

INDAVER WASTE TO ENERGY FACILITY RINGASKIDDY – ASSESSMENT OF COMPLIANCE WITH CONCLUSIONS ON BEST AVAILABLE TECHNIQUES FROM THE BREF FOR EMISSIONS FROM STORAGE

The full and complete Emissions from Storage BAT reference document (July 2006) is available at the EIPPC Bureau website:
<http://eippcb.jrc.ec.europa.eu/reference/>

<p>SCOPE The storage and the transfer/handling of liquids, liquefied gases and solids.</p>
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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>5.1 Storage of liquids and Liquefied gases 5.1.1.1 General principles to prevent and reduce emissions</p>		
<p>BAT 1. BAT for a proper design is to take into account at least the following:</p> <ul style="list-style-type: none"> • the physico-chemical properties of the substance being stored • how the storage is operated, what level of instrumentation is needed, how many operators are required, and what their workload will be • how the operators are informed of deviations from normal process conditions (alarms) • how the storage is protected against deviations from normal process conditions (safety instructions, interlock systems, pressure relief devices, leak detection and containment, etc.) • what equipment has to be installed, largely taking account of past experiences of the product (construction materials, valve quality, etc.) • which maintenance and inspection plan needs to be implemented and how to ease the maintenance and inspection work (access, layout, etc.) 	<p>Applicable -</p> <p>Health and safety are an integral part of the facility's design. Hazard and operability studies (HAZOP's) will be carried out as part of the operational design phase in which hazards will be systematically identified and mitigation measures will be included. In compliance with the Safety, Health and Welfare at Work Act 2005, Indaver will update the company safety statement covering the operation of the new facility and will appoint safety representatives at the site.</p>	<p>Proposed facility – BAT to be in place prior to commencement.</p>

<ul style="list-style-type: none"> • 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.). 	<p>The process itself has undergone the relevant HAZOP's 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 will be 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 will be specified in order to be compatible to what is being stored.</p> <p>Tanks will be equipped with leak detection. Level alarms and leak detection (between layers for double skinned tanks, or level drops for single skinned tanks).</p> <p>All process parameters will be monitored and recorded by the Automated Control System.</p>	
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	<p>The emergency response team will be trained in emergency response and spill management and will follow the relevant procedures.</p> <p>An emergency response plan will be prepared prior to commencement which will outline the required actions to be undertaken in the event of an accident or incident.</p>	
<p>BAT 2. 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>Applicable -</p> <p>A maintenance schedule will be maintained on site for all process and service equipment.</p> <p>Process parameters of the furnace will be monitored to ensure the process is operating correctly.</p> <p>The HAZOP's carried out on the design will ensure that all necessary controls are in place to avoid any potential hazard.</p>	<p>Proposed facility – BAT to be in place prior to commencement.</p>
<p>BAT3. 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 – All process related tanks are located above ground.</p> <p>Tanks include aqueous ammonia, light fuel oil and aqueous waste.</p>	<p>Proposed facility – BAT to be in place prior to commencement.</p>

	Fire water retention and surface water attenuation tanks are located below ground.	
<p>BAT 4. 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 – Bulk tank storage of aqueous ammonia and light fuel oil will be protected in accordance with BAT.</p>	Proposed facility – BAT to be in place prior to commencement.
<p>BAT 5. 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 – Tank storage of aqueous ammonia, light fuel oil and aqueous waste.</p> <p>Tanks will be double skinned or banded and will be equipped with leak detection.</p> <p>The tanker unloading area, located adjacent to the fuel tank, will be 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 will be trained in spill management and spill kits will be readily available. 2 no. Class 1 Full Retention Hydrocarbon interceptors will be installed on the storm water drainage line draining surface water from the roads and hard stand areas to the firewater retention tank. The aqueous waste unloading area will be fully contained and not linked to the main drainage network on site. It will have the</p>	Proposed facility – BAT to be in place prior to commencement.

