

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

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

The Permit number is: EPR/BL1312IE
The Operator is: Mastermelt Refining Services Limited
The Installation is: Staden Lane Industrial Estate
This Variation Notice number is: EPR/BL1312IE/V011

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 non-ferrous metals industries sector published on 30 June 2016 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. 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 the non-ferrous metals industries as detailed in the Official Journal of the European Union (L174) following a European Union, implementing decision (EU) 2016/1032 of 13 June 2016. 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- Review of operating techniques within the installation against BAT Conclusions
5. Annex 2a - Review and assessment of derogation request(s) made by the operator in relation to BAT Conclusions which include an Associated Emission Level (BAT-AEL) value
6. Annex 2b - Consultation responses
7. Annex 3 - Improvement conditions
8. Annex 4 - Review and assessment of changes that are not part of the BAT Conclusions derived permit review
9. Annex 5 – Priority compliance issues & detailed assessment of Regulation 60 notice responses where future action is likely

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 60(1) of the Environmental Permitting (England and Wales) Regulations 2010 (a Regulation 60 notice) on 16 December 2016 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 30 June 2020, which will then ensure that operations meet the revised standard, or
- justifies why standards will not be met by 30 June 2020, 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 60 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 60 notice response from the operator was received on 03 April 2017.

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 60 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 consider that the operator will be able to comply with the techniques and standards described in the BAT Conclusions. For the majority of the BAT Conclusions the operator has demonstrated that they currently operate in compliance with the requirements of the BAT Conclusions other than for those techniques and requirements described in BAT Conclusion 10 and 144. In relation to these BAT Conclusions we have included improvement conditions IC01 and IC02 in the consolidated variation notice to ensure that the requirements of the BAT Conclusion are delivered before 30 June 2020 (the “compliance date”). We are satisfied that pending completion of the improvement conditions the operator will be compliant by 30 June 2020.

2.3 Requests for further information during determination

Although we were able to consider the Regulation 60 notice response generally satisfactory at receipt, we did in fact need more information in order to complete our permit review assessment, and issued a further information

request in the form of a Regulation 61 notice on 20 April 2018. A copy of the further information request was placed on our public register.

In addition to the response to our further information request, we received additional information and/or clarification from the operator during the determination as follows:

- Responses to our email dated 05/03/2018, received 05/03/2018 and 06/03/2018, regarding process flow diagrams.
- Response to our email dated 14/05/2018, received 15/05/2018, clarifying the operator's response to BATs 5, 139, 140, 141, 142, 143, 144 and confirmation that the operator's climate change agreement has terminated.

We made a copy of this information available to the public in the same way as the response to our information request.

2.4 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 60 notice, to undertake a surface water pollution risk assessment, in two stages, as follows:

- a) Provide emissions data for the following hazardous pollutants: silver, arsenic, cadmium, cobalt, chromium (total), chromium (VI), copper, mercury, nickel, lead and zinc. The BAT Conclusions for the Non-Ferrous Metals Industries specify BAT-AELs associated with the direct discharge of these substances to surface water. We therefore considered that these substances potentially posed the highest risk from industry and listed them in our Regulation 60 notice. In addition, operators were required to identify and assess any other hazardous pollutants that may be present in their effluent. A full list of hazardous pollutants is included in our surface water pollution risk assessment guidance, which we 'signposted' operators to via the Regulation 60 notice.

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

- b) Undertake a risk assessment using the above emissions data to determine whether any hazardous pollutants were liable to cause pollution of the downstream receiving waters. The WFD requires Member States to prior regulate, all substances in a discharge which are “liable to cause pollution”. Previously discharges from the Non-Ferrous Metals Industries were controlled on a “liable to contain” approach set by the Dangerous Substances Directive through either numeric limits, or descriptive conditions. Under the “liable to cause pollution” approach we would only consider applying numeric emission limits to those pollutants calculated to have the potential to cause pollution.

The risk assessment methodology uses a number of sequential screening steps to determine if a substance warrants detailed modelling and hence any emission limits being required, namely:

- Screen out insignificant emissions that do not warrant further investigation;
- Determine if significant load test is failed (for priority hazardous substances only);
- Decide if detailed modelling is needed;
- Assess emissions against relevant standards and set permit limits where considered necessary.

The methodology provides for undertaking assessments of both direct and indirect discharges to surface water, ‘indirect’ meaning that the effluent is discharged to foul sewer from the installation and is treated at a sewage treatment works (STW) prior to discharge to surface water. Treatment at the STW will remove a proportion of a discharged substance from the final effluent discharged to the environment. This removal needs to be taken into account when calculating the concentration of a hazardous pollutant which will be discharged to a receiving water via the sewage works. This is achieved by applying STRFs (sewage treatment reduction factors) within the screening steps.

Our intention was to use the non-ferrous metals permit review to regulate any discharge of hazardous pollutants to surface waters from this installation using the “liable to cause pollution” approach. However the operator has not provided satisfactory responses to questions 5 and 6 on our Regulation 60 notice to enable us to undertake this aspect of the review within the agreed project timeline. We have therefore carried over this requirement into the consolidated variation notice.

We have included improvement condition IC03 requiring the operator to submit a surface water pollution risk assessment in accordance with our guidance using representative emissions data.

The operator will be required to submit their risk assessment within 12 months of the effective date of our notice.

2.5 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 non-ferrous metals permit review to regulate against the above IED requirements. Our Regulation 60 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.

In response to questions 5 and 6 of our Regulation 60 notice, on 03/04/2017 the operator provided a copy of report 'Environmental Assessment of the Lea Ronal Inc. Site at Buxton, Derbyshire', December 1999, document reference: 1280/G:lwd/jme, which was commissioned by Shipley Europe Limited who operated the installation prior to Mastermelt Refining Services Limited. The report concludes that both widespread and isolated contamination is unlikely to be present. In their Regulation 61 response, the operator confirmed that this report is still representative of conditions on site. Mastermelt accept responsibility and liability for any remedial work where necessary upon surrender of the permit on the basis that there have been no incidents or releases that could cause ground contamination at the site. The only new materials that have been added to the process are additional permitted waste types. No other hazardous substances have been introduced at the installation.

As a result of the operator's assessment we are satisfied that no new risks of contamination have been established and that the report represents baseline conditions having regard to the state of the site before the facility was put into operation. We consider no further action is required.

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 (ELVs) 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 two tables in Schedule 3 – Emissions and monitoring, as follows:

Emissions to air

- Table S3.1a, the requirements of which are effective from the date of issue of the notice, and which contains the existing ELVs and monitoring requirements; and
- Table S3.1b, the requirements of which will take effect from 30 June 2020, and which contains amended ELVs where a BAT-AEL is specified in the BAT Conclusions, and any associated updated monitoring requirements.

Annex 1

Review of operating techniques within the installation against BAT Conclusions

BAT Conclusions for the non-ferrous metals industries, were published by the European Commission on 30 June 2016. There are 184 BAT Conclusions. 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.

