

Environment Agency

Review of an Environmental Permit for an Installation subject to Chapter II of the Industrial Emissions Directive under the Environmental Permitting (England & Wales) Regulations 2016 (as amended)

Decision document recording our decision-making process following review of a permit

The Permit number is: EPR/BT0359IP
The Operator is: Campact Limited
The Installation is: Campact
This Variation Notice number is: EPR/BT0359IP/V007

What this document is about

Article 21(3) of the Industrial Emissions Directive (IED) requires the Environment Agency to review conditions in permits that it has issued and to ensure that the permit delivers compliance with relevant standards, within four years of the publication by the European Commission of updated decisions on BAT conclusions.

We have reviewed the permit for this installation against the revised BAT Conclusions for the Large Volume Organic Chemicals industry sector published on 07 December 2017 in the Official Journal of the European Union.

Where appropriate, we also considered other relevant BAT Conclusions published prior to this date but not previously included in a permit review for the Installation:

Common Waste Water and Waste Gas Treatment/Management Systems in the Chemical Sector. Published 09 June 2016

In this decision document, we set out the reasoning for the consolidated variation notice that we have issued.

It explains how we have reviewed and considered the techniques used by the operator in the operation and control of the plant and activities of the installation. This review has been undertaken with reference to the decision made by the European Commission establishing best available techniques (BAT) conclusions (BATc) for Production of Large Volume Organic Chemicals (LVOC) and Common Waste Water And Waste Gas Treatment/Management Systems in the Chemical Sector (CWW) as detailed in documents reference C(2017) 7469 and C(2016) 3127 respectively. It is our record of our decision-

making process and shows how we have taken into account all relevant factors in reaching our position.

As well as considering the review of the operating techniques used by the operator for the operation of the plant and activities of the installation, the consolidated variation notice takes into account and brings together in a single document all previous variations that relate to the original permit issue. Where this has not already been done, it also modernises the entire permit to reflect the conditions contained in our current generic permit template.

The introduction of new template conditions makes the permit consistent with our current general approach and with other permits issued to installations in this sector. Although the wording of some conditions has changed, while others have been deleted because of the new regulatory approach, it does not reduce the level of environmental protection achieved by the permit in any way. In this document we therefore address only our determination of substantive issues relating to the new BAT Conclusions.

We try to explain our decision as accurately, comprehensively and plainly as possible. Achieving all three objectives is not always easy, and we would welcome any feedback as to how we might improve our decision documents in future.

How this document is structured

1. Our proposed decision
2. How we reached our decision
3. The legal framework
4. Annex 1 – Decision checklist regarding relevant BAT Conclusions.
5. Annex 2 – Improvement Conditions

1 Our decision

We have decided to issue the variation notice to the operator. This will allow it to continue to operate the Installation, subject to the conditions in the consolidated variation notice that updates the whole permit.

We consider that, in reaching our decision, we have taken into account all relevant considerations and legal requirements and that the varied permit will ensure that a high level of protection is provided for the environment and human health.

The consolidated variation notice contains many conditions taken from our standard environmental permit template including the relevant annexes. We developed these conditions in consultation with industry, having regard to the legal requirements of the Environmental Permitting Regulations and other relevant legislation. This document does not therefore include an explanation for these standard conditions. Where they are included in the notice, we have considered the techniques identified by the operator for the operation of their installation, and have accepted that the details are sufficient and satisfactory to make those standard conditions appropriate. This document does, however, provide an explanation of our use of “tailor-made” or installation-specific conditions, or where our permit template provides two or more options.

2 How we reached our decision

2.1 Requesting information to demonstrate compliance with BAT Conclusion techniques

We issued a notice under regulation 61(1) of the Environmental Permitting (England and Wales) Regulations 2016 (a Regulation 61 Notice) on 04/05/18 requiring the operator to provide information to demonstrate where the operation of their installation currently meets, or how it will subsequently meet, the revised standards described in the relevant BAT Conclusions document. The notice required that where the revised standards are not currently met, the operator should provide information that

- Describes the techniques that will be implemented before 07/12/21 which will then ensure that operations meet the revised standard, or
- justifies why standards will not be met by 07/12/21, and confirmation of the date when the operation of those processes will cease within the installation or an explanation of why the revised BAT standard is not applicable to those processes, or
- justifies why an alternative technique will achieve the same level of environmental protection equivalent to the revised standard described in the BAT Conclusions.

Where the operator proposed that they were not intending to meet a BAT standard that also included a BAT Associated Emission Level (BAT AEL) described in the BAT Conclusions Document, the Regulation 61 notice required that the operator make a formal request for derogation from compliance with that AEL (as provisioned by Article 15(4) of IED). In this circumstance, the notice identified that any such request for derogation must be supported and justified by sufficient technical and commercial information that would enable us to determine acceptability of the derogation request.

