

Permitting decisions

Bespoke permit

We have decided to grant the permit for Graphic Plc, for Down End operated by Graphic Plc.

The permit number is EPR/PP3239RN.

We consider in reaching that decision we have taken into account all relevant considerations and legal requirements and that the permit will ensure that the appropriate level of environmental protection is provided.

Purpose of this document

This decision document provides a record of the decision making process. It:

- highlights key issues in the determination
- summarises the decision making process in the decision checklist to show how all relevant factors have been taken into account

Unless the decision document specifies otherwise we have accepted the applicant's proposals.

Read the permitting decisions in conjunction with the environmental permit. The introductory note summarises what the permit covers.

1 Description of the Installation

1.1 The permitted activities

The Installation is subject to the Environmental Permitting Regulations (EPR) because it carries out activities listed in Part 1 of Schedule 1 to the EPR, as follows:

- (a) Section 2.3 Part A(1)(a) - Surface treating metals and plastic materials using electrolytic or chemical processes where the aggregated volume of the treatment vats is more than 30m³.
- (b) Section 5.3 Part A(1)(a)(ii) - Disposal of hazardous waste with a capacity exceeding 10 tonnes per day involving physico-chemical treatment.

We refer to the above activities as '*listed*' activities.

The Installation has been operating for several decades but until now has not regulated under the EPR or predecessor legislation. The recent installation of new manufacturing equipment has seen the total volume of the treatment vats increase to approximately 37m³, thereby exceeding the EPR activity threshold under subparagraph (a) above.

An installation may also comprise "directly associated activities" (DAAs) which at this Installation includes several activities associated with the listed activities, e.g. raw materials handling and storage. Together, the listed activities and DAAs comprise the Installation.

1.2 What the Installation does

The Installation manufactures printed circuit boards using a chemical etching process. The manufacturing process starts with laminate board clad on both sides with a thin layer of copper sheet, being washed and prepared for etching. The required pattern of conducting tracks is then transferred onto the surface of the copper using a photographic process whereby the board is covered with a thin layer of photo resist material and then exposed to light through a photographic film or photo-mask detailing the required tracks. The photo resist is placed in a developer so that only those areas of the copper where tracks are required are covered in the resist. The next step involves chemical etching where the boards are placed in reaction vats containing etching liquid, typically ferric chloride, which etches away (removes) the unwanted copper. Depending on the customer requirement the boards can be configured in multi-layer arrangements, being joined electronically by copper lined holes (called vias) drilled through the boards. Finally the exposed copper tracks are plated with solder, tin, gold, or other anti-corrosion coating, which first involves the application of a layer of solder resist, followed by the plating layer. The completed printed circuit boards are then quality checked and tested, packed and stored ready for dispatch.

2 The site and its protection

2.1 Site setting, layout and history

The installation is located in the town of Crediton, Devon, at National Grid Reference SS 84816 00292. The site is located on the edge of an industrial estate, on the eastern side of the town, with farmland immediately to the south. There are no Habitats Directive sites (Special Area of Conservation, Special Protection Area or Ramsar) within 10km of the installation, nor any Sites of Special Scientific Interest or non-statutory Local Wildlife Sites within 2km of the installation. The nearest residential property is located approximately 400m metres from the site boundary.

The site is located on a minor aquifer but not within a groundwater source protection zone. The nearest watercourse is located approximately 150m due east of the site and which drains into the River Creedy. The site is not within a designated flood zone. The site is located within the Crediton AQMA (Air Quality Management Area) designated by Mid Devon District Council, for the pollutants, nitrogen dioxide and particulate matter (PM₁₀).

The Operator submitted a plan which we consider is satisfactory, showing the site of the Installation and its extent. A plan is included in Schedule 7 of the Permit, and the Operator is required to carry on the permitted activities within the site boundary.

2.2 Proposed site design: potentially polluting substances and prevention measures

We are required to ensure that installations are operated in accordance with the principles of taking all appropriate measures against pollution and ensuring no significant pollution is caused.

We set out below the key features of the Installation for the prevention of pollution to soil and groundwater. We have also considered the pollution of other environmental media (i.e. surface water and air) which we consider elsewhere in this decision document.

The site surfacing is impermeable hardstanding with a sealed drainage system. Un-contaminated surface water run-off is discharged via surface water drains to a local watercourse. There are no discharges to land or groundwater from the installation.

Process effluent from within the main factory will drain to the effluent treatment plant (ETP) room where it be treated prior to discharge to foul sewer. Effluent from the Hot Air Solder Level (HASL) process in the Oak 4 building is discharged (without treatment) to foul sewer. Both discharges, which are made under agreement with South West Water Limited (SWW), are passed forward to Crediton (Lords Meadow) sewage treatment works.

The Operator submitted a bund assessment with their Application in relation to the containment provided on the lower ground floor within the ETP room, for effluent treatment tanks, chemical tanks (including those for the de-ionisation plant) and liquid waste storage tanks. Data for smaller stores of chemicals, located locally to their point of use, and for the main process tanks associated with the coating of boards, was also provided. The bunds are designed to hold a minimum of 110% of the capacity of the largest tank or 25% of total tank volume, whichever is the greater.

