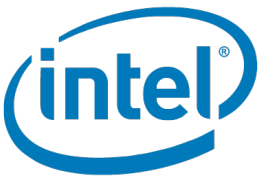
# Intel Ireland Ltd.

# Annual Environmental Report

## 2018

Prepared by EHS Department
Intel Ireland Ltd.



This Annual Environmental Report was generated using excel template documents provided by the Environmental Protection Agency. The report provides summary information on key environmental emissions and management practices associated with Intel Ireland Ltd.'s Industrial Emissions Licence P0207-04. Note in 2019 the EPA required for Intel to provide Environmental Performance Reporting (EPR) information in an EPA online system Eden/Alder in place of a Pollution Release & Transfer Register excel document. For transparency Intel have provided summary information from the EPR into this AER pdf document.

# Table of Contents

| Facility Information Summary | |
|---|---|
| AER Reporting Year | 2018 |
| Licence Register Number | P0207-04 |
| Name of site | Intel Ireland Ltd. |
| Site Location | Collinstown Industrial Park,<br>Leixlip, County Kildare, Ireland |
| NACE Code | 2611 |
| Class/Classes of Activity | Principal Activity:<br>13.2 The Manufacture of integrated circuits and printed circuit boards.<br>Related Activities:<br>2.1 The operation of combustion installations with a rated thermal input equal to or greater than 50 MegaWatt.<br>12.2.1 The surface treatment of products using organic solvents, in particular for coating, cleaning, with a consumption capacity of more than 200 tonnes per year. |
| National Grid Reference (6E, 6N) | 298310E, 236940N |
| A description of the activities/processes at the site for the reporting year. This should include information such as production increases or decreases on site, any infrastructural changes, environmental performance which was measured during the reporting year **and an overview of compliance with your licence** listing all exceedances of licence limits (where applicable) and what they relate to e.g. air, water, noise. | In 2018, production levels increased and contributed to an increase in some emissions. An increase in production levels contributed to an increase in ammonia air emissions. For wastewater emissions there was a decrease in chloride due to on-site optimisation of our Ultra Pure Water system and a decrease in copper due to improved copper abatement in wastewater. There was an increase in fluoride wastewater (mass emission) due to an increase in production but overall there is a reduction in flouride per unit output relative to older products manufactured on-site.<br>In 2018, there was a construction project on-site which lead to an increase in total volumes of non-hazardous waste and also volumes of recycled non-hazardous waste. There was a drop in non-hazardous waste going to landfill with calcium fluoride filter cake now being recovered as opposed to being landfilled. There is an increase in hazardous waste recycling with segregated sulphuric acid being sent for recovery off-site. |

**Declaration:**

All the data and information presented in this report has been checked and certified as being accurate. The quality of the information is assured to meet licence requirements.

Submission Date 28th March 2018

Signature

Environmental Health & Safety Manager

| AER Monitoring returns summary template-WATER/WASTEWATER (SEWER) | Lic No: | P0207-04 | Year | 2018 |
|---|---|---|---|---|

**Abbreviations: Chemical Oxygen Demand (COD), Total Organic Carbon (TOC), Acid Waste Neutralization System (AWN), Total Suspended Solids (TSS), Volatile Suspended Solids (VSS), Emission Limit Value (ELV), Limit of Quantification (LoQ), Environmental Quality Standard (EQS).**

| | | | Additional information |
|---|---|---|---|
| 1 | Does your site have licensed emissions direct to surface water or direct to sewer? If yes please complete table W2 and W3 below for the current reporting year and answer further questions. If **you do not have** licenced emissions you only need to complete table W1 and or W2 for storm water analysis and visual inspections. | Yes | |
| 2 | Was it a requirement of your licence to carry out visual inspections on any surface water discharges or watercourses on or near your site? If yes please complete table W2 below summarising only any evidence of contamination noted during visual inspections. | Yes | |

**Table W1 Storm water monitoring**

| Location reference | Location relative to site activities | PRTR Parameter | Licenced Parameter | Monitoring date | ELV or trigger level in licence or any revision thereof* | Licence Compliance criteria | Measured value | Unit of measurement | Compliant with licence | Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| SW1 | onsite | N/A | pH | Continuous | ~6-9.3/10.6 | N/A | 7.82 | pH Units | N/A | Action Limits agreed with the EPA (upper limit increases in summer to allow for natural increase in pH). |
| SW1 | onsite | N/A | Flow | Continuous | N/A | N/A | 828.41 | m3/day | N/A | |
| SW1 | onsite | N/A | COD | Weekly | N/A | N/A | 16.44 | mg/L | N/A | |
| SW1 | onsite | N/A | Conductivity | Weekly | N/A | N/A | 754.36 | µS/cm@25oC | N/A | |
| SW1 | onsite | N/A | Total Organic Carbon (as C) | Weekly | N/A | N/A | 5.04 | mg/L | N/A | |
| SW1 | onsite | N/A | Total Heavy Metals | Biannually | N/A | N/A | 17.37 | µg/L | N/A | |

*trigger values may be agreed by the Agency outside of licence conditions

**Table W2 Visual inspections-Please only enter details where contamination was observed.**

| Location Reference | Date of inspection | Description of contamination | Source of contamination | Corrective action | Comments |
|---|---|---|---|---|---|
| SW1 | 07/02/2018 | Oily sheen at outlet | site | Pond outlet closed to prevent potential release to Rye River and to allow slick to absorb into oil booms and source investigated. | Hydrocarbon leakages from vehicles are cleaned up as soon as they are discovered. Site interceptors prevent most of the slick from reaching the pond. Oil booms are permanently in place at the pond inlet and outlet to absorb any slick that passes through the interceptors. This ensures release to the Rye River is prevented. |
| SW1 | 08/02/2018 | Oil slick at pond inlet | site | Pond outlet closed to prevent potential release to Rye River and to allow slick to absorb into oil booms and source investigated. | |
| SW1 | 03/12/2018 | Oil slick at pond inlet | site | Pond outlet closed to prevent potential release to Rye River and to allow slick to absorb into oil booms and source investigated. | |

**Licensed Emissions to water and /or wastewater(sewer)-periodic monitoring (non-continuous)**

| | | | | Additional information |
|---|---|---|---|---|
| 3 | Was there any result in breach of licence requirements? If yes please provide brief details in the comment section of Table W3 below. | | No | |
| 4 | Was all monitoring carried out in accordance with EPA guidance and checklists for Quality of Aqueous Monitoring Data Reported to the EPA? If no please detail what areas require improvement in additional information box. | External /Internal Lab Quality checklist / Assessment of results checklist | Yes | |

| AER Monitoring returns summary template-WATER/WASTEWATER (SEWER) | Lic No: | P0207-04 | Year | 2018 |
|---|---|---|---|---|

**Table W3: Licensed Emissions to water and /or wastewater (sewer)-periodic monitoring (non-continuous)**

| Emission reference no: | Emission released to | Parameter/ SubstanceNote 1 | Type of sample | Frequency of monitoring | Averaging period | ELV or trigger values in licence or any revision therof[Note 2] | Licence Compliance criteria | Measured value | Unit of measurement | Compliant with licence | Method of analysis | Procedural reference source | Procedural reference standard number | Annual mass load (kg) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SE1 | Wastewater/Sewer | COD Equivalence | composite | Weekly | Yearly | 13,200 | All results < 1.2 times ELV, plus 8 from ten results must be < ELV | 5,740 | kg/day | yes | High temperature combustion plus conversion factor | APHA / AWWA "Standard Methods" | 5310-B | 2,095,039 | Based upon test data from monitoring of TOC at the AWNs and the application of a conversion factor (2.5). |
| SE1 | Wastewater/Sewer | Inorganic Suspended Solids | composite | Weekly | Yearly | 2,700 | All results < 1.2 times ELV, plus 8 from ten results must be < ELV | 168 | kg/day | yes | In house calculation (TSS - VSS) | N/A | N/A | 61,475 | |
| SE1 | Wastewater/Sewer | Suspended Solids | composite | Weekly | Yearly | 4,125 | All results < 1.2 times ELV, plus 8 from ten results must be < ELV | 447 | kg/day | yes | Gravimetric analysis | APHA / AWWA "Standard Methods" | 2540D | 163,244 | |
| SE1 | Wastewater/Sewer | Total Dissolved Solids | composite | Weekly | Yearly | 60,570 | All results < 1.2 times ELV, plus 8 from ten results must be < ELV | 28,736 | kg/day | yes | Gravimetric analysis | APHA / AWWA "Standard Methods" | 2540C | 10,488,524 | |
| SE1 | Wastewater/Sewer | Total Nitrogen | composite | Weekly | Yearly | 990 | All results < 1.2 times ELV, plus 8 from ten results must be < ELV | 570 | kg/day | yes | Total Nitrogen Analyser | I.S. (Irish Standard) | IS EN 12260:2003 | 208,066 | Based upon test data from monitoring at the AWNs which is more representative than SE1. |
| SE1 | Wastewater/Sewer | Total Phosphorus | composite | Weekly | Yearly | 140 | All results < 1.2 times ELV, plus 8 from ten results must be < ELV | 9.67 | kg/day | yes | Digestion + Spectrophotometry | APHA / AWWA "Standard Methods" | 4500-PD and Hach method 8190 | 3,530 | |
| SE1 | Wastewater/Sewer | Fluorides (as total F) | composite | Weekly | Yearly | 160 | All results < 1.2 times ELV, plus 8 from ten results must be < ELV | 60.66 | kg/day | yes | Ion Chromatography | APHA / AWWA "Standard Methods" | 4110B | 22,141 | |
| SE1 | Wastewater/Sewer | Cyanides (as total CN) | composite | Weekly | Yearly | 0.1 | All results < 1.2 times ELV, plus 8 from ten results must be < ELV | 0.01 | mg/L | yes | Spectrophotometry (Colorimetry) | APHA / AWWA "Standard Methods" | 4500-CN--E | N/A see below result | |
| SE1 | Wastewater/Sewer | Cyanides (as total CN) | composite | Weekly | Yearly | 1.35 | All results < 1.2 times ELV, plus 8 from ten results must be < ELV | 0.000 | kg/day | yes | Spectrophotometry (Colorimetry) | APHA / AWWA "Standard Methods" | 4500-CN--E | 0 | Most measurements for Cyanide were less than the limit of quantification (LoQ) and in these instances the value used for averaging was half the LoQ. The total annual mass of Cyanide in the site's wastewater emissions was equal to the total annual mass in the incoming water so net emissions are zero. |
| SE1 | Wastewater/Sewer | Arsenic and compounds (as As) | composite | Weekly | Yearly | 0.1 | All results < 1.2 times ELV, plus 8 from ten results must be < ELV | 0.002 | mg/L | yes | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | US EPA | 200.8 (supplement 1 rev. 5.4 May 1994) | N/A see below result | |
| SE1 | Wastewater/Sewer | Arsenic and compounds (as As) | composite | Weekly | Yearly | 1.35 | All results < 1.2 times ELV, plus 8 from ten results must be < ELV | 0.002 | kg/day | yes | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | US EPA | 200.8 (supplement 1 rev. 5.4 May 1994) | 0.75 | Some of the measurements for arsenic were less than the limit of quantification (LoQ) and in these instances the value used for averaging was half the LoQ. |

| AER Monitoring returns summary template-WATER/WASTEWATER (SEWER) | | | | | | Lic No: | P0207-04 | | Year | 2018 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Emission reference no: | Emission released to | Parameter/ SubstanceNote 1 | Type of sample | Frequency of monitoring | Averaging period | ELV or trigger values in licence or any revision thereof[Note 2] | Licence Compliance criteria | Measured value | Unit of measurement | Compliant with licence | Method of analysis | Procedural reference source | Procedural reference standard number | Annual mass load (kg) | Comments |
| SE1 | Wastewater/Sewer | Copper and compounds (as Cu) | composite | Weekly | Yearly | 0.3 | All results < 1.2 times ELV, plus 8 from ten results must be < ELV | 0.016 | mg/L | yes | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | US EPA | 200.8 (supplement 1 rev. 5.4 May 1994) | N/A see below result | |
| SE1 | Wastewater/Sewer | Copper and compounds (as Cu) | composite | Weekly | Yearly | 4.05 | All results < 1.2 times ELV, plus 8 from ten results must be < ELV | 0.209 | kg/day | yes | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | US EPA | 200.8 (supplement 1 rev. 5.4 May 1994) | 76.4 | |
| SE1 | Wastewater/Sewer | Chromium and compounds (as Cr) | composite | Weekly | Yearly | 0.1 | All results < 1.2 times ELV, plus 8 from ten results must be < ELV | 0.004 | mg/L | yes | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | US EPA | 200.8 (supplement 1 rev. 5.4 May 1994) | N/A see below result | |
| SE1 | Wastewater/Sewer | Chromium and compounds (as Cr) | composite | Weekly | Yearly | 1.35 | All results < 1.2 times ELV, plus 8 from ten results must be < ELV | 0.008 | kg/day | yes | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | US EPA | 200.8 (supplement 1 rev. 5.4 May 1994) | 3.05 | Some of the measurements for chromium were less than the limit of quantification (LoQ) and in these instances the value used for averaging was half the LoQ. |
| SE1 | Wastewater/Sewer | Nickel and compounds (as Ni) | composite | Weekly | Yearly | 0.2 | All results < 1.2 times ELV, plus 8 from ten results must be < ELV | 0.003 | mg/L | yes | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | US EPA | 200.8 (supplement 1 rev. 5.4 May 1994) | N/A see below result | |
| SE1 | Wastewater/Sewer | Nickel and compounds (as Ni) | composite | Weekly | Yearly | 2.7 | All results < 1.2 times ELV, plus 8 from ten results must be < ELV | 0.056 | kg/day | yes | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | US EPA | 200.8 (supplement 1 rev. 5.4 May 1994) | 20.40 | |
| SE1 | Wastewater/Sewer | Tin | composite | Weekly | Yearly | 0.4 | All results < 1.2 times ELV, plus 8 from ten results must be < ELV | 0.004 | mg/L | yes | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | US EPA | 200.8 (supplement 1 rev. 5.4 May 1994) | N/A see below result | |
| SE1 | Wastewater/Sewer | Tin | composite | Weekly | Yearly | 5.4 | All results < 1.2 times ELV, plus 8 from ten results must be < ELV | 0.002 | kg/day | yes | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | US EPA | 200.8 (supplement 1 rev. 5.4 May 1994) | 0.68 | Some of the measurements for tin were less than the limit of quantification (LoQ) and in these instances the value used for averaging was half the LoQ. |

| AER Monitoring returns summary template-WATER/WASTEWATER (SEWER) | | | | | | Lic No: | P0207-04 | | Year | 2018 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Emission reference no: | Emission released to | Parameter/ SubstanceNote 1 | Type of sample | Frequency of monitoring | Averaging period | ELV or trigger values in licence or any revision thereof[Note 2] | Licence Compliance criteria | Measured value | Unit of measurement | Compliant with licence | Method of analysis | Procedural reference source | Procedural reference standard number | Annual mass load (kg) | Comments |
| SE1 | Wastewater/Sewer | Lead and compounds (as Pb) | composite | Weekly | Yearly | 0.4 | All results < 1.2 times ELV, plus 8 from ten results must be < ELV | 0.001 | mg/L | yes | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | US EPA | 200.8 (supplement 1 rev. 5.4 May 1994) | N/A see below result | |
| SE1 | Wastewater/Sewer | Lead and compounds (as Pb) | composite | Weekly | Yearly | 1.6 | All results < 1.2 times ELV, plus 8 from ten results must be < ELV | 0.0000 | kg/day | yes | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | US EPA | 200.8 (supplement 1 rev. 5.4 May 1994) | 0.00 | Most measurements for Lead were less than the limit of quantification (LoQ) and in these instances the value used for averaging was half the LoQ.<br>The total annual mass of Lead in the site's wastewater emissions was equal to the total annual mass in the incoming water so net emissions are zero. |
| SE1 | Wastewater/Sewer | Total heavy metals | composite | Weekly | Yearly | 13.5 | All results < 1.2 times ELV, plus 8 from ten results must be < ELV | 0.34 | kg/day | yes | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | US EPA | 200.8 (supplement 1 rev. 5.4 May 1994) | 124.3 | |
| SE1 | Wastewater/Sewer | Ammonia (as N) | composite | Weekly | Yearly | N/A | N/A | 140 | kg/day | yes | UV/Vis | APHA / AWWA "Standard Methods" | 4500- NH3 F | 51,048 | |
| SE1 | Wastewater/Sewer | Cobalt | composite | Weekly | Yearly | N/A | N/A | 0.0004 | kg/day | yes | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | US EPA | 200.8 (supplement 1 rev. 5.4 May 1994) | 0.14 | All of the measurements for Cobalt were less than the limit of quantification (LoQ) and in these instances the value used for averaging was half the LoQ. |
| SE1 | Wastewater/Sewer | Nitrate (as N) | composite | Weekly | Yearly | N/A | N/A | 52.50 | kg/day | yes | Ion Chromatography | APHA / AWWA "Standard Methods" | 4110B | 19,161 | |
| SE1 | Wastewater/Sewer | Sulphate | composite | Weekly | Yearly | N/A | N/A | 17,042 | kg/day | yes | Ion Chromatography | APHA / AWWA "Standard Methods" | 4110B | 6,220,153 | |

Note 1: Volumetric flow shall be included as a reportable parameter

Note 2: Where Emission Limit Values (ELV) do not apply to your licence please compare results against EQS for Surface water or relevant receptor quality standards

| AER Monitoring returns summary template-WATER/WASTEWATER (SEWER) | Lic No: | P0207-04 | Year | 2018 |
|---|---|---|---|---|

## Continuous monitoring

| | | | Additional Information |
|---|---|---|---|
| 5 | Does your site carry out continuous emissions to water/sewer monitoring? **If yes please summarise your continuous monitoring data below in Table W4 and compare it to its relevant Emission Limit Value (ELV)** | Yes | |
| 6 | Did continuous monitoring equipment experience downtime? **If yes please record downtime in table W4 below** | Yes | |
| 7 | Do you have a proactive service contract for each piece of continuous monitoring equipment on site? | Yes | |
| 8 | Did abatement system bypass occur during the reporting year? **If yes please complete table W5 below** | No | |

### Table W4: Summary of average emissions -continuous monitoring

| Emission reference no: | Emission released to | Parameter/ Substance | ELV or trigger values in licence or any revision thereof | Averaging Period | Compliance Criteria | Units of measurement | Annual Average | % change +/- from previous reporting year | Monitoring Equipment downtime (hours) | Number of ELV exceedences in reporting year | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SE1 | Wastewater/Sewer | volumetric flow | 23000 | Yearly | No flow value shall exceed the specific limit | m3/day | 14,147 | 1.19 | 53.75 | 0 | The flowmeter downtime was due to electrical and signal issues with the flowmeter in April and August 2018 . The site has upstream flow meters which can be used to illustrate compliance. |
| SE1 | Wastewater/Sewer | volumetric flow | 1,150 | Yearly | No flow value shall exceed the specific limit | m3/hr | 589 | 1.19 | 53.75 | 0 | SE1 flows are measured at a single flowmeter, downtime as above. |
| SE1 | Wastewater/Sewer | volumetric flow | 320 | Yearly | No flow value shall exceed the specific limit | l/sec | 164 | 1.19 | 53.75 | 0 | SE1 flows are measured at a single flowmeter, downtime as above. |
| SE1 | Wastewater/Sewer | pH | 6-9.5 | Yearly | No pH value shall deviate from the specified range | pH units | 7.64 | -0.48 | 0 | 0 | The percentage change from 2017 was calculated arithmetically. |
| SE1 | Wastewater/Sewer | temperature | 30 | Yearly | No temperature value shall exceed the limit value | degrees C | 26.88 | 1.85 | 0.33 | 0 | The SE1 temperature probe was disconnected for 20 minutes during the installation of a second temperature probe at SE1 which was required for redundancy and verification. |

Note 1: Volumetric flow shall be included as a reportable parameter.

### Table W5: Abatement system bypass reporting table

| Date | Duration (hours) | Location | Resultant emissions | Reason for bypass | Corrective action* | Was a report submitted to the EPA? | When was this report submitted? |
|---|---|---|---|---|---|---|---|
| N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |

*Measures taken or proposed to reduce or limit bypass frequency

| Groundwater/Soil monitoring template | Lic No: | P0207-04 | Year | 2018 |
|---|---|---|---|---|

**Abbreviations**: KCC: Kildare County Council, GTV; Groundwater Threshold Value, IGV: Interim Guideline Value, MW: Monitoring Well

| | | | | Comments | |
|---|---|---|---|---|---|
| 1 | Are you required to carry out groundwater monitoring as part of your licence requirements? | | Yes | | **Please provide an interpretation of groundwater monitoring data in the interpretation box below or if you require additional space please include a groundwater/contaminated land monitoring results interpretaion as an additional section in this AER** |
| 2 | Are you required to carry out soil monitoring as part of your licence requirements? | | No | | |
| 3 | Do you extract groundwater for use on site? If yes please specify use in comment section | | No | Groundwater is extracted on-site only for the purposes of relieving hydrostatic pressure on underground structures. This groundwater is discharged to the site storm water system and is registered with the EPA via Eden Portal. | |
| 4 | Do monitoring results show that groundwater generic assessment criteria such as GTVs or IGVs are exceeded or is there an upward trend in results for a substance? If yes, please complete the Groundwater Monitoring Guideline Template Report (link in cell G8) and submit separately through ALDER as a licensee return AND answer questions 5-12 below. | Groundwater monitoring template | Yes | Some wells were found to be in exceedance of the Groundwater Threshold values (GTVs) for the following parameters: conductivity, chloride, sulphate and orthophosphate. Chloride, conductivity and orthophosphate have been detected in concentrations above the GTVs in both up-gradient and down-gradient wells. This suggests that the source of the contamination is an up-gradient offsite source.<br>The levels of conductivity and chloride tend to be higher in upgradient wells and this was the subject of a report by TMS Environment Ltd. commissioned by Intel in 2009. The conclusion of this report was that elevated levels were due to an off-site leaking sewer south of Intel owned by KCC. Monthly monitoring was conducted on upgradient wells in 2017 and it was determined that the levels of these parameters remain constant throughout the year supporting a consistent offsite source.<br><br>Sulphate levels were found at higher concentrations in downgradient wells than in upgradient wells which suggests a site source. However, the likely source of sulphates onsite, the underground process water pipes and Effluent Balance Tank, are all subject to integrity testing every three years and to date no leak has been found. Also, no significant upward trend in Sulphates was seen in any site wells.<br><br>Lead was detected above the GTV in one well in 2018. However, there was no upward trend for any heavy metal in the last five years nor has there been an increase when compared to historical data from 1998 - 2004.<br><br>24 upward trends were identified in the last 5 years of annual average data. However, when compared to the variation of these parameters over the full range of available data for those wells, only 5 upward trends were considered significant. A small increase in conductivity at MW11 and chloride at MW14A are considered relatively minor. A small increase in potassium at MW16, MW18 and MW19 may possibly be from a source upgradient of the site as recently potassium has increased in the upgradient monitoring well MW8.<br><br>Testing for hydrocarbons in groundwater is not required under the conditions of the IE licence however it is carried out in specific wells due to a historic spill of diesel in 1997. A number of studies have been done on this contamination (RSK Group 2010 and AWN Consulting 2014) and it was determined that while some trace amounts of diesel are still being detected in the area immediately surrounding MW18, the contamination was localised to this area as no contamination was detected in downstream wells. | |
| 5 | Is the contamination related to operations at the facility (either current and/or historic) | | Yes | | |

| Groundwater/Soil monitoring template | | Lic No: | P0207-04 | | Year | 2018 | | |
|---|---|---|---|---|---|---|---|---|
| 6 | Have actions been taken to address contamination issues?If yes please summarise remediation strategies proposed/undertaken for the site | Yes | The TMS Environment Ltd. report mentioned above was sent to KCC in May 2010 as requested by the EPA but we have received no reply to date.<br>In 2015, AWN Consulting Ltd. developed a remediation strategy for the hydrocarbon contamination at MW18 which involved injection of a bioremediator a number of times over set intervals. A course of groundwater monitoring in the area showed that this failed to fully remediate the contamination in the short term but again showed that the contamination was confined to the area immediately surrounding MW18 and was not migrating downgradient. Monitoring for hydrocarbons has continued on a biannual basis with no hydrocarbon sheen being seen since 2016 and levels of Diesel Range Organics being consistently below 1mg/l since 2015. | | | | |
| 7 | Please specify the proposed time frame for the remediation strategy. | N/A | | | | | |
| 8 | Is there a licence condition to carry out/update Environmental Liability Risk assessment (ELRA) for the site? | Yes | | | | | |
| 9 | Has any type of risk assesment been carried out for the site? | Yes | | | | | |
| 10 | Has a Conceptual Site Model been developed for the site? | Yes | | | | | |
| 11 | Have potential receptors been identified on and off site? | Yes | | | | | |
| 12 | Is there evidence that contamination is migrating offsite? | No | | | | | |