The Regulation 61 notice response from the Operator was received on 09/08/18.

We considered it was in the correct form and contained sufficient information for us to begin our determination of the permit review but not that it necessarily contained all the information we would need to complete that determination.

The Operator made no claim for commercial confidentiality. We have not received any information in relation to the Regulation 61 Notice response that appears to be confidential in relation to any party.

2.2 Review of our own information in respect to the capability of the installation to meet revised standards included in the BAT Conclusions document

Based on our records and previous experience in the regulation of the installation we have no reason to consider that the operator will not be able to comply with the techniques and standards described in the BAT Conclusions.

2.3 Requests for further information during determination

Although we were able to consider the Regulation 61 notice response generally satisfactory at receipt, we did in fact need more information in order to complete our permit review assessment, and issued further information requests on 04/09/19, 05/01/21 and 18/02/21 requesting further detail on some of the BAT conclusion responses. A copy of the further information received was placed on our public register.

2.4 Condition of Soil and Groundwater

Articles 16 and 22 of the Industrial Emissions Directive (IED) require that a quantified baseline is established for the level of contamination of soil and groundwater with hazardous substances, in order that a comparison can be made on final cessation of activities.

We have used the Large Volume Organic Chemicals permit review to regulate against the above IED requirements. Our Regulation 61 notice required operators, where the activity of the installation involved the use, production or release of a relevant hazardous substance (as defined in Article 3(18) of the Industrial Emissions Directive), to carry out a risk assessment considering the

possibility of soil and groundwater contamination at the installation with such substances. Where any risk of such contamination was established we requested that the operator either:

- prepare and submit a baseline report containing information necessary to determine the current state of soil and groundwater contamination; or
- provide a summary report referring to information previously submitted where they were satisfied that such information represented the current state of soil and groundwater contamination so as to enable a quantified comparison to be made with the state of soil and groundwater contamination upon definitive cessation the activity.

Where operators concluded that there were no risks of soil or groundwater contamination (due to there not being any release of hazardous substances), they were required to provide a copy of the risk assessment.

The permit variation in 2014 included a small extension to the north-east installation boundary. As such, the variation application included an updated site condition report (CAM.001-SCR/Rev 3, 08/05/14), which we reviewed to confirm that:

- All activities are carried out on concreted areas with appropriate bunding to process areas and tank storage with additional tertiary containment.
- Underground pipework is subject to inspection and only carries low risk effluent to the nearby sewage treatment works.
- All dangerous/hazardous materials are stored in appropriate containers/tanks in bunded areas. Transfer of liquids is by pipeline.
- All bunds, surfaces and infrastructure is subject to a maintenance programme.
- A risk assessment has been undertaken and appropriate safeguards are in place to prevent any 'major incident' leading to pollution.
- Baseline data has been provided.

Following the 2014 variation, the site protection and monitoring programme (SPMP) was updated in October 2015 (CAM.002-SPMP) to cover the changes at site. The SPMP provides:

- An up-to-date statement on: the site infrastructure changes; raw materials and product storage areas; and the risks posed by emission to soil and groundwater.
- A statement justifying the future monitoring programme for: effectiveness of pollution prevention; data to inform permit surrender; defensive monitoring at site boundaries; and movement of pollutants beneath the site.

We are satisfied that the SCR and SPMP meet our requirements and are still relevant to the current operations.

The operator has informed us that a small corner of the land added to the site boundary under the extension in 2014, and the thermal oil room situated on it, is under the control of Egger UK Limited, who operate a Part A(2) board manufacturing activity on the adjacent land, permitted by Northumberland County Council (EPW020/035). Both Campact and Egger will need to resolve this site boundary matter with their relevant competent authority. The permit includes improvement condition 6 to address this.

2.5 Surface Water Pollution Risk Assessment

As part of our delivery of the Water Framework Directive (WFD) requirements, we need to identify and assess the impact of all sources of hazardous pollutants to surface waters from regulated industry. We use the term 'hazardous pollutants' to collectively describe substances covered by the EQSD¹ (priority hazardous substances, priority substances and "other pollutants"). It also applies to the specific pollutants listed in the 2015 Directions², and substances which have operational (non-statutory) Environmental Quality Standards (EQS).

For all installations with discharges to surface water and/or sewer we required the operator, via our Regulation 61 notice, to provide a summary report of the current hazardous pollutant releases referring to the series of screening tests, which are described in our H1 risk assessment guidance, which would allow us to assess whether the emissions of hazardous pollutants from the installation are significant.