Under Article 22(2) of the Industrial Emissions Directive (IED) the Operator is required to provide a baseline report containing at least the information set out in points (a) and (b) of that Article before starting operation. The Operator has submitted a site condition report (SCR) as required by Article 22 of the IED. The Operator has not submitted baseline monitoring data. They have however stated in the SCR that prior to the site being developed (sometime between 1991 and 1994) the former land use was agricultural. Historical land-use maps support this statement.

The baseline report is an important reference document in the assessment of contamination that might arise during the operational lifetime of the Installation and at cessation of activities at the Installation. We have discussed this with the Operator such that they are aware that they will be responsible (upon definitive cessation of activities and surrender of their permit in the future) for returning the land (in terms of soil and groundwater quality) to a satisfactory state, which in this case, in the absence of any baseline data, will mean to its pre-development condition.

3 Operation of the Installation – general issues

3.1 Administrative issues

Graphic Plc (the Operator) is the sole operator of the Installation.

3.2 Management

The Operator's Environmental Management System (EMS) is certified under ISO14001. We are satisfied that appropriate management systems and management structures are in place for this Installation, and that sufficient resources are available to the Operator to ensure compliance with all the Permit conditions.

3.3 Accident management

We are required to ensure that installations are operated in accordance with the principle of taking necessary measures to prevent accidents and limit their consequences. The Operator has considered the potential for accidents in their Application. We are satisfied that appropriate measures will be in place to ensure that accidents that may cause pollution are prevented but that, if they should occur, their consequences are minimised.

3.4 Off-site conditions

We do not consider that any off-site conditions are necessary.

3.5 Operating techniques

We have specified that the Installation must be operated in accordance with the following documents contained in the Application:

Description	Parts Included
Application EPR/PP3239RN/A001	Application forms C2 and C3 and all relevant supporting documentation
Response to Schedule 5 Notice dated 09/12/2016	BAT submission
Additional information received	Summary of abatement systems
Additional information received	Emission points plans, refs. Q1420F-2, Q1426A-3 and Q1424-3

Table 1. Operating techniques

4 Key issues of the decision

Regulated activities can present different types of risk to the environment. The next sections of this document explain how we have approached the key issues relevant to this installation and what measures we are requiring to ensure a high level of protection.

The key issues associated with this application were:

- Emissions to air
- Emissions to sewer

- Application of Best Available Techniques (BAT).

We discuss these issues below.

4.1 Application of Environment Agency guidance ‘risk assessments for your environmental permit’

Methodologies for risk assessment of point source emissions to air and water, which we use to assess the risk of applications we receive for permits, is set out in our guidance on our website, and have the following common steps:

- Describe emissions and receptors
- Calculate process contributions
- Screen out insignificant emissions that do not warrant further investigation
- Decide if detailed modelling is needed
- Assess emissions against relevant standards
- Summarise the effects of emissions

The methodologies uses a concept of “process contribution (PC)”, which is the estimated concentration of emitted substances after dispersion into the receiving environmental media at the point where the magnitude of the concentration is greatest. The methodology provides a simple method of calculating PC primarily for screening purposes and for estimating process contributions where environmental consequences are relatively low. More accurate calculation of process contributions can be achieved by modelling, which take into account relevant parameters of the release and surrounding conditions.

4.2 Assessment of emissions to air

The Operator submitted an H1 screening assessment of emission to air from the installation. Both short-term and long-term PCs were calculated and compared with Environmental Standards (ES).

Where an Ambient Air Directive (AAD) Limit Value exists, the relevant standard is the AAD Limit Value. Where an AAD Limit Value does not exist, AAD target values, UK Air Quality Strategy (AQS) Objectives or Environmental Assessment Levels (EALs) are used. Our web guide sets out EALs which have been derived to provide a similar level of protection to Human Health and the Environment as the AAD limit values, AAD target and AQS objectives. In a very small number of cases, e.g. for emissions of lead, the AQS objective is more stringent than the AAD value. In such cases, we use the AQS objective for our assessment. AAD target values, AQS objectives and EALs do not have the same legal status as AAD limit values, and there is no explicit requirement to impose stricter conditions than BAT in order to comply with them. However, they are a standard for harm and any significant contribution to a breach is likely to be unacceptable.

PCs are considered **Insignificant** if:

- the **long-term** process contribution is less than **1%** of the relevant ES; and
- the **short-term** process contribution is less than **10%** of the relevant ES.

Where an emission is screened out in this way, we would normally consider that the Applicant’s proposals for the prevention and control of the emissions to be BAT. That is because if the impact of the emission is already insignificant, it follows that any further reduction in this emission will also be insignificant.

However, where an emission cannot be screened out as insignificant, it does not mean it will necessarily be significant. For those pollutants which do not screen out as insignificant, we determine whether exceedences of the relevant ES are likely. This would be done through detailed audit and review of the Applicant’s air dispersion modelling taking background concentrations and modelling uncertainties into account. Where an exceedance of an AAD limit value is identified, we may require the Applicant to go beyond what would normally be considered BAT for the Installation or we may refuse the application if the applicant is

unable to provide suitable proposals. Whether or not exceedences are considered likely, the application is subject to the requirement to operate in accordance with BAT.