**Table 1: Upgradient Groundwater monitoring results**

| Date of sampling | Sample location reference | Parameter/ Substance | Methodology | Monitoring frequency | Maximum Concentration++ | Average Concentration+ | unit | GTV's* | IGV | Upward trend in yearly average pollutant concentration over last 5 years of monitoring data |
|---|---|---|---|---|---|---|---|---|---|---|
| 14th February 2018 and 16th August 2018 | MW1 | pH | pH Electrode | Biannual | 7.09 | 7.07 | pH Units | N/A | ≥ 6.5 and ≤ 9.5 | no |
| 14th February 2018 and 16th August 2018 | MW1 | Conductivity | Conductivity Meter | Biannual | 1276 | 1203 | uS/cm | 800-1875 | 1000 | no |
| 14th February 2018 and 16th August 2018 | MW1 | COD | Microdigestion, colorimetry | Biannual | 10 | 8 | mg/l O2 | N/A | N/A | no |
| 14th February 2018 and 16th August 2018 | MW1 | Nitrate | Spectrophotometry | Biannual | 3.8 | 3.33 | mg/l NO3 | 37.5 | 25 | no |
| 14th February 2018 and 16th August 2018 | MW1 | Total Ammonia | Spectrophotometry | Biannual | 0.052 | 0.045 | mg/l as N | N/A | 0.15 | no |
| 14th February 2018 and 16th August 2018 | MW1 | Total Nitrogen | Addition of TKN + TON | Biannual | 5.7 | 4.3 | mg/l | N/A | N/A | no |
| 14th February 2018 and 16th August 2018 | MW1 | Chloride | Titration | Biannual | 202 | 201 | mg/l | 24-187.5 | 30 | no |
| 14th February 2018 and 16th August 2018 | MW1 | Fluoride | Ion Selective Electrode | Biannual | 0.22 | 0.16 | mg/l | N/A | 1 | no |
| 14th February 2018 and 16th August 2018 | MW1 | Sodium | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | 34.8 | 34.75 | mg/l | 150 | 150 | no |

| Groundwater/Soil monitoring template | | | | | Lic No: | P0207-04 | | Year | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|
| 14th February 2018 and 16th August 2018 | MW1 | Potassium | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | 2.75 | 2.18 | mg/l | N/A | 5 | no |
| 14th February 2018 and 16th August 2018 | MW1 | Orthophosphate | Spectrophotometry | Biannual | 0.1 | 0.085 | mg/l P | 0.035 | 0.03 | no |
| 14th February 2018 and 16th August 2018 | MW1 | Sulphate | Turbidimetry | Biannual | 119 | 113 | mg/l | N/A | 200 | no |
| 14th February 2018 and 16th August 2018 | MW1 | Chromium | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <2 | 1 | ug/l | 37.5 | 30 | no |
| 14th February 2018 and 16th August 2018 | MW1 | Copper | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <9 | 4.5 | ug/l | 1500 | 30 | no |
| 14th February 2018 and 16th August 2018 | MW1 | Lead | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <6 | 3 | ug/l | 18.75 | 10 | no |
| 14th February 2018 and 16th August 2018 | MW1 | Nickel | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | 4 | 2.75 | ug/l | N/A | 20 | no |
| 14th February 2018 and 16th August 2018 | MW1 | Tin | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | 8 | 5.75 | ug/l | N/A | N/A | no |
| 14th February 2018 and 16th August 2018 | MW1 | Arsenic | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <1 | 0.5 | ug/l | 7.5 | 10 | no |
| 12th February 2018 and 14th August 2018 | MW7 | pH | pH Electrode | Biannual | 7.12 | 7.07 | pH Units | N/A | ≥ 6.5 and ≤ 9.5 | no |
| 12th February 2018 and 14th August 2018 | MW7 | Conductivity | Conductivity Meter | Biannual | 741 | 717 | uS/cm | 800-1875 | 1000 | no |
| 12th February 2018 and 14th August 2018 | MW7 | COD | Microdigestion, colorimetry | Biannual | 12 | 7.25 | mg/l O2 | N/A | N/A | no |
| 12th February 2018 and 14th August 2018 | MW7 | Nitrate | Spectrophotometry | Biannual | 1.37 | 0.935 | mg/l NO3 | 37.5 | 25 | no |
| 12th February 2018 and 14th August 2018 | MW7 | Total Ammonia | Spectrophotometry | Biannual | 0.296 | 0.187 | mg/l as NH4 | N/A | 0.15 | no |
| 12th February 2018 and 14th August 2018 | MW7 | Total Nitrogen | Addition of TKN + TON | Biannual | 1.1 | 0.8 | mg/l N | N/A | N/A | no |
| 12th February 2018 and 14th August 2018 | MW7 | Chloride | Titration | Biannual | 52.5 | 50.4 | mg/l Cl | 24-187.5 | 30 | no |

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|---|---|---|---|---|---|---|---|---|---|---|
| 12th February 2018 and 14th August 2018 | MW7 | Fluoride | Ion Selective Electrode | Biannual | 0.32 | 0.24 | mg/l F | N/A | 1 | no |
| 12th February 2018 and 14th August 2018 | MW7 | Sodium | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | 11.5 | 11.3 | mg/l | 150 | 150 | no |
| 12th February 2018 and 14th August 2018 | MW7 | Potassium | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | 3.53 | 2.87 | mg/l | N/A | 5 | no |
| 12th February 2018 and 14th August 2018 | MW7 | Orthophosphate | Spectrophotometry | Biannual | 0.03 | 0.03 | mg/l P | 0.035 | 0.03 | no |
| 12th February 2018 and 14th August 2018 | MW7 | Sulphate | Turbidimetry | Biannual | 32 | 30.3 | mg/l | N/A | 200 | no |
| 12th February 2018 and 14th August 2018 | MW7 | Chromium | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <2 | 1 | ug/l | 37.5 | 30 | no |
| 12th February 2018 and 14th August 2018 | MW7 | Copper | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <9 | 4.5 | ug/l | 1500 | 30 | no |
| 12th February 2018 and 14th August 2018 | MW7 | Lead | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <6 | 3 | ug/l | 18.75 | 10 | no |
| 12th February 2018 and 14th August 2018 | MW7 | Nickel | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <3 | 1.5 | ug/l | N/A | 20 | no |
| 12th February 2018 and 14th August 2018 | MW7 | Tin | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | 7 | 5.25 | ug/l | N/A | N/A | no |
| 12th February 2018 and 14th August 2018 | MW7 | Arsenic | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <1 | 0.5 | ug/l | 7.5 | 10 | no |
| 12th February 2018 and 14th August 2018 | MW8 | pH | pH Electrode | Biannual | 7.4 | 7.38 | pH Units | N/A | ≥ 6.5 and ≤ 9.5 | no |
| 12th February 2018 and 14th August 2018 | MW8 | Conductivity | Conductivity Meter | Biannual | 813 | 763.5 | uS/cm | 800-1875 | 1000 | no |
| 12th February 2018 and 14th August 2018 | MW8 | COD | Microdigestion, colorimetry | Biannual | 2.5 | 2.5 | mg/l O2 | N/A | N/A | no |
| 12th February 2018 and 14th August 2018 | MW8 | Nitrate | Spectrophotometry | Biannual | 1.72 | 1.11 | mg/l NO3 | 37.5 | 25 | no |

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|---|---|---|---|---|---|---|---|---|---|---|
| 12th February 2018 and 14th August 2018 | MW8 | Total Ammonia | Spectrophotometry | Biannual | 0.065 | 0.051 | mg/l as NH4 | N/A | 0.15 | no |
| 12th February 2018 and 14th August 2018 | MW8 | Total Nitrogen | Addition of TKN + TON | Biannual | 1.6 | 1.05 | mg/l N | N/A | N/A | no |
| 12th February 2018 and 14th August 2018 | MW8 | Chloride | Titration | Biannual | 42.1 | 37.3 | mg/l Cl | 24-187.5 | 30 | Yes |
| 12th February 2018 and 14th August 2018 | MW8 | Fluoride | Ion Selective Electrode | Biannual | 0.16 | 0.105 | mg/l F | N/A | 1 | no |
| 12th February 2018 and 14th August 2018 | MW8 | Sodium | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | 19.6 | 16.55 | mg/l | 150 | 150 | Yes |
| 12th February 2018 and 14th August 2018 | MW8 | Potassium | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | 7.7 | 6.24 | mg/l | N/A | 5 | no |
| 12th February 2018 and 14th August 2018 | MW8 | Orthophosphate | Spectrophotometry | Biannual | 0.05 | 0.03 | mg/l P | 0.035 | 0.03 | no |
| 12th February 2018 and 14th August 2018 | MW8 | Sulphate | Turbidimetry | Biannual | 39.7 | 38.6 | mg/l | N/A | 200 | no |
| 12th February 2018 and 14th August 2018 | MW8 | Chromium | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <2 | 1 | ug/l | 37.5 | 30 | no |
| 12th February 2018 and 14th August 2018 | MW8 | Copper | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <9 | 4.5 | ug/l | 1500 | 30 | no |
| 12th February 2018 and 14th August 2018 | MW8 | Lead | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <6 | 3 | ug/l | 18.75 | 10 | no |
| 12th February 2018 and 14th August 2018 | MW8 | Nickel | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <3 | 1.5 | ug/l | N/A | 20 | no |
| 12th February 2018 and 14th August 2018 | MW8 | Tin | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <7 | 3.5 | ug/l | N/A | N/A | no |
| 12th February 2018 and 14th August 2018 | MW8 | Arsenic | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | 1.1 | 0.8 | ug/l | 7.5 | 10 | no |
| 14th February 2018 and 16th August 2018 | MW9 | pH | pH Electrode | Biannual | 7.61 | 7.58 | pH Units | N/A | ≥ 6.5 and ≤ 9.5 | Yes |

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|---|---|---|---|---|---|---|---|---|---|---|
| 14th February 2018 and 16th August 2018 | MW9 | Conductivity | Conductivity Meter | Biannual | 722 | 683 | uS/cm | 800-1875 | 1000 | no |
| 14th February 2018 and 16th August 2018 | MW9 | COD | Microdigestion, colorimetry | Biannual | 11 | 6.75 | mg/l O2 | N/A | N/A | no |
| 14th February 2018 and 16th August 2018 | MW9 | Nitrate | Spectrophotometry | Biannual | 1.76 | 1.13 | mg/l NO3 | 37.5 | 25 | no |
| 14th February 2018 and 16th August 2018 | MW9 | Total Ammonia | Spectrophotometry | Biannual | 0.039 | 0.026 | mg/l as NH4 | N/A | 0.15 | no |
| 14th February 2018 and 16th August 2018 | MW9 | Total Nitrogen | Addition of TKN + TON | Biannual | 2.4 | 1.7 | mg/l N | N/A | N/A | no |
| 14th February 2018 and 16th August 2018 | MW9 | Chloride | Titration | Biannual | 45 | 32.85 | mg/l Cl | 24-187.5 | 30 | no |
| 14th February 2018 and 16th August 2018 | MW9 | Fluoride | Ion Selective Electrode | Biannual | 0.18 | 0.13 | mg/l F | N/A | 1 | no |
| 14th February 2018 and 16th August 2018 | MW9 | Sodium | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | 18.3 | 13.905 | mg/l | 150 | 150 | no |
| 14th February 2018 and 16th August 2018 | MW9 | Potassium | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | 11.8 | 9.745 | mg/l | N/A | 5 | no |
| 14th February 2018 and 16th August 2018 | MW9 | Orthophosphate | Spectrophotometry | Biannual | 0.02 | 0.015 | mg/l P | 0.035 | 0.03 | no |
| 14th February 2018 and 16th August 2018 | MW9 | Sulphate | Turbidimetry | Biannual | 29.9 | 29.1 | mg/l | N/A | 200 | no |
| 14th February 2018 and 16th August 2018 | MW9 | Chromium | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <2 | 1 | ug/l | 37.5 | 30 | no |
| 14th February 2018 and 16th August 2018 | MW9 | Copper | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <9 | 4.5 | ug/l | 1500 | 30 | no |
| 14th February 2018 and 16th August 2018 | MW9 | Lead | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <6 | 3 | ug/l | 18.75 | 10 | no |
| 14th February 2018 and 16th August 2018 | MW9 | Nickel | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | 4 | 2.75 | ug/l | N/A | 20 | no |
| 14th February 2018 and 16th August 2018 | MW9 | Tin | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | 13 | 8.25 | ug/l | N/A | N/A | no |

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|---|---|---|---|---|---|---|---|---|---|---|
| 14th February 2018 and 16th August 2018 | MW9 | Arsenic | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <1 | 0.5 | ug/l | 7.5 | 10 | no |
| 14th February 2018 and 16th August 2018 | MW13 | pH | pH Electrode | Biannual | 6.93 | 6.9 | pH Units | N/A | ≥ 6.5 and ≤ 9.5 | no |
| 14th February 2018 and 16th August 2018 | MW13 | Conductivity | Conductivity Meter | Biannual | 1369 | 1255.5 | uS/cm | 800-1875 | 1000 | no |
| 14th February 2018 and 16th August 2018 | MW13 | COD | Microdigestion, colorimetry | Biannual | 13 | 7.75 | mg/l O2 | N/A | N/A | no |
| 14th February 2018 and 16th August 2018 | MW13 | Nitrate | Spectrophotometry | Biannual | 2.96 | 2.09 | mg/l NO3 | 37.5 | 25 | no |
| 14th February 2018 and 16th August 2018 | MW13 | Total Ammonia | Spectrophotometry | Biannual | 0.155 | 0.084 | mg/l as NH4 | N/A | 0.15 | no |
| 14th February 2018 and 16th August 2018 | MW13 | Total Nitrogen | Addition of TKN + TON | Biannual | 6.3 | 3.9 | mg/l N | N/A | N/A | no |
| 14th February 2018 and 16th August 2018 | MW13 | Chloride | Titration | Biannual | 121 | 108 | mg/l Cl | 24-187.5 | 30 | no |
| 14th February 2018 and 16th August 2018 | MW13 | Fluoride | Ion Selective Electrode | Biannual | 0.17 | 0.135 | mg/l F | N/A | 1 | no |
| 14th February 2018 and 16th August 2018 | MW13 | Sodium | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | 29.5 | 28.7 | mg/l | 150 | 150 | no |
| 14th February 2018 and 16th August 2018 | MW13 | Potassium | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | 3.92 | 3.68 | mg/l | N/A | 5 | no |

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|---|---|---|---|---|---|---|---|---|---|---|
| 14th February 2018 and 16th August 2018 | MW13 | Orthophosphate | Spectrophotometry | Biannual | 0.03 | 0.02 | mg/l P | 0.035 | 0.03 | no |
| 14th February 2018 and 16th August 2018 | MW13 | Sulphate | Turbidimetry | Biannual | 307 | 231.5 | mg/l | N/A | 200 | no |
| 14th February 2018 and 16th August 2018 | MW13 | Chromium | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <2 | 1 | ug/l | 37.5 | 30 | no |
| 14th February 2018 and 16th August 2018 | MW13 | Copper | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <9 | 4.5 | ug/l | 1500 | 30 | no |
| 14th February 2018 and 16th August 2018 | MW13 | Lead | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <6 | 3 | ug/l | 18.75 | 10 | no |
| 14th February 2018 and 16th August 2018 | MW13 | Nickel | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | 6 | 5 | ug/l | N/A | 20 | no |
| 14th February 2018 and 16th August 2018 | MW13 | Tin | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <7 | 3.5 | ug/l | N/A | N/A | no |
| 14th February 2018 and 16th August 2018 | MW13 | Arsenic | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <1 | 0.5 | ug/l | 7.5 | 10 | no |
| .+ where average indicates arithmetic mean | | | | | | | | | | |
| .++ maximum concentration indicates the maximum measured concentration from all monitoring results produced during the reporting year | | | | | | | | | | |

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|---|---|---|---|---|---|---|---|---|---|---|
| **Table 2: Downgradient Groundwater monitoring results** | | | | | | | | | | |
| **Date of sampling** | **Sample location reference** | **Parameter/ Substance** | **Methodology** | **Monitoring frequency** | **Maximum Concentra** | **Average Concentr** | **unit** | **GTV's*** | **IGV** | **Upward trend in yearly average pollutant concentration over last 5 years of monitoring data** |
| 13th February 2018 and 15th August 2018 | MW2 | pH | pH Electrode | Biannual | 6.98 | 6.95 | pH Units | N/A | ≥ 6.5 and ≤ 9.5 | no |
| 13th February 2018 and 15th August 2018 | MW2 | Conductivity | Conductivity Meter | Biannual | 688 | 673 | uS/cm | 800-1875 | 1000 | no |
| 13th February 2018 and 15th August 2018 | MW2 | COD | Microdigestion, colorimetry | Biannual | 564 | 467.5 | mg/l O2 | N/A | N/A | no |
| 13th February 2018 and 15th August 2018 | MW2 | Nitrate | Spectrophotometry | Biannual | 1.1 | 0.8 | mg/l NO3 | 37.5 | 25 | no |
| 13th February 2018 and 15th August 2018 | MW2 | Total Ammonia | Spectrophotometry | Biannual | 0.052 | 0.032 | mg/l as NH4 | N/A | 0.15 | no |
| 13th February 2018 and 15th August 2018 | MW2 | Total Nitrogen | Addition of TKN + TON | Biannual | 3.3 | 2.15 | mg/l N | N/A | N/A | no |
| 13th February 2018 and 15th August 2018 | MW2 | Chloride | Titration | Biannual | 29.6 | 28.55 | mg/l Cl | 24-187.5 | 30 | no |
| 13th February 2018 and 15th August 2018 | MW2 | Fluoride | Ion Selective Electrode | Biannual | 0.29 | 0.215 | mg/l F | N/A | 1 | no |
| 13th February 2018 and 15th August 2018 | MW2 | Sodium | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | 14.2 | 12.45 | mg/l | 150 | 150 | no |
| 13th February 2018 and 15th August 2018 | MW2 | Potassium | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | 3.03 | 2.935 | mg/l | N/A | 5 | no |
| 13th February 2018 and 15th August 2018 | MW2 | Orthophosphate | Spectrophotometry | Biannual | 0.06 | 0.05 | mg/l P | 0.035 | 0.03 | no |
| 13th February 2018 and 15th August 2018 | MW2 | Sulphate | Turbidimetry | Biannual | 105 | 84.3 | mg/l | N/A | 200 | no |
| 13th February 2018 and 15th August 2018 | MW2 | Chromium | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <2 | 1 | ug/l | 37.5 | 30 | no |
| 13th February 2018 and 15th August 2018 | MW2 | Copper | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <9 | 4.5 | ug/l | 1500 | 30 | no |

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|---|---|---|---|---|---|---|---|---|---|---|
| 13th February 2018 and 15th August 2018 | MW2 | Lead | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <6 | 3 | ug/l | 18.75 | 10 | no |
| 13th February 2018 and 15th August 2018 | MW2 | Nickel | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | 9 | 5.25 | ug/l | N/A | 20 | no |
| 13th February 2018 and 15th August 2018 | MW2 | Tin | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | 13 | 12.5 | ug/l | N/A | N/A | no |
| 13th February 2018 and 15th August 2018 | MW2 | Arsenic | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <1 | 0.5 | ug/l | 7.5 | 10 | no |
| 13th February 2018 and 15th August 2018 | MW3 | pH | pH Electrode | Biannual | 7.22 | 7.15 | pH Units | N/A | ≥ 6.5 and ≤ 9.5 | no |
| 13th February 2018 and 15th August 2018 | MW3 | Conductivity | Conductivity Meter | Biannual | 774 | 758 | uS/cm | 800-1875 | 1000 | Yes |
| 13th February 2018 and 15th August 2018 | MW3 | COD | Microdigestion, colorimetry | Biannual | 26 | 14.25 | mg/l O2 | N/A | N/A | no |
| 13th February 2018 and 15th August 2018 | MW3 | Nitrate | Spectrophotometry | Biannual | 1.08 | 0.79 | mg/l NO3 | 37.5 | 25 | no |
| 13th February 2018 and 15th August 2018 | MW3 | Total Ammonia | Spectrophotometry | Biannual | 0.039 | 0.026 | mg/l as NH4 | N/A | 0.15 | no |
| 13th February 2018 and 15th August 2018 | MW3 | Total Nitrogen | Addition of TKN + TON | Biannual | 6 | 4 | mg/l N | N/A | N/A | no |
| 13th February 2018 and 15th August 2018 | MW3 | Chloride | Titration | Biannual | 36.5 | 32 | mg/l Cl | 24-187.5 | 30 | no |
| 13th February 2018 and 15th August 2018 | MW3 | Fluoride | Ion Selective Electrode | Biannual | 0.23 | 0.16 | mg/l F | N/A | 1 | no |
| 13th February 2018 and 15th August 2018 | MW3 | Sodium | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | 11.8 | 11.4 | mg/l | 150 | 150 | no |
| 13th February 2018 and 15th August 2018 | MW3 | Potassium | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | 2.08 | 1.895 | mg/l | N/A | 5 | no |
| 13th February 2018 and 15th August 2018 | MW3 | Orthophosphate | Spectrophotometry | Biannual | 0.07 | 0.065 | mg/l P | 0.035 | 0.03 | no |
| 13th February 2018 and 15th August 2018 | MW3 | Sulphate | Colorimetry | Biannual | 63.1 | 57.05 | mg/l | N/A | 200 | no |

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|---|---|---|---|---|---|---|---|---|---|---|
| 13th February 2018 and 15th August 2018 | MW3 | Chromium | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <2 | 1 | ug/l | 37.5 | 30 | no |
| 13th February 2018 and 15th August 2018 | MW3 | Copper | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <9 | 4.5 | ug/l | 1500 | 30 | no |
| 13th February 2018 and 15th August 2018 | MW3 | Lead | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <6 | 3 | ug/l | 18.75 | 10 | no |
| 13th February 2018 and 15th August 2018 | MW3 | Nickel | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <3 | 1.5 | ug/l | N/A | 20 | no |
| 13th February 2018 and 15th August 2018 | MW3 | Tin | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <7 | 3.5 | ug/l | N/A | N/A | no |
| 13th February 2018 and 15th August 2018 | MW3 | Arsenic | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <1 | 0.5 | ug/l | 7.5 | 10 | no |
| 13th February 2018 and 14th August 2018 | MW4 | pH | pH Electrode | Biannual | 7.46 | 7.33 | pH Units | N/A | ≥ 6.5 and ≤ 9.5 | Yes |
| 13th February 2018 and 14th August 2018 | MW4 | Conductivity | Conductivity Meter | Biannual | 1651 | 1464 | uS/cm | 800-1875 | 1000 | no |
| 13th February 2018 and 14th August 2018 | MW4 | COD | Microdigestion, colorimetry | Biannual | 8 | 6.5 | mg/l O2 | N/A | N/A | no |
| 13th February 2018 and 14th August 2018 | MW4 | Nitrate | Spectrophotometry | Biannual | 19.6 | 15.3 | mg/l NO3 | 37.5 | 25 | no |
| 13th February 2018 and 14th August 2018 | MW4 | Total Ammonia | Spectrophotometry | Biannual | 0.090 | 0.051 | mg/l as NH4 | N/A | 0.15 | no |
| 13th February 2018 and 14th August 2018 | MW4 | Total Nitrogen | Addition of TKN + TON | Biannual | 5.2 | 4.85 | mg/l N | N/A | N/A | no |
| 13th February 2018 and 14th August 2018 | MW4 | Chloride | Titration | Biannual | 112 | 90 | mg/l Cl | 24-187.5 | 30 | Yes |
| 13th February 2018 and 14th August 2018 | MW4 | Fluoride | Ion Selective Electrode | Biannual | 0.21 | 0.155 | mg/l F | N/A | 1 | no |
| 13th February 2018 and 14th August 2018 | MW4 | Sodium | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | 20.4 | 19.5 | mg/l | 150 | 150 | no |

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| 13th February 2018 and 14th August 2018 | MW4 | Potassium | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | 6.68 | 6.665 | mg/l | N/A | 5 | Yes |
| 13th February 2018 and 14th August 2018 | MW4 | Orthophosphate | Spectrophotometry | Biannual | 0.03 | 0.02 | mg/l P | 0.035 | 0.03 | no |
| 13th February 2018 and 14th August 2018 | MW4 | Sulphate | Colorimetry | Biannual | 512 | 415 | mg/l | N/A | 200 | no |
| 13th February 2018 and 14th August 2018 | MW4 | Chromium | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <2 | 1 | ug/l | 37.5 | 30 | no |
| 13th February 2018 and 14th August 2018 | MW4 | Copper | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <9 | 4.5 | ug/l | 1500 | 30 | no |
| 13th February 2018 and 14th August 2018 | MW4 | Lead | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <6 | 3 | ug/l | 18.75 | 10 | no |
| 13th February 2018 and 14th August 2018 | MW4 | Nickel | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | 5 | 3.25 | ug/l | N/A | 20 | no |
| 13th February 2018 and 14th August 2018 | MW4 | Tin | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <7 | 3.5 | ug/l | N/A | N/A | no |
| 13th February 2018 and 14th August 2018 | MW4 | Arsenic | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <1 | 0.5 | ug/l | 7.5 | 10 | no |
| 12th February 2018 and 14th August 2018 | MW5 | pH | pH Electrode | Biannual | 7.55 | 7.54 | pH Units | N/A | ≥ 6.5 and ≤ 9.5 | Yes |
| 12th February 2018 and 14th August 2018 | MW5 | Conductivity | Conductivity Meter | Biannual | 898 | 861 | uS/cm | 800-1875 | 1000 | no |
| 12th February 2018 and 14th August 2018 | MW5 | COD | Microdigestion, colorimetry | Biannual | 21 | 11.75 | mg/l O2 | N/A | N/A | no |
| 12th February 2018 and 14th August 2018 | MW5 | Nitrate | Spectrophotometry | Biannual | 1.54 | 1.02 | mg/l NO3 | 37.5 | 25 | no |
| 12th February 2018 and 14th August 2018 | MW5 | Total Ammonia | Spectrophotometry | Biannual | 0.065 | 0.040 | mg/l as NH4 | N/A | 0.15 | no |
| 12th February 2018 and 14th August 2018 | MW5 | Total Nitrogen | Addition of TKN + TON | Biannual | 1.9 | 1.45 | mg/l N | N/A | N/A | no |
| 12th February 2018 and 14th August 2018 | MW5 | Chloride | Titration | Biannual | 40.4 | 37.7 | mg/l Cl | 24-187.5 | 30 | no |

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|---|---|---|---|---|---|---|---|---|---|---|
| 12th February 2018 and 14th August 2018 | MW5 | Fluoride | Ion Selective Electrode | Biannual | 0.51 | 0.425 | mg/l F | N/A | 1 | no |
| 12th February 2018 and 14th August 2018 | MW5 | Sodium | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | 19.3 | 18.7 | mg/l | 150 | 150 | no |
| 12th February 2018 and 14th August 2018 | MW5 | Potassium | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | 5.43 | 5.18 | mg/l | N/A | 5 | Yes |
| 12th February 2018 and 14th August 2018 | MW5 | Orthophosphate | Spectrophotometry | Biannual | 0.01 | 0.01 | mg/l P | 0.035 | 0.03 | no |
| 12th February 2018 and 14th August 2018 | MW5 | Sulphate | Colorimetry | Biannual | 139 | 137 | mg/l | N/A | 200 | no |
| 12th February 2018 and 14th August 2018 | MW5 | Chromium | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <2 | 1 | ug/l | 37.5 | 30 | no |
| 12th February 2018 and 14th August 2018 | MW5 | Copper | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <9 | 4.5 | ug/l | 1500 | 30 | no |
| 12th February 2018 and 14th August 2018 | MW5 | Lead | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <6 | 3 | ug/l | 18.75 | 10 | no |
| 12th February 2018 and 14th August 2018 | MW5 | Nickel | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <3 | 1.5 | ug/l | N/A | 20 | no |
| 12th February 2018 and 14th August 2018 | MW5 | Tin | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | 19 | 11.25 | ug/l | N/A | N/A | no |
| 12th February 2018 and 14th August 2018 | MW5 | Arsenic | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <1 | 0.5 | ug/l | 7.5 | 10 | no |
| 14th February 2018 and 16th August 2018 | MW10 | pH | pH Electrode | Biannual | 7.2 | 7.16 | pH Units | N/A | ≥ 6.5 and ≤ 9.5 | no |
| 14th February 2018 and 16th August 2018 | MW10 | Conductivity | Conductivity Meter | Biannual | 813 | 791.5 | uS/cm | 800-1875 | 1000 | no |
| 14th February 2018 and 16th August 2018 | MW10 | COD | Microdigestion, colorimetry | Biannual | 2.5 | 2.5 | mg/l O2 | N/A | N/A | no |
| 14th February 2018 and 16th August 2018 | MW10 | Nitrate | Spectrophotometry | Biannual | 1.6 | 1.05 | mg/l NO3 | 37.5 | 25 | no |

