

**Indaver Ireland Limited**

## IE Licence Review Application

Reference Document on Best Available Techniques on Emissions from Storage; July 2006

Reference: LA010332

Issue | 13 March 2023

This report takes into account the particular instructions and requirements of our client. It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

Job number 289377-00




**Ove Arup & Partners Ireland Limited**  
One Albert Quay  
Cork  
T12 X8N6  
Ireland  
[arup.com](http://arup.com)

## Document Verification

**Project title** IE Licence Review Application  
**Document title** Reference Document on Best Available Techniques on Emissions from Storage; July 2006  
**Job number** 289377-00  
**Document ref** LA010332  
**File reference** 4-04 reports

Revision	Date	Filename	Attachment 4-7-4 Reference Document on Best Available Techniques on Emissions from Storage, July 2006
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Issue	13 Mar 2023	Description	For Issue
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	Prepared by	Checked by	Approved by
<b>Name</b>	David Horgan	Naoimh O Regan	Dan Garvey
<b>Signature</b>			

Filename
<b>Description</b>

	Prepared by	Checked by	Approved by
<b>Name</b>			
<b>Signature</b>			

Filename
<b>Description</b>

	Prepared by	Checked by	Approved by
<b>Name</b>			
<b>Signature</b>			

Issue Document Verification with Document

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# 1. Introduction

This report has been prepared for the purposes of **Section 4.7** of an Industrial Emissions Licence (IEL) Review application submitted by Indaver Ireland for their site at Carranstown, Duleek, County Meath. This report, which applies to IE Licence W0167-04, consists of a review of the licenced activities on site and the proposed activities to which the licence review relates in the context of any applicable Best Available Techniques (BAT).

The Industrial Emissions Directive 2010/75/EU (IED) and the European Union (Industrial Emissions) Regulations 2013 (SI 138 of 2013) define BAT, BAT Reference Document (BREF) and BAT Conclusions (BATC) as follows:

The Industrial Emissions Directive defines Best Available Techniques as follows:

‘Best available techniques’ means the most effective and advanced stage in the development of activities and their methods of operation which indicates the practical suitability of particular techniques for providing the basis for emission limit values and other permit conditions designed to prevent and, where that is not practicable, to reduce emissions and the impact on the environment as a whole:

- a) ‘techniques’ includes both the technology used and the way in which the installation is designed, built, maintained, operated and decommissioned.
- b) ‘Available techniques’ means those developed on a scale which allows implementation in the relevant industrial sector, under economically and technically viable conditions, taking into consideration the costs and advantages, whether or not the techniques are used or produced inside the Member State in question, as long as they are reasonably accessible to the operator;
- c) (c) ‘best’ means most effective in achieving a high general level of protection of the environment as a whole;

The Industrial Emissions Directive definition of BAT Reference Document is as follows:

“(11) ‘BAT reference document’ means a document, resulting from the exchange of information organised pursuant to Article 13, drawn up for defined activities and describing, in particular, applied techniques, present emissions and consumption levels, techniques considered for the determination of best available techniques as well as BAT conclusions and any emerging techniques, giving special consideration to the criteria listed in Annex III;”

SI 138 of 2013 has a similar definition.

The Industrial Emissions Directive and SI 138 of 2013 have the same definition of BAT conclusions, as follows:

‘BAT conclusions’ means a document containing the parts of a BAT reference document laying down the conclusions on best available techniques, their description, information to assess their applicability, the emission levels associated with the best available techniques, associated monitoring, associated consumption levels and, where appropriate, relevant site remediation measures;

The Industrial Emissions Directive 2010/75/EU replaced seven existing directives including the Integrated Pollution Prevention and Control (IPPC) Directive (2008/1/EC).

- Historically, the BREF process for the IPPC Directive produced guidance documents that member states had to have regard to when permitting (licensing) installations.
- However, the IED has made BAT conclusions mandatory in the permitting process (Article 14(3) of the IED).

Where BAT conclusions are available for any new installations, they are expected to achieve the associated standard before commencement of operations.

For existing installations, the IED provides that where a Commission Implementing Decision on BAT conclusions is published, within four years (relating to the main activity of the installation), the Environmental Protection Agency (EPA) should undertake that ‘all permit/licence conditions for the installation concerned are reconsidered, where necessary updated’ and ‘ensure compliance with the BAT’.

The European IPPC Bureau (EIPPCB) organises and co-ordinates the exchange of information between Member States and the industries concerned on Best Available Techniques (BAT), as set forth in Article 13 of the IED. The EIPPCB produces BAT reference documents (BREF) and BAT conclusions.

## 2. Activity

As per W0167-03 the facility is currently licensed to carry out the following activities as outlined in the First Schedule of the Environmental Protection Agency (EPA) Act 1992, as amended:

*11.3: Disposal or recovery of waste in waste incineration plants or in waste co-incineration plants –*

- (a) for non-hazardous waste with a capacity exceeding 3 tonnes per hour,*
- (b) for hazardous waste with a capacity exceeding 10 tonnes per day.*

Following implementation of the proposed development, which includes an increase in the amount of waste being accepted at the facility and the construction of a hydrogen generation unit, two new activities as outlined in the First Schedule of the EPA Act 1992, as amended, will be carried out:

- 5.13 (a) The production of inorganic chemicals, such as gases, such as ammonia, chlorine or hydrogen chloride, fluorine, or hydrogen fluoride, carbon oxides, sulphur compounds, nitrogen oxides, hydrogen, sulphur dioxide, carbonyl chloride (production means the production on an industrial scale by chemical or biological processing);*
- 11.6 Temporary storage of hazardous waste, (other than waste referred to in paragraph 11.5) pending any of the activities referred to in paragraph 11.2, 11.3, 11.5 or 11.7 with a total capacity exceeding 50 tonnes, other than temporary storage, pending collection, on the site where the waste is generated.*

## 3. BAT/BREF Assessments

A review of the European Commission Integrated Pollution Prevention and Control *Reference Document on Best Available Techniques on Emissions from Storage July 2006* is presented in the table below.

**Table 1: Review of European Commission Integrated Pollution Prevention and Control Reference Document on Best Available Techniques on Emissions from Storage, July 2006**

Conclusions on BAT	Applicability Assessment (describe how the technique applies or not to your installation)	State whether it is in place or state schedule for implementation
<b>5.1 Storage of liquids and Liquefied gases</b>		
<b>5.1.1.1 General principles to prevent and reduce emissions</b>		
<p><b>BAT 1.</b></p> <p>BAT for a proper design is to take into account at least the following:</p> <ul style="list-style-type: none"> <li>• the physio-chemical properties of the substance being stored.</li> <li>• how the storage is operated, what level of instrumentation is needed, how many operators are required, and what their workload will be</li> <li>• how the operators are informed of deviations from normal process conditions (alarms)</li> <li>• how the storage is protected against deviations from normal process conditions (safety instructions, interlock systems, pressure relief devices, leak detection and containment, etc.)</li> <li>• what equipment has to be installed, largely taking account of past experiences of the product (construction materials, valve quality, etc.)</li> <li>• which maintenance and inspection plan needs to be implemented and how to ease the maintenance and inspection work (access, layout, etc.)</li> <li>• how to deal with emergency situations (distances to other tanks, facilities and to the boundary, fire protection, access for emergency services such as the fire brigade, etc.).</li> </ul>	<p>Applicable</p> <p>In compliance with the Safety, Health and Welfare at Work Act 2005, Indaver will update the company safety statement covering the operation of the existing facility and proposed development. Indaver will appoint safety representatives at the site.</p> <p>The process itself has undergone the relevant HAZOPs to ensure that the necessary controls are in place in the case of deviations from the operating norms.</p> <p>The facility has been designed in order to allow for ease of and safe access for maintenance.</p> <p>Standard Operating Procedures plans, and manuals have been prepared to address each of the items outlined in BAT 1 of this BAT document including management and maintenance of plant, procedures for addressing deviations from normal process conditions, storage and management of chemicals and wastes, requirements for integrity testing and preventative maintenance of bunds/tanks/pipelines, and emergency response procedures.</p> <p>All storage tanks have been specified in order to be compatible to what is being stored.</p> <p>Tanks are equipped with leak detection, level alarms and leak detection (between layers for double skinned tanks, or level drops for single skinned tanks) or appropriate bunding capacity.</p> <p>All process parameters are monitored and recorded by the Distributed Control System (DCS).</p> <p>The emergency response team have been trained in emergency response and spill management and will follow the relevant procedures.</p>	<p>In place</p> <p>The proposed development will tie in with existing measures on site and has been designed in order to allow for ease of and safe access for maintenance.</p>
<b>BAT 2.</b>	Applicable	In place