This is not the end of the risk assessment, because we also take into account local factors (for example, particularly sensitive receptors nearby such as a Sites of Special Scientific Interest, Special Areas of Conservation or Special Protection Areas). These additional factors may also lead us to include more stringent conditions than BAT. If, as a result of reviewing of the risk assessment and taking account of any additional techniques that could be applied to limit emissions, we consider that emissions **would cause significant pollution**, we would refuse the Application.

The results of the Operator's H1 screening assessment for long-term (LT) and short-term (ST) emissions to air are shown in Table 2 below:

Substance	EAL		Process contribution (PC)		PC as % of EAL		PC insignificant?	
	LT	ST	LT	ST	LT	ST	<1% EAL	<10% EAL
	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$
Nitrogen dioxide	40	200	0.0055	1.47	0.014	0.733	Yes	Yes
Sulphur dioxide	-	125	-	0.679	-	0.543	-	Yes
Particulates (PM ₁₀)	-	50	-	0.0102	-	0.0203	-	Yes
Carbon monoxide	-	10,000	-	1.21	-	0.0121	-	Yes
Copper	10	200	6×10^{-4}	0.0146	0.006	0.0073	Yes	Yes
Hydrogen chloride	-	750	-	0.0996	-	0.0133	-	Yes
Ammonia	180	2,500	0.0018	0.0609	0.001	0.0024	Yes	Yes
VOC	22	22	0.002	0.070	0.0095	0.323	Yes	Yes
Nickel	0.02	-	1.8×10^{-6}	-	0.0090	-	Yes	-
Formaldehyde	5	100	0.0006	0.023	0.0137	0.023	Yes	Yes

Table 2. Screening results for emissions to air (human health)

From the above table, the results show that all emissions can be screened out as insignificant as the PC is less than 1% and/or 10% of the respective EAL. We are satisfied with the Applicant's assessment and consider the techniques for preventing and minimising the emissions of these substances to be BAT for the Installation. The abatement techniques currently in place for controlling emissions to air are summarised in Table 3 below.

Emission Point	Source	Abatement Technique
A1	Wet Process Fume Scrubber	Wet scrubber
A2	Plating Lines Fume Scrubber	Wet scrubber
A3	Photomech Fume Scrubber	Wet scrubber
A4	Via Fill Fume Scrubber	Wet scrubber
A10	CNC Drill Swarf / Dust cyclone	Cyclone and filter
A27	Special Plate Line Fume Scrubber	Wet scrubber

Table 3. Existing abatement technology for the control of emissions to air

4.3 Assessment of emissions to sewer

The Operator discharges process effluent to sewer under two trade effluent consents issued by the sewerage undertaker, South West Water Limited. They have undertaken an H1 screening assessment of these discharges, which they have identified as containing a number of Hazardous Pollutants (as defined in our guidance), namely, copper, cyanide, formaldehyde, lead, nickel and tin. These substances were assessed against a series of screening tests (Tests 1-4) included within the H1 tool to determine whether the discharge is “liable to cause pollution” of the receiving watercourse downstream of Crediton STW, and thus enable the Environment Agency to determine whether the discharge needs to be controlled with emission limit values (ELV’s). Screening tests 1-4 are summarised below.

Test 1 checks whether the concentration of the hazardous pollutant in the discharge is more than 10% of the environmental quality standard (EQS). If it’s less than 10% then the pollutant isn’t a risk to the environment and no further assessment is required. If it’s more than 10% then the assessment proceeds to test 2.

Test 2 introduces the dilution available in the receiving water, using river flow data and the daily discharge volume of the effluent. The test checks whether the process contribution (PC) of the pollutant is more than 4% of the EQS. The PC is the concentration of a discharged pollutant in the receiving water after it’s been diluted. If the PC is less than 4% then the pollutant isn’t a risk to the environment and no further assessment is required. If it’s more than 4% then the assessment proceeds to tests 3 and 4, both of which must be carried out.

Test 3 considers the predicted environmental concentration (PEC) and requires background concentration (BC) data. The PEC in the water downstream of the discharge is a combination of the PC and BC. The test checks whether the discharge increases the concentration of the pollutant in the river downstream of the discharge by more than 10% of the pollutant’s EQS value. If the difference between the BC and PEC is more than 10% of the EQS then the pollutant is potentially a risk to the environment and in such cases the Environment Agency would undertake modelling of the discharge. If the difference is less than 10%, the assessment proceeds to test 4.

Test 4 checks whether the PEC is higher than the EQS. If it is, the Environment Agency would undertake modelling of the discharge. If it is not, then modelling is not required, and the pollutant can be considered not to pose a risk to the environment.

The results of the Operator’s H1 screening assessment are shown in Table 4 below. None of the hazardous pollutants screened out at Test 1, so the results presented relate to tests 2-4. We have made our own simple verification calculation of the percentage process contribution and predicted environmental concentration. These are the numbers shown in the table below and so may be very slightly different to those shown in the Application. Any such minor discrepancies do not materially impact on our conclusions.

