2018

Annual Report for Allington Energy from Waste Facility

Permit Number: BR4551IC

Report prepared by

Kent Enviropower Ltd

Annual performance report for: Kent Enviropower Limited, Allington Incinerator, Allington Quarry

Permit Number: EPR/BR4551IC

Year: 2018

This report is required under the Industrial Emissions Directive's Article 55(2) requirements on reporting and public information on waste incineration plants and co-incineration plants, which require the operator to produce an annual report on the functioning and monitoring of the plant and make it available to the public.

1. Introduction

Name and address of plant	Allington Incinerator. Allington Quarry, Laverstoke Road, Maidstone, Kent. ME16 0LE
Description of waste input	Municipal Solid Waste (MSW) collected from households by Kent County Council (KCC) and trade waste collected from industry
Operator contact details if members of the public have any questions	Community information line 0844 736 9990 (staffed 9am to 5.30pm weekdays)

2. Plant description

Installation Description

The Installation receives non hazardous municipal and industrial waste, recovers recyclable elements for reuse and eliminates the combustible element of the residue by burning in a fluidised bed furnace. Energy is recovered from the process and converted to electricity in place of non-renewable fossil fuels. The combustion gases are cleaned to meet the standards required by the Directive before discharge from a tall chimney. Ashes and other solid residues are removed from the installation.

The Installation covers the site and the entire EfW plant including all EfW lines, waste reception, storage, on-site pre-treatment facilities, water, fuel and air supply systems, boiler, facilities for the treatment of exhaust gases, on-site facilities for treatment or storage of residues and waste water, stack, devices and systems for controlling combustion operations, recording and monitoring conditions.

The Installation has a design throughput of approx 580,000 tonnes per annum with an EfW capacity approx 560,000 tonnes per annum. The transfer loading station receives food waste and clean source separated recyclables which it reloads for onward transport and recovery. There is a single waste reception followed by three independent waste treatment lines each complete with a heat recovery boiler, acid gas abatement, bag filter and a separate flue in the chimney. The heat produced from the combustion of the waste is used to generate steam in the boilers and the steam is then combined and passed to a steam turbine which generates approx 34.5 MW of electrical energy for export to the National Grid.

Raw Materials

Waste is delivered to the plant in road vehicles which are weighed before proceeding to the tipping hall. This is a fully enclosed building with controlled airflow to reduce the likelihood of odours, dust or litter escaping the building. The municipal solid waste (MSW) is tipped into an appropriate storage bunker.

The MSW waste (black bag) is transferred by crane grab to a waste shredding line, it then moves forward through a metals extraction section where ferrous metals are removed for recycling before moving to the prepared fuel bunker.

Crane grabs in the prepared fuel bunker both mix the waste and feed the hoppers of the three lines.

General

Hydrated lime for the flue gas cleaning process is delivered by bulk tanker and offloaded pneumatically into three 125m3 silos vented through a reverse pulse jet filter.

Activated carbon for the flue gas cleaning process is stored in dedicated silos that are pneumatically filled from delivery trucks. There are three silos, one for each line and one common silo each equipped with filters to prevent dust emissions during filling.

Urea, dissolved in water is stored in a fully bunded tank and is injected into the furnaces as necessary to control Nox emissions.

Caustic soda for water treatment resin regeneration is delivered by bulk tanker and offloaded into a 5.5m3 tank with scrubber, inside the demineralisation area.

Hydrochloric acid for water treatment resin regeneration is delivered by bulk tanker and offloaded into a 5.5m3 tank vented through caustic soda scrubber in a bund outside the demineralisation area.

Various other water treatment chemicals are delivered in appropriate containers and stored in bunded areas.

Gas oil for the combustion chamber burners and on-site vehicles is stored in a fully bunded 100m3 tank.

Sand for the fluidised bed furnaces is stored in 3 silos each of 55m3 capacity and a further ‘common’ sand silo with a capacity of 71m3 (approx. 80 tonnes).

Various maintenance materials (oils, greases, insulants, antifreezes, welding and fire fighting gases etc.) are stored in the appropriate manner.

Combustion Process

The ROWITEC unit uses a twin interchanging fluidised bed process. The design has an inclined air distributor plate with a number of separate air supply nozzles providing differential air flows across the bed, causing a revolving action of the sand. This technique promotes rapid and uniform combustion of the waste and ensures that heavy

inert and non-combustible material migrates to the sides of the bed where they can easily be removed.

An angled furnace wall above the fluidised bed zone restrains bed expansion under high fluidising air flows and so minimises particulate carry over. The elliptical patterns of air flow converge in the centre of the combustion area ensuring effective vertical and lateral turbulent mixing and high combustion efficiency and uniformity.

The material is burned above and on a bed consisting of sand, fuel and ash that is held in suspension by an upward flow of primary air that maintains the sand in suspension.

The furnace operating design is based on a thermal capacity of 53.8MW at full load and this can be achieved over a typical range of waste calorific values expected with municipal waste.

The combustion air system provides the furnace with the total air requirements for fluidisation and combustion. Primary air is supplied to the bottom of the combustion chamber and fluidises the bottom bed. This air is extracted from the tipping hall and waste storage areas and burnt in the combustion chamber.

Each furnace is equipped with two lance burners for use at start-up to heat the furnace and also during extreme reductions in waste fuel calorific value when the temperature of the furnace would otherwise fall below 850 degrees Centigrade.

Combustion control of the furnace will be achieved through a combination of furnace bed and freeboard temperature control, primary air flow control, oxygen control within the flue gas and furnace load.

Recirculated flue gas is fed to the furnace bed as a cooling medium to control the furnace bed temperature and also to assist the control of Nox by influencing the combustion temperature conditions within the furnace.
The furnace bed is managed to remove non-combustible material (bottom ash) from the bed and maintain the sand level within the optimum operating range. Bottom ashes produced in the furnace together with sand migrate down the slope of the furnace to the discharge section located at each side of the bed. The bottom ash and sand are both withdrawn from the discharge sections of the bed by water-cooled discharge screw conveyors, operating on an alternating basis. Material passing out of the screw conveyors is discharged to a vibrating screen. Material of a suitable size is returned to the sand hopper for re-use within the furnace while the oversized material is sent off site for use as a secondary aggregate.

Energy Recovery

Hot gases from the furnace pass through to a boiler designed to generate steam. The boiler comprises two water tubed steam generating vertical gas passes, and a single pass horizontal section incorporating an evaporator, three stage superheater, and a plain tube economiser sections.

Steam is generated at 65 bar and a final temperature of 420^0C. The high pressure steam from all three boilers feeds into a common header which in turn feeds a condensing steam turbine that generates electricity. Steam exiting the turbine is condensed in an air cooled condenser and the condensate returned to the boilers.

Gas Cleaning

The Facility is designed to meet the requirements of the Waste Incineration Directive as a minimum for releases to air by a combination of main process design and operation and abatement equipment.

Flue gases pass from the boiler to the gas cleaning equipment. The gas passes to an electrostatic precipitator (ESP) for the separation of ash carried over from the furnace with the flue gas. Material collected in the ESP will be discharged by means of rotary valves and chain conveyors and then pneumatically fed to the residual ash silos.

Gases leaving the ESP enter the gas cleaning system. This comprises a Circulating Fluidised Bed (Circoclean) reactor and bag filter system. Gases entering the core will be at a temperature of 170^0C to 230^0 C and come into contact with a mixture of water, hydrated lime and activated carbon that have been injected into the reactor. The reactor is designed to reduce or remove acidic pollutants such as HCl, SO2 and HF by the use of the hydrated lime and dioxins and furans, PCBs, PAHs, mercury vapour and heavy metal salts such as mercury chloride by the use of the activated carbon. The injected water cools the gas and enhances the reactions and cools the gas. The control system of the CFB optimises the use of reagents by balancing the feed rate with the concentration of the pollutants entering the circoclean.

The final stage of the gas cleaning system is the bag filter unit which separates the particulate material from the flue gas. The baghouse filter consists of 4 compartments each of which contains 427 tubular filter bags. A thick porous layer of particulate builds on the bag surfaces to form a filter cake which efficiently removes ultra fine particles from the gas stream and the excess lime continues to react with the acid gases.

Bag house residue is discharged from the compartments via the integrated buffer storage by a closed pneumatic conveying system into the reaction product silos. Silos are equipped with a filter, hopper heating and fluidisation system to assist discharge. The residue is then discharged directly into road vehicles under dust free conditions for transport off site to a licensed landfill.

Nitrogen oxides (NOx) abatement is achieved by the use of both flue gas recirculation (FGR) and selective non-catalytic reduction (SNCR). The SNCR is based on the injection of urea into the furnace chambers before the boilers.

The cleaned gas then discharges to atmosphere via three 80-metre flues in a common stack both at an efflux velocity in excess of 15 ms-1 at maximum throughput.

Ancillary Operations

Demineralised water is required to compensate for boiler blowdown losses. A package demineralisation plant provides this water. The ion exchange resins are regenerated using sodium hydroxide and hydrochloric acid and the regeneration effluent is routed through a neutralisation tank to the collection pit for reuse where possible.

Ash Handling

Bottom ash, the combined boiler and ESP ash and the flue gas treatment residue (FGT) from the bag filter system, are each sent for disposal off site by licensed contractors subject to environmental permitting and waste legislation. The bottom ash is subject to

ferrous and non-ferrous metals extraction by the contractors before reuse. All operations are subject to waste legislation regulated by the Environment Agency. At least quarterly sampling of the bottom ash is being carried out to ensure effective burn out is being achieved by testing for the “loss on ignition” of the residual ash. All other solid waste residues arising from the operation of the process will be removed from site, in enclosed containers, for disposal by suitably licensed contractors.

Liquid Effluent and Site Drainage

Uncontaminated surface water from roads and parking area within the process is discharged to sewer or to the conservation area on site.

Emissions Monitoring

Emissions from the stack are continuously monitored for: particulate, carbon monoxide (CO), ammonia (NH3), sulphur dioxide (SO2), hydrogen chloride (HCl), oxygen (O2), nitrogen oxides (NOx) and volatile organic compounds (VOC). In addition periodic sampling and measurement will be carried out for metals; cadmium (Cd), thallium (Tl), mercury (Hg), antimony (Sb), arsenic (As), lead (Pb), chromium (Cr), cobalt (Co), copper (Cu), manganese (Mn), nickel (Ni), vanadium (V), dioxins and furans, dioxin like PCBs, hydrogen fluoride (HF) and nitrous oxide (N2O). Periodic measurements will be carried out four times in the first year and thereafter either at the same frequency or twice per year dependant on the substances.