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|---|---|---|---|---|---|---|---|---|---|---|
| 14th February 2018 and 16th August 2018 | MW10 | Total Ammonia | Spectrophotometry | Biannual | 0.1 | 0.058 | mg/l as NH4 | N/A | 0.15 | no |
| 14th February 2018 and 16th August 2018 | MW10 | Total Nitrogen | Addition of TKN + TON | Biannual | 1.9 | 1.35 | mg/l N | N/A | N/A | no |
| 14th February 2018 and 16th August 2018 | MW10 | Chloride | Titration | Biannual | 42.2 | 37.35 | mg/l Cl | 24-187.5 | 30 | no |
| 14th February 2018 and 16th August 2018 | MW10 | Fluoride | Ion Selective Electrode | Biannual | 0.19 | 0.145 | mg/l F | N/A | 1 | no |
| 14th February 2018 and 16th August 2018 | MW10 | Sodium | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | 13.2 | 12.5 | mg/l | 150 | 150 | no |
| 14th February 2018 and 16th August 2018 | MW10 | Potassium | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | 2.13 | 1.98 | mg/l | N/A | 5 | no |
| 14th February 2018 and 16th August 2018 | MW10 | Orthophosphate | Spectrophotometry | Biannual | 0.01 | 0.01 | mg/l P | 0.035 | 0.03 | no |
| 14th February 2018 and 16th August 2018 | MW10 | Sulphate | Colorimetry | Biannual | 73.5 | 63.05 | mg/l | N/A | 200 | no |
| 14th February 2018 and 16th August 2018 | MW10 | Chromium | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <2 | 1 | ug/l | 37.5 | 30 | no |
| 14th February 2018 and 16th August 2018 | MW10 | Copper | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <9 | 4.5 | ug/l | 1500 | 30 | no |
| 14th February 2018 and 16th August 2018 | MW10 | Lead | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <6 | 3 | ug/l | 18.75 | 10 | no |
| 14th February 2018 and 16th August 2018 | MW10 | Nickel | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <3 | 1.5 | ug/l | N/A | 20 | no |
| 14th February 2018 and 16th August 2018 | MW10 | Tin | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | 13 | 8.25 | ug/l | N/A | N/A | no |
| 14th February 2018 and 16th August 2018 | MW10 | Arsenic | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <1 | 0.5 | ug/l | 7.5 | 10 | no |
| 14th February 2018 and 16th August 2018 | MW11 | pH | pH Electrode | Biannual | 7.35 | 7.28 | pH Units | N/A | ≥ 6.5 and ≤ 9.5 | no |

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|---|---|---|---|---|---|---|---|---|---|---|
| 14th February 2018 and 16th August 2018 | MW11 | Conductivity | Conductivity Meter | Biannual | 988 | 968 | uS/cm | 800-1875 | 1000 | Yes |
| 14th February 2018 and 16th August 2018 | MW11 | COD | Microdigestion, colorimetry | Biannual | 14 | 8.25 | mg/l O2 | N/A | N/A | no |
| 14th February 2018 and 16th August 2018 | MW11 | Nitrate | Spectrophotometry | Biannual | 2.18 | 1.81 | mg/l NO3 | 37.5 | 25 | no |
| 14th February 2018 and 16th August 2018 | MW11 | Total Ammonia | Spectrophotometry | Biannual | 0.168 | 0.104 | mg/l as NH4 | N/A | 0.15 | no |
| 14th February 2018 and 16th August 2018 | MW11 | Total Nitrogen | Addition of TKN + TON | Biannual | 3.3 | 2.15 | mg/l N | N/A | N/A | no |
| 14th February 2018 and 16th August 2018 | MW11 | Chloride | Titration | Biannual | 72.5 | 59.9 | mg/l Cl | 24-187.5 | 30 | no |
| 14th February 2018 and 16th August 2018 | MW11 | Fluoride | Ion Selective Electrode | Biannual | 0.27 | 0.185 | mg/l F | N/A | 1 | no |
| 14th February 2018 and 16th August 2018 | MW11 | Sodium | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | 16.4 | 16.2 | mg/l | 150 | 150 | no |
| 14th February 2018 and 16th August 2018 | MW11 | Potassium | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | 2.89 | 2.775 | mg/l | N/A | 5 | no |
| 14th February 2018 and 16th August 2018 | MW11 | Orthophosphate | Spectrophotometry | Biannual | 0.02 | 0.015 | mg/l P | 0.035 | 0.03 | no |
| 14th February 2018 and 16th August 2018 | MW11 | Sulphate | Colorimetry | Biannual | 114.2 | 111.6 | mg/l | N/A | 200 | Yes |
| 14th February 2018 and 16th August 2018 | MW11 | Chromium | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <2 | 1 | ug/l | 37.5 | 30 | no |
| 14th February 2018 and 16th August 2018 | MW11 | Copper | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <9 | 4.5 | ug/l | 1500 | 30 | no |
| 14th February 2018 and 16th August 2018 | MW11 | Lead | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <6 | 3 | ug/l | 18.75 | 10 | no |
| 14th February 2018 and 16th August 2018 | MW11 | Nickel | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | 3 | 2.25 | ug/l | N/A | 20 | no |
| 14th February 2018 and 16th August 2018 | MW11 | Tin | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <7 | 3.5 | ug/l | N/A | N/A | no |

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|---|---|---|---|---|---|---|---|---|---|---|
| 14th February 2018 and 16th August 2018 | MW11 | Arsenic | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <1 | 0.5 | ug/l | 7.5 | 10 | no |
| 14th February 2018 and 16th August 2018 | MW12 | pH | pH Electrode | Biannual | 7.17 | 7.09 | pH Units | N/A | ≥ 6.5 and ≤ 9.5 | no |
| 14th February 2018 and 16th August 2018 | MW12 | Conductivity | Conductivity Meter | Biannual | 742 | 740.5 | uS/cm | 800-1875 | 1000 | Yes |
| 14th February 2018 and 16th August 2018 | MW12 | COD | Microdigestion, colorimetry | Biannual | 8 | 7.5 | mg/l O2 | N/A | N/A | no |
| 14th February 2018 and 16th August 2018 | MW12 | Nitrate | Spectrophotometry | Biannual | 1.68 | 1.09 | mg/l NO3 | 37.5 | 25 | no |
| 14th February 2018 and 16th August 2018 | MW12 | Total Ammonia | Spectrophotometry | Biannual | 0.052 | 0.032 | mg/l as NH4 | N/A | 0.15 | no |
| 14th February 2018 and 16th August 2018 | MW12 | Total Nitrogen | Addition of TKN + TON | Biannual | 5 | 3.3 | mg/l N | N/A | N/A | no |
| 14th February 2018 and 16th August 2018 | MW12 | Chloride | Titration | Biannual | 55 | 46.7 | mg/l Cl | 24-187.5 | 30 | no |
| 14th February 2018 and 16th August 2018 | MW12 | Fluoride | Ion Selective Electrode | Biannual | 0.4 | 0.395 | mg/l F | N/A | 1 | no |
| 14th February 2018 and 16th August 2018 | MW12 | Sodium | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | 12.9 | 12.7 | mg/l | 150 | 150 | no |
| 14th February 2018 and 16th August 2018 | MW12 | Potassium | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | 3.05 | 2.975 | mg/l | N/A | 5 | no |
| 14th February 2018 and 16th August 2018 | MW12 | Orthophosphate | Spectrophotometry | Biannual | 0.08 | 0.045 | mg/l P | 0.035 | 0.03 | no |
| 14th February 2018 and 16th August 2018 | MW12 | Sulphate | Colorimetry | Biannual | 52.4 | 50.9 | mg/l | N/A | 200 | Yes |
| 14th February 2018 and 16th August 2018 | MW12 | Chromium | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <2 | 1 | ug/l | 37.5 | 30 | no |
| 14th February 2018 and 16th August 2018 | MW12 | Copper | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <9 | 4.5 | ug/l | 1500 | 30 | no |
| 14th February 2018 and 16th August 2018 | MW12 | Lead | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <6 | 3 | ug/l | 18.75 | 10 | no |

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|---|---|---|---|---|---|---|---|---|---|---|
| 14th February 2018 and 16th August 2018 | MW12 | Nickel | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <3 | 1.5 | ug/l | N/A | 20 | no |
| 14th February 2018 and 16th August 2018 | MW12 | Tin | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | 9 | 6.25 | ug/l | N/A | N/A | no |
| 14th February 2018 and 16th August 2018 | MW12 | Arsenic | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <1 | 0.5 | ug/l | 7.5 | 10 | no |
| 12th February 2018 and 14th August 2018 | MW14A | pH | pH Electrode | Biannual | 7.5 | 7.41 | pH Units | N/A | ≥ 6.5 and ≤ 9.5 | no |
| 12th February 2018 and 14th August 2018 | MW14A | Conductivity | Conductivity Meter | Biannual | 863 | 861.5 | uS/cm | 800-1875 | 1000 | no |
| 12th February 2018 and 14th August 2018 | MW14A | COD | Microdigestion, colorimetry | Biannual | 2.5 | 2.5 | mg/l O2 | N/A | N/A | no |
| 12th February 2018 and 14th August 2018 | MW14A | Nitrate | Spectrophotometry | Biannual | 1.56 | 1.03 | mg/l NO3 | 37.5 | 25 | no |
| 12th February 2018 and 14th August 2018 | MW14A | Total Ammonia | Spectrophotometry | Biannual | 0.090 | 0.071 | mg/l as NH4 | N/A | 0.15 | no |
| 12th February 2018 and 14th August 2018 | MW14A | Total Nitrogen | Addition of TKN + TON | Biannual | 2 | 1.95 | mg/l N | N/A | N/A | no |
| 12th February 2018 and 14th August 2018 | MW14A | Chloride | Titration | Biannual | 100 | 91.25 | mg/l Cl | 24-187.5 | 30 | Yes |
| 12th February 2018 and 14th August 2018 | MW14A | Fluoride | Ion Selective Electrode | Biannual | 0.18 | 0.145 | mg/l F | N/A | 1 | no |
| 12th February 2018 and 14th August 2018 | MW14A | Sodium | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | 41.1 | 37.25 | mg/l | 150 | 150 | Yes |
| 12th February 2018 and 14th August 2018 | MW14A | Potassium | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | 3.92 | 2.66 | mg/l | N/A | 5 | no |
| 12th February 2018 and 14th August 2018 | MW14A | Orthophosphate | Spectrophotometry | Biannual | 0.03 | 0.02 | mg/l P | 0.035 | 0.03 | no |
| 12th February 2018 and 14th August 2018 | MW14A | Sulphate | Colorimetry | Biannual | 41.3 | 39.3 | mg/l | N/A | 200 | Yes |
| 12th February 2018 and 14th August 2018 | MW14A | Chromium | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <2 | 1 | ug/l | 37.5 | 30 | no |

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|---|---|---|---|---|---|---|---|---|---|---|
| 12th February 2018 and 14th August 2018 | MW14A | Copper | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <9 | 4.5 | ug/l | 1500 | 30 | no |
| 12th February 2018 and 14th August 2018 | MW14A | Lead | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <6 | 3 | ug/l | 18.75 | 10 | no |
| 12th February 2018 and 14th August 2018 | MW14A | Nickel | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <3 | 1.5 | ug/l | N/A | 20 | no |
| 12th February 2018 and 14th August 2018 | MW14A | Tin | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | 16 | 12.5 | ug/l | N/A | N/A | no |
| 12th February 2018 and 14th August 2018 | MW14A | Arsenic | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <1 | 0.5 | ug/l | 7.5 | 10 | no |
| 12th February 2018 and 14th August 2018 | MW15 | pH | pH Electrode | Biannual | 7.06 | 6.96 | pH Units | N/A | ≥ 6.5 and ≤ 9.5 | no |
| 12th February 2018 and 14th August 2018 | MW15 | Conductivity | Conductivity Meter | Biannual | 1070 | 1041 | uS/cm | 800-1875 | 1000 | no |
| 12th February 2018 and 14th August 2018 | MW15 | COD | Microdigestion, colorimetry | Biannual | 14 | 11.25 | mg/l O2 | N/A | N/A | no |
| 12th February 2018 and 14th August 2018 | MW15 | Nitrate | Spectrophotometry | Biannual | 1.04 | 0.77 | mg/l NO3 | 37.5 | 25 | no |
| 12th February 2018 and 14th August 2018 | MW15 | Total Ammonia | Spectrophotometry | Biannual | 0.052 | 0.052 | mg/l as NH4 | N/A | 0.15 | no |
| 12th February 2018 and 14th August 2018 | MW15 | Total Nitrogen | Addition of TKN + TON | Biannual | 3 | 2.6 | mg/l N | N/A | N/A | no |
| 12th February 2018 and 14th August 2018 | MW15 | Chloride | Titration | Biannual | 47.3 | 46.15 | mg/l Cl | 24-187.5 | 30 | no |
| 12th February 2018 and 14th August 2018 | MW15 | Fluoride | Ion Selective Electrode | Biannual | 0.14 | 0.115 | mg/l F | N/A | 1 | no |
| 12th February 2018 and 14th August 2018 | MW15 | Sodium | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | 18.6 | 18.2 | mg/l | 150 | 150 | no |
| 12th February 2018 and 14th August 2018 | MW15 | Potassium | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | 2.62 | 2.385 | mg/l | N/A | 5 | no |
| 12th February 2018 and 14th August 2018 | MW15 | Orthophosphate | Spectrophotometry | Biannual | 0.01 | 0.01 | mg/l P | 0.035 | 0.03 | no |

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|---|---|---|---|---|---|---|---|---|---|---|
| 12th February 2018 and 14th August 2018 | MW15 | Sulphate | Colorimetry | Biannual | 256 | 252 | mg/l | N/A | 200 | no |
| 12th February 2018 and 14th August 2018 | MW15 | Chromium | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <2 | 1 | ug/l | 37.5 | 30 | no |
| 12th February 2018 and 14th August 2018 | MW15 | Copper | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <9 | 4.5 | ug/l | 1500 | 30 | no |
| 12th February 2018 and 14th August 2018 | MW15 | Lead | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <6 | 3 | ug/l | 18.75 | 10 | no |
| 12th February 2018 and 14th August 2018 | MW15 | Nickel | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <3 | 1.5 | ug/l | N/A | 20 | no |
| 12th February 2018 and 14th August 2018 | MW15 | Tin | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <7 | 3.5 | ug/l | N/A | N/A | no |
| 12th February 2018 and 14th August 2018 | MW15 | Arsenic | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <1 | 0.5 | ug/l | 7.5 | 10 | no |
| 12th February 2018 and 14th August 2018 | MW16 | pH | pH Electrode | Biannual | 6.95 | 6.84 | pH Units | N/A | ≥ 6.5 and ≤ 9.5 | no |
| 12th February 2018 and 14th August 2018 | MW16 | Conductivity | Conductivity Meter | Biannual | 1386 | 1373.5 | uS/cm | 800-1875 | 1000 | no |
| 12th February 2018 and 14th August 2018 | MW16 | COD | Microdigestion, colorimetry | Biannual | 72 | 39.5 | mg/l O2 | N/A | N/A | no |
| 12th February 2018 and 14th August 2018 | MW16 | Nitrate | Spectrophotometry | Biannual | 17.6 | 16.4 | mg/l NO3 | 37.5 | 25 | no |
| 12th February 2018 and 14th August 2018 | MW16 | Total Ammonia | Spectrophotometry | Biannual | 0.077 | 0.071 | mg/l as NH4 | N/A | 0.15 | no |
| 12th February 2018 and 14th August 2018 | MW16 | Total Nitrogen | Addition of TKN + TON | Biannual | 9 | 7.35 | mg/l N | N/A | N/A | no |
| 12th February 2018 and 14th August 2018 | MW16 | Chloride | Titration | Biannual | 188 | 141.2 | mg/l Cl | 24-187.5 | 30 | no |
| 12th February 2018 and 14th August 2018 | MW16 | Fluoride | Ion Selective Electrode | Biannual | 0.23 | 0.21 | mg/l F | N/A | 1 | no |
| 12th February 2018 and 14th August 2018 | MW16 | Sodium | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | 34.5 | 30.4 | mg/l | 150 | 150 | no |

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|---|---|---|---|---|---|---|---|---|---|---|
| 12th February 2018 and 14th August 2018 | MW16 | Potassium | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | 27.7 | 18.815 | mg/l | N/A | 5 | Yes |
| 12th February 2018 and 14th August 2018 | MW16 | Orthophosphate | Spectrophotometry | Biannual | 0.1 | 0.055 | mg/l P | 0.035 | 0.03 | no |
| 12th February 2018 and 14th August 2018 | MW16 | Sulphate | Colorimetry | Biannual | 498 | 360.5 | mg/l | N/A | 200 | no |
| 12th February 2018 and 14th August 2018 | MW16 | Chromium | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <2 | 1 | ug/l | 37.5 | 30 | no |
| 12th February 2018 and 14th August 2018 | MW16 | Copper | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <9 | 4.5 | ug/l | 1500 | 30 | no |
| 12th February 2018 and 14th August 2018 | MW16 | Lead | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | 9 | 6 | ug/l | 18.75 | 10 | no |
| 12th February 2018 and 14th August 2018 | MW16 | Nickel | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | 20 | 10.75 | ug/l | N/A | 20 | no |
| 12th February 2018 and 14th August 2018 | MW16 | Tin | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | 14 | 13.5 | ug/l | N/A | N/A | no |
| 12th February 2018 and 14th August 2018 | MW16 | Arsenic | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <1 | 0.5 | ug/l | 7.5 | 10 | no |
| 13th February 2018 and 15th August 2018 | MW17 | pH | pH Electrode | Biannual | 7.35 | 7.295 | pH Units | N/A | ≥ 6.5 and ≤ 9.5 | no |
| 13th February 2018 and 15th August 2018 | MW17 | Conductivity | Conductivity Meter | Biannual | 1030 | 1015 | uS/cm | 800-1875 | 1000 | no |
| 13th February 2018 and 15th August 2018 | MW17 | COD | Microdigestion, colorimetry | Biannual | 2.5 | 2.5 | mg/l O2 | N/A | N/A | no |
| 13th February 2018 and 15th August 2018 | MW17 | Nitrate | Spectrophotometry | Biannual | 0.5 | 0.5 | mg/l NO3 | 37.5 | 25 | no |
| 13th February 2018 and 15th August 2018 | MW17 | Total Ammonia | Spectrophotometry | Biannual | 0.193 | 0.129 | mg/l as NH4 | N/A | 0.15 | no |
| 13th February 2018 and 15th August 2018 | MW17 | Total Nitrogen | Addition of TKN + TON | Biannual | 0.15 | 0.1 | mg/l N | N/A | N/A | no |
| 13th February 2018 and 15th August 2018 | MW17 | Chloride | Titration | Biannual | 42.5 | 40.45 | mg/l Cl | 24-187.5 | 30 | no |

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|---|---|---|---|---|---|---|---|---|---|---|
| 13th February 2018 and 15th August 2018 | MW17 | Fluoride | Ion Selective Electrode | Biannual | 0.25 | 0.25 | mg/l F | N/A | 1 | no |
| 13th February 2018 and 15th August 2018 | MW17 | Sodium | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | 17.1 | 16.45 | mg/l | 150 | 150 | no |
| 13th February 2018 and 15th August 2018 | MW17 | Potassium | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | 3.28 | 3.125 | mg/l | N/A | 5 | no |
| 13th February 2018 and 15th August 2018 | MW17 | Orthophosphate | Spectrophotometry | Biannual | 0.06 | 0.035 | mg/l P | 0.035 | 0.03 | no |
| 13th February 2018 and 15th August 2018 | MW17 | Sulphate | Colorimetry | Biannual | 268 | 243.5 | mg/l | N/A | 200 | no |
| 13th February 2018 and 15th August 2018 | MW17 | Chromium | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <2 | 1 | ug/l | 37.5 | 30 | no |
| 13th February 2018 and 15th August 2018 | MW17 | Copper | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <9 | 4.5 | ug/l | 1500 | 30 | no |
| 13th February 2018 and 15th August 2018 | MW17 | Lead | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <6 | 3 | ug/l | 18.75 | 10 | no |
| 13th February 2018 and 15th August 2018 | MW17 | Nickel | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | 13 | 7.25 | ug/l | N/A | 20 | no |
| 13th February 2018 and 15th August 2018 | MW17 | Tin | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <7 | 3.5 | ug/l | N/A | N/A | no |
| 13th February 2018 and 15th August 2018 | MW17 | Arsenic | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <1 | 0.5 | ug/l | 7.5 | 10 | no |
| 14th February 2018 and 15th August 2018 | MW18 | pH | pH Electrode | Biannual | 7.03 | 7.02 | pH Units | N/A | ≥ 6.5 and ≤ 9.5 | no |
| 14th February 2018 and 15th August 2018 | MW18 | Conductivity | Conductivity Meter | Biannual | 373 | 371 | uS/cm | 800-1875 | 1000 | no |
| 14th February 2018 and 15th August 2018 | MW18 | COD | Microdigestion, colorimetry | Biannual | 29 | 24.5 | mg/l O2 | N/A | N/A | no |
| 14th February 2018 and 15th August 2018 | MW18 | Nitrate | Spectrophotometry | Biannual | 3.41 | 3.155 | mg/l NO3 | 37.5 | 25 | no |

| Groundwater/Soil monitoring template | | | | | Lic No: | P0207-04 | | Year | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|
| 14th February 2018 and 15th August 2018 | MW18 | Total Ammonia | Spectrophotometry | Biannual | 0.039 | 0.039 | mg/l as NH4 | N/A | 0.15 | no |
| 14th February 2018 and 15th August 2018 | MW18 | Total Nitrogen | Addition of TKN + TON | Biannual | 5.8 | 3.75 | mg/l N | N/A | N/A | Yes |
| 14th February 2018 and 15th August 2018 | MW18 | Chloride | Titration | Biannual | 36.5 | 22 | mg/l Cl | 24-187.5 | 30 | no |
| 14th February 2018 and 15th August 2018 | MW18 | Fluoride | Ion Selective Electrode | Biannual | 0.42 | 0.365 | mg/l F | N/A | 1 | no |
| 14th February 2018 and 15th August 2018 | MW18 | Sodium | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | 6.38 | 5.65 | mg/l | 150 | 150 | no |
| 14th February 2018 and 15th August 2018 | MW18 | Potassium | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | 8.55 | 6.365 | mg/l | N/A | 5 | Yes |
| 14th February 2018 and 15th August 2018 | MW18 | Orthophosphate | Spectrophotometry | Biannual | 0.02 | 0.015 | mg/l P | 0.035 | 0.03 | no |
| 14th February 2018 and 15th August 2018 | MW18 | Sulphate | Colorimetry | Biannual | 18.3 | 17.65 | mg/l | N/A | 200 | no |
| 14th February 2018 and 15th August 2018 | MW18 | Chromium | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <2 | 1 | ug/l | 37.5 | 30 | no |
| 14th February 2018 and 15th August 2018 | MW18 | Copper | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <9 | 4.5 | ug/l | 1500 | 30 | no |
| 14th February 2018 and 15th August 2018 | MW18 | Lead | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <6 | 3 | ug/l | 18.75 | 10 | no |
| 14th February 2018 and 15th August 2018 | MW18 | Nickel | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <3 | 1.5 | ug/l | N/A | 20 | no |
| 14th February 2018 and 15th August 2018 | MW18 | Tin | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <7 | 3.5 | ug/l | N/A | N/A | no |
| 14th February 2018 and 15th August 2018 | MW18 | Arsenic | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <1 | 0.5 | ug/l | 7.5 | 10 | no |
| 14th February 2018 and 16th August 2018 | MW19 | pH | pH Electrode | Biannual | 7.06 | 7.04 | pH Units | N/A | ≥ 6.5 and ≤ 9.5 | no |

| Groundwater/Soil monitoring template | | | | | Lic No: | P0207-04 | | Year | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|
| 14th February 2018 and 16th August 2018 | MW19 | Conductivity | Conductivity Meter | Biannual | 1023 | 998 | uS/cm | 800-1875 | 1000 | Yes |
| 14th February 2018 and 16th August 2018 | MW19 | COD | Microdigestion, colorimetry | Biannual | 2.5 | 2.5 | mg/l O2 | N/A | N/A | no |
| 14th February 2018 and 16th August 2018 | MW19 | Nitrate | Spectrophotometry | Biannual | 12.4 | 9.37 | mg/l NO3 | 37.5 | 25 | no |
| 14th February 2018 and 16th August 2018 | MW19 | Total Ammonia | Spectrophotometry | Biannual | 0.039 | 0.032 | mg/l as NH4 | N/A | 0.15 | no |
| 14th February 2018 and 16th August 2018 | MW19 | Total Nitrogen | Addition of TKN + TON | Biannual | 8.8 | 5.5 | mg/l N | N/A | N/A | no |
| 14th February 2018 and 16th August 2018 | MW19 | Chloride | Titration | Biannual | 121 | 101.9 | mg/l Cl | 24-187.5 | 30 | Yes |
| 14th February 2018 and 16th August 2018 | MW19 | Fluoride | Ion Selective Electrode | Biannual | 0.26 | 0.24 | mg/l F | N/A | 1 | no |
| 14th February 2018 and 16th August 2018 | MW19 | Sodium | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | 25.4 | 22.65 | mg/l | 150 | 150 | no |
| 14th February 2018 and 16th August 2018 | MW19 | Potassium | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | 6.54 | 5.48 | mg/l | N/A | 5 | Yes |
| 14th February 2018 and 16th August 2018 | MW19 | Orthophosphate | Spectrophotometry | Biannual | 0.03 | 0.02 | mg/l P | 0.035 | 0.03 | no |
| 14th February 2018 and 16th August 2018 | MW19 | Sulphate | Colorimetry | Biannual | 111 | 106 | mg/l | N/A | 200 | no |
| 14th February 2018 and 16th August 2018 | MW19 | Chromium | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <2 | 1 | ug/l | 37.5 | 30 | no |
| 14th February 2018 and 16th August 2018 | MW19 | Copper | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <9 | 4.5 | ug/l | 1500 | 30 | no |
| 14th February 2018 and 16th August 2018 | MW19 | Lead | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <6 | 3 | ug/l | 18.75 | 10 | no |
| 14th February 2018 and 16th August 2018 | MW19 | Nickel | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | 5 | 4 | ug/l | N/A | 20 | no |
| 14th February 2018 and 16th August 2018 | MW19 | Tin | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <7 | 3.5 | ug/l | N/A | N/A | no |

| Groundwater/Soil monitoring template | | | | | Lic No: | P0207-04 | | Year | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|
| 14th February 2018 and 16th August 2018 | MW19 | Arsenic | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <1 | 0.5 | ug/l | 7.5 | 10 | no |
| 13th February 2018 and 15th August 2018 | MW20 | pH | pH Electrode | Biannual | 7.31 | 7.255 | pH Units | N/A | ≥ 6.5 and ≤ 9.5 | Yes |
| 13th February 2018 and 15th August 2018 | MW20 | Conductivity | Conductivity Meter | Biannual | 837 | 825 | uS/cm | 800-1875 | 1000 | Yes |
| 13th February 2018 and 15th August 2018 | MW20 | COD | Microdigestion, colorimetry | Biannual | 6 | 4.25 | mg/l O2 | N/A | N/A | no |
| 13th February 2018 and 15th August 2018 | MW20 | Nitrate | Spectrophotometry | Biannual | 14.7 | 9.27 | mg/l NO3 | 37.5 | 25 | no |
| 13th February 2018 and 15th August 2018 | MW20 | Total Ammonia | Spectrophotometry | Biannual | 0.077 | 0.065 | mg/l as NH4 | N/A | 0.15 | no |
| 13th February 2018 and 15th August 2018 | MW20 | Total Nitrogen | Addition of TKN + TON | Biannual | 5.9 | 5.25 | mg/l N | N/A | N/A | no |
| 13th February 2018 and 15th August 2018 | MW20 | Chloride | Titration | Biannual | 42.4 | 38.7 | mg/l Cl | 24-187.5 | 30 | no |
| 13th February 2018 and 15th August 2018 | MW20 | Fluoride | Ion Selective Electrode | Biannual | 0.13 | 0.13 | mg/l F | N/A | 1 | no |
| 13th February 2018 and 15th August 2018 | MW20 | Sodium | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | 16.9 | 16.3 | mg/l | 150 | 150 | no |
| 13th February 2018 and 15th August 2018 | MW20 | Potassium | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | 1.54 | 1.4 | mg/l | N/A | 5 | no |
| 13th February 2018 and 15th August 2018 | MW20 | Orthophosphate | Spectrophotometry | Biannual | 0.01 | 0.01 | mg/l P | 0.035 | 0.03 | no |
| 13th February 2018 and 15th August 2018 | MW20 | Sulphate | Colorimetry | Biannual | 39.2 | 34.5 | mg/l | N/A | 200 | no |
| 13th February 2018 and 15th August 2018 | MW20 | Chromium | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <2 | 1 | ug/l | 37.5 | 30 | no |
| 13th February 2018 and 15th August 2018 | MW20 | Copper | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <9 | 4.5 | ug/l | 1500 | 30 | no |
| 13th February 2018 and 15th August 2018 | MW20 | Lead | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <6 | 3 | ug/l | 18.75 | 10 | no |

| Groundwater/Soil monitoring template | | | | | Lic No: | P0207-04 | | Year | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|
| 13th February 2018 and 15th August 2018 | MW20 | Nickel | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <3 | 1.5 | ug/l | N/A | 20 | no |
| 13th February 2018 and 15th August 2018 | MW20 | Tin | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | 12 | 7.75 | ug/l | N/A | N/A | no |
| 13th February 2018 and 15th August 2018 | MW20 | Arsenic | ICP / ICPMS (Inductively Coupled Plasma - Mass Spectrometry) | Biannual | <1 | 0.5 | ug/l | 7.5 | 10 | no |
| *please note exceedance of generic assessment criteria (GAC) such as a Groundwater Threshold Value (GTV) or an Interim Guideline Value (IGV) or an upward trend in results for a substance indicates that further interpretation of monitoring results is required. In addition to completing the above table, please complete the Groundwater Monitoring Guideline Template Report at the link provided and submit separately through ALDER as a licensee return or as otherwise instructed by the EPA. | | | | | | | | Groundwater monitoring template | | |
| More information on the use of soil and groundwater standards/ generic assessment criteria (GAC) and risk assessment tools is available in the EPA published guidance (see the link in G31) | | | | | Guidance on the Management of Contaminated Land and Groundwater at EPA Licensed Sites (EPA 2013). | | | | | |
| **Depending on location of the site and proximity to other sensitive receptors alternative Receptor based Water Quality standards should be used in addition to the GTV e.g. if the site is close to surface water compare to Surface Water Environmental Quality Standards (SWEQS), If the site is close to a drinking water supply compare results to the Drinking Water Standards (DWS) | | | | | | | | Surface water EQS | Groundwater regulations GTV's | Drinking water (private supply) standards |

| Groundwater/Soil monitoring template | Lic No: | P0207-04 | Year | 2018 |
|---|---|---|---|---|