Hazardous Pollutant	EQS	Back-ground conc	Test 2		Test 3		Test 4	
			PC < 4% EQS?		PEC-BC > 10% EQS?		PEC > 100% EQS?	
	µg/l	µg/l	PC µg/l	% of EQS	PEC-BC µg/l	% of EQS	PEC µg/l	% of EQS
Copper	1 LT	1.71	1.9427	194.27	1.9435	194.3	3.66	366
Cyanide	1 LT	0.01	0.0542	5.42	0.033	5.43	0.0643	6.43
	5 ST		0.1134	2.27	0.114	2.28	0.124	2.48
Formaldehyde	5 LT	2.5	14.127	282.55	14.2	284	16.7	334
	50 ST		119.335	239	119.5	239	122	244
Lead	1.2 LT	-	0.0002	0.01	-	-	-	-
	14 ST	-	0.0452	0.324	-	-	-	-
Nickel	4 LT	2	0.6813	17.03	0.69	17.25	2.69	67.25
	34 ST		4.8216	14.2	4.83	14.2		20.1
Tin	25 LT	-	< 1	< 4	-	-	-	-

Table 4. Screening results for emissions to water (via foul sewer)

From Table 4 the results show that emissions of lead and tin screen out at test 2 as the short-term and long-term PC's are less than 4% of the relevant EQS, while cyanide screens out following assessment against tests 3 and 4. The discharge of copper, formaldehyde and nickel do not screen out. These parameters were therefore modelled in detail by the Environment Agency in accordance with our published assessment process.

Having undertaken detailed modelling of copper, formaldehyde and nickel using the 'Monte Carlo' mass balance modelling package, we have determined that copper and nickel are not liable to cause pollution and do not require emission limits to be set in order to protect downstream water quality. Nickel and copper were modelled using the 'Mper' tool (a module within the Monte Carlo package) as these substances have EQS's which now relate to 'bioavailability' of metals within the aquatic environment. The Mper tool takes bioavailability into account in assessing potential impact on the receiving watercourse. With respect to the emission benchmarks for copper and nickel in our sector guidance (*EPR 2.07 - The Surface Treatment of Metals and Plastics by Electrolytic and Chemical Processes*), we are satisfied that as the operator is already required to comply with emission limits for copper and nickel on their trade effluent consent from SWW, additional regulation through the application of permit ELV's is not necessary.

Our modelling has shown that there are potential issues resulting from the discharge of formaldehyde. There is no emission benchmark for formaldehyde within our EPR 2.07 guidance. Furthermore there is no limit for formaldehyde on the trade effluent consent issued by SWW.

4.3.1 Discussion on Formaldehyde

In printed circuit board manufacture formaldehyde is used as a reducing agent in the autocatalytic (electroless) copper plating process. This process provides the electrically conductive surface for drilled holes in copper clad laminate board prior to electroplating. The laminate boards are dipped in vats (baths) of solution which typically comprises copper, sodium hydroxide, chelating agents such as EDTA or similar, or tartrates and

reducing agents, e.g. formaldehyde. This use of formaldehyde in this manner is described in the EU BAT Reference document (BREF) for Surface Treatment of Metals and Plastic.

We requested further information from the operator on their use of formaldehyde via a Schedule 5 Notice. In their response the operator states that formaldehyde has been used in the electroless copper process since the factory was built in 1992. The method of use and discharge to foul sewer has remained the same during this time. The operator reports that their electroless copper baths are formulated to result in "solution growth", in order to control the level of reaction by-products in the solution to maintain constant performance. This solution growth results in between 100-150 litres per day of waste electroless copper solution being emptied ("baled out") via common floor drains to tanks in the ETP room.

The electroless copper process is the only source of formaldehyde within the installation. The operator states that there are no commercially available alternatives to formaldehyde-based electroless coppers, which have been proven to give them reliable results over many years. Their processes are driven by the requirements of their major aerospace customers who demand reliability in the products they supply.

Formaldehyde is a colourless gas which readily forms solution in water. As such it is not expected to adsorb significantly to sediment or suspended solids. The main route of removal of formaldehyde in the aquatic environment is biodegradation. It is reported to be readily biodegradable and undergoes biodegradation in both aerobic and anaerobic conditions. Estimated half lives in surface water are in the range of hours to a few days therefore it is not expected to persist in the aquatic environment. Formaldehyde is also not expected to bioaccumulate in aquatic organisms. Formaldehyde is nevertheless a potentially toxic pollutant. The available experimental data on its toxicity to aquatic organisms such as invertebrates and fish indicates that it is of moderate acute toxicity.

The effluent monitoring results submitted by the operator contained 24 sample results for formaldehyde taken over a 3 day period from 18th October to 20th October 2016. The results ranged from 0.04mg/l to 17.0mg/l, with a mean of 4.21mg/l. By comparison, the EQS (Environmental Quality Standard) (non-statutory) for inland freshwaters, as an annual average is only 0.005mg/l, and 0.05mg/l as a MAC (maximum allowable concentration). The results of our detailed modelling confirmed that the concentration of formaldehyde in the receiving waters could significantly exceed the EQS.