The overall status of compliance with the BAT conclusion is indicated in the table as:

- NA Not Applicable
- CC Currently Compliant
- FC Compliant in the future (within 4 years of publication of BAT conclusions)
- NC Not Compliant

Table 1: Decision checklist for relevant BAT Conclusions

Summary of BAT Conclusion requirement for Non-Ferrous Metals Industries	Status NA / CC / FC / NC	Assessment of the installation capability to demonstrate compliance with the BAT Conclusion requirement Type of process: PRECIOUS METALS PRODUCTION
BAT Conclusions that are not applicable to this installation.	NA	<p>General BAT Conclusions for Non-Ferrous Metals Industries: 11-13, 15-17.</p> <p>BAT Conclusions for copper production: 20-54 inclusive. BAT Conclusions for alumina production: 55-57 inclusive. BAT Conclusions for anode production: 58-63 inclusive. BAT Conclusions for primary aluminium production: 64-73 inclusive. BAT Conclusions for secondary aluminium production: 74-86 inclusive. BAT Conclusions for salt slag recycling process: 87-89 inclusive. BAT Conclusions for lead and/or tin production: 90-107 inclusive. BAT Conclusions for primary zinc production: 108-120 inclusive. BAT Conclusions for secondary zinc production, 121-130 inclusive. BAT Conclusions for cadmium production: 131-133 inclusive.</p> <p>BAT Conclusions for precious metals production: 143 and 145.</p> <p>BAT Conclusions for ferro-alloys production: 150-162 inclusive. BAT Conclusions for nickel and/or cobalt production: 163-176 inclusive. BAT Conclusions for carbon and/or graphite production: 177-184 inclusive.</p>
BAT Conclusions where we accept the operator’s Reg 60	CC	<p>General BAT Conclusions for Non-Ferrous Metals Industries: 1-9, 14, 18-19.</p>

Table 1: Decision checklist for relevant BAT Conclusions		
Summary of BAT Conclusion requirement for Non-Ferrous Metals Industries	Status NA / CC / FC / NC	Assessment of the installation capability to demonstrate compliance with the BAT Conclusion requirement Type of process: PRECIOUS METALS PRODUCTION
notice response that they are currently compliant and no further explanation is required.		BAT Conclusions for precious metals production: 134-142, 146-149.
BAT Conclusions where improvements will be undertaken on site within the 4 year period in order to achieve compliance with the narrative and/or BAT-AEL prior to the 4 year deadline.	FC	General BAT Conclusions for Non-Ferrous Metals Industries: 10. BAT Conclusions for precious metals production: 144.
BAT Conclusions where the operator has responded that they are not compliant and have not submitted any plans to become compliant.	NC	General BAT Conclusions for Non-Ferrous Metals Industries: None. BAT Conclusions for precious metals production: None.

Key Issues

Where relevant and appropriate, we have incorporated the techniques described by the operator in their Regulation 60/61 notice responses as specific operating techniques required by the permit, through their inclusion in Table S1.2 of the consolidated variation notice.

Consideration of Section 4.2 activities

The operation of the installation comprises activities that are permitted under both Sections 2.2 and 4.2 of Schedule 1 of the Environmental Permitting Regulations 2016 (EPR), which relate to the non-ferrous metals (NFM) sector and the inorganic chemicals sector respectively. The Section 4.2 activities principally concern the hydrometallurgical refining of precious metals, operations which are likely to result in emissions to air of hydrogen halides and oxides of nitrogen. Although permitted as Section 4.2 activities the processes are closely described in the NFM BREF and BAT Conclusions. However due to the way in which EPR is implemented, these activities do not fall under the non-ferrous metals section of EPR.

The driver for reviewing this permit is the publication of the NFM BAT Conclusions in June 2016 because it was considered that the Section 2.2 activity undertaken (cyanide dissolution) was the main activity of the installation. Under the Industrial Emissions Directive (IED) our obligation is to review a permit within 4 years of the BAT Conclusions being produced for the main activity of an installation, taking into account all new or updated BAT Conclusions applicable to the installation (IED, article 21(3)). While this is clearly a reference to activities explicitly covered by the BAT Conclusions, we also consider that this brings within scope of the BAT Conclusions any other parts of the installation that we consider appropriate whether part of the main activity or not. In this case, due to widespread use of hydrometallurgical activities within precious metals production, and due to the fact that BAT for these activities is set out in the NFM BAT Conclusions, we have taken the decision to review the Section 4.2 activities and apply BAT as set out in the NFM BAT Conclusions. We consider that the NFM BREF is the most appropriate BREF for the installation.

BAT Conclusion 10

BAT 10 sets out the minimum monitoring requirements for the NFM sector, stating that BAT is to monitor stack emissions to air with at least the frequency given and in accordance with EN standards. Furthermore, it says that if EN standards are not available, BAT is to use ISO, national or other international standards that ensure the provision of data of an equivalent scientific quality.

A potential issue is that BAT 10 specifies that continuous or periodic monitoring is BAT for a number of parameters, but this is then qualified by footnote (1) to the monitoring table, which states:

“For sources of high emissions, BAT is continuous measurement or, where continuous measurement is not applicable, more frequent periodic monitoring.”

‘High emissions’ are not defined in the BAT Conclusions / BREF, however the implication is that this term links to higher environmental impacts / risk. Continuous monitoring is typically used for controlling higher environmental risks, when the feedback from such monitoring is required for process controls (e.g. abatement, such as de-NO_x and acid-gas scrubbing) and where the absence of such monitoring could result in a lack of sufficient control and significant impacts; or when periodic monitoring does not give sufficiently representative results.

Our view is that rather than referring to ‘high emissions’, we will consider what levels of emissions can BAT for abatement and process controls achieve, and having determined that, we will consider the following questions:

- Can periodic monitoring provide representative results?
- Can the installation keep within the ELVs under normal conditions without the need for process controls through continuous monitoring?
- Are there surrogate parameters available that can be used to reliably infer the emissions and at an acceptable level of uncertainty, in case there is a breakdown in the abatement equipment, or under abnormal operations?

If the answer is ‘yes’ to all of the above three questions, our view is that periodic monitoring could be deemed to provide a sufficient level of control and demonstration of compliance. However, if the answer is ‘no’ to one or more of the above questions - especially the first and second question, then we would consider continuous or more frequent periodic monitoring to be more appropriate for the site.

Monitoring requirements can also be influenced by environmental risk, for example, if the risks were very low, we could opt for a combination of surrogate parameters and/or more frequent periodic monitoring, rather than continuous monitoring. We will also take this into consideration when making our judgement.

We have been unable to fully consider the implications for the operator as part of this review and will require the operator to provide further information to enable us to determine with respect to monitoring frequency, what is BAT for the site, and therefore to agree the appropriate monitoring provision to be

applied at the site from 30 June 2020. Our pragmatic approach to the monitoring aspects of the permit review is therefore:

1. To ensure that the existing permit has been updated to reflect current monitoring standards, in accordance with our M2 monitoring guidance. These standards are contained within Table S3.1a.
2. The inclusion of an improvement condition (IC02) in the permit requiring that the operator provides evidence to justify the level of monitoring to be employed, including where relevant, the frequency of periodic monitoring. That evidence will allow us to address the questions above, and facilitate agreement of the appropriate monitoring provision that will apply from 30 June 2020 onwards.
3. To carry over the existing periodic monitoring requirements in Table S3.1b pending completion of IC02, which must be submitted to the Environment Agency within 12 months of the date of issue of this variation.

BAT 140

We have retained an ELV for particulate matter of 5 mg/Nm³ at emission points A4 (old ashing down plant and melting furnaces) and A5 (new ashing down plant), which is in accordance with the upper BAT-AEL value for emissions to air from dusty operations (melting, incineration and refining). Whilst crushing and sieving operations are undertaken on site, these processes are housed internally with LEV systems collecting particulates into dedicated dust collection units (ultra-web high efficiency nano fibre filter cartridges). There is no emission point associated with these units.

In line with BAT 10 the frequency of monitoring for particulates at emission points A4 and A5 is reduced to once per year. However this may be subject to change on completion of improvement condition IC02. See above discussion of BAT 10 for further explanation.

Table S3.1b has been updated in the consolidated variation notice.

BAT 141

We have retained an ELV for oxides of nitrogen of 75 mg/Nm³ at emission points A1 (acid dissolution). The ELV specified on the existing permit is already below the upper BAT-AEL for emissions to air from a hydrometallurgical process involving dissolving/leaching with nitric acid. We

have therefore carried the existing limit forward into Table S3.1b of the consolidated variation notice.