Following a request for further information, the operator confirmed on 04/10/19 that formaldehyde is the only hazardous pollutant in their effluent requiring risk assessment. The operator holds a trade effluent consent from Northumbrian Water Limited (NWL) for a discharge to Hexham Sewage Treatment Works (STW). This emission is reflected in Table S3.3 of the permit, with a discharge via emission point S1. Formaldehyde is a listed parameter, with monitoring requirements but no emission limit value.

The operator has confirmed with NWL that trade effluent consent limits were set to ensure compliance with the Environmental Quality Standards (EQS) in the River Tyne. They have not made their calculations available.

In their initial response to the Regulation 61 Notice, the operator included the results of their H1 screening assessment for a discharge to sewer containing formaldehyde. This used a standard removal factor for the treatment of formaldehyde of only 2%. Under the conservative screening steps, this resulted in predicted failures of the EQS in the River Tyne. By adding in the dilution afforded by mixing with the other effluents in the STW, the impact was lessened but still not insignificant. We raised these concerns with the operator with a further request for information. In their response of 28/01/21 they

¹ Environmental Quality Standards Directive (EQSD) (2008/105/EC, as amended by 2013/39/EU)

² The Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015

confirmed that NWL had carried out sampling to analyse for the actual measured formaldehyde removal at Hexham STW. This showed that the STW achieves, on average, 50% removal of formaldehyde. The operator also provided information from a literature review to demonstrate that formaldehyde is readily biodegradable.

We re-ran the H1 screening assessment using the new figure of 50% removal of formaldehyde, as well as recent monitoring data from the operator's reporting.

Period	Maximum formaldehyde result (mg/l) for Campact effluent prior to discharge to sewer
01/10/20 – 31/12/20	43
01/07/20 – 30/09/20	40
01/04/20 – 30/06/20	35
01/01/20 – 31/03/20	46

We used the highest of the maximum monitoring results as the maximum concentration and the average of the maximum monitoring results as the annual average (41 mg/l - likely to be an overestimate). We have not included any dilution of the effluent with the other effluents received at the STW (around 25 times dilution would be provided by the works' dry weather flow of 4,960 m³/day). We do not have monitoring data for the upstream quality of the River Tyne so we assumed, as a worst-case, that it is already at 50% of the EQS, which means there is little headroom available before the EQS is exceeded. There is no allowance for the biodegradation of formaldehyde that is likely to occur in the sewer on the way to the STW, nor in the River Tyne.

Under this extremely conservative scenario, the screening results are:

Number	Substance	Bkgrnd Conc. µg/l	Annual Avg EQS				MAC* EQS				PEC >100% MAC								
			PC µg/l	PEC µg/l	(PEC - BC)/ EQS	PEC - BC >10% AA EQS	% PEC of EQS	PEC >100% AA EQS	PC µg/l	PEC µg/l		% PEC of MAC							
		e.g. 200																	
1	Formaldehyde (River Tyne at Hexham)	2.5	2.92	5.42	58.4%	Fail	108	Fail	10.6	13.1	26.2	Pass							

The screening tool predicts that with a predicted environmental concentration (PEC) of 5.42 µg/l following the discharge to the River Tyne, the maximum allowable concentration (MAC) EQS of 50 µg/l will be met, but that it will be at 108% of the annual average (AA) EQS of 5 µg/l. As this failure is marginal, we are satisfied that it is unlikely that the discharge from Campact is causing an EQS failure in the River Tyne. The screening assessment itself is precautionary and the inputs we used are extremely conservative. We do not need to carry out detailed modelling (indeed, we do not have sufficient data to make this worthwhile), nor add an emission limit value to the permit at this time.

Although we are satisfied that Campact's discharge to sewer is BAT for both the hazardous pollutants and the sanitary determinands in the effluent, we have included an improvement condition to require that they review the potential for on-site pretreatment of their effluent to reduce the concentration

of formaldehyde prior to discharge to sewer. The operator will also be required to carry out an annual review to confirm whether there have been any significant changes at the installation or at Hexham STW that may affect whether treatment off-site at Hexham STW is BAT and provides an equivalent level of protection of the environment as if the effluent were treated on-site. This requirement is included as a performance parameter in the permit.

3 The legal framework

The consolidated variation notice will be issued under Regulations 18 and 20 of the EPR. The Environmental Permitting regime is a legal vehicle which delivers most of the relevant legal requirements for activities falling within its scope. In particular, the regulated facility is:

- an *installation* as described by the IED;
- subject to aspects of other relevant legislation which also have to be addressed.

We consider that, in issuing the consolidated variation notice, it will ensure that the operation of the installation complies with all relevant legal requirements and that a high level of protection will be delivered for the environment and human health.

We explain how we have addressed specific statutory requirements more fully in the rest of this document.