	<p>capacity to contain the contents of a full tanker (25m³),.</p> <p>All bulk chemical storage tanks will be equipped with relief vents.</p>	
<p>BAT 6. On sites where significant VOC emissions are to be expected, BAT includes calculating the VOC emissions regularly.</p>	Not applicable – no significant VOC emissions.	N/A
<p>BAT 7. BAT is to apply dedicated systems; see Section 4.1.4.4. <i>In ‘dedicated systems’, tanks and equipment are dedicated to one group of products. This means no changes in products. This makes it possible to install and use technologies specifically tailored to the products stored (and handled), thereby preventing and abating emissions efficiently and effectively.</i></p>	<p>Applicable –</p> <p>All tanks will be dedicated to specific substances.</p>	Proposed facility – BAT to be in place prior to commencement.
5.1.1.2 Tank specific considerations		
Open top tanks		
<p>BAT 8. If emissions to air occur, BAT is to cover the tank by applying:</p> <ul style="list-style-type: none"> • a floating cover, see Section 4.1.3.2 • a flexible or tent cover, see Section 4.1.3.3, or • a rigid cover, see Section 4.1.3.4. <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>	Not applicable – No open top tanks will be onsite	N/A
<p>BAT 9. 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>	Not applicable – No open top tanks will be onsite	N/A

External floating roof tank		
<p>BAT 10. 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>	Not applicable – No floating roof tanks	N/A
<p>BAT 11. 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>	Not applicable – No floating roof tanks	N/A
<p>BAT 12. 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>	Not applicable – No floating roof tanks	N/A
Fixed roof tanks		
<p>BAT 13. 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 tanks will be used for the storage of aqueous ammonia, light fuel oil (c. 3 x 1.5m³ tanks at the firewater pumps and 7m³ tank at the emergency generator), and aqueous waste. These are atmospheric tanks.</p> <p>The aqueous waste may or may not be volatile depending on the nature of the waste received. Vapours from the aqueous waste tank will vent to the furnace in accordance with BAT. There will be a piping connection between 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.</p>	Proposed facility – BAT to be in place prior to commencement.

	<p>The small light fuel oil tanks and the aqueous ammonia tank are equipped with free venting tank vents that vent to atmosphere. The ammonia tank is also 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>BAT 14. 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>Applicable - fixed roof tanks used for storing aqueous ammonia, light fuel oil and aqueous waste.</p> <p>There will be a piping connection between the aqueous waste tank and furnace installed 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>	Proposed facility – BAT to be in place prior to commencement.
<p>BAT 15. For tanks < 50 m³, BAT is to apply a pressure relief valve set at the highest possible value consistent with the tank design criteria.</p>	<p>Applicable – Pressure relief valves will be installed on all bulk chemical storage tanks.</p>	Proposed facility – BAT to be in place prior to commencement.
<p>BAT 16. 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 liquids with high levels of particulates are stored. Aqueous waste is filtered prior to being stored in the aqueous waste tank.</p>	N/A

Atmospheric horizontal tanks		
<p>BAT 17. 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>A horizontal fixed roof tank will be used for the storage of light fuel oil in the rear yard.</p> <p>The diesel tank will be equipped with a pressure relief vent that vents 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>Proposed facility – BAT to be in place prior to commencement.</p>
<p>BAT 18. 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"> • apply pressure vacuum relief valves; see Section 4.1.3.11 • up rate to 56 mbar; see Section 4.1.3.11 • apply vapour balancing; see Section 4.1.3.13 • apply a vapour holding tank, see Section 4.1.3.14, or • apply vapour treatment; see Section 4.1.3.15. <p>The selection of the vapour treatment technology has to be decided on a case-by-case basis.</p>	<p>Applicable – Additional atmospheric horizontal tanks will be compliant with BAT18 if installed.</p>	<p>Proposed facility – BAT to be in place prior to commencement.</p>
Pressurised storage		
<p>BAT 19. 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 – small volumes of pressurised gases for flue gas monitoring system only. No vapour treatment required. Bottles are fully sealed.</p>	<p>N/A</p>
Lifter roof tanks		
<p>BAT 20. For emissions to air, BAT is to (see Sections 3.1.9 and 4.1.3.14):</p>	<p>Not applicable - No lifter roof tanks</p>	<p>N/A</p>