**Table 3: Soil results**

| Date of sampling | Sample location reference | Parameter/ Substance | Methodology | Monitoring frequency | Maximum Concentration | Average Concentration | unit |
|---|---|---|---|---|---|---|---|
| N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |

Where additional detail is required please enter it here in 200 words or less.

| Bund/Pipeline testing template | | Lic No: | P0207-04 | Year: 2018 |
|---|---|---|---|---|
| Bund testing | dropdown menu click to see options | | | Additional information |
| 1 | Are you required by your licence to undertake integrity testing on bunds and containment structures ? if yes please fill out table B1 below listing all **new bunds and containment structures** on site, in addition to **all bunds which failed** the integrity test-**all bunding structures which failed including mobile bunds must be listed in the table below, please include all bunds outside the licenced testing period** (mobile bunds and chemstore included) | | Yes | |
| 2 | Please provide integrity testing frequency period | | 3 years | |
| 3 | Does the site maintain a register of bunds, underground pipelines (including stormwater and foul), Tanks, sumps and containers? (containers refers to "Chemstore" type units and mobile bunds) | | Yes | |
| 4 | How many bunds are on site? | | 105 | |
| 5 | How many of these bunds have been tested within the required test schedule? | | 105 | |
| 6 | How many mobile bunds are on site? | | 86 | |
| 7 | Are the mobile bunds included in the bund test schedule? | | Yes | |
| 8 | How many of these mobile bunds have been tested within the required test schedule? | | 86 | |
| 9 | How many sumps on site are included in the integrity test schedule? | | 15 | Sumps in this case is taken to mean sumps that are not part of a bund e.g. chemical offload sumps. |
| 10 | How many of these sumps are integrity tested within the test schedule? | | 15 | |
| | **Please list any sump integrity failures in table B1** | | | |
| 11 | Do all sumps and chambers have high level liquid alarms? | | Yes | There are some sumps on-site that are used to contain chemical offloads which do not have high level liquid alarms. These sumps are open to the storm water system unless there is a chemical transfer occuring in which case they are closed. |
| 12 | If yes to Q11 are these failsafe systems included in a maintenance and testing programme? | | Yes | All failsafe systems are subject to a maintenance and testing programme with the exception of the effluent balance tank which has two liquid levels sensors with a differential alarm which triggers maintenance. |
| 13 | Is the Fire Water Retention Pond included in your integrity test programme? | | Yes | |

**Table B1:** Summary details of bund /containment structure integrity test

| Bund/Containment structure ID | Type | Specify Other type | Product containment | Actual capacity | Capacity required* | Type of integrity test | Other test type | Test date | Integrity reports maintained on site? | Results of test | Integrity test failure explanation <50 words | Corrective action taken | Scheduled date for retest | Results of retest (if in current reporting year) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bund no. 58 | general purpose concrete/masonry | | Slurry Copper Waste | 180 $m^3$ | 67.2 $m^3$ | Structural assessment | | 14/11/2018 | Yes | Fail | Small areas of damage to chemical resistant coating | Chemical resistant coating (CRC) will be repaired when the ambient temperature reaches the required level to cure the CRC | May-19 | N/A |
| Bund no. 63 | general purpose concrete/masonry | | Hydrochloric Acid | 56 $m^3$ | 11.2 $m^3$ | Structural assessment | | 14/11/2018 | Yes | Fail | Small areas of damage to chemical resistant coating | Chemical resistant coating (CRC) will be repaired when the ambient temperature reaches the required level to cure the CRC | May-19 | N/A |
| Bund no. 68a | general purpose concrete/masonry | | Ammonia Wastewater | 384 $m^3$ | 77 $m^3$ | Structural assessment | | 14/11/2018 | Yes | Fail | Small areas of damage to chemical resistant coating | Chemical resistant coating (CRC) will be repaired when the ambient temperature reaches the required level to cure the CRC | May-19 | N/A |
| Bund no. 68b | general purpose concrete/masonry | | Ammonia Wastewater | 384 $m^3$ | 77 $m^3$ | Structural assessment | | 14/11/2018 | Yes | Fail | Small areas of damage to chemical resistant coating | Chemical resistant coating (CRC) will be repaired when the ambient temperature reaches the required level to cure the CRC | May-19 | N/A |
| Bund no. 94 | general purpose concrete/masonry | | Acid Scrubber Liquor | 9.1 $m^3$ | 9 $m^3$ | Structural assessment | | 14/11/2018 | Yes | Fail | Small areas of damage to chemical resistant coating | Chemical resistant coating (CRC) will be repaired when the ambient temperature reaches the required level to cure the CRC | May-19 | N/A |
| Bund no. 171a | prefabricated | | Liquid Hazardous Waste | 1.1 $m^3$ | 1 $m^3$ | Hydraulic test | | 13/12/2018 | Yes | Fail | Leak from prefabricated metal bund. | Bund taken out of use | N/A | N/A |
| Bund no. 256 | other (please specify) | concrete sump with storm drain isolation valve | Bulk Corrosive Chemicals | 22.6$m^3$ | 22$m^3$ | Structural assessment | | 17/09/2018 | Yes | Fail | Small areas of damage to chemical resistant coating | Chemical resistant coating (CRC) will be repaired when the ambient temperature reaches the required level to cure the CRC | May-19 | N/A |
| Bund no. 258 | other (please specify) | concrete sump with storm drain isolation valve | Packaged Solvents | 0.76$m^3$ In the event of a spill additional containment can be provided by closing a storm containment valve. | 1$m^3$ | Hydraulic test | | 04/09/2018 | Yes | Fail | Debris caught in valve preventing closure | Valve flushed to remove debris. Closure of valve verified by camera. | 13/03/2019 | Pass |

**Bund/Pipeline testing template** | **Lic No:** P0207-04 | **Year: 2018**

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bund no. 262 | other (please specify) | concrete sump with storm drain isolation valve | Bulk Solvent Waste | 33.5m$^3$ | 31m$^3$ | Hydraulic test | | 20/12/2018<br>01/03/2019 | Yes | Fail | Debris caught in valve preventing closure. | Valve flushed to remove debris. Closure of valve verified. Valve still passing after second test so valve to be replced. The passing valve flows to another contained area so there is no loss of containment. | Apr-19 | N/A |
| Retention Pond | other (please specify) | Lined firewater retention pond | Firewater | N/A | N/A | Hydraulic test | | 19/12/2018<br>12/03/2019 | Yes | Invalid test | The test had to be abandoned as flow into the pond could not be isolated via the inlet sluice gate. | The sluice gate was repaired and cleaned but after two attempts still failed to seal. Large scale silt removal is required before test can be repeated. | Apr-19 | N/A |

* Capacity required should comply with 25% or 110% containment rule as detailed in your licence

| | | | Commentary |
|---|---|---|---|
| 15 | Has integrity testing been carried out in accordance with licence requirements and are all structures tested in line with bunding and storage guidelines BS8007/EPA Guidance? | Yes | |
| 16 | Are channels/transfer systems to remote containment systems tested? | No | Due to the extremely large capacities of the site remote containment transfer systems it is deemed impractical to conduct hydrostatic testing. However, liquid leak detection systems are widespread across the site which allow rapid response to leakages. |
| 17 | Are channels/transfer systems compliant in both integrity and available volume? | Yes | All channels/transfer systems are compliant in available volume.<br>For integrity see above. |

Pipeline/underground structure testing

| | | | |
|---|---|---|---|
| 1 | Are you required by your licence to undertake integrity testing* on underground structures e.g. pipelines or sumps etc ? if yes please fill out table 2 below listing all underground structures and pipelines on site **which failed the integrity test and all which have not been tested withing the integrity test period as specified** | Yes | All underground pipelines are tested using CCTV surveys. Tanks and sumps are hydrostatically tested. |
| 2 | Please provide integrity testing frequency period<br>*please note integrity testing means water tightness testing for process and foul pipelines (as required under your licence) | 3 years | |

**Table B2:** Summary details of pipeline/underground structures integrity test

| Structure ID | Type system | Material of construction: | Does this structure have Secondary containment? | Type of secondary containment | Type integrity testing | Integrity reports maintained on site? | Results of test | Integrity test failure explanation <50 words | Corrective action taken | Scheduled date for retest | Results of retest(if in current reporting year) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| F10 Contained Storm System | Contained Storm | Ductile Iron | No | N/A | CCTV | Yes | Fail | Open joint on underground contained storm pipe discovered. | Lining of inside of pipe with chemical resistant epoxy liner. | Apr-19 | N/A |

Please use commentary for additional details not answered by tables/ questions above

| | AIR-summary template | Lic No: | P0207-04 | Year | 2018 |
|---|---|---|---|---|---|

**Abbreviations**: ELV: Emission Limit Value, RCTO: Rotary Concetrator Thermal Oxidiser, LOD: Limit of Detection, CEMS: Continuous Environmental Monitoring System, PM: Preventive Maintenance

**Answer all questions and complete all tables where relevant**

| | | | Additional information |
|---|---|---|---|
| 1 | Does your site have licensed air emissions? If yes please complete table A1 and A2 below for the current reporting year and answer further questions. If **you do not have** licenced emissions and **do not complete a solvent management plan** (table A4 and A5) you do not need to complete the tables | Yes | |

**Periodic/Non-Continuous Monitoring**

| | | | |
|---|---|---|---|
| 2 | Are there any results in breach of licence requirements? If yes please provide brief details in the comment section of Table A1 below. | No | All emission results were in compliance with licence requirements. The Q4 2018 Hydrofluoric acid (HF) header weighted average emission results for the Fab 14 scrubbers and HF for an individual F14 scrubber (A105) were within the licence limits when the "Agency Requirements for applying measurement uncertainty (MU) to periodic air monitoring" was applied. |
| 3 | Was all monitoring carried out in accordance with EPA guidance note AG2 and using the basic air monitoring checklist? Basic air monitoring checklist AGN2 | Yes | |

**Table A1: Licensed Mass Emissions/Ambient data-periodic monitoring (non-continuous)**

| Emission Description | Emission reference no: | Parameter/ Substance | Frequency of Monitoring | ELV in licence or any revision therof | Licence Compliance criteria | Measured value | Unit of measurement | Compliant with licence limit | Method of analysis | Annual mass load (kg) | Comments -reason for change in % mass load from previous year if applicable |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Fab 14 and Fab 24-2 Ammonia exhausts | A158-A161; A257-A259; A273 | Ammonia (NH3) | Biannually | 2.0 | 100 % of values < ELV | 0.52 | mg/Nm3 | yes | EN 14791:2005 | 1,657 | The strictest ELV is reported which applies when all four F24-2 ammonia exhaust fans are operating. The average of all emission point results is reported. The annual mass emission includes ammonia scrubbers and trimix waste treatment system emissions. |
| Fab 14 Ammonia exhausts | A158-A161 | Volumetric flow | Biannually | 41,000 | 100 % of values < ELV | 22,199 | Nm3/hour | yes | EN 16911-1 | | The average of all emission point results is reported. |
| Fab 24-2 Ammonia exhausts | A257-A259; A273 | Volumetric flow | Biannually | 65,000 | 100 % of values < ELV | 40,480 | Nm3/hour | yes | EN 16911-1 | | The average of all emission point results is reported. |
| Fab 10 Boilers | A01/A03/A04/A05/A06 | Nitrogen oxides (NOx/NO2) | Annually | 180 | 100 % of values < ELV | 111 | mg/Nm3 | yes | EN 14792:2005 | 21,747 | The average of all emission point results is reported. The annual mass emission includes boilers, RCTO and Trimix waste emissions. |
| Fab 14 Boilers | A101/A102/A103 | Nitrogen oxides (NOx/NO2) | Annually | 170 | 100 % of values < ELV | 81 | mg/Nm3 | yes | EN 14792:2005 | | The average of all emission point results is reported. |
| Fab 24 Boilers | A201/A202/A203/A204/A205/A248/A253 | Nitrogen oxides (NOx/NO2) | Annually | 150 | 100 % of values < ELV | 96 | mg/Nm3 | yes | EN 14792:2005 | | The average of all emission point results is reported. |
| Fab 10, 14 and 24 Boilers | A01/A03/A04/A05/A06, A101/A102/A103,A201/A202/A203/A204/A205/A248/A253 | Carbon monoxide (CO) | Annually | N/A | 100 % of values < ELV | 3.5 | mg/Nm3 | yes | EN 15058:2004 | 11,882 | The average of all emission point results is reported. The annual mass emission includes boilers, RCTO and Trimix waste emissions. |

| AIR-summary template | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Lic No: | P0207-04 | | Year | 2018 | |
| Emission Description | Emission reference no: | Parameter/ Substance | Frequency of Monitoring | ELV in licence or any revision therof | Licence Compliance criteria | Measured value | Unit of measurement | Compliant with licence limit | Method of analysis | Annual mass load (kg) | Comments -reason for change in % mass load from previous year if applicable |
| Fab 24 Speciality Exhaust | A218 | Volumetric flow | Biannually | 25,200 | 100 % of values < ELV | 17,917 | Nm3/hr | yes | EN 16911-1 | | The average of all emission point results is reported. |
| Fab 14 Speciality Exhaust | A152 | Volumetric flow | Biannually | 24,500 | 100 % of values < ELV | 13,873 | Nm3/hr | yes | EN 16911-1 | | The average of all emission point results is reported. |
| Fab 14 and Fab 24 Speciality Exhaust | A218/A152 | Inorganic Dust Particles Class I | Biannually | 0.05 | 100 % of values < ELV | <.0.0002 | mg/Nm3 | yes | EN 13284-1 | 0.07 | The average of all emission point results is reported. |
| Fab 14 and Fab 24 Speciality Exhaust | A218/A152 | Inorganic Dust Particles Class II | Biannually | 0.20 | 100 % of values < ELV | <0.0075 | mg/Nm3 | yes | EN 13284-1 | 2.34 | The average of all emission point results is reported. |
| Fab 14 and Fab 24 Speciality Exhaust | A218/A152 | Inorganic Dust Particles Class III | Biannually | 0.20 | 100 % of values < ELV | <0.0163 | mg/Nm3 | yes | EN 13284-1 | 4.93 | The average of all emission point results is reported. |
| Fab 14 and Fab 24 Speciality Exhaust | A218/A152 | Total Dusts | Biannually | 20 | 100 % of values < ELV | 0.19 | mg/Nm3 | yes | EN 13284-1 | 50 | The average of all emission point results is reported. |
| Fab 10 RCTO Oxidiser Exhaust | A65-A66 | Volumetric flow | Quarterly | 5,100 | 100 % of values < ELV | 2,307 | Nm3/hour | yes | EN 16911-1 | | The average of all emission point results is reported. |
| Fab 14, Fab 24 and Fab 24-2 RCTO Oxidiser Exhaust | A155-A157, A214-A216, A287, A267-A269 | Volumetric flow | Quarterly | 4,000 | 100 % of values < ELV | 2,222 | Nm3/hour | yes | EN 16911-1 | | The average of all emission point results is reported. |
| Fab 10 RCTO Concentrator Exhaust | A61 | Volumetric flow | Quarterly | 120,000 | 100 % of values < ELV | 13,828 | Nm3/hour | yes | EN 16911-1 | | The average of all emission point results is reported. |
| Fab 14 and Fab 24-2 RCTO Concentrator Exhaust | A141-A144, A263-A266 | Volumetric flow | Quarterly | 34,700 | 100 % of values < ELV | 25,988 | Nm3/hour | yes | EN 16911-1 | | The average of all emission point results is reported. |
| Fab 24 RCTO Concentrator Exhaust | A260-A262, A270 | Volumetric flow | Quarterly | 48,000 | 100 % of values < ELV | 19,802 | Nm3/hour | yes | EN 16911-1 | | The average of all emission point results is reported. |
| Fab 10, Fab 14, Fab 24 and Fab 24-2 RCTO Oxidiser and Concentrator Exhaust | A61, A65, A66, A155-A157, A141-A144, A214-A216, A287, A263-A266, A260-A262, A267-A269, A270 | Organics Class I | Quarterly | 5 | 100 % of values < ELV | < 4.349 | mg/Nm3 | yes | EN 13649:2001 | 9,079 | The average of all emission point results is reported. Where results were < LOD, it was assumed that the emission concentration was equal to the LOD for calculating mass emissions. |
| Fab 10, Fab 14, Fab 24 and Fab 24-2 RCTO Concentrator Exhaust | A61, A141-A144, A263-A266, A260-A262, A270 | Organics Class II | Quarterly | 20 | 100 % of values < ELV | <4.546 | mg/Nm3 | yes | EN 13649:2001 | 11,425 | The average of all emission point results is reported. Where results were < LOD, it was assumed that the emission concentration was equal to the LOD for calculating mass emissions. |
| Fab 10 Acid Scrubbed Exhaust | A07, A15, A20 | Volumetric flow | Quarterly | 151,421 | 100 % of values < ELV | 35,977 | Nm3/hour | yes | EN 16911-1 | | The average of the total flow from this bank of scrubbers is provided for comparison with the ELV. |
| Fab 14 Acid Scrubbed Exhaust | A105-A107, A109-A111 | Volumetric flow | Quarterly | 350,660 | 100 % of values < ELV | 38,225 | Nm3/hour | yes | EN 16911-1 | | The average of the total flow from this bank of scrubbers is provided for comparison with the ELV. |
| Fab 24 Main and Fab 24 Bridge Acid Scrubbed Exhaust | A206-A213 | Volumetric flow | Quarterly | 181,705 | 100 % of values < ELV | 36,537 | Nm3/hour | yes | EN 16911-1 | | The average total flow from this bank of scrubbers is provided for comparison with the ELV. |

| AIR-summary template | | | | | | Lic No: | P0207-04 | | Year | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Emission Description | Emission reference no: | Parameter/ Substance | Frequency of Monitoring | ELV in licence or any revision therof | Licence Compliance criteria | Measured value | Unit of measurement | Compliant with licence limit | Method of analysis | Annual mass load (kg) | Comments -reason for change in % mass load from previous year if applicable. |
| Fab 24-2 Acid Scrubbed Exhaust | A249-A251 | Volumetric flow | Quarterly | 159,391 | 100 % of values < ELV | 47,127 | Nm3/hour | yes | EN 16911-1 | | The average total flow from this bank of scrubbers is provided for comparison with the ELV. |
| Fab 10 Acid Scrubbed Exhaust | A07, A15, A20 | Hydrogen fluoride | Quarterly | 1.70 - 3.00 | 100 % of values < ELV | 0.13 | mg/Nm3 | yes | ISO 15713:2006 | 3,698 | The applicable ELV is dependent upon the total scrubber header flow and the mean weighted average concentration across all emission points is reported. |
| Fab 14, Fab 24 Main, Fab 24 Bridge and Fab 24-2 Acid Scrubbed Exhaust | A105-A107, A109-A111, A206-A213, A249-A251 | Hydrogen fluoride | Quarterly | 0.85 - 3.00 | 100 % of values < ELV | 0.56 | mg/Nm3 | yes | ISO 15713:2006 | | The applicable ELV is dependent upon the total scrubber header flow and the mean weighted average concentration across all emission points is reported. |
| Fab 10 Acid Scrubbed Exhaust | A07, A15, A20 | Total fluoride | Quarterly | 2.20 - 4.00 | 100 % of values < ELV | 0.15 | mg/Nm3 | yes | ISO 15713:2006 | 4,149 | The applicable ELV is dependent upon the total scrubber header flow and the mean weighted average concentration across all emission points is reported. The ISO 15713 method has been adapted to include filter analysis and therefore, a value for total fluoride. |
| Fab 14, Fab 24 Main, Fab 24 Bridge and Fab 24-2 Acid Scrubbed Exhaust | A105-A107, A109-A111, A206-A213, A249-A251 | Total fluoride | Quarterly | 1.10 - 4.00 | 100 % of values < ELV | 0.64 | mg/Nm3 | yes | ISO 15713:2006 | | The applicable ELV is dependent upon the total scrubber header flow and the mean weighted average concentration across all emission points is reported. The ISO 15713 method has been adapted to include filter analysis and therefore, a value for total fluoride. |

| AIR-summary template | | | | | | Lic No: | P0207-04 | | Year | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Emission Description | Emission reference no: | Parameter/ Substance | Frequency of Monitoring | ELV in licence or any revision therof | Licence Compliance criteria | Measured value | Unit of measurement | Compliant with licence limit | Method of analysis | Annual mass load (kg) | Comments -reason for change in % mass load from previous year if applicable |
| Fab 10, Fab 14, Fab 24 Main, Fab 24 Bridge and Fab 24-2 Acid Scrubbed Exhaust | A07, A15, A20, A105-A107, A109-A111, A206-A213, A249-A251 | Total acids | Quarterly | 4 | 100 % of values < ELV | 0.74 | mg/Nm3 | yes | EN 1911-1 (Part 1) | 5,217 | The average of all emission point results is reported. |
| Fab 10 Acid Scrubbed Exhaust | A07, A15, A20 | Total acids | Quarterly | 0.202 | 100 % of values < ELV | 0.02 | kg/hr | yes | EN 1911-1 (Part 1) | | The average of all emission point results is reported. |
| Fab 14 Acid Scrubbed Exhaust | A105-A107, A109-A111 | Total acids | Quarterly | 0.234 | 100 % of values < ELV | 0.03 | kg/hr | yes | EN 1911-1 (Part 1) | | The average of all emission point results is reported. |
| Fab 24 Main and Fab 24 Bridge Acid Scrubbed Exhaust | A206-A213 | Total acids | Quarterly | 0.182 | 100 % of values < ELV | 0.02 | kg/hr | yes | EN 1911-1 (Part 1) | | The average of all emission point results is reported. |
| Fab 24-2 Acid Scrubbed Exhaust | A249-A251 | Total acids | Quarterly | 0.213 | 100 % of values < ELV | 0.06 | kg/hr | yes | EN 1911-1 (Part 1) | | The average of all emission point results is reported. |
| Trimix Waste Treatment System A and System B Exhaust | A256A/A256B | Volumetric flow | Quarterly | 7,000 | 100 % of values < ELV | 3,974 | Nm3/hr | yes | EN 16911-1 | | The average of all emission point results is reported. |
| Trimix Waste Treatment System A and System B Exhaust | A256A/A256B | Ammonia (NH3) | Quarterly | 80 | 100 % of values < ELV | 6.4 | mg/Nm3 | yes | EN 14791:2005 | | The average of all emission point results is reported. |
| Trimix Waste Treatment System A and System B Exhaust | A256A/A256B | Nitrogen oxides (NOx/NO2) | Quarterly | 140 | 100 % of values < ELV | 27.0 | mg/Nm3 | yes | EN 14792:2005 | | The average of all emission point results is reported. |
| Trimix Waste Treatment System Exhausts | A256A/A256B | Carbon monoxide (CO) | Quarterly | 600 | 100 % of values < ELV | 37.4 | mg/Nm3 | yes | EN 15058:2004 | | The average of all emission point results is reported. |
| Ambient Air | Ambient (L1-L5) | Nitrogen dioxide | Biannually | N/A | N/A | 14.21 | ug/m3 | N/A | PER | | The average of all emission point results is reported. The method used for analysis of the diffusion tubes is UV Spectrophotometry. |
| Ambient Air | Vegetation | Fluoride | Quarterly | N/A | N/A | 11.43 | mg/kg | N/A | PER | | The average of all vegetation location results is reported. A method developed by Newcastle University specifically for fluoride analysis in vegetation using Ion Selective Electrode analysis is employed. |

| | AIR-summary template | Lic No: | P0207-04 | Year | 2018 |
|---|---|---|---|---|---|

| | Continuous Monitoring | | |
|---|---|---|---|
| 4 | Does your site carry out continuous air emissions monitoring? | Yes | |
| | If yes please review your continuous monitoring data and report the required fields below in Table A2 and | | |
| 5 | Did continuous monitoring equipment experience downtime? If yes please record downtime in table A2 below | Yes | |
| 6 | Do you have a proactive service agreement for each piece of continuous monitoring equipment? | Yes | |
| 7 | Did your site experience any abatement system bypasses? If yes please detail them in table A3 below | Yes | |