We have set emission limit values (ELV's) in line with the BAT Conclusions, unless a tighter, i.e. more stringent, limit was previously imposed and these limits have been carried forward. For emissions to each relevant environmental receptor (i.e. air, or surface water), the emission limits and monitoring requirements have been incorporated into the consolidated variation notice via tables with notes in Schedule 3 – Emissions and Monitoring for

- a) the existing ELVs and monitoring requirements which are effective from the date of issue of the notice; and
- b) amended ELVs where a BAT-AEL is specified in the BAT conclusions, and any associated monitoring requirements which will take effect from 7th December 2021.

Annex 1: decision checklist regarding relevant BAT Conclusions

BAT Conclusions for the Large Volume Organic Chemicals industry sector were published by the European Commission on 07 December 2017. There are 19 General BAT Conclusions and a further 71 BAT Conclusions in 10 subsector-specific sections. Where appropriate, we also considered other relevant BAT Conclusions published prior to this date but not previously included in a permit review for the Installation; 23 BAT Conclusions for Common Waste Water and Waste Gas Treatment/Management Systems in the Chemical Sector. This annex provides a record of decisions made in relation to each relevant BAT Conclusion applicable to the installation. This annex should be read in conjunction with the consolidated variation notice.

BAT Conclusion No	Summary of BAT Conclusion requirement for Production of Large Volume Organic Chemicals	Status NA/ CC / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
	BAT Conclusions that are not applicable to this installation	NA	<p>LVOC BAT Conclusions 20 to 23 inclusive are not applicable as there is no production of lower olefins at this installation.</p> <p>LVOC BAT Conclusions 24 to 30 inclusive are not applicable as there is no production of aromatics at this installation.</p> <p>LVOC BAT Conclusions 31 to 44 inclusive are not applicable as there is no production of ethylbenzene and styrene monomer at this installation.</p> <p>LVOC BAT Conclusions 48 to 55 inclusive are not applicable as there is no production of ethylene oxide and ethylene glycols at this installation.</p> <p>LVOC BAT Conclusions 56 to 60 inclusive are not applicable as there is no production of phenol at this installation.</p> <p>LVOC BAT Conclusions 61 to 63 inclusive are not applicable as there is no production of ethanolamine at this installation.</p> <p>LVOC BAT Conclusions 64 to 74 inclusive are not applicable as there is no production of toluene diisocyanate(TDI) and methylene diphenyl diisocyanate (MDI) at this installation.</p> <p>LVOC BAT Conclusions 76 to 85 inclusive are not applicable as there is no production of ethylene dichloride and vinyl chloride monomer at this installation.</p>

			<p>LVOC BAT Conclusions 86 to 90 inclusive are not applicable as there is no production of hydrogen peroxide at this installation.</p> <p>LVOC BAT Conclusions: 1,3-6 relating to process furnaces/heaters are not applicable as the installation does not operate any process heaters/furnaces as defined in the LVOC BAT-C. A new gas-fired steam boiler has been permitted, whose operation and emissions will be subject to separate limits and controls under MCPD requirements.</p> <p>LVOC BAT Conclusion 7 is not applicable as there is no SCR or SNCR at this installation.</p> <p>LVOC BAT Conclusion 13 is not applicable as the site uses a catalytic oxidiser not a thermal oxidiser.</p> <p>LVOC BAT Conclusion 16 is not applicable because the solvents become constituents in the products so are not available for recovery.</p>
	BAT Conclusions where we accept the operator's Reg 61 notice response that they are currently compliant and no further explanation is required.	CC	See rows below
2	Monitor channelled emissions to air other than from process furnaces/heaters in accordance with the described standards and minimum frequencies	CC	<p>The operator currently monitors formaldehyde and TVOC emissions from the Formox plant twice per year and formaldehyde and TVOC emissions from the scrubber four times per year, in line with the permit requirements.</p> <p>The operator has confirmed that no other pollutants that are potentially relevant to their process as listed in BAT 2 are present in their waste gases (benzene, dust, gaseous chlorides, SO₂).</p>