Given the potential implications of setting emissions limits for formaldehyde, we made further enquiries with the operator regarding the reliability of their sample results (which were highly variable), considering both the timing of monitoring in relation to on-site processes and also the nature of the analytical test methods used. They reported that the waste electroless copper solution is processed via a tank where effluent treatment is undertaken on a batch basis and that the discharge from these tanks would contain elevated levels of formaldehyde. Should the monitoring take place while this tank was being drained, which takes 60-90 minutes, this could result in much higher concentrations being recorded. They also stated that the sample analysis method used by their chosen contractor is subject to interference from copper at concentrations above 1.6mg/l of copper. Inspection of the operator's effluent sample data does confirm that where the levels of copper exceeded 1.6mg/l the corresponding formaldehyde concentrations were also at the upper end of the measured range.

Due to the high concentrations and high variability of the sampled results, over a short time period, and with questions over the suitability of the test method, we are not satisfied that the results are fully representative of formaldehyde emissions to sewer during normal operation of the installation. This casts doubt over the impact assessments undertaken to date. We have therefore determined that in order for a robust, representative impact assessment to be undertaken, more reliable effluent data, and water quality data should first be obtained.

In order to facilitate this further assessment we have included the following Improvement Conditions (IC) on the permit. The IC will enable the Environment Agency to approve the operator's proposal for further monitoring before they do it, to ensure that the monitoring data is appropriate for the subsequent impact assessment.

Ref	Requirement	Date
IC1	<p>The operator shall submit a formaldehyde monitoring plan to the Environment Agency for approval, to inform the risk assessment required by IC2. The monitoring plan shall include (but not be limited to) the following information:</p> <ul style="list-style-type: none"> a) proposals for obtaining a minimum of 12 representative samples of treated effluent from emission point S1, including justification for the timing and frequency of sampling b) proposals for obtaining the following river water samples: <ul style="list-style-type: none"> (i) 2 water samples from the River Yeo, i.e. one sample upstream of the Crediton Sewage Treatment Works (STW) outlet (located at NGR SX 85720 99120) and one sample downstream of the STW outlet but before the confluence with the River Creedy; and (ii) 2 water samples from the River Creedy, i.e. one sample upstream of the Crediton STW outlet (located at NGR SS 84877 00621) and one sample downstream of the STW outlet but before the confluence with the River Yeo. <p>Note that Crediton STW has two outlets, one on the River Yeo and the other on the River Creedy, which is why water quality data on both watercourses is required.</p> c) proposals for analysing the samples obtained in (a) and (b) for formaldehyde, including details of the testing organisation and of the UKAS accredited test method to be followed. 	Within 3 months of the date of this variation notice
IC2	<p>The operator shall carry out a risk assessment using the results of the monitoring undertaken in accordance with the approved plan under IC1. The assessment will consider the impact of the discharge upon the receiving water downstream of Crediton (Lords Meadow) sewage treatment works. The assessment shall be carried out with reference to the Environment Agency's 'surface water pollution risk assessment' guidance, available at GOV.UK. The operator shall submit the completed risk assessment to the Environment Agency for approval.</p>	Within 18 months of the date of this variation notice
IC3	<p>If the Environment Agency concludes that the risk assessment required by IC2 identifies that the discharge is impacting upon the River Creedy, the Operator shall submit a written Action Plan to the Environment Agency for approval identifying what improvements to the treatment system shall be made to address the impact(s).</p>	Within 3 months of the Environment Agency requesting in writing that the operator submit a written Action Plan
IC4	<p>The operator shall implement the improvements identified within any Action Plan approved by the Environment Agency under IC3 and provide written confirmation to the Environment Agency that the improvements have been made.</p>	Within 12 months of the Action Plan being approved by the Environment Agency or any subsequent date as notified in writing by the Environment Agency

4.4 Application of Best Available Techniques (BAT)

We are required to ensure that installations are operated in accordance with the principle of applying Best Available Techniques (BAT). BAT means the available techniques which are the best for preventing or, where that is not practicable, reducing emissions and impacts on the environment as a whole. 'Techniques' within the meaning of BAT include both the technology used and the way an installation is designed, built, maintained, operated and decommissioned. The concept of BAT and how it should be applied is set out in the IED.

The principal sector guidance for this for this installation is:

- How to comply with your environmental permit - Additional guidance for: The Surface Treatment of Metals and Plastics by Electrolytic and Chemical Processes (EPR 2.07)

We also consider that some aspects of the installation fall under other guidance, for example, the treatment of hazardous waste, where we have made additional checks against the following:

- Sector Guidance Note IPPC S5.06 - Guidance for the Recovery and Disposal of Hazardous and Non Hazardous Waste.