Conclusions on BAT	Applicability Assessment (describe how the technique applies or not to your installation)	State whether it is in place or state schedule for implementation
<p>BAT is to apply a tool to determine proactive maintenance plans and to develop risk-based inspection plans such as the risk and reliability-based maintenance approach; see Section 4.1.2.2.1.</p>	<p>A maintenance schedule is maintained on site for all process and service equipment.</p> <p>All emergency equipment and facilities are inspected and maintained in accordance with regulatory requirements, relevant standards, and corporate requirements and is managed as part of the site maintenance management system using SAP.</p> <p>Process parameters of the furnace are monitored to ensure the process is operating correctly.</p> <p>The HAZOP's in place will ensure that all necessary controls are in place to avoid any potential hazard.</p>	<p>The proposed development will be incorporated into the existing maintenance schedule on site.</p>
<p><b>BAT 3.</b></p> <p>BAT is to locate a tank operating at, or close to, atmospheric pressure aboveground. However, for storing flammable liquids on a site with restricted space, underground tanks can also be considered. For liquefied gases, underground, mounded storage or spheres can be considered, depending on the storage volume.</p>	<p>Applicable</p> <p>All process related tanks are located above ground.</p> <p>Tanks include propane, aqueous ammonia, light fuel oil and aqueous waste.</p> <p>Fire water retention and surface water attenuation tanks are located below ground.</p>	<p>In place</p> <p>All process related tanks as part of the proposed development will be located above ground. These include a vertical pressurised nitrogen tank, a potassium hydroxide electrolyte solution tank in the HGU building, aqueous waste and boiler water storage tanks, and a horizontal steel hydrogen storage tank.</p> <p>The proposed development also includes an increase to underground surface water attenuation capacity.</p>
<p><b>BAT 4.</b></p> <p>BAT is to apply either a tank colour with a reflectivity of thermal or light radiation of at least 70 %, or a solar shield on aboveground tanks which contain volatile substances, see Section 4.1.3.6 and 4.1.3.7 respectively.</p>	<p>Applicable</p> <p>Bulk tank storage of aqueous ammonia and light fuel oil is protected in accordance with BAT.</p>	<p>In place</p> <p>The Aqueous waste storage tanks will be protected in accordance with BAT.</p>
<p><b>BAT 5.</b></p> <p>BAT is to abate emissions from tank storage, transfer and handling that have a significant negative environmental effect, as described in Section 4.1.3.1.</p>	<p>Applicable</p> <p>Tank storage of aqueous ammonia, diesel, propane and aqueous waste.</p> <p>Tanks are double skinned or banded and equipped with leak detection or appropriately banded.</p> <p>The tanker unloading area is provided with cut off drains to collect any spillage that may occur during loading/unloading.</p> <p>In the event of a spill or leak from a tank, the emergency response team have been trained in spill management and spill kits are readily available. There are two Class 1 interceptors installed on the site. There is a full-retention interceptor linking the ammonia/</p>	<p>In place</p> <p>The proposed aqueous waste tank farm and drainage network will tie in with the existing drainage system. The attenuation tanks have been sized to provide adequate buffer capacity.</p>

Conclusions on BAT	Applicability Assessment (describe how the technique applies or not to your installation)	State whether it is in place or state schedule for implementation
	<p>diesel unloading area to the main stormwater network on site. Before the inlet to the stormwater attenuation pond there is a bypass interceptor. The proposed aqueous waste unloading area will be fully contained, and discharge will only be done after an assessment show that there is no contamination.</p> <p>All storage tanks are equipped with relief vents with the exception of the diesel tank which is open to atmosphere. All solids' silos have self-cleaning filter devices.</p>	
<p><b>BAT 6.</b> On sites where, significant VOC emissions are to be expected, BAT includes calculating the VOC emissions regularly.</p>	<p>Not applicable No significant VOC emissions.</p>	<p>N/A</p>
<p><b>BAT 7.</b> BAT is to apply dedicated systems; see Section 4.1.4.4.</p>	<p>Applicable All tanks are dedicated to specific substances.</p>	<p>In place All proposed tanks will be dedicated to specific substances.</p>
<b>5.1.1.2 Tank specific considerations</b>		
<b>Open top tanks</b>		
<p><b>BAT 8.</b></p> <p>If emissions to air occur, BAT is to cover the tank by applying:</p> <ul style="list-style-type: none"> <li>• a floating cover, see Section 4.1.3.2</li> <li>• a flexible or tent cover, see Section 4.1.3.3, or</li> <li>• a rigid cover, see Section 4.1.3.4.</li> </ul> <p>Additionally, with an open top tank covered with a flexible, tent or a rigid cover, a vapour treatment installation can be applied to achieve an additional emission reduction, see Section 4.1.3.15. The type of cover and the necessity for applying the vapour treatment system depend on the substances stored and must be decided on a case-by-case basis.</p>	<p>Not applicable No open top tanks onsite.</p>	<p>N/A</p>
<p><b>BAT 9.</b> To prevent deposition that would call for an additional cleaning step, BAT is to mix the stored substance (e.g., slurry), see Section 4.1.5.1.</p>	<p>Not applicable No open top tanks onsite</p>	<p>N/A</p>
<b>External floating roof tank</b>		
<p><b>BAT 10.</b></p>	<p>Not applicable</p>	<p>N/A</p>



Conclusions on BAT	Applicability Assessment (describe how the technique applies or not to your installation)	State whether it is in place or state schedule for implementation
<p>The BAT associated emission reduction level for a large tank is at least 97 % (compared to a fixed roof tank without measures), which can be achieved when over at least 95 % of the circumference the gap between the roof and the wall is less than 3.2 mm and the seals are liquid mounted, mechanical shoe seals.</p>	<p>No floating roof tanks</p>	
<p><b>BAT 11.</b>            BAT is to apply direct contact floating roofs (double-deck), however, existing non-contact floating roofs (pontoon) are also BAT. See Section 3.1.2. A dome can be BAT for adverse weather conditions, such as high winds, rain or snowfall. See Section 4.1.3.5.</p>	<p>Not applicable            No floating roof tanks</p>	<p>N/A</p>
<p><b>BAT 12.</b>            For liquids containing a high level of particles (e.g., crude oil), BAT is to mix the stored substance to prevent deposition that would call for an additional cleaning step, see Section 4.1.5.1.</p>	<p>Not applicable            No floating roof tanks</p>	<p>N/A</p>
<p><b>Fixed roof tanks</b></p>		
<p><b>BAT 13.</b>            For the storage of volatile substances which are toxic (T), very toxic (T+), or carcinogenic, mutagenic, and reproductive toxic (CMR) categories 1 and 2 in a fixed roof tank, BAT is to apply a vapour treatment installation.</p>	<p>Applicable            Vertical fixed roof tank is used for the storage of aqueous ammonia. Horizontal tanks are used for light fuel oil, and also currently for aqueous waste. These are atmospheric tanks.            The aqueous waste may or may not be volatile depending on the nature of the waste received. Vapours from the proposed aqueous waste tanks will be vented to the furnace in accordance with BAT. There is a proposed piping connection between proposed aqueous waste tanks and furnace installed that will allow for vapour venting out of the tanks to tie-into the secondary air system to the furnace. A pipe rack will be provided to link to the existing pipe rack servicing the aqueous ammonia and fuel oil area to the proposed tank farm.            The light fuel oil tank is equipped with free venting tank vents that vent to atmosphere. The ammonia tank is equipped with a pressure relief vent. Vapours from these tanks are not significant in quantity as the substances are not highly volatile. As such, vapour treatment is not required.</p>	<p>In place            Fixed roof tanks as part of the proposed development will incorporate existing vapour treatment measures. A pipe rack will be provided to link to the existing pipe rack servicing the aqueous ammonia and fuel oil area to the proposed tank farm.</p>
<p><b>BAT 14.</b></p>	<p>Applicable</p>	<p>In place</p>