In line with BAT 10 the frequency of monitoring for particulates at emission point A1 is reduced to once per year. However this may be subject to change on completion of improvement condition IC02. See above discussion of BAT 10 for further explanation.

BAT 142

We have retained an ELV for sulphur dioxide of 50 mg/Nm³ at emission points A4 (old ashing down plant and melting furnaces) and A5 (new ashing down plant). This ELV, which is specified on the existing permit, is already in line with the lower BAT-AEL for emissions to air from a melting operation for the production of Doré metal, including the associated incineration. We have therefore carried forward the existing limit into Table S3.1b of the consolidated variation notice.

In line with BAT 10 the frequency of monitoring for particulates at emission point A1 is reduced to once per year. However this may be subject to change on completion of improvement condition IC02. See above discussion of BAT 10 for further explanation.

BAT 144

We have imposed an ELV for gaseous chlorides (as HCl) of 10 mg/Nm³ at emission point A1 (acid dissolution), which is in accordance with the upper BAT-AEL value for emissions to air from a hydrometallurgical operation. This constitutes a reduction from the ELV specified on the existing permit (60 mg/Nm³).

We have imposed an ELV for chlorine of 2 mg/Nm³ at emission point A1 (acid dissolution), which is in accordance with the upper BAT-AEL value for emissions to air from a hydrometallurgical operation. There is currently no limit specified in the existing permit for monitoring of chlorine and the operator therefore does not currently monitor chlorine emissions. We have set an improvement condition IC01 which requires the operator to provide a methodology for reaching the BAT-AEL and to regularly report progress towards achieving compliance with this measure by 30 June 2020.

In line with BAT 10 the frequency of monitoring for gaseous chlorides (as HCl) and chlorine at emission A1 is specified as once per year.

Table S3.1b has been updated in the consolidated variation notice.

The operator has confirmed that gaseous chlorides (as HCl) and chlorine cannot arise from the cyanide dissolution process (the process uses sodium

cyanide to strip precious metals from the surface of coated wastes), therefore the BAT-AELs have not been imposed at emission points A4 and A5.

BAT 146

We have retained an ELV for dioxins and furans of 0.1 ng I-TEQ/Nm³ at emission points A4 (old ashing down plant and melting furnaces) and A5 (new ashing down plant), which is in accordance with the upper BAT-AEL value for emissions to air from incineration processes.

In line with BAT 10 the frequency of monitoring for dioxins and furans at emission points A4 and A5 is reduced to once per year.

Table S3.1b has been updated in the consolidated variation notice.

Removal of parameters and ELVs

Monitoring of volatile organic compounds, carbon monoxide, beryllium, selenium and total arsenic, antimony, beryllium, cadmium, copper, lead, mercury and zinc and the associated emission limits are not specifically required by the BAT Conclusions.

A review of recent monitoring shows emissions of these substances to be consistently below the ELVs specified in the existing permit.

The requirement to monitor these parameters has therefore been removed from the permit. Table S3.1b has been updated in the consolidated variation notice.

Annex 2a

Assessment, determination and decision where an application(s) for derogation from BAT Conclusions with associated emission levels (AEL) has been requested.

The IED enables a competent authority to allow derogations from BAT-AELs stated in BAT Conclusions under specific circumstances as detailed under Article 15(4):

‘By way of derogation from paragraph 3, and without prejudice to Article 18, the competent authority may, in specific cases, set less strict emission limit values. Such a derogation may apply only where an assessment shows that the achievement of emission levels associated with the best available techniques as described in BAT Conclusions would lead to disproportionately higher costs compared to the environmental benefits due to:

- a) the geographical location or the local environmental conditions of the installation concerned; or
- b) the technical characteristics of the installation concerned.

The competent authority shall document in an annex to the permit conditions the reasons for the application of the first subparagraph including the result of the assessment and the justification for the conditions imposed.

A summary of any derogation granted is also recorded in an Annex of the consolidated variation notice in accordance with the requirement of IED Article 15(4) as described above.

The operator did not request derogation from compliance with any AEL included within the BAT Conclusions as part of their Regulation 60 notice response.

Annex 2b

Advertising and consultation on the draft decision

This section is not applicable as no derogations from BAT-AELs have been considered, nor is the installation a site of high public interest.

Annex 3

Improvement conditions

Based on the information in the operator's Regulation 60/61 notice responses 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 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.

We consider that we also need to set an improvement condition relating to changes in the permit not arising from the review of compliance with BAT Conclusions. The justification for this is provided in section 2.4 of this decision document.

Reference	Improvement condition	Completion date
IC01	<p>The operator shall submit, for approval by Environment Agency, a report setting out progress to achieving the BAT conclusion AELs where BAT is currently not achieved, but will be achieved before 30 June 2020. The report shall include, but not be limited to, the following:</p> <ul style="list-style-type: none">• Current performance against the BAT-AEL.• Methodology for reaching the AEL.• Associated targets/timelines for reaching compliance by 30 June 2020.• Any alterations to the initial plan. <p>The report shall address the following BAT Conclusions:</p> <p>BAT 10 and BAT 144 (monitoring and compliance with BAT-AEL for emissions of chlorine at emission point A1).</p> <p>Refer to BAT Conclusions and Table S3.1b for a full description of the BAT requirements.</p>	<p>Unless otherwise agreed by the Environment Agency progress reports to be submitted every 6 months from the date of issue of notice V011.</p> <p>Compliance by 30 June 2020.</p>

Reference	Improvement condition	Completion date
IC02	<p>The operator shall undertake a review of periodic monitoring for emissions to air of:</p> <ul style="list-style-type: none"> • Particulate matter from emission points A4 and A5. • Oxides of nitrogen NO_x (as NO₂) from emission point A1. • Sulphur dioxide from emission points A4 and A5. <p>The review will be made with reference to BAT 10 of the BAT Conclusions for the Non-Ferrous Metals Industries (Commission Implementing Decision EU2016/1032) and shall justify, with appropriate evidence, the frequency of monitoring to be employed at the installation from 30 June 2020. The evidence required under this condition shall include analysis and interpretation of monitoring results for each substance, and performance against the relevant BAT-AEL. Consideration should be given to <i>inter alia</i> the nature of the raw materials, fluxing agents, refining chemicals used; operational stability; and process monitoring associated with operation of abatement plant. The quantity of monitoring data considered must be justified and be sufficient so as to demonstrate that the results are statistically representative of emissions during normal operations, covering the concentration range and mass emission rate of substances emitted at all stages of the process.</p> <p>A report on the above review shall be submitted to the Environment Agency to facilitate agreement in writing of the appropriate monitoring provision at the installation.</p>	<p>Within 12 months of effective date of notice V011.</p>

Reference	Improvement condition	Completion date
IC03	<p>The operator shall submit a surface water pollution risk assessment to the Environment Agency for approval, which shall assess the impact of discharges of hazardous pollutants to surface water and/or sewer from the installation. The risk assessment shall include, but not be limited to the following:</p> <ul style="list-style-type: none"> a) representative emissions data for the following hazardous pollutants: silver, arsenic, cadmium, cobalt, chromium (total), chromium (VI), copper, mercury, nickel, lead, zinc; and any other relevant substances discharged from the installation. Any emissions monitoring required should be carried out using the methods and standards described in Environment Agency M18 guidance; and b) a risk assessment in accordance with the screening procedures in Environment Agency guidance "Surface water pollution risk assessment for your environmental permit", using the representative emissions data obtained in (a) above. 	Within 12 months of effective date of notice V011.

Annex 4

Review and assessment of changes that are not part of the BAT Conclusions derived permit review.