3. Summary of Plant Operation

Municipal waste received	513,098.50 tonnes
Other waste received	16,413.38 Recyclates waste 4,843.78 Food waste
Total waste received	534,355.66 tonnes
Total plant operational hours	22,153.61 hours
Total hours of “abnormal operation” (see permit for definition)	1.5 hours
Total quantity of incinerator bottom ash (IBA) produced	51,916.12 tonnes
Disposal or recovery route for IBA	Recovered as Incinerator Bottom Ash Aggregate (IBBA)
Did any batches of IBA test as hazardous? If yes, state quantity	No
Total quantity of air pollution control (APC) residues produced	48,151.02 tonnes
Disposal or recovery route for APC residues	7,405.48 recycle 40,745.54 landfill
Total electricity generated for export to the National Grid	222,989 MWh

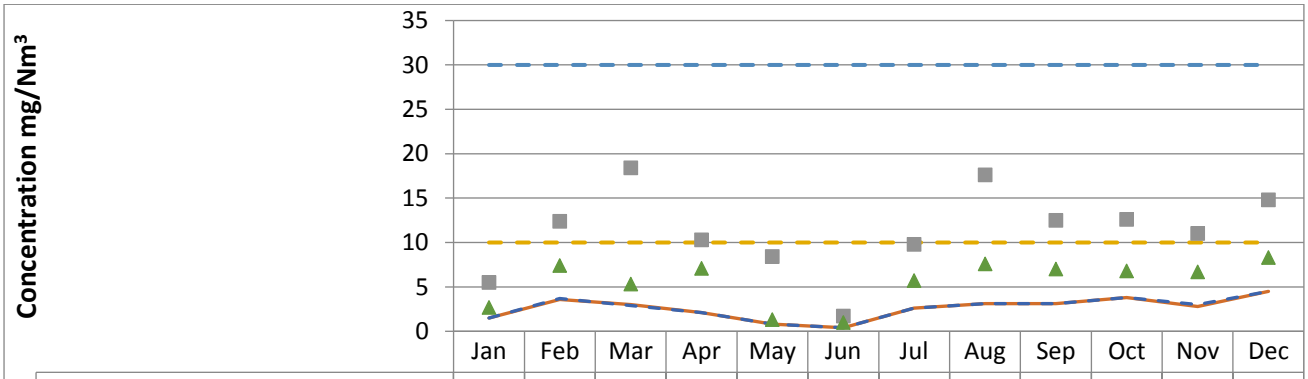
4. Summary of Plant Emissions

4.1 Summary of continuous emissions monitoring results for emissions to air

The following charts show the performance of the plant against its emission limit values (ELVs) for substances that are continuously monitored.

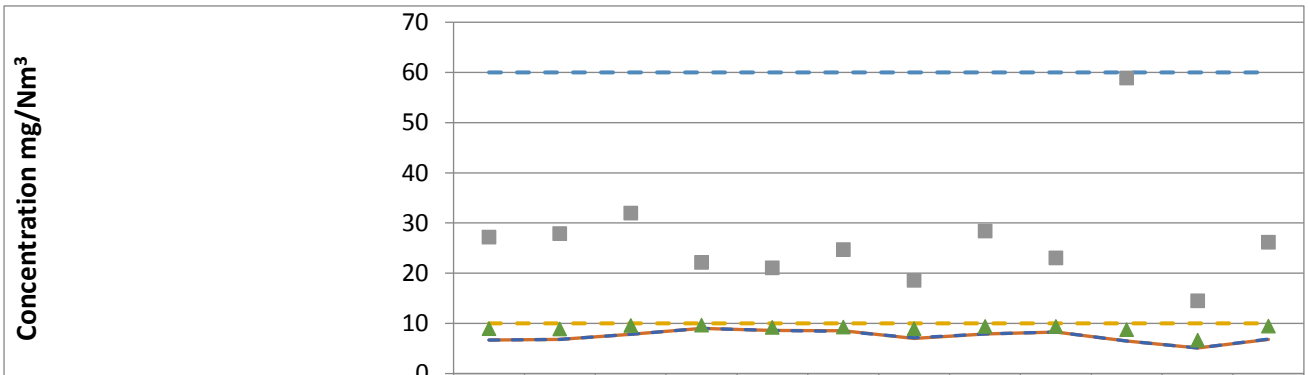
LINE 1

Line 1 Particulates



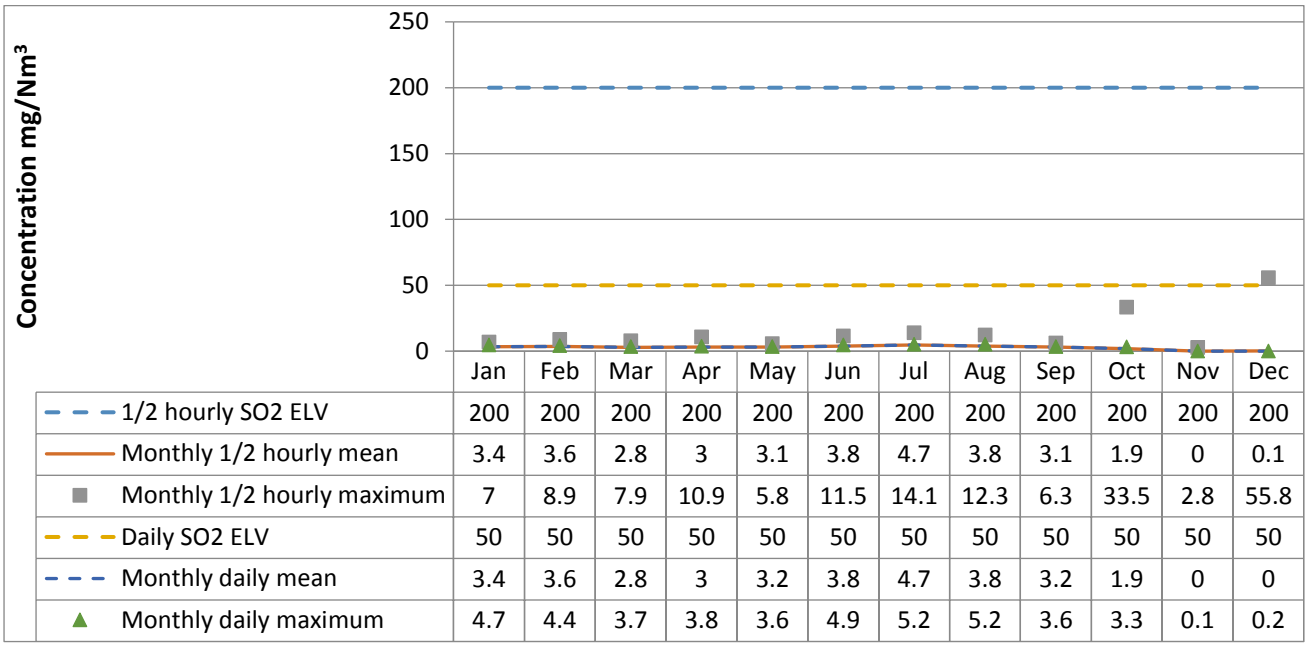
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1/2 hourly PM ELV	30	30	30	30	30	30	30	30	30	30	30	30
Monthly 1/2 hourly mean	1.5	3.6	3	2.1	0.8	0.4	2.6	3.1	3.1	3.8	2.8	4.5
Monthly 1/2 hourly maximum	5.5	12.4	18.4	10.3	8.4	1.7	9.8	17.6	12.5	12.6	11	14.8
Daily PM ELV	10	10	10	10	10	10	10	10	10	10	10	10
Monthly daily mean	1.5	3.7	2.9	2.1	0.8	0.4	2.6	3.1	3.1	3.8	3	4.5
Monthly daily maximum	2.7	7.4	5.3	7.1	1.3	1	5.7	7.6	7	6.8	6.7	8.3

Line 1 HCL



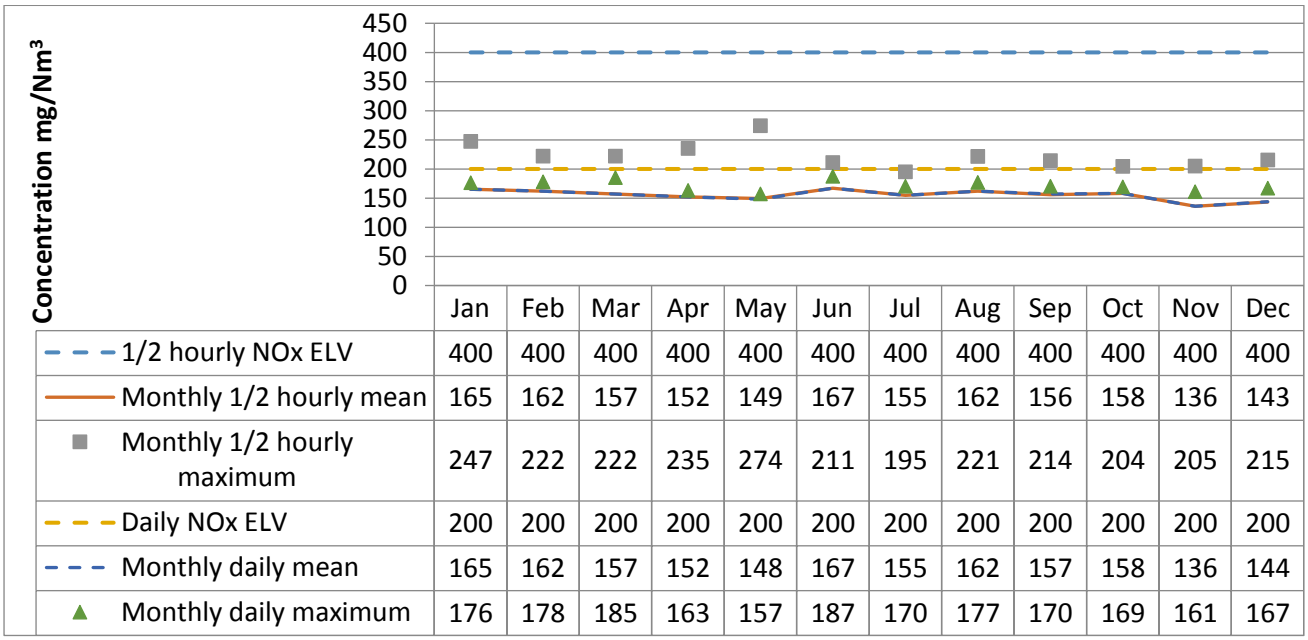
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1/2 hourly HCl ELV	60	60	60	60	60	60	60	60	60	60	60	60
Monthly 1/2 hourly mean	6.7	6.8	7.8	9	8.6	8.5	7	7.9	8.3	6.5	5.1	6.8
Monthly 1/2 hourly maximum	27.2	27.9	32	22.2	21.1	24.7	18.6	28.4	23.1	58.9	14.5	26.2
Daily HCl ELV	10	10	10	10	10	10	10	10	10	10	10	10
Monthly daily mean	6.7	6.8	7.8	9	8.6	8.4	7.1	7.9	8.3	6.5	5.1	6.9
Monthly daily maximum	9	8.9	9.6	9.7	9.2	9.3	9	9.4	9.4	8.8	6.7	9.5