Conclusions on BAT	Applicability Assessment (describe how the technique applies or not to your installation)	State whether it is in place or state schedule for implementation
<p>For other substances, BAT is to apply a vapour treatment installation, or to install an internal floating roof (see Sections 4.1.3.15 and 4.1.3.10 respectively). Direct contact floating roofs and non-contact floating roofs are BAT.</p>	<p>Fixed roof tanks used for storing aqueous ammonia, light fuel oil and aqueous waste.</p> <p>There is a piping connection between the proposed aqueous waste tanks and furnace, that will allow for vapour venting out of the tanks. This vapour will tie into the secondary air system to the furnace.</p> <p>Floating roofs are not appropriate for the chemicals stored.</p>	<p>A pipe rack will be provided to link to the existing pipe rack servicing the aqueous ammonia and fuel oil area to the proposed tank farm.</p>
<p><b>BAT 15.</b></p> <p>For tanks &lt; 50 m<sup>3</sup>, BAT is to apply a pressure relief valve set at the highest possible value consistent with the tank design criteria.</p>	<p>Applicable</p> <p>Propane Tank is approximately 2m<sup>3</sup> and has a pressure relief valve fitted.</p> <p>Overpressure in the proposed tanks will be managed by forced ventilation to the secondary air system in the furnace. Pressure transmitters and over/under pressure venting devices will also be installed on each tank.</p>	<p>In place.</p>
<p><b>BAT 16.</b></p> <p>For liquids containing a high level of particles (e.g. crude oil) BAT is to mix the stored substance to prevent deposition that would call for an additional cleaning step, see Section 4.1.5.1.</p>	<p>Not applicable</p> <p>No liquids with high levels of particulates are stored. Aqueous waste is filtered prior to being stored in the aqueous waste tank.</p>	<p>N/A</p>
<b>Atmospheric horizontal tanks</b>		
<p><b>BAT 17.</b></p> <p>For the storage of volatile substances which are toxic (T), very toxic (T+), or CMR categories 1 and 2 in an atmospheric horizontal tank, BAT is to apply a vapour treatment installation.</p>	<p>Applicable</p> <p>Horizontal fixed roof tanks are used for the storage of light fuel oil and the existing aqueous waste on site.</p> <p>The diesel tank is open to atmosphere. Vapours from this tank will not be significant in quantity as diesel is not highly volatile. As such, vapour treatment is not required.</p> <p>The existing aqueous waste storage tank is equipped with a relief valve to atmosphere but is not storing any wastes which fall into these categories.</p>	<p>N/A</p>
<p><b>BAT 18.</b></p> <p>For other substances, BAT is to do all, or a combination, of the following techniques, depending on the substances stored:</p> <ul style="list-style-type: none"> <li>• apply pressure vacuum relief valves; see Section 4.1.3.11</li> <li>• up rate to 56 mbar; see Section 4.1.3.11</li> </ul>	<p>Not applicable</p> <p>No additional horizontal tanks envisaged</p>	<p>N/A</p>

Conclusions on BAT	Applicability Assessment (describe how the technique applies or not to your installation)	State whether it is in place or state schedule for implementation
<ul style="list-style-type: none"> <li>• apply vapour balancing; see Section 4.1.3.13</li> <li>• apply a vapour holding tank, see Section 4.1.3.14, or</li> <li>• apply vapour treatment; see Section 4.1.3.15.</li> </ul> <p>The selection of the vapour treatment technology has to be decided on a case-by-case basis.</p>		
<b>Pressurised storage</b>		
<p><b>BAT 19.</b></p> <p>BAT for draining depends on the tank type but may be the application of a closed drain system connected to a vapour treatment installation, see Section 4.1.4. The selection of the vapour treatment technology has to be decided on a case-by-case basis.</p>	<p>Not Applicable</p> <p>Small volumes of pressurised gases for flue gas monitoring system. No vapour treatment required. Bottles are fully sealed Propane storage tank for the burner pilot flames has a pressure relief valve fitted which vents to atmosphere.</p>	<p>N/A</p>
<b>Lifter roof tanks</b>		
<p><b>BAT 20.</b></p> <p>For emissions to air, BAT is to (see Sections 3.1.9 and 4.1.3.14):</p> <ul style="list-style-type: none"> <li>• apply a flexible diaphragm tank equipped with pressure/vacuum relief valves, or</li> <li>• apply a lifter roof tank equipped with pressure/vacuum relief valves and connected to a vapour treatment installation.</li> </ul> <p>The selection of the vapour treatment technology has to be decided on a case-by-case basis.</p>	<p>Not applicable</p> <p>No lifter roof tanks</p>	<p>N/A</p>
<b>Underground and mounded tanks</b>		
<p><b>BAT 21.</b></p> <p>For the storage of volatile substances which are toxic (T), very toxic (T+), or CMR categories 1 and 2 in an underground or mounded tank, BAT is to apply a vapour treatment installation.</p>	<p>Not applicable</p> <p>Underground tanks for surface water attenuation and firewater retention only.</p>	<p>N/A</p>
<p><b>BAT 22.</b></p> <p>For other substances, BAT is to do all, or a combination, of the following techniques, depending on the substances stored:</p> <ul style="list-style-type: none"> <li>• apply pressure vacuum relief valves; see Section 4.1.3.11</li> <li>• apply vapour balancing; see Section 4.1.3.13</li> <li>• apply a vapour holding tank, see Section 4.1.3.14, or</li> <li>• apply vapour treatment; see Section 4.1.3.15.</li> </ul>	<p>Not applicable</p> <p>Underground tanks for surface water attenuation and firewater retention only.</p>	<p>N/A</p>

Conclusions on BAT	Applicability Assessment (describe how the technique applies or not to your installation)	State whether it is in place or state schedule for implementation
The selection of the vapour treatment technology has to be decided on a case-by-case basis.		
<b>5.1.1.3 Preventing incidents and (major) accidents</b>		
<p><b>BAT 23.</b> BAT in preventing incidents and accidents is to apply a safety management system as described in Section 4.1.6.1.</p>	<p>Applicable.</p> <p>Indaver carries out Health and Safety Risk Assessments in order to identify health and safety risks at their sites and determine whether controls are required. These will be updated to incorporate the new facility. Indaver is certified to ISO 45001.</p> <p>The facility also implements an Environmental Management System (EMS) which outlines the operational controls in place to prevent incidents as well as the required corrective and preventative actions.</p> <p>In compliance with the Safety, Health and Welfare at Work Act 2005, Indaver will update the company safety statement covering the operation of the existing facility and the proposed development. A dedicated Health and Safety professional is employed full time on site.</p>	<p>In place</p> <p>The proposed development will be incorporated into the EMS.</p>
<p><b>BAT 24.</b> BAT is to implement and follow adequate organisational measures and to enable training and instruction of employees for safe and responsible operation of the installation as described in Section 4.1.6.1.1.</p>	<p>Applicable</p> <p>An Emergency Response Plan has been prepared for the existing facility, which sets out the requirements for emergency planning, training programmes, and emergency drill and exercise programmes. This will be updated for the proposed development.</p> <p>All staff are fully qualified and fully trained, and all training records are held on site. Training includes training staff on all relevant operating procedures, emergency response procedure, housekeeping, safety procedures and other relevant EMS procedures.</p>	<p>In place</p> <p>The proposed development will be incorporated into the site Emergency response plan.</p>
<p><b>BAT 25.</b> BAT is to prevent corrosion by:</p> <ul style="list-style-type: none"> <li>• selecting construction material that is resistant to the product stored.</li> <li>• applying proper construction methods</li> </ul>	<p>Applicable</p> <p>Corrosive substances are used on-site.</p> <p>Corrosive substances are stored in small volumes in the self-bundled units.</p> <p>Flue gas residue has a corrosive nature and is fully contained within the silos. Silos are constructed in</p>	<p>In place</p> <p>The proposed development will be incorporated into the existing maintenance schedule.</p>

Conclusions on BAT	Applicability Assessment (describe how the technique applies or not to your installation)	State whether it is in place or state schedule for implementation
<ul style="list-style-type: none"> <li>preventing rainwater or groundwater entering the tank and if necessary, removing water that has accumulated in the tank.</li> <li>applying rainwater management to bund drainage</li> <li>applying preventive maintenance, and</li> <li>where applicable, adding corrosion inhibitors, or applying cathodic protection on the inside of the tank.</li> </ul>	<p>accordance with the nature of the material and are fully sealed. Preventative maintenance of the silos is undertaken in accordance with Indaver's SOPs.</p> <p>The materials of construction for the proposed development will be compatible with the materials that will be used in the process. This will ensure that corrosion is avoided.</p> <p>A preventive maintenance schedule is in place and will be updated following commencement of the operation of the proposed development.</p>	
<p><b>BAT 26.</b></p> <p>Additionally, for an underground tank, BAT is to apply to the outside of the tank:</p> <ul style="list-style-type: none"> <li>a corrosion-resistant coating</li> <li>plating, and/or</li> <li>a cathodic protection system.</li> </ul>	<p>Not applicable</p> <p>No underground tanks containing corrosive substances.</p>	<p>N/A</p>
<p><b>BAT 27.</b></p> <p>BAT is to prevent stress corrosion cracking (SCC) by:</p> <ul style="list-style-type: none"> <li>stress relieving by post-weld heat treatment, see Section 4.1.6.1.4, and</li> <li>applying a risk-based inspection as described in Section 4.1.2.2.1.</li> </ul>	<p>Applicable</p> <p>Post-weld heat treatment has been conducted when necessary.</p>	<p>In place</p>
<p><b>BAT 28.</b></p> <p>BAT is to implement and maintain operational procedures – e.g., by means of a management system – as described in Section 4.1.6.1.5, to ensure that:</p> <ul style="list-style-type: none"> <li>high level or high-pressure instrumentation with alarm settings and/or auto closing of valves is installed.</li> <li>proper operating instructions are applied to prevent overflow during a tank filling operation, and</li> <li>sufficient ullage is available to receive a batch filling.</li> </ul>	<p>Applicable</p> <p>The facility and the processes are governed by SOPs and by the DCS which controls all process parameters.</p> <p>Fixed Tanks are fitted with high level alarms to prevent overflowing.</p>	<p>In place</p> <p>The proposed development will tie in with the existing DCS automated control systems.</p>
<p><b>BAT 29.</b></p>	<p>Applicable</p>	<p>In place</p>