Removal of references to obsolete processes

The operator has confirmed that the purification of silver by electrolysis is no longer undertaken at the installation and there is no intention of restarting this process in the future. Table S1.1 (activities) has therefore been revised in the consolidated variation notice; the directly associated activity 'purification of silver by electrolysis' has been removed.

Annex 5

Priority compliance issues & detailed assessment of Regulation 60 notice responses where future action is likely

BATc Number	Compliance Issue Priority BAT indicated in Bold Text	Relevant permit condition	Compliance stated by operator NA / CC / FC / NC	Compliance assessment conclusion NA / CC / FC / NC	Summary of Permitting Officer assessment against BATc techniques	Compliance Action to implement BATc
	BAT 1-19: General requirements					
1	In order to improve the overall environmental performance, BAT is to implement and adhere to an environmental management system (EMS) that incorporates all of the features given.	1.1	CC	CC	<p>The operator has confirmed in their response that they are currently compliant with BAT 1.</p> <p>The operator confirmed that the company has an ISO14001 certified EMS that incorporates all the aspects specified in the BAT Conclusion.</p> <p>The Environment Agency is satisfied that the operator meets the requirements of this BAT Conclusion.</p>	None.
2	In order to use energy efficiently, BAT is to use a combination of the techniques given.	1.2	CC	CC	<p>The operator has confirmed in their response that they are currently compliant with BAT 2. The following techniques are in use at the installation:</p> <p>BAT 2c: heat recovery (e.g. steam, hot water, hot air) from waste process heat.</p> <p>BAT 2f: raise the temperature of the leaching liquors using steam or hot water from waste heat recovery.</p>	None.

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					<p>The operator confirms that flue gas at 850°C from the afterburner enters a heat exchanger fed by water to cool the gas. This cooling process generates steam which in turn is used to heat glass-lined kettles for acid dissolution, and stainless steel kettles and caustic barrel plants for cyanide precipitation as well as steam heaters and radiators for the workplace and offices.</p> <p>BAT 2l: suitable insulation for high temperature equipment such as steam and hot water pipes. Steam pipes are insulated.</p> <p>BAT 2n: use high efficiency electric motors equipped with variable-frequency drive, for equipment such as fans. Compressor with variable speed drive; inverters fitted on larger fans and motors where applicable.</p> <p>BAT 2o: use control systems that automatically activate the air extraction system or adjust the extraction rate depending on actual emissions. Variable speed drives control the extraction rate when material is loaded into the ashing down units.</p>	

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					The Environment Agency is satisfied that the operator meets the requirements of this BAT Conclusion.	
3	In order to improve overall environmental performance, BAT is to ensure stable process operation by using a process control system together with a combination of the techniques given.	1.1	CC	CC	<p>The operator has confirmed in their response that they are currently compliant with BAT 3; PLC (programmable logic controllers) control panels and documented procedures (ISO9001) are used across the site to ensure stable process operation at all times.</p> <p>The following techniques are in use at the installation:</p> <p>BAT 3a: inspect and select input materials according to the process and the abatement techniques applied. Incoming waste materials are allocated to process activities, i.e. chemical dissolution, thermal ashing down or melting with separate abatement systems for each.</p> <p>BAT 3c: feed weighing and metering systems.</p> <p>BAT 3d: processors to control material feed rate, critical process parameters and conditions including the alarm, combustion conditions and gas additions.</p>	None.

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					<p>The operator states that feed of activated carbon and sodium bicarbonate into bag filters is automated and is determined by the feedstock. Gas flow to the bag filters automatically shuts off when set temperatures are reached. Additionally the Luhr PLC control panel alarms for high temperature, low level silos, low water and compressed air.</p> <p>BAT 3f: monitor the critical process parameters of the air emission abatement plant such as gas temperature, reagent metering, pressure drop, ESP current and voltage, scrubbing liquid flow and pH and gaseous components (e.g. O₂, CO, VOC). The operator identifies the following parameters that are monitored: gas temperatures in afterburner, pressure in bag filters, scrubber liquid flow and pH of alkali solution.</p> <p>BAT 3j: temperature monitoring and control at melting and smelting furnaces to prevent the generation of metal and metal oxide fumes through overheating. Infra-red heat guns are used to monitor the temperature of the metal during melting, thus allowing adjustment and temperature control.</p>	

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					The Environment Agency is satisfied that the operator meets the requirements of this BAT Conclusion.	
4	In order to reduce channelled dust and metal emissions to air, BAT is to apply a maintenance management system which especially addresses the performance of dust abatement systems as part of the environmental management system (see BAT 1).	3.1	CC	CC	<p>The operator has confirmed in their response that they are currently compliant with BAT 4.</p> <p>The operator confirmed that daily/weekly/monthly maintenance programmes for dust abatement plant form part of the EMS.</p> <p>The Environment Agency is satisfied that the operator meets the requirements of this BAT Conclusion.</p>	None.
5	In order to prevent or, where this is not practicable, to reduce diffuse emissions to air and water, BAT is to collect diffuse emissions as much as possible nearest to the source and treat them.	3.2	CC	CC	<p>The operator has confirmed in their response that they are currently compliant with BAT 5.</p> <p>To prevent diffuse emissions to air, local exhaust ventilation and lip and hood extraction, linked to baghouse extraction and wet scrubbers, are in place over dust and fume liberation points, including furnaces.</p> <p>To prevent diffuse emissions to water, the site is surfaced in impervious concrete. Only solid materials are stored on the yard area and are either covered or</p>	None.

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					<p>sealed. External liquid storage tanks are sited inside designated impervious concrete bunds with connection valves located inside the bund. Rainwater from these bunded areas is discharged to sewer. Other liquids are stored internally with drainage channels to capture sumps which are located in bunded areas with contents pumped directly to bunded holding tanks.</p> <p>An in-line pneumatic activated drain valve is in place which, when activated, effectively seals the drainage system in the event of a spillage on the external yard area. Any spillage would be contained within the drainage system until pumped into an IBC or other suitable container. If the spilled material contained precious metals it would be reprocessed on site. If not, e.g. a spill of acid, the material would be pumped to the appropriate waste storage tank (after testing for pH) awaiting disposal off-site.</p> <p>The Environment Agency is satisfied that the operator meets the requirements of this BAT Conclusion.</p>	
6	In order to prevent or, where this is not practicable, to reduce diffuse dust emissions to air, BAT is to set up and implement an action plan on diffuse	3.2	CC	CC	The operator has confirmed in their response that they are currently compliant with BAT 6. The operator confirms that the EMS contains sections that incorporate the requirements of BAT 6.	None.

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	Priority BAT indicated in Bold Text		NA / CC / FC / NC	NA / CC / FC / NC		
	<p>dust emissions, as part of the environmental management system (see BAT 1), that incorporates both of the following measures:</p> <p>(a) identify the most relevant diffuse dust emission sources (using e.g. EN 15445);</p> <p>(b) define and implement appropriate actions and techniques to prevent or reduce diffuse emissions over a given time frame.</p>				<p>The Environment Agency is satisfied that the operator meets the requirements of this BAT Conclusion.</p>	
7	<p>In order to prevent diffuse emissions from the storage of raw materials, BAT is to use a combination of the techniques given.</p>	3.2	CC	CC	<p>The operator has confirmed in their response that they are currently compliant with BAT 7. The following techniques are in use at the installation:</p> <p>BAT 7a: enclosed buildings or silos/bins for storing dust-forming materials such as concentrates, fluxes and fine materials. Carbon and sodium bicarbonate stored in silos in enclosed building.</p> <p>BAT 7b: covered storage of non-dust-forming materials such as concentrates, fluxes, solid fuels, bulk materials and coke and secondary materials that contain water-soluble organic compounds.</p>	None.