Line 1 SO2



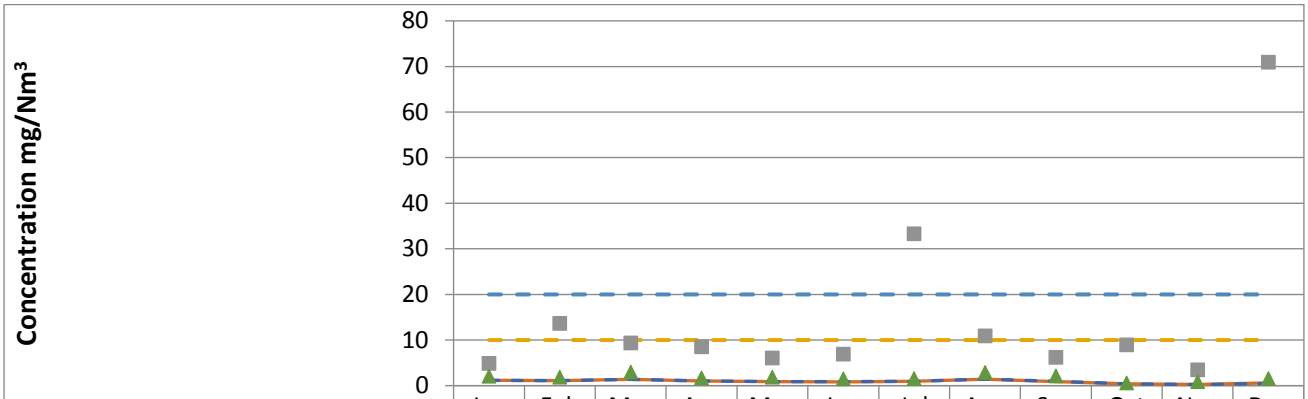
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1/2 hourly SO2 ELV	200	200	200	200	200	200	200	200	200	200	200	200
Monthly 1/2 hourly mean	3.4	3.6	2.8	3	3.1	3.8	4.7	3.8	3.1	1.9	0	0.1
Monthly 1/2 hourly maximum	7	8.9	7.9	10.9	5.8	11.5	14.1	12.3	6.3	33.5	2.8	55.8
Daily SO2 ELV	50	50	50	50	50	50	50	50	50	50	50	50
Monthly daily mean	3.4	3.6	2.8	3	3.2	3.8	4.7	3.8	3.2	1.9	0	0
Monthly daily maximum	4.7	4.4	3.7	3.8	3.6	4.9	5.2	5.2	3.6	3.3	0.1	0.2

Line 1 NOx



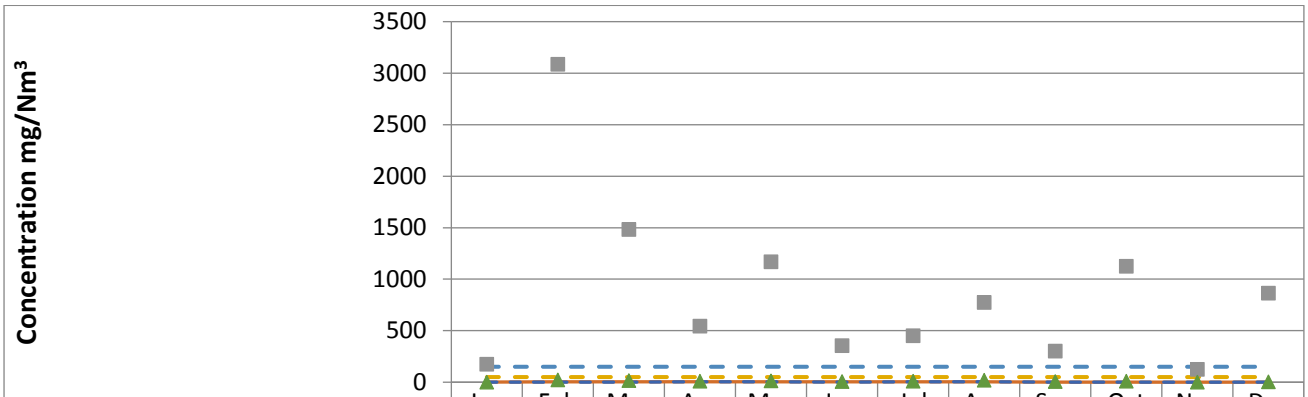
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1/2 hourly NOx ELV	400	400	400	400	400	400	400	400	400	400	400	400
Monthly 1/2 hourly mean	165	162	157	152	149	167	155	162	156	158	136	143
Monthly 1/2 hourly maximum	247	222	222	235	274	211	195	221	214	204	205	215
Daily NOx ELV	200	200	200	200	200	200	200	200	200	200	200	200
Monthly daily mean	165	162	157	152	148	167	155	162	157	158	136	144
Monthly daily maximum	176	178	185	163	157	187	170	177	170	169	161	167

Line 1 TOC



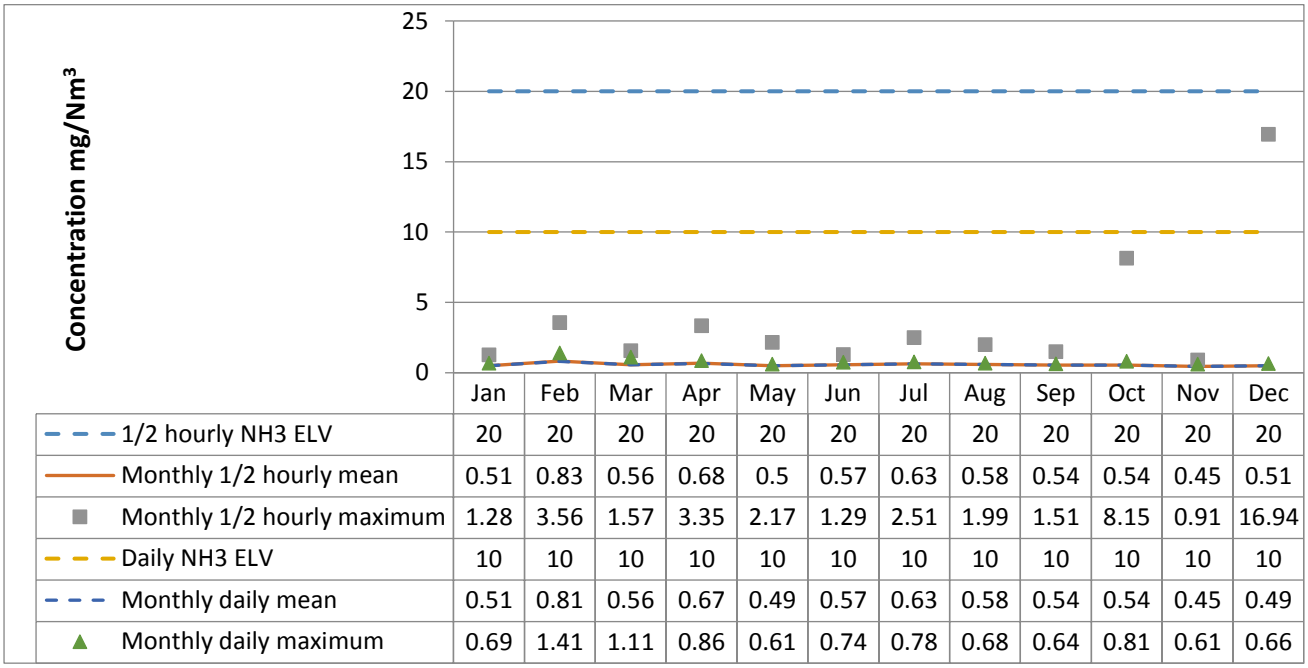
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1/2 hourly TOC ELV	20	20	20	20	20	20	20	20	20	20	20	20
Monthly 1/2 hourly mean	1.15	1.12	1.38	1.05	0.86	0.85	0.96	1.41	0.91	0.4	0.26	0.61
Monthly 1/2 hourly maximum	4.86	13.65	9.41	8.57	6.06	6.92	33.33	10.92	6.25	8.93	3.45	70.95
Daily TOC ELV	10	10	10	10	10	10	10	10	10	10	10	10
Monthly daily mean	1.15	1.12	1.39	1.04	0.88	0.88	0.93	1.43	0.97	0.4	0.24	0.47
Monthly daily maximum	2.06	1.88	2.98	1.76	1.87	1.54	1.61	2.89	2.15	0.61	0.86	1.57

Line 1 CO



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
10 minute CO ELV (95%)	150	150	150	150	150	150	150	150	150	150	150	150
Monthly 95% 10 minute maximum												
Monthly 10 minute mean	1.16	2.28	2.53	4.27	3.76	2.67	3.46	3.76	2.23	1.28	0.26	1.76
Monthly 10 minute maximum	176	3088	1482	544	1169	354	452	775	303	1126	124	865
Daily CO ELV	50	50	50	50	50	50	50	50	50	50	50	50
Monthly daily mean	1	2	2	4	3	2	3	4	2	1	0	1
Monthly daily maximum	2	23	17	11	13	6	10	18	7	9	2	5