**Table A2: Summary of average emissions -continuous monitoring**

| Emission Description | Emission reference no: | Parameter/ Substance | ELV in licence or any revision therof | Averaging Period | Compliance Criteria | Units of measurement | Annual Emission | Annual maximum | Monitoring Equipment downtime (hours) | Number of ELV exceedences in current reporting year | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| All RCTO Oxidiser and Concentrator Exhausts | A61, A65, A66, A155-A157, A141-A144, A214-A216, A287, A263-A266, A260-A262, A267-A269, A270 | Total Organic Carbon (as C) | 50 | 30 minute | All 30-minutes averages < 2 x ELV | mg/Nm3 | 1.17 | 30.73 | 632.5 | None | All values were in compliance with the ELV of 100 mg/Nm3 TOC during normal operation i.e. all 30 minute averages were less than twice the nominal ELV. 97% of all 30-minute mean values were < 1.2 ELV. The figure for monitoring equipment downtime represents the combined downtime across all five TOC analysers on site. During the CEMS downtime, manufacturing operations were as normal and all RCTOs were operating within specifications. Therefore, all emissions were expected to be within the normal range for that system. |
| All RCTO Oxidiser and Concentrator Exhausts | A61, A65, A66, A155-A157, A141-A144, A214-A216, A287, A263-A266, A260-A262, A267-A269, A270 | Total Organic Carbon (as C) | 50 | 24 hour | Daily average < ELV | mg/Nm3 | 1.26 | 24.12 | | None | |
| All RCTO Oxidiser Exhausts | A65-A67, A155-A157, A214-A216, A287, A267-A269 | Nitrogen oxides (NOx/NO2) | 200 | 30 minute | All 30-minutes averages < 2 x ELV | mg/Nm3 | 23.27 | 94.15 | 67 | None | All values were in compliance with the ELV of 400 mg/Nm3 NOx as NO2 i.e. all 30 minute averages were less than twice the nominal ELV. 97% of all 30-minute mean values were < 1.2 ELV. The figure for monitoring equipment downtime represents the combined downtime across all four combustion gas analysers on site. During the CEMS downtime, manufacturing operations were as normal and all RCTOs were operating within specifications. Therefore, all emissions were expected to be within the normal range for that system. |
| All RCTO Oxidiser Exhausts | A65-A67, A155-A157, A214-A216, A287, A267-A269 | Nitrogen oxides (NOx/NO2) | 200 | 24 hour | Daily average < ELV | mg/Nm3 | 23.6 | 74.16 | | None | |
| All RCTO Oxidiser Exhausts | A65-A67, A155-A157, A214-A216, A287, A267-A269 | Carbon monoxide (CO) | 600 | 30 minute | All 30-minutes averages < 2 x ELV | mg/Nm3 | 38.46 | 453.21 | | None | All values were in compliance with the ELV of 1200 mg/Nm3 CO i.e. all 30 minute averages were less than twice the nominal ELV. 97% of all 30-minute mean values were < 1.2 ELV. |
| All RCTO Oxidiser Exhausts | A65-A67, A155-A157, A214-A216, A287, A267-A269 | Carbon monoxide (CO) | 600 | 24 hour | Daily average < ELV | mg/Nm3 | 38.74 | 228.17 | | None | |
| Ambient Air | Ambient | Nitrogen oxides (NOx/NO2) | N/A | | N/A | µg/Nm3 | 16.6 | 978.81 | 116.5 | N/A | |

**Table A3: Abatement system bypass reporting table** Bypass protocol

| Date* | Duration** (hours) | Location | Reason for bypass | Impact magnitude | Corrective action |
|---|---|---|---|---|---|
| 20/03/2018 | 30.0 | F24-2 | Annual PM for RCTO No. 2 | Non-significant | Project in progress to enable duty/standby operation of RCTOs |
| 22/03/2018 | 1.0 | F14 | Preventive maintenance on RCTO Fan No. 3 | Non-significant | Not applicable |
| 23/04/2018 | 0.7 | F14 | Fan rotation required to carry out processor upgrade. | Non-significant | Not applicable |
| 21/07/2018 | 27.3 | F24 | Failure of RCTO No. 3 | Non-significant | System restored to normal operation. |
| 26/07/2018 | 12.9 | F24-2 | Annual PM for RCTO No. 3 | Non-significant | Project in progress to enable duty/standby operation of RCTOs |
| 01/08/2018 | 13.1 | F24-2 | Annual PM for RCTO No. 1 | Non-significant | Project in progress to enable duty/standby operation of RCTOs |
| 12/08/2018 | 31.6 | F14 | Failure of RCTO No. 3 | Non-significant | System restored to normal operation. |
| 29/08/2018 | 0.8 | F14 | Preventive maintenance on RCTO Fan No. 3 | Non-significant | Not applicable |
| 26/09/2018 | 0.8 | F24-2 | Failure of RCTO No. 2 | Non-significant | Project in progress to enable duty/standby operation of RCTOs |
| 14/10/2018 | 8.8 | F10 | Electrical shakedown for Fab 10 upgrade project | Non-significant | Not applicable |

Note: In all cases except where specified otherwise, these were partial bypasses with at least 50% of the air being abated through the operational RCTOs.

| AIR-summary template | Lic No: | P0207-04 | Year | 2018 |
|---|---|---|---|---|

**Solvent use and management on site**

| | | | |
|---|---|---|---|
| 8 | Do you have a total Emission Limit Value of direct and fugitive emissions on site? if yes please fill out tables A4 and A5 | Yes | |

| **Table A4: Solvent Management Plan Summary Total VOC Emission limit value** | | | Solvent regulations | Please refer to linked solvent regulations to complete table 5 and 6 | | |
|---|---|---|---|---|---|---|
| Reporting year | Total solvent input on site (kg) | Total Fugitive emissions to Air from site (kg) | Fugitive emissions as % of solvent input | Fugitive Emission Limit Value (ELV) (%) in licence or any revision therof | Compliance | Comment |
| 2018 | 6,863,348 | 25,817 | 0.4% | 15% of total solvent input | Yes | |

| **Table A5: Solvent Mass Balance summary** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | (I) Inputs (kg) | (O) Outputs (kg) | | | | | | |
| Solvent | (I) Inputs (kg) | Organic solvent emission in waste gases(kg) | Solvents lost in water (kg) | Collected waste solvent (kg) | Fugitive Organic Solvent (kg) | Solvent released in other ways e.g. by-passes (kg) | Solvents destroyed onsite through physical reaction e.g. incineration(kg) | Total emission of Solvent to air (kg) |
| All | 6,863,348 | 12,380 | 608,784 | 5,626,303 | 25,817 | 2,769 | 624,526 | 40,966 |
| | | | | | | | | |
| | | | | | | | Total | 40,966 |

| Noise monitoring summary report | Lic No: | P0207-4 | Year | 2018 |
|---|---|---|---|---|

| | | | |
|---|---|---|---|
| 1 | Was noise monitoring a licence requirement for the AER period? If yes please fill in table N1 noise summary below | | Yes |
| 2 | Was noise monitoring carried out using the EPA Guidance note, including completion of the "Checklist for noise measurement report" included in the guidance note as table 6? | Noise Guidance note NG4 | Yes |
| 3 | Does your site have a noise reduction plan | | No |
| 4 | When was the noise reduction plan last updated? | | N/A |
| 5 | Have there been changes relevant to site noise emissions (e.g. plant or operational changes) since the last noise survey? | | Yes — The site underwent an upgrade project in 2018 which introduced additional noise sources. Noise sources associated with this project were incorporated into the comprehensive noise model to ensure the facility would meet the 45dB limit for night time noise. |

**Table N1: Noise monitoring summary**

| Date of monitoring | Time period | Noise sensitive location -NSL (if applicable) | $LA_{eq}$ | $LA_{90}$ | $LA_{10}$ | $LA_{max}$ | Tonal or Impulsive noise* (Y/N) | If tonal /impulsive noise was identified was 5dB penalty applied? | Comments (ex. main noise sources on site, & extraneous noise ex. road traffic) | Is site compliant with noise limits (day/evening/night)? |
|---|---|---|---|---|---|---|---|---|---|---|
| 31/05/2018 | 15:43-16:13 | NM01 | 51 | 41 | 54 | 68 | No | N/A | Intel plant noise just audible. Occasional traffic and aircraft flyover. | Yes |
| 31/05/2018 | 16:59-17:29 | NM01 | 52 | 43 | 55 | 63 | No | N/A | Intel plant noise just audible. Occasional traffic, birdsong and aircraft flyover. | Yes |
| 31/05/2018 | 18:15-18:45 | NM01 | 51 | 44 | 54 | 65 | No | N/A | Intel plant noise just audible. Occasional traffic and aircraft flyover. | Yes |
| 29/08/2018 | 20:56-21:26 | NM01 | 48 | 35 | 51 | 67 | No | N/A | Intel plant noise just audible. Occasional traffic and aircraft flyover. | Yes |
| 30/08/2018 | 00:00-00:15 | NM01 | 37 | 33 | 38 | 59 | No | N/A | Intel plant noise dominant with intermittent road traffic noise. | Yes |
| 30/08/2018 | 00:23-00:38 | NM01 | 41 | 32 | 39 | 63 | No | N/A | Intel plant noise audible. Distant traffic and railway noise with occasional aircraft flyover. | Yes |
| 31/05/2018 | 16:21-16:51 | NM02 | 48 | 39 | 50 | 75 | No | N/A | Intel plant noise audible in the distance and during lulls in traffic. Road traffic noise dominant with intermittent aircraft flyover and birdsong. Local traffic paused out where possible. | Yes |
| 31/05/2018 | 17:37-18:07 | NM02 | 47 | 37 | 51 | 62 | No | N/A | Intel plant noise audible during lulls in traffic. Road traffic noise dominant with intermittent aircraft flyover and birdsong. | Yes |
| 31/05/2018 | 18:51-19:21 | NM02 | 46 | 38 | 50 | 60 | No | N/A | Intel plant noise audible during lulls in traffic. Road traffic noise dominant with intermittent aircraft flyover and birdsong. Survey delayed due to local activity in the area, extending monitoring period into evening period by 21 minutes. No noted noise difference between noise sources before/after 19:00. | Yes |
| 29/08/2018 | 20:15-20:45 | NM02 | 47 | 37 | 49 | 63 | No | N/A | Steady Intel plant noise discernible. Noise contribution from distant traffic noise and birdsong. | Yes |
| 03/10/2018 | 23:46-00:01 | NM02 | 42 | 39 | 43 | 56 | No | N/A | Steady Intel plant noise dominant. Occasional noise contribution from traffic noise. | Yes |
| 04/10/2018 | 00:33-00:48 | NM02 | 40 | 35 | 39 | 58 | No | N/A | Steady Intel plant noise dominant. Occasional noise contribution from traffic noise. | Yes |

| Noise monitoring summary report | | | | | | Lic No: | P0207-4 | Year | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|
| Date of monitoring | Time period | Noise sensitive location -NSL (if applicable) | $LA_{eq}$ | $LA_{90}$ | $LA_{10}$ | LAmax | Tonal or Impulsive noise* (Y/N) | If tonal /impulsive noise was identified was 5dB penalty applied? | Comments (ex. main noise sources on site, & extraneous noise ex. road traffic) | Is site compliant with noise limits (day/evening/night)? |
| 08/06/2018 | 10:16-10:46 | NM03 | 46 | 33 | 44 | 75 | No | N/A | Steady Intel plant noise dominant with occasional distant road traffic noise, aircraft flyover and birdsong. | Yes |
| 08/06/2018 | 12:13-12:43 | NM03 | 41 | 34 | 43 | 67 | No | N/A | Steady Intel plant noise just audible with occasional mobile plant audible. Occasional distant road traffic noise, aircraft flyover and birdsong. | Yes |
| 08/06/2018 | 14:00-14:30 | NM03 | 42 | 36 | 43 | 61 | No | N/A | Steady Intel plant noise just audible with occasional mobile plant audible. Occasional distant road traffic noise and aircraft flyover. | Yes |
| 29/08/2018 | 19:38-20:08 | NM03 | 48 | 36 | 51 | 63 | No | N/A | Steady Intel plant noise just audible with occasional mobile plant audible. Occasional distant road traffic noise and birdsong. | Yes |
| 03/10/2018 | 23:22-23:37 | NM03 | 41 | 40 | 42 | 65 | No | N/A | Steady Intel plant noise dominant with intermittent distant traffic. | Yes |
| 04/10/2018 | 00:10-00:25 | NM03 | 40 | 38 | 41 | 62 | No | N/A | Steady Intel plant noise dominant with intermittent distant traffic. | Yes |
| 08/06/2018 | 10:58-11:28 | NM04 | 54 | 32 | 58 | 73 | No | N/A | Noise contributions from distant road traffic noise, livestock, dogs barking, birdsong and occasional aircraft flyover. Intel plant noise not discernible. | Yes |
| 08/06/2018 | 12:49-13:19 | NM04 | 54 | 33 | 58 | 72 | No | N/A | Noise contributions from local and distant road traffic noise and birdsong. Occasional mobile plant audible from Intel site. | Yes |
| 08/06/2018 | 14:36-15:06 | NM04 | 57 | 36 | 61 | 75 | No | N/A | Noise contributions from distant road traffic noise, birdsong and occasional aircraft flyover. Intel plant noise not discernible. | Yes |
| 29/08/2018 | 19:02-19:32 | NM04 | 61 | 39 | 63 | 81 | No | N/A | Farm machinery operating to NW of location, non-Intel related activity. Intel plant inaudible. Other noise sources included road traffic noise and intermittent aircraft noise. | Yes |
| 29/08/2018 | 23:25-23:40 | NM04 | 36 | 29 | 32 | 68 | No | N/A | Noise contributions from local and distant road traffic noise and birdsong. Occasional mobile plant audible from Intel site. | Yes |
| 30/08/2018 | 00:47-01:02 | NM04 | 50 | 27 | 37 | 76 | No | N/A | Steady Intel plant noise dominant with intermittent activity from nearby residential property, dogs barking and aircraft flyover. | Yes |
| 15/06/2018 | 11:30-12:00 | NM05 | 50 | 47 | 52 | 67 | No | N/A | Steady plant noise dominant with occasional mobile plant movements on site. Intermittent local traffic, aircraft flyover, railway and foliage noise. | Yes |
| 15/06/2018 | 14:17-14:47 | NM05 | 50 | 47 | 51 | 65 | No | N/A | Steady plant noise dominant. Intermittent local traffic, aircraft flyover and foliage noise. | Yes |
| 15/06/2018 | 16:53-17:23 | NM05 | 50 | 46 | 51 | 69 | No | N/A | Road traffic noise and birdsong dominant with occasional mobile plant movements on site. No plant noise discernible. Intermittent railway and aircraft flyover noise. | Yes |
| 03/10/2018 | 19:49-20:19 | NM05 | 51 | 48 | 53 | 71 | No | N/A | Intel plant noise steady and audible. Distant traffic, foliage noise and occasional aircraft flyover. Intermittent spectator noise from local football grounds. | Yes |
| 04/10/2018 | 01:46-02:01 | NM05 | 41 | 39 | 42 | 58 | No | N/A | Intel plant noise dominant with intermittent road traffic noise. | Yes |
| 04/10/2018 | 02:25-02:40 | NM05 | 40 | 38 | 42 | 56 | No | N/A | Intel plant noise dominant with intermittent road traffic noise. | Yes |

| Noise monitoring summary report | | | | | | Lic No: | P0207-4 | Year | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|
| Date of monitoring | Time period | Noise sensitive location -NSL (if applicable) | $LA_{eq}$ | $LA_{90}$ | $LA_{10}$ | $LA_{max}$ | Tonal or Impulsive noise* (Y/N) | If tonal /impulsive noise was identified was 5dB penalty applied? | Comments (ex. main noise sources on site, & extraneous noise ex. road traffic) | Is site compliant with noise limits (day/evening/night)? |
| 15/06/2018 | 12:06-12:36 | NM06 | 53 | 49 | 54 | 73 | No | N/A | Main noise contribution from traffic noise, railway and aircraft flyover noise. Steady Intel plant noise discernible during lulls. | Yes |
| 15/06/2018 | 14:51-15:21 | NM06 | 55 | 51 | 57 | 77 | No | N/A | Main noise contribution from traffic noise, railway and aircraft flyover noise. Steady Intel plant noise discernible during lulls. | Yes |
| 15/06/2018 | 17:26-17:56 | NM06 | 53 | 49 | 54 | 73 | No | N/A | Main noise contribution from traffic noise, railway and aircraft flyover noise. Steady Intel plant noise discernible during lulls. | Yes |
| 03/10/2018 | 20:22-20:52 | NM06 | 52 | 49 | 54 | 73 | No | N/A | Main noise contribution from traffic noise, railway and aircraft flyover noise. Intermittent football spectator noise in distance. Steady Intel plant noise barely audible. | Yes |
| 04/10/2018 | 02:04-02:19 | NM06 | 39 | 35 | 40 | 56 | No | N/A | Intel plant noise dominant with intermittent road traffic noise. | Yes |
| 04/10/2018 | 02:43-02:58 | NM06 | 41 | 36 | 44 | 58 | No | N/A | Intel plant noise dominant with intermittent road traffic noise. | Yes |
| 15/06/2018 | 12:48-13:18 | NM07 | 55 | 51 | 58 | 66 | No | N/A | Main noise contribution from traffic noise, local noise in the estate and aircraft flyover noise. Intel plant noise was not discernible. | Yes |
| 29/08/2018 | 17:15-17:45 | NM07 | 54 | 49 | 56 | 69 | No | N/A | Main noise contribution from traffic noise, local noise in the estate and aircraft flyover noise. Intel plant noise was not discernible. | Yes |
| 22/10/2018 | 12:11-12:41 | NM07 | 51 | 47 | 53 | 65 | No | N/A | Main noise contribution from traffic noise, local noise in the estate, birdsong and aircraft flyover noise. Intel plant noise was not discernible. | Yes |
| 03/10/2018 | 21:01-21:31 | NM07 | 52 | 46 | 53 | 69 | No | N/A | Road traffic noise and intermittent railway noise. Audible activities from sports ground to North of location. No plant noise audible. | Yes |
| 04/10/2018 | 01:23-01:38 | NM07 | 40 | 35 | 42 | 52 | No | N/A | Road traffic noise from M4 dominant noise source with plant noise audible. | Yes |
| 04/10/2018 | 03:06-03:21 | NM07 | 41 | 36 | 44 | 60 | No | N/A | Road traffic noise from M4 dominant noise source with plant noise audible. | Yes |
| 08/06/2018 | 11:37-12:07 | NM08 | 39 | 33 | 42 | 63 | No | N/A | Distant road traffic noise with birdsong, foliage noise and occasional aircraft flyover. Plant noise difficult to distinguish. | Yes |
| 08/06/2018 | 13:24-13:54 | NM08 | 40 | 32 | 43 | 64 | No | N/A | Distant road traffic noise with birdsong, foliage noise and occasional aircraft flyover. Plant noise difficult to distinguish. | Yes |
| 08/06/2018 | 15:10-15:40 | NM08 | 45 | 33 | 44 | 67 | No | N/A | Local and distant road traffic noise with birdsong, foliage noise and occasional aircraft flyover. Plant noise difficult to distinguish. | Yes |
| 03/10/2018 | 22:20-22:50 | NM08 | 47 | 40 | 43 | 70 | No | N/A | Steady Intel plant noise dominant with distant road traffic and intermittent aircraft flyover and dogs barking. | Yes |
| 03/10/2018 | 23:00-23:15 | NM08 | 40 | 39 | 41 | 57 | No | N/A | Intel plant noise dominant with intermittent road traffic noise. | Yes |
| 04/10/2018 | 00:56-01:11 | NM08 | 38 | 36 | 39 | 54 | No | N/A | Intel plant noise dominant with intermittent road traffic noise. | Yes |

** please explain the reason for not taking action/resolution of noise issues?

Any additional comments? (less than 200 words)

| Resource Usage/Energy efficiency summary | Lic No: | P0207-04 | Year | 2018 |
|---|---|---|---|---|

| | | | | Additional information |
|---|---|---|---|---|
| 1 | When did the site carry out the most recent energy efficiency audit? Please list the recommendations in table 3 below | | | The site is accredited to the international standard ISO 50001. To support this accreditiation we carry out energy auditing. A surveillance audit was completed on 8th November 2018. |
| 2 | Is the site a member of any accredited programmes for reducing energy usage/water conservation such as the SEAI programme linked to the right? If yes please list them in additional information | SEAI - Large Industry Energy Network (LIEN) | Yes | ISO 50001<br>SEAI - Large Industry Energy Network (LIEN) |
| 3 | Where Fuel Oil is used in boilers on site is the sulphur content compliant with licence conditions? Please state percentage in additional information | | Yes | <0.1% |

Table R1 Energy usage on site

| Energy Use | Previous year | Current year | Production +/- % compared to previous reporting year** | Energy Consumption +/- % vs overall site production* |
|---|---|---|---|---|
| Total Energy Used (MWHrs) | 988,194 | 1,017,953 | | |
| Total Energy Generated (MWHrs) | | | | |
| Total Renewable Energy Generated (MWHrs) | 96,354 | 89,778 | | |
| Electricity Consumption (MWHrs) | 768,552 | 788,894 | | |
| Fossil Fuels Consumption: | | | | |
| Heavy Fuel Oil (m3) | 0 | 0 | | |
| Light Fuel Oil (m3) | 115 | 86 | | |
| Natural gas (m3) | 19,366,757 | 21,224,887 | | |
| Coal/Solid fuel (metric tonnes) | | | | |
| Peat (metric tonnes) | | | | |
| Renewable Biomass | | | | |
| Renewable energy generated on site*** | 96,354 | 89,778 | | |

* where consumption of energy can be compared to overall site production please enter this information as percentage increase or decrease compared to the previous reporting year.
** where site production information is available please enter percentage increase or decrease compared to previous year.
*** renewable energy generated from heat recovery.

| Table R2 Water usage on site | | | | | **Water Emissions** | **Water Consumption** | |
|---|---|---|---|---|---|---|---|
| Water use | Water extracted Previous year m3/yr. | Water extracted Current year m3/yr. | Production +/- % compared to previous reporting year** | Energy Consumption +/- % vs overall site production* | Volume Discharged back to environment($m^3$yr): | Volume used i.e not discharged to environment e.g. released as steam m3/yr | Unaccounted for Water: |
| Groundwater | N/A | N/A | | | | | |
| Surface water | N/A | N/A | | | | | |
| Public supply | 5,931,895 | 5,963,928 | | | | | |
| Recycled water | N/A | N/A | | | | | |
| Total | 5,931,895 | 5,963,928 | | | 5,150,890 | 813,038 | |

* where consumption of water can be compared to overall site production please enter this information as percentage increase or decrease compared to the previous reporting year.
** where site production information is available please enter percentage increase or decrease compared to previous year

## Resource Usage/Energy efficiency summary

**Lic No:** **P0207-04** **Year** **2018**

Table R3 Waste Stream Summary

| | Total | Landfill | Incineration | Recycled | Other | Comment |
|---|---|---|---|---|---|---|
| Hazardous (Tonnes) | 21,279.55 | 0.00 | 5,948.97 | 11,650.45 | 3,680.13 | An increase in recycled hazardous waste was due to segregated sulphuric acid being sent off-site as a waste for recycling. Typically segregated sulphuric acid is used directly as sulphuric acid on-site. |
| Non-Hazardous (Tonnes) | 16,187.04 | 0.00 | 5.90 | 16,143.26 | 37.88 | 1. An increase in Non-Haz Recycled waste 2018 versus 2017 was related to a construction project on site in 2018.<br>2. There was a drop in Non-Haz waste going to landfill as Calcium Fluoride Filter Cake was sent for recycling in 2018, which was previously landfilled. |

Table R4: Energy Audit finding recommendations

| Date of audit | Recommendations | Description of Measures proposed | Origin of measures | Predicted energy savings % | Implementation date | Responsibility | Completion date | Status and comments |
|---|---|---|---|---|---|---|---|---|
| Not applicable. Please note that audit recommendations are evaluated and where feasible, the recommendations will become a site energy project and is tracked through the site's Environmental management objectives, targets and programmes. For high level energy information please refer to the EMP template. More detailed information is available for review at the Intel site. | | | SELECT | | | | | |

NA

Table R5: Power Generation: Where power is generated onsite (e.g. power generation facilities/food and drink industry)please complete the following information

| | Unit ID | Unit ID | Unit ID | Unit ID | Station Total |
|---|---|---|---|---|---|
| Technology | | | | | |
| Primary Fuel | | | | | |
| Thermal Efficiency | | | | | |
| Unit Date of Commission | | | | | |
| Total Starts for year | | | | | |
| Total Running Time | | | | | |
| Total Electricity Generated (GWH) | | | | | |
| House Load (GWH) | | | | | |
| KWH per Litre of Process Water | | | | | |
| KWH per Litre of Total Water used on Site | | | | | |

| Complaints and Incidents summary template | Lic No: | P0207-04 | Year | 2018 |
|---|---|---|---|---|

**Complaints**

| | | Additional information |
|---|---|---|
| Have you received any environmental complaints in the current reporting year? If yes please complete summary details of complaints received on site in table 1 below | No | Table 1 deleted as not applicable. |

Incidents

| | | Additional information |
|---|---|---|
| Have any incidents occurred on site in the current reporting year? Please list all incidents for current reporting year in Table 2 below | Yes | 1 Minor incident in 2018 |
| *For information on how to report and what constitutes an incident | What is an incident | |