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					<p>BAT 7c: sealed packaging of dust-forming materials or secondary materials that contain water-soluble organic compounds.</p> <p>The operator confirms that all materials stored on the external yard area are covered or stored in sealed drums.</p> <p>BAT 7f: dust/gas extraction devices placed at transfer and tipping points for dust-forming materials. Flexible lip extraction is in place at the tipping point in the ashing down areas.</p> <p>BAT 7h: tank construction materials that are resistant to the contained materials. Resistant mild steel silo hoppers for the storage of carbon and sodium bicarbonate.</p> <p>BAT 7j: store reactive materials in double-walled tanks or tanks placed in chemical-resistant bunds of the same capacity and use a storage area that is impermeable and resistant to the material stored.</p> <p>BAT 7k: design storage areas so that any leaks from tanks and delivery systems are intercepted and contained in bunds that have a capacity capable of</p>	

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					<p>containing at least the volume of the largest storage tank within the bund; delivery points are within the bund to collect any spilled material.</p> <p>The Environment Agency is satisfied that the operator meets the requirements of this BAT Conclusion.</p>	
8	In order to prevent diffuse emissions from the handling and transport of raw materials, BAT is to use a combination of the techniques given.	3.2	CC	CC	<p>The operator has confirmed in their response that they are currently compliant with BAT 8. The following techniques are in use at the installation:</p> <p>BAT 8a: enclosed conveyors or pneumatic systems to transfer and handle dust-forming concentrates and fluxes and fine-grained material. Enclosed conveyors are used to deliver abatement additives such as sodium bicarbonate and activated carbon.</p> <p>BAT 8c: extraction of dust from delivery points, silo vents, pneumatic transfer systems and conveyor transfer points, and connection to a filtration system (for dust-forming materials). Hoods are in place at the milling and sieving process extracting to dedicated dust collection units. Flexible lip extraction is in place at the tipping point in the ashing down areas.</p>	None.

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					<p>BAT 8d: closed bags or drums to handle materials with dispersible or water-soluble components.</p> <p>BAT 8o: use planned campaigns for road sweeping. Road sweeping undertaken as part of planned housekeeping audits of the site.</p> <p>BAT 8p: segregate incompatible materials (e.g. oxidising agents and organic materials). Liquid acidic and alkaline materials are segregated and stored in separate work areas in line with safety data sheets and in-house COSHH (control of substances hazardous to health) assessments.</p> <p>The Environment Agency is satisfied that the operator meets the requirements of this BAT Conclusion.</p>	
9	In order to prevent or, where this is not practicable, to reduce diffuse emissions from metal production, BAT is to optimise the efficiency of off-gas collection and treatment by using a combination of the techniques given.	3.2	CC	CC	<p>The operator has confirmed in their response that they are currently compliant with BAT 9. The following techniques are in use at the installation:</p> <p>BAT 9a: thermal or mechanical pretreatment of secondary raw material to minimise organic contamination of the furnace feed. Ashing down (in combination with a thermal oxidiser) is a thermal pre-</p>	None.

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					<p>treatment to remove/minimise the organic content prior to melting.</p> <p>BAT 9c: use a secondary hood for furnace operations such as charging and tapping.</p> <p>BAT 9d: dust or fume collection where dusty material transfers take place (e.g. furnace charging and tapping points, covered launders).</p> <p>The operator confirmed that the induction furnaces are fitted with local exhaust ventilation providing lip extraction when charging and hood extraction when pouring molten metal to the mould conveyor.</p> <p>BAT 9i: treat the collected emissions in an adequate abatement system. Furnace emissions are treated using a bag filter and wet scrubber.</p> <p>The Environment Agency is satisfied that the operator meets the requirements of this BAT Conclusion.</p>	
10	BAT is to monitor the stack emissions to air with at least the given frequency and in accordance with EN standards. If EN standards are not available, BAT	3.1 3.5	CC	FC	The operator has confirmed in their response that they are currently compliant with BAT 10.	Confirm future compliance with

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	is to use ISO, national or other international standards that ensure the provision of data of an equivalent scientific quality.				<p>The relevant emission points are:</p> <p>A1 (acid dissolution) currently monitored twice yearly for:</p> <ul style="list-style-type: none"> • oxides of nitrogen • gaseous chlorides (as HCl). <p>A4 (old ashing down plant and melting furnaces) and A5 (new ashing down plant) currently monitored twice yearly for:</p> <ul style="list-style-type: none"> • particulate matter • dioxins and furans • sulphur dioxide • volatile organic compounds (VOCs) • carbon monoxide • beryllium • selenium • total arsenic beryllium, cadmium, copper, lead mercury and zinc. <p>From 30 June 2020 the following monitoring specified in BAT 10 will be required:</p> <p>A1 (acid dissolution): annual monitoring for:</p> <ul style="list-style-type: none"> • gaseous chlorides (as HCl) 	improvement condition IC01.

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					<ul style="list-style-type: none"> • chlorine. <p>A4 (old ashing down plant and melting furnaces) and A5 (new ashing down plant) annual monitoring for:</p> <ul style="list-style-type: none"> • dioxins and furans. <p>The following monitoring is also required after 30 June 2020:</p> <ul style="list-style-type: none"> • Particulate matter at emission points A4 and A5 • Oxides of nitrogen NO_x at emission point A1 • Sulphur dioxide at emission points A4 and A5 <p>However the Environment Agency requires further information from the operator in order to determine the appropriate level of monitoring provision to be employed at the site. We have included improvement condition IC02 in order to obtain this information and to subsequently agree with the operator the BAT requirements for the site. We describe this aspect of our review in more detail within the Key Issues section of this decision document.</p>	

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					The Environment Agency is unable to agree that the operator is currently compliant with the monitoring requirements of BAT 10, but we are satisfied that pending completion of IC02, the operator will be compliant by 30 June 2020.	
11	In order to reduce mercury emissions to air (other than those that are routed to the sulphuric acid plant) from a pyrometallurgical process, BAT is to use one or both of the techniques given. BAT-AEL for Hg.	NA	CC	NA	<p>The operator has confirmed in their response that they are currently compliant with BAT 11.</p> <p>However BAT 11 is only applicable to pyrometallurgical processes, which are activities falling within Section 2.2, Part A(1) of Schedule 1 of the EPR. Whilst there are Section 2.2, Part A(1) activities listed on the permit these are limited to the precipitating out of precious metals from precious metal bearing solution, generally containing cyanide. The melting process undertaken at the installation falls within Section 2.2, Part B and does not constitute a pyrometallurgical process – non-ferrous metal is simply melted, rather than produced from ore, concentrates or secondary raw materials.</p> <p>The Environment Agency has therefore determined that this BAT Conclusion and BAT-AEL are therefore not applicable to this installation.</p>	None.
12	In order to reduce emissions of SO ₂ from off-gases with a high SO ₂ content and to avoid the generation of waste	NA	CC	NA	The operator has confirmed in their response that they are currently compliant with BAT 12.	None.

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	from the flue-gas cleaning system, BAT is to recover sulphur by producing sulphuric acid or liquid SO ₂ .				<p>However sulphur dioxide is typically produced at higher concentrations during the sintering, roasting and smelting of sulphidic ores and concentrates (section 2.7.1 NFM BREF). These processes are not undertaken at this installation. The Environment Agency has therefore determined that this BAT Conclusion is not applicable to this installation.</p> <p>Sulphur dioxide is currently monitored at the installation. A review of recent monitoring shows that emissions are regularly below the lower BAT-AEL specified in BAT 143, which is relevant for lower concentrations.</p>	
13	In order to prevent NO _x emissions to air from a pyrometallurgical process, BAT is to use one of the techniques given.	NA	NA	NA	<p>The operator has confirmed in their response that this BAT Conclusion is not applicable.</p> <p>BAT 13 is only applicable to pyrometallurgical processes, which are activities falling within Section 2.2, Part A(1) of Schedule 1 of the EPR. Whilst there are Section 2.2, Part A(1) activities listed on the permit these are limited to the precipitating out of precious metals from precious metal bearing solution, generally containing cyanide. The melting process undertaken at the installation falls within Section 2.2, Part B and does not constitute a pyrometallurgical process – non-ferrous metal is simply melted, rather</p>	None.