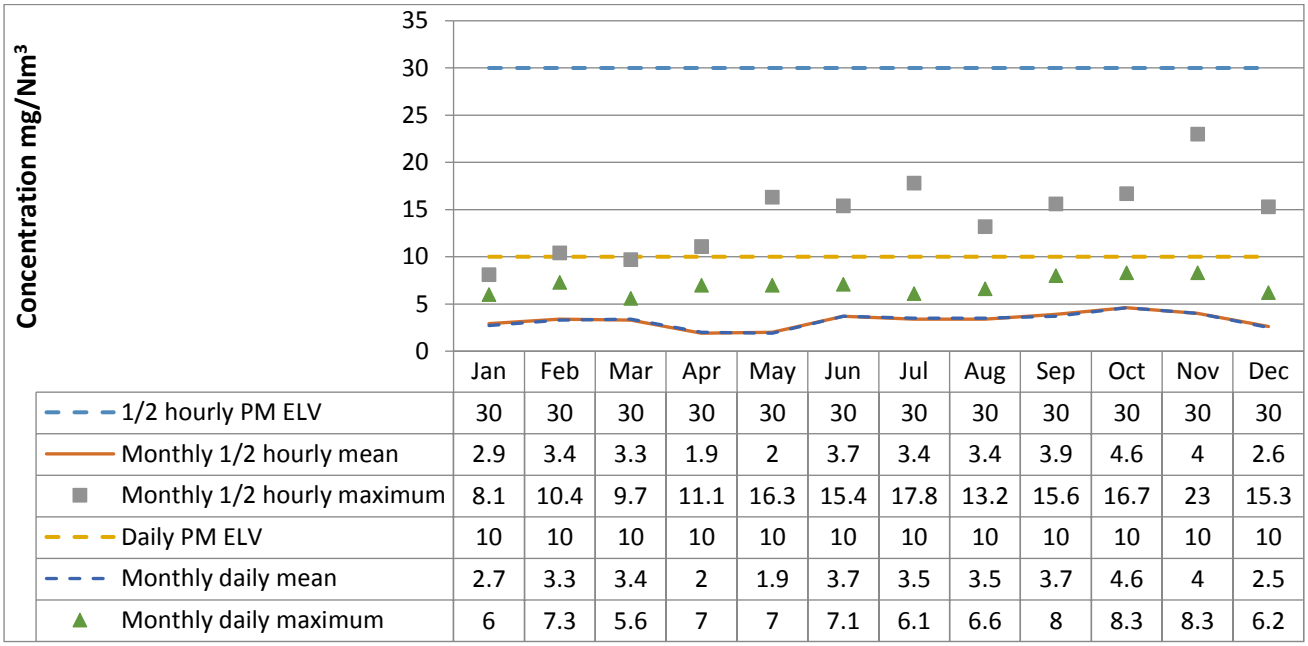
Line 1 NH3



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1/2 hourly NH3 ELV	20	20	20	20	20	20	20	20	20	20	20	20
Monthly 1/2 hourly mean	0.51	0.83	0.56	0.68	0.5	0.57	0.63	0.58	0.54	0.54	0.45	0.51
Monthly 1/2 hourly maximum	1.28	3.56	1.57	3.35	2.17	1.29	2.51	1.99	1.51	8.15	0.91	16.94
Daily NH3 ELV	10	10	10	10	10	10	10	10	10	10	10	10
Monthly daily mean	0.51	0.81	0.56	0.67	0.49	0.57	0.63	0.58	0.54	0.54	0.45	0.49
Monthly daily maximum	0.69	1.41	1.11	0.86	0.61	0.74	0.78	0.68	0.64	0.81	0.61	0.66

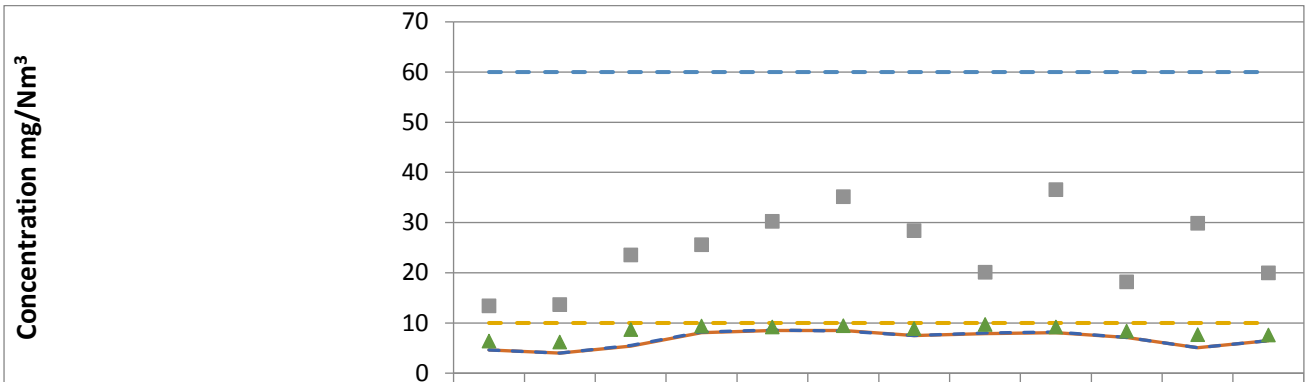
LINE 2

Line 2 Particulates



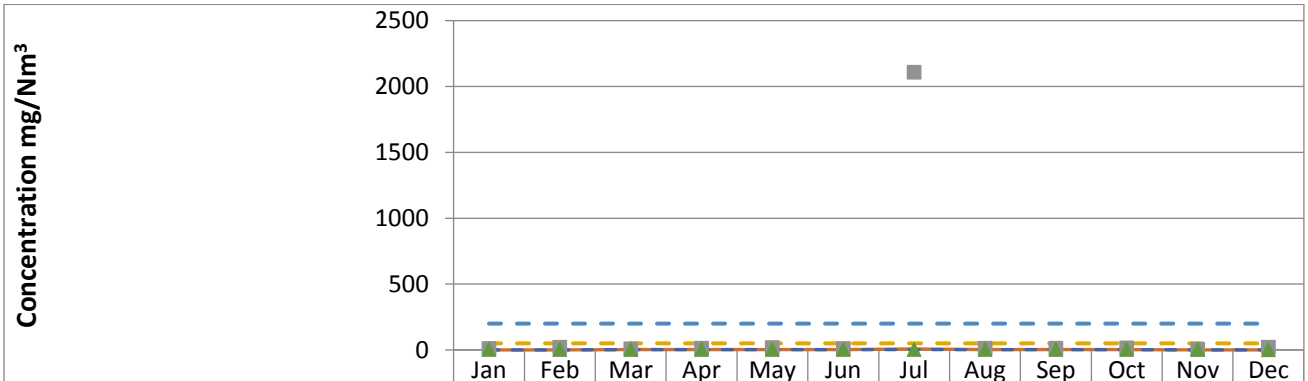
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1/2 hourly PM ELV	30	30	30	30	30	30	30	30	30	30	30	30
Monthly 1/2 hourly mean	2.9	3.4	3.3	1.9	2	3.7	3.4	3.4	3.9	4.6	4	2.6
Monthly 1/2 hourly maximum	8.1	10.4	9.7	11.1	16.3	15.4	17.8	13.2	15.6	16.7	23	15.3
Daily PM ELV	10	10	10	10	10	10	10	10	10	10	10	10
Monthly daily mean	2.7	3.3	3.4	2	1.9	3.7	3.5	3.5	3.7	4.6	4	2.5
Monthly daily maximum	6	7.3	5.6	7	7	7.1	6.1	6.6	8	8.3	8.3	6.2

Line 2 HCL



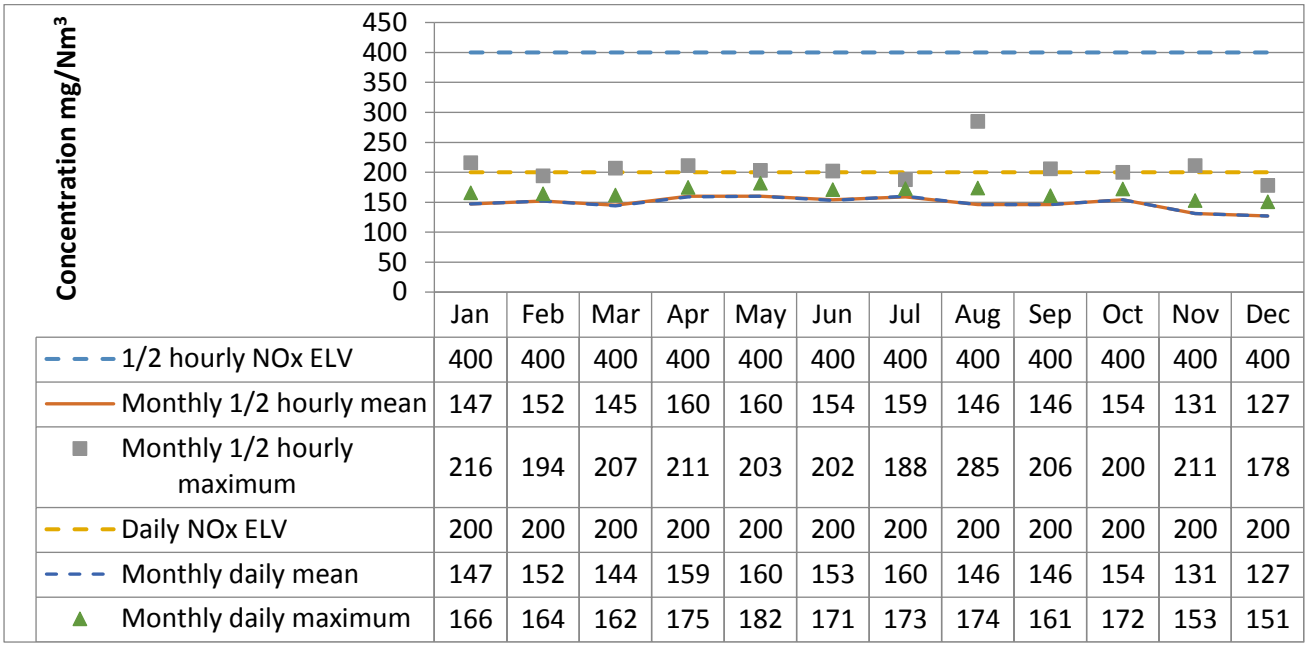
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1/2 hourly HCl ELV	60	60	60	60	60	60	60	60	60	60	60	60
Monthly 1/2 hourly mean	4.6	4	5.4	8.1	8.5	8.5	7.5	7.9	8.1	7.1	5.1	6.5
Monthly 1/2 hourly maximum	13.4	13.7	23.6	25.6	30.3	35.2	28.4	20.1	36.6	18.2	29.9	20
Daily HCl ELV	10	10	10	10	10	10	10	10	10	10	10	10
Monthly daily mean	4.6	4	5.5	8.2	8.6	8.4	7.5	8	8.2	7.1	5.1	6.5
Monthly daily maximum	6.4	6.2	8.7	9.4	9.2	9.5	8.9	9.7	9.2	8.4	7.7	7.6

