

# Permitting decisions

## Variation

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We have decided to grant the variation for Bowling Park Drive Chemicals operated by Kemira Chemicals (UK) Limited.

The variation number is EPR/TP3737SB/V003.

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:

- provides a description of the main changes introduced by this variation
- 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
- shows how we have considered the consultation responses

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

Read the permitting decisions in conjunction with the environmental permit and the variation notice.

## Main changes introduced by this variation

This Substantial Variation is in consequence of an application made by the operator to reflect the following changes:

- The introduction of a bio-acrylamide manufacturing plant which falls into regulation as a new listed activity under Section 4.1 Part A(1)(a)(iv).
- Expansion to the dry polyacrylamide production line No.4 comprising replacement of the reaction belt and dryer No.2 with higher capacity units.
- Addition of a new 14MWth boiler to support the expansion of line No.4 and associated emission point (A12).
- Relocation of emission points A4 and A10 to accommodate the expansion of line 4 and associated new emission point.
- Update to the registered office address.

In addition, as part of the permitting process, we have reviewed the permit and updated it into the modern format. In particular, the following changes have been made as an Environment Agency led variation:

- The Improvement Programme as per permit variation notice V002 has been updated to reflect completion of these requirements.
- Table S1.5 and associated conditions have been removed to reflect satisfaction of the previous pre-operational condition.
- Improvement Programme requirements IC10 and IC11 have been added to ensure actual monitoring data supports the emissions data used in previous risk assessments.

## Key issues of the decision

### 1. Introduction of a new listed activity

#### 1.1 Overview

The operator is seeking the addition of a new listed activity under Section 4.1 Part A(1)(a)(iv) to enable the production of bio-acrylamide, which is an intermediate used in the dry polyacrylamide production process. Bio-acrylamide production on this site is to be achieved using a biological reaction process, which has been chosen due to the greater level of inherent safety and lower environmental impact than the alternative copper catalyst chemical process. This is due to the biological process operating at ambient temperature and pressure. The addition of the bio-acrylamide production process will remove the sites dependence on supplies currently provided by other chemical plant abroad.

The production process is divided into the following steps:

- Acrylonitrile offloading and storage.
- Biomass activation.
- Recycled and fresh process water charge to the reactor.
- Biomass charge to the reactor.
- Acrylonitrile dosing into the reactor and Bio-acrylamide synthesis.
- Transfer of Bio-acrylamide from the reactor to the acrylamide holding tank.
- Centrifugation.
- Transfer of Bio-acrylamide to the acrylamide storage tank.

#### 1.2 Environmental risk

The main environmental risks associated with the addition of this new listed activity have been considered as follows:

##### 1.2.1 General management

The site operates under an Environmental, Health and Safety Management System which maintains compliance to UK and EU legislation, and corporate HSE requirements. The Environmental Management System (EMS) complies with ISO14001 and the Occupational Health and Safety Management System to OSHAS 18001. Synergies from both these management systems exist within the ISO 9001 Quality Management System. The site is certified to these management standards, which are regularly audited by an external organisation to ensure ongoing continual improvement. Activities within the new process will be integrated into these systems and associated audit programme.

### 1.2.2 Operating techniques

It should be noted that the new bio-acrylamide production process will move the site from a 'lower' tier to an 'upper' tier COMAH regulated site. As a result, a safety report and associated action plan has been prepared for the site which will be implemented following construction of the new process to further reduce the risk to the environment. Both the safety report and action plan addresses all concerns by demonstrating Best Available Techniques (BAT). The potential environmental, safety and operational risks associated with the new process have been reviewed by HAZOP methodology as an inherent part of the design process. The management of these risks have been incorporated into the existing management plans, policies and procedures.

### 1.2.3 Odour

It is not anticipated that the proposed change will give rise to odours which will lead to any significant off-site impacts. The storage systems for the new materials, products and waste have been designed in a closed loop system in order to prevent emissions to air.