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					<p>than produced from ore, concentrates or secondary raw materials.</p> <p>The Environment Agency therefore agrees that this BAT Conclusion and BAT-AEL are not applicable to this installation.</p>	
14	In order to prevent or reduce the generation of waste water, BAT is to use one or a combination of the techniques given.	3.1	CC	CC	<p>The operator has confirmed in their response that they are currently compliant with BAT 14. The following techniques are in use at the installation:</p> <p>BAT 14a: measure the amount of fresh water used and the amount of waste water discharged. Water meter readings are taken and recorded on a weekly basis along with sub-meter readings to identify water usage by process. The discharge of water can be estimated by deducting process usage volume from the primary meter reading.</p> <p>BAT 14b: reuse waste water from cleaning operations and spills in the same process. Water used in metal dissolution and stripping process is reused.</p> <p>BAT 14f: use a closed circuit cooling system.</p>	None.

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					The Environment Agency is satisfied that the operator meets the requirements of this BAT Conclusion.	
15	In order to prevent the contamination of water and to reduce emissions to water, BAT is to segregate uncontaminated waste water streams from waste water streams requiring treatment.	NA	NA	NA	<p>The operator states that BAT 15 is not applicable and has confirmed that there is no waste water treatment at the installation.</p> <p>The Environment Agency agrees that this BAT Conclusion is not applicable for this installation as there is no on-site treatment of waste water.</p>	None.
16	<p>BAT is to use ISO 5667 for water sampling and to monitor the emissions to water at the point where the emission leaves the installation at least once per month and in accordance with EN standards. If EN standards are not available, BAT is to use ISO, national or other international standards that ensure the provision of data of an equivalent scientific quality.</p> <p>The monitoring frequency may be adapted if the data series clearly demonstrate sufficient stability of the emissions.</p>	NA	CC	NA	<p>Processes using water have no direct release to drainage systems. Process run off is collected in sumps and tanks which are located in bunded areas with contents pumped directly to holding tanks pending collection and disposal off-site. Rainwater collected in bunds is discharged to sewer.</p> <p>The Environment Agency has determined that this BAT Conclusion is not generally applicable for installations which only discharge waste water to sewer.</p> <p>We do not require operators to routinely monitor discharges of waste water to sewer where the discharge is already regulated (and monitored) by the sewerage undertaker via a trade effluent consent,</p>	None.

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					<p>unless there is a site-specific environmental need for additional monitoring, e.g. if there was a ELV on the environmental permit to protect water quality, in which case we would require monitoring to be undertaken in accordance with BAT 16.</p> <p>The above position is consistent with how we regulate other industrial sectors through the permitting process.</p>	
17	<p>In order to reduce emissions to water, BAT is to treat the leakages from the storage of liquids and the waste water from non-ferrous metals production, including from the washing stage in the Waelz kiln process, and to remove metals and sulphates by using a combination of the techniques given.</p>	NA	CC	NA	<p>The Environment Agency has determined that this BAT Conclusion is not applicable for installations which only discharge waste water to sewer.</p> <p>The BAT-AELs for BAT 17 relate to direct emissions to receiving waters (as opposed to indirect emissions made via the foul sewer).</p> <p>It is our view that the intention of BAT 17 is to ensure that surface waters are appropriately protected, through the prevention of direct discharges which may otherwise have been made without (or with minimal) treatment.</p>	None.

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18	In order to reduce noise emissions, BAT is to use one or a combination of the techniques given.	3.4	CC	CC	<p>The operator has confirmed in their response that they are currently compliant with BAT 18. The following techniques are in use at the installation:</p> <p>BAT 18b: enclose noise plants or components in sound-absorbing structures. Ball mills are fully enclosed with 4" thick wooden internal access doors as well as external doors.</p> <p>BAT 18c: use anti-vibration supports and interconnections for equipment. Motors and fans are sited on rubber mounts wherever possible.</p> <p>The Environment Agency is satisfied that the operator meets the requirements of this BAT Conclusion.</p>	None.
19	In order to reduce odour emissions, BAT is to use one or a combination of the techniques given.	3.3	CC	CC	<p>The operator has confirmed in their response that they are currently compliant with BAT 19. The following techniques are in use at the installation:</p> <p>BAT 19a: appropriate storage and handling of odorous materials. Chemicals are stored in containers to minimise fugitive emissions. Methods of liquid chemical transfers include siphoning and</p>	None.

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					<p>mechanical pumping with containers receiving materials fitted with either lip or hood extraction.</p> <p>BAT 19c: careful design, operation and maintenance of any equipment that could generate odour emissions.</p> <p>The Environment Agency is satisfied that the operator meets the requirements of this BAT Conclusion.</p>	
134	In order to reduce diffuse emissions to air from a pretreatment operation (such as crushing, sieving and mixing), BAT is to use one or a combination of the techniques given.	3.2	CC	CC	<p>The operator has confirmed in their response that they are currently compliant with BAT 134. The following techniques are in use at the installation:</p> <p>BAT 134a: enclose pretreatment areas and transfer systems for dusty materials. Ball milling areas are enclosed with heavy duty internal wooden doors and steel external doors.</p> <p>BAT 134b: connect pretreatment and handling operations to dust collectors or extractors via hoods and a ductwork system for dusty materials. Local exhaust ventilation (LEV) systems leading to dust</p>	None.

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					<p>collection units operate in ball mill rooms and shaker sieves.</p> <p>BAT 134c: electrically interlock pretreatment and handling equipment with their dust collector or extractor, in order to ensure that no equipment may be operated unless the dust collector and filtering system are in operation. Wooden access doors into mill rooms fitted with door interlocks which only allows ball mills to operate and allow ball mills to rotate when the interlock doors are closed. Shaker sieves also connected to LEV with manual controls and formal operating procedures signed off by all production personnel ensuring LEV systems are switched on at all times during processing.</p> <p>The Environment Agency is satisfied that the operator meets the requirements of this BAT Conclusion.</p>	
135	In order to reduce diffuse emissions to air from smelting and melting (both Doré and non-Doré operations), BAT is to use all of the techniques given.	3.2	CC	CC	<p>The operator has confirmed in their response that they are currently compliant with BAT 135. The following techniques are in use at the installation:</p> <p>BAT 135a: enclose building and/or smelting furnace areas. The furnaces are located inside an enclosed</p>	None.

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					<p>building. The operator has confirmed that at present the furnace is not enclosed; however the operator has indicated that they plan to fully enclose the furnace up to the roofline to further improve collection of diffuse emissions.</p> <p>BAT 135b: perform operations under negative pressure. Melting is undertaken with negative pressure from LEV system.</p> <p>BAT 135c: connect furnace operations to dust collectors or extractors via hoods and a ductwork system. Furnaces are fitted with lip and over hood extraction with LEV drawing into bag filter.</p> <p>BAT 135d: electrically interlock furnace equipment with their dust collector or extractor, in order to ensure that no equipment may be operated unless the dust collector and filtering system are in operation. Whilst the furnaces and extraction / dust collectors are on separate operating circuits the operator has start-up procedures in place that ensure all units operate together at all times.</p>	

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					The Environment Agency is satisfied that the operator meets the requirements of this BAT Conclusion.	
136	In order to reduce diffuse emissions to air from leaching and gold electrolysis, BAT is to use one or a combination of the techniques given.	3.2	CC	CC	<p>The operator has confirmed in their response that they are currently compliant with BAT 136 and identifies technique (b) as being in use at the installation:</p> <p>BAT 136b: hood and extraction systems for electrolytic cells. The operator has confirmed that electrolysis is not undertaken on site. However the BAT Conclusion also refers to leaching, which is a process undertaken on site. The operator has confirmed that dedicated LEV extraction hoods are in place over the leaching plant.</p> <p>The operator has also confirmed that techniques (a) and (c) are not relevant for any processes occurring on site.</p> <p>The Environment Agency is satisfied that the operator meets the requirements of this BAT Conclusion.</p>	None.