Line 2 SO2



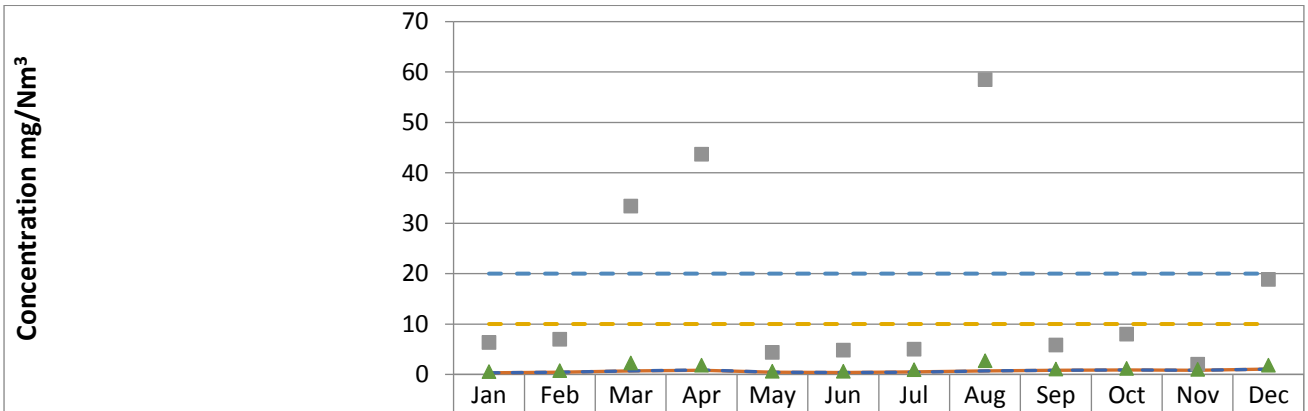
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1/2 hourly SO2 ELV	200	200	200	200	200	200	200	200	200	200	200	200
Monthly 1/2 hourly mean	1.3	1.1	1.7	1.9	1.8	2.3	7.4	2.3	2.1	2.3	0.8	0.5
Monthly 1/2 hourly maximum	8.8	20.1	8.5	13.4	17.1	9.3	2106.4	12.3	12.4	13.8	4.7	19.5
Daily SO2 ELV	50	50	50	50	50	50	50	50	50	50	50	50
Monthly daily mean	1.3	1.1	1.8	1.9	1.8	2.3	2.1	2.3	2.1	2.3	0.8	0.5
Monthly daily maximum	1.8	1.5	2.3	2.6	2.2	2.9	2.3	3.2	3	3.8	2.4	1.1

Line 2 NOx



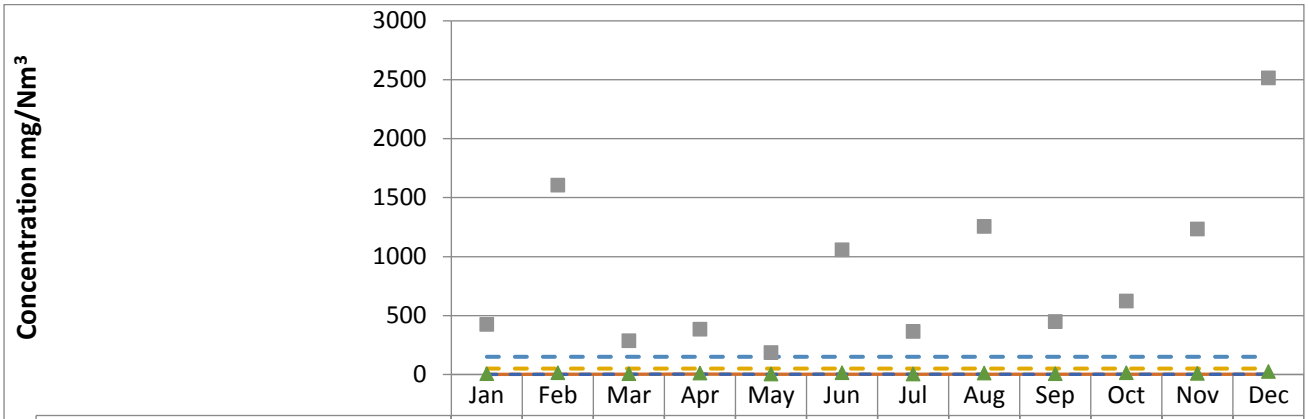
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1/2 hourly NOx ELV	400	400	400	400	400	400	400	400	400	400	400	400
Monthly 1/2 hourly mean	147	152	145	160	160	154	159	146	146	154	131	127
Monthly 1/2 hourly maximum	216	194	207	211	203	202	188	285	206	200	211	178
Daily NOx ELV	200	200	200	200	200	200	200	200	200	200	200	200
Monthly daily mean	147	152	144	159	160	153	160	146	146	154	131	127
Monthly daily maximum	166	164	162	175	182	171	173	174	161	172	153	151

Line 2 TOC



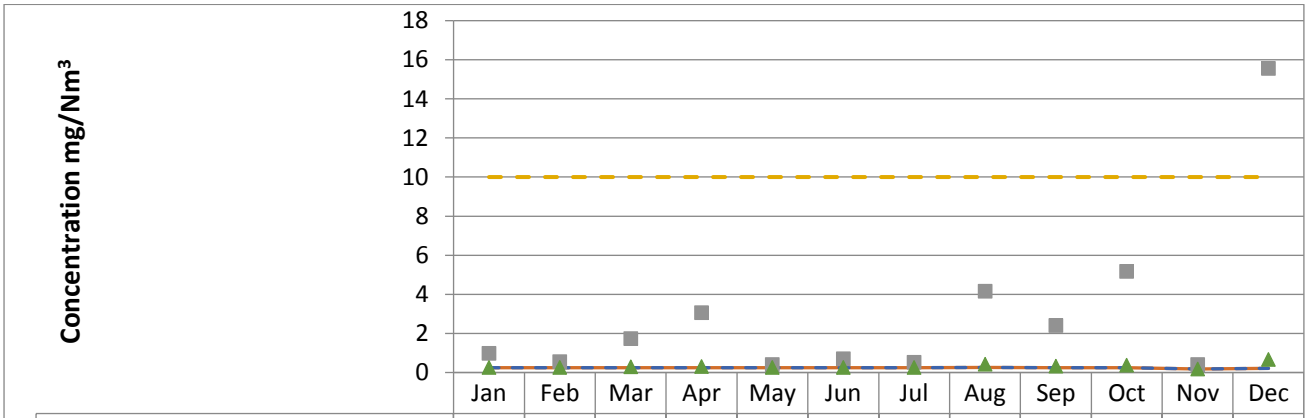
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1/2 hourly TOC ELV	20	20	20	20	20	20	20	20	20	20	20	20
Monthly 1/2 hourly mean	0.32	0.46	0.68	0.85	0.42	0.38	0.48	0.71	0.85	0.89	0.81	1.06
Monthly 1/2 hourly maximum	6.37	6.96	33.42	43.72	4.4	4.85	5.03	58.49	5.86	8.03	2.04	18.88
Daily TOC ELV	10	10	10	10	10	10	10	10	10	10	10	10
Monthly daily mean	0.32	0.45	0.67	0.87	0.41	0.39	0.46	0.7	0.85	0.89	0.81	1.04
Monthly daily maximum	0.55	0.79	2.29	1.84	0.6	0.65	0.95	2.74	1.1	1.19	1.03	1.83

Line 2 CO



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
10 minute CO ELV (95%)	150	150	150	150	150	150	150	150	150	150	150	150
Monthly 95% 10 minute maximum												
Monthly 10 minute mean	0.58	1.31	1.9	3.33	0.92	3.01	2.86	1.88	1.41	1.84	1.82	3.32
Monthly 10 minute maximum	426	1608	288	386	186	1058	367	1256	450	623	1234	2518
Daily CO ELV	50	50	50	50	50	50	50	50	50	50	50	50
Monthly daily mean	1	1	2	3	1	3	2	2	1	2	1	3
Monthly daily maximum	7	15	7	12	5	16	4	12	8	15	11	26

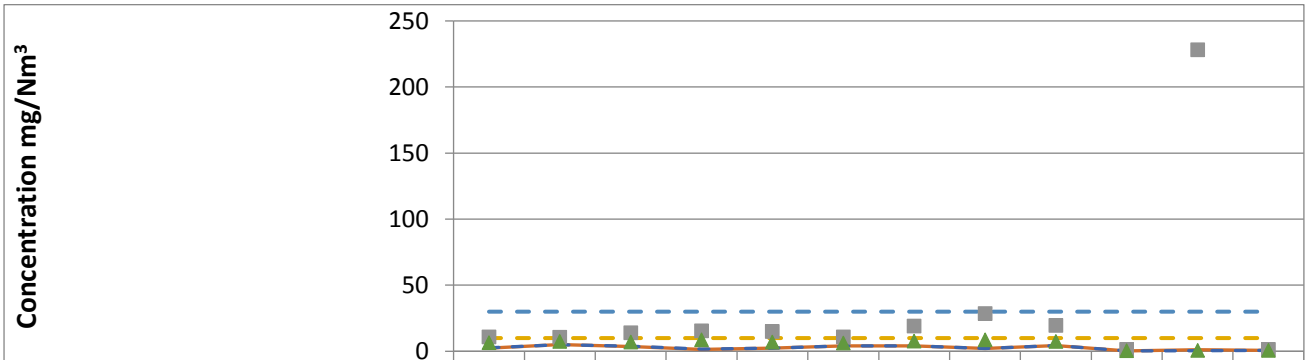
Line 2 NH3



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1/2 hourly NH3 ELV												
Monthly 1/2 hourly mean	0.24	0.24	0.24	0.25	0.24	0.24	0.25	0.26	0.25	0.25	0.18	0.21
Monthly 1/2 hourly maximum	0.99	0.55	1.74	3.06	0.41	0.71	0.52	4.16	2.4	5.17	0.41	15.56
Daily NH3 ELV	10	10	10	10	10	10	10	10	10	10	10	10
Monthly daily mean	0.24	0.24	0.24	0.25	0.25	0.24	0.25	0.26	0.25	0.25	0.18	0.21
Monthly daily maximum	0.26	0.26	0.29	0.31	0.26	0.27	0.26	0.43	0.33	0.38	0.18	0.67