### 1.2.4 Noise and vibration

All the upgrades are located within enclosed buildings and are sited to minimise any off-site noise/vibration impact. In addition, due to the current site background noise level, it is not expected that the operation will have any appreciable impact on the noise levels at the site boundary.

### 1.2.5 Fugitive emissions

Due to the nature of the process and the materials used, it is not considered that there will be any significant fugitive emissions to air. In addition, it is not expected that there will be any fugitive emissions to water as a result of the new process. Any leaks can be contained and directed to the existing on-site effluent system. Additional protection measures, such as bunded pumps, hardstandings and dedicated drainage systems are in place. The regular inspection of drains to test integrity is already currently undertaken at this site.

### 1.2.6 Point source emissions

There are no new point source emissions to air as a result of the new bio-acrylamide process.

### 1.2.7 Resource efficiency

#### Raw materials:

The bio-acrylamide reaction process has been chosen to minimise both chemical and water use. New raw materials will be included on the existing site electronic inventory and stock volumes will be maintained in the site inventory once the plant is operational. The fate of the new chemicals and the volumes in storage at any one time indicate that there is a minimal risk to the environment. The water supply for the new bio-acrylamide process will be met by the existing site distribution systems. The majority of the waste water will be recycled back into the process.

#### Waste generation:

The new process has been designed in such a way as to minimise waste generation. The only significant waste stream will be exhausted biomass slurry. It has been estimated that approximately 1.6 tonnes per day will be generated. This material will be collected in 1 tonne capacity IBCs and transferred to a dedicated storage area. Storage has been designed in line with best practise guidelines. The IBCs will be collected from site by a dedicated waste contractor on a regular basis. This waste stream will be classified as hazardous due to the acrylamide content.

#### Energy usage:

The new process will increase the annual demand for electricity at the site. However, it is considered that by being able to manufacture the material on-site, there will be an overall reduction in the current carbon footprint of the facility due to the significant reduction in tanker deliveries coming to the site from European supply points. The existing electricity supply is in the process of being upgraded to ensure sufficient capacity is available. In addition, the site has recently installed a solar powered system providing a small percentage of the sites electricity requirements.

## 2. Expansion to dry polyacrylamide production line No.4

### **2.1 Overview**

The line 4 expansion will result in an increase in the line capacity to match the capacities of the other 3 production lines on site. This will be achieved through an increase in the drying system capacity and an upgrade to the size of the reactor belt. The process will remain the same with the only material change being the volume of dry polyacrylamide able to be manufactured on this line.

### **2.2 Environmental risk**

The expansion of line 4 will require that the current emission point (A4) will move location and boiler 2 emission point (A10) will move location by a few meters and be located next to the new emission stack (A12) for the new boiler 3. The cladding covering boiler 2 and boiler 3 emission stacks will mean that visually it will appear that there will be no additional stacks associated with the boilers.

The main risk of increased emissions from the line expansion is the potential increase in cutting oil emissions. However, the operator has demonstrated that there will be no significant increase in cutting oil emissions and compliance with the existing Emission Limit Value (ELV) will be maintained.

The size reduction equipment to be installed on Line 4 is the same size as similar equipment on the other production lines, so whilst the increase in throughput may necessitate a small increase in the instantaneous quantity of cutting oil required to process the gel and ensure good coverage of the surfactant, the equipment itself is not expected to require more cutting oil than would be the case elsewhere on site. It is also worth noting that Line 4 uses an oil-in-water emulsion as its cutting fluid, with only a 10% oil content at current formulation levels. The most significant aspect to increasing the capacity of Line 4 has been the installation of a much larger fluidised bed drying system, which in turn requires a significant increase in air volume to fluidise the much larger bed and facilitate complete drying of the increased production throughput. This will also ensure that the emitted concentration of cutting oil from Line 4 will be lower than it was pre-expansion. Once at design capacity, the expectation is that the 'per tonne' usage of oil will also decrease.

On that basis, it is considered that the expansion to line No. 4 and the associated relocation of the existing emission points will not result in any significant environmental impact. The potential impacts of the new boiler emission point are considered below.

