 2008.

There was no recorded contamination in the stormwater outlet during 2008 and therefore no requirement for off-site treatment.

3.10 Resources Consumption

In accordance with Schedule E of Waste License W0211-01, ERAS ECO Ltd. must submit a summary of the resources consumed during 2008 in the Annual Environmental Report.

The following resources are used on site:

- Water consumption
- Light fuel oil
- Diesel
- Electricity
- Wood chip

3.10.1 Water Consumption

The operation of facility utilises water in two main areas which are outlined below:

- Process Water (Sludge Dryer Plant Boiler, Cooling Screw for dry product, wheel wash and admin building sanitary water/potable water).
- Fire Water (Fire fighting equipment for entire site).

The approximate 2008 municipal water consumption in ERAS ECO Ltd. was 17,759 m^3 (reading taken from onsite Youghal Town Council water meter).

3.10.2 Electricity Consumption

Electricity is supplied to ERAS ECO Ltd. by Electricity Supply Board (ESB).

The total electricity consumed since the sludge drying plant entered into commercial operation (January 2008 to December 2008) was **1,083,866kWh**

Table 3-26 and Figure 3-6 below outlines the electricity consumption by ERAS ECO Ltd. during the period January 2008 to December 2008.

Table 3-26 Total Electricity consumed in ERAS ECO Ltd. during 2008.

Month	Total kWh Units 2008
January	81091
February	99590
March	89048
April	96797
May	101698
June	96825
July	91513
August	81434
September	73965
October	97793
November	97744
December	76368
Total kWh units (Jan 08-Dec08)	1,083,866

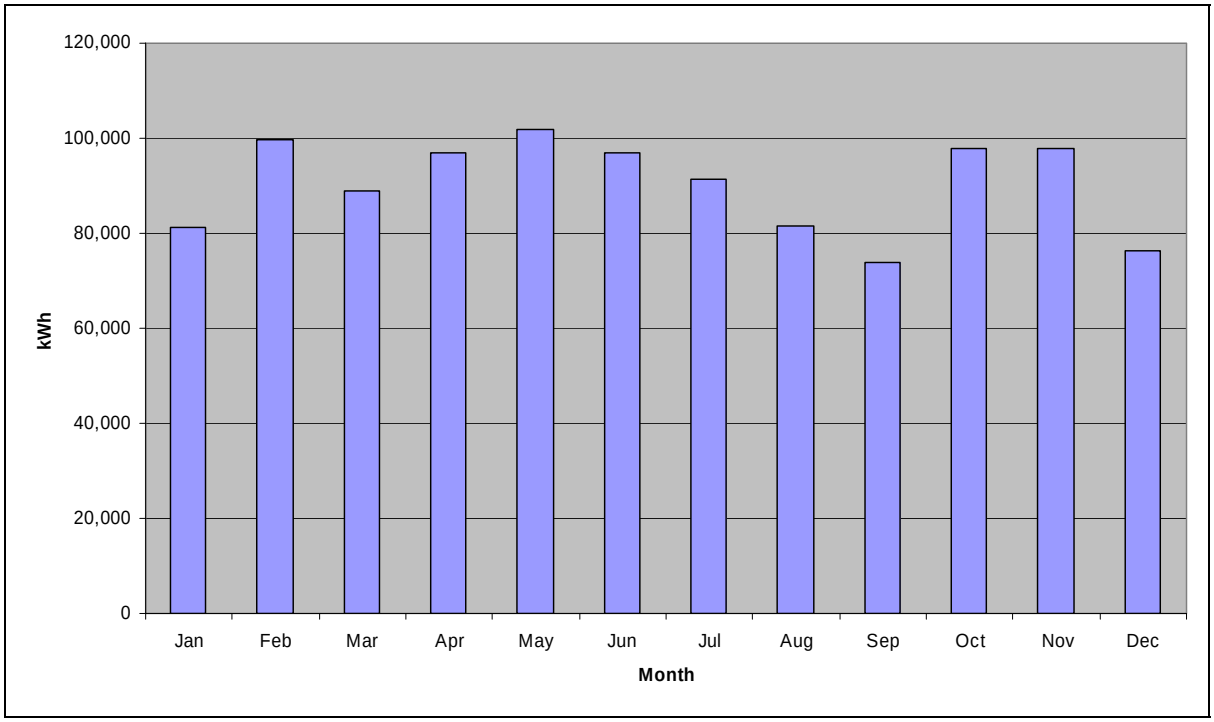

Figure 3-6 Total Electricity consumed in ERAS ECO Ltd. during 2008.

Table 3-27 kWh Electricity per Kg Sludge Accepted 2008

Month	Total kWh Units 2008	Kg Sludge received	kWh Electricity per Kg Sludge Accepted
January	81091	288,220	0.28
February	99590	340,900	0.29
March	89048	354,980	0.25
April	96797	364,700	0.27
May	101698	464,700	0.22
June	96825	410,840	0.24
July	91513	418,120	0.22
August	81434	378,340	0.22
September	73965	319,780	0.23
October	97793	413,000	0.24
November	97744	423,000	0.23
December	76368	329,640	0.23
Total kWh units (Jan 08-Dec 08)	1083866	4,506,220	

Figure 3-7 above considers the use of Electricity in kilowatt hours per kgs of sludge accepted. This reveals there has been a trend towards increased electricity efficiency, during 2008.

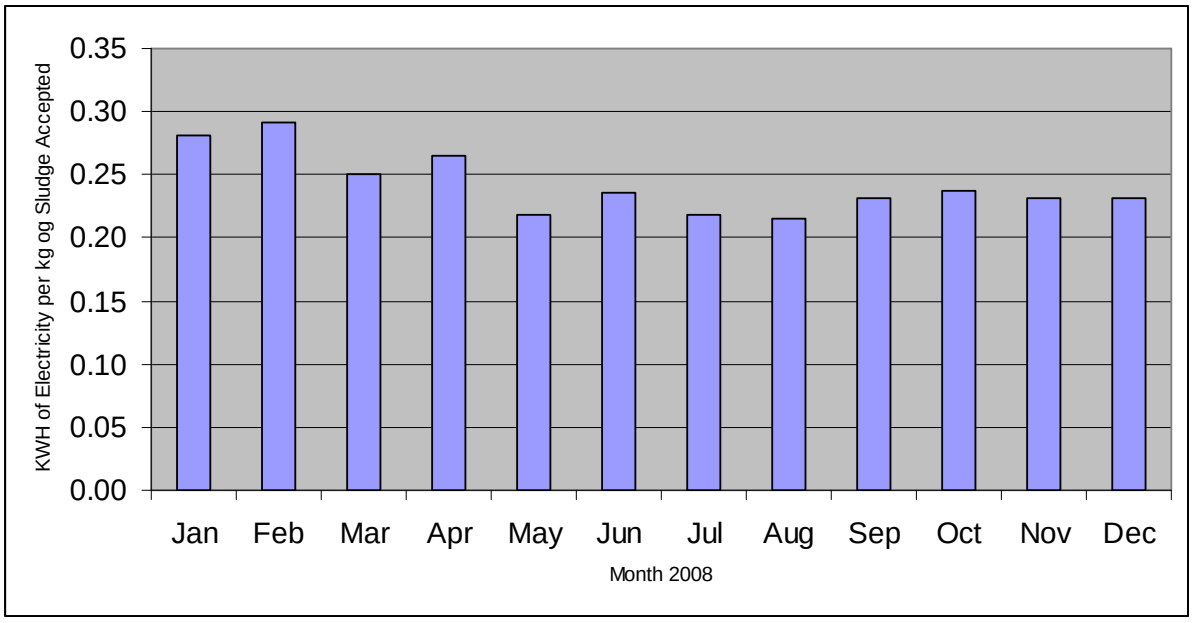

Figure 3-7 kWh Electricity Consumption per Kg Sludge Accepted-2008

3.10.3 Light Fuel Oil Consumption

Light Fuel Oil is mainly consumed for the boiler start-up procedure to raise the furnace temperature to approximately 400ºC. Light Fuel Oil is also consumed for the onsite teleporter and forklift.

The approximate total 2008 light fuel oil consumption in ERAS ECO Ltd. was **13,537 Litres**.

Figure 3-8 below outlines the total light fuel oil consumed per month by ERAS ECO Ltd during 2008.