<ul style="list-style-type: none"> • apply a flexible diaphragm tank equipped with pressure/vacuum relief valves, or • apply a lifter roof tank equipped with pressure/vacuum relief valves and connected to a vapour treatment installation. <p>The selection of the vapour treatment technology has to be decided on a case-by-case basis.</p>		
Underground and mounded tanks		
<p>BAT 21. 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>	Not applicable – underground tanks for surface water attenuation and firewater retention only.	N/A
<p>BAT 22. 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"> • apply pressure vacuum relief valves; see Section 4.1.3.11 • apply vapour balancing; see Section 4.1.3.13 • apply a vapour holding tank, see Section 4.1.3.14, or • apply vapour treatment; see Section 4.1.3.15. <p>The selection of the vapour treatment technology has to be decided on a case-by-case basis.</p>	Not applicable – underground tanks for surface water attenuation and firewater retention only.	N/A
5.1.1.3 Preventing incidents and (major) accidents		
<p>BAT 23. 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 operate a combined Quality, Environmental, Safety and Health (QESH) Management System. The QESH policies are high level documents which define Indaver’s environmental and health and safety objectives and set out the control of the possible impacts from the activities.</p> <p>Indaver carries out Health and Safety Risk Assessments in order to identify health and safety risks at their sites and</p>	Proposed facility – BAT to be in place prior to commencement.

	<p>determine whether controls are required. These will be updated to incorporate the new facility.</p> <p>The proposed facility will also implement an Environmental Management System (EMS) which will outline 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 new facility and will appoint safety representatives.</p>	
<p>BAT 24. 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 will be prepared for the new facility which will set out the requirements for emergency planning, training programmes, and emergency drill and exercise programmes.</p> <p>All staff will be fully qualified and fully trained, and all training records will be held on site. Training includes training staff on all relevant operating procedures, emergency response procedure, housekeeping, safety</p>	<p>Proposed facility – BAT to be in place prior to commencement.</p>

	procedures and other relevant EMS procedures.	
<p>BAT 25. BAT is to prevent corrosion by:</p> <ul style="list-style-type: none"> • selecting construction material that is resistant to the product stored • applying proper construction methods • preventing rainwater or groundwater entering the tank and if necessary, removing water that has accumulated in the tank • applying rainwater management to bund drainage • applying preventive maintenance, and • where applicable, adding corrosion inhibitors, or applying cathodic protection on the inside of the tank. 	<p>Applicable - Corrosive substances are used on-site.</p> <p>Corrosive substances are stored in small volumes in the self-bunded units.</p> <p>Flue gas residue is corrosive and is fully contained within the silos. Silos are constructed in accordance with the nature of the material and will be fully sealed. Preventative maintenance of the silos will be undertaken in accordance with Indaver's SOPs.</p> <p>The materials of construction 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 will be in place following commencement of the operation.</p>	Proposed facility – BAT to be in place prior to commencement.
<p>BAT 26. Additionally for an underground tank, BAT is to apply to the outside of the tank:</p> <ul style="list-style-type: none"> • a corrosion-resistant coating • plating, and/or • a cathodic protection system. 	Not applicable – no underground tanks containing corrosive substances	N/A

<p>BAT 27. BAT is to prevent stress corrosion cracking (SCC) by:</p> <ul style="list-style-type: none"> • stress relieving by post-weld heat treatment, see Section 4.1.6.1.4, and • applying a risk based inspection as described in Section 4.1.2.2.1. 	<p>Applicable - post-weld heat treatment will be conducted when necessary.</p>	<p>Proposed facility – BAT to be in place prior to commencement.</p>
<p>BAT 28. 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"> • high level or high pressure instrumentation with alarm settings and/or auto closing of valves is installed • proper operating instructions are applied to prevent overflow during a tank filling operation, and • sufficient ullage is available to receive a batch filling. 	<p>Applicable -</p> <p>The facility and the processes will be governed by SOPs and by the Automated Control System which controls all process parameters.</p> <p>Tanks are fitted with high level alarms to prevent overflowing.</p>	<p>Proposed facility – BAT to be in place prior to commencement.</p>
<p>BAT 29. BAT is to apply leak detection on storage tanks containing liquids that can potentially cause soil pollution.</p>	<p>Applicable -</p> <p>Where required, bulk chemical storage tanks (ammonia, fuel oil, aqueous waste) will be fitted with level alarms and switches to prevent overfills and unnecessary emissions.</p> <p>All process parameters will be controlled by the Automated Control System. The Automated Control System, as well as the appropriate periodic visual checks to be implemented, will allow leakages to be quickly and reliably recognised.</p> <p>Staff will be trained in emergency response including spill response and SOPs will be in place outlining appropriate spill response techniques.</p>	<p>Proposed facility – BAT to be in place prior to commencement.</p>