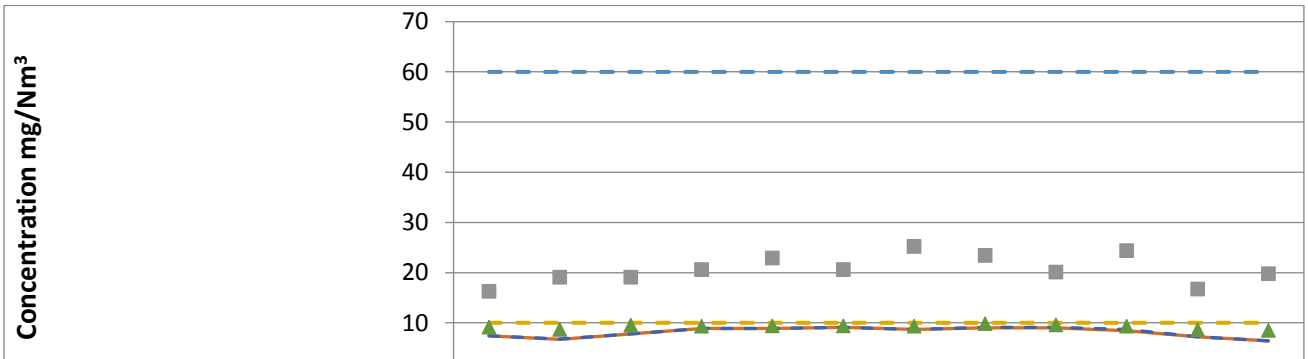
LINE 3

Line 3 Particulates



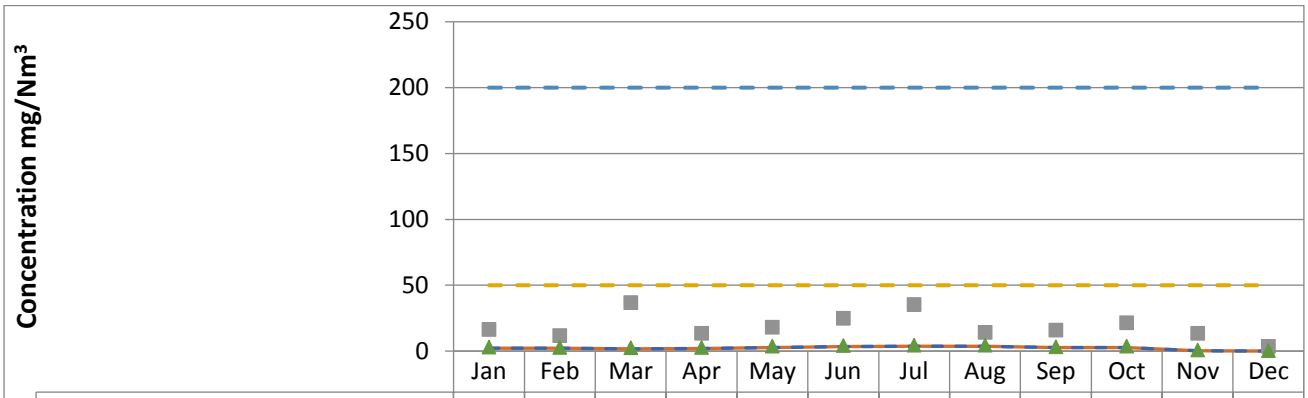
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1/2 hourly PM ELV	30	30	30	30	30	30	30	30	30	30	30	30
Monthly 1/2 hourly mean	2.5	5.1	3.6	1.5	2.5	4.2	4.2	2.1	4.4	0.3	1.1	0.6
Monthly 1/2 hourly maximum	10.8	10.7	14.1	15.5	15.1	10.9	19	28.5	19.7	1.5	228.2	1.5
Daily PM ELV	10	10	10	10	10	10	10	10	10	10	10	10
Monthly daily mean	2.6	5	3.8	1.6	2.5	4.1	4.2	2.2	4.3	0.3	0.5	0.6
Monthly daily maximum	6.5	7.4	7.1	8.6	6.9	6.2	7.7	8.7	7.4	0.4	0.6	0.7

Line 3 HCL



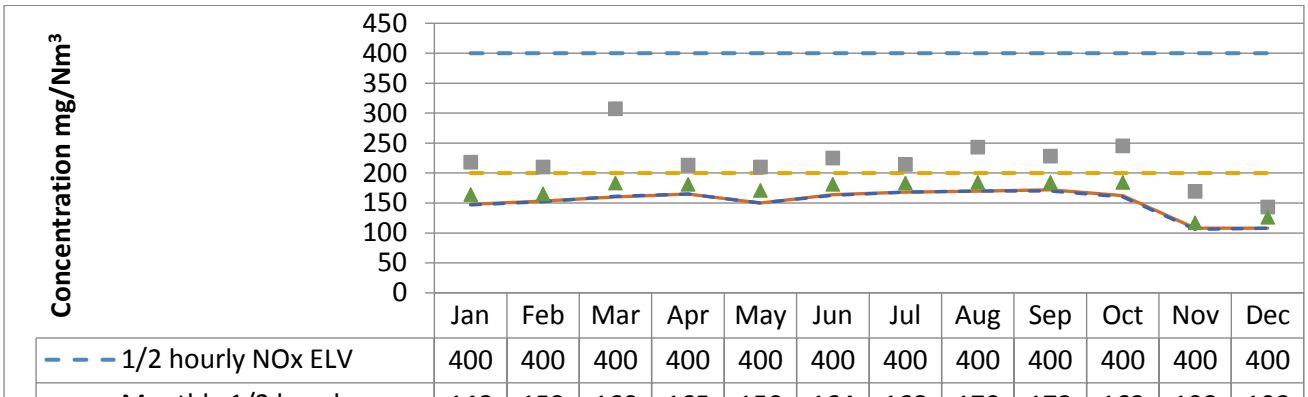
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1/2 hourly HCl ELV	60	60	60	60	60	60	60	60	60	60	60	60
Monthly 1/2 hourly mean	7.4	6.7	7.8	8.9	8.9	9.1	8.7	9	9	8.4	7.2	6.4
Monthly 1/2 hourly maximum	16.3	19.1	19.1	20.6	22.9	20.6	25.2	23.4	20.1	24.4	16.7	19.8
Daily HCl ELV	10	10	10	10	10	10	10	10	10	10	10	10
Monthly daily mean	7.4	6.8	7.8	8.9	8.9	9.1	8.7	9.1	9.1	8.7	7.2	6.4
Monthly daily maximum	9.1	8.7	9.5	9.3	9.4	9.4	9.3	9.8	9.6	9.3	8.6	8.5

Line 3 SO2



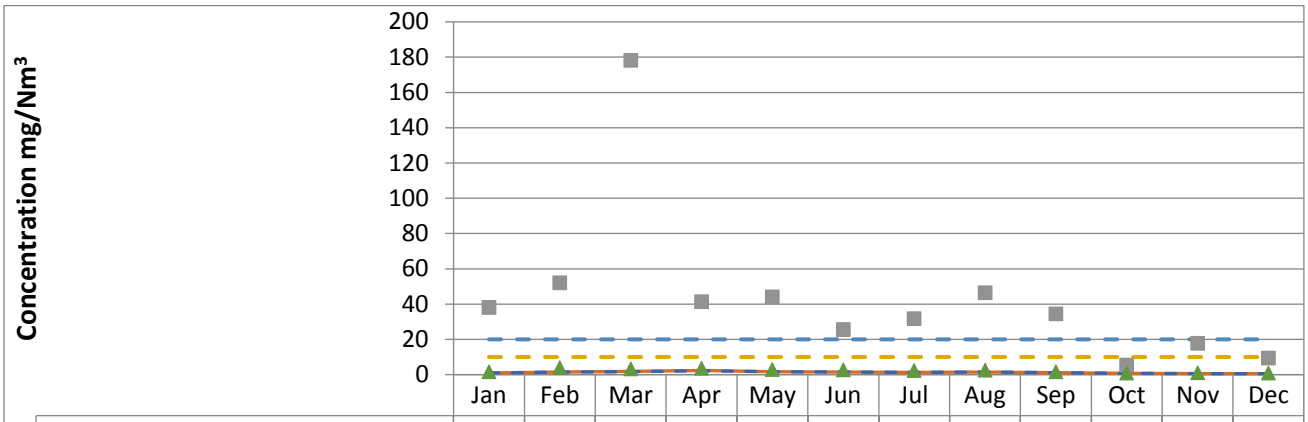
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1/2 hourly SO2 ELV	200	200	200	200	200	200	200	200	200	200	200	200
Monthly 1/2 hourly mean	2.1	2.2	1.7	1.9	2.6	3.3	3.7	3.6	2.6	2.8	0.2	0
Monthly 1/2 hourly maximum	16.3	11.7	36.7	13.3	18	24.8	35.3	14.1	15.9	21.3	13.4	3.4
Daily SO2 ELV	50	50	50	50	50	50	50	50	50	50	50	50
Monthly daily mean	2.1	2.2	1.6	1.9	2.6	3.3	3.7	3.6	2.6	2.8	0.2	0
Monthly daily maximum	3	2.6	2.5	2.8	3.7	4.2	4.5	4.4	3.2	3.7	0.7	0.2

Line 3 NOx



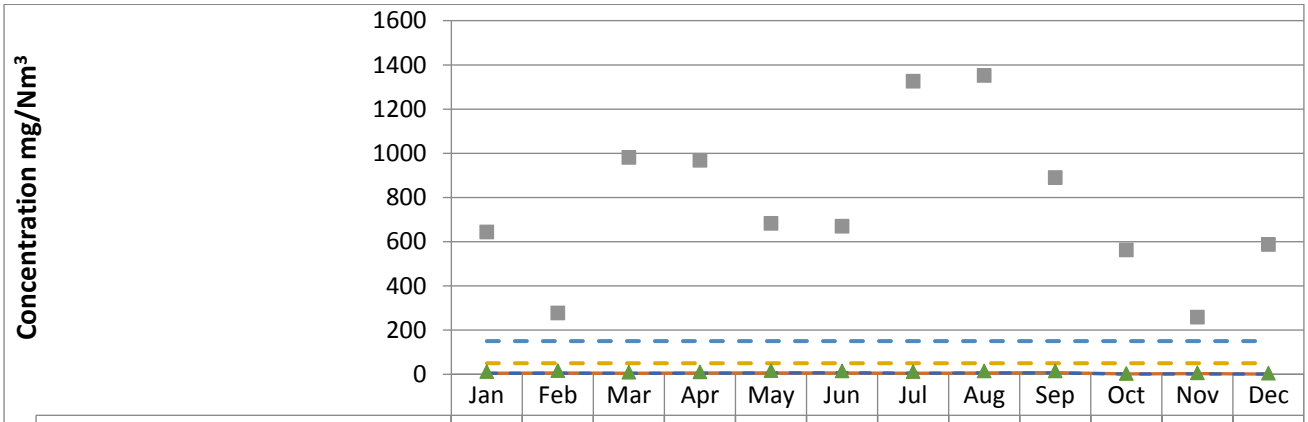
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1/2 hourly NOx ELV	400	400	400	400	400	400	400	400	400	400	400	400
Monthly 1/2 hourly mean	148	153	160	165	150	164	168	170	172	162	108	108
Monthly 1/2 hourly maximum	218	210	307	213	210	225	214	243	228	245	169	143
Daily NOx ELV	200	200	200	200	200	200	200	200	200	200	200	200
Monthly daily mean	147	152	161	165	150	163	168	170	170	160	106	108
Monthly daily maximum	164	165	183	181	171	181	183	184	184	184	117	126