Conclusions on BAT	Applicability Assessment (describe how the technique applies or not to your installation)	State whether it is in place or state schedule for implementation
<p>BAT is to apply leak detection on storage tanks containing liquids that can potentially cause soil pollution.</p>	<p>Where required, bulk chemical storage tanks (ammonia &amp; fuel oil) have been fitted with level alarms and switches to prevent overfills and unnecessary emissions.</p> <p>All process parameters are controlled by the DCS Automated Control System. The DCS Automated Control System, as well as the appropriate periodic visual checks are implemented, which allow leakages to be quickly and reliably recognised.</p> <p>Staff have been trained in emergency response including spill response. SOPs are in place outlining appropriate spill response techniques.</p> <p>Spill kits are available at key points across the site.</p> <p>A site-specific Emergency Response Plan is in place as required under condition of the IE licence.</p>	<p>The proposed development will tie in with the existing DCS Automated control systems.</p>
<p><b>BAT 30.</b></p> <p>BAT is to achieve a ‘negligible risk level’ of soil pollution from bottom and bottom-wall connections of aboveground storage tanks. However, on a case-by-case basis, situations might be identified where an ‘acceptable risk level’ is sufficient.</p>	<p>Applicable</p> <p>Existing external chemical storage consists of a fuel tank (double skinned), an aqueous ammonia tank (double skinned), an aqueous waste tank (double skinned) and self-bunded chemstores. Bulk storage tanks are fitted with level monitoring and overflow protection.</p> <p>These existing bulk tanks, and those proposed, are either within a bund or are double skinned and located on areas of continuous hard stand. There are no direct pathways to either the soil and groundwater environment or the surface water environment.</p> <p>A leakage from a bulk tank would be fully contained in the designated bund or the double skin lining of the tank, with leaks during delivery fully contained within the continuous hard stand delivery area. Any leakage outside of the delivery area would be contained within the closed drainage system.</p>	<p>In place</p> <p>BAT to be in place for the proposed development. Aqueous waste tanks are contained within a bund.</p>
<p><b>BAT 31.</b></p>	<p>Applicable</p> <p>External bulk chemical storage consists of fuel oil, aqueous waste and aqueous ammonia. Bulk tanks are either bunded or double skinned. Where required, bulk</p>	<p>In place</p> <p>BAT to be in place for the proposed development.</p>

Conclusions on BAT	Applicability Assessment (describe how the technique applies or not to your installation)	State whether it is in place or state schedule for implementation
<p>BAT for aboveground tanks containing flammable liquids or liquids that pose a risk for significant soil pollution or a significant pollution of adjacent watercourses is to provide secondary containment, such as:</p> <ul style="list-style-type: none"> <li>• tank bunds around single wall tanks; see Section 4.1.6.1.11</li> <li>• double wall tanks; see Section 4.1.6.1.13</li> <li>• cup-tanks; see Section 4.1.6.1.14</li> <li>• double wall tanks with monitored bottom discharge; see Section 4.1.6.1.15.</li> </ul>	<p>chemical storage tanks have been fitted with level alarms and switches to prevent overfills and unnecessary emissions.</p> <p>Self-bunded units will also be used to store smaller volumes of chemicals.</p> <p>The yard areas are continuous hard stand to protect the soil environment from spills or leaks.</p> <p>In the event of a spill or leak from a tank, the emergency response team have been trained in spill management and spill kits are readily available. There are two Class 1 interceptors installed on the site. There is a full-retention interceptor linking the ammonia/ diesel unloading area to the main stormwater network on site. Before the inlet to the stormwater attenuation pond there is a bypass interceptor.</p>	
<p><b>BAT 32.</b></p> <p>For building new single walled tanks containing liquids that pose a risk for significant soil pollution or a significant pollution of adjacent watercourses, BAT is to apply a full, impervious, barrier in the bund, see Section 4.1.6.1.10.</p>	<p>Applicable</p> <p>All bunds will have full impervious barriers.</p>	<p>In place</p>
<p><b>BAT 33.</b></p> <p>For existing tanks within a bund, BAT is to apply a risk-based approach, considering the significance of risk from product spillage to the soil, to determine if and which barrier is best applicable. This risk-based approach can also be applied to determine if a partial impervious barrier in a tank bund is sufficient or if the whole bund needs to be equipped with an impervious barrier. See Section 4.1.6.1.11.</p>	<p>Applicable</p> <p>All bunds have full impervious barriers.</p>	<p>In place</p> <p>BAT to be in place for tanks within a bund as part of the proposed development.</p>
<p><b>BAT 34.</b></p> <p>For chlorinated hydrocarbon solvents (CHC) in single walled tanks, BAT is to apply CHC-proof laminates to concrete barriers (and containments), based on phenolic or furan resins. One form of epoxy resin is also CHC-proof. See Section 4.1.6.1.12.</p>	<p>Not applicable</p> <p>No CHCs used or stored on-site.</p>	<p>N/A</p>
<p><b>BAT 35.</b></p>	<p>Applicable</p>	<p>In place</p>

Conclusions on BAT	Applicability Assessment (describe how the technique applies or not to your installation)	State whether it is in place or state schedule for implementation
<p>BAT for underground and mounded tanks containing products that can potentially cause soil pollution is to:</p> <ul style="list-style-type: none"> <li>• apply a double walled tank with leak detection, see Section 4.1.6.1.16, or</li> <li>• to apply a single walled tank with secondary containment and leak detection, see Section 4.1.6.1.17.</li> </ul>	<p>Underground tank for potentially contaminated firewater retention.</p> <p>In the unlikely event that surface water in the firewater retention tank is contaminated, the firewater will be pumped out and disposed of by a licensed contractor or treated on site and the stormwater line flushed if required. There will be no long-term storage of contaminated firewater.</p> <p>Integrity testing of the firewater retention tank and underground pipelines is undertaken every 3 years in accordance with the requirements of the IE licence.</p>	
<p><b>BAT 36.</b></p> <p>For toxic, carcinogenic or other hazardous substances, BAT is to apply full containment.</p>	<p>Applicable</p> <p>A number of hazardous substances are used onsite. Bulk tanks are double skinned or stored within designated bunds and IBCs/drums are stored within bunded units. The design of all bunds conforms to standard bunding specifications - BS8007:1987</p> <p>In the event of a fire a shut-off valve on the outlet of the stormwater discharge point has been provided and any contaminated surface water could be isolated onsite if required.</p>	<p>In place</p> <p>The proposed development will comply with BAT.</p>
<b>5.1.2. Storage of packaged dangerous substances</b>		
<p><b>BAT 37.</b></p> <p>BAT in preventing incidents and accidents is to apply a safety management system as described in Sections 4.1.6.1.</p> <p>The minimum level of BAT is to assess the risks of accidents and incidents on the site using the five steps described in Section 4.1.6.1</p>	<p>Applicable</p> <p>Indaver operates under an EMS and is certified to ISO 45001 which outlines are operational controls in place to prevent accidents and as well incident management and the required corrective and preventative actions.</p> <p>Indaver also have a documented procedure for reviewing and approving chemicals for use onsite and a procedure on reporting, investigating and documenting incidents.</p>	<p>In place</p> <p>The proposed development will be incorporated into the site EMS.</p>
<p><b>BAT 38.</b></p> <p>BAT is to appoint a person or persons who is or are responsible for the operation of the store.</p>	<p>Applicable</p> <p>The warehouse will store only a small amount of chemicals (e.g., lubricants, greases). The majority of</p>	<p>In place.</p>



