

Table 1 - Emission Breaches Summary 2006 to present

Date	Parameter	Dates/ details of breaches and outcome
January 2006	Heavy metals (Antimony, arsenic, lead, chromium, cobalt, copper, manganese, nickel and vanadium and their compounds)	Boiler 1. Breach of heavy metals emission limit of 0.5 mg/m <sup>3</sup> during check monitoring on behalf of SEPA. Higher of two sample runs exceeded emission limit at 0.77 mg/m <sup>3</sup> although average was within emission limit. Emissions of cadmium and thallium (combined emission limit of 0.05 mg/m <sup>3</sup> ) and mercury (emission limit 0.05 mg/m <sup>3</sup> ) taken at the same time were satisfactory, i.e. within limits.
June 2006	Total dust (particulates), Dioxins and furans	Boiler 1 (identified during periodic monitoring). Dioxins/furans which have a particularly stringent emission limit of 0.1 ng/m <sup>3</sup> , tend to adhere to particulate matter. An increase in emissions of Total dust would therefore tend to lead to an increase in emissions dioxins/furans. Results from re-test in July 2006 were satisfactory.
October 2006	Dioxin/furan emissions at level of emission limit value (ELV), possible heavy metals breach	Boiler 1 (identified during periodic monitoring). Dioxin/furan present at/around the ELV, not reported as a breach. Cannot confirm whether heavy metals exceeded emission limit due high limit of detection (above value of ELV).
March 2007	Dioxin/furan emission at level of emission limit value (ELV), possible heavy metals breach (6/03/07)	Boiler 2 (identified during periodic monitoring). Dioxin/furan present at the ELV, not reported as a breach.
March 2007	Hydrogen chloride breach (18/03/07)	Boiler 2 (identified from continuous monitoring on 18/03/07). Problems indicated that lime coating on the bag filters was insufficient. Manual lime dosing was therefore instigated but a breach occurred after which the boiler was shut down until the problem was rectified.
March and November 2007	Total dust (particulates), Dioxins and furans, Heavy metals (Antimony, arsenic, lead, chromium, cobalt, copper, manganese, nickel and vanadium and their compounds)	Boiler 1 (Identified during periodic monitoring and check monitoring on behalf of SEPA). Because heavy metals and dioxins/furans both adhere to particulate, higher emissions of these parameters in conjunction with Total Dust was indicative of problems with the dust removal equipment on Boiler 1 bag filter. DERL believed the problem was due to damage to dust bag filtration units (known as bag filters) caused by high temperature gases and moisture arising from an increase in boiler tube leaks. DERL proposed to undertake major upgrades to both boilers during the May-June 2008 to reduce the number of tube leaks. In the meantime, DERL accelerated a replacement programme for the faulty bags. Re-monitoring by contractors on behalf of DERL in early March 2008 confirmed compliance with all limits - this confirmed the success of the replacement of the bag filters.

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		<p>Other outcomes included:  DERL were asked to investigate why the continuous emission monitor (CEM) for particulates had not identified high particulate reading which could have permitted more rapid identification of the problem. A new procedure was implemented requiring additional cleaning of the optical lens on this equipment during boiler tube leaks as no equipment faults were identified. DERL and SEPA requested faster reporting from their respective monitoring contractors as reporting delays had prolonged the period before the requirement for action was identified.</p>
September 2007	Odour	<p>Odour from odour abatement plant measured at 9,911 European Odour Units (OU<sub>E</sub>)/m<sup>3</sup> compared to the emission limit of 6,000 OU<sub>E</sub>/m<sup>3</sup>. This indicated a problem with the filter media (activated carbon). DERL carried out some remedial work to prevent short-circuiting of odorous air. This may have resulted in an odour complaint in September 2007. Re-testing in November 2007 following the remedial work confirmed compliance with the emission limit and a significant reduction in emissions to 900 OU<sub>E</sub>/m<sup>3</sup>.</p>
Late March 2008 to August 2008	Dioxins and furans, Heavy metals (Antimony, arsenic, lead, chromium, cobalt, copper, manganese, nickel and vanadium and their compounds)	<p>Boiler 1. Repeat check monitoring carried out in March 2009 as a formal monitoring exercise under Section 108 of the Environment Act 1995 following the breaches referred to above. Whilst this confirmed that Total dust emissions remained in compliance:</p> <ul style="list-style-type: none"> <li>- One of the two heavy metals results exceeded the emission limit although the average of the two was in compliance (reported 18/04/08);</li> <li>- The dioxin/furans result (reported 29/05/08 due to a problem on the analytical equipment used for the dioxins analysis) confirmed a further breach on dioxins and furans (0.31 ng/m<sup>3</sup> compared to the emission limit of 0.1 ng/m<sup>3</sup>).</li> </ul> <p>DERL were therefore required to carry out further investigation whilst SEPA considered formal enforcement action - Enforcement Notice Ref. EN01 was subsequently issued on 2/07/08.</p> <p>EN01 required DERL to take the necessary steps to rectify the situation and to undertake frequent additional testing for dioxins and furans until compliance with the ELV could be demonstrated. During this process DERL stopped operating Boiler 1 following an elevated dioxin/furan result from 26-30/06/08 (10.2 ng/m<sup>3</sup> compared to the emission limit of 0.1 ng/m<sup>3</sup>). Boiler 1 was subsequently only operated to allow monitoring until the Enforcement Notice was complied with.</p> <p>DERL also increased the rate of dosing of activated carbon upstream of the bag filters to optimise the removal rate of dioxins/furans and heavy metals in the exhaust gas, and carried out extensive cleaning to remove dust entrained in the boiler which is a potential</p>