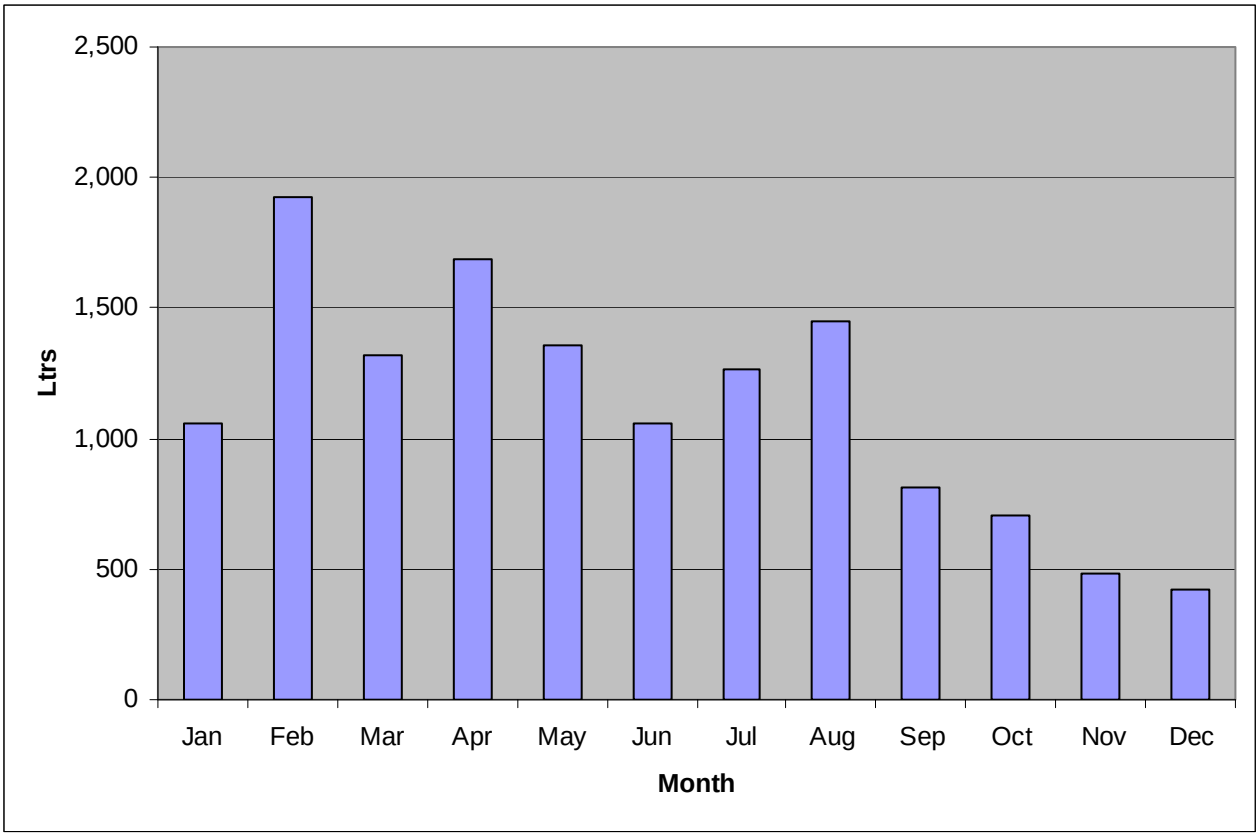

Figure 3-8 Light Fuel Oil Consumption during 2008

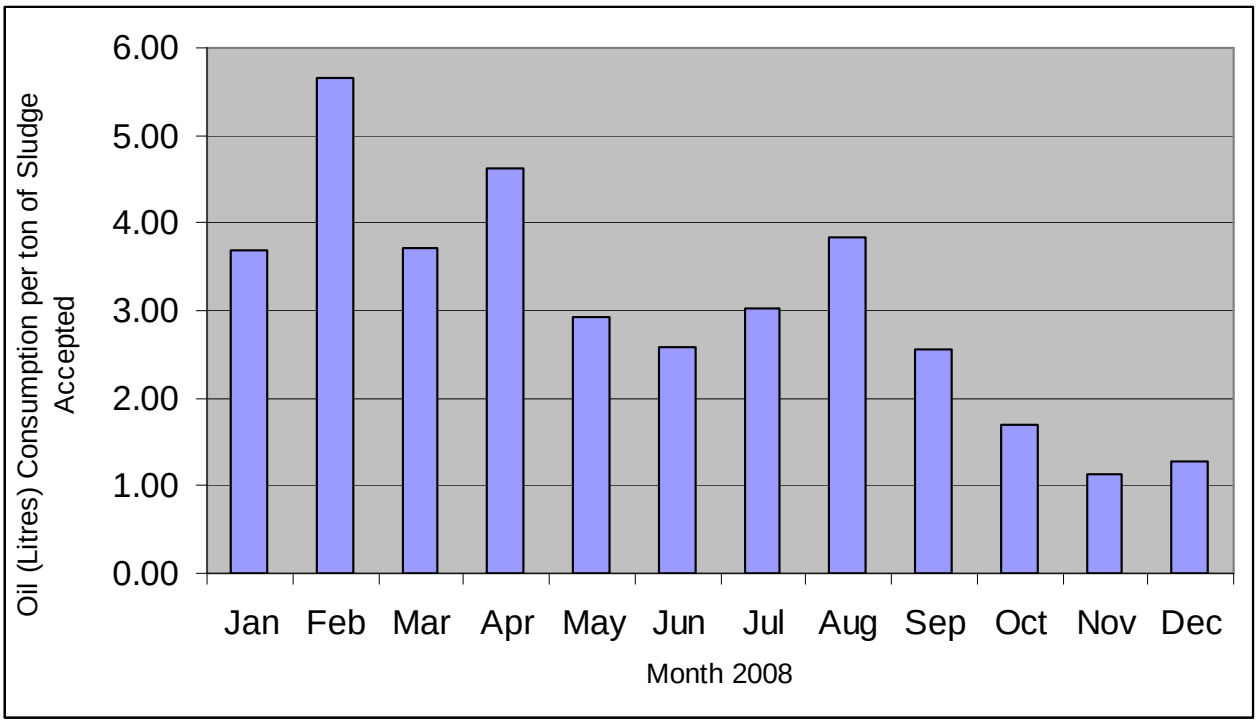

Figure 3-9 Light Fuel Oil Consumption (litre) per ton sludge processed

3.10.4 Woodchip consumption

The sludge drying process (non-contact drying process) utilises 12 bar steam generated by the onsite biomass boiler. This biomass system utilises woodchip as fuel.

Virgin and recycled woodchip are both used as a fuel in the onsite boiler.