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137	In order to reduce diffuse emissions from a hydrometallurgical operation, BAT is to use all of the techniques given.	3.2	CC	CC	<p>The operator has confirmed in their response that they are currently compliant with BAT 137. The following techniques are in use at the installation:</p> <p>BAT 137a: containment measures: enclosed reaction vessels, waste storage tanks, sealed bunded drainage system, preventive maintenance programmes. Glass lined and stainless steel vessels sealed with lids are used. Process run off is collected in sumps and tanks which are located in bunded areas with contents pumped directly to bunded holding tanks pending disposal off-site.</p> <p>BAT 137b: reaction vessels and tanks connected to a common ductwork system with off-gas extraction (automatic standby/back-up unit available in case of failure).</p> <p>For the cyanide dissolution process the operator has confirmed that there is no reaction occurring within the tank; there is no off-gas production, only steam which is vented to atmosphere. For the acid dissolution process, the vessel lids vent directly to local exhaust ventilation (LEV) systems. The operator has not indicated a back-up unit in case of failure, although in-house maintenance and stocking of critical spares ensures continued operations.</p>	None.

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					The Environment Agency is satisfied that the operator meets the requirements of this BAT Conclusion.	
138	In order to reduce diffuse emissions to air from incineration, calcining and drying, BAT is to use all of the techniques given.	3.2	CC	CC	<p>The operator has confirmed in their response that they are currently compliant with BAT 138. The following techniques are in use at the installation:</p> <p>BAT 138a: connect all calcining furnaces, incinerators and drying ovens to a ductwork system extracting process exhaust gases. All incinerators are connected to abatement plant via LEV extraction.</p> <p>BAT 138b: scrubber plant on a priority electricity circuit which is served by a back-up generator in the event of power failure. Wet scrubbers are supported by a backup generator in the event of primary power failure.</p> <p>BAT 138c: operating start-up and shut-down, spent acid disposal, and fresh acid make-up of scrubbers via an automated control system. The operator confirms automated controls for the scrubber and spent scrubber liquor. Formal operating procedures for incineration and scrubbing systems are documented within the ISO9001 quality system.</p>	None.

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					The Environment Agency is satisfied that the operator meets the requirements of this BAT Conclusion.	
139	In order to reduce diffuse emissions to air from the melting of final metal products during refining, BAT is to use both of the techniques given.	3.2	CC	CC	<p>The operator has confirmed in their response that they are currently compliant with BAT 139. The BAT Conclusion specifies that both of the following techniques should be in use:</p> <p>BAT 139a: enclosed furnace with negative pressure.</p> <p>BAT 139b: appropriate housing, enclosures and capture hoods with efficient extraction/ventilation.</p> <p>The operator has confirmed that at present the furnace is not enclosed; however the operator has indicated that they plan to fully enclose the furnace up to the roofline to further improve collection of diffuse emissions.</p> <p>Negative pressure is imposed by LEV extraction at the lip of the furnace. The large induction furnace has a capacity of 350kg, the small induction furnace has a capacity of 15 kg.</p>	None.

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					<p>Section 13.1.4.1 of the BREF describes the use of induction furnaces and the appropriate abatement. A small induction furnace is reported to melt up to 30 tonnes of metal. Fume extraction hoods and dust abatement are referred to, with efficient lip extraction given as an alternative. There is no reference to the use of enclosures for induction furnaces.</p> <p>Given the size of the induction furnaces in use at the site and the use of lip extraction the Environment Agency is satisfied that the techniques in use at the site represent BAT for this installation.</p>	
140	In order to reduce dust and metal emissions to air from all dusty operations, such as crushing, sieving, mixing, melting, smelting, incineration, calcining, drying and refining, BAT is to use one of the techniques given BAT-AEL for Dust.	3.1	CC	CC	<p>The operator has confirmed in their response that they are currently compliant with BAT 140. The following techniques are in use at the installation:</p> <p>BAT 140a: bag filter. Bag filters and filter cartridges are used to abate emissions from ashing down and milling and sieving processes.</p> <p>The emission limit value for particulate matter specified in the existing permit is 5 mg/Nm³, which is in line with the upper BAT-AEL.</p> <p>The relevant emission points are:</p>	Confirm compliance with BAT-AEL via routine inspection.

BATc Number	Compliance Issue Priority BAT indicated in Bold Text	Relevant permit condition	Compliance stated by operator NA / CC / FC / NC	Compliance assessment conclusion NA / CC / FC / NC	Summary of Permitting Officer assessment against BATc techniques	Compliance Action to implement BATc
					<p>A4: Old ashing down plant and melting furnaces. A5: New ashing down plant.</p> <p>A review of recent monitoring shows that emissions of particulate matter are regularly below the BAT-AEL.</p> <p>There is no emission point from the dust collection units serving the milling and sieving processes. The operator uses ultra-web high efficiency non-fibre filter cartridges to collect particulates and the units are housed within an enclosed building.</p> <p>The Environment Agency is satisfied that the operator meets the requirements of this BAT Conclusion.</p>	
141	<p>In order to reduce NO_x emissions to air from a hydrometallurgical operation involving dissolving/leaching with nitric acid, BAT is to use one or both of the techniques given. BAT-AEL for NO_x.</p>	3.1	CC	CC	<p>The operator has confirmed in their response that they are currently compliant with BAT 141. The following techniques are in use at the installation:</p> <p>BAT 141a: alkaline scrubber with caustic soda. The wet scrubber is fitted with automated dosing of liquid caustic soda with inhibitor to limit the salting out effect during the colder months.</p>	<p>Confirm compliance with BAT-AEL via routine inspection.</p>

BATc Number	Compliance Issue Priority BAT indicated in Bold Text	Relevant permit condition	Compliance stated by operator NA / CC / FC / NC	Compliance assessment conclusion NA / CC / FC / NC	Summary of Permitting Officer assessment against BATc techniques	Compliance Action to implement BATc
					<p>The relevant emission point is:</p> <p>A1: acid dissolution process.</p> <p>The emission limit value for NO_x specified in the existing permit is 75 mg/Nm³, which is below the upper BAT-AEL of 150 mg/Nm³.</p> <p>A review of recent monitoring shows that emissions of particulate matter are regularly below the specified limit of 75 mg/Nm³ (and consequently the BAT-AEL).</p> <p>The Environment Agency is satisfied that the operator meets the requirements of this BAT Conclusion.</p>	
142	In order to reduce emissions to air (other than those that are routed to the sulphuric acid plant) from a melting and smelting operation for the production of Doré metal, including the associated incineration, calcining and drying operations, BAT is to use one or a combination of the techniques given.	3.1	CC	CC	<p>The operator has confirmed in their response that they are currently compliant with BAT 142. The following techniques are in use at the installation:</p> <p>BAT 142a: lime injection in combination with a bag filter. Hydrated lime and sodium bicarbonate are added to the bag filters.</p>	Confirm compliance with BAT-AEL via routine inspection.