**Table 2 Incidents summary**

| Date of occurrence | Incident nature | Location of occurrence | Incident category*please refer to guidance | Receptor | Cause of incident | Other cause(please specify) | Activity in progress at time of incident | Communication | Occurrence | Corrective action<20 words | Preventative action <20 words | Resolution status | Resolution date | Likelihood of reoccurence |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 24/10/2018 | Other (Approach to Licence Limit for Hydrofluoric acid (HF) from Fab 14 Acid Gas Scrubber Header and A105 (Scrubber No. 7). | F14 Header Scrubbers. Licenced air emission discharge points (A109, A110, A111, A105 and A106). | 1. Minor | Air | Other (The leading root cause was found to be due to ammonia emissions from certain tools into the scrubbed exhaust system resulting in reduced scrubber removal efficiency for Hydrogen Fluoride). | | Normal activities | EPA | New | Confirmed scrubbers operating within specification. Investigated elevated levels and retest of Scrubber No. 6 (A106) and Scrubber No. 7 (A105) showed HF emissions within normal range. | Converted certain ammonia contributing F14 manufacturing equipment from the acid scrubbed exhaust system to the ammonia scrubbed exhaust system. | Complete | 31/12/2018 | Low |

| | |
|---|---|
| Total number of incidents current year | 1 |
| Total number of incidents previous year | 5 |
| % reduction/ increase | 80% reduction |

| Environmental Management Programme/Continuous Improvement Programme template | | | Year | 2018 |
|---|---|---|---|---|
| Progress Update for EMP 2018 | | | Lic No: | P0207-04 |
| Do you maintain an Environmental Mangement System (EMS) for the site. If yes, please detail in additional information | Yes | Intel Corporation holds a multisite certification to the voluntary environmental standard ISO 14001 and safety stanardard OHSAS 18001. The Intel Ireland site also holds site certification to the energy management standard ISO 50001. | | |
| Does the EMS reference the most significant environmental aspects and associated impacts on-site | Yes | | | |
| Does the EMS maintain an Environmental Management Programme (EMP) as required in accordance with the licence requirements | Yes | | | |
| Do you maintain an environmental documentation/communication system to inform the public on environmental performance of the facility, as required by the licence | Yes | | | |

| Objective Category or Environmental Aspect | Objective | Obj No. | Target | Project | Due Date | Owner | Comments/Updates | Status |
|---|---|---|---|---|---|---|---|---|
| Air Emissions | Improve access to F24-2 emission points | **1** | Install equipment hoist to reduce manual handling risk | Installation of hoist for air abatement monitoring equipment. | Q2 2018 | Env. Engineer | An equipment hoist was installed to reduce manual handling risks related to air monitoring. | Complete |
| Air Emissions | Improve access to F14 emission points | **2** | Install equipment hoist to reduce manual handling risk | Installation of hoist for air abatement monitoring equipment. | Q3 2018 | Env. Engineer | An equipment hoist was installed to reduce manual handling risks related to air monitoring. | Complete |

| Objective Category or Environmental Aspect | Objective | Obj No. | Target | Project | Due Date | Owner | Comments/Updates | Status |
|---|---|---|---|---|---|---|---|---|
| Air Emissions | Compliance with Condition 2.2.2.2 | **3** | Control parameters correlation with ammonia and fluoride emissions to air. | Investigate how the control parameters associated with the emissions to air abatement systems correlate with emission levels of fluorides and ammonia. | Q4 2018 | Env. Engineer | The control parameters specified in Intel's Industrial Emissions Licence (IEL) for the acid and ammonia scrubbers are pH and conductivity. Intel's Technology Development site determine, based on best practice and manufacturers recommendations, what the optimum setpoints are for pH and conductivity are for fluoride and ammonia removal. While there is inconclusive data in relation to any correlation between fluoride/ammonia emissions and conductivity, this parameter is optimised to ensure the blowdown from the scrubbers is at a sufficient concentration for onsite wastewater treatment. In relation to pH, general scrubber vendor recommendations for optimum HF removal is a higher pH, while a lower pH is recommended for optimum ammonia removal. Intel's Technology Development site has identified ammonia emission sources for conversion from the acid gas scrubber system to the ammonia scrubbed exhaust system which will improve the efficiency of the acid gas scrubbers for fluoride removal. Projects have been completed to convert these sources during 2018 and will continue in 2019. | In progress |
| Air Emissions | Reduction of Emissions to Air | **4** | Operation of the Fab 24-2 RCTO system on a duty/standby basis to reduce the frequency of bypasses of the system. | Investigate the feasibility of improving the design of the F24-2 RCTO system to ensure the system can operate on a duty/standby basis. | Q4 2019 | Env. Engineer | The capacity of the system has been increased by moving some sources of solvent emissions to the F24-1 RCTO abatement system. During 2019, it is planned to enable the system to be operated on a duty/standby basis. | In progress |
| Air Emissions | Reduction of Emissions to Air | **5** | Operation of the Fab 14 RCTO system on a duty/standby basis to reduce the frequency of bypasses of the system. | Investigate the feasibility of improving the design of the F14 RCTO system to ensure the fans can operate on a duty/standby basis. | Q3 2018 | Env. Engineer | Due to focus on improving the F24-2 RCTO design, this project has been pushed out to 2019. | In progress |
| Surface/Groudwater protection | Compliance with Condition 6.16 | **6** | Ensure all required bund/underground pipe integrity testing is completed | Carry out integrity testing of all 44 bunds that are due for testing in 2018. | Q4 2018 | Env. Engineer | All bunds that were due testing in 2018 have been tested. | Complete |
| Surface/Groudwater protection | Compliance with Condition 6.16 | **7** | Ensure all required bund/underground pipe integrity testing is completed | Carry out hydrostatic testing of 9 loading aprons | Q4 2018 | Env. Engineer | All loading aprons that were due testing in 2018 have been tested. | Complete |
| Surface/Groudwater protection | Compliance with Condition 6.16 | **8** | Ensure all required bund/underground pipe integrity testing is completed | Conduct testing of Fab 10 contained storm system. | Q4 2018 | Env. Engineer | The Fab 10 contained storm system was tested in 2018. | Complete |
| Surface/Groudwater protection | Compliance with Condition 6.16 | **9** | Ensure all required bund/underground pipe integrity testing is completed | Conduct hydrostatic testing of site retention pond. | Q4 2018 | Env. Engineer | The site retention pond cannot be tested due to an issue isolating the flow into the pond. The pond will be tested as soon as these issues are addressed and weather permitting. | In progress |

| Objective Category or Environmental Aspect | Objective | Obj No. | Target | Project | Due Date | Owner | Comments/Updates | Status |
|---|---|---|---|---|---|---|---|---|
| Surface/Groudwater protection | Compliance with Condition 6.16 | **10** | Ensure all required bund/underground pipe integrity testing is completed | Repair and retest all contained storm valves that failed testing | Q2 2018 | Env. Engineer | The automated control of one contained storm valve in F14 has not yet been fixed due to a number of complications. However these valves have been manually closed to maintain environmental protection. | In progress |
| Hazardous Waste | Reduce environmental impact of chemical waste generated by IR site operations. | **11** | Achieve zero chemical waste to landfill in line with Intel corporate targets. | Achieve zero chemical waste to landfill by 2020 in line with Intel corporate targets. | 2020 | EHS Manager | Zero hazardous waste went to landfill during 2018. | Ongoing |
| Non-Hazardous Waste | Recycle 90% of our solid waste (non-hazardous) generated per year | **12** | Recycle 90% of our non-hazardous waste in line with Intel Corporate targets | Recycle 90% of our non-hazardous waste in line with Intel Corporate targets | Market Dependent Timeframe | EHS Manager | All filter cake was recycled in 2018. This has resulted in the site meeting the 90% recycling target. 99% of non-hazardous waste was recycled in 2018. | Ongoing |
| Resource utilization | Conserve natural resources | **13** | Conserve in excess of 400,000$m^3$ water through various water conservation projects. | Implementation of water conservation projects as scheduled in the site energy project tracker. | Q4 2018 | Corporate Services Engineering groups | Through the implementation of various water conservation projects, the goal of conserving in excess of 400,000$m^3$ was met with a total of 1,000,254$m^3$ of water conserved in 2018. | Complete |
| Resource utilization | Conserve natural resources | **14** | Provide annualised savings of $3.2M in energy projects and rebates. There is a stretch target in place for $4M. | Implementation of energy projects as scheduled in the site energy project tracker. | Q4 2018 | Corporate Services Engineering groups | Annualised savings from energy projects and energy rebates completed in 2018 was $4.99M. | Complete |
| Resource utilization | Conserve natural resources | **15** | Maintain accreditation to a multisite ISO 50001 accreditation with Ireland as the head office. | Complete a head office ISO 50001 external audit to maintain accreditation | Q4 2018 | Env. Engineer | Audit completed on 8th November 2018. No category 1 findings were reported. | Complete |
| Wastewater | To track fluoride emissions in wastewater | **16** | Track fluoride emissions to sewer against our commitment to the EPA (letter dated 5th December 2007) to reduce fluoride emissions on a production basis for future technologies. | Fluoride emissions from the site are tracked on a weekly basis as per IE licence requirements. The average mass emissions for the current technology and the previous technology are calculated using representative production timeframes to determine, when normalized for the increased process complexity, the reduction in Fluoride emissions. | Ongoing | Env. Engineer | A full year's worth of production and emissions data was used in the fluoride reduction calculations for 2018. These calculations demonstrate an approximate 44% reduction in fluoride emissions when normalised for production and complexity factors between the current production technology and the previous production technology. | Ongoing |

| Objective Category or Environmental Aspect | Objective | Obj No. | Target | Project | Due Date | Owner | Comments/Updates | Status |
|---|---|---|---|---|---|---|---|---|
| Visual Impact/ Impact on local Environment | To increase Env Awareness at the Intel Ireland Site | **17** | Maintain a Biodiversity Programme for the Intel Ireland site | Continue an overall biodiversity plan for the site that all employees and local community can see e.g. Ergo/ Env Walks, Bat/Bird Boxes | Q4 2018 | Env. Engineer | In 2018, biodiversity work will continue throughout the year. Projects included:<br>Q1 - Winter Bird Feeding programme established at 5 locations throughout the site.<br>On Feb 7th - Trintity College Dublin MSc. students along with Dr Maria Long visited the site to review work being completed and how to engage employees on a biodiversity programme.<br>Q2 -Established North Kildare Biodiversity Programme with local tidy Towns and Maynooth University.<br>Q3 - Supported a Site Visit with a NGO e.g. Butterfly conservation Ireland and a US based NGO to share learnings on Intel's biodiversity programme. Ecological surveying of bird and bat boxes completed to assess occupancy in 2018.<br>Q4- Updated Biodiversity Database with site findings throughout 2018. | Complete |
| Environmental Health & Safety Management System | Engage in local community on environmental awareness topics | **18** | Provide school visits as part of Engineers Ireland Week and Intel Miniscientist. Provide community engagement evenings in 2018. | Provide school visits as part of Engineers Ireland Week and Intel Miniscientist. | Q1 & Q4 2018 | Env. Engineer | Feb 23rd - Leixlip School site visit for Engineering Ireland Week. Due to adverse weather conditions 'The Beast from the East' Engineers week volunteering was cancelled for Env Engineers. Community evenings were not carried out in 2018. Other awareness activities were carried out in place such as Transition Year Programme which included updates from Environmental Engineers, community advisory panel meetings, 'Friends of the River Rye' meetings and hosting of university students and other groups on information on Intel's Biodiversity Programme. | Complete |

| Objective Category or Environmental Aspect | Objective | Obj No. | Target | Project | Due Date | Owner | Comments/Updates | Status |
|---|---|---|---|---|---|---|---|---|
| Environmental Health & Safety Management System | Improved EHS awareness | **19** | Increase level of EHS awareness on-site and externally | 1. Updating of EHS webpage<br>2. Awareness as part of Earth Week<br>3. Updating of EHS New Employee Orientiation Video<br>4. Carry out environmental benchmarking on environmental awareness and culture at other multinationals<br>5. Use site social media communications channels to promote environmental awareness at the site.<br>6. Carry an employee hazardous waste and WEEE collection event onsite.<br>7. Updating of the Site Environmental Awareness Class | Q2 2018 | Env. Engineer | 1. The EHS webpage was updated.<br>2. An employee Waste Electrical & Electronic equipment and hazardous waste collection for employees was carried out as part of Earth Week. Also a competition for an electric bike was carried out asking employees for environmental suggestions. Tree planting occurred at IR6 East of a natrive irish tree.<br>3. The EHS New Employee Orientation Video was significant updated with more EHS footage of the site to improve awareness.<br>4. Benchmarking was carried out with another multinational and focus from this was on a significant revision of Intel's Safety Statement in 2018.<br>5. The Public Affairs Team carried out a number of social media commumications relating to the environment e.g. Biodiversity at the site & work Intel does in relation to the annual surveying of the River Rye.<br>6. Completed as part of Earth week.<br>7. The site environmental awareness class was significantly revised to incorporate both corporate EHS, Intel Sustainability and local site information. | Complete |

| Objective Category or Environmental Aspect | Objective | Obj No. | Target | Project | Due Date | Owner | Comments/Updates | Status |
|---|---|---|---|---|---|---|---|---|
| Environmental Health & Safety Management System | Improve EHS document management and retention | **20** | Improve EHS document management and retention | Review of EHS document management cabinets to streamline and ensure master listing is up to date. | Q1 2018 | Env. Engineer | Completed in Q1 2018. | Complete |
| Noise | Improve Noise Source Survey Model | **21** | Update the site Noise survey report 2015 to measure emissions which were provided as technical estimates and incorporate any new sources in 2018. | Update the site Noise survey report 2015 to measure emissions which were provided as technical estimates. Add any additional noise sources to the site noise model. | Q3 2019 | Env. Engineer | Noise measurement were taken of equipment in 2017 where in 2015 this was not feasible. Additional noise sources will be measured in 2019 in order to rerun the noise model and update the AWN noise source survey report. New noise sources include those from Fab 10 upgrade project. Noise sources associated with this project were incorporated into the comprehensive CGA noise model to ensure the facility would meet the 45dB limit for night time noise. | In progress |
| Environmental Health & Safety Management System | Improve Site EHS Management System | **22** | Develop implementation plan for site to implement ISO45001 | 1. Review requirements of ISO45001 and provide implementation plan for new standard. | Q4 2019 | Env. Engineer | In March 2018, site environmental engineer attended workshop on ISO45001 held by NSAI. This target was pushed to Q4 2019 as corporate EHS advised that implementation of multisite certification would not occur until 2019. | In progress |

| Objective Category or Environmental Aspect | Objective | Obj No. | Target | Project | Due Date | Owner | Comments/Updates | Status |
|---|---|---|---|---|---|---|---|---|
| Non-Hazardous Waste | Reduce environmental impact of front of house waste being produced onsite | **23** | Reduce environmental impact of front of house waste being produced onsite | 1. Improve waste segregation facilities at front of house<br>2. Reduce the impact of disposables being used onsite | Q4 2018 | Env. Engineer | 1.(a) Segregated waste bins were introduced in kitchen areas of canteen in Q.2 for the 3 waste streams - General Waste, Dry Mixed Recyclable waste and Food/Compostable waste.<br>1. (b) Segregated waste bins were installed in canteen seating areas and in appropriate corridor/reception areas in Q.3.<br>2. (a) All food take-away containers are now compostable, as well as porridge/soup bowls and lids and single-use cutlery. Signage was introduced Q.4 in canteens to remind people which of the disposables are compostable.<br>2. (b) A cost of 20c was applied to take away coffee cups in Q.2 to encourage people to use their own mugs.<br>2. (c) Salt/pepper/sugar single use paper sachets have been replaced with canisters.<br>2. (d) Signage was in situ in canteens requesting people reduce usage of single-use items during Q.3. | Complete |
| Environmental Health & Safety Management System | Review of site best practice tasks and also site compliance task to make continuous improvements to the management system. | **24** | Improve EHS compliance and best practice system | 1. Review of the site compliance and best practice tasks to assess if improvements can be made.<br>2. Assess resources required to improve the document system for this process.<br>3. If feasible implement changes to improve the system for tracking compliance and best practices. | Q2 2018 | Env. Engineer | Internal benchmarking was carried out with other Intel sites in terms of compliance task set up. Over 400 compliance tasks were reviewed for set-up and updated to streamline the process in place. | Complete |

**Note: Please note that Intel Corporation generate a 10 year plans for achievement of public environmental goals which the site aligns to and this is detailed in the current EMP where appropriate.**
**Note a rolling 5 year plan for site is not generated due to the rapid changes in the technology sector the site implements an annual plan which is more appropriate to the business environment we operate in.**

## Environmental Management Programme 2019

| Objective Category or Environmental Aspect | Objective | Obj No. | Target | Project | Due Date | Owner | Comments/Updates | Status |
|---|---|---|---|---|---|---|---|---|
| Air Emissions | Install equipment hoist to reduce manual handling risk | **1** | Installation of hoist for air abatement monitoring equipment. | Installation of hoist for air abatement monitoring equipment. | Q3 2019 | Env. Engineer | | Not started |
| Air Emissions | Control parameters correlation with ammonia and fluoride emissions to air. | **2** | Investigate how the control parameters associated with the emissions to air abatement systems correlate with emission levels of fluorides and ammonia. | Investigate how the control parameters associated with the emissions to air abatement systems correlate with emission levels of fluorides and ammonia. | Q4 2019 | Env. Engineer | Convert known ammonia sources from the acid gas scrubbers to the ammonia scrubbers in line with Intel's Technology Development site criteria. | In progress |
| Air Emissions | Operation of the Fab 24-2 Rotary Concentrator Thermal Oxidiser (RCTO) system on a duty/standby basis to reduce the frequency of bypasses of the system. | **3** | Investigate the feasbility of improving the design of the F24-2 RCTO system to ensure the system can operate on a duty/standby basis. | Investigate the feasbility of improving the design of the F24-2 RCTO system to ensure the system can operate on a duty/standby basis. | Q4 2019 | Env. Engineer | Ensure the Fab 24-2 RCTO system is designed to operate on a duty/standby basis. | In progress |
| Air Emissions | Operation of the Fab 14 RCTO system on a duty/standby basis to reduce the frequency of bypasses of the system. | **4** | Investigate the feasbility of improving the design of the F14 RCTO system to ensure the system can operate on a duty/standby basis. | Investigate the feasbility of improving the design of the F14 RCTO system to ensure the system can operate on a duty/standby basis. | Q4 2019 | Env. Engineer | Due to focus on the F24-2 RCTO system, this project was delayed. However, the feasbility of this project will be assessed during 2019. | In progress |
| Surface/Groudwater protection | Compliance with Condition 6.16 | **5** | Ensure all required bund/underground pipe integrity testing is completed | Carry out integrity testing of all 35 bunds that are due for testing in 2019. | Q4 2019 | Env. Engineer | | In progress |
| Surface/Groudwater protection | Compliance with Condition 6.16 | **6** | Ensure all required bund/underground pipe integrity testing is completed | Carry out hydrostatic testing of 5 loading aprons | Q4 2019 | Env. Engineer | | In progress |
| Surface/Groudwater protection | Compliance with Condition 6.16 | **7** | Ensure all required bund/underground pipe integrity testing is completed | Conduct testing of Fab 10 process effluent pipe. | Q4 2019 | Env. Engineer | | In progress |
| Surface/Groudwater protection | Compliance with Condition 6.16 | **8** | Ensure all required bund/underground pipe integrity testing is completed | Conduct testing of Fab 14 contained storm system pipework. | Q4 2019 | Env. Engineer | | In progress |
| Surface/Groudwater protection | Compliance with Condition 6.16 | **9** | Ensure all required bund/underground pipe integrity testing is completed | Conduct hydrostatic testing of site retention pond. | Q4 2019 | Env. Engineer | | In progress |
| Surface/Groudwater protection | Reduce risk to storm and ground water from site activities | **10** | Ensure all required bund/underground pipe integrity testing is completed | Improve cleaning and maintenance programme for contained storm containment valves. | Q3 2019 | Env. Engineer | | Not started |
| Hazardous Waste | Reduce environmental impact of chemical waste generated by IR site operations. | **11** | Achieve zero chemical waste to landfill in line with Intel corporate targets. | Achieve zero chemical waste to landfill by 2020 in line with Intel corporate targets. | 2020 | EHS Manager | | Ongoing |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Non-Hazardous Waste | Recycle 90% of our solid waste (non-hazardous) generated per year | **12** | Recycle 90% of our non-hazardous waste in line with Intel Corporate targets | Recycle 90% of our non-hazardous waste in line with Intel Corporate targets | Market Dependent Timeframe | EHS Manager | | Ongoing |
| Resource utilization | Conserve natural resources | **13** | Conserve in excess of 300,000$m^3$ water through various water conservation projects. | Implementation of water conservation projects as scheduled in the site energy project tracker. | Q4 2019 | Corporate Services Engineering groups | | In progress |
| Resource utilization | Conserve natural resources | **14** | Provide annualised energy conservation of 15 GWhrs | Implementation of energy projects as scheduled in the site energy project tracker. | Q4 2019 | Corporate Services Engineering groups | | In progress |
| Resource utilization | Conserve natural resources | **15** | Maintain accreditation to a multisite ISO 50001 accreditation with Ireland as the head office. | Complete a head office ISO 50001 recertification audit to maintain certification | Q4 2019 | Env. Engineer | | Not started |
| Wastewater | To track fluoride emissions in wastewater | **16** | Track fluoride emissions to sewer against our commitment to the EPA (letter dated 5th December 2007) to reduce fluoride emissions on a production basis for future technologies. | Fluoride emissions from the site are tracked on a weekly basis as per IE licence requirements. The average mass emissions for the current technology and the previous technology are calculated using representative production timeframes to determine, when normalized for the increased process complexity, the reduction in Fluoride emissions. | Ongoing | Env. Engineer | | Ongoing |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Visual Impact/ Impact on local Environment | To increase Env Awareness at the Intel Ireland Site | **17** | Maintain a Biodiversity Programme for the Intel Ireland site | Carry out actions as per the Biodiversity program plan | Q1, Q2, Q3, Q4 2019 | Env. Engineer | Q1 - presentation to Trinty College Dublin students studying MSc. in Conservation to share learnings on business actions taken by Intel on biodiversity. Q1 - Intel actively participated in the National Biodiversity Conference 2019 to gain learnings from all sectors and also to present on business actions which can be taken by industry in relation to biodiversity. Q2 Bee identification workshop being held on-site in conjunction with the National Biodiversity Centre Ireland for internal and external community participates again to promote biodiversity measures. Q2 species identification at Intel's Wildflower meadow. Q3 extend pollinator planting at front of house for more employee visibility to encourage biodiversity at home. | In progress |
| Noise | Improve Noise Source Survey Model | **18** | Update the site Noise survey report 2015 to measure emissions which were provided as technical estimates and incorporate any new sources in 2018. | Update the site Noise survey report 2015 to measure emissions which were provided as technical estimates. Add any additional noise sources to the site noise model. | Q3 2019 | Env. Engineer | Noise measurements were taken of equipment in 2017 where in 2015 this was not feasible. Additional noise sources will be measured in 2019 in order to rerun the noise model and update the AWN noise source survey report. New noise sources include those from Fab 10 upgrade project. Noise sources associated with this project were incorporated into the comprehensive CGA noise model to ensure the facility would meet the 45dB limit for night time noise. | In progress |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Hazardous Waste | Reduce environmental impact of chemical waste generated by Ireland site operations. | **19** | Move three hazardous waste streams up the waste management hierarchy. | 1. Shift GSW from incineration (D10) to regeneration (R6)<br>2. Shift CCW and CMW from physico chemical treatment (D9) to recycling/reclamation (R4/R6) | Q4 2019 | Env. Engineer | | Ongoing |
| EHS Management system | Implement ISO45001 requirements into site EHS MS system | **20** | Implement ISO45001 requirements into site EHS MS system | Implement ISO45001 requirements into site EHS MS system | Q2, Q3 & Q4 2019 | Env. Engineer | In March 2018, site environmental engineer attended workshop on ISO45001 held by NSAI. Cross site team kicked off in March 2019 to commence implementation as part of corporate EHS MS. | In progress |
| EHS Management | Improve internal and external environmental awareness | **21** | Improve site and external environmental awareness | 1. Provide new Environmental related film footage for Intel's external environmental page Explore Intel explore.intel.com/ireland<br>2. Provide revised Explore Intel site as per Sustainability Group project<br>3. Provide audio visual of Intel Ireland's EHS & Energy Policy<br>4. Support Environmental Awareness Activities on-site and in the community | 1. Q3 2019<br>2. Q3 and Q4 2019<br>3. Q3 2019 | Env. Engineer | | In progress |

**Note: Please note that Intel Corporation generate a 10 year plans for achievement of public environmental goals which the site aligns to and this is detailed in the current EMP where appropriate.**

**Note a rolling 5 year plan for site is not generated due to the rapid changes in the technology sector the site implements an annual plan which is more appropriate to the business environment we operate in.**

| Environmental Liabilities template | Lic No: P0207-04 | Year: 2018 |
|---|---|---|

Click here to access EPA guidance on Environmental Liabilities and Financial provision

| | | Commentary |
|---|---|---|
| Environmental Liabilities Risk Assessment (ELRA) initial agreement status | Submitted and agreed by EPA; | Previously, the ELRA was incorporated into the Residual Management Plan (RMP). The initial RMP was submitted to the Agency in 2003 and was updated in 2005, 2006 and 2007. A standalone ELRA was produced in 2010 and submitted to the Agency. The Agency has not provided any comments on the content of the intial RMP/ELRA's submitted. |
| ELRA review status | Submitted and agreed by EPA; | Intel Ireland submitted a revised ELRA in December 2015 in accordance with the revised Guidance Document (2014) and this was agreed in full by the Agency on October 9th 2017. A revision was carried out for the year 2018 which showed a slight increase in the value of the ELRA (less than 5%). Intel will submit the draft revision to the Agency for approval. |
| Amount of Financial Provision cover required as determined by the latest ELRA | €775,000 | This figure is taken from the ELRA submitted to the Agency in December 2015 and approved by the Agency in 2017. The revision to cover the year 2018 showed a slight increase in the value of ELRA (less than 5%). Intel will submit the draft revision to the Agency for Approval. |
| Financial Provision for ELRA status | Submitted and agreed by EPA | |
| Financial Provision for ELRA - amount of cover | €775,000 | This figure is incorported into the overall Parent Company Guarantee (PCG) which covered the ELRA and the CRAMP. |
| Financial Provision for ELRA - type | Other please specify | Parent Company Guarantee (PCG) |
| Financial provision for ELRA expiry date | None | |
| Closure plan initial agreement status | Closure plan submitted and not agreed by EPA | Incorporated into the RMP-CRAMP document submitted to the Agency in 2010. The Agency has not provided any comments on the content of the RMP-CRAMP. A 2010 update was submitted to the Agency, but the Agency has not provided comment. |
| Closure plan review status | Submitted and agreed by EPA | The company submitted a revised closure plan in Dec 2015 and this was approved by the EPA. A revision was carried out for the year 2018 which showed a slight increase in the value of the CRAMP (less than 5%). Intel will submit the draft revision to the Agency for approval. |
| Financial Provision for Closure status | Submitted and agreed by EPA | This was agreed in full by the Agency on October 9th 2017. |
| Financial Provision for Closure - amount of cover | €18.34 Million | This figure is incorported into the overall Parent Company Guarantee (PCG) which covered the ELRA and the CRAMP. |
| Financial Provision for Closure - type | Other please specify | Parent Company Guarantee |
| Financial provision for Closure expiry date | None | |

**P207-04 Schedule D: Report on the assessment of the efficiency of use of raw materials in processes and the reduction in waste generated.**

**Design for the Environment (Technology Goals)**

Intel Corporation develops and delivers a new chip manufacturing technology approximately every two years. The development cycle starts typically with six years external research in universities and government labs, followed by approximately four years joint research and development between Intel and suppliers followed by two years process development to produce a fully functional technology before transfer to high volume manufacturing (Figure 1). Intel has recognised that there is an opportunity for early engagement to effect change for environmental benefit during external and joint research, in addition to when the process is in high volume manufacturing mode. However, the optimum time to effect change for environmental design of the process is during the 2 years of final process development. The Intel Environmental Technology Development (TD) group is involved throughout this timeframe and has input into manufacturing process development, chemical selection, waste management, facility systems design and manufacturing equipment selection.