The total amount of woodchip used during 2008 was 1,868.9 tonne

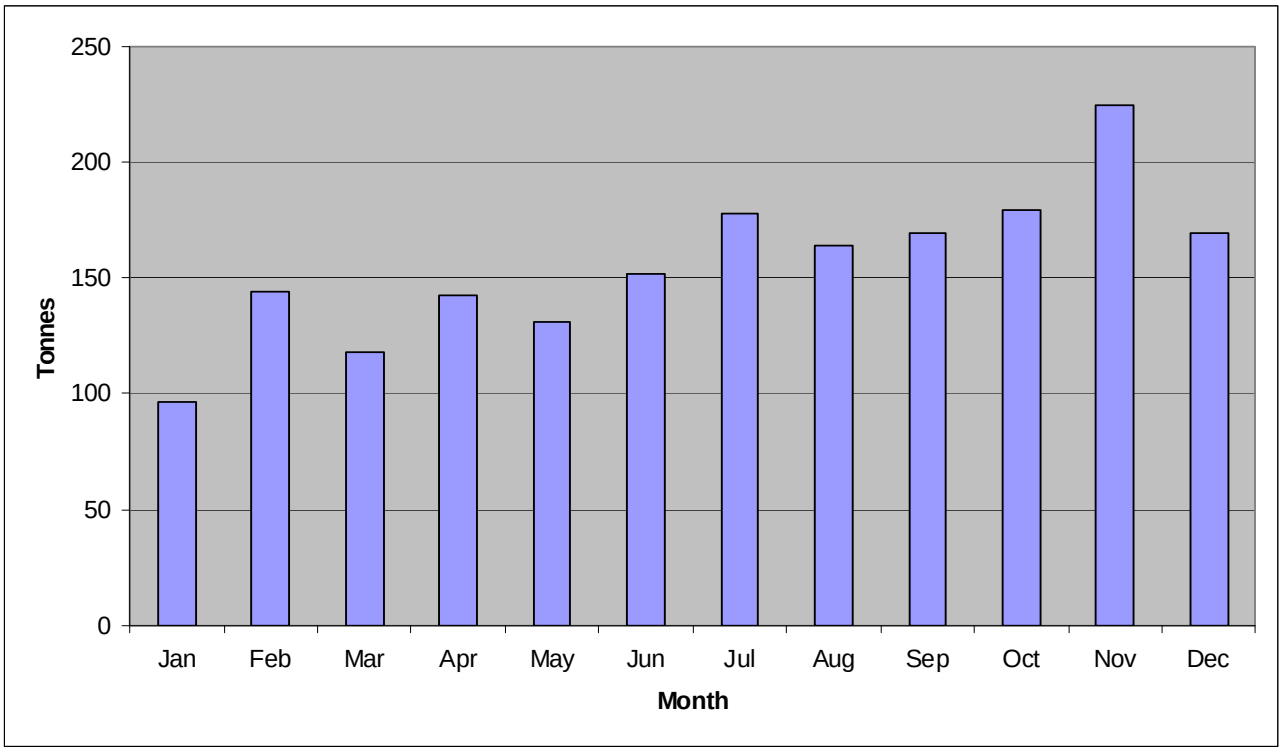

Figure 3-10 Woodchip consumption during 2008

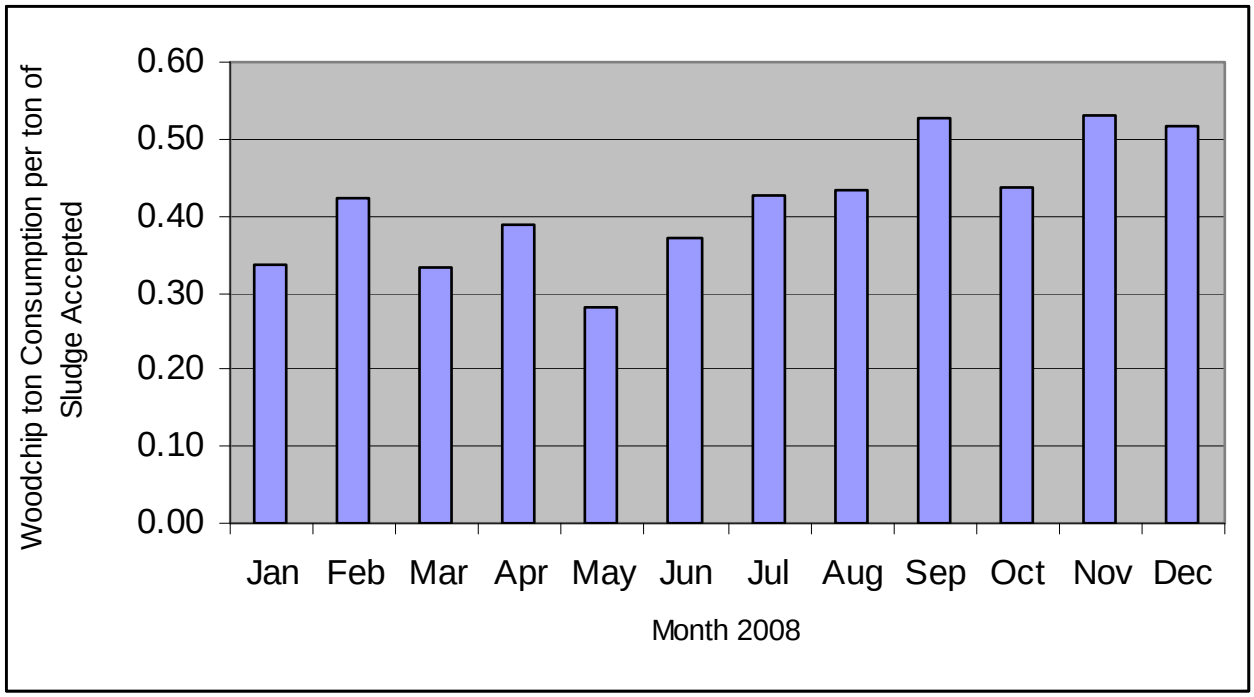

Figure 3-11 Woodchip consumption (t) per Sludge processed (t) 2008

Table 3-28 below summarises all energy consumption data during 2008.

Table 3-28 Summary of Energy Consumption 2008

Month	Sludge (kg)	Sludge (ton)	Electricity (kWh)	Wood Chip (Ton)	Oil (Liters)	Woodchip (t)/Sludge (t)	Oil (Litre)/ Sludge (t)	Electricity (Kwh per Ton sludge
Jan	288,220	288	81,091	97	1,060	0.34	3.68	281.35
Feb	340,900	341	99,590	144	1,927	0.42	5.65	292.14
Mar	354,980	355	89,048	118	1,316	0.33	3.71	250.85
Apr	364,700	365	96,797	142	1,689	0.39	4.63	265.42
May	464,700	465	101,698	131	1,356	0.28	2.92	218.85
Jun	410,840	411	96,825	152	1,056	0.37	2.57	235.68
Jul	418,120	418	91,513	178	1,266	0.43	3.03	218.87
Aug	378,340	378	81,434	164	1,449	0.43	3.83	215.24
Sep	319,780	320	73,965	169	815	0.53	2.55	231.30
Oct	413,000	413	97,793	180	703	0.44	1.70	236.79
Nov	423,000	409	97,744	225	480	0.55	1.17	239.04
Dec	329,640	330	76,368	170	420	0.52	1.27	231.67

3.11 Environmental Incidents

Three environmental incidents were recorded during 2008. In each case corrective actions were taken and reports relayed to the EPA. Table 3-29 below summarises the environmental incidents recorded in ERAS ECO Ltd. during 2008. This table also outlines the corrective actions taken to prevent and correct the incident.

In each case the incidents were closed out as soon as practicable.

Table 3-29 Summary of 2008 Environmental Incidents recorded.

Date	Reference No.	Nature of Incident/ Non compliance	Cause	Environmental impact	Corrective Action
19/02/08	2008_001	Odour	Odour caused by a number of emergency shutdowns earlier in the morning in quick succession caused by a temporary malfunction in the CO analyser.	Odour nuisance	o CO analyser malfunction repaired. o Operators were informed on quicker diagnosing of this problem and future immediate remedial action.
	W0211-01/NC03/CN	Condition 5.2 (same as above)	Same as above	Same as above	o Same as above
	W0211-01/NC03/CN	Condition 11.2	Notification to agency	N/A	o Incident report sent on 21/02/2008. Company will communicate immediately to Agency in future
	W0211-01/NC03/CN	Condition 3.24.5 (enclosed system /odour nuisance)	Door open due to re-routing of cooling water prior installation chiller unit	Odour nuisance	o Unit was installed and doors are kept closed except for times of operator entry exit sludge building
15/05/08	W0211-01/NC02/CN	Condition 3.24.5 (enclosed system) Odour nuisance)	Integrity test of building (smoke test) failed.	Odour nuisance	o MultiRoofing carried out works in roof and wall cladding to fully enclose the dryer room.
2008	SE1	SE1 exceedences (Schedule B.4 W0211-01)	Effluent exceedences (see SE1 report)	Negligible impact in flora/fauna or immediate environment (as per modelling study by Aquafact)	o Different actions taken (installation GAC, aeration, and other equipment. See Env Objectives & Targets SE1) and study. Continuous action is being taken at present.

3.12 Environmental Complaints

Seven environmental Complaints were recorded during 2008. However it should be noted that none of these complaints during the 2008 operational phase were attributable to ERAS ECO Ltd., as outlined in Table 3-30 below.

Table 3-30 below summarises all complaints recorded during 2008 and investigations and corrective actions, where applicable, carried out for all complaints recorded.

Table 3-30 Environmental Complaints during 2008

Date	Reference no.	Name of Complainant	Nature of Complaint	Investigation/ Corrective Action	Closed out
15/02/08	2008_001	Mr. Michael White	Odour detected from our site together with the landfill odour	o Sniff test carried out as daily procedure. Noxious odour not caused by ERAS ECO Ltd. detected and noted down in the daily checks. No odour from the ERAS ECO Ltd. site detected in off-site locations or site boundaries.	15/ 02/08
19/02/08	2008_002 W0211- cc04noc	Mr. Billy Ellis Mr. Pat Collins (complaints sent by epa)	Odour	o Odour caused by a number of emergency shutdowns in the sludge drying process in quick succession caused by a temporary malfunction in the CO analyser earlier in the morning (approx 8.30 am). This odour was aggravated by an external source not attributable to ERAS ECO Ltd. Temporary malfunction was immediately repaired. Operators were informed on quicker diagnosing of this problem and future immediate remedial action.	19/02/2008, incident report faxed to epa 21/02/2008, responses to complaints sent on 03/03/2008
20/02/08	2008_003 W0211- cc04noc	Mr. Billy Ellis Ms. Siobhan Hennessey Mr. Brendan Dempsey Mr. Ger Flannigan (complaints sent by epa)	Odour	o Sniff test carried out by ERAS ECO Ltd. personnel detected noxious fugitive odour at Greencloyne (Youghal) area on R634 that is not attributed to ERAS ECO Ltd. on the day in question. o No fugitive emissions were detected emanating from the ERAS ECO Ltd.	Responses to complaints sent on 03/03/2008

Date	Reference no.	Name of Complainant	Nature of Complaint	Investigation/ Corrective Action	Closed out
27/02/08	2008_004 W0211- cc05noc	Ms. Siobhan Hennessey (complaints sent by epa)	Odour	o Sludge drying activities ceased on 26th March 2008 and did not recommence to 3rd March 2008. Furthermore, no sludge deliveries were recorded during the day in question.	Responses to complaints sent on 03/03/2008 Smell is not attributable to ERAS ECO Ltd.
13/03/08	2008_005 W0211- cc06cn	Ms. Margaret Bernard (complaints sent by epa)	Odour	o Sniff test carried out and noted no odour relevant to ERAS ECO Ltd. operations. Weather: overcast with S wind. The facility is downstream of wind direction for premises specified at Copper Alley Close.	Responses to complaints sent on 19/03/2008. Smell is not attributable to ERAS ECO Ltd.
16/04/08	2008_006 W0211- cc07noc	Ms. Ann Cooney (complaints sent by epa)	Gassy odour	o No sludge drying activities have occurred during the 16th April 2006. Sludge drying plant operations ceased on Monday the 14th of April 2008 due to a malfunction of one of the process controller valves and did not re-commence until Friday 18th of April 2008, when a new controller was put in place.	The complaint noting "a gassy odour" cannot be attributed to activities on the ERAS ECO Ltd. site Response sent to EPA and complainant on 24th April
29/04/08	2008_007	Ms. Ann Cooney	Odour	o No sludge has been processed through the drying system when the complaint occurred. o Daily sniff test also indicated that no odour could be detected from ERAS ECO Ltd. site. o Smell could no be attributable to ERAS ECO Ltd. site	Odour could not be attributed to ERAS ECO Ltd.

