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EMISSIONS COMPLIANCE REPORT

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1. INTRODUCTION

This attachment summarises the most recent emissions monitoring undertaken at the ERAS ECO Ltd. facility and discusses the emissions compliance with relevant emissions limit values set out the Licence.

Condition 6.2 and Schedule C of the EPA licence requires the monitoring of the CHP gas engine stacks, the biofilters, the flare, surface water, waste water, groundwater, dust and air at defined monitoring locations. Noise monitoring is not required unless requested by the Agency.

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2. STORM WATER MONITORING

2.1 Locations

Rainwater run-off from roofs and non-waste storage paved areas is collected in the surface water drainage system that connects to two silt/ oil interceptors (Class 1) and a storm water retention tank. The run-off is reused on-site when possible (wheel wash), and the surplus water discharges to the estuary. The licence specifies emission limit values for the emission and also the monitoring requirements. The monitoring location (SW-1) is shown on Figure 2.1.

2.2 Methods

The monitoring is carried out by site personnel and the samples are stored in a cooler box at 9°C prior to dispatch to the laboratory.

2.3 Results

Sampling is carried out weekly and quarterly and the samples are analysed for the list of parameters specified in Schedule C.3.4 of the Licence. The results for the most recent monitoring events from 2020 to July 2021 are presented on Table 2.1. The results indicate that the quality of discharge is good and will not impact on the quality of water in the estuary.

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Table 2.1 Storm Water Results (SW-1)

Date	pH	TSS	EC	TOC	BOD	COD	Ammonia	Total Nitrogen	Sulphate	Mineral Oils
09/01/2020	6.69	<10	192	11.0	<0.1	<50	<0.01	3.4	<10	
16/01/2020	6.70	40	218	4.6						
23/01/2020	6.96	<5	211	4.4						
30/01/2020	7.42	<10	215	4.2						<0.01
06/02/2020	6.85	<10	220	2.1						
13/02/2020	7.34	<25	318	10.0						
20/02/2020	6.74	<5	159	7.1						
27/02/2020	7.10	<5	118	5.6	<0.1	<15	<0.01			
05/03/2020	7.28	<15	187	5.2						
12/03/2020	8.34	<1	1106	18.0						
19/03/2020	7.25	<10	199	3.4						
26/03/2020	7.76	10	644	5.5						
02/04/2020	8.60	<10	1246	13.0	2.2	<15	<0.01			
23/04/2020	7.96	<5	1146	4.5						
30/04/2020	8.06	<5	1081	3.7						
07/05/2020	8.31	<10	1081	6.8	1.3	<15	0.039	1	27	<0.01
20/05/2020	6.95	<10	198	4.2						
27/05/2020	6.62	<10	186	<2.0						
18/06/2020	7.43	<10	181	5.6						
24/06/2020	7.60	<10	188	5.4						
01/07/2020	7.21	<10	154	11,000	0.4	<15	<0.01	2	18	
08/07/2020	6.95	<10	154	3.8						
15/07/2020	7.12	<10	176	9.9						
22/07/2020	7.34	<5	197	3.5						
29/07/2020	7.11	<10	94	3.4						
12/08/2020	7.24	<10	174	5.1	<0.1	<15				
19/08/2020	8.61	<10	639	7.4						
26/08/2020	7.27	<10	205	3.5						
02/09/2020	7.83	<10	384	2.9						
09/09/2020	7.46	<5	188	3.2						
16/09/2020	7.22	<10	180	3.2						
23/09/2020	7.80	<5	189	2.7	0.5	<15	<0.01	3.2	<10	
30/09/2020	7.56	<10	173	2.9						<0.01
14/10/2020	7.09	<10	123	5.0						
21/10/2020	7.52	5.6	1109	4.9	2.5	<15	<0.01			
28/10/2020	7.08	<5	205	4.3						
04/11/2020	7.42	<10	376	1.7			<0.01	<1	<10	
18/11/2020	7.31	6.2	172	19.0						
25/11/2020	7.30	<10	227	4.1						
02/12/2020	7.09	<10	188	3.7						
09/12/2020	7.42	<10	217	2.9	0.3	<15				<0.01
16/12/2020	7.25	<10	164	2.6						
06/01/2021	7.17	<25	215	2.4	1.1	<15	<0.01	<1	15	
13/01/2021	7.09	<25	233	2.6						
19/01/2021	7.33	26	313	29.0						
27/01/2021	7.34	8.8	84	3.8						
10/02/2021	6.51	<10	154	3.5						
03/02/2021	6.62	<5	165	3.2						
17/02/2021	6.91	<5	178	<2.0	<0.1	<15	<0.01	3.4	11	
24/02/2021	6.70	<5	175	2.6						
03/03/2021	6.98	<10	244	2.4						
10/03/2021	7.03	<10	284	2.2						
18/03/2021	6.96	<10	159	2.5						
24/03/2021	7.46	<10	285	3.8						<0.01
31/03/2021	6.99	<5	124	2.2						
07/04/2021	7.04	<10	201	<2.0						
14/04/2021	7.54	<5	198	<2.0						
21/04/2021	7.80	<25	271	5.5						
05/05/2021	6.94	<5	191	<2.0						
12/05/2021	7.16	<25	217	4.9						
19/05/2021	7.00	<5	195	<2.0						
26/05/2021	7.20	<10	121	3.4						
02/06/2021	7.10	<5	151	3.0						
11/06/2021	7.41	<5	180	2.4						
16/06/2021	7.12	<10	179	2.1						
23/06/2021	7.08	<10	190	<2.0						
07/07/2021	7.34	11	191	3.8	2.6	<15	0.011	1.8	<10	<0.01
14/07/2021	7.02	<5	187	<2.0						