4.4.1 *BAT Assessment*

Our guidance sets out the BAT requirements for operators across the following operational and environmental areas:

- Energy efficiency
- Efficient use of raw materials and water
- Avoidance, recovery and disposal of wastes
- Material storage and handling
- Surface preparation
- Surface treatment
- Drying
- Point source emissions to air and water
- Fugitive emissions to air, surface water, sewer and groundwater
- Waste storage
- Sludge treatment and disposal
- Accidents

The operator submitted a BAT assessment with their permit application setting out how they comply with our sector guidance. We have reviewed the operator's assessment against BAT for each of the above listed areas. We have concluded that the operator is applying BAT across the majority of their activities, however there are some issues, where current operations are not at the expected standard. For these situations we have considered the risk to human health and the environment, and determined that the inclusion of Improvement Conditions on the permit is appropriate for ensuring that the operator brings these aspects of the installation up to the expected standard within a required timescale. Our conclusions are based on both the information provided in the application and our observations during a site visit undertaken with our Area colleagues. We discuss these issues further below.

Filter presses in Effluent Treatment Plant (ETP) room

BAT is for filter cake presses to be operated at not less than 7 bar pressure and preferably 10-15 bar to reduce the mass, volume and water content of the filter cake, potentially increasing the solids content up to 35-40%.

The two filter presses in the effluent treatment plant (ETP) room appeared to be of a considerable age, a fact that was acknowledged in the application. They are served by air driven pumps with the operating pressure set at 6 bar. The maximum pressure attainable is determined by the requirements of other factory processes. Currently, the resultant filter cake has a solids content of 20-25%. The filter cake is recycled and is sent to a smelter in Europe for recovery of metals, principally copper.

We consider that the filter presses are not operated in accordance with BAT and that based on their apparent age, a review of their performance and ability to meet BAT is justified. We have therefore included the following improvement conditions in the permit:

Ref	Requirement	Date
IC5	<p>The operator shall submit to the Environment Agency a report on the performance of the filter presses within the effluent treatment plant room. The report shall include (but not be limited to) the following information:</p> <p>a) a technical description of the presses b) the key operational parameters for control of the process c) how waste is handled.</p> <p>The report shall also give consideration to improving the efficiency of the presses by increasing the solids content of the filter cake to meet indicative BAT as set out in Environment Agency sector guidance EPR 2.07.</p>	Within 6 months of the date of this variation notice
IC6	Should the report required under IC5 conclude that the existing filter presses are unable to be operated in accordance with indicative BAT the operator shall undertake an options appraisal for replacement of the presses and submit a written Action Plan to the Environment Agency for approval identifying what improvements shall be made.	Within 12 months of the date of this variation notice
IC7	The operator shall implement the improvements identified within any Action Plan approved by the Environment Agency under IC6 and provide written confirmation to the Environment Agency that the improvements have been made.	Within 12 months of the Action Plan being approved by the Environment Agency or any subsequent date as notified in writing by the Environment Agency

Open topped tanks in ETP room

BAT requires that as a general rule, no open-topped tanks, vessels or pits should be used for storage or treatment of hazardous or liquid wastes and that any exceptions would require justification in the permit application.

There are a number of open topped tanks within the ETP room. They are used for the collection of waste and temporary storage prior to transfer to mixing vessels and treatment. As with the filter presses we consider that the tanks are quite old and looked like they had been in use for a number of years. This was apparent from visual inspection during our site visit.

We consider that these open topped tanks are not BAT and no justification for their use has been submitted. Our view is that an Action Plan for replacing them with enclosed tanks should be provided and have included the following improvement conditions in the permit:

Ref	Requirement	Date
IC8	<p>The operator shall submit to the Environment Agency a report on the use of all open topped tanks for the storage and/or treatment of hazardous or liquid wastes. For each such tank the operator shall include the following details:</p> <ul style="list-style-type: none"> a) location of the tank and unique identifier b) what the tank is used for c) wastes stored / treated, including flashpoint limit d) dimensions and capacity e) type of construction f) age of the tank g) details of most recent inspection h) current appraisal of tank condition. <p>The report shall also include a written Action Plan (for approval) for replacing the open topped tanks with enclosed tanks in order to meet indicative BAT as set out in Environment Agency sector guidance IPPC S5.06. Robust, risk-based justification must be provided for any exceptions to this requirement, the approval for which may not be granted.</p>	Within 6 months of the date of this variation notice
IC9	<p>The operator shall implement the improvements identified within any Action Plan approved by the Environment Agency under IC8 and provide written confirmation to the Environment Agency that the improvements have been made.</p>	Within 12 months of the Action Plan being approved by the Environment Agency or any subsequent date as notified in writing by the Environment Agency

Storage areas, vessels, tanks and valves

BAT requires that all storage areas, vessels, tanks and valves are clearly signed as to their contents and capacity and should have a unique identifier. Labelling should differentiate between wastewater and raw process water, combustible liquid and combustible vapour and direction of flow. All valves should be appropriately tagged and be identifiable on process and instrumentation diagrams. Regular inspection and maintenance schedules must be maintained and written records of results kept.

Our view upon visiting the site was that the above requirements were not being implemented consistently across all areas / activities of the installation, and therefore to ensure that the operator addresses any shortfalls we have included the following improvement conditions on the permit.