3.13 Summary of Non - Compliances - 2008

Table 3-31 below summarises non-compliances recorded during 2008:

Table 3-31 Non-Compliance Summary 2008

Non-compliance	Description	Corrective Action
Condition 5.2 of Waste License W0211-01	Emissions (odour)	As summarised in Table 3-30
Condition 11.2 of Waste License W0211-01	Notification of damage in biofilter ducting	Refer to **section 3.11** of the AER (Environmental incident 13/08/08) and **Appendix 13. Non-compliances**
Condition 11.2.2 and 11.2.3, Schedule B.4 Waste License W0211-01.	Emissions to sewer	Refer to **Appendix** E **- Emissions to Sewer.**

With respect to each of these non-compliances ERAS ECO Ltd. put in place corrective actions to address the same.

A programme for continual improvement is included in site's Environmental Objectives and Targets (see section 5.3 of the Annual Environmental report) indicating timelines and plan of action the company is committed to ensure that emissions to sewer are in compliance and to prevent any odour nuisance.

4 Waste License Specific Reports

As per schedule E of Waste License W0211-01, the following reports must also be submitted in the Annual Environmental Report:

- Tank and pipeline testing report.
- Closure, restoration management plan.
- Environmental Liabilities Risk Assessment.
- Energy efficiency audit report summary.
- Development / Infrastructural work summary

4.1 Tank and Pipeline Testing & Inspection Report

In accordance with condition 6.14 of Waste License W0211-01, "all tanks and pipelines shall be maintained impervious to materials carried by stored therein. The integrity and water tightness of all underground pipes, tanks, bunding structures or containers and their resistance to penetration by water or other materials carried or stored therein shall be tested and demonstrated by the license prior to use. This testing shall be carried out by the license at least once every three years thereafter and reported to the Agency on each occasion. A written record of all integrity tests and any maintenance or remedial works arising from them shall be maintained by the license"

All underground pipework was completed and tested in accordance to the relevant standards during 2006 and 2007. A pipeline testing report is submitted in Appendix Q.

All bunds and sumps have been designed and tested in accordance with the requirements of BS8007 – Standard Code Practice for the Design Liquid Retaining Concrete Structures and in accordance with Chapter 6 of Environmental Protection Agency IPPC Guidance Notes, June 2004. The bund integrity assessment report and certificates of all onsite bunds are enclosed in Appendix Q.

Table 4-1 List of bunds on site

Name	Description	Bund Test	Due for Bund test
The Diesel Fuel Oil Tank Bund – purchased unit	The Fuel Oil Bund is an above ground structure. The unit is a Kingspan Ecosafe ES2600 Double skinned tank measuring 2585mm x 1570mm x 1465mm high. The maximum capacity of the vessel is 2600lts. The vessel is designed and constructed in accordance with OFS T-100 (OFCERT No. 0641099913).	A bund certificate was issued by the manufacturer and is attached to the Appendix Q Report. Manufactured 22/09/06	22/09/2009
The Main Chemical Store Area – purchased units	Main Chemical Store is an enclosed covered 4 IBC Bunded Chemical Store –purchased from Chemstore (Model 4IBC-P)	Tested 27/02/07	27/02/2010
Spill Tray s	ST100-307	Tested 02/03/07	03/03/2010
	IBC-22B	Tested 15/02/07	15/02/2010
	IBC-22B	Tested 15/02/07	15/02/2010
Sludge reception bin	Sludge reception bin	01/03/2007	01/02/2110

4.2 Closure, Restoration & Aftercare Management Plan

In accordance with Condition 10.2, "the license shall prepare, to the satisfaction of the agency, a fully detailed and costed plan for the decommissioning or closure of the site or part thereof. This plan shall be submitted to the Agency for agreement in advance of the commencement of the licensed activities"

A Closure, Restoration and Aftercare Management Plan, which was carried out in January 2007

> 10.2.2 The plan shall be reviewed annually and proposed amendments thereto notified to the Agency for agreement as part of the AER. No amendments may be implemented without the agreement of the Agency.

The closure bond was agreed and submitted to the Agency in 2008. Financial bonds have been put in place. This Closure, Restoration and Aftercare Management Plan has been reviewed by Management and no modifications are deemed necessary for 2009. This plan is provided in Appendix R of this report.

4.3 Environmental Liabilities Risk Assessment

In accordance with condition 12.3.2 of Waste license W0211-01, "the license shall arrange for the completion, by an independent and appropriately qualified consultant, of a comprehensive and fully costed Environmental Liabilities Risk Assessment (ELRA) which addresses the liabilities from past and present activities. The assessment shall include those liabilities and cost identified in Condition 10 for the execution of RMP/CRAMP".
The site Environmental Risk Liability Assessment, which was carried out in March 2007, is enclosed in Appendix S.

A detailed Environmental Liabilities Risk Assessment was conducted for ERAS ECO Ltd., which is a Risk Category 3 facility (based on the EPA guidance on Liability Risk Assessment, Residuals Management Plans and Financial Provision). The ELRA considers the risk of unplanned events occurring during the operation of the facility that could result in unplanned events occurring during the operation of a facility that could result in unknown liabilities materialising.

The ELRA covers environmental risks leading to a potential or anticipated liability. Environmental Risks will be deemed to cover all risks to surface water, groundwater, atmosphere, land and human health.

> ''12.3.2 The licensee shall arrange for the completion, by an independent and appropriately qualified consultant, of a comprehensive and fully costed Environmental Liabilities Risk Assessment (ELRA), which addresses the liabilities from past and present activities. The assessment shall include those liabilities and costs identified in Condition 10 for execution of the RMP/CRAMP. A report on this assessment shall be submitted to the Agency for agreement in advance of the commencement of the licensed activities. The ELRA shall be reviewed as necessary to reflect any significant change on site, and in any case every three years following initial agreement: review results are to be notified as part of the AER. ''

The Environmental Liabilities Risk Assessment was agreed and submitted to the Agency in 2008 and financial cover is in place. The contents of the assessment have been reviewed by management and no modifications are deemed necessary for 2009.

4.4 Statement of measures taken

In accordance with condition section 12.3.1 an annual statement relating to the measures taken or adopted on site to prevent potential environmental nuisance/damage is required. A summary of all measures taken during 2008 are summarised in the update provided in the Environmental Objectives and Targets 2008 (Section 5). Financial provisions are in place following the completion of the Environmental Liabilities Risk Assessment. The company's re-affirms its financial commitment for the implementation of environmental improvement measures as required.

4.5 Energy Efficiency Audit Report

As per condition 7.1 of Waste License W0211-01, "the license shall carry out an audit of the energy efficiency of the site within a year of the commencement of the licensed activities. The audit shall be carried out in accordance with the guidance published by the Agency: "Guidance Note on Energy Efficiency Auditing". The energy efficiency audit shall be repeated at intervals as required by the Agency".

The site Energy Efficiency Audit was carried out during 2008 and an energy efficiency audit report summary was submitted to the EPA.

A copy of this report is provided in Appendix T.

The following conclusions were stated in the energy audit report:

''The company has a sound common sense approach to energy usage which is backed by good personal communications.

Overall the site is performing reasonably well in terms of energy performance, largely due to the automated controls that would put in place on much of the equipment during construction. There is however scope for improvement. By implementing the low cost (0-12months payback) measures identified, annual savings in excess of € 20,000 could be achieved.

Further areas of potential energy and cost savings were also identified during the energy survey, but require further investigation in order to justify the potential payback periods.''

4.6 Development / Infrastructural Works summary 2008

The following works outlined below exclude any development and/or infrastructural works carried out in 2008 relating to construction works for the site i.e. prior to commercial operation for Sludge Dryer Building and C&I Building.

The Waste Water treatment plant had a number of alterations and/or additions in its infrastructure in order to improve/streamline the treatment process. These alterations/additions are outlined in Section 4 of Emissions to the Sewer 2008 Report contained in Appendix E.

There were no other development works related to ERAS ECO Ltd. activities on site for the calendar year 2008.