## 3. Addition of a new boiler (boiler 3) and associated emission point (A12)

### **3.1 Overview**

Following this variation, the site configuration will be such that there are three dual-fuel boilers, each with a thermal input capacity of 14MWth (total aggregated thermal input of 42MWth). Normal operations will be two duty and one stand-by (low fire mode). The addition of the new boiler is required to ensure that at least 2 boilers are available for operations at any point in time. This is to cover periods when a duty boiler is taken off line for service and statutory inspections, and remove the requirement to bring inefficient and unreliable temporary boilers on site. It will also provide back-up cover if one of the 2 duty boilers fail for any reason during normal service.

### **3.2 Environmental risk**

The main environmental risk associated with this change is impact of emissions from the additional boiler on air quality. The main concern is the potential impact of combustion gases on nearby sensitive receptors, in particular the residential properties to the North East of the site (52 – 72 Bowling Park Drive).

Middleton Environmental Limited have undertaken air dispersion modelling on behalf of the operator using ADMS 5.1. A report, dated 18 December 2016, has been submitted in support of the application. The scope of the modelling work is to determine the impact of emissions of NOx, SOx and CO from the three boilers on site on local air quality.

### 3.2.1 Predicted short term impact

The model appears to indicate that using the annual average emission rates of NO<sub>x</sub> from two or three boilers operating normally, there are no exceedances of the 200µg/m<sup>3</sup> short term environmental air quality standard, with typical concentrations being around 33% of this limit. When the model was presented with the maximum theoretical release from all three boilers, the one hour 99.79 percentile concentration is 71% of the environmental air quality standard.

### 3.2.2 Predicted long term impact

The model appears to indicate that the average annual air quality standard for NO<sub>x</sub> is unlikely to be exceeded in the area surrounding the installation during normal boiler operations. The predicted annual peak ground level environmental concentrations from typical operations were 29.3µg/m<sup>3</sup> and 31.1µg/m<sup>3</sup> respectively, with almost 90% of the predicted impact coming from off-site background (ambient) concentrations. Even when the model was presented with peak emissions (continuous operation) no exceedances of the long term environmental air quality standard (40µg/m<sup>3</sup>) was predicted. In any case, this scenario is very unlikely due to plant limitations and environmental permit conditions.

The predicted impacts of SO<sub>x</sub> and CO were shown to be negligible.

### 3.2.3 Predicted impact on sensitive receptors

The model used a number of nearby sensitive receptors. These included the closest residential properties, and residential/populated areas to the North and South of the site.

For all scenarios modelled, the highest predicted long term environmental concentration of NO<sub>x</sub> was 36.9µg/m<sup>3</sup> with the vast majority of the impact coming from existing background sources. No exceedances of the long term environmental air quality standard were predicted at any of the chosen sensitive receptors.

### 3.2.4 Our audit of the modelling

We undertook an initial audit of the modelling work using AQMAU Screening Tool Version 5.2. This confirmed that the impacts are unlikely to be significant at sensitive receptors and there is unlikely to be any exceedance of the environmental air quality standard. The tool showed that the maximum Predicted Environmental Concentration (PEC) is 32% and 70% of the short term and long term environmental air quality standards respectively. At the nearest sensitive receptors (residential properties on Bowling Park Drive) the highest PEC was shown to be 27% (ST) and 63% (LT). However, given the assumptions made in the modelling work and the built-up location of the site, we decided that further certainty was required. On that basis, a full audit of the modelling report and associated files was undertaken by our specialist technical unit using ADMS 5.2 and meteorological data observed at Bradford Airport (2003 - 2007).

As a result of our audits, we agree with the consultants conclusions regarding human health impacts. Based on the emission concentrations provided, the facility is unlikely to result in a breach of any of the air quality objectives assessed. To validate the modelling assessment, an improvement condition has been imposed to confirm, through monitoring, the actual emission concentrations.