	<p>Spill kits will also be available at key points across the site.</p> <p>A site-specific Emergency Response Plan will be in place as required under condition of the IE licence.</p>	
<p>BAT 30. The risk-based approach to emissions to soil from an aboveground flat-bottom and vertical, storage tank containing liquids with a potency to pollute soil, is that soil protection measures are applied at such a level that there is a 'negligible risk' for soil pollution because of leakage from the tank bottom or from the seal where the bottom and the wall are connected.</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>External bulk chemical storage will consist of fuel oil, aqueous waste and aqueous ammonia. These bulk tanks 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>Proposed facility – BAT to be in place prior to commencement.</p>
<p>BAT 31. 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"> • tank bunds around single wall tanks; see Section 4.1.6.1.11 	<p>Applicable –</p> <p>External bulk chemical storage will consist of fuel oil, aqueous waste and aqueous ammonia. Bulk tanks will be</p>	<p>Proposed facility – BAT to be in place prior to commencement.</p>

<ul style="list-style-type: none"> • double wall tanks; see Section 4.1.6.1.13 • cup-tanks; see Section 4.1.6.1.14 • double wall tanks with monitored bottom discharge; see Section 4.1.6.1.15. 	<p>bunded or double skinned. Where required, bulk chemical storage tanks will be 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 will be trained in spill management and spill kits will be readily available. 2 no. Class 1 Full Retention Hydrocarbon interceptors will be installed on the stormwater drainage line draining surface water from the roads and hard stand areas to the firewater retention tank.</p>	
<p>BAT 32. 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 – New single walled tanks will be within concrete bunds sized in accordance with EPA guidelines.</p>	<p>Proposed facility – BAT to be in place prior to commencement.</p>
<p>BAT 33. 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</p>	<p>Not applicable – no existing tanks within bunds. New facility.</p>	<p>Proposed facility – BAT to be in place prior to commencement.</p>

<p>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>BAT 34. 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- No CHCs used or stored onsite.</p>	<p>N/A</p>
<p>BAT 35. BAT for underground and mounded tanks containing products that can potentially cause soil pollution is to:</p> <ul style="list-style-type: none"> • apply a double walled tank with leak detection, see Section 4.1.6.1.16, or • to apply a single walled tank with secondary containment and leak detection, see Section 4.1.6.1.17. 	<p>Applicable – 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 licenced 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 will be undertaken every 3 years in accordance with the requirements of the IE licence.</p>	<p>Proposed facility – BAT to be in place prior to commencement.</p>
<p>BAT 36. For toxic, carcinogenic or other hazardous substances, BAT is to apply full containment.</p>	<p>Applicable – a number of hazardous substances will be used onsite. Bulk tanks will be double skinned or stored within designated bunds and IBCs/drums will be stored within bunded units. The design of all bunds conforms to standard bunding specifications - BS8007:1987.</p>	<p>Proposed facility – BAT to be in place prior to commencement.</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.	
5.1.2. Storage of packaged dangerous substances		
<p>BAT 37. BAT in preventing incidents and accidents is to apply a safety management system as described in Sections 4.1.6.1. 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 – No dangerous substances stored in the Warehouse. The chemicals stored in the self-bunded units may be flammable/dangerous; however, these are stored away from the Warehouse.</p> <p>Indaver will operate under an EMS 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>	Proposed facility – BAT to be in place prior to commencement.
<p>BAT 38. BAT is to appoint a person or persons who is or are responsible for the operation of the store.</p>	<p>Applicable – No dangerous substances stored in the Warehouse. The chemicals stored in the self-bunded units may be flammable/dangerous; however, these are stored away from the Warehouse.</p>	Proposed facility – BAT to be in place prior to commencement.