4.7 EPA Audits 2008

The EPA carried out three audits during 2008:

- 19th February 2008
- 16th September 2008
- 09th December 2008

Table 4-2 summaises the findings of these inspections and the corrective action taken by ERAS ECO Ltd.

Table 4-2 EPA audit summary

Date	Observation	Non Compliance(s)	Details	Corrective action required	Corrective action implemented
Date of Audit 19/02/08					
19/02/08, W0211-01/NC02CN	1. A significant odour from the facility was detected at the site boundary. 2. Strong odours from the sludge drying process were also detected within the sludge processing building.	1	The sludge drying equipment shall operate as a closed system and shall be operated within a fully enclosed sludge drying building.	1. Carry out appropriate measures to ensure the sludge drying equipment is a fully enclosed system.	A thorough inspection was carried out on the sludge drying equipment incorporating the dryer, cyclone, bag filter, condenser, extraction ducting, and bio-filter. It can be confirmed that this system as a whole is fully enclosed.
				2. Carry out appropriate measures to seal the sludge drying building, particularly sealing the potential fugitive emission points to the external environment, but also addressing the potential fugitive emission points from the drying room into the two adjacent rooms within the same building (e.g. the sludge reception and boiler rooms).	The smoke test performed by Odour monitoring Ireland on 15th May was carried out under the auspices of the Agency to ascertain the integrity of the sludge dryer building in respect of any fugitive emissions from the within the building. All potential fugitive emission points as identified in this assessment were sealed immediately following receipt of correspondence from the Agency using a local reputable contractor. Multi-roofing carried out all sealing works as per the instructions of ERAS ECO Ltd. Facility Manager, Bill O Leary
				3. Cease the acceptance and drying of further sludge's at the facility until such time as Actions 1 and 2 above are carried out.	The remedial works for sealing of sludge dryer room were carried out immediately following receipt of the EPA recommendations outlined in letter dated 21st of May. Following on from the completion of these works it can be confirmed that the drying process re-commenced at 21.00 on Tuesday 27/5/08.

Date	Observation	Non Compliance(s)	Details	Corrective action required	Corrective action implemented
					The present odour abatement system, a Bord Na Mona Mona shell type Bio-filter, has a treatment capacity of 1,500m3/hr and is designed to meet with condition 3.24.2 of waste licence W0211-01. This filter is routinely maintained by Bord Na Mona, is regularly monitored by our on-site EHSQ Manager and is operating within TA Luft 2002 Guidelines (Table C.1.2) for emissions to air. Furthermore, and as part of our ongoing commitment to achieve continual improvements in quality, and environmental performance we have already commissioned an external consultancy to carry out an ambient air monitoring survey within the sludge dryer building
				5. Clarify why smoke was observed being discharged via the bio-filter air emissions stack given that the air abatement system includes dust/particle removal systems such as a cyclone and bag filter	The relatively small amount of smoke evidenced exiting the bio-filter following on from the smoke test is as a result of simple diffusion of some of the smoke from within the dryer room into the bio-filter. Such an observation is to be expected, and is consistent with normal operation of the bio-filter in extracting some air from the dryer room. It should be pointed out that there is a clear distinction between smoke and dust particulates, and that the cyclone and bag filter are designed purely to remove dust particulates. There is never any requirement to remove smoke from the building.
				6. Submit a schedule to the Agency within 10 working days that details how and when the corrective actions specified above will be completed.	Corrective actions as requested by EPA dated 21st of May 2008 completed as of 26th May 2008.

Date	Observation	Non Compliance(s)	Details	Corrective action required	Corrective action implemented
09/12/2008	Records of Reject Consignments not maintained	1	A full record shall be open to inspection by the Agency, including: Details of any reject consignments	Review and Revise where necessary waste tracking documentation and procedures	Relevant staff notified and trained in respect of correct recording and filing of reject loads
09/12/2008	Effluent Discharge Exceedances	1	No Emission shall exceed emission limit values. Exceedances shall be notified to the Agency.	Report all Exceedances.	Standarised Fax Notification now in place for any future exceedance.
09/12/2008	All Tanks were not Labelled to indicate their contents	1	All tanks, containers and drums shall be labelled to indicate their contents	Label Tanks	All tanks have been appropriately labelled and the daily site checklist has been updated to ensure continual conformance with this condition.
09/12/2008	Sludge from one customer had a Dry Solids Content of less than 10%	1	Sludge shall have a minimum dry solids content of 10%	Notify customer(s) that 10% is a minimum dry solids content	All sludge suppliers have been notified of the lower dry solids content (i.e. 10%). The operators sludge checklist has been amended to account for lower dry solids content.

Date	Observation	Non Compliance(s)	Details	Corrective action required	Corrective action implemented
EPA Site Inspection: 16th September 2008 EPA Reference 9W0211-01)07si07Id					
16/09/08	Mud on the road in front of the facility gates	No non conformances raised	-	Ensure that the local road network in the vicinity of the facility is kept clean and free from debris caused by vehicle entering /leaving the facility	

EPA Site Inspection: 09th December 2008 EPA Reference nc04pos/W0211-01

Licence Cond	Non Compliance	Action taken/to be taken	Timeline
11.10 (vi)	Records of Reject consignments not maintained	Relevant staff notified and retrained in respect of correct recording and filing of all reject loads	Completed /closed out.
5.1 and 9.3.1	Effluent discharge – exceedence not reported immediately	Standardised fax notification now in place detailing effluent discharge exceedence with a new SOP.	Completed/closed out
3.6.5	Unlabelled oil storage tank, carbon filter tanks within the Water Treatment, and boiler water softener	These tanks have now been appropriately labelled, and daily site checklist ammended to ensure continual conformance with this license condition	Completed/closed out
8.13	Maintenance of minimum dry solid content of 10% as part of sludge acceptance procedure	All sludge suppliers have been notified of the lower dry solids limit of 10%. Operator sludge Checklist has been ammended to account for the lower dry solids limit	Completed/closed out
Licence Cond	**Observation**	**Action taken/to be taken**	**Timeline**
NR	Mis-classification of dried sludge on TFS documentation by notifier	Dry sludge now exported to end user by ERAS ECO under TFS IE 312108 and correctly classified as 190812 on all relevant paperwork	Completed/closed out
NR	IBCs with carbon waste not classified in accordance with required National and European standards	IBC's now classified and labelled	Completed/closed out
NR	Odour survey	Daily air emission checklist modified recording odour, and wind direction at numerous boundary positions	Completed/closed out
NR	Smoke test demonstrating air tightness of sludge processing building to be repeated	Work has been tendered-awaiting award and completion.	Completed /closed out
NR	Change of company name	See enclosed Certificate of Incorporation.	Completed/closed out

5 MANAGEMENT OF THE FACILITY

5.1 Environmental Management Programme (Environmental Objectives and Targets)

In accordance with condition 2.2.2.3 of W0211-01, ERAS ECO Ltd. have established, implemented and maintained an Environmental Management System during 2008. This EMP was submitted to the Agency prior to ERAS ECO Ltd. entering into commercial operation The EMS was implemented in line with ISO 14001:2004 and complies with all regulatory and legislative requirements pertinent to industry, local operating environment and customer requirements.

The Environmental Management System is reviewed annually together with the company's Environmental Objectives and Targets. In section 5.2 a progress report details the significant achievements and developments attained at ERAS ECO Ltd. during 2008. These objectives and targets form part of a longer term Environmental Management Programme. When setting targets for 2009, consideration was taken of both the Environmental Management Programme and developments to date. Thus the 2009 targets will help build upon developments/improvements in 2008 and also realise longer term goals. The achievement of the environmental targets will be evaluated during 2009.

The Board of Management, Facility Manager, EHSQ Manager and the operational staff are responsible for achieving these objectives and targets within a set time frame.

The environmental objectives and targets which are established at relevant functions and levels within the company are consistent with the company's environmental policy and all legislative requirements that the facility must be in compliance with. Objectives and targets must also be consistent with BATNEEC (Best Available Technology Not Entailing Excessive Cost) and the financial, operational and business requirements of the organisation.

ERAS ECO Ltd. will invest funds for both internal and external works to be carried out as appropriate, as may be defined as part of the objectives and target programme and any follow-up actions required.

For each objective the following information is detailed in the schedule for the Environmental Objectives and Targets:

- Objectives.
- Target.
- Plan of Action / Methodology.
- Responsibility.
- Timeframe for implementation.

A schedule for the Environmental objectives and targets is included below:

- **Objective 1** - Compliance with Schedule B4. Emission to Sewer of Waste License W0211-01
- **Objective 2 -** Nuisance Prevention (Ambient Monitoring).
- **Objective 3 -** Energy efficiency.
- **Objective 4** - Prevention of noise nuisance.
- **Objective 5** - Waste recycling efficiency.
- **Objective 6** - Administration Waste Management.
- **Objective 7 -** Environmental Health & Safety Awareness

5.2 Progress on 2008 Objectives and Targets

OBJECTIVE 1(2008 AER)

Reference: SE1

Title: Compliance with Schedule B4. Emission to Sewer of Waste License W0211-01

Objectives: To ensure that emission to the sewers are in compliance with the Emission Limit Values of the waste license W211-01

Targets:

- Upgrading of the WWTP in order to lower the concentration of parameters exceeding the emission limit values in the final effluent.
- To continuously monitor the proposed improvements to ensure that discharge limits are within the permitted Emission Limit Values.