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		<p>source of dioxins/furans. Soil sampling for dioxins and furans in the vicinity of the DERL site was undertaken by SEPA. Whilst this found levels of dioxins/furans to be higher downwind of DERL, all levels were still within those expected in urban environments. Due to the persistent nature of dioxins/furans these could also be a legacy of the original Baldovie incinerator.</p> <p>The conditions of the Enforcement Notice were satisfied on 30 September 2008 following three sets of compliant results. DERL complied fully with the terms of the Enforcement Notice and were co-operative throughout.</p>
June 2009	Dioxin/ furan	<p>Boiler 2 periodic monitoring. Dioxin/furan result of 0.15 relative to emission limit of 0.1 ng/m<sup>3</sup> reported to SEPA on 13/07/09. Initially not identified as a clear breach of limit when measurement uncertainty (+/- 50%) is taken into account. However, following subsequent investigation, the monitoring contractors Scientifics identified an error in the original measurement uncertainty which reduced the uncertainty and confirmed the original value was a clear breach of the ELV. DERL therefore formally notified this as a breach on 20/08/09.</p> <p>No problems were recorded on the plant during monitoring. Therefore Boiler 2 was re-tested on 23 July 2009. The results from the re-test reported on 6/08/09 have confirmed a much lower dioxin/furan level, however these remain around the value of the ELV at 0.1048 ng/m<sup>3</sup>. Consequently DERL were asked to investigate optimising the abatement of dioxins/furans without delay. DERL have increased the activated carbon injection rate on the plant and are planning a detailed review of the activated carbon system to identify areas for improvement/upgrade as well as a trial to combine activated carbon dosing with the lime injection system. SEPA Check monitoring is planned for Boiler 2 in early September 2009 to confirm compliance with all emission limits.</p>
Intermittent exceedences since 2006	Carbon Monoxide	<p>Both boilers have had intermittent breaches of the hourly average emission limit of 100 mg/m<sup>3</sup> for carbon monoxide since the Permit was issued. 'Peaks' in carbon monoxide emissions are a particular feature associated with fluidised bed boilers which react rapidly to any variations in the fuel feed to the boilers and are particularly sensitive to start up and shut down of the boilers. Many of the breaches were 'technical breaches' arising from a Permit requirement to report an hourly average where the boiler may have been in operation on waste for only 10 minutes during the hour (start up and shutdown is carried out using gas oil). SEPA have recently varied the permit to remove the requirement for reporting under these circumstances. Some breaches may still occur due to the particular design of the plant and nature of operations. This will continue to be</p>

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		<p>investigated in the future with DERL alongside the possibility of upgrading the monitoring equipment for carbon monoxide to provide greater accuracy.</p> <p>Following issue of the recent variation to the PPC permit, a single carbon monoxide breach is reported to have occurred in Quarter 3 2009 to date on 3 July 2009 (102 mg/m<sup>3</sup> compared to the ELV of 100 mg/m<sup>3</sup>).</p> <p>The impacts of the carbon monoxide breaches has been assessed as insignificant to human health or the environment when compared to guidelines for safe levels of carbon monoxide in ambient air.</p>