	Appropriate staff are employed to run the warehouse and other storage areas at the facility.	
<p>BAT 39. 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 – No dangerous substances stored in the Warehouse. The chemicals stored in the self-bunded units may be flammable/dangerous; however, these are stored away from the Warehouse.</p> <p>Staff are fully trained in site procedures, including all SOPs and emergency response and safety procedures in relation to the storage and handling of all substances being used at the facility.</p>	Proposed facility – BAT to be in place prior to commencement.
<p>BAT 40. 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 – No dangerous substances stored in the Warehouse. The chemicals stored in the self-bunded units may be flammable/dangerous; however, these are stored away from the Warehouse.</p> <p>The units are self-bunded, covered, and lockable units.</p>	Proposed facility – BAT to be in place prior to commencement.
<p>BAT 41. 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 – 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>	Proposed facility – BAT to be in place prior to commencement.

	<p>A full programme of HAZOP studies to cover all process steps will be 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>BAT 42. BAT is to separate and/or segregate incompatible substances. For the compatible and incompatible combinations see Annex 8.3.</p>	<p>Applicable – 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) will be separated.</p>	<p>Proposed facility – BAT to be in place prior to commencement.</p>
<p>BAT 43. 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 – Firewater retention tank will be provided.</p> <p>A monitoring station will be 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>Proposed facility – BAT to be in place prior to commencement.</p>

<p>BAT 44. 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 proposed facility has been designed and provided with adequate fire protection and detection systems.</p> <p>The fire-fighting system will include 4 no. water cannons in the waste bunker. All firewater, discharged from the canons, will be contained in the bunker.</p> <p>Sprinklers will be in place for the hopper.</p> <p>A firewater retention tank will be provided which has been designed to capture potentially contaminated firewater.</p>	<p>Proposed facility – BAT to be in place prior to commencement.</p>
<p>BAT 45. 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 will be installed across the site. These measures are based on tried and tested systems at Indaver’s existing sites.</p> <p>This will include infrared detectors in the waste bunker. In the event of a fire, an alarm will be activated in the control room. 4 no. water cannons will be available in the waste bunker for suppression of a fire.</p> <p>The hopper and the furnace will be installed with infrared detectors and in</p>	<p>Proposed facility – BAT to be in place prior to commencement.</p>

	<p>the event of a fire, sprinklers over the hopper will turn on automatically.</p> <p>The ram for feeding waste into the furnace will be equipped with a fire damper above it, which activates when the temperature exceeds a set level.</p>	
<p>BAT 46. 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 a dedicated smoking area.</p> <p>Operatives will require a permit to work and as such will identify any potential hazards in order to work safely.</p>	<p>Proposed facility – BAT to be in place prior to commencement.</p>
<p>5.1.3 Basins and lagoons</p>		
<p>BAT 47. 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"> • a plastic cover; see Section 4.1.8.2 • a floating cover; see Section 4.1.8.1, or • only small basins, a rigid cover; see Section 4.1.8.2. <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 – no basins/lagoons onsite</p>	<p>N/A</p>
<p>BAT 48. 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 – no basins/lagoons onsite</p>	<p>N/A</p>

<p>BAT 49. 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 – no basins/lagoons onsite</p>	<p>N/A</p>
<p>5.2 Transfer and handling of liquids and liquefied gases 5.2.1 General principles to prevent and reduce emissions</p>		
<p>BAT 50. 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>Applicable – transfer of liquids</p> <p>A maintenance schedule is maintained on site for all process and service equipment. The 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>Proposed facility – BAT to be in place prior to commencement.</p>
<p>BAT 51. 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 – Bulk storage tanks will be 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 will be to standard bunding specifications - BS8007:1987.</p>	<p>Proposed facility – BAT to be in place prior to commencement.</p>

	<p>Bund and pipeline testing using a hydraulic test will be undertaken at least every 3 years and will be included in the annual environmental report for the site.</p>	
<p>BAT 52. 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 – External bulk chemical storage will be in place.</p> <p>Handling and transfer of fuel and chemicals will be carefully controlled.</p> <p>The tanker unloading area, located adjacent to the fuel tank, will be provided with bunds 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>An emergency response plan will be in place as required under condition of the existing IE licence.</p>	<p>Proposed facility – BAT to be in place prior to commencement.</p>