Line 3 TOC



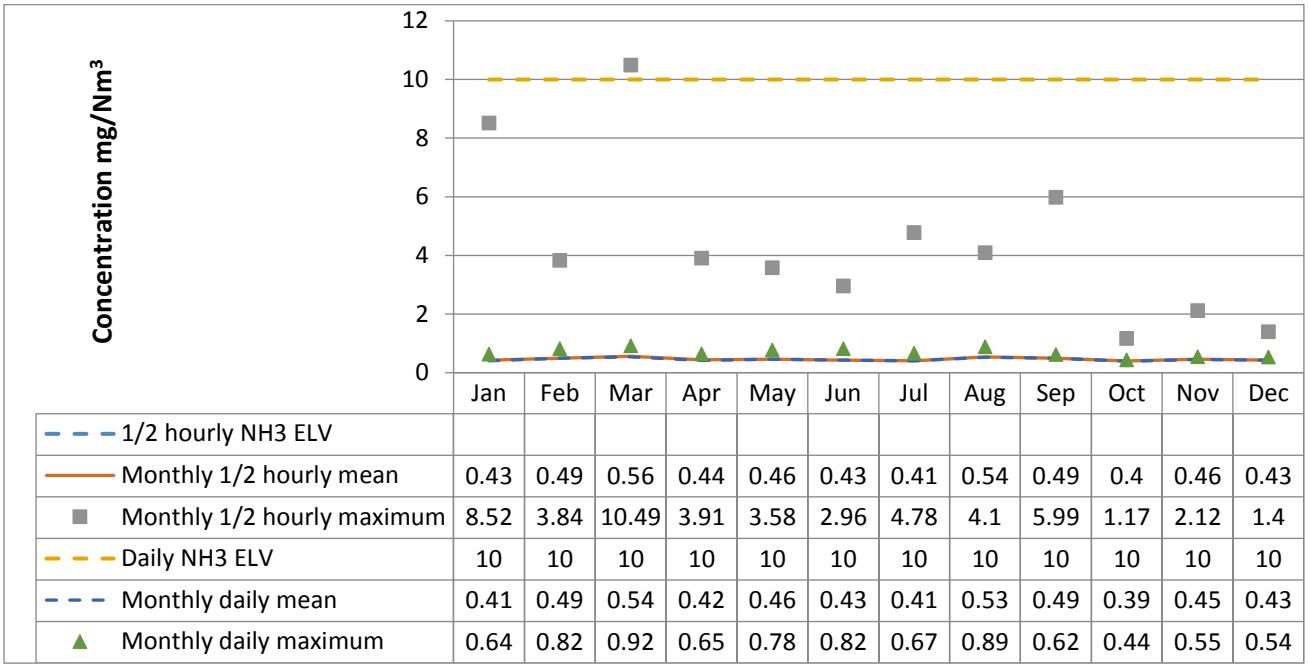
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1/2 hourly TOC ELV	20	20	20	20	20	20	20	20	20	20	20	20
Monthly 1/2 hourly mean	0.99	1.48	1.87	2.36	1.63	1.5	1.31	1.54	1.12	0.76	0.61	0.54
Monthly 1/2 hourly maximum	38.21	52.06	178.31	41.43	44.07	25.7	31.87	46.54	34.59	5.42	17.74	9.43
Daily TOC ELV	10	10	10	10	10	10	10	10	10	10	10	10
Monthly daily mean	0.91	1.48	1.71	2.2	1.63	1.51	1.3	1.48	1.09	0.7	0.56	0.53
Monthly daily maximum	1.62	4.01	3.25	3.7	2.97	2.78	2.33	2.65	1.58	1.01	1.19	0.9

Line 3 CO



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
10 minute CO ELV (95%)	150	150	150	150	150	150	150	150	150	150	150	150
Monthly 95% 10 minute maximum												
Monthly 10 minute mean	4.87	5.32	4.87	5.99	5.96	6.52	4.06	6.49	7.34	2.19	2.38	0.78
Monthly 10 minute maximum	643	277	980	968	682	669	1326	1352	890	562	258	586
Daily CO ELV	50	50	50	50	50	50	50	50	50	50	50	50
Monthly daily mean	5	5	4	5	6	7	4	6	6	1	2	1
Monthly daily maximum	11	16	9	10	16	15	12	14	15	3	6	5

Line 3 NH3



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1/2 hourly NH3 ELV												
Monthly 1/2 hourly mean	0.43	0.49	0.56	0.44	0.46	0.43	0.41	0.54	0.49	0.4	0.46	0.43
Monthly 1/2 hourly maximum	8.52	3.84	10.49	3.91	3.58	2.96	4.78	4.1	5.99	1.17	2.12	1.4
Daily NH3 ELV	10	10	10	10	10	10	10	10	10	10	10	10
Monthly daily mean	0.41	0.49	0.54	0.42	0.46	0.43	0.41	0.53	0.49	0.39	0.45	0.43
Monthly daily maximum	0.64	0.82	0.92	0.65	0.78	0.82	0.67	0.89	0.62	0.44	0.55	0.54

4.2 Summary of periodic monitoring results for emissions to air

The table below shows the results of periodically monitored substances.

Substance	Emission limit value	Results Line 1	
		January to June 2018	July to December 2018
Mercury and its compounds	0.05 mg/m^3	<0.00083 mg/m^3	0.001 mg/m^3
Cadmium & thallium and their compounds (total)	0.05 mg/m^3	<0.0016 mg/m^3	0.002 mg/m^3
Sb, As, Pb, Cr, Co, Cu, Mn, Ni and V and their compounds (total)	0.5 mg/m^3	0.18 mg/m^3	0.240 mg/m^3
Dioxins and furans (I-TEQ)	0.1 ng/m^3	0.0091 ng/m^3	0.0070 ng/m^3
Hydrogen Fluoride	1 mg/m^3	0.14 mg/m^3	<0.04 mg/m^3

Substance	Emission limit value	Results Line 2	
		January to June 2018	July to December 2018
Mercury and its compounds	0.05 mg/m^3	<0.00066 mg/m^3	0.001 mg/m^3
Cadmium & thallium and their compounds (total)	0.05 mg/m^3	<0.0011 mg/m^3	0.001 mg/m^3
Sb, As, Pb, Cr, Co, Cu, Mn, Ni and V and their compounds (total)	0.5 mg/m^3	0.095 mg/m^3	0.169 mg/m^3
Dioxins and furans (I-TEQ)	0.1 ng/m^3	0.0075 ng/m^3	0.0129 ng/m^3
Hydrogen Fluoride	1 mg/m^3	<0.040 mg/m^3	<0.04 mg/m^3

Substance	Emission limit value	Results Line 3	
		January to June 2018	July to December 2018
Mercury and its compounds	0.05 mg/m^3	0.0017 mg/m^3	0.001 mg/m^3
Cadmium & thallium and their compounds (total)	0.05 mg/m^3	0.0011 mg/m^3	<0.001 mg/m^3
Sb, As, Pb, Cr, Co, Cu, Mn, Ni and V and their compounds (total)	0.5 mg/m^3	0.018 mg/m^3	0.034 mg/m^3
Dioxins and furans (I-TEQ)	0.1 ng/m^3	0.015 ng/m^3	0.0082 ng/m^3
Hydrogen Fluoride	1 mg/m^3	<0.038 mg/m^3	<0.04 mg/m^3

4.3 Summary of monitoring results for emissions to water

There are no emissions to water from the process

5. Summary of Permit Compliance

5.1 Compliance with permit limits for continuously monitored pollutants

The plant met its emission limits as shown in the table below.

Substance	Percentage time compliant during operation	
	Half-hourly limit	**Daily limit**
Particulates	99.996 %	100 %
Oxides of nitrogen	100 %	100%
Sulphur dioxide	100 %	100 %
Carbon monoxide	100 % 95% of 10-min averages (delete as appropriate)	100 %
Total organic carbon	100 %	100 %
Hydrogen chloride	100 %	100 %
Hydrogen fluoride	100 %	100 %

5.2 Summary of any notifications or non-compliances under the permit

Date	Summary of notification or non-compliance	Reason	Measures taken to prevent reoccurrence
15/02/2018	**Schedule 1:** Furnace Pressure Relief Valve operated for one second between 14:52:42 and 14:52:43	A sudden increase in pressure did occur but there is reasonable concern that there was a failure of the PRV proximity switch and/or the pressure measuring devices.	Actions taken:- 1. Doubled the sampling rate of the furnace pressure data to provide improved data going forward. 2. Replaced key components, namely the proximity switch and the pressure gauges at the next opportunity
09/07/2018	**Abnormal Operation:** SO2 half hour	The moisture level recorded at the stack during this event caused a significant disturbance of the SO2 CEMS analyser that became unreliable and gave a falsely high reading.	Our aspiration is to alter the definition or shutdown / effective operating time so these periods of transition are not included in the effective operating period as we are clearly not operating normally.

03/08/2018	**Schedule 1:** The Furnace Pressure Relief Valve Operated on three occasions. 07.02 for 1 second 07.15 for 1 second 07.22 for 2 seconds	Pressure relief valve is opening below design pressure. Design pressure = 40 mbar	These events occurred below 20 mbar and work shall be required during the forthcoming outage in October to test the exiting hatch
08/08/2018	**Schedule 1:** Furnace Pressure Relief Valve operated for 2 seconds	Pressure relief valve is opening below design pressure. Design pressure = 40 mbar	These events occurred below 20 mbar and work shall be required during the forthcoming outage in October to test the exiting hatch
10/11/2018	**Abnormal Operation:** Dust half hour	Filter bag failure	Filter bag replaced immediately
11/11/2018	**Abnormal Operation:** Dust half hour	Filter bag failure	Filter bag replaced immediately
13/11/2018	**Schedule 1:** Dust half hour	Filter bag failure	All Filter bags replaced immediately
18/11/2018	**Schedule 1:** Dust half hour	Filter bag failure	Filter bag replaced immediately. Air blower system refitted.
13/12/2018	**Schedule 1:** Shredder Fire	High probability of lithium batteries in waste	No emission released – shredder shut down for repair.