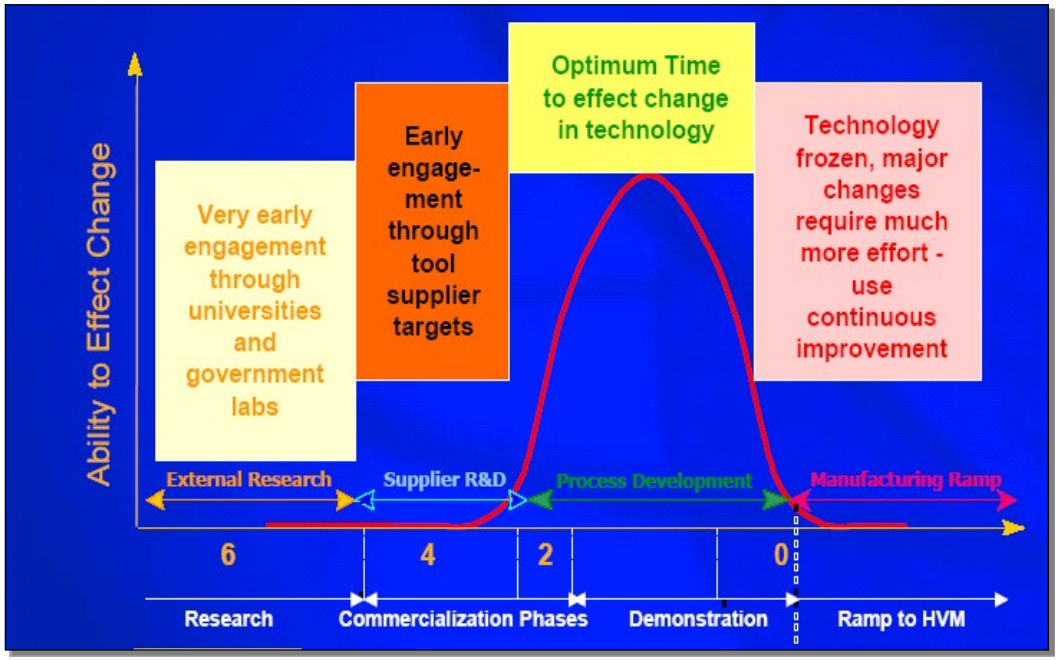


**Figure 1: Effecting change during Intel process technology development**

For each technology, goals are set for specific types of emissions, for example: - mass of VOCs or copper emitted per wafer produced. The methodology used for the setting of these goals is to first

evaluate the receiving environment at each of the High Volume Manufacturing (HVM) sites. Items considered during this review would include existing site permits, local area regulations, wastewater treatment plant capacity, air and water quality standards and demographic growth projections. Against this data is set projected wafer manufacturing capacities at each of the HVMs for each of the technologies. From this are derived acceptable emissions/wafer figures for each of the HVM sites. To set the corporate goal, the lowest emission/wafer figure so calculated is used. Once the goals have been ratified at the appropriate management level, measures are put in place during the development cycle to ensure the targets are met. Measures include material selection, material substitution, recipe optimisation, emissions treatment and waste segregation. In this way, the Corporation aims to ensure that the transfer of technologies to the HVMs can be successfully transferred without detrimental effect on the local environment.

Once the technology is transferred to a receiving HVM site, such as Intel Ireland, actual emissions per unit of product for each parameter are sampled and reported back to the development site and to the receiving factory site management to confirm that, when the technology is run in high volume manufacturing conditions, it performs to the goals that the Technology Development (TD) group is required to deliver.

Since the inception of the environmental technology goals process, a number of additional parameters have been included in the more recent years. Currently Intel has technology goals for reducing air, water and waste emissions per wafer produced.

**Material Efficiency**

**Process Optimisation for Material Efficiency**

Due to the very minute dimensions that are patterned onto a wafer during manufacture, process chemical and gas flow set points need to be very exact.

Process optimisation through the statistical 'Design of Experiments' methodology is a practice used extensively throughout the process to determine the wafer processing recipe set points such as gas and chemical flows and power during technology development.

Using this method, tests are carried out by varying equipment recipe set points and measuring the result on the wafer. For example, in a dry etch process; set-point variables for an etchant gas may be tested at varying flow rates. The flow that provides optimum results on the surface of the wafer is

selected. Process optimisation ensures that excess chemicals, gases or energy are not consumed which conserves resources.

The current technology that is being manufactured in Intel Ireland uses a 12 inch (or 300mm) wafer which carries more than twice the number of dies that can be produced on the old 8 inch wafer. This economy of scale has given rise to an increase in production without a proportional increase in consumption of raw materials.

**Yield Improvements**

In all the manufacturing technologies operated on site, yield improvement is a focus area. This covers the line yield, (the number of wafers that are not scrapped in line), as well as die yield (which is the number of functioning die per wafer at end of line). The continuous effort to improve yield gives rise to more efficient use of raw material, thereby conserving resources.

For example; certain compounds reduce the number of defects on the product which can cause failures in circuits and reducing die yield. Failed circuits are discarded at end of process and require replacements. Use of these chemicals reduce these process losses and makes the manufacturing process more efficient, thereby reducing overall emissions and resource use per unit of production.

## Proposed PRTR Parameters for 2019

Intel Ireland is proposing the following PRTR parameters for 2019. Please note that this is an indicative listing of pollutants to be emitted and may therefore change based upon actual manufacturing operations and emissions.

### Emissions to Air:

**Sector-Specific PRTR Pollutants**

| No. Annex II | Name |
|---|---|
| 06 | Ammonia (NH3) |
| 03 | Carbon dioxide (CO2) |
| 02 | Carbon monoxide (CO) |
| 04 | Hydro-fluorocarbons (HFCs) |
| 08 | Nitrogen oxides (NOx/NO2) |
| 05 | Nitrous oxide (N2O) |
| 09 | Perfluorocarbons (PFCs) |
| 10 | Sulphur hexafluoride (SF6) |
| 80 | Chlorine and inorganic compounds (as HCl) |
| 86 | Particulate Matters (PM10) |
| 07 | Non-methane volatile organic compounds (NMVOC) |

**Remaining PRTR Pollutants**

| No. Annex II | Name |
|---|---|
| 84 | Fluorine and inorganic compounds (as HF) |

### Emissions to Wastewater:

**Sector-Specific PRTR Pollutants**

| No. Annex II | Name |
|---|---|
| 12 | Total Nitrogen |
| 13 | Total Phosphorus |
| 17 | Arsenic and compounds (as As) |
| 18 | Cadmium and compounds (as Cd) |
| 19 | Chromium and compounds(as Cr) |
| 20 | Copper and compounds (as Cu) |
| 21 | Mercury and compounds (as Hg) |
| 22 | Nickel and compounds (as Ni) |
| 23 | Lead and compounds (as Pb) |
| 24 | Zinc and compounds (as Zn) |
| 76 | Total Organic Carbon (TOC) (as total C or as COD/3) |
| 79 | Chlorides (as total Cl) |
| 82 | Cyanides (as total CN) |
| 83 | Fluorides (as total F) |

**Remaining PRTR Pollutants**

| No. Annex II | Name |
|---|---|
| 238 | Ammonia (as N) |
| 240 | Suspended Solids |
| 327 | Nitrate (as N) |
| 343 | Sulphate |
| 347 | Total Heavy Metals |
| 356 | Cobalt |
| 358 | Tin |
| 363 | Total Dissolved Solids |

| Transferred Waste | | | | | | | |
|---|---|---|---|---|---|---|---|
| List of Waste (LoW) | | | | Next Destination | | Final Destination | |
| LoW Code | LoW Description | Classification | Quantity of waste Tonnes / year | Organisation | Waste Treatment Operation | Organisation | Waste Treatment Operation |
| 06 01 01* | sulphuric acid and sulphurous acid | Hazardous | 2,046.64 | - | | Eco Option (UK) Llimited (EPR/RP3931XD/V004) | R05 - Recycling/reclamation of other inorganic materials |
| 06 01 01* | sulphuric acid and sulphurous acid | Hazardous | 2,508.74 | Enva Ireland Limited (Shannon) - W0041 | D09 - Physico-chemical treatment not specified elsewhere in this Annex which results in final compounds or mixtures which are discarded by means of any of the operations numbered D 1 to D 12 (e.g. evaporation, drying, calcination, etc.) | - | |
| 06 01 01* | sulphuric acid and sulphurous acid | Hazardous | 2.82 | Veolia Environmental Services Technical Solutions Ltd, Corrin, Fermoy, Cork - W0050 | D15 - Storage pending any of the operations numbered D 1 to D 14 (excluding temporary storage, pending collection, on the site where the waste is produced) | Sava GmbH (A51G00508) | D10 - Incineration on land |
| 06 02 01* | calcium hydroxide | Hazardous | 10.31 | Veolia Environmental Services Technical Solutions Ltd, Corrin, Fermoy, Cork - W0050 | D13 - Blending or mixing prior to submission to any of the operations numbered D 1 to D 12 | Sava GmbH (A51G00508) | D10 - Incineration on land |

| Transferred Waste | | | | | | | |
|---|---|---|---|---|---|---|---|
| List of Waste (LoW) | | | | Next Destination | | Final Destination | |
| LoW Code | LoW Description | Classification | Quantity of waste Tonnes / year | Organisation | Waste Treatment Operation | Organisation | Waste Treatment Operation |
| 06 02 03* | ammonium hydroxide | Hazardous | 0.01 | Veolia Environmental Services Technical Solutions Ltd, Corrin, Fermoy, Cork - W0050 | D15 - Storage pending any of the operations numbered D 1 to D 14 (excluding temporary storage, pending collection, on the site where the waste is produced) | Sava GmbH (A51G00508) | D10 - Incineration on land |
| 06 13 02* | spent activated carbon (except 06 07 02) | Hazardous | 26 | Enva Ireland Limited (Shannon) - W0041 | R12 - Exchange of waste for submission to any of the operations numbered R 1 to R 11 | Lindenschmidt KG Umweltservice (E97095037) | R01 - Use principally as a fuel or other means to generate energy |
| 07 01 01* | aqueous washing liquids and mother liquors | Hazardous | 12.93 | Veolia Environmental Services Technical Solutions Ltd, Corrin, Fermoy, Cork - W0050 | D13 - Blending or mixing prior to submission to any of the operations numbered D 1 to D 12 | Sava GmbH (A51G00508) | D10 - Incineration on land |
| 07 01 01* | aqueous washing liquids and mother liquors | Hazardous | 0.91 | Veolia Environmental Services Technical Solutions Ltd, Corrin, Fermoy, Cork - W0050 | R12 - Exchange of waste for submission to any of the operations numbered R 1 to R 11 | Sava GmbH (A51G00508) | |
| 07 01 03* | organic halogenated solvents, washing liquids and mother liquors | Hazardous | 0.1 | Veolia Environmental Services Technical Solutions Ltd, Corrin, Fermoy, Cork - W0050 | D15 - Storage pending any of the operations numbered D 1 to D 14 (excluding temporary storage, pending collection, on the site where the waste is produced) | Sava GmbH (A51G00508) | D10 - Incineration on land |

| Transferred Waste | | | | | | | |
|---|---|---|---|---|---|---|---|
| List of Waste (LoW) | | | | Next Destination | | Final Destination | |
| LoW Code | LoW Description | Classification | Quantity of waste Tonnes / year | Organisation | Waste Treatment Operation | Organisation | Waste Treatment Operation |
| 07 01 04* | other organic solvents, washing liquids and mother liquors | Hazardous | 0.06 | Veolia Environmental Services Technical Solutions Ltd, Corrin, Fermoy, Cork - W0050 | R12 - Exchange of waste for submission to any of the operations numbered R 1 to R 11 | - | |
| 08 03 18 | waste printing toner other than those mentioned in 08 03 17 | Non hazardous | 0.14 | Brian Kehoe Ltd (WFP-CW-16-02) | R12 - Exchange of waste for submission to any of the operations numbered R 1 to R 11 | - | |
| 11 01 10 | sludges and filter cakes other than those mentioned in 11 01 09 | Non hazardous | 2,908.23 | John Gannon Concrete Ltd (WFP-WM-2014-05) | R05 - Recycling/reclamation of other inorganic materials | - | |
| 11 01 10 | sludges and filter cakes other than those mentioned in 11 01 09 | Non hazardous | 3.28 | Veolia Environmental Services Technical Solutions Ltd, Corrin, Fermoy, Cork - W0050 | D15 - Storage pending any of the operations numbered D 1 to D 14 (excluding temporary storage, pending collection, on the site where the waste is produced) | - | |
| 11 01 11* | aqueous rinsing liquids containing hazardous substances | Hazardous | 4,807.60 | - | | Eco Option (UK) Llimited (EPR/RP3931XD/V004) | R05 - Recycling/reclamation of other inorganic materials |
| 11 01 12 | aqueous rinsing liquids other than those mentioned in 11 01 11 | Non hazardous | 5.51 | Veolia Environmental Services Technical Solutions Ltd, Corrin, Fermoy, Cork - W0050 | D13 - Blending or mixing prior to submission to any of the operations numbered D 1 to D 12 | - | |
| 11 01 16* | saturated or spent ion exchange resins | Hazardous | 10 | Enva Ireland Limited (Shannon) - W0041 | R12 - Exchange of waste for submission to any of the operations numbered R 1 to R 11 | Lindenschmidt KG Umweltservice (E97095037) | R01 - Use principally as a fuel or other means to generate energy |

| Transferred Waste | | | | | | | |
|---|---|---|---|---|---|---|---|
| List of Waste (LoW) | | | | Next Destination | | Final Destination | |
| LoW Code | LoW Description | Classification | Quantity of waste Tonnes / year | Organisation | Waste Treatment Operation | Organisation | Waste Treatment Operation |
| 11 01 16* | saturated or spent ion exchange resins | Hazardous | 5.76 | Veolia Environmental Services Technical Solutions Ltd, Corrin, Fermoy, Cork - W0050 | D15 - Storage pending any of the operations numbered D 1 to D 14 (excluding temporary storage, pending collection, on the site where the waste is produced) | Sava GmbH (A51G00508) | D10 - Incineration on land |
| 11 01 16* | saturated or spent ion exchange resins | Hazardous | 85 | Enva Ireland Limited (Shannon) - W0041 | R07 - Recovery of components used for pollution abatement | - | |
| 11 01 98* | other wastes containing hazardous substances | Hazardous | 1.12 | Veolia Environmental Services Technical Solutions Ltd, Corrin, Fermoy, Cork - W0050 | D15 - Storage pending any of the operations numbered D 1 to D 14 (excluding temporary storage, pending collection, on the site where the waste is produced) | Sava GmbH (A51G00508) | D10 - Incineration on land |
| 11 02 05* | wastes from copper hydrometallurgical processes containing hazardous substances | Hazardous | 18.16 | SRCL Limited (Kylemore Road) trading as Eco-Safe Systems Ltd, Allied Industrial Estate, Kylemore Road, D10 - W0054 | R13 - Storage of waste pending any of the operations numbered R 1 to R 12 (excluding temporary storage, pending collection, on the site where the waste is produced) | Mastermelt (EPR/BL1312IE) | R04 - Recycling/reclamation of metals and metal compounds |

| Transferred Waste | | | | | | | |
|---|---|---|---|---|---|---|---|
| List of Waste (LoW) | | | | Next Destination | | Final Destination | |
| LoW Code | LoW Description | Classification | Quantity of waste Tonnes / year | Organisation | Waste Treatment Operation | Organisation | Waste Treatment Operation |
| 12 01 01 | ferrous metal filings and turnings | Non hazardous | 1.32 | Starrus Eco Holdings Limited (Millenium Business Park) - W0183 | R13 - Storage of waste pending any of the operations numbered R 1 to R 12 (excluding temporary storage, pending collection, on the site where the waste is produced) | - | |
| 12 01 01 | ferrous metal filings and turnings | Non hazardous | 92.28 | Starrus Eco Holdings Limited (Greenogue) - W0188 | R13 - Storage of waste pending any of the operations numbered R 1 to R 12 (excluding temporary storage, pending collection, on the site where the waste is produced) | - | |
| 12 01 01 | ferrous metal filings and turnings | Non hazardous | 12.75 | KMK Metals Recycling Limited - W0113 | R13 - Storage of waste pending any of the operations numbered R 1 to R 12 (excluding temporary storage, pending collection, on the site where the waste is produced) | - | |
| 12 01 16* | waste blasting material containing hazardous substances | Hazardous | 4.74 | Veolia Environmental Services Technical Solutions Ltd, Corrin, Fermoy, Cork - W0050 | D15 - Storage pending any of the operations numbered D 1 to D 14 (excluding temporary storage, pending collection, on the site where the waste is produced) | Sava GmbH (A51G00508) | D10 - Incineration on land |

| Transferred Waste | | | | | | | |
|---|---|---|---|---|---|---|---|
| List of Waste (LoW) | | | | Next Destination | | Final Destination | |
| LoW Code | LoW Description | Classification | Quantity of waste Tonnes / year | Organisation | Waste Treatment Operation | Organisation | Waste Treatment Operation |
| 13 02 08* | other engine, gear and lubricating oils | Hazardous | 2.86 | Veolia Environmental Services Technical Solutions Ltd, Corrin, Fermoy, Cork - W0050 | R12 - Exchange of waste for submission to any of the operations numbered R 1 to R 11 | - | |
| 13 05 07* | oily water from oil/water separators | Hazardous | 0.34 | Veolia Environmental Services Technical Solutions Ltd, Corrin, Fermoy, Cork - W0050 | D13 - Blending or mixing prior to submission to any of the operations numbered D 1 to D 12 | - | |
| 13 05 07* | oily water from oil/water separators | Hazardous | 2.85 | Dublin City Council Drainage Services (D0034-01) | D09 - Physico-chemical treatment not specified elsewhere in this Annex which results in final compounds or mixtures which are discarded by means of any of the operations numbered D 1 to D 12 (e.g. evaporation, drying, calcination, etc.) | - | |
| 13 05 07* | oily water from oil/water separators | Hazardous | 0.15 | Dublin City Council Drainage Services (D0034-01) | R13 - Storage of waste pending any of the operations numbered R 1 to R 12 (excluding temporary storage, pending collection, on the site where the waste is produced) | - | |

| Transferred Waste | | | | | | | |
|---|---|---|---|---|---|---|---|
| List of Waste (LoW) | | | | Next Destination | | Final Destination | |
| LoW Code | LoW Description | Classification | Quantity of waste Tonnes / year | Organisation | Waste Treatment Operation | Organisation | Waste Treatment Operation |
| 13 05 07* | oily water from oil/water separators | Hazardous | 12.13 | Enva Ireland Limited (Naas Road) - W0196 | D09 - Physico-chemical treatment not specified elsewhere in this Annex which results in final compounds or mixtures which are discarded by means of any of the operations numbered D 1 to D 12 (e.g. evaporation, drying, calcination, etc.) | - | |
| 13 05 07* | oily water from oil/water separators | Hazardous | 0.63 | Enva Ireland Limited (Naas Road) - W0196 | R13 - Storage of waste pending any of the operations numbered R 1 to R 12 (excluding temporary storage, pending collection, on the site where the waste is produced) | - | |
| 13 07 01* | fuel oil and diesel | Hazardous | 0.59 | Veolia Environmental Services Technical Solutions Ltd, Corrin, Fermoy, Cork - W0050 | R12 - Exchange of waste for submission to any of the operations numbered R 1 to R 11 | - | |
| 14 06 01* | chlorofluorocarbons, HCFC, HFC | Hazardous | 6.04 | SRCL Limited (Kylemore Road) trading as Eco-Safe Systems Ltd, Allied Industrial Estate, Kylemore Road, D10 - W0054 | R13 - Storage of waste pending any of the operations numbered R 1 to R 12 (excluding temporary storage, pending collection, on the site where the waste is produced) | A-Gas (Uk) Limited (EPR/BP3390FS) | R03 - Recycling/reclamation of organic substances which are not used as solvents (including composting and other biological transformation processes) |
| 14 06 03* | other solvents and solvent mixtures | Hazardous | 5,484.86 | - | | Ellesmere Port Incinerator (BS5193IE) | D10 - Incineration on land |

| Transferred Waste | | | | | | | |
|---|---|---|---|---|---|---|---|
| List of Waste (LoW) | | | | Next Destination | | Final Destination | |
| LoW Code | LoW Description | Classification | Quantity of waste Tonnes / year | Organisation | Waste Treatment Operation | Organisation | Waste Treatment Operation |
| 14 06 03* | other solvents and solvent mixtures | Hazardous | 3,588.74 | - | | Veolia ES (UK) Limited (EPR/FP3133GL) | R02 - Solvent reclamation/regeneration |
| 14 06 03* | other solvents and solvent mixtures | Hazardous | 1,154.73 | Veolia Environmental Services Technical Solutions Ltd, Corrin, Fermoy, Cork - W0050 | D13 - Blending or mixing prior to submission to any of the operations numbered D 1 to D 12 | - | |
| 14 06 03* | other solvents and solvent mixtures | Hazardous | 1,052.77 | Veolia Environmental Services Technical Solutions Ltd, Corrin, Fermoy, Cork - W0050 | R12 - Exchange of waste for submission to any of the operations numbered R 1 to R 11 | - | |
| 15 01 02 | plastic packaging | Non hazardous | 13.64 | Irish Packaging Recycling - W0263 | R12 - Exchange of waste for submission to any of the operations numbered R 1 to R 11 | - | |
| 15 01 02 | plastic packaging | Non hazardous | 10.72 | Irish Packaging Recycling - W0263 | R13 - Storage of waste pending any of the operations numbered R 1 to R 12 (excluding temporary storage, pending collection, on the site where the waste is produced) | - | |
| 15 01 02 | plastic packaging | Non hazardous | 1.6 | Starrus Eco Holdings Limited (Fassaroe) - W0053 | R13 - Storage of waste pending any of the operations numbered R 1 to R 12 (excluding temporary storage, pending collection, on the site where the waste is produced) | - | |

| Transferred Waste | | | | | | | |
|---|---|---|---|---|---|---|---|
| List of Waste (LoW) | | | | Next Destination | | Final Destination | |
| LoW Code | LoW Description | Classification | Quantity of waste Tonnes / year | Organisation | Waste Treatment Operation | Organisation | Waste Treatment Operation |
| 15 01 02 | plastic packaging | Non hazardous | 5.02 | Ballymount MRF (Merrywell) - W0238 | R12 - Exchange of waste for submission to any of the operations numbered R 1 to R 11 | - | |
| 15 01 02 | plastic packaging | Non hazardous | 11.04 | Starrus Eco Holdings Limited - W0261 | R12 - Exchange of waste for submission to any of the operations numbered R 1 to R 11 | - | |
| 15 01 02 | plastic packaging | Non hazardous | 0.3 | Veolia Environmental Services Technical Solutions Ltd, Corrin, Fermoy, Cork - W0050 | D13 - Blending or mixing prior to submission to any of the operations numbered D 1 to D 12 | - | |
| 15 01 04 | metallic packaging | Non hazardous | 2.5 | Starrus Eco Holdings Limited (Greenogue) - W0188 | R13 - Storage of waste pending any of the operations numbered R 1 to R 12 (excluding temporary storage, pending collection, on the site where the waste is produced) | - | |
| 15 01 06 | mixed packaging | Non hazardous | 23.46 | Starrus Eco Holdings Limited (Millenium Business Park) - W0183 | R12 - Exchange of waste for submission to any of the operations numbered R 1 to R 11 | - | |
| 15 01 06 | mixed packaging | Non hazardous | 315.99 | Starrus Eco Holdings Limited (Greenogue) - W0188 | R12 - Exchange of waste for submission to any of the operations numbered R 1 to R 11 | - | |

| Transferred Waste | | | | | | | |
|---|---|---|---|---|---|---|---|
| List of Waste (LoW) | | | | Next Destination | | Final Destination | |
| LoW Code | LoW Description | Classification | Quantity of waste Tonnes / year | Organisation | Waste Treatment Operation | Organisation | Waste Treatment Operation |
| 15 01 06 | mixed packaging | Non hazardous | 4.18 | Ballymount Baling Station - W0003 | R12 - Exchange of waste for submission to any of the operations numbered R 1 to R 11 | - | |
| 15 01 06 | mixed packaging | Non hazardous | 0.95 | Irish Packaging Recycling - W0263 | R12 - Exchange of waste for submission to any of the operations numbered R 1 to R 11 | - | |
| 15 01 06 | mixed packaging | Non hazardous | 1.27 | Ballymount MRF (Merrywell) - W0238 | R12 - Exchange of waste for submission to any of the operations numbered R 1 to R 11 | - | |
| 15 01 10* | packaging containing residues of or contaminated by hazardous substances | Hazardous | 0.12 | Veolia Environmental Services Technical Solutions Ltd, Corrin, Fermoy, Cork - W0050 | R13 - Storage of waste pending any of the operations numbered R 1 to R 12 (excluding temporary storage, pending collection, on the site where the waste is produced) | - | |
| 15 01 10* | packaging containing residues of or contaminated by hazardous substances | Hazardous | 0.26 | - | | Sava GmbH (A51G00508) | D10 - Incineration on land |
| 15 02 02* | absorbents, filter materials (including oil filters not otherwise specified), wiping cloths, protective clothing contaminated by hazardous substances | Hazardous | 411.56 | - | | Sava GmbH (A51G00508) | D10 - Incineration on land |

| Transferred Waste | | | | | | | |
|---|---|---|---|---|---|---|---|
| List of Waste (LoW) | | | | Next Destination | | Final Destination | |
| LoW Code | LoW Description | Classification | Quantity of waste Tonnes / year | Organisation | Waste Treatment Operation | Organisation | Waste Treatment Operation |
| 15 02 03 | absorbents, filter materials, wiping cloths and protective clothing other than those mentioned in 15 02 02 | Non hazardous | 5.9 | Sava GmbH (A51G00508) | D10 - Incineration on land | - | |
| 16 02 14 D | Non-household other waste electrical and electronic equipment, non-hazardous | Non hazardous | 0.12 | ClearCircle Metal Limerick (WFP-L-2017-11-001-01-R4-T1) | D13 - Blending or mixing prior to submission to any of the operations numbered D 1 to D 12 | - | |
| 16 02 14 D | Non-household other waste electrical and electronic equipment, non-hazardous | Non hazardous | 5.92 | ClearCircle Metal Limerick (WFP-L-2017-11-001-01-R4-T1) | R04 - Recycling/reclamation of metals and metal compounds | - | |
| 16 02 14 D | Non-household other waste electrical and electronic equipment, non-hazardous | Non hazardous | 8.06 | KMK Metals Recycling Limited - W0113 | R13 - Storage of waste pending any of the operations numbered R 1 to R 12 (excluding temporary storage, pending collection, on the site where the waste is produced) | - | |
| 16 02 14 D | Non-household other waste electrical and electronic equipment, non-hazardous | Non hazardous | 0.07 | Rilta Environmental Limited - W0192 | D13 - Blending or mixing prior to submission to any of the operations numbered D 1 to D 12 | - | |
| 16 02 14 D | Non-household other waste electrical and electronic equipment, non-hazardous | Non hazardous | 3.37 | Rilta Environmental Limited - W0192 | R04 - Recycling/reclamation of metals and metal compounds | - | |

| Transferred Waste | | | | | | | |
|---|---|---|---|---|---|---|---|
| List of Waste (LoW) | | | | Next Destination | | Final Destination | |
| LoW Code | LoW Description | Classification | Quantity of waste Tonnes / year | Organisation | Waste Treatment Operation | Organisation | Waste Treatment Operation |
| 16 02 14 D | Non-household other waste electrical and electronic equipment, non-hazardous | Non hazardous | 0.01 | Starrus Eco Holdings Limited (Millenium Business Park) - W0183 | R12 - Exchange of waste for submission to any of the operations numbered R 1 to R 11 | - | |
| 16 02 16 | components removed from discarded equipment other than those mentioned in 16 02 15 | Non hazardous | 0.01 | KMK Metals Recycling Limited - W0113 | R04 - Recycling/reclamation of metals and metal compounds | - | |
| 16 03 04 | inorganic wastes other than those mentioned in 16 03 03 | Non hazardous | 0.86 | Veolia Environmental Services Technical Solutions Ltd, Corrin, Fermoy, Cork - W0050 | D13 - Blending or mixing prior to submission to any of the operations numbered D 1 to D 12 | - | |
| 16 03 05* | organic wastes containing hazardous substances | Hazardous | 0.01 | Veolia Environmental Services Technical Solutions Ltd, Corrin, Fermoy, Cork - W0050 | R12 - Exchange of waste for submission to any of the operations numbered R 1 to R 11 | - | |
| 16 05 04* | gases in pressure containers (including halons) containing hazardous substances | Hazardous | 0.52 | Veolia Environmental Services Technical Solutions Ltd, Corrin, Fermoy, Cork - W0050 | R13 - Storage of waste pending any of the operations numbered R 1 to R 12 (excluding temporary storage, pending collection, on the site where the waste is produced) | - | |