Conclusions on BAT	Applicability Assessment (describe how the technique applies or not to your installation)	State whether it is in place or state schedule for implementation
	<p>chemicals stored in the self-bunded units which may be flammable/dangerous are stored outside the warehouse.</p> <p>Appropriate staff are employed to run the warehouse and other storage areas at the facility.</p>	
<p><b>BAT 39.</b></p> <p>BAT is to provide the responsible person(s) with specific training and retraining in emergency procedures as described in Section 4.1.7.1 and to inform other staff on the site of the risks of storing packaged dangerous substances and the precautions necessary to safely store substances that have different hazards.</p>	<p>Applicable</p> <p>Staff are fully trained in site procedures, including all SOPs and emergency response, chemical awareness, and safety procedures in relation to the storage and handling of all substances being used at the facility.</p>	<p>In place</p>
<p><b>BAT 40.</b></p> <p>BAT is to apply a storage building and/or an outdoor storage area covered with a roof, as described in Section 4.1.7.2. For storing quantities of less than 2500 litres or kilograms dangerous substances, applying a storage cell as described in Section 4.1.7.2 is also BAT.</p>	<p>Applicable</p> <p>The warehouse will store only a small amount of chemicals (e.g., lubricants, greases). The majority of chemicals stored in the self-bunded units which may be flammable/dangerous are stored outside the warehouse.</p> <p>The units are self-bunded, covered, and lockable units.</p>	<p>In place</p>
<p><b>BAT 41.</b></p> <p>BAT is to separate the storage area or building of packaged dangerous substances from other storage, from ignition sources and from other buildings on- and off-site by applying a sufficient distance, sometimes in combination with fire-resistant walls.</p>	<p>Applicable</p> <p>Packed dangerous substances may be present onsite.</p> <p>Flammable and combustible materials are stored away from ignition sources in a designated chemstore unit.</p> <p>A full programme of HAZOP studies to cover all process steps has been completed. ATEX and all other relevant safety studies were included in the design scope. These ensure that the relevant control measures are in place to avoid any hazards and plant operability issues which may or may not lead to environmental impact.</p>	<p>In place</p>
<p><b>BAT 42.</b></p> <p>BAT is to separate and/or segregate incompatible substances. For the compatible and incompatible combinations see Annex 8.3.</p>	<p>Applicable</p> <p>Dangerous substances may be present in packaged waste onsite, but no incompatible wastes will be introduced to the bunker.</p> <p>All incompatible substances (raw materials/consumables) are separated.</p>	<p>In place</p>

Conclusions on BAT	Applicability Assessment (describe how the technique applies or not to your installation)	State whether it is in place or state schedule for implementation
<p><b>BAT 43.</b></p> <p>BAT is to install a liquid-tight reservoir according to Section 4.1.7.5, that can contain all or a part of the dangerous liquids stored above such a reservoir. The choice whether all or only a part of the leakage needs to be contained depends on the substances stored and on the location of the storage (e.g. in a water catchment area) and can only be decided on a case-by-case basis.</p>	<p>Applicable</p> <p>Firewater retention tank is present on site.</p> <p>A monitoring station is in place between the firewater retention tank and the stormwater attenuation tank. In the event that hazardous liquids enter the stormwater system, a shut off valve linked to the continuous monitoring system will shut off the connection to the stormwater tank and will contain the substances. The firewater retention tank will then be pumped out and disposed of by a licensed contractor or treated on site.</p>	<p>In place</p> <p>The proposed development will tie in with the existing drainage network on site.</p>
<p><b>BAT 44.</b></p> <p>BAT is to install a liquid-tight extinguishant collecting provision in storage buildings and storage areas according to Section 4.1.7.5. The collecting capacity depends on the substances stored, the amount of substances stored, the type of package used and the applied fire-fighting system and can only be decided on a case-by-case basis.</p>	<p>Applicable</p> <p>The existing facility and proposed development has been designed and provided with adequate fire protection and detection systems.</p> <p>Water cannons are available in the waste bunker for suppression of a fire.</p> <p>Sprinklers are in place for the hopper.</p> <p>A firewater retention tank is provided which has been designed to capture potentially contaminated firewater.</p>	<p>In place</p>
<p><b>BAT 45.</b></p> <p>BAT is to apply a suitable protection level of fire prevention and fire-fighting measures as described in Section 4.1.7.6. The appropriate protection level has to be decided on a case-by-case basis in agreement with the local fire brigade.</p>	<p>Applicable</p> <p>Extensive fire detection measures have been installed across the site. These measures are tried and tested systems in place across Indaver's existing sites.</p> <p>This includes infrared detectors in the waste bunker. In the event of a fire, an alarm is activated in the control room. Water cannons are available in the waste bunker for suppression of a fire.</p> <p>The hopper and the furnace have been installed with infrared detectors and in the event of a fire, sprinklers over the hopper will turn on automatically.</p> <p>The ram for feeding waste into the furnace has been equipped with a fire damper above it, which activates when the temperature exceeds a set level.</p>	<p>In place.</p>

Conclusions on BAT	Applicability Assessment (describe how the technique applies or not to your installation)	State whether it is in place or state schedule for implementation
<p><b>BAT 46.</b></p> <p>BAT is to prevent ignition at source as described in Section 4.1.7.6.1.</p>	<p>Applicable</p> <p>Smoking is not permitted on site with the exception of dedicated smoking areas.</p> <p>Operatives will require a permit to work and as such will identify any potential hazards in order to work safely for the proposed development.</p>	<p>In place.</p>
<b>5.1.3 Basins and lagoons</b>		
<p><b>BAT 47.</b></p> <p>Where emissions to air from normal operation are significant, e.g. with the storage of pig slurry, BAT is to cover basins and lagoons using one of the following options:</p> <ul style="list-style-type: none"> <li>• a plastic cover; see Section 4.1.8.2</li> <li>• a floating cover; see Section 4.1.8.1, or</li> <li>• only small basins, a rigid cover; see Section 4.1.8.2.</li> </ul> <p>Additionally, where a rigid cover is used, a vapour treatment installation can be applied to achieve an extra emission reduction, see Section 4.1.3.15. The need for and type of vapour treatment must be decided on a case-by-case basis.</p>	<p>Not Applicable</p> <p>No basins/lagoons onsite.</p>	<p>N/A</p>
<p><b>BAT 48.</b></p> <p>To prevent overflowing due to rainfall in situations where the basin or lagoon is not covered, BAT is to apply a sufficient freeboard, see Section 4.1.11.1.</p>	<p>Not Applicable</p> <p>No basins/lagoons onsite.</p>	<p>N/A</p>
<p><b>BAT 49.</b></p> <p>Where substances are stored in a basin or lagoon with a risk of soil contamination, BAT is to apply an impervious barrier. This can be a flexible membrane, a sufficient clay layer or concrete, see Section 4.1.9.1</p>	<p>Not Applicable</p> <p>No basins/lagoons onsite.</p>	<p>N/A</p>
<b>5.2 Transfer and handling of liquids and liquefied gases</b>		
<b>5.2.1 General principles to prevent and reduce emissions</b>		
<p><b>BAT 50.</b></p>	<p>Applicable</p>	<p>In place</p>

Conclusions on BAT	Applicability Assessment (describe how the technique applies or not to your installation)	State whether it is in place or state schedule for implementation
<p>BAT is to apply a tool to determine proactive maintenance plans and to develop risk-based inspection plans such as, the risk and reliability-based maintenance approach; see Section 4.1.2.2.1.</p>	<p>Transfer of liquids: A maintenance schedule is maintained on site for all process and service equipment. The DCS Automated Control System allows for monitoring of parameters to ensure that all equipment is working as planned. The HAZOPs carried out on the design will ensure that all necessary controls are in place to avoid any potential hazard.</p>	<p>The proposed development will tie into the existing DCS automated control system.</p>
<p><b>BAT 51.</b></p> <p>For large storage facilities, according to the properties of the products stored, BAT is to apply a leak detection and repair programme. Focus needs to be on those situations most likely to cause emissions (such as gas/light liquid, under high pressure and/or temperature duties). See Section 4.2.1.3.</p>	<p>Applicable</p> <p>Bulk storage tanks have been fitted with level alarms and switches to prevent overfills and unnecessary emissions.</p> <p>Storage of hazardous materials on site is either in double skinned or banded containers. The design of all bunds is in line with standard bunding specifications - BS8007:1987.</p> <p>Bund and pipeline testing using a hydraulic test is undertaken at least every 3 years and is included in the annual environmental report for the site.</p>	<p>In place</p> <p>BAT also applies to storage facilities associated with the proposed development which incorporates the same measures.</p>
<p><b>BAT 52.</b></p> <p>BAT is to abate emissions from tank storage, transfer and handling that have a significant negative environmental effect, as described in Section 4.1.3.1.</p>	<p>Applicable</p> <p>External bulk chemical storage is in place.</p> <p>Handling and transfer of fuel and chemicals is carefully controlled.</p> <p>The current and proposed tanker unloading areas, have been provided with containment areas and cut off drains to collect any spillage that may occur during loading/unloading.</p> <p>The volume of chemicals stored, and the containment measures planned, will minimise the risk of release of solid/liquid material spillages to the water environment.</p> <p>Staff are trained in emergency response including spill response and SOPs are in place outlining appropriate spill response techniques. Spill kits are available across the site.</p>	<p>In place</p>

