**C 3.4a Emissions Monitoring**

Environmental permit EPR/KP3733AN identifies monitoring requirements for point source emissions to air (table S3.1), and sewer (table S3.2). As described in Section C 3.2, Emissions to Air, Water and Land, the permit does not specify any monitoring requirements for point source emissions to air and sewer. There are no emissions direct to land, water or groundwater.

The changes which are the subject of this variation application have not removed or changed existing point source emission point locations and have not changed the composition or quantity of releases from those emission points with the exception of release point S3 linked to the sewer discharge point from the development site known as the “Aquarius Discharge”. As described in Section 3.2 of the permit variation application, the proposed development will introduce new point source emission points to air.

Emissions monitoring proposals for both the existing and the new point source emission points to air and to sewer are shown in the tables below.

**Emissions to Air**

|  |  |  |  |
| --- | --- | --- | --- |
| **Point source emission point** | **Substance(s) / parameter(s) to be monitored** | **Monitoring technique(s) / comments** | **Frequency** |
| **Existing Air Emission Points** |  |  |  |
| A3 | NOx, CO | Extractive sampling of exhaust gases from gas fired steam boiler vent stack. | Minimum annual performance test including emissions monitoring by specialist third party Contractor |
| A4 | NOx, CO | Extractive sampling of exhaust gases from gas fired steam boiler vent stack. | Minimum annual performance test including emissions monitoring by specialist third party Contractor |
| A5 | NOx, CO | Extractive sampling of exhaust gases from common exhaust flue from three hot water boilers. | Minimum annual performance test including emissions monitoring by specialist third party Contractor |
| A6.1 | NOx, CO | Extractive sampling of exhaust gases from gas fired flash roaster | Minimum annual performance test including emissions monitoring by specialist third party Contractor |
| A6.2 | NOx, CO | Extractive sampling of exhaust gases from gas fired oven line 1 | Minimum annual performance test including emissions monitoring by specialist third party Contractor |
| A6.3 | NOx, CO | Extractive sampling of exhaust gases from gas fired oven line 2 | Minimum annual performance test including emissions monitoring by specialist third party Contractor |
| **New Air Emission Points** |  |  |  |
| A7 New natural gas fired 3.6 MWh steam / hot water boiler | NOx, CO | Extractive sampling of exhaust gases from boiler vent stack (refer to C3.4b Air Emissions Sampling for details) | Minimum annual performance test including emissions monitoring by specialist third party Contractor |
| A8 New natural gas fired 2.9 MWh thermal oil heater. | NOx, CO | Extractive sampling of exhaust gases from thermal oil heater vent stack (refer to C3.4b Air Emissions Sampling for details) | Minimum annual performance test including emissions monitoring by specialist third party Contractor |
| A9 Continuous fryer vent extracted by roof mounted fan. | Unspecified | This emission point is the outlet from a continuous fryer extraction fan located in the process building roof structure and is not readily accessible to allow emissions monitoring at source. Potential for release of specified substances or odorous releases is very low. | Weekly olfactory monitoring conducted by site staff at designated monitoring locations (see section B3.3b).  Periodic odour monitoring by independent third-party Contractor conducted if and when necessary. |
| A10 Continuous fryer vent extracted by roof mounted fan. | Unspecified | As A9 | As A9 |