| Transferred Waste | | | | | | | |
|---|---|---|---|---|---|---|---|
| List of Waste (LoW) | | | | Next Destination | | Final Destination | |
| LoW Code | LoW Description | Classification | Quantity of waste Tonnes / year | Organisation | Waste Treatment Operation | Organisation | Waste Treatment Operation |
| 16 05 07* | discarded inorganic chemicals consisting of or containing hazardous substances | Hazardous | 4.7 | Veolia Environmental Services Technical Solutions Ltd, Corrin, Fermoy, Cork - W0050 | D15 - Storage pending any of the operations numbered D 1 to D 14 (excluding temporary storage, pending collection, on the site where the waste is produced) | Sava GmbH (A51G00508) | D10 - Incineration on land |
| 16 05 08* | discarded organic chemicals consisting of or containing hazardous substances | Hazardous | 0.38 | Veolia Environmental Services Technical Solutions Ltd, Corrin, Fermoy, Cork - W0050 | D15 - Storage pending any of the operations numbered D 1 to D 14 (excluding temporary storage, pending collection, on the site where the waste is produced) | Sava GmbH (A51G00508) | D10 - Incineration on land |
| 16 05 09 | discarded chemicals other than those mentioned in 16 05 06, 16 05 07 or 16 05 08 | Non hazardous | 1.91 | Veolia Environmental Services Technical Solutions Ltd, Corrin, Fermoy, Cork - W0050 | D13 - Blending or mixing prior to submission to any of the operations numbered D 1 to D 12 | - | |
| 16 05 09 | discarded chemicals other than those mentioned in 16 05 06, 16 05 07 or 16 05 08 | Non hazardous | 0.2 | Veolia Environmental Services Technical Solutions Ltd, Corrin, Fermoy, Cork - W0050 | D15 - Storage pending any of the operations numbered D 1 to D 14 (excluding temporary storage, pending collection, on the site where the waste is produced) | - | |
| 16 06 01* | lead batteries | Hazardous | 1 | KMK Metals Recycling Limited - W0113 | R04 - Recycling/reclamation of metals and metal compounds | - | |

| Transferred Waste | | | | | | | |
|---|---|---|---|---|---|---|---|
| List of Waste (LoW) | | | | Next Destination | | Final Destination | |
| LoW Code | LoW Description | Classification | Quantity of waste Tonnes / year | Organisation | Waste Treatment Operation | Organisation | Waste Treatment Operation |
| 16 06 02* | Ni-Cd batteries | Hazardous | 0.18 | KMK Metals Recycling Limited - W0113 | R04 - Recycling/reclamation of metals and metal compounds | - | |
| 16 06 04 | alkaline batteries (except 16 06 03) | Non hazardous | 1.09 | KMK Metals Recycling Limited - W0113 | R04 - Recycling/reclamation of metals and metal compounds | - | |
| 16 09 03* | peroxides, for example hydrogen peroxide | Hazardous | 0.13 | Veolia Environmental Services Technical Solutions Ltd, Corrin, Fermoy, Cork - W0050 | D15 - Storage pending any of the operations numbered D 1 to D 14 (excluding temporary storage, pending collection, on the site where the waste is produced) | Sava GmbH (A51G00508) | D10 - Incineration on land |
| 16 10 01* | aqueous liquid wastes containing hazardous substances | Hazardous | 0.23 | Veolia Environmental Services Technical Solutions Ltd, Corrin, Fermoy, Cork - W0050 | D13 - Blending or mixing prior to submission to any of the operations numbered D 1 to D 12 | Sava GmbH (A51G00508) | D10 - Incineration on land |
| 16 10 01* | aqueous liquid wastes containing hazardous substances | Hazardous | 1.34 | Veolia Environmental Services Technical Solutions Ltd, Corrin, Fermoy, Cork - W0050 | D13 - Blending or mixing prior to submission to any of the operations numbered D 1 to D 12 | - | |
| 16 10 02 | aqueous liquid wastes other than those mentioned in 16 10 01 | Non hazardous | 17.24 | Veolia Environmental Services Technical Solutions Ltd, Corrin, Fermoy, Cork - W0050 | D13 - Blending or mixing prior to submission to any of the operations numbered D 1 to D 12 | - | |
| 17 01 01 | Concrete | Non hazardous | 510.09 | Cullen Excavations Ltd (WFP-WW-17-0003-03) | R05 - Recycling/reclamation of other inorganic materials | - | |

| Transferred Waste | | | | | | | |
|---|---|---|---|---|---|---|---|
| List of Waste (LoW) | | | | Next Destination | | Final Destination | |
| LoW Code | LoW Description | Classification | Quantity of waste Tonnes / year | Organisation | Waste Treatment Operation | Organisation | Waste Treatment Operation |
| 17 01 01 | Concrete | Non hazardous | 597.12 | Murphy Concrete Manufacturing Limited - W0151 | R05 - Recycling/reclamation of other inorganic materials | - | |
| 17 03 02 | bituminous mixtures other than those mentioned in 17 03 01 | Non hazardous | 463.72 | Cullen Excavations Ltd (WFP-WW-17-0003-03) | R05 - Recycling/reclamation of other inorganic materials | - | |
| 17 04 01 | copper, bronze, brass | Non hazardous | 22.18 | Starrus Eco Holdings Limited (Greenogue) - W0188 | R13 - Storage of waste pending any of the operations numbered R 1 to R 12 (excluding temporary storage, pending collection, on the site where the waste is produced) | - | |
| 17 08 02 | gypsum-based construction materials other than those mentioned in 17 08 01 | Non hazardous | 38 | Starrus Eco Holdings Limited (Greenogue) - W0188 | R12 - Exchange of waste for submission to any of the operations numbered R 1 to R 11 | - | |
| 17 05 04 | soil and stones other than those mentioned in 17 05 03 | Non hazardous | 2,022.22 | Corranure Landfill - W0077 | R05 - Recycling/reclamation of other inorganic materials | - | |
| 17 05 04 | soil and stones other than those mentioned in 17 05 03 | Non hazardous | 4,284.63 | Huntstown Inert Waste Recovery Facility - W0277 | R05 - Recycling/reclamation of other inorganic materials | - | |
| 17 09 03* | other construction and demolition wastes (including mixed wastes) containing hazardous substances | Hazardous | 0.15 | Veolia Environmental Services Technical Solutions Ltd, Corrin, Fermoy, Cork - W0050 | D15 - Storage pending any of the operations numbered D 1 to D 14 (excluding temporary storage, pending collection, on the site where the waste is produced) | Sava GmbH (A51G00508) | D10 - Incineration on land |

| Transferred Waste | | | | | | | |
|---|---|---|---|---|---|---|---|
| List of Waste (LoW) | | | | Next Destination | | Final Destination | |
| LoW Code | LoW Description | Classification | Quantity of waste Tonnes / year | Organisation | Waste Treatment Operation | Organisation | Waste Treatment Operation |
| 17 09 03* | other construction and demolition wastes (including mixed wastes) containing hazardous substances | Hazardous | 6.82 | - | | Sava GmbH (A51G00508) | D10 - Incineration on land |
| 17 09 04 | mixed construction and demolition wastes other than those mentioned in 17 09 01, 17 09 02 and 17 09 03 | Non hazardous | 50.9 | Starrus Eco Holdings Limited (Greenogue) - W0188 | R12 - Exchange of waste for submission to any of the operations numbered R 1 to R 11 | - | |
| 18 01 03* | wastes whose collection and disposal is subject to special requirements in order to prevent infection | Hazardous | 1.18 | SRCL Limited - W0055 | R03 - Recycling/reclamation of organic substances which are not used as solvents (including composting and other biological transformation processes) | - | |
| 19 09 05 | saturated or spent ion exchange resins | Non hazardous | 4.68 | Starrus Eco Holdings Limited (Millenium Business Park) - W0183 | R12 - Exchange of waste for submission to any of the operations numbered R 1 to R 11 | - | |
| 19 09 05 | saturated or spent ion exchange resins | Non hazardous | 36.02 | Starrus Eco Holdings Limited (Greenogue) - W0188 | R12 - Exchange of waste for submission to any of the operations numbered R 1 to R 11 | - | |

| Transferred Waste | | | | | | | |
|---|---|---|---|---|---|---|---|
| List of Waste (LoW) | | | | Next Destination | | Final Destination | |
| LoW Code | LoW Description | Classification | Quantity of waste Tonnes / year | Organisation | Waste Treatment Operation | Organisation | Waste Treatment Operation |
| 20 01 01 | paper and cardboard | Non hazardous | 13.38 | Shred It ROI Limited (WFP-DC-09-0011-02) | R13 - Storage of waste pending any of the operations numbered R 1 to R 12 (excluding temporary storage, pending collection, on the site where the waste is produced) | - | |
| 20 01 02 | Glass | Non hazardous | 21.27 | Starrus Eco Holdings Limited (Greenogue) - W0188 | R13 - Storage of waste pending any of the operations numbered R 1 to R 12 (excluding temporary storage, pending collection, on the site where the waste is produced) | - | |
| 20 01 08 B | Non-household biodegradable kitchen & canteen waste | Non hazardous | 2.24 | Starrus Eco Holdings Limited (Millenium Business Park) - W0183 | R13 - Storage of waste pending any of the operations numbered R 1 to R 12 (excluding temporary storage, pending collection, on the site where the waste is produced) | - | |
| 20 01 08 B | Non-household biodegradable kitchen & canteen waste | Non hazardous | 24.35 | Starrus Eco Holdings Limited (Greenogue) - W0188 | R13 - Storage of waste pending any of the operations numbered R 1 to R 12 (excluding temporary storage, pending collection, on the site where the waste is produced) | - | |

| Transferred Waste | | | | | | | |
|---|---|---|---|---|---|---|---|
| List of Waste (LoW) | | | | Next Destination | | Final Destination | |
| LoW Code | LoW Description | Classification | Quantity of waste Tonnes / year | Organisation | Waste Treatment Operation | Organisation | Waste Treatment Operation |
| 20 01 08 B | Non-household biodegradable kitchen & canteen waste | Non hazardous | 76.4 | Key Waste Management Limited - W0045 | R13 - Storage of waste pending any of the operations numbered R 1 to R 12 (excluding temporary storage, pending collection, on the site where the waste is produced) | - | |
| 20 01 08 B | Non-household biodegradable kitchen & canteen waste | Non hazardous | 39.52 | Ballymount MRF (Merrywell) - W0238 | R13 - Storage of waste pending any of the operations numbered R 1 to R 12 (excluding temporary storage, pending collection, on the site where the waste is produced) | - | |
| 20 01 08 B | Non-household biodegradable kitchen & canteen waste | Non hazardous | 11.5 | Ballymount Baling Station - W0003 | R13 - Storage of waste pending any of the operations numbered R 1 to R 12 (excluding temporary storage, pending collection, on the site where the waste is produced) | - | |
| 20 01 08 B | Non-household biodegradable kitchen & canteen waste | Non hazardous | 135 | Ormonde Organics Limited (Portlaw) - W0287 | R13 - Storage of waste pending any of the operations numbered R 1 to R 12 (excluding temporary storage, pending collection, on the site where the waste is produced) | - | |
| 20 01 19* | Pesticides | Hazardous | 0.03 | - | | Sava GmbH (A51G00508) | D10 - Incineration on land |

| Transferred Waste | | | | | | | |
|---|---|---|---|---|---|---|---|
| List of Waste (LoW) | | | | Next Destination | | Final Destination | |
| LoW Code | LoW Description | Classification | Quantity of waste Tonnes / year | Organisation | Waste Treatment Operation | Organisation | Waste Treatment Operation |
| 20 01 21* | Household waste fluorescent lamps and other mercury containing waste | Hazardous | 1.29 | Irish Lamp Recycling Limited (WFP-KE-14-0072-01) | R04 - Recycling/reclamation of metals and metal compounds | - | |
| 20 01 25 | edible oil and fat | Non hazardous | 10.65 | Frylite (WFP-FG-16-0004) | R12 - Exchange of waste for submission to any of the operations numbered R 1 to R 11 | - | |
| 20 01 27* | paint, inks, adhesives and resins containing hazardous substances | Hazardous | 2.06 | Veolia Environmental Services Technical Solutions Ltd, Corrin, Fermoy, Cork - W0050 | D15 - Storage pending any of the operations numbered D 1 to D 14 (excluding temporary storage, pending collection, on the site where the waste is produced) | Sava GmbH (A51G00508) | D10 - Incineration on land |
| 20 01 36 D | Household other waste electrical and electronic equipment, non-hazardous | Non hazardous | 2.69 | Electronics Recycling (WFP-DC-09-0015-02) | R12 - Exchange of waste for submission to any of the operations numbered R 1 to R 11 | - | |
| 20 01 36 D | Household other waste electrical and electronic equipment, non-hazardous | Non hazardous | 11.3 | KMK Metals Recycling Limited - W0113 | R12 - Exchange of waste for submission to any of the operations numbered R 1 to R 11 | - | |
| 20 01 36 D | Household other waste electrical and electronic equipment, non-hazardous | Non hazardous | 21.35 | Rehab Recycle (WFP-DS-10-0008-05) | R12 - Exchange of waste for submission to any of the operations numbered R 1 to R 11 | - | |

| Transferred Waste | | | | | | | |
|---|---|---|---|---|---|---|---|
| List of Waste (LoW) | | | | Next Destination | | Final Destination | |
| LoW Code | LoW Description | Classification | Quantity of waste Tonnes / year | Organisation | Waste Treatment Operation | Organisation | Waste Treatment Operation |
| 20 01 38 | wood other than that mentioned in 20 01 37 | Non hazardous | 120.98 | Starrus Eco Holdings Limited (Millenium Business Park) - W0183 | R12 - Exchange of waste for submission to any of the operations numbered R 1 to R 11 | - | |
| 20 01 38 | wood other than that mentioned in 20 01 37 | Non hazardous | 1,029.28 | Starrus Eco Holdings Limited (Greenogue) - W0188 | R12 - Exchange of waste for submission to any of the operations numbered R 1 to R 11 | - | |
| 20 01 40 C | Mixed metals | Non hazardous | 2.2 | Starrus Eco Holdings Limited (Fassaroe) - W0053 | R12 - Exchange of waste for submission to any of the operations numbered R 1 to R 11 | - | |
| 20 01 40 C | Mixed metals | Non hazardous | 15.36 | Starrus Eco Holdings Limited (Millenium Business Park) - W0183 | R13 - Storage of waste pending any of the operations numbered R 1 to R 12 (excluding temporary storage, pending collection, on the site where the waste is produced) | - | |
| 20 01 40 C | Mixed metals | Non hazardous | 902.13 | Starrus Eco Holdings Limited (Greenogue) - W0188 | R13 - Storage of waste pending any of the operations numbered R 1 to R 12 (excluding temporary storage, pending collection, on the site where the waste is produced) | - | |

| Transferred Waste | | | | | | | |
|---|---|---|---|---|---|---|---|
| List of Waste (LoW) | | | | Next Destination | | Final Destination | |
| LoW Code | LoW Description | Classification | Quantity of waste Tonnes / year | Organisation | Waste Treatment Operation | Organisation | Waste Treatment Operation |
| 20 01 40 C | Mixed metals | Non hazardous | 6.54 | KMK Metals Recycling Limited - W0113 | R13 - Storage of waste pending any of the operations numbered R 1 to R 12 (excluding temporary storage, pending collection, on the site where the waste is produced) | - | |
| 20 01 40 C | Mixed metals | Non hazardous | 10.97 | Starrus Eco Holdings Limited (Millenium Business Park) - W0183 | R12 - Exchange of waste for submission to any of the operations numbered R 1 to R 11 | - | |
| 20 02 01 | biodegradable waste | Non hazardous | 1.02 | Starrus Eco Holdings Limited (Millenium Business Park) - W0183 | R13 - Storage of waste pending any of the operations numbered R 1 to R 12 (excluding temporary storage, pending collection, on the site where the waste is produced) | - | |
| 20 02 01 | biodegradable waste | Non hazardous | 40.62 | Starrus Eco Holdings Limited (Greenogue) - W0188 | R13 - Storage of waste pending any of the operations numbered R 1 to R 12 (excluding temporary storage, pending collection, on the site where the waste is produced) | - | |

| Transferred Waste | | | | | | | |
|---|---|---|---|---|---|---|---|
| List of Waste (LoW) | | | | Next Destination | | Final Destination | |
| LoW Code | LoW Description | Classification | Quantity of waste Tonnes / year | Organisation | Waste Treatment Operation | Organisation | Waste Treatment Operation |
| 20 03 01 B | Municipal mixed residual non-household | Non hazardous | 14.99 | Ballymount Baling Station - W0003 | R13 - Storage of waste pending any of the operations numbered R 1 to R 12 (excluding temporary storage, pending collection, on the site where the waste is produced) | - | |
| 20 03 01 B | Municipal mixed residual non-household | Non hazardous | 0.14 | Starrus Eco Holdings Limited (Millenium Business Park) - W0183 | R13 - Storage of waste pending any of the operations numbered R 1 to R 12 (excluding temporary storage, pending collection, on the site where the waste is produced) | - | |
| 20 03 01 B | Municipal mixed residual non-household | Non hazardous | 0.33 | Starrus Eco Holdings Limited (Greenogue) - W0188 | D13 - Blending or mixing prior to submission to any of the operations numbered D 1 to D 12 | - | |
| 20 03 01 B | Municipal mixed residual non-household | Non hazardous | 14.57 | Starrus Eco Holdings Limited (Greenogue) - W0188 | R12 - Exchange of waste for submission to any of the operations numbered R 1 to R 11 | - | |
| 20 03 01 B | Municipal mixed residual non-household | Non hazardous | 12.57 | Starrus Eco Holdings Limited (Greenogue) - W0188 | R13 - Storage of waste pending any of the operations numbered R 1 to R 12 (excluding temporary storage, pending collection, on the site where the waste is produced) | - | |

| Transferred Waste | | | | | | | |
|---|---|---|---|---|---|---|---|
| List of Waste (LoW) | | | | Next Destination | | Final Destination | |
| LoW Code | LoW Description | Classification | Quantity of waste Tonnes / year | Organisation | Waste Treatment Operation | Organisation | Waste Treatment Operation |
| 20 03 01 B | Municipal mixed residual non-household | Non hazardous | 0.06 | Starrus Eco Holdings Limited - W0261 | R13 - Storage of waste pending any of the operations numbered R 1 to R 12 (excluding temporary storage, pending collection, on the site where the waste is produced) | - | |
| 20 03 01 B | Municipal mixed residual non-household | Non hazardous | 0.61 | Starrus Eco Holdings Limited - W0140 | R13 - Storage of waste pending any of the operations numbered R 1 to R 12 (excluding temporary storage, pending collection, on the site where the waste is produced) | - | |
| 20 03 01 B | Municipal mixed residual non-household | Non hazardous | 0.15 | Starrus Eco Holdings Limited - W0140 | R12 - Exchange of waste for submission to any of the operations numbered R 1 to R 11 | - | |
| 20 03 01 B | Municipal mixed residual non-household | Non hazardous | 27.82 | Ballymount Baling Station - W0003 | R12 - Exchange of waste for submission to any of the operations numbered R 1 to R 11 | - | |

| Transferred Waste | | | | | | | |
|---|---|---|---|---|---|---|---|
| List of Waste (LoW) | | | | Next Destination | | Final Destination | |
| LoW Code | LoW Description | Classification | Quantity of waste Tonnes / year | Organisation | Waste Treatment Operation | Organisation | Waste Treatment Operation |
| 20 03 03 | street-cleaning residues | Non hazardous | 3 | Dublin City Council Drainage Services (D0034-01) | D09 - Physico-chemical treatment not specified elsewhere in this Annex which results in final compounds or mixtures which are discarded by means of any of the operations numbered D 1 to D 12 (e.g. evaporation, drying, calcination, etc.) | - | |
| 20 03 07 B | Bulky waste non-household | Non hazardous | 0.24 | Starrus Eco Holdings Limited (Millenium Business Park) - W0183 | D13 - Blending or mixing prior to submission to any of the operations numbered D 1 to D 12 | - | |
| 20 03 07 B | Bulky waste non-household | Non hazardous | 188.97 | Starrus Eco Holdings Limited (Millenium Business Park) - W0183 | R12 - Exchange of waste for submission to any of the operations numbered R 1 to R 11 | - | |
| 20 03 07 B | Bulky waste non-household | Non hazardous | 0.5 | Starrus Eco Holdings Limited (Millenium Business Park) - W0183 | R13 - Storage of waste pending any of the operations numbered R 1 to R 12 (excluding temporary storage, pending collection, on the site where the waste is produced) | - | |
| 20 03 07 B | Bulky waste non-household | Non hazardous | 4.77 | Starrus Eco Holdings Limited (Greenogue) - W0188 | D13 - Blending or mixing prior to submission to any of the operations numbered D 1 to D 12 | - | |

| Transferred Waste | | | | | | | |
|---|---|---|---|---|---|---|---|
| List of Waste (LoW) | | | | Next Destination | | Final Destination | |
| LoW Code | LoW Description | Classification | Quantity of waste Tonnes / year | Organisation | Waste Treatment Operation | Organisation | Waste Treatment Operation |
| 20 03 07 B | Bulky waste non-household | Non hazardous | 1,866.91 | Starrus Eco Holdings Limited (Greenogue) - W0188 | R12 - Exchange of waste for submission to any of the operations numbered R 1 to R 11 | - | |
| 20 03 07 B | Bulky waste non-household | Non hazardous | 12.76 | Starrus Eco Holdings Limited (Greenogue) - W0188 | R13 - Storage of waste pending any of the operations numbered R 1 to R 12 (excluding temporary storage, pending collection, on the site where the waste is produced) | - | |
| 20 03 07 B | Bulky waste non-household | Non hazardous | 0.05 | Ballymount MRF (Merrywell) - W0238 | D13 - Blending or mixing prior to submission to any of the operations numbered D 1 to D 12 | - | |
| 20 03 07 B | Bulky waste non-household | Non hazardous | 5.88 | Ballymount MRF (Merrywell) - W0238 | R12 - Exchange of waste for submission to any of the operations numbered R 1 to R 11 | - | |
| 20 03 07 B | Bulky waste non-household | Non hazardous | 0.78 | Starrus Eco Holdings Limited - W0261 | R12 - Exchange of waste for submission to any of the operations numbered R 1 to R 11 | - | |
| 20 03 07 B | Bulky waste non-household | Non hazardous | 43.81 | Ballymount Baling Station - W0003 | R12 - Exchange of waste for submission to any of the operations numbered R 1 to R 11 | - | |

| Transferred Waste | | | | | | | |
|---|---|---|---|---|---|---|---|
| List of Waste (LoW) | | | | Next Destination | | Final Destination | |
| LoW Code | LoW Description | Classification | Quantity of waste Tonnes / year | Organisation | Waste Treatment Operation | Organisation | Waste Treatment Operation |
| 20 03 07 B | Bulky waste non-household | Non hazardous | 0.88 | Ballymount Baling Station - W0003 | R13 - Storage of waste pending any of the operations numbered R 1 to R 12 (excluding temporary storage, pending collection, on the site where the waste is produced) | - | |

| Environmental Performance Reporting - Wastewater Emissions 2018 | | | | | | |
|---|---|---|---|---|---|---|
| **Pollutant** | **Method Code** | **Method Classification** | **Emission KG/year** | **Accidental KG/year** | **Fugitive KG/year** | **Total** |
| Arsenic - unspecified - Kilograms per year - PRTR | M | CRM | 0.75 | 0 | 0 | 0.75 |
| Cadmium - unspecified - Kilograms per year - PRTR | M | CRM | 0.1 | 0 | 0 | 0.1 |
| Chloride - Kilograms per year - PRTR | M | CRM | 188863 | 0 | 0 | 188863 |
| Chromium - unspecified - Kilograms per year - PRTR | M | CRM | 3.05 | 0 | 0 | 3.05 |
| Copper - unspecified - Kilograms per year - PRTR | M | CRM | 76.4 | 0 | 0 | 76.4 |
| Fluoride - Kilograms per year - PRTR | M | CRM | 22141 | 0 | 0 | 22141 |
| Mercury - unspecified - Kilograms per year - PRTR | M | CRM | 0.06 | 0 | 0 | 0.06 |
| Nickel - unspecified - Kilograms per year - PRTR | M | CRM | 20.4 | 0 | 0 | 20.4 |
| Total Nitrogen - Kilograms per year - PRTR | M | CEN-ISO | 208066 | 0 | 0 | 208066 |
| Total Phosphorus (as P) - Kilograms per year - PRTR | M | CRM | 3530 | 0 | 0 | 3530 |
| Zinc - unspecified - Kilograms per year - PRTR | M | CRM | 34.1 | 0 | 0 | 34.1 |

| Environmental Performance Reporting - Air Emissions 2018 | | | | | | |
|---|---|---|---|---|---|---|
| **Pollutant** | **Method Code** | **Method Classification** | **Emission KG/year** | **Accidental KG/year** | **Fugitive KG/year** | **Total** |
| Ammonia-Total (as NH3) - Kilograms per year - PRTR | M | CEN-ISO | 1657.35 | 0 | 0 | 1657.35 |
| Carbon Dioxide - Kilograms per year - PRTR | C | ETS | 43367000 | 0 | 0 | 43367000 |
| Carbon Monoxide - Kilograms per year - PRTR | M | CEN-ISO | 11882 | 0 | 0 | 11882 |
| Chlorine and Inorganic Compounds (as HCl) - Kilograms per year - PRTR | M | CEN-ISO | 1012.9 | 0 | 0 | 1012.9 |
| Fluorine and Inorganic Compounds (as HF) - Kilograms per year - PRTR | M | CEN-ISO | 3698.37 | 0 | 0 | 3698.37 |
| Hydro-fluorocarbons (HFCs) - Kilograms per year - PRTR | C | OTH | 330 | 0 | 168 | 498 |
| Nitrogen oxides (as NO2) - Kilograms per year - PRTR | M | CEN-ISO | 21747 | 0 | 0 | 21747 |
| Nitrous Oxide (N2O) - Kilograms per year - PRTR | C | OTH | 75528 | 0 | 0 | 75528 |
| Non-methane volatile organic compounds (NMVOC) - Kilograms per year - PRTR | M | OTH | 9491.57 | 0 | 27434.4 | 36925.97 |
| Particulate Matter (PM10) - Kilograms per year - PRTR | C | OTH | 21094.28 | 0 | 0 | 21094.28 |
| Perfluorocarbons (PFCs) - Kilograms per year - PRTR | C | OTH | 6144 | 0 | 0 | 6144 |
| Sulphur Hexafluoride (SF6) - Kilograms per year - PRTR | C | OTH | 334 | 0 | 0 | 334 |