5.3 Summary of any complaints received and actions to taken to resolve them.

Date of complaint	Summary of complaint	Reason for complaint including whether substantiated by the operator or the EA	If substantiated, measures to prevent reoccurrence
27/01/2018	Odour	Not Substantiated	N/A
19/04/2018	Noise	Substantiated	Identified an open condensate trap bypass which was then closed.
10/05/2018	Odour	Substantiated	See below
30/05/2018	Flies	Not Substantiated	N/A
18/06/2018	Odour	Substantiated	See below
19/06/2018	Odour	Substantiated	See below
29/06/2018	Noise	Not Substantiated	N/A
17/07/2018	Odour	Substantiated	Note: The facility substantiates the odour when the wind direction is towards the complainant. The facility is currently engaged in substantial integrity testing of the buildings that hold waste and are undertaking significant repairs and replacement of roof louvers.
31/07/2018	Odour	Substantiated	
08/08/2018	Odour	Substantiated	
14/08/2018	Odour	Substantiated	
24/08/2018	Odour	Substantiated	
01/10/2018	Odour	Substantiated	
14/10/2018	Odour	Substantiated	
19/10/2018	Odour	Substantiated	
27/10/2018	Odour	Substantiated	

6. Summary of plant improvements

Summary of any permit improvement conditions that have been completed within the year and the resulting environmental benefits.
None (all permit improvement conditions complete)
Summary of any changes to the plant or operating techniques which required a variation to the permit and a summary of the resulting environmental impact.
None (no permit variations approved)
Summary of any other improvements made to the plant or planned to be made and a summary of the resulting environmental benefits.

1. Boiler: A new design of Superheater 3 was installed with the aim of reducing the likelihood of boiler tube leaks.

Resulting Environmental Benefit:-
Tube leaks create increased emissions for a short period of time. A reduction of the number of tube leaks will reduce emissions to air.

2. Circoclean: Line 3 had a new lance system installed with the aim of reducing the likelihood of Circoclean blockages and reducing the number of times that the lance has to be changed. The former aim will take a little while longer to judge if it's successful, but the latter has so far been successful. We now change the lance 3 times less frequently than previously.

Resulting Environmental Benefit:-
The facility has not exceeded its permitted limits for HCL but Circoclean lance changes increase the amount of HCL released over a short period of time. This improvement will result in reduced HCL emissions.

3. Filter bags: New design of bags installed – extra reinforcements where majority of failures occur. This will reduce the number of failures.

Resulting Environmental Benefit:-
Bag failures increase emissions of dust and these filter bags will significantly reduce this.

4. Rowitec: Pressure relief valve on Line 3 checked and modified so that it will not lift prematurely. Line 2 and Line 1 to complete next year.

Resulting Environmental Benefit:-
Pressure relief valve lifting allows unabated emissions to be released. These modifications will prevent this occurring.

5. Fuel use: Burner cut in value reduced by 5 degrees, considerable fuel savings resultant

Resulting Environmental Benefit:-
A reduction of fossil fuel usage has significant environmental impact and reduces energy use.

6. **Details of any public liaison planned for 2019**:

Date and time	Description	Location
26th February 2019	Community Liaison Meeting	FCC Allington, Laverstoke Road
June 2019	Community Liaison Meeting	FCC Allington, Laverstoke Road
October 2019	Community Liaison Meeting	FCC Allington, Laverstoke Road

The Facility has an active liaison group involving representatives from the following stakeholders:

- Environment Agency
- 10 Local Residents
- Councillors Walker and Hammond (TMBC members)
- Councillors Robertson, Harwood and Daley (MBC members). Cllr Daley is also a member of KCC.
- Councillors Homewood and Bird (KCC members)
- Maidstone Borough Council Environmental Health, Wilcock
- Councillors Walker and Balcombe (Aylesford Parish Council)
- Tonbridge & Malling & Maidstone Borough Council Environmental Health
- Kent County Council Waste Management
- Kent Enviropower

The liaison group currently meets approx every 16 weeks. For further information please contact:

- Brian White (Chairman) - Email: drbdwhite@yahoo.co.uk

Reporting of Waste Disposal and Recovery for the year 2018

Permit Reference Number: BR4551 Operator: Kent Enviropower Ltd

Reporting of Water Usage for the year 2018

Waste Description	Disposal Route	Tonnes	Recovery Tonnes
1) Hazardous Wastes			
APC residues	Recycle Landfill	7,405.48 40,745.54	7,405.48
Other haz wastes (bottom ash)	Landfill	0	0
Total hazardous waste		48,151.02	0
2) Non-Hazardous Wastes			
Bottom Ash	Recycle	51,916.12	51,916.12
Dirty Ferrous	Recycle Landfill	14,703.40 0	14,703.40
MRF Materials	Transfer	16,413.38	16,413.38
Other non-haz wastes (food waste)	Transfer	4,843.78	4,843.78
Reject MSW to landfill	Transfer	18.98	
Bypass MSW to landfill	Transfer	0	
Linings & refractory to landfill	Transfer	76.62	
Mixed Metal	Transfer	163.52	
Total non-hazardous waste		88,135.80	
TOTAL WASTE		136,286.82	95,282.16

Trends in Waste Disposal and Recovery Year	Parameter		
	Named Waste	Total Waste	Waste per unit output
Total Haz 2006	APC Residue	6939	
Total Haz 2007	APC Residue	23184	
Total Haz 2008	APC Residue	15619	
Total Haz 2009	APC Residue	41303	
Total Haz 2010	APC Residue	34301	
Total Haz 2011	APC Residue	40848	
Total Haz 2012	APC Residue	40,741	
Total Haz 2013	APC Residue & IBA	59,855	
Total Haz 2014	APC Residue	48,989	
Total Haz 2015	APC Residue	51,740	
Total Haz 2016	APC Residue	51,933	
Total Haz 2017	APC Residue	46,355	
Total Haz 2018	APC Residue	48,151	
Total Non Haz 2006	Bottom Ash & MRF	20365	
Total Non Haz 2007	Bottom Ash & MRF	39487	
Total Non Haz 2008	Bottom Ash & MRF	34127	
Total Non Haz 2009	Bottom Ash & MRF	64560	
Total Non Haz 2010	Bottom Ash & MRF	67092	
Total Non Haz 2011	Bottom Ash & MRF	73083	
Total Non Haz 2012	Bottom Ash & MRF	85,550	
Total Non Haz 2013	Bottom Ash & MRF	62,288	
Total Non Haz 2014	Bottom Ash & MRF	89,819	
Total Non Haz 2015	Bottom Ash & MRF	92,132	
Total Non Haz 2016	Bottom Ash & MRF	92,794	
Total Non Haz 2017	Bottom Ash & MRF	85,999	
Total Non Haz 2018	Bottom Ash & MRF	88,135	

Permit Reference Number: BR4551 Operator: Kent Enviropower Ltd

Installation: Allington Quarry Form Number: Agency Form / BR4551 / WU1 / Form Dated 12 January 2006.

Water Source	Usage (m^3)	Specific Usage (m^3/t)
Mains water	138,225	N/A
Site borehole	N/A	N/A
River abstraction	N/A	N/A
TOTAL WATER USAGE	138,225	

Trends in Water Usage			
Year	Parameter		
	Named Water source	Total Water usage	Water per unit output
2011	Mains	116,563	
2012	Mains	158,806	
2013	Mains	224,751	
2014	Mains	142,568	
2015	Mains	164,472	
2016	Mains	156,225	
2017	Mains	135,204	
2018	Mains	138,225	

Operator's comments :

Reporting of Energy Usage for the year 2018

Permit Reference Number: BR4551 Operator: Kent Enviropower Ltd

Installation: Allington Quarry Form Number: Agency Form / BR4551 / E1 / Form Dated 12 January 2006.

Energy Source	Energy Usage Quantity	Primary Energy (MWh)	CO_2 Produced (tonnes)
Electricity	MWh	1,839	753.2
Gas/Fuel Oil	tonnes	12,355	3,308
Recovered Fuel Oil	tonnes	N/A	N/A

Trends in Energy Usage Year	Parameter Primary Energy usage	CO_2 produced	CO_2 per unit output
2011	81,575	26,604	
2012	39,833	11,728	
2013	46,360	12,599	
2014	49,225	14,451	
2015	23,179	6,363	
2016	20,183	5,835	
2017	19,576	5,308	
2018	14,194	4,061	

Operator's comments :

CO2 based on Carbon Trust conversion of 0.40957 KgCO2/Kwh for Electricity and 0.26782 KgCO2/Kwh for gas/fuel oil
Gas/Fuel oil conversion from Ltrs used (1,200,390) to tonnes based on density 885 Kg/m3
www.thecalculatorsite.com/conversions/common/liters-to-metric-tons.php & then converted from tonnes to MWh DEFRA Carbon Factors

Reporting of Performance Indicators for the period Jan 2018 to Dec 2018

Permit Reference Number: BR4551 Operator: Kent Enviropower Ltd

Installation: Allington Quarry Form Number: Agency Form / BR4551 / PI1 / Form Dated 12 January 2006.

Annual Production/Treatment		
Total waste incinerated	**492,249**	Tonnes

Environmental Performance Indicators

Parameter	Quarterly Average	Units
Supplementary Fuel Oil	300,097.5	litres
Mass of bottom ash produced	12,979	Tonnes
Mass of boiler, FGT & ESP Ash.	12,037	Tonnes
Mass of other solid residues	0	Tonnes
Mass of carbon used	69.8	Tonnes
Mass of lime used	895.7	Tonnes
Mass of urea used	1.8	Tonnes
Potable Water Use	34,556	M3
Waste Hazard Score	N/A	
Waste Disposal Score	N/A	

Trends in Environmental Performance		
Year	Parameter	

Operator's comments :

Permit Number : BR4551IC

Operator : Kent Enviropower Ltd

Facility : Allington

Form Number : performance 1 / 30/01/2019

Reporting of other performance indicators for the period: January to December 2018

Parameter	Result
Operating hours for the year	22,153.61 hours
Number of periods of abnormal operation	3
Cumulative hours of abnormal operation for this calendar year	1.5 hours

Operator's comments :
The 2017 operating hours were 21,173 hours.

Signed …….. Date: 30th January 2018

(authorised to sign as representative of Kent Enviropower)

	Prepared by	**Approved by**
	Name Trevor Ellis	Name Paul Newton
Date: 31st January 2019	Signature	Signature