			For Formaldehyde and TVOC, there is a footnote to BAT 2 allowing a reduction of the monitoring frequency to annually if emissions are stable. The operator has provided evidence from emissions monitoring of the resin plant scrubber and the formox plant to demonstrate compliance with the emission limit values. At this time, we are satisfied that the monitoring results are sufficiently stable to retain the current bespoke monitoring frequencies, rather than increase these to monthly monitoring requirements.
8	Increase resource efficiency/reduce the pollutant load on final waste gas treatment by using one or a combination of the described techniques on process off-gas streams (8a/b take precedence over 9)	CC	There is a demister in the top of the Formox plant absorber, and a resin plant scrubber. In addition, condensers are installed after each reactor, to recycle condensed vapours back into the reactors.
9	Increase energy efficiency/reduce the pollutant load on final waste gas treatment by sending process off-gas streams of sufficient calorific value to a combustion unit	CC	The formaldehyde plant is fitted with an integrated Emissions Control System (ECS) - catalytic incineration – with energy recovery of approx. 0.75MW transferred to the oil heat transfer system for use preferentially in the resin plant and remaining heat transferred to third party use.
10	Reduce channelled emissions of organic compounds to air by using one or a combination of the described techniques.	CC	ECS catalytic oxidiser with heat recovery, see BAT 9.
11	Reduce channelled dust emissions to air, by using one or a combination of the described techniques.	CC	Dust from the formaldehyde and resin plants is not an issue because little or no dust is produced by the processes and the wet scrubber would remove any potential dust particles.

12	Reduce emissions to air of sulphur dioxide and other acid gases (e.g. HCl), by using wet scrubbing.	CC	SO ₂ or other acid gases are not added and not formed as part of the processes. However wet scrubbing is used for resin process venting and formaldehyde tank vent breathing.
14	Reduce the waste water volume, the pollutant loads discharged to a suitable final treatment (typically biological treatment), and emissions to water, by using appropriate techniques based on the information provided by the inventory of waste water streams specified in the CWW BAT conclusions.	CC	Formaldehyde and resin plant processes do not generate waste water. Water is created in the Formox Plant as a by-product but all of it is recovered / reused in the process. Recovered water (condensate/distillate from absorber) is used to make urea solution. The Formox Process as well as Resin manufacturing is hence waste water free. The only waste water occurs from cooling tower purges, boiler blowdown and general cleaning activities including reactor cleaning activities. Waste water also includes general surface water (rain).
15	Increase resource efficiency when using catalysts by using a combination of the described techniques.	CC	All four techniques are used. The process is ongoing to optimise yield and monitor the performance of the catalyst in the reactor. Weekly data is sent to the catalyst supplier for review. Replacement is approximately every 8 months depending on throughput. Campact also monitor the ECS catalyst activity annually as well as ongoing monitoring of process parameters around the ECS. The ECS catalyst is anticipated to be replaced every 3 to 5 years.
17	Prevent, or where not practicable reduce, waste for disposal by using a combination of the described techniques.	CC	The general principles are relevant: c) the Formox and resin plant are inherently designed to minimise raw materials wastage. d) catalysts returned to supplier for regeneration. e) off gas is used as a fuel – see BAT 45.
18	Prevent or reduce emissions from equipment malfunctions, by using all the described techniques.	CC	All Campact assets have a safety and environmental critical ranking with supported preventative maintenance regime.

			A back-up system is not in place, but there is a structured programme to maximise equipment availability and performance which includes standard operating procedures, preventive maintenance, monitoring, recording of incidents, and continuous improvements.
19	Prevent or reduce emissions to air and water occurring during other than normal operating conditions, by implementing measures commensurate with the relevance of potential pollutant releases for: i) Start up and shutdown operations ii) Other circumstances	CC	Procedures for start-up and shut-down are in place. The operator has provided details of the additional procedures for extraordinary maintenance work and cleaning operations that have been prepared during 2019. The procedure formalising the scrubber inspection regime is also now available.
45	In order to reduce emissions of organic compounds to air from formaldehyde production and to use energy efficiently, BAT is to use one of the techniques given.	CC	The Formox process integrates the ECS catalytic oxidiser with approx. 0.75MW energy recovery to the thermal oil system for use on-site and also off-site.
	<u>Table 5.1</u> BAT-AELs for emission to air from formaldehyde production: TVOC < 5 – 30 mg/Nm ³ Formaldehyde 2 – 5 mg/Nm ³	CC	Current permit emission limit values: Formaldehyde: 5 mg/m ³ daily average; TVOC: 75 mg/m ³ daily average. Monitoring of these shows that the operator can meet the new BAT-AELs, which will be included in the permit variation. (The BAT-AELs are only applicable to the ECS (A1). The scrubber (A2) is not part of the formaldehyde production process.)
46	Prevent or reduce waste water generation and the organic load discharged by using one or both of the techniques given.	CC	Campact doesn't reuse water from cleaning at present. (The only potential pre-treatment of water from cleaning is pH adjustment if required to comply with NWL discharge consent. This is