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Figure 2.1

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3. GROUNDWATER MONITORING

3.1 Locations

Groundwater monitoring is carried out biannually at 2 monitoring locations (MW2 and MW3), MW2 is located at the western boundary, while MW3 is located in the car park. There are two wells at monitoring point MW3, one shallow (MW3s) and one deep (MW3d).

3.2 Methods

The monitoring is carried out by site personnel and the samples are stored in a cooler box at 9°C prior to dispatch to the laboratory.

3.3 Results

Sampling is carried out biannually and the samples are analysed for the list of parameters specified in Schedule C.7.2 of the Licence. There are no emission limits set in the Licence. The results for 2020 and Round 1 2021 are presented in Tables 3.1 to 3.3. Ammonia, DRO, PRO, VOC and SVOC were not detected in any of the wells during the 3 monitoring periods. COD was not detected in MW2, while cadmium and cobalt were not detected in MW2 and MW3d. The results indicate that the facility is not having a negative effect on groundwater.

Table 3.1 Groundwater monitoring results MW2

Parameter	Unit	21/02/2020	26/08/2020	19/01/2021
pH	pH Units	7.18	7.3	7.17
Conductivity	µS/cm	673	704	712
COD	mg/l	<15	<15	<15
Nitrate	mg/l	26	21	26
Ammonia	mg/l	<0.01	<0.01	<0.01
Chloride	mg/l	38	32	44
DRO	mg/l	<0.0001	<0.0001	<0.0001
PRO	mg/l	<0.0001	<0.0001	<0.0001
Cadmium	mg/l	<0.005	<0.005	<0.005
Cobalt	mg/l	<0.01	<0.01	<0.01
Iron	mg/l	2.4	3.8	2
Manganese	mg/l	0.037	0.11	0.26
Arsenic	mg/l	<0.0025	<0.0025	<0.005
VOC	mg/l	ND	ND	ND
SVOC	mg/l	ND	ND	ND

Table 3.2 Groundwater monitoring results MW3s

Parameter	Unit	21/02/2020	26/08/2020	19/01/2021
pH	pH Units	7.55	7.27	7.32
Conductivity	µS/cm	447	847	410
COD	mg/l	223	875	<15
Nitrate	mg/l	<0.5	1.2	6.6
Ammonia	mg/l	<0.01	<0.01	<0.01
Chloride	mg/l	32	16	16
DRO	mg/l	<0.0001	<0.0001	<0.0001
PRO	mg/l	<0.0001	<0.0001	<0.0001
Cadmium	mg/l	0.009	0.01	0.008
Cobalt	mg/l	<0.01	0.057	0.051
Iron	mg/l	83	148	121
Manganese	mg/l	1.6	2.1	2.1
Arsenic	mg/l	0.013	0.071	0.014
VOC	mg/l	ND	ND	ND
SVOC	mg/l	ND	ND	ND