Plan of Action Vs Timescale:

As part of onsite continual improvement and corrective action procedures, ERAS ECO Ltd. commenced a scope of work to identify the source of the problem and initiate corrective actions to address same. Table below outlines plan of action taken to correct non-compliances.

WWTP Plan of Action (methodology)	Timescale	Progress made in 2008	New Timescale
Replacement carbon of the third Cullighan filter	September 2007	Completed.	Repeated as Required
Installation of an aeration system in the balance tank (130 m^3).	October 2007	Completed	Not Applicable
Installation of a Granular Activated Carbon (GAC) filter unit	End of November 2007	Completed	Not Applicable
Installation of larger dosing pumps for sodium hydroxide to enable pH correction to an upper level of 11.6 pH units to facilitate improved aeration. Subsequent dosing with greater amounts of sulphuric acid reducing inline pH to an optimum level of 7-8.8 pH units to optimise a absorption in the activated carbon unit	End of November 2007	Completed	Not Applicable
Installation of a control system system with a correction loop for pH correction, and subsequent dosing with greater amounts of sulphuric acid reducing inline pH to an optimum level of 7-8.8 pH units to optimise absorption in the activated carbon unit	End of November 2007	Completed	Not Applicable
Addition of a high molecular weight flocculant to the WWTP and alum sulphate pumps upsized to facilitate improved suspended solids removal, and aid COD reduction via downstream filtration.	Mid February 2008	Completed	Not Applicable
Installation of a mixing tank inline together an increase of sodium hypochlorite dosing rate.	End of February 2008	Completed	Not Applicable

Installation of new inline mixers to aid contact between effluent and flocculant/ co-agulant.	End of February 2008	Completed	Not Applicable
Replacement of Granular Activated Carbon (end of life)	Early March 2008	Completed	As needs arise
Installation of a DAF (dissolved air flotation) trial unit to remove suspended solids recirculating in the system	Mid April 2008	Completed. Trial did not demonstrate significant benefits	Not Applicable
Installation of a biological trial unit with an anoxic zone	May – June 2008	Completed. Trial did not demonstrate significant benefits	Not Applicable
Other improvements to be made subject to performance of the installed trial units	May 2008 onwards	n/a	
Replacement of the granular activated carbon. Depending on end of life of carbon (approximately every three or four months)	March 2008-December 2008	Completed.	Ongoing as Needs Arise
In-house Control and monitoring: Upgrade lab equipment to carry out regular in-house COD and other analysis (Purchasing of spectrophotometer and COD reactor)	End of November 2007	Completed. Spectrophotometer onsite.	To be continued in 2009
Regular in-house analysis of COD and Total Nitrogen levels to check the performance of new installations	December 2007 onwards	Completed.	To be continued in 2009
External Mass spec analysis to identify further sources of the COD levels	April 2008	Completed	
Monitoring as per schedule C.3.2 of Waste License W0211-01. Analysis will be carried out in an accredited external lab.	Weekly/monthly/quarterly and annual monitoring	Completed.	Ongoing to be continued in 2009

OBJECTIVE 2 (2008 AER)

Reference: Ambient Monitoring

Title: Nuisance Prevention.

Objectives: To ensure that air/ odour emissions do not produce any significant environmental impact.

Targets:

- To maintain and check the odour abatement system regularly to ensure its correct performance

Plan of Action Vs Timescale:

WWTP Plan of Action (methodology)	Timescale	Progress made in 2008	New Timescale
Daily recordings of Odour monitoring to be carried out by trained ERAS ECO Ltd. –staff within the site and its boundary.	01/01/2008 - Onwards	Completed.	Ongoing & to be continued in 2009
Monitoring of the odour abatement system as per schedule C.1.1 and C.1.2 (Emission Point Ref: A2- Biofilter) of Waste License W0211-01.		Completed	Ongoing & continued in 2009
Annual maintenance of the existing odour abatement system by external contractor.		Completed by Bord Na Mona.	To be continued as necessary
To keep regular inspections and controls for nuisance.		Complete	Ongoing to be continued daily in 2009
Dustfall analysis to be carried out by external accredited lab.		Complete.	Ongoing to be continued 3 times per annum in 2009
Daily recordings of litter presence onsite and site cleaning.		Complete.	Ongoing to be continued daily in 2009

OBJECTIVE 3 (2008 AER)

Reference: To minimise the use of resources on site.

Title: Energy Efficiency

Objectives: Energy, water and raw materials use are a significant cost factor in addition to having a potential adverse environmental impact. Consequently ERAS ECO Ltd. propose to minimise the use of resources on site as far as is practicably possible.

Targets:

- To reduce water consumption saving approximately 10,000 m^3/ year.
- To carry out a full energy audit
- Try to minimise where possible light fuel and woodchip consumption
- Reduce electricity consumption in the administration building

Plan of Action Vs Timescale:

Plan of Action (methodology)	Timescale	Progress	New Timescale
Water consumption reduction: To recirculate cooling water for dry product within an enclosed loop using a chiller unit to maintain cooling temperature thus eliminating any water run-off to waste water treatment plant.	April 2008	Completed	Ongoing
A comprehensive energy audit	April 2008 – June 2008 and every three years	Completed	Implement Findings
Installation of a new wood shredder in the Waste Transfer Facility to reduce dependency on external supply sources.	March –April 2008	Completed	Ongoing
Boiler running continually at low temperature during shutdown periods if and when possible (depending on boiler pressure): to reduce light fuel oil consumption in start-up	Shutdowns during 2008	Completed	Ongoing
Reduction of electricity consumption in admin building by installation of a new heating system using process condensate.	April- June 2008	Completed	Ongoing
No electrical equipment to be left on stand- by when not in use	2008	Complete	Ongoing

OBJECTIVE 4 (2008 AER)

Reference: N1, N2, N3 (boundary points)/ NSR-1 (Nearest Noise Sensitive Location)

Title: Prevention of Noise Nuisance.

Objectives: To ensure that noise emissions are in compliance with the waste license noise emission limits.

Targets:

- To ensure that existing and new equipment do not produce noise nuisance.
- To ensure that ERAS ECO Ltd. noise emissions are in compliance with Schedule B.5- Noise Emissions of Waste License W0211-01.

Daytime dB(A) L_{Aeq}(30 minutes)	Night-time dB(A) L_{Aeq}(30 minutes)
55 Note 1	45 Note 1

Note 1: There shall be no clearly audible tonal component or impulsive component in the noise emission from the activity at any noise sensitive location.

Plan of Action v Timescale:

Plan of Action (methodology)	Timescale	Progress	New Timescale
Review of any new equipment to be brought to site in terms of ensuring noise emissions SPL's will not result in excessive noise at the site	2008	Complete. Noise within limits	Ongoing
Regular maintenance of existing and new equipment.		Completed as part of site maintenance plan	
Annual Noise monitoring by an independent external contractor, as per schedule C.5 Noise Monitoring of Waste License W0211-01		Completed	

Location	As per *Figure F.2: Noise Monitoring Locations* (submitted in Application Form, received 1/10/2004)
N1, N2 & N3	Three boundary points
NSR-1	Nearest noise sensitive location – dwelling house

Parameter	Monitoring Frequency	Analysis Method/Technique
$L(A)_{EQ}$ [30 minutes]	Annual	Standard Note 1
$L(A)_{10}$ [30 minutes]	Annual	Standard Note 1
$L(A)_{90}$ [30 minutes]	Annual	Standard Note 1
Frequency Analysis(1/3 Octave band analysis)	Annual	Standard Note 1

Note 1: "International Standards Organisation. ISO 1996. Acoustics - description and Measurement of Environmental noise. Parts 1, 2 and 3."

OBJECTIVE 5 (2008 AER)

Reference: Waste Transfer Facility.

Title: Waste recycling efficiency.

Objectives: Monitoring of rejected waste in the picking line.

Targets:

- To monitor efficiency in the picking line station.

Plan of Action v Timescale:

Plan of Action (methodology)	Timescale	Progress	New Timescale
To monitor and control mixed dry recyclables waste recovered vs. rejected landfill waste.	2008	Completed	Ongoing/ Repeated as Necessary
Where possible, operators will be trained to improve efficiency of materials segregation.		Completed	
Any excessive volumes of rejected waste resulting in ERAS ECO Ltd. increasing waste disposal to landfill will result in review with waste supplier.		Completed	

OBJECTIVE 6 (2008 AER)

Reference: Admin waste.

Title: Administration Waste Management

Objectives: To reduce waste generation and disposal off-site.