			<p>rarely necessary and is not a routine part of operations, although is covered by a management procedure.)</p> <p>Further pre-treatment of formaldehyde has not yet been requested by the sewerage undertaker, so we accept that it is not having a negative effect on the downstream biological waste water treatment. (See also CWW BAT 10 & 11.)</p> <p>There is a settlement pit for the reactor cleaning activities. This is inspected annually, with any solids removed and disposed of in accordance with the operator's waste procedures.</p>
47	In order to reduce the amount of paraformaldehyde-containing waste being sent for disposal, BAT is to use one or a combination of the techniques given.	CC	<p>Site experience is that the most effective method is technique a) minimisation, hence the process is monitored and controlled to that effect.</p> <p>The formation of paraformaldehyde is minimised by improved heating, insulation and flow circulation in the resin reactors.</p>

Key Issues

A variation was granted in 2017 to replace two steam raising standby boilers with a single modern Medium Combustion Plant Directive-compliant unit with a thermal input of 11MW and a single 15 metre stack. This supplies back-up heat to the process and buildings when there is insufficient available heat stored in the accumulator recovered from the exothermic process. The boiler runs on natural gas with gas-oil as a back-up in the event of gas supply interruption.

This MCP was not commissioned until July 2019, making it a 'new' plant. As such, the relevant emission limit value (for operation on natural gas) and monitoring requirements have been added to the permit for emission point A3. From the information provided in the 2017 application, we are satisfied that the operator can meet these requirements and that the predicted impacts were assessed at the time and found to be acceptable. No emission limit values are required for operation on gas oil, as this is limited to use only as a back-up fuel in the event of a gas supply interruption.

BAT Conclusion No	Summary of BAT Conclusion requirement for Common Waste Water and Waste Gas Treatment/ Management Systems in the Chemical Sector	Status NA/ CC / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
	BAT Conclusions that are not applicable to this installation	NA	CWW BAT Conclusions 6, 20 and 21 are not applicable as no odour nuisance is expected or has been substantiated. CWW BAT Conclusion 14 is not applicable as minimal waste water sludge is generated in the settlement pit. CWW BAT Conclusions 17 and 18 are not applicable because the site does not have a flare. CWW BAT Conclusions 22 and 23 are not applicable as no noise nuisance is expected or has been substantiated.
	BAT Conclusions where we accept the operator's Reg 61 notice response that they are currently compliant and no further explanation is required.	CC	See rows below
1	To improve overall environmental performance implement and adhere to an EMS incorporating all the described features.	CC	EMS certified to ISO 14001. Campact's Integrated Management System for Health, Safety, Environment and Quality is a requirement of and supported by the Egger group. There are measures to review, identify and address continuous improvement. Operating Procedures are in

BAT Conclusion No	Summary of BAT Conclusion requirement for Common Waste Water and Waste Gas Treatment/ Management Systems in the Chemical Sector	Status NA/ CC / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
			place, the effectiveness of the systems are monitored and evaluated, with records kept. Egger remain at the forefront of developing and researching cleaner technologies. There is a commitment to the waste hierarchy and there are inventories of waste water and waste gas streams. There are response procedures for logging any odour or noise complaints.
2	To facilitate reduction of emissions to water and air and water usage, establish and maintain an inventory of waste water and waste gas streams as part of BAT1 EMS incorporating the described features.	CC	Information is in place for the chemical production processes. Waste water: these are in place for the relevant pollutants (COD and formaldehyde). We have confirmed with the operator that there are no other substances of concern in the effluent. Waste gas: in place as far as current permit requires it, which we have reviewed to confirm that the requirements remain appropriate.
3	For relevant emissions to water monitor key process parameters at key locations.	CC	The permit includes monitoring for the discharge to sewer of the relevant pollutants (COD and formaldehyde) and flow. There is monitoring in-reactor of boilout liquid prior to discharge into the effluent tank.

BAT Conclusion No	Summary of BAT Conclusion requirement for Common Waste Water and Waste Gas Treatment/ Management Systems in the Chemical Sector	Status NA/ CC / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
			There is a regime in place to check for contamination of sumps (should a chemical leak have occurred), however no direct relevant emissions to water occur.
4	Monitor emissions to water in accordance with the described standards and minimum frequencies.	CC	Campact does not have any direct emissions to water of process effluent (only uncontaminated roof water). The monitoring specified in the permit for the discharge to sewer reflects the requirements for the relevant pollutants (COD and formaldehyde) to ensure sufficient treatment is provided. The operator also monitors the flow of the discharge to sewer and this provision will be added to the permit.
5	Periodically monitor diffuse VOC emissions to air from relevant sources using a combination (or for large amounts – all) of the described techniques.	CC	Diffuse emissions are contained – and hence no periodic monitoring is required. The plant was upgraded in 2012 and the continuing minimisation of diffuse emissions is ensured with the specification of high quality items and materials of construction. Formaldehyde emissions are easily detectable and it is ensured that maintenance rapidly seals any leaks.