Table 3.3 Groundwater monitoring results MW3d

Parameter	Unit	21/02/2020	26/08/2020	19/01/2021
pH	pH Units	7.11	7.42	7.09
Conductivity	µS/cm	732	496	219
COD	mg/l	18	36	24
Nitrate	mg/l	<0.5	<0.5	0.763
Ammonia	mg/l	<0.01	<0.01	<0.01
Chloride	mg/l	60	65	10
DRO	mg/l	<0.0001	<0.0001	<0.0001
PRO	mg/l	<0.0001	<0.0001	<0.0001
Cadmium	mg/l	<0.005	<0.005	<0.005
Cobalt	mg/l	<0.01	<0.01	<0.01
Iron	mg/l	7.5	3.8	1.7
Manganese	mg/l	1.2	1.1	1.1
Arsenic	mg/l	0.008	<0.0025	<0.0025
VOC	mg/l	ND	ND	ND
SVOC	mg/l	ND	ND	ND

4. AIR MONITORING

4.1 Locations

Air monitoring includes dust deposition carried out by ERAS ECO; odour and bioaerosol monitoring carried out by Odour Monitoring Ireland Ltd (OMI) and stack emission monitoring carried out by Air Scientific Ltd.

Dust monitoring is carried out at 3 locations within the site boundary (D1, D2 and D3). Stack emission monitoring is carried out on the CHP stack, A4. Bioaerosol monitoring is carried out at three on-site locations (Upwind 1, Downwind 2 and Downwind 3). Odour monitoring is carried out on the carbon filter exhaust. The monitoring locations are shown on Figure 2.1.

4.2 Methods

The dust monitoring is completed using Bergerhoff gauges specified in the German Engineering Institute VDI 2119 document entitled "Measurement of Dustfall Using the Bergerhoff Instrument (Standard Method). Details on the methodologies applied in the odour, bioaerosol and stack emission testing are in the OMI and Air Scientific monitoring reports which are in Appendix 1.

4.3 Results

Dust monitoring is carried out three times per year and the results for 2020 and Q1 2021 are presented in Table 4.1. Stack emission monitoring is carried out quarterly and the results for 2020 and Q1 2021 are presented on Table 4.2. Monitoring of the biofilters is carried out quarterly by OMI and the results are shown on Table 4.3. The tables also include the emission limits set in the Licence.

Table 4.1 Dust Monitoring Results

Sample Location	Units	Q2 2020	Q3 2020	Q4 2020	Q2 2021	Emission Limit
D1	(mg/m ² /day)	307	109	140	115	350
D2	(mg/m ² /day)	132	91	78	80	350
D3	(mg/m ² /day)	10	190	89	284	350

Table 4.2 CHP Stack Emissions A4

Stack Monitoring		Q1 2020	Q2 2020	Q3 2020	Q4 2020	Q1 2021	Q2 2021	ELV
Carbon Monoxide	mg/m ³	345	310.92	452.39	455.72	398.81	360.36	1400
Oxides of Nitrogen	mg/m ³	119.61	116.04	137.39	137.35	168.81	85.36	190
Total Volatile Organic Compounds	mg/m ³	591.1	332.19	202.83	243.08	428.01	335.54	1000
TNMVOC	mg/m ³	<0.54	<0.18	<0.94	<1.16	<0.62	<1.15	75
Oxygen	% v/v	14.71	7.62	11.62	14.02	12.82	13.06	-
Carbon Dioxide	% v/v	5.59	11.64	7.51	6.1	7.87	5.75	-
H2O	% v/v	8.2	9.2	7.7	7.1	7.2	7.8	-
Sulphur Dioxide	% v/v	11.51	0.54	27.37	30.54	28.74	3.54	40
Stack Gas Temp	K	621.15	641.15	655.15	641.15	613.15	416.45	-
Stack Gas Velocity	m/s	18.63	10.27	14.17	13.79	13.04	13.57	-
Volumetric Flow Rate	m ³ /h	13,559	7,168	9,905	9,621	9,861	14,826	3000
Volumetric Flow Rate (Ref)	m ³ /h	15,627	15,915	15,614	11,904	12,368	19,701	3000

Table 4.3 Odour Monitoring Results A3

Location	Q1 2020	Q2 2020	Q3 2020	Q4 2020	Q1 2021	Q2 2021	ELV
Average Odour OUe/m ³							
Carbon Filter Exhaust	845	1149	575	627	211	391	1500

4.4 Discussion

The dust deposition results and the odour emissions were all below the emission limit values. The CHP stack emissions were below the limits set in the licence with the exception of the Total Volatile Organic the volumetric flow rate. The exceedance of the volumetric flow rate ELV is due to the methodology specified in the licence to calculate emission limit values.