<p>BAT 53. 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.</p> <p>The proposed facility will also implement a site specific EMS which will outline the operational controls to be in place to prevent incidents as well as the required corrective and preventative actions.</p>	<p>Proposed facility – BAT to be in place prior to commencement.</p>
<p>BAT 54. 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 will be fully qualified and fully trained. All training records will be held on site. Training will include training staff on all relevant procedures, emergency response procedure, housekeeping, safety procedures and other relevant EMS procedures.</p>	<p>Proposed facility – BAT to be in place prior to commencement.</p>
<p>5.2.2 Considerations on transfer and handling techniques 5.2.2.1 Piping</p>		
<p>BAT 55. BAT is to apply aboveground closed piping in new situations, see Section 4.2.4.1. 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 – The facility will use aboveground closed piping for all transfer of materials (excluding stormwater).</p> <p>Above ground piping will be fully welded and pressure tested, and regular</p>	<p>Proposed facility – BAT to be in place prior to commencement.</p>

	<p>inspections will be conducted. Above ground pipelines will be above continuous hard stand.</p> <p>Underground pipelines will be provided for stormwater only. Pipeline testing using a hydraulic test will be undertaken at least every 3 years and the results will be included in the annual environmental report for the site.</p>	
<p>BAT 56. 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>Applicable –</p> <p>Pipelines will be installed in accordance with BAT with welded connections to be used where practical.</p>	<p>Proposed facility – BAT to be in place prior to commencement.</p>
<p>BAT 57. BAT for bolted flange connections (see Section 4.2.2.2.) include:</p> <ul style="list-style-type: none"> • fitting blind flanges to infrequently used fittings to prevent accidental opening • using end caps or plugs on open-ended lines and not valves • ensuring gaskets are selected appropriate to the process application • ensuring the gasket is installed correctly • ensuring the flange joint is assembled and loaded correctly • where toxic, carcinogenic or other hazardous substances are transferred, fitting high integrity gaskets, such as spiral wound, kamm profile or ring joints. 	<p>Applicable –</p> <p>Where bolted flange connections are used, pipelines will be 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 will be used.</p>	<p>Proposed facility – BAT to be in place prior to commencement.</p>
<p>BAT 58. BAT is to prevent corrosion by:</p> <ul style="list-style-type: none"> • selecting construction material that is resistant to the product • applying proper construction methods 	<p>Applicable –</p> <p>The pipelines will be designed for their use and will be installed / constructed in</p>	<p>Proposed facility – BAT to be in place prior to commencement.</p>

<ul style="list-style-type: none"> • applying preventive maintenance, and • where applicable, applying an internal coating or adding corrosion inhibitors. 	<p>accordance with manufacturers recommendations and proper construction methods.</p> <p>Corrosion inhibitors will be used where applicable. This will depend on the design and whether an open or a closed cooling system is used for example.</p> <p>Bund and underground pipeline testing using a hydraulic test will be undertaken at least every 3 years in accordance with the requirements of the IE licence, and the results will be included in the annual environmental report (AER) for the site to be submitted to the Agency.</p>	
<p>BAT 59. 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 will be in designed and installed in accordance with BAT. The numbers of layers on above ground piping will be decided on during detailed design.</p>	<p>Proposed facility – BAT to be in place prior to commencement.</p>
5.2.2.2 Vapour treatment		
<p>BAT 60. 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 aqueous waste tank will be vented to main process building where it ties into the secondary air system and will vent into the furnace.</p>	<p>Proposed facility – BAT to be in place prior to commencement.</p>