BAT Conclusion No	Summary of BAT Conclusion requirement for Common Waste Water and Waste Gas Treatment/ Management Systems in the Chemical Sector	Status NA/ CC / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
			There is continuous monitoring of formaldehyde and methanol on the Formox plant and further gas sensors are being added around the resin plant.
7	Reduce usage of water and the generation of waste water, by reducing the volume and/or pollutant load of waste water streams, enhancing the reuse of waste water within the production process and recovery and reuse of raw materials.	CC	Waste water volumes from the site (trade effluent) are directly linked to rainfall. Water usage and waste water are examined on a regular basis, but are mainly temperature driven (cooling tower water consumption) or rainfall (trade effluent volume).
8	Prevent the contamination of uncontaminated water and reduce emissions to water, by segregating uncontaminated waste water streams from waste water streams that require treatment.	CC	Uncontaminated water is roof water which is discharged separately – there is no potential for cross contamination.
9	Prevent uncontrolled emissions to water by providing an appropriate buffer storage	CC	ARCAM105 Bund, Sump and Trade Effluent Management operating procedure in place.

BAT Conclusion No	Summary of BAT Conclusion requirement for Common Waste Water and Waste Gas Treatment/ Management Systems in the Chemical Sector	Status NA/ CC / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
	capacity for waste water incurred during other than normal operating conditions based on a risk assessment, and taking appropriate further measures.		Pollutants only expected if there is a loss of containment event. Each storage and production area is separately bunded and linked to a sump. Where possible, water will be fed back into process but if not then arrangements will be made for its removal and disposal.
10	Reduce emissions to water, by using an integrated waste water management and treatment strategy that includes an appropriate combination of the described techniques (in the priority order given).	CC	<p>Due to limited space on site, the proximity to a sewer and low volumes of effluent, BAT is to discharge to sewer for final waste water treatment. Low concentrations mean the process effluent is best treated via sewer. (The only potential pre-treatment of effluent is pH adjustment if required to comply with NWL discharge consent. This is rarely necessary and is not a routine part of operations, although is covered by a management procedure.)</p> <p>Although pre-treatment of formaldehyde is not strictly necessary to meet the requirements of LVOC BAT 46 and CWW BAT 11, we will include an improvement condition requiring the operator to review the techniques to abate the concentration of formaldehyde in their effluent before the final waste water treatment. We are satisfied that the operator meets the overall aim of BAT 10 to reduce emissions to water but this improvement</p>

BAT Conclusion No	Summary of BAT Conclusion requirement for Common Waste Water and Waste Gas Treatment/ Management Systems in the Chemical Sector	Status NA/ CC / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
			condition will ensure that the hierarchy of treatment is fully considered. (See Key Issues below.)
11	Reduce emissions to water, by pre-treating waste water that contains pollutants that cannot be dealt with adequately during final waste water treatment using appropriate techniques as part of an integrated waste water management and treatment strategy.	CC	Further pre-treatment of formaldehyde has not yet been requested by the sewerage undertaker, so we accept that it is being dealt with adequately during final waste water treatment. This has been verified using our surface water pollution risk assessment (see section 2.5 above). The operator is in regular communication with the sewerage undertaker, which will ensure if this changes then pre-treatment will be considered. (See also LVOC BAT 46 and CWW BAT 10.)
12	Reduce emissions to water, by using an appropriate combination of the described final waste water treatment techniques.	CC	Final waste water treatment takes place off-site at Hexham STW (includes trickle filtration and aeration).
	BAT-AELs	CC	The discharge of process effluent to sewer (S1) is an indirect emission. We are satisfied that emission limit values are not required in the permit to ensure that the BAT-AELs for direct emissions are met following off-

BAT Conclusion No	Summary of BAT Conclusion requirement for Common Waste Water and Waste Gas Treatment/ Management Systems in the Chemical Sector	Status NA/ CC / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
			site treatment. We have added a Performance Parameter to the permit (Table S4.3) to require the operator to review annually that treatment off-site at Hexham STW remains BAT and provides an equivalent level of protection of the environment as if the effluent were treated on-site.
13	Prevent or, where this is not practicable, reduce the quantity of waste being sent for disposal by setting up and implementing a waste management plan as part of the environmental management system (see BAT 1) that, in order of priority, ensures that waste is prevented, prepared for reuse, recycled or otherwise recovered.	CC	Data is submitted to the Environment Agency annually. Reductions have been applied and although 100% prevention is not possible, resource efficiency principles are applied and tracked. KPI of waste per tonne of resin are used to track performance.
15	Facilitate the recovery of compounds and the reduction of emissions to air, by enclosing the emission sources and treating the emissions, where possible.	CC	The Formox reactor plant consists of an entirely enclosed and ducted system, culminating in release to atmosphere via the Emissions Control System (ECS). The resin reactors and appropriate storage tanks vent to wet scrubber for treatment and point source emission.