| A11 Continuous fryer vent extracted by roof mounted fan. | Unspecified | As A9 | As A9 |
| A12 Continuous fryer vent extracted by roof mounted fan. | Unspecified | As A9 | As A9 |
| A13 Continuous fryer vent extracted by roof mounted fan. | Unspecified | As A9 | As A9 |
| A14 Continuous fryer vent extracted by roof mounted fan. | Unspecified | As A9 | As A9 |
| A15 Oven vent extracted by roof mounted fan. | Unspecified | This emission point is the outlet from an oven extraction fan located in the process building roof structure and is not readily accessible to allow emissions monitoring at source. Potential for release of specified substances or odorous releases is very low. | Weekly olfactory monitoring conducted by site staff at designated monitoring locations (see section B3.3b).  Periodic odour monitoring by independent third - party Contractor conducted if and when necessary. |
| A16 Oven vent extracted by in duct mounted fan. | Unspecified | This emission point is the outlet from an in-duct oven extraction fan located in the process building roof structure and is not readily accessible to allow emissions monitoring at source. Potential for release of specified substances or odorous releases is very low. | Weekly olfactory monitoring conducted by site staff at designated monitoring locations (see section B3.3b).  Periodic odour monitoring by independent third - party Contractor conducted if and when necessary. |
| A17 Oven vent extracted by in duct mounted fan. | Unspecified | As A16 | As A16 |
| A18 (a to h) – Emergency ammonia vents in refrigeration plant room and at valve stations / PRV’s | NH3 | Emergency ammonia vents from refrigeration plantroom, valve stations / PRV’s (8 emergency vent outlet points in total A18a, A18b, A18c A18d, A18e and A18f associated with valve stations, A18g and A18h associated with refrigeration plant room). Ammonia leak detection equipment in place. | n/a  NH3 release occurs only in event of malfunction (eg. leakage in plant room, pressure relief operation or leakage at valve station) resulting in automatic plant shutdown and emergency venting for safety reasons. |
| A19 Emergency pressure relief on liquified Carbon Dioxide MAP gas storage tank | CO2 | n/a | n/a |
| A20 Emergency pressure relief on liquified Nitrogen MAP gas storage tank | N2 | n/a | n/a |
| A21 (a to n)General building ventilation / air extraction including food preparation and cooking areas, crate etc washing areas. | Unspecified | These emission points are the outlets from air extraction / general workplace ventilation fans located in the process building roof structure and are not readily accessible to allow emissions monitoring at source. Potential for release of specified substances or odorous releases is very low. | Weekly olfactory monitoring conducted by site staff at designated monitoring locations (see section B3.3b).  Periodic odour monitoring by independent third party Contractor conducted if and when necessary. |
| A22 Emergency pressure relief on liquified Nitrogen soft mixer contents chilling gas storage tank. | N2 | n/a | n/a |
| A23 Soft mixing plant vent extracted by in duct mounted fan. | Unspecified | This emission point is the outlet from an in-duct soft mixer extraction fan located in the process building roof structure and is not readily accessible to allow emissions monitoring at source. Potential for release of specified substances or odorous releases is very low. | Weekly olfactory monitoring conducted by site staff at designated monitoring locations (see section B3.3b).  Periodic odour monitoring by independent third - party Contractor conducted if and when necessary. |
| A24 Soft mixing plant vent extracted by in duct mounted fan. | Unspecified | As A23 | As A23 |