Targets:

- To manage properly all waste generated in the administration building.
- To segregate and recycle all administration recyclable waste in the onsite Waste Recovery transfer Facility.

Plan of Action v Timescale:

Plan of Action (methodology)	Timescale	Progress	New Timescale
Segregation of all recyclable canteen waste.	2008	Completed	2009
Segregation of all recyclable administration waste.		Complete	Ongoing
To dispose all dry recyclable waste generated in the administration building (canteen and administration waste) in the onsite Waste Recovery and Transfer Facility for recycling.		Completed	
To reuse paper and print double side when possible.		Ongoing	2009
All used hazardous waste such as fluorescent lighting and batteries to be collected and removed from site by approved waste collectors.		Ongoing	2009

OBJECTIVE 7 (2008 AER)

Reference: Environmental Health & Safety.

Title: Environmental Health & Safety Awareness.

Objective: To increase the awareness of all on-site personnel of the provisions and requirements of Health and Safety in the work place.

Targets:

- To complete the Health and Safety Statement integrating the Waste Recovery Transfer facility.
- To develop a program for H&S audits and inspections.
- To increase the environmental and Health & Safety awareness of onsite personnel through standard operational procedures and training.

Plan of Action v Timescale:

Plan of Action (methodology)	Timescale	Progress	New Timescale
Completion of the Health and Safety Statement of the site integrating the Waste Recovering and Transfer Facility.	2008	Completed	Needs Revision in 2009
Periodically Health & Safety programme audits and inspections to be carried out		Completed	Ongoing
Assess and control safety risks as they are identified.		Completed	Ongoing
100% compilation of MSDS for all hazardous chemicals on site.		Completed	2009
Risk Assessment of all new equipment to be performed prior to purchasing.		Ongoing as required	2009
Health and Safety induction for every new employee.		Completed.	Ongoing
Fire Safety awareness training course.		Completed	Training Matrix – Reviewed Periodically
First aid training		Completed	Training Matrix – Reviewed Periodically

5.3 Environmental Management Programme 2009

Eight objectives are documented for 2009. The objectives cover the follow areas

- To ensure that emission to the sewers are in compliance with the Emission Limit Values of the waste license W211-01 – Ongoing management of wastewater treatment plant
- To ensure that air/ odour emissions do not produce any significant environmental impact/nuisance
- Energy Efficiency- setting KPIs for all natural resources used on site
- Ensure that noise emissions are in compliance with the waste license noise emission limits.
- Increase recycling rates
- Review and improve Environmental Management System in place

Objectives 2009

OBJECTIVE 1

Reference: SE1

Title: Compliance with Schedule B4. Emission to Sewer of Waste License W0211-01

Objectives: To ensure that emission to the sewers are in compliance with the Emission Limit Values of the waste license W211-01

Targets:

- To continuously monitor the proposed improvements to ensure that discharge limits are within the permitted Emission Limit Values.
- Evaluate & Monitor the impact of dosing on discharge levels e.g. levels of sulphate resulting from use of aluminium sulphate co-agulant.
- Optimise the WWTP's performance.

Plan of Action/ Methodology Vs Timescale:

Plan of Action (methodology)	Timescale (2009)			
	Quarter 1	Quarter 2	Quarter 3	Quarter 4
Increase frequency and range of in-house sampling e.g. suspended solids (TSS/ TN) analysis so as to reduce number of license non-compliances	January to December 2009			
Document procedures for testing of TSS and train staff accordingly. Also detail actions to be taken to control levels in excess of ELV's.		April to December 2009		
Scheduled cleaning of Wash-water Sump.	January to December 2009			
Explore and trial alternatives to Aluminium Sulphate.		April to December 2009		
Use of proprietary flocculant in washwater line to improve particulate/water separation, and prolong filter lifetime.	January to December 2009			
Update WWTP SOP's on, in particular the Backwashing procedure.		April to June 2009		

Responsibility:

- Alternatives to Aluminium Sulphates: Facility Manager/ EHSQ Manager/ Chemical Experts
- Schedule Washwater Cleaning: External Contractor
- Source and Trial Washwater Flocculants: Facility Manager/ WWTP Specialists/ Consultants
- Development and Training of New SOP's: Facility Manager/ EHSQ Manager/ Supervisor
- Practice and Implementation of SOP's: Facility Manager/ Supervisor/ EHSQ Manager/ All Staff

OBJECTIVE 2

Reference: Ambient Emissions

Title: Nuisance Prevention.

Objectives: To ensure that air/ odour emissions do not produce any significant environmental impact/nuisance

Targets:

- To keep regular inspections and controls for nuisance
- To maintain and check the odour abatement system regularly to ensure its correct performance

Plan of Action/ Methodolgy Vs Timescale:

Plan of Action (methodology)	Timescale (2009)			
	Quarter 1	Quarter 2	Quarter 3	Quarter 4
Reduce number of Complaints (i.e. <7)- and categorize by type (Noise, Odour, Traffic, Visual, etc.)	January to December 2009			
Complete Smoke Test in the Sludge Drying Building	January to April 2009			
Train/Re-train staff on Environmental Checks (Sniff Test)	January to December 2009			
Trial mobile odour control units	January to April 2009			

Responsibility:

- Reduce Complaints: Facility Manager, EHSQ Manager, Supervisor & all staff
- Categorise Complaints: EHSQ Manager
- Smoke Test: Facility Manager/ External Contractor
- Train/ Retrain staff on Environmental Checks: Facility Manager/EHSQ Manger
- Trial mobile odour control unit: Facility Manager/ EHSQ Manager/ Odour Control Company

OBJECTIVE 3

Reference: To minimise the use of resources on site.

Title: Energy Efficiency

Objectives: Energy, water and raw materials use are a significant cost factor in addition to having a potential adverse environmental impact. Consequently ERAS ECO Ltd. propose to minimise the use of resources on site as far as is practicably possible.

Targets:

- Increase energy efficiency awareness among all staff
- To revisit the energy audit and implement finding(s)
- Establish/ Increase us of performance indications
- Minimise where possible consumption of energy resources

Plan of Action/ Methodology Vs Timescale:

Plan of Action (methodology)	Timescale (2009)			
	Quarter 1	Quarter 2	Quarter 3	Quarter 4
Consult with Energy Experts: Energy consultants/ SEI, etc.	January 2009 – July 2009			
Meter the building to determine electricity usage by area	January to June 2009			
Implement Recommendations of Energy Audit where possible	January to December 2009			
Conduct energy efficiency projects (Woodchip to Sludge Ratio)	January to December 2009			
Draw on external experience e.g Sustainable Energy placement programme	January to May 2009			
Record Water Usage Weekly	January to April 2009			
Document Procedure and Datasheets for Water Monitoring	January to December 2009			
Establish Key Performance Indicator's: Such as: o Performance against targets in AER o Non Compliances o Kilowatt per kg or tonne of Dry Sludge o Woodchip kg per kg of Dry Sludge o M^3 of Water per kg of dry sludge o Diesel per kg of dry sludge	January to December 2009			

Responsibility:

- To provide sufficient resources to minimise resources consumption: Board Management
- Energy audit: Facility Manager/ EHSQ Manger / external consultancy.
- Establish KPI's: Facility Manager/ EHSQ Manager
- To minimise resources consumption as possible: All staff.

OBJECTIVE 4

Reference: N1, N2, N3 (boundary points)/ NSR-1 (Nearest Noise Sensitive Location)

Title: Prevention of Noise Nuisance.

Objectives: To ensure that noise emissions are in compliance with the waste license noise emission limits.

Targets:

- To ensure that existing and new equipment do not produce noise nuisance.
- To ensure that ERAS ECO Ltd. noise emissions are in compliance with Schedule B.5- Noise Emissions of Waste License W0211-01.

Daytime dB(A) L_{Aeq}(30 minutes)	Night-time dB(A) L_{Aeq}(30 minutes)
55 Note 1	45 Note 1

Note 1: There shall be no clearly audible tonal component or impulsive component in the noise emission from the activity at any noise sensitive location.

Plan of Action / Methodology Vs Timescale:

Plan of Action (methodology)	Timescale (2009)			
	Quarter 1	Quarter 2	Quarter 3	Quarter 4
Complete Noise survey as per Condition C.5		January 2009 – December 2009		
Conduct occupational noise survey to determine the personal exposure for operators		January 2009 – December 2009		
Monitor Complaints – Group Complaints by issue (Noise, Odour, Traffic, Visual, etc.)	January to December 2009			

Location	As per *Figure F.2: Noise Monitoring Locations* (submitted in Application Form, received 1/10/2004)
N1, N2 & N3	Three boundary points
NSR-1	Nearest noise sensitive location – dwelling house

Parameter	Monitoring Frequency	Analysis Method/Technique
$L(A)_{EQ}$ [30 minutes]	Annual	Standard Note 1
$L(A)_{10}$ [30 minutes]	Annual	Standard Note 1
$L(A)_{90}$ [30 minutes]	Annual	Standard Note 1
Frequency Analysis(1/3 Octave band analysis)	Annual	Standard Note 1

Note 1: "International Standards Organisation. ISO 1996. Acoustics - description and Measurement of Environmental noise. Parts 1, 2 and 3."