BAT Conclusion No	Summary of BAT Conclusion requirement for Common Waste Water and Waste Gas Treatment/ Management Systems in the Chemical Sector	Status NA/ CC / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
16	Reduce emissions to air, by using an integrated waste gas management and treatment strategy that includes process-integrated and waste gas treatment techniques.	CC	The Formox process utilises an integrated design with ECS and energy recovery.
19	Prevent or, where that is not practicable, reduce diffuse VOC emissions to air, by using a combination of the described techniques.	CC	The plant has been designed, built and is operated to reduce potential diffuse emission sources.

Key Issues

In relation to LVOC BAT Conclusion 46 and CWW BAT Conclusions 10 & 11, we are satisfied that the formaldehyde in the discharge to sewer does not have a negative effect on the downstream biological waste water treatment at Hexham STW (LVOC BAT 46) and that the works can adequately deal with the treatment of formaldehyde (CWW BAT 11). However, there may be potential for the operator to further reduce their emissions to water (CWW BAT 10) by pre-treating their effluent on-site to abate the

concentration of formaldehyde before the final waste water treatment. We require the operator to review the techniques available to them, including those described in the BAT Reference Document for the Production of Large Volume Organic Chemicals, section 6.4.2.2 Chemical pretreatment. We have therefore included Improvement Condition 5 in the consolidated variation notice.

Where relevant and appropriate, we have incorporated the techniques described by the operator in their Regulation 61 notice response as specific operating techniques required by the permit, through their inclusion in Table S1.2 of the consolidated variation notice.

Annex 2: Improvement Conditions

Based on the information in the operator's Regulation 61 Notice response and our own records of the capability and performance of the installation at this site, we consider that we need to set improvement conditions so that the full outcome of the techniques detailed in the BAT Conclusions are achieved by the installation. These improvement conditions are set out below - justifications for them is provided at the relevant section of the decision document (Section 2.4 and Annex 1).

Table S1.3 Improvement programme requirements		
Reference	Requirement	Date
1 - 4	Confirmed status of existing improvement conditions: 1, 2 & 3 - complete 4 - superseded	-
5	<p>The operator shall submit, for approval by the Environment Agency, a report on options for the on-site pretreatment of formaldehyde in their process effluent prior to discharge via emission point S1 to Hexham STW. The report shall include, but not be limited to, the following:</p> <ul style="list-style-type: none"> • Monitoring data for formaldehyde and flow. • Measures to minimise the discharge of formaldehyde. • Identification of the options available for the on-site pretreatment of formaldehyde (including those described in BAT Reference Document for the Production of Large Volume Organic Chemicals, section 6.4.2.2 Chemical pretreatment). • An assessment of the feasibility of installing these pretreatment options. • A timetable for the implementation of any improvements planned. • Details of how the operator will identify the need for future reviews on the use of on-site pretreatment of formaldehyde (including if requested by the Environment Agency or the sewerage undertaker) and how these will be actioned. <p>The report shall address the following BAT Conclusions:</p> <ul style="list-style-type: none"> • Production of Large Volume Organic Chemicals BAT 46 (Emissions to water). • Common waste water and waste gas treatment/management systems in the chemical sector BAT 10 & 11 (waste water treatment and priority order of techniques). <p>Refer to BAT Conclusions for a full description of the BAT requirements.</p> <p>On receipt of approval in writing from the Environment Agency the operator shall implement any improvements in accordance with the agreed timescales.</p>	12/11/21

Table S1.3 Improvement programme requirements		
Reference	Requirement	Date
6	<p>The operator shall submit a written report to the Environment Agency on the area of land at the north-eastern corner of the site boundary. The report shall include, but not be limited to, the following:</p> <ul style="list-style-type: none"> • An updated site boundary plan to show the extent of the site boundaries as agreed between Campact Limited and Egger (UK) Limited. • Details from September 2014 onwards of: <ul style="list-style-type: none"> - Who has been the legal operator on this corner of land. - The activities that have been carried out on this corner of land. - The measures that have been in place to protect land and groundwater. - Any pollution incidents that may have affected land and groundwater in this area (including any investigation and/or remediation). - Any monitoring of soil or groundwater in this area. - Updates to the Site Protection and Monitoring Programme and/or the Site Condition Report. <p>Following a technical assessment of this report by the Environment Agency, the operator shall take the actions agreed in writing to ensure that their site boundary plan (as referred to in condition 2.2.1) accurately reflects the extent of their activities, to a timetable agreed with the Environment Agency.</p>	12/11/21