Ref	Requirement	Date
IC10	The operator shall ensure that clear signage is provided for all storage areas, vessels, tanks and valves. Signage shall include a unique identifier for each storage area, vessel, tank or valve. The operator shall provide written confirmation to the Environment Agency that the above improvements have been made.	Within 12 months of the date of this variation notice
IC11	The operator shall submit to the Environment Agency for approval details of the inspection and maintenance procedures associated with all storage areas, tanks and vessels, their associated pipework and valves.	Within 3 months of the date of this variation notice

Condition of main bunded area on lower ground floor

BAT requires that appropriate surfacing, containment and drainage is incorporated into the design of all operational areas. There should be an inspection and maintenance programme in place for impervious surfaces and containment facilities. Improvement plans should be in place where operational areas have not been equipped with an impervious surface, spill containment kerbs, sealed construction joints, or connected to a sealed drainage system. The operator has stated that all surfaces are coated in chemical resistant material and are impervious, and that all surfacing is inspected and recorded weekly in process maintenance database. Our view is that in general the installation is employing BAT as described above.

The ETP room on the lower ground floor contains a range of tanks used for effluent treatment, chemical storage, for example, de-ionisation plant chemicals, and for liquid waste storage. The ETP room incorporates a number of bunded areas in relation to the various tanks. However like with a number of other aspects of the ETP room, we were concerned during our site visit as to the integrity of the surfacing and of the ability of the raised domed kerbing (which appeared relatively shallow) to adequately contain the contents of any tanks should there be a catastrophic tank failure. We therefore consider it appropriate that the operator reviews this aspect of their operation to ensure that it meets the latest industry standards, as referenced in the improvement condition.

Ref	Requirement	Date
IC12	The operator shall submit a report on the condition of the bunded areas on the lower ground floor to ensure that no releases to groundwater, surface water or sewer can take place through normal operation or as a result of an accident. The report shall include (but not be limited to) the following information: <ul style="list-style-type: none"> a physical description and assessment of integrity of the secondary containment in place, i.e. the existing bunds, including flooring and any chemical sealants; the suitability of the existing bunds for providing containment in the event of a catastrophic tank failure; details of any remedial action required to ensure compliance with the standards set out in CIRIA C736 - Containment Systems for the Prevention of Pollution - secondary, tertiary and other measures for industrial and commercial premises or other relevant industry standard. 	Within 6 months of the date of this variation notice
IC13	Should the report required under IC12 conclude that there is a risk of releases to groundwater, surface water or sewer through normal operation or as a result of an accident the operator shall submit an	Within 12 months of the date of this variation notice

Ref	Requirement	Date
	Action Plan to the Environment Agency for approval identifying what improvements shall be made.	
IC14	The operator shall implement the improvements identified within any Action Plan approved by the Environment Agency under IC13 and provide written confirmation to the Environment Agency that the improvements have been made.	Within 12 months of the Action Plan being approved by the Environment Agency or any subsequent date as notified in writing by the Environment Agency

Decision checklist

Aspect considered	Decision
Receipt of application	
Confidential information	A claim for commercial or industrial confidentiality has not been made.
Identifying confidential information	We have not identified information provided as part of the application that we consider to be confidential.
Consultation	
Consultation	<p>The consultation requirements were identified in accordance with the Environmental Permitting Regulations and our public participation statement.</p> <p>The application was publicised on the GOV.UK website.</p> <p>We consulted the following organisations:</p> <ul style="list-style-type: none"> • Health and Safety Executive (HSE) • Local Authority, Environmental Protection department <p>No responses were received.</p>
Operator	
Control of the facility	We are satisfied that the applicant (now the operator) is the person who will have control over the operation of the facility after the grant of the permit. The decision was taken in accordance with our guidance on legal operator for environmental permits.
The facility	
The regulated facility	<p>We considered the extent and nature of the facility at the site in accordance with RGN2 'Understanding the meaning of regulated facility', Appendix 1 of RGN 2 'Interpretation of Schedule 1', and Appendix 2 of RGN 2 'Defining the scope of the installation'.</p> <p>The extent of the facility is defined in the site plan and in the permit. The activities are defined in table S1.1 of the permit.</p>
The site	
Extent of the site of the facility	The operator has provided plans which we consider are satisfactory, showing the extent of the site of the facility. The plan is included in the permit.
Site condition report	The operator has provided a description of the condition of the site, which we consider is satisfactory. The decision was taken in accordance with our guidance on site condition reports and baseline reporting under the Industrial Emissions Directive.