**Emissions to Sewer**

|  |  |  |  |
| --- | --- | --- | --- |
| **Point source emission point** | **Substance(s) / parameter(s) to be monitored** | **Monitoring technique(s) / comments** | **Frequency** |
| **Existing Unchanged Emission Points S1 and S2** |  |  |  |
| S1 | Flow rate | Estimated based on potable water supply consumption as agreed with the sewerage undertaker. | n/a |
| S1 | pH | UKAS or equivalent approved test method by specialist third party water analysis laboratory | Quarterly |
| S1 | COD | UKAS or equivalent approved test method by specialist third party water analysis laboratory | Quarterly |
| S1 | Settleable solids | UKAS or equivalent approved test method by specialist third party water analysis laboratory | Quarterly |
| S2 | Flow rate | Estimated based on potable water supply consumption as agreed with the sewerage undertaker. | n/a |
| S2 | pH | UKAS or equivalent approved test method by specialist third party water analysis laboratory | Quarterly |
| S2 | COD | UKAS or equivalent approved test method by specialist third party water analysis laboratory | Quarterly |
| S2 | Settleable solids | UKAS or equivalent approved test method by specialist third party water analysis laboratory | Quarterly |
| **Modified Emission Point S3** |  |  |  |
| S3 | Flow rate | Magnetic induction flow meter | Continuous (MCERTS) |
| S3 | pH | UKAS or equivalent approved test method by specialist third party water analysis laboratory | Quarterly |
| S3 | COD | UKAS or equivalent approved test method by specialist third party water analysis laboratory | Quarterly |
| S3 | Settleable solids | UKAS or equivalent approved test method by specialist third party water analysis laboratory | Quarterly |
| S3 | Chloride | UKAS or equivalent approved test method by specialist third party water analysis laboratory | Quarterly |
| S3 | Phosphate | UKAS or equivalent approved test method by specialist third party water analysis laboratory | Quarterly |
| S3 | Nitrate | UKAS or equivalent approved test method by specialist third party water analysis laboratory | Quarterly |
| S3 | Sulphate | UKAS or equivalent approved test method by specialist third party water analysis laboratory | Quarterly |
| S3 | Ammonia | UKAS or equivalent approved test method by specialist third party water analysis laboratory | Quarterly |
| S3 | Cadmium | UKAS or equivalent approved test method by specialist third party water analysis laboratory | Annually |
| S3 | Mercury | UKAS or equivalent approved test method by specialist third party water analysis laboratory | Annually |
| S3 | Alkyl dimethyl amine oxide | Testing by third party laboratory using UKAS approved test method if possible or alternative approved method otherwise. | Annually |
| S3 | 1 – Tetradecanol | Testing by third party laboratory using UKAS approved test method if possible or alternative approved method otherwise. | Annually |
| S3 | Alcohol ethoxylates | Testing by third party laboratory using UKAS approved test method if possible or alternative approved method otherwise. | Annually |
| S3 | N(3-aminopropyl)-N-dodecylpropane-1,3-diamine | Testing by third party laboratory using UKAS approved test method if possible or alternative approved method otherwise. | Annually |
| S3 | Dodecan-1-ol | Testing by third party laboratory using UKAS approved test method if possible or alternative approved method otherwise. | Annually |
| S3 | Sodium Alkyl Ether Sulphate | Testing by third party laboratory using UKAS approved test method if possible or alternative approved method otherwise. | Annually |
| S3 | N,N Didecyl-N,N Dimethyl  Ammonium Carbonate | Testing by third party laboratory using UKAS approved test method if possible or alternative approved method otherwise. | Annually |
| S3 | Alkyl Benzyl Dimethyl  Ammonium Chloride | Testing by third party laboratory using UKAS approved test method if possible or alternative approved method otherwise. | Annually |
| S3 | Coconut Diethanolamide | Testing by third party laboratory using UKAS approved test method if possible or alternative approved method otherwise. | Annually |

The arrangements in place for controlling and monitoring fugitive emissions, are described in Sections C3.1, Activities to be Varied, C3.3 / C3.3a1a Operating Techniques and Technical Standards and C3.3b General Requirements of the permit variation application. The table below shows example fugitive emissions and other parameters to be monitored, the monitoring technique(s) to be used and the frequency at which it is intended to monitor the emission or parameter.

|  |  |  |
| --- | --- | --- |
| **Emission / Parameter to be monitored** | **Monitoring technique(s)** | **Frequency** |
| Odour | Olfactory by site staff  Olfactometry | Weekly olfactory monitoring in accordance with existing odour monitoring plan EMS023-A  One-off independent third-party assessments if and when considered necessary. |
| Noise | By site staff using hand-held noise meter at designated monitoring locations  Survey using integrating sound level meter and assessment of impacts at receptors in accordance with BS 4142:2014. | Weekly in accordance with existing noise monitoring plan ENO025-A  One-off independent third-party assessments if and when considered necessary. |
| Ammonia | Multipoint leak detection system linked to emergency extractive venting in refrigeration plant room, at PRV’s, and valve stations. | Continuous monitoring linked to automatic alarm and response system.  Minimum 6 monthly inspection / testing of equipment by supplier. |

All monitoring results will be formally reviewed periodically (bi-monthly) by the site management team. Any actions required as a result of the review will be implemented and tracked to completion by the management team during subsequent management meetings.

Where a monitoring exercise identifies the need for immediate action (for example in the case of an environmental permit specified limit being exceeded, a measured parameter being outside the associated design tolerance envelope, or the detection of an abnormal condition perceived by an individual undertaking the monitoring), the situation will be brought immediately to the attention of a member of the site management team in accordance with site environmental monitoring and incident reporting procedures so that appropriate action can be identified and implemented.