Conclusions on BAT	Applicability Assessment (describe how the technique applies or not to your installation)	State whether it is in place or state schedule for implementation
	An emergency response plan is in place as required under condition of the existing IE licence.	
<p><b>BAT 53.</b></p> <p>BAT in preventing incidents and accidents is to apply a safety management system as described in Section 4.1.6.1.</p>	<p>Applicable</p> <p>Indaver carries out Health and Safety Risk Assessments in order to identify health and safety risks at their sites and determine whether controls are required. These will be updated to incorporate the proposed development. Indaver are certified to ISO 45001.</p> <p>The existing facility implements a site-specific EMS which outlines the operational controls to be in place to prevent incidents as well as the required corrective and preventative actions</p>	<p>In place</p> <p>The proposed development will be incorporated into the site EMS.</p>
<p><b>BAT 54.</b></p> <p>BAT is to implement and follow adequate organisational measures and to enable the training and instruction of employees for safe and responsible operation of the installation as described in Section 4.1.6.1.1.</p>	<p>Applicable</p> <p>All staff are fully qualified and fully trained. All training records are held on site. Training includes training staff on all relevant procedures, emergency response procedure, housekeeping, safety procedures and other relevant EMS procedures.</p>	<p>In place</p> <p>The proposed development will be incorporated into the site EMS</p>
<b>5.2.2 Considerations on transfer and handling techniques</b>		
<b>5.2.2.1 Piping</b>		
<p><b>BAT 55.</b></p> <p>BAT is to apply aboveground closed piping in new situations, see Section 4.2.4.1.</p> <p>For existing underground piping it is BAT to apply a risk and reliability based maintenance approach as described in Section 4.1.2.2.1.</p>	<p>Applicable</p> <p>The facility uses aboveground closed piping for all transfer of liquids (excluding stormwater).</p> <p>Above ground piping has been fully welded and pressure tested, and regular inspections are conducted. Above ground pipelines are above continuous hard stand.</p> <p>Underground pipelines have been provided for stormwater only. Pipeline testing using a hydraulic test is undertaken at least every 3 years.</p>	<p>In place</p> <p>BAT will be in place for the proposed pipe rack.</p>
<p><b>BAT 56.</b></p>	<p>Applicable</p> <p>Pipelines has been installed in accordance with BAT with welded connections to be used where practical.</p>	<p>In place</p> <p>Proposed pipelines will be installed in accordance with BAT.</p>

Conclusions on BAT	Applicability Assessment (describe how the technique applies or not to your installation)	State whether it is in place or state schedule for implementation
<p>BAT is to minimise the number of flanges by replacing them with welded connections, within the limitation of operational requirements for equipment maintenance or transfer system flexibility, see Section 4.2.2.1.</p>		
<p><b>BAT 57.</b></p> <p>BAT for bolted flange connections (see Section 4.2.2.2.) include:</p> <ul style="list-style-type: none"> <li>• fitting blind flanges to infrequently used fittings to prevent accidental opening.</li> <li>• using end caps or plugs on open-ended lines and not valves.</li> <li>• ensuring gaskets are selected appropriate to the process application.</li> <li>• ensuring the gasket is installed correctly.</li> <li>• ensuring the flange joint is assembled and loaded correctly.</li> <li>• where toxic, carcinogenic or other hazardous substances are transferred, fitting high integrity gaskets, such as spiral wound, kamm profile or ring joints.</li> </ul>	<p>Applicable</p> <p>Where bolted flange connections are used, pipelines are installed in accordance with BAT.</p> <p>For the transfer of toxic or hazardous chemicals including the transfer of diesel, ammonia, aqueous wastes, and glycol (in the turbine cooling circuit), the correct gaskets as per product specification are used.</p>	<p>In place</p> <p>Proposed pipelines will be installed in accordance with BAT.</p>
<p><b>BAT 58.</b></p> <p>BAT is to prevent corrosion by:</p> <ul style="list-style-type: none"> <li>• selecting construction material that is resistant to the product.</li> <li>• applying proper construction methods</li> <li>• applying preventive maintenance, and</li> <li>• where applicable, applying an internal coating or adding corrosion inhibitors.</li> </ul>	<p>Applicable</p> <p>The pipelines have been designed for their use and have been installed / constructed in accordance with manufacturers recommendations and proper construction methods.</p> <p>Corrosion inhibitors are used where applicable. This depends on the design and whether an open or a closed cooling system has been used for example.</p> <p>Bund and underground pipeline testing using a hydraulic test is undertaken at least every 3 years in accordance with the requirements of the IE licence.</p>	<p>In place</p> <p>Proposed pipelines will be installed in accordance with BAT.</p>
<p><b>BAT 59.</b></p> <p>To prevent the piping from external corrosion, BAT is to apply a one, two, or three-layer coating system depending on the site-specific conditions (e.g., close to sea). Coating is normally not applied to plastic or stainless-steel pipelines. See Section 4.2.3.2.</p>	<p>Applicable</p> <p>All piping is designed and installed in accordance with BAT.</p>	<p>In place</p> <p>BAT to be in place for the proposed pipe rack and piping system.</p>
<p><b>5.2.2.2 Vapour treatment</b></p>		

Conclusions on BAT	Applicability Assessment (describe how the technique applies or not to your installation)	State whether it is in place or state schedule for implementation
<p><b>BAT 60.</b></p> <p>BAT is to apply vapour balancing or treatment on significant emissions from the loading and unloading of volatile substances to (or from) trucks, barges and ships. The significance of the emission depends on the substance and the volume that is emitted and has to be decided on a case-by-case basis. For more detail see Section 4.2.8.</p>	<p>Applicable</p> <p>Overpressure from the proposed aqueous waste tanks will be vented to main process building where it ties into the secondary air system and will vent into the furnace.</p> <p>Vapor treatment is not required for other bulk storage tanks containing diesel and aqueous ammonia.</p>	<p>Will be in place</p>
<b>5.2.2.3 Valves</b>		
<p><b>BAT 61.</b></p> <p>BAT for valves include:</p> <ul style="list-style-type: none"> <li>• correct selection of the packing material and construction for the process application</li> <li>• with monitoring, focus on those valves most at risk (such as rising stem control valves in continual operation)</li> <li>• applying rotating control valves or variable speed pumps instead of rising stem control valves</li> <li>• where toxic, carcinogenic or other hazardous substances are involved, fit diaphragm, bellows, or double walled valves.</li> <li>• route relief valves back into the transfer or storage system or to a vapour treatment system.</li> </ul>	<p>Applicable</p> <p>All valves are fit for purpose and have been considered in the process HAZOP. All valves were installed by a qualified contractor and have been commissioned and tested. All valves are inspected as part of the preventive maintenance schedule.</p>	<p>In place</p> <p>BAT to be in place for the proposed development.</p>
<b>5.2.2.4 Pumps and compressors</b>		
<p><b>BAT 62.</b></p> <p>The following are some of the main factors which constitute BAT:</p> <ul style="list-style-type: none"> <li>• proper fixing of the pump or compressor unit to its baseplate or frame</li> <li>• having connecting pipe forces within producers' recommendations.</li> <li>• proper design of suction pipework to minimise hydraulic imbalance.</li> <li>• alignment of shaft and casing within producers' recommendations</li> <li>• alignment of driver/pump or compressor coupling within producers' recommendations when fitted.</li> <li>• correct level of balance of rotating parts</li> </ul>	<p>Applicable</p> <p>All pumps and compressors are fit for purpose and have been considered in the process HAZOP. All pumps/compressors were installed by a qualified contractor and have been commissioned and tested. All pumps are inspected as part of the preventive maintenance schedule.</p>	<p>In place</p> <p>BAT to be in place for pumps associated with the proposed development.</p>