Aspect considered	Decision
Biodiversity, heritage, landscape and nature conservation	<p>The application is within the relevant distance criteria of a site of heritage, landscape or nature conservation, and/or protected species or habitat.</p> <p>With regard to emissions to air, there are three Local Wildlife Sites, namely Creedy Park, Shobrooke Park, and Shobrooke Mill Farm West; and one un-named area of ancient woodland within 2km of the installation.</p> <p>The operator did not include a conservation assessment in their H1 screening therefore we have undertaken our own checks with regard to emissions of oxides of nitrogen, sulphur dioxide, and ammonia, concluding that due to the very low levels of substances being emitted, the installation will not have an impact upon the designated sites.</p> <p>With regard to emissions to water, the watercourse downstream of Crediton STW provides for both designated Protected Habitats, i.e. Coastal and Floodplain Grazing Marsh; and for Protected Species, i.e. the European eel for which the watercourse is a migratory route; and the white clawed crayfish. With respect to the discharge of copper, cyanide, lead, nickel and tin, we are satisfied that as the receiving water quality will not be significantly impacted, as demonstrated by the operator's H1 assessment and our further detailed modelling, then the designated habitat and species which depend on that water will similarly be protected.</p> <p>With regard to the discharge of formaldehyde, we have set improvement conditions to enable further assessment to be undertaken, however it should be noted that the discharge has already been in existence for approximately 25 years. Further information on the proposed improvement conditions is provided in <u>key issues</u> section above.</p>
Environmental risk assessment	
Environmental risk	<p>We have reviewed the operator's assessment of the environmental risk from the facility.</p> <p>The operator's risk assessment is satisfactory.</p> <p>Further information on the operator's H1 assessment is provided in <u>key issues</u> section above.</p>
Operating techniques	
General operating techniques	<p>We have reviewed the techniques used by the operator and compared these with the relevant guidance notes and we consider them to represent appropriate techniques for the facility.</p> <p>The operating techniques that the applicant must use are specified in table S1.2 in the environmental permit.</p> <p>Further information on the operator's BAT assessment is provided in <u>key issues</u> section above.</p>
Operating techniques for emissions that do not screen out as insignificant	<p>Emissions of copper, nickel and formaldehyde cannot be screened out as insignificant however we are satisfied that the proposed techniques / emission levels for copper and nickel are in line with the techniques and benchmark levels contained in the technical guidance and we consider them to represent appropriate techniques for the facility. The permit conditions ensure compliance with relevant BREFs.</p>

Aspect considered	Decision
	<p>We have set improvement conditions (IC1-4) on the permit which will enable appropriate decisions regarding the discharge of formaldehyde, its control, and what is considered BAT for the installation, to be made. Further information is provided in <u>key issues</u> section above.</p>
<p>Operating techniques for emissions that screen out as insignificant</p>	<p>Emissions to air of particulates, nitrogen dioxide, carbon monoxide, sulphur dioxide, hydrogen chloride, formaldehyde, ammonia, volatile organic compounds, and copper dust and mists have been screened out as insignificant, and so we agree that the applicant's proposed techniques are BAT for the installation.</p> <p>Emissions to sewer of lead and tin have been screened out as insignificant, and so we agree that the applicant's proposed techniques are BAT for the installation.</p> <p>Further information on the operator's H1 assessment is provided in <u>key issues</u> section above.</p>
<p>Permit conditions</p>	
<p>Improvement programme</p>	<p>Based on the information on the application, we consider that we need to impose an improvement programme.</p> <p>Further information on the proposed improvement conditions is provided in <u>key issues</u> section above.</p>
<p>Emission limits</p>	<p>We have decided that emission limits are not required in the permit at this time.</p> <p>It is possible that an ELV for formaldehyde (to sewer) may be required in the future, pending completion of IC2 in Table S1.3.</p>
<p>Reporting</p>	<p>We have specified reporting of performance parameters in the permit, with respect to water usage, energy usage, and waste disposal and/or recovery.</p>
<p>Operator competence</p>	
<p>Management system</p>	<p>There is no known reason to consider that the operator will not have the management system to enable it to comply with the permit conditions.</p> <p>The decision was taken in accordance with the guidance on operator competence and how to develop a management system for environmental permits.</p>
<p>Relevant convictions</p>	<p>The Case Management System and National Enforcement Database have been checked to ensure that all relevant convictions have been declared.</p> <p>No relevant convictions were found. The operator satisfies the criteria in our guidance on operator competence.</p>
<p>Financial competence</p>	<p>There is no known reason to consider that the operator will not be financially able to comply with the permit conditions.</p>

Aspect considered	Decision
Growth Duty	
<p>Section 108 Deregulation Act 2015 – Growth duty</p>	<p>We have considered our duty to have regard to the desirability of promoting economic growth set out in section 108(1) of the Deregulation Act 2015 and the guidance issued under section 110 of that Act in deciding whether to grant this permit.</p> <p>Paragraph 1.3 of the guidance says:</p> <p>“The primary role of regulators, in delivering regulation, is to achieve the regulatory outcomes for which they are responsible. For a number of regulators, these regulatory outcomes include an explicit reference to development or growth. The growth duty establishes economic growth as a factor that all specified regulators should have regard to, alongside the delivery of the protections set out in the relevant legislation.”</p> <p>We have addressed the legislative requirements and environmental standards to be set for this operation in the body of the decision document above. The guidance is clear at paragraph 1.5 that the growth duty does not legitimise non-compliance and its purpose is not to achieve or pursue economic growth at the expense of necessary protections.</p> <p>We consider the requirements and standards we have set in this permit are reasonable and necessary to avoid a risk of an unacceptable level of pollution. This also promotes growth amongst legitimate operators because the standards applied to the operator are consistent across businesses in this sector and have been set to achieve the required legislative standards.</p>