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	BAT-AEL for SO ₂ .				<p>BAT 142b: wet scrubber. Wet scrubber fitted with automated dosing of liquid caustic soda with inhibitor to limit the salting out effect during the colder months</p> <p>The relevant emission points are:</p> <p>A4: old ashing down plant and melting furnaces. A5: new ashing down plant.</p> <p>The BAT-AEL for sulphur dioxide (SO₂) is 480 mg/Nm³. A review of recent monitoring shows that emissions of SO₂ are regularly below the emission limit value specified in the existing permit 50 mg/Nm³ (and consequently the BAT-AEL).</p> <p>The Environment Agency is satisfied that the operator meets the requirements of this BAT Conclusion.</p>	
143	In order to reduce SO ₂ emissions to air from a hydrometallurgical operation, including the associated incineration, calcining and drying operations, BAT is to use a wet scrubber.	NA	NA	NA	The operator has confirmed in their response that this BAT Conclusion is not applicable. There are no hydrometallurgical processes undertaken on site that can give rise to sulphur dioxide emissions (the acid dissolution process uses nitric and hydrochloric acid	None.

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	BAT-AEL for SO ₂ .				<p>and the cyanide dissolution process uses sodium cyanide). There is no incineration associated with either of the hydrometallurgical processes undertaken at the site.</p> <p>The Environment Agency agrees that this BAT Conclusion is not applicable to this installation.</p>	
144	<p>In order to reduce HCl and Cl₂ emissions to air from a hydrometallurgical operation, including the associated incineration, calcining and drying operations, BAT is to use an alkaline scrubber.</p> <p>BAT-AELs for HCl and Cl₂.</p>	3.1	FC	FC	<p>The operator has confirmed in their response that they are not fully currently compliant with BAT 144. This BAT Conclusion applies to the acid dissolution process, the relevant emission point is A1.</p> <p>Compliance with the BAT Conclusion requires the use of an alkaline scrubber, which is in place at A1.</p> <p>There is also the requirement to monitor gaseous chlorides (as HCl) (BAT-AEL=10 mg/Nm³) and chlorine (BAT-AEL =2 mg/m³).</p> <p>A review of recent monitoring shows that emissions of gaseous chlorides (as HCl) are regularly below the BAT-AEL.</p> <p>However chlorine is not currently monitored at emission point A1. The operator has indicated that</p>	Confirm future compliance with improvement condition IC01.

BATc Number	Compliance Issue Priority BAT indicated in Bold Text	Relevant permit condition	Compliance stated by operator NA / CC / FC / NC	Compliance assessment conclusion NA / CC / FC / NC	Summary of Permitting Officer assessment against BATc techniques	Compliance Action to implement BATc
					<p>chlorine will be added to the suite of monitoring on receipt of the varied permit.</p> <p>As chlorine is not currently monitored at the installation compliance cannot currently be demonstrated for the relevant BAT-AEL. We have therefore set an improvement condition IC01 which requires the operator to provide a methodology for reaching the BAT-AEL and to regularly report progress towards achieving compliance with this measure by 30 June 2020.</p>	
145	<p>In order to reduce NH₃ emissions to air from a hydrometallurgical operation using ammonia or ammonium chloride, BAT is to use a wet scrubber with sulphuric acid.</p> <p>BAT-AEL for NH₃.</p>	NA	NA	NA	<p>The operator has stated in their response that this BAT Conclusion is not applicable; neither ammonia nor ammonium chloride are used in any process at the installation.</p> <p>The Environment Agency is satisfied that this BAT Conclusion is not applicable.</p>	None.
146	<p>In order to reduce PCDD/F emissions to air from a drying operation where the raw materials contain organic compounds, halogens or other PCDD/F precursors, from an incineration operation, and from a</p>	3.1	CC	CC	<p>The operator has confirmed in their response that they are currently compliant with BAT 146. The following techniques are in use at the installation:</p>	<p>Confirm compliance with BAT-AEL via routine inspection.</p>

BATc Number	Compliance Issue	Relevant permit condition	Compliance stated by operator	Compliance assessment conclusion	Summary of Permitting Officer assessment against BATc techniques	Compliance Action to implement BATc
	Priority BAT indicated in Bold Text		NA / CC / FC / NC	NA / CC / FC / NC		
	<p>calcining operation, BAT is to use one or a combination of the techniques given.</p> <p>BAT-AEL for PCDD/F.</p>				<p>BAT 146a: afterburner or regenerative thermal oxidiser. An afterburner is in place after the ashing down plant.</p> <p>BAT 146b: injection of adsorption agent in combination with an efficient dust collection system. Hydrated lime, sodium bicarbonate and activated carbon are added to off-gases prior to introduction into bag filters/cartridges.</p> <p>BAT 146e: rapid quenching.</p> <p>BAT 146f: thermal destruction of PCDD/F in the furnace at high temperatures (> 850°C).</p> <p>The relevant emission points are:</p> <p>A4: old ashing down plant and melting furnaces. A5: new ashing down plant.</p> <p>The BAT Conclusion specifies a BAT-AEL of 0.1ng/Nm³ ITEQ PCDD/F. The existing permit already includes this emission limit value at these emission points. A review of recent monitoring</p>	

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					<p>shows below emission regularly below the BAT-AEL at these emission points.</p> <p>The Environment Agency is satisfied that the operator meets the requirements of this BAT Conclusion.</p>	
147	In order to prevent soil and groundwater contamination, BAT is to use a combination of the techniques given.	3.2	CC	CC	<p>The operator has confirmed in their response that they are currently compliant with BAT 147. The following techniques are in use at the installation:</p> <p>BAT 147a: use of sealed drainage systems. Sealed drainage systems are in place with an in-line pneumatic activated drain valve in the event of spillages.</p> <p>BAT 147b: use of double-walled tanks or placement in resistant bunds. Chemical storage tanks fabricated from glass fibre reinforced plastic (GRP). Secondary bund tanks hold 110% of the primary tanks.</p> <p>BAT 147c: use of impermeable and acid-resistant floors. Impermeable concrete floors with resistant chemical coatings where required.</p>	None.

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					The Environment Agency is satisfied that the operator meets the requirements of this BAT Conclusion.	
148	In order to prevent the generation of waste water, BAT is to use one or both of the techniques given.	3.1	CC	CC	<p>The operator has confirmed in their response that they are currently compliant with BAT 148. The following techniques are in use at the installation:</p> <p>BAT 148a: recycling of spent/recovered scrubbing liquids and other hydrometallurgical reagents in leaching and other refining operations. Drop out residues from wet scrubbing base tanks are reprocessed for further recovery of precious metals.</p> <p>BAT 148b: recycling of solutions from leaching, extraction and precipitation operations. Alkaline leach liquor is reused after replenishing with caustic to maintain the required process concentration.</p> <p>The Environment Agency is satisfied that the operator meets the requirements of this BAT Conclusion.</p>	None.
149	In order to reduce the quantities of waste sent for disposal, BAT is to	2.3	CC	CC	The operator has confirmed in their response that they are currently compliant with BAT 149.	None.

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	organise operations on site so as to facilitate process residues reuse or, failing that, process residues recycling, including by using one or a combination of the techniques given.				<p>The operator confirms that precious group metals are recovered from all activity waste streams, for example:</p> <ul style="list-style-type: none"> • reprocessing liquor from floor tanks • spent cartridge and bag filters are ashed down and processed via milling and melting • drop out dust from filter shake downs • alkali waste from floor tanks processed through cyanide destruction cells • alkali solutions in the cyanide dissolution plant. <p>This is in line with the following BAT techniques:</p> <p>BAT 149a: recovery of the metal content from slags, filter dust and residues of the wet dedusting system.</p> <p>BAT 149h: recovery of metals from the treatment of process end liquors.</p> <p>The Environment Agency is satisfied that the operator meets the requirements of this BAT Conclusion.</p>	