Responsibility:

- Resources for Monitoring: Board of Management/Facility Manager
- Monitoring: EHSQ Manger / Independent external contractor
- Complaints: Facility Manager/ EHSQ Manager/ Administration

OBJECTIVE 5

Reference: Waste & Recycling

Title: Waste recycling efficiency.

Objectives: Monitoring of waste accepted, processed or rejected

Targets:

- To monitor efficiency of waste segregation and increase landfill diversion

Plan of Action / Methodology V's Timescale:

Plan of Action (methodology)	Timescale (2009)			
	Quarter 1	**Quarter 2**	**Quarter 3**	**Quarter 4**
Revise/ Retrain staff on load acceptance and rejection procedures		January 2009 – December 2009		
Quantify Waste Generated by Type & potential for recycling: a. Boiler Ash b. Metals		April to December 2009		
Explore potential of more localised outlet options for the following: c. Dried Sludge d. Spent Carbon e. Boiler Ash	January 2009 – Continuous			
Management Review of C&I Operations	January to December 2009			

Responsibility:

- Re-train staff on Waste Acceptance Procedures: Facility Manager/ EHSQ Manager/ All Staff
- Review C&I Operations: Board of Management/ Facility Manager
- Explore alternative outlet options: Facility Manager/ EHSQ Manager

OBJECTIVE 6

Reference: Administration waste.

Title: Administration Waste Management

Objectives: To improve waste segregation and consequently reducing waste to landfill

Targets:

- To manage properly all waste generated in the administration building.
- To segregate and recycle all administration recyclable waste in the onsite Waste Recovery transfer Facility.

Plan of Action/ Methodology V's Timescale:

Plan of Action (methodology)	Timescale (2009)			
	Quarter 1	Quarter 2	Quarter 3	Quarter 4
Review of current waste generation		April to June 2009		
Select and trial a suitable alternative, such as setting-up a 3 Bin System or suitable alternative source segregation i.e. General Waste, Mix Dry Recyclables & Brown Waste			June to December 2009	
Provide additional resources and training required for source segregation		April to December 2009		
Review effectiveness of trials and report to Facility Manager				August to December 2009

Responsibility:

- Waste Generation: EHSQ Manager
- Trial Suitable System: Facility Manager/ EHSQ Manager/ All Staff
- Provision of additional resources: Facility Manager
- Effectiveness of system: Facility Manager

OBJECTIVE 7

Reference: Environmental Health & Safety.

Title: Environmental Health & Safety Awareness.

Objective: To increase the awareness of all on-site personnel of the provisions and requirements of Health and Safety in the work place.

Targets:

- To continually improve Environmental, Health & Safety and Waste License awareness issues among staff
- To review, and improve the signage/labeling onsite
- To continually improve the working environment for persons onsite

Plan of Action/ Methodology V's Timescale:

Plan of Action (methodology)	Timescale (2009)			
	Quarter 1	Quarter 2	Quarter 3	Quarter 4
Review Training Matrix for additional training needs/requirements		April to June 2009		
Site Foreman to enroll in FAS Waste Management Course	June to December 2009			
Implement Environmental & Waste License Awareness Training		April to December 2009		
Increase Labelling: o Tanks, drums, vessels. o Chemstore o H&S		April to September 2009		
Plan Monthly Safety meetings of Site Safety Management Team.	January to September			
Train/Retrain all staff in Manual Handling so as to complete company training matrix plan.		April to December 2009		
Implement Lock Out & Tag Out Procedures.		April to June 2009		
Maintain/improve on current onsite accident rate.		April to December 2009		
Revise Safety Statement and Communicate changes to all staff				September to December 2009

Responsibility:

- To provide sufficient resources for training: Board Management and Facility Manager
- To ensure a safe place to work: Board Management; Facility Manager; All Staff
- New Labelling: EHSQ Manager/ supervisor/ Administration
- Health and Safety Statement: EHSQ Manager and or Safety Consultant; Safety Rep; All Staff

OBJECTIVE 8

Reference: Environmental Management System

Title: Environmental Health & System Update

Objective: To ensure all documents are accurate, available to all, relevant, understood and in use. .

Targets:

- To continually improve Environmental Management System
- Ensure all documents are accurate and correctly named
- Ensure documentation is easy to locate and understandable for visitors

Plan of Action/ Methodology V's Timescale:

Plan of Action (methodology)	Timescale (2009)			
	Quarter 1	Quarter 2	Quarter 3	Quarter 4
Ensure all SOP's, datasheets and folders are up to date, and amend where appropriate.		April to December 2009		
Ensure all documentation uses the name ERAS ECO Ltd.			June to December 2009	
Complete Chart/Flowchart/ Table/etc outlining the location of documents			June to December 2009	
Update Health, Safety & Environmental Emergency Response procedure, and ensure all relevant persons are familiar with procedure and the necessary training is completed.		April to September 2009		

Responsibility:

- To provide sufficient resources for training: Board Management and Facility Manager
- Review and Amend SOP's: Facility Manager; EHSQ Manager; All Staff
- Flow Diagram for Document Location; EHSQ Manager
- Revise ERP: EHSQ Manager; All Staff
- Document approval: Facility Manager

5.2 Resources Consumption 2008 Planned Efficiency Improvements

5.2.1 Municipal Water /Trade Effluent

ERAS ECO Ltd. consumed approximately 17,759 m^3 of municipal water for the calendar year 2008 based on Youghal town council water meter.

The operation of facility utilizes water in two main areas these are outlined below:

a) Process Water (Sludge Dryer Plant Boiler, Cooling water for dry product, wheel wash and admin building sanitary water/potable water)
b) Fire Water (Fire fighting equipment for entire site)

During 2007 cooling water for dry product was re-circulated within an enclosed loop using a chiller unit to maintain cooling temperature thus eliminating any water run-off to waste water treatment plant.

5.2.2 Boiler Woodchip Fuel

The total consumption of virgin and recycling woodchip for the calendar year 2007 was **1,868.9 tonnes**. This woodchip is imported from a number of outlets and is used for generating the 12 bar steam required for the sludge drying process.

It is difficult to ascertain efficiencies for woodchip due to the intermittent start-up/shut-down of plant and due to commissioning operations in 2007.

5.2.3 Light Fuel Oil

The total consumption of light fuel oil for the calendar year 2008 is approximately 13, 537 litres. The light fuel oil is used for the start up procedure for boiler to raise the temperature of furnace to 400 degrees Celsius and for the continual operation of the on-site vehicles.

It is proposed that performance indicators are now to be established for all natural resources used on site ERAS ECO Ltd are now in a position to do this as full 12 months data for each energy source is available.

5.4 Facility Operational Procedures

A list of all approved Facility Standard Operational Procedures is enclosed in Appendix U. The company adopted an extensive series of onsite operational procedures developed prior to entering into commercial operation and as part of the company's environmental management system all in-house procedures are subject to quality reviews. In addition, further in-house procedures have been adopted since entering into commercial operation including procedures developed for operation of the waste recovery facility. All additional 2007 Standard Operational Procedures adopted since entering into commercial operation in June 2007 are highlighted in Bold for ease reference. A summary of these additional Standard Operational Procedures is also enclosed in Appendix U.

6 E-PRTR / AER SUMMARY TABLE

In accordance with the requirements of the S.I. No. 123 of 2007, European Communities (European Pollutant Release and Transfer Register) Regulations 2007, ERAS ECO Ltd. submitted information in relation to releases of pollutants and off-site transfers of pollutants and waste occurred during 2008. This information was also submitted to the EPA via electronic format and is provided in Appendix C of this report.

LIST OF APPENDIXES

Appendix A Certification of Incorporation

Appendix B EPA Waste Survey 2008

Appendix C EPA PRTR Returns 2008

Appendix D Waste Monitoring Results 2008 - Sludge and Ash

Appendix E Emissions to Sewer- SE1 Report 2008

Appendix F Emissions to Sewer- Toxicity Results 2008

Appendix G Emissions to Sewer- Aquafact Report 2008

Appendix H A1 Boiler Monitoring Reports Q1-Q4

Appendix I A2 Biofilter Monitoring Reports B1 & B2 2008

Appendix J A2 Biofilter Health Check Report Bord Na Mona

Appendix K Surface Water SW1 Daily Inspections

Appendix L Surface Water SW1 Monitoring Reports 2008

Appendix M Noise Monitoring Report 2008

Appendix N Groundwater Monitoring Results 2008

Appendix O Dust Monitoring Results 2008

Appendix P Daily Odour Inspections

Appendix Q Pipeline & Bund Testing Reports

Appendix R Closure restoration and management plan v2.00

Appendix S ERLA v2.00

Appendix T EPA Energy Audit

Appendix U SOP's Master List