Conclusions on BAT	Applicability Assessment (describe how the technique applies or not to your installation)	State whether it is in place or state schedule for implementation
<ul style="list-style-type: none"> <li>effective priming of pumps and compressors prior to start-up</li> <li>operation of the pump and compressor within producers' recommended performance range (The optimum performance is achieved at its best efficiency point.)</li> <li>the level of net positive suction head available should always be in excess of the pump or compressor.</li> <li>regular monitoring and maintenance of both rotating equipment and seal systems, combined with a repair or replacement programme.</li> </ul>		
<p><b>BAT 63.</b></p> <p>BAT is to use the correct selection of pump and seal types for the process application, preferably pumps that are technologically designed to be tight such as canned motor pumps, magnetically coupled pumps, pumps with multiple mechanical seals and a quench or buffer system, pumps with multiple mechanical seals and seals dry to the atmosphere, diaphragm pumps or bellows pumps. For more details see Sections 3.2.2.2, 3.2.4.1 and 4.2.9.</p>	<p>Applicable</p> <p>All pumps have been sized, selected and purchased for their dedicated systems. This includes the type of seals required for each system.</p>	<p>In place</p> <p>BAT to be in place for pumps associated with the proposed development.</p>
<p><b>BAT 64.</b></p> <p>BAT for compressors transferring non-toxic gases is to apply gas lubricated mechanical seals.</p>	<p>Applicable</p> <p>Ambient air only. Compressors have been designed and installed in accordance with BAT.</p>	<p>In place</p>
<p><b>BAT 65.</b></p> <p>BAT for compressors, transferring toxic gases is to apply double seals with a liquid or gas barrier and to purge the process side of the containment seal with an inert buffer gas.</p>	<p>Not Applicable</p> <p>Compressors are for air only</p>	<p>N/A</p>
<p><b>BAT 66.</b></p> <p>In very high-pressure services, BAT is to apply a triple tandem seal system.</p>	<p>Not Applicable</p> <p>No very high-pressure services.</p>	<p>N/A</p>
<p><b>5.2.2.5 Sampling Connections</b></p>		
<p><b>BAT 67.</b></p> <p>BAT, for sample points for volatile products, is to apply a ram type sampling valve or a needle valve and a block valve. Where sampling</p>	<p>Not applicable.</p>	<p>N/A</p>



Conclusions on BAT	Applicability Assessment (describe how the technique applies or not to your installation)	State whether it is in place or state schedule for implementation
lines require purging, BAT is to apply closed-loop sampling lines. See Section 4.2.9.14.	<p>No sampling of volatile products as part of the installation.</p> <p>Sampling of the aqueous waste in the road tankers is carried out prior to offloading into the aqueous waste tank. This is completed by opening the valve on the top of the road tanker and taking a sample with a core sampler. In this instance BAT 67 is not applicable.</p>	
<b>5.3 Storage of Solids</b>		
<b>5.3.1 Open storage</b>		
<p><b>BAT 68.</b></p> <p>BAT is to apply enclosed storage by using, for example, silos, bunkers, hoppers and containers, to eliminate the influence of wind and to prevent the formation of dust by wind as far as possible by primary measures. See Table 4.12 for these primary measures with cross-references to the relevant sections.</p>	<p>Applicable</p> <p>Lime, activated carbon/clay, flue gas residue, and boiler ash are each stored in silos. These are enclosed and equipped with filtration systems. Preventative maintenance is in place to check the efficacy of these filters.</p>	<p>In place</p> <p>The proposed development will include additional silos for third-party boiler ash and flue gas cleaning residues.</p>
<p><b>BAT 69.</b></p> <p>BAT for open storage is to carry out regular or continuous visual inspections to see if dust emissions occur and to check if preventive measures are in good working order. Following the weather forecast by, e.g., using meteorological instruments on site, will help to identify when the moistening of heaps is necessary and will prevent unnecessary use of resources for moistening the open storage. See Section 4.3.3.1.</p>	<p>Not applicable.</p> <p>No external storage of solid materials</p>	<p>N/A</p>
<p><b>BAT 70.</b></p> <p>BAT for long-term open storage are one, or a proper combination, of the following techniques:</p> <ul style="list-style-type: none"> <li>• moistening the surface using durable dust-binding substances, see Section 4.3.6.1</li> <li>• covering the surface, e.g., with tarpaulins, see Section 4.3.4.4</li> <li>• solidification of the surface, see Table 4.13</li> <li>• grassing-over of the surface, see Table 4.13.</li> </ul>	<p>Not applicable.</p> <p>No external storage of solid materials</p>	<p>N/A</p>
<p><b>BAT 71.</b></p>	<p>Not applicable.</p>	<p>N/A</p>

Conclusions on BAT	Applicability Assessment (describe how the technique applies or not to your installation)	State whether it is in place or state schedule for implementation
<p>BAT for short-term open storage are one, or a proper combination, of the following techniques:</p> <ul style="list-style-type: none"> <li>moistening the surface using durable dust-binding substances, see Section 4.3.6.1</li> <li>moistening the surface with water, see Sections 4.3.6.1</li> <li>covering the surface, e.g., with tarpaulins, see Section 4.3.4.4.</li> </ul>	No external storage of solid materials	
<b>5.3.2 Enclosed storage</b>		
<p><b>BAT 72.</b></p> <p>BAT is to apply enclosed storage by using, for example, silos, bunkers, hoppers and containers. Where silos are not applicable, storage in sheds can be an alternative. This is, e.g., the case if apart from storage, the mixing of batches is needed.</p>	<p>Applicable</p> <p>Lime, activated carbon/clay, flue gas residue, and boiler ash are each stored in silos. These are be enclosed and equipped with self-cleaning (pneumatic) filters.</p> <p>Bottom ash is discharged from the furnace into a water bath and then via a conveyor to the ash hall which is an enclosed building. The waste tipping hall is also sometimes used for storage before being transferred to a collection truck using a front-end loader. All trucks leaving the facility to be securely covered to prevent any ash escaping.</p>	In place
<p><b>BAT 73.</b></p> <p>BAT for silos is to apply a proper design to provide stability and prevent the silo from collapsing. See Sections 4.3.4.1 and 4.3.4.5.</p>	<p>Applicable</p> <p>All silos are designed in accordance with best practice.</p>	In place
<p><b>BAT 74.</b></p> <p>BAT for sheds is to apply proper designed ventilation and filtering systems and to keep the doors closed. See Section 4.3.4.2.</p>	<p>Not Applicable</p> <p>No storage sheds. The bottom ash hall is part of the building and not an external storage unit.</p>	N/A
<p><b>BAT 75</b></p> <p>BAT is to apply dust abatement and a BAT associated emission level of 1 – 10 mg/m<sup>3</sup>, depending on the nature/type of substance stored. The type of abatement technique has to be decided on a case-by-case basis. See Section 4.3.7.</p>	<p>Applicable</p> <p>Self-cleaning (pneumatic) filters are employed for the storage of activated carbon/clay, lime, boiler ash, flue gas cleaning residue</p>	In place
<p><b>BAT 76.</b></p>	Not applicable	N/A

Conclusions on BAT	Applicability Assessment (describe how the technique applies or not to your installation)	State whether it is in place or state schedule for implementation
For a silo containing organic solids, BAT is to apply an explosion resistant silo (see Section 4.3.8.3), equipped with a relief valve that closes rapidly after the explosion to prevent oxygen entering the silo, as described in Section 4.3.8.4.	No organic solids in silos	
<b>5.3.4 Preventing incidents and (major) accidents</b>		
<p><b>BAT 77.</b></p> <p>BAT in preventing incidents and accidents is applying a safety management system as described in Section 4.1.7.1.</p>	<p>Applicable</p> <p>Indaver carries out Health and Safety Risk Assessments in order to identify health and safety risks at their sites and determine whether controls are required. These will be updated to incorporate the new facility. Indaver is certified to ISO 45001.</p> <p>The existing facility implements an EMS which outlines the operational controls to be in place to prevent incidents as well as the required corrective and preventative actions.</p> <p>In compliance with the Safety, Health and Welfare at Work Act 2005, Indaver will update the company safety statement covering the operation of the existing facility and proposed development and a full-time safety manager is employed at the site.</p>	<p>In place</p> <p>The proposed development will be incorporated into the site EMS.</p>
<b>5.4 Transfer and handling of solids</b>		
<b>5.4.1 General approaches to minimise dust from transfer and handling</b>		
<p><b>BAT 78.</b></p> <p>BAT is to prevent dust dispersion due to loading and unloading activities in the open air, by scheduling the transfer as much as possible when the wind speed is low. However, and taking into account the local situation, this type of measure cannot be generalised to the whole EU and to any situation irrespective of the possible high costs. See Section 4.4.3.1.</p>	<p>Not Applicable</p> <p>No loading/unloading activities of dusty materials occur in the open air.</p>	<p>N/A</p>
<p><b>BAT 79.</b></p> <p>When applying a mechanical shovel, BAT is to reduce the drop height and to choose the best position during discharging into a truck; see Section 4.4.3.4.</p>	<p>Applicable</p> <p>Bottom ash is transferred from the ash hall which is an enclosed building. The waste tipping hall is also sometimes used for storage before transfer to a collection truck using a front-end loader. All trucks leaving the</p>	<p>In place</p>