## Decision checklist

Aspect considered	Decision
<b>Receipt of application</b>	
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.
<b>Consultation</b>	
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"> <li>- City of Bradford MBC</li> <li>- Public Health England</li> <li>- Director of Public Health</li> <li>- Health and Safety Executive</li> </ul> <p>The comments and our responses are summarised in the <a href="#">consultation section</a>.</p>
<b>The facility</b>	
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 2 of RGN 2 'Defining the scope of the installation' and Appendix 1 of RGN 2 'Interpretation of Schedule 1'</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>
<b>The site</b>	
Biodiversity, heritage, landscape and nature conservation	<p>The application is within the relevant distance criteria of locally designated sites of heritage, landscape or nature conservation, and/or protected species or habitat.</p> <p>We have assessed the application and its potential to affect all known locally designated sites of nature conservation, landscape and heritage and/or protected species or habitats identified in the nature conservation screening report as part of the permitting process.</p> <p>We consider that the application will not affect any locally designated sites of nature conservation, landscape and heritage, and/or protected species or habitats identified.</p>

Aspect considered	Decision
<b>Environmental risk assessment</b>	
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>The assessment shows that, applying the relevant criteria in our guidance on environmental risk assessment, all emissions may be categorised as 'not environmentally significant'.</p>
<b>Operating techniques</b>	
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>
Operating techniques for emissions that screen out as 'not significant'	<p>Emissions of combustion gases have been screened out as not significant, and so we agree that the applicant's proposed techniques are BAT for the installation.</p> <p>There are also controls in place within the permit to ensure the operator runs the boilers on a 2 x duty, 1 x stand-by basis.</p>
<b>Permit conditions</b>	
Updating permit conditions during consolidation	<p>We have updated permit conditions to those in the current generic permit template as part of permit consolidation. The conditions will provide the same level of protection as those in the previous permit(s).</p>
Changes to the permit conditions due to an Environment Agency initiated variation	<p>We have varied the permit as stated in the variation notice.</p> <p>Schedule 1 of the variation notice clarifies which permit conditions and schedules are changed due to an Environment Agency initiated variation.</p>
Improvement programme	<p>We have transposed the requirements of the improvement programme from the previous permit. Where these requirements have been completed, we have marked them as such.</p> <p>Further improvement programme requirements have been imposed as part of this variation as follows:</p> <p>IC10 has been imposed to reflect the requirement for MCERTS ammonia monitoring, a revised risk assessment and potential future ELVs and monitoring regime as set out in Compliance Assessment Report (CAR) TP3737SB/0276874.</p> <p>IC11 has been imposed to require the operator to undertake monitoring of the emissions from the boilers to validate the emission concentrations used in the modelling report submitted in support of this application.</p>

Aspect considered	Decision
Emission limits	No emission limits have been added, amended or deleted as a result of this variation.
Monitoring	Routine monitoring has not changed as a result of this variation.
Reporting	<p>We have added/amended/deleted reporting in the permit for the following parameters:</p> <p>Annual reporting of bio-acrylamide production</p> <p>We made these decisions in accordance with our guidance</p>
<b>Operator competence</b>	
Management system	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.
<b>Growth Duty</b>	
Section 108 Deregulation Act 2015 – Growth duty	<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>



## Consultation

The following summarises the responses to consultation with other organisations and our notice on GOV.UK for the public, and the way in which we have considered these in the determination process.

### Responses from organisations listed in the consultation section

<b>Response received from City of Bradford Metropolitan Borough Council.</b>
Date received: 16/01/2017
<b>Brief summary of issues raised</b>
Bradford Council Planning Service have no objection to the proposed Environmental Permit Variation to cover the introduction of a Bio-acrylamide manufacturing plant at the site.
<b>Summary of actions taken or show how this has been covered</b>
No action necessary.

<b>Response received from Public Health England.</b>
Date received: 24/01/2017
<b>Brief summary of issues raised</b>
Based on the information contained in the application supplied, Public Health England has no significant concerns regarding the risk to the health of the local population from the installation.
<b>Summary of actions taken or show how this has been covered</b>
No action necessary.

No other responses were received.

### Representations from individual members of the public.

No responses were received to our notice on GOV.UK