Conclusions on BAT	Applicability Assessment (describe how the technique applies or not to your installation)	State whether it is in place or state schedule for implementation
	facility will be securely covered to prevent any ash escaping.	
<b>BAT 80.</b> BAT then is to adjust the speed of vehicles on-site to avoid or minimise dust being swirled up; see Section 4.4.3.5.2.	Applicable Vehicles on site are subject to speed limits – note no significant dust generated by the activity.	In place
<b>BAT 81.</b> BAT for roads that are used by trucks and cars only, is applying hard surfaces to the roads of, for example, concrete or asphalt, because these can be cleaned easily to avoid dust being swirled up by vehicles, see Section 4.4.3.5.3. However, applying hard surfaces to the roads is not justified when the roads are used just for big shovel vehicles or when a road is temporary.	Applicable All access roads are hard standing surfaces (concrete or asphalt).	In place
<b>BAT 82.</b> BAT is to clean roads that are fitted with hard surfaces according to Section 4.4.6.12.	Applicable All roads are checked and cleaned periodically	In place
<b>BAT 83.</b> Cleaning of vehicle tyres is BAT. The frequency of cleaning and type of cleaning facility applied (see Section 4.4.6.13) has to be decided on a case-by-case basis.	Not applicable All deliveries come from the National Road Network.	N/A
<b>BAT 84.</b> Where it neither compromises product quality, plant safety, nor water resources, BAT for loading/unloading drift sensitive, wettable products is to moisten the product as described in Sections 4.4.6.8, 4.4.6.9 and 4.3.6.1. Risk of freezing of the product, risk of slippery situations because of ice forming or wet product on the road and shortage of water are examples when this BAT might not be applicable.	Applicable Lime, activated carbon/clay, flue gas residue, and boiler ash are each stored in silos. These are to be enclosed and equipped with self-cleaning (pneumatic) filters. Bottom ash is discharged from the furnace into a water bath and then via a conveyor to the ash hall which is an enclosed building. The waste tipping hall is also sometimes used for storage before being transferred to a collection truck using a front-end loader. All trucks leaving the facility to be securely covered to prevent any ash escaping.	In place
<b>BAT 85.</b> For loading/unloading activities, BAT is to minimise the speed of descent and the free fall height of the product; see Sections 4.4.5.6 and	Applicable	In place

Conclusions on BAT	Applicability Assessment (describe how the technique applies or not to your installation)	State whether it is in place or state schedule for implementation
<p>4.4.5.7 respectively. Minimising the speed of descent can be achieved by the following techniques that are BAT:</p> <ul style="list-style-type: none"> <li>installing baffles inside fill pipes</li> <li>applying a loading head at the end of the pipe or tube to regulate the output speed.</li> <li>applying a cascade (e.g., cascade tube or hopper)</li> <li>applying a minimum slope angle with, e.g., chutes.</li> </ul>	<p>Free fall of waste into the bunker from the tipping hall. Procedures are in place which outline how wastes are to be unloaded into the bunker.</p>	
<p><b>BAT 86.</b></p> <p>To minimise the free fall height of the product, the outlet of the discharger should reach down onto the bottom of the cargo space or onto the material already piled up. Loading techniques that can achieve this, and that are BAT, are:</p> <ul style="list-style-type: none"> <li>height adjustable fill pipes</li> <li>height adjustable fill tubes, and</li> <li>height adjustable cascade tubes.</li> </ul> <p>These techniques are BAT, except when loading/unloading non-drift sensitive products, for which the free fall height is not that critical.</p>	<p>Not Applicable</p> <p>Not expected to be relevant for the existing or proposed activities.</p>	<p>N/A</p>
<b>5.4.2 Considerations on transfer techniques</b>		
<p><b>BAT 87.</b></p> <p>For applying a grab, BAT is to follow the decision diagram as shown in Section 4.4.3.2 and to leave the grab in the hopper for a sufficient time after the material discharge.</p>	<p>Not Applicable</p> <p>Grab can only drop waste into the hopper. At all other times the grab remains in the bunker. Grab is not used for transfer of powders, etc., that may generate dust.</p>	<p>N/A</p>
<p><b>BAT 88.</b></p> <p>BAT for new grabs, is to apply grabs with the following properties (see Section 4.4.5.1):</p> <ul style="list-style-type: none"> <li>geometric shape and optimal load capacity</li> <li>the grab volume is always higher than the volume that is given by the grab curve.</li> <li>the surface is smooth to avoid material adhering, and</li> <li>a good closure capacity during permanent operation.</li> </ul>	<p>Not Applicable</p> <p>Grab can only drop waste into the hopper. At all other times the grab remains in the bunker. Grab is not used for transfer of powders, etc., that may generate dust.</p>	<p>N/A</p>
<p><b>BAT 89.</b></p>	<p>Applicable</p>	<p>In place</p>

Conclusions on BAT	Applicability Assessment (describe how the technique applies or not to your installation)	State whether it is in place or state schedule for implementation
<p>For all types of substances, BAT is to design conveyor to conveyor transfer chutes in such a way that spillage is reduced to a minimum. A modelling process is available to generate detail designs for new and existing transfer points. For more details see Section 4.4.5.5.</p>	<p>The design and operation of the conveyors has been in accordance with BAT.</p> <p>The conveyors are enclosed to prevent spillage, with the exception of the bottom ash conveyors, which have to be open as they are prone to blockages.</p>	
<p><b>BAT 90.</b></p> <p>For non or very slightly drift sensitive products (S5) and moderately drift sensitive, wettable products (S4), BAT is to apply an open belt conveyor and additionally, depending on the local circumstances, one or a proper combination of the following techniques:</p> <ul style="list-style-type: none"> <li>• lateral wind protection, see Section 4.4.6.1</li> <li>• spraying water and jet spraying at the transfer points, see Sections 4.4.6.8 and 4.4.6.9, and/or</li> <li>• belt cleaning, see Section 4.4.6.10.</li> </ul>	<p>Not applicable</p> <p>No open conveyors outside the main process building.</p>	<p>N/A</p>

Conclusions on BAT	Applicability Assessment (describe how the technique applies or not to your installation)	State whether it is in place or state schedule for implementation
<p><b>BAT 91.</b></p> <p>For highly drift sensitive products (S1 and S2) and moderately drift sensitive, not wettable products (S3) BAT for new situations, is to:</p> <p>apply closed conveyors, or types where the belt itself or a second belt locks the material (see Section 4.4.5.2), such as:</p> <ul style="list-style-type: none"> <li>• pneumatic conveyors</li> <li>• trough chain conveyors</li> <li>• screw conveyors</li> <li>• tube belt conveyor</li> <li>• loop belt conveyor</li> <li>• double belt conveyor</li> </ul> <p>or to apply enclosed conveyor belts without support pulleys (see Section 4.4.5.3), such as:</p> <ul style="list-style-type: none"> <li>• aero belt conveyor</li> <li>• low friction conveyor</li> <li>• conveyor with diabolos.</li> </ul> <p>The type of conveyor depends on the substance to be transported and on the location and has to be decided on a case-by-case basis.</p>	<p>Applicable</p> <p>Enclosed conveyors are used for the transfer of lime, activated carbon/clay, boiler ash, and flue gas cleaning residue.</p> <p>Raw materials are primarily conveyed pneumatically with screw conveyors linking the storage silos to the pneumatic enclosed conveying system.</p> <p>Boiler ash and flue gas cleaning residues are transported by a combination of enclosed screw conveyors and enclosed trough chain conveyors.</p>	<p>In place</p> <p>BAT to be in place for the proposed development.</p>
<p><b>BAT 92.</b></p> <p>For existing conventional conveyors, transporting highly drift sensitive products (S1 and S2) and moderately drift sensitive, not wettable products (S3), BAT is to apply housing; see Section 4.4.6.2. When applying an extraction system, BAT is to filter the outgoing air stream; see Section 4.4.6.4.</p>	<p>Not applicable</p> <p>Conventional conveyors are only used for the transfer of wetted bottom ash, which is not a highly drift-sensitive or moderately drift-sensitive material.</p>	<p>N/A</p>
<p><b>BAT 93.</b></p> <p>To reduce energy consumption for conveyor belts (see Section 4.4.5.2), BAT is to apply:</p> <ul style="list-style-type: none"> <li>• a good conveyor design, including idlers and idler spacing.</li> <li>• an accurate installation tolerance, and</li> <li>• a belt with low rolling resistance.</li> </ul>	<p>Applicable</p> <p>The design and operation of the proposed conveyors is in accordance with BAT</p>	<p>In place</p> <p>The design and operation of the proposed conveyors will be in accordance with BAT</p>