	Vapor treatment is not required for other bulk storage tanks containing diesel and aqueous ammonia.	
5.2.2.3 Valves		
<p>BAT 61. BAT for valves include:</p> <ul style="list-style-type: none"> • correct selection of the packing material and construction for the process application • with monitoring, focus on those valves most at risk (such as rising stem control valves in continual operation) • applying rotating control valves or variable speed pumps instead of rising stem control valves • where toxic, carcinogenic or other hazardous substances are involved, fit diaphragm, bellows, or double walled valves • route relief valves back into the transfer or storage system or to a vapour treatment system. 	<p>Applicable –</p> <p>All valves will be fit for purpose and will be considered in the process HAZOP. All valves will be installed by a qualified contractor and will also be commissioned and tested. All valves will be inspected as part of the preventive maintenance schedule.</p>	<p>Proposed facility – BAT to be in place prior to commencement.</p>
5.2.2.4 Pumps and compressors		
<p>BAT 62. The following are some of the main factors which constitute BAT:</p> <ul style="list-style-type: none"> • proper fixing of the pump or compressor unit to its base-plate or frame • having connecting pipe forces within producers’ recommendations • proper design of suction pipework to minimise hydraulic imbalance • alignment of shaft and casing within producers’ recommendations • alignment of driver/pump or compressor coupling within producers’ recommendations when fitted • correct level of balance of rotating parts • effective priming of pumps and compressors prior to start-up • operation of the pump and compressor within producers’ recommended performance range (The optimum performance is achieved at its best efficiency point.) 	<p>Applicable -</p> <p>All pumps and compressors will be fit for purpose and will be considered in the process HAZOP. All pumps/compressors will be installed by a qualified contractor and will also be commissioned and tested. All pumps will be inspected as part of the preventive maintenance schedule.</p>	<p>Proposed facility – BAT to be in place prior to commencement.</p>

<ul style="list-style-type: none"> • the level of net positive suction head available should always be in excess of the pump or compressor • regular monitoring and maintenance of both rotating equipment and seal systems, combined with a repair or replacement programme. 		
<p>BAT 63. 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 bellow pumps. For more details see Sections 3.2.2.2, 3.2.4.1 and 4.2.9.</p>	<p>Applicable – All pumps will be sized, selected and purchased for their dedicated systems. This includes the type of seals required for each system.</p>	<p>Proposed facility – BAT to be in place prior to commencement.</p>
<p>BAT 64. BAT for compressors transferring non-toxic gases is to apply gas lubricated mechanical seals.</p>	<p>Applicable – ambient air only. Compressors will be designed and installed in accordance with BAT</p>	<p>Proposed facility – BAT to be in place prior to commencement.</p>
<p>BAT 65. 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 – compressors are for air only</p>	<p>N/A</p>
<p>BAT 66. In very high pressure services, BAT is to apply a triple tandem seal system.</p>	<p>Not Applicable – no very high pressure services.</p>	<p>N/A</p>
<p>5.2.2.5 Sampling connections</p>		
<p>BAT 67. 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 lines require purging, BAT is to apply closed-loop sampling lines. See Section 4.2.9.14.</p>	<p>Not applicable – no sampling of volatile products as part of the installation. Sampling of the aqueous waste in the road tankers is sampled 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</p>	<p>N/A</p>

	sample with a core sampler. In this instance BAT 67 is not applicable.	
5.3 Storage of solids 5.3.1 Open storage		
BAT 68. 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.	Applicable- lime, activated carbon, flue gas residue, and boiler ash will each be stored in silos. These will be enclosed and will be equipped with HEPA filters. Preventative maintenance will be planned to check the efficacy of these filters.	Proposed facility – BAT to be in place prior to commencement.
BAT 69. 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.	Not applicable – no external storage of solid materials	NA
BAT 70. BAT for long-term open storage are one, or a proper combination, of the following techniques: <ul style="list-style-type: none"> • moistening the surface using durable dust-binding substances, see Section 4.3.6.1 • covering the surface, e.g. with tarpaulins, see Section 4.3.4.4 • solidification of the surface, see Table 4.13 • grassing-over of the surface, see Table 4.13. 	Not applicable – no external storage of solid materials	NA
BAT 71. BAT for short-term open storage are one, or a proper combination, of the following techniques: <ul style="list-style-type: none"> • moistening the surface using durable dust-binding substances, see Section 4.3.6.1 • moistening the surface with water, see Sections 4.3.6.1 	Not applicable – no external storage of solid materials	NA

<ul style="list-style-type: none"> • covering the surface, e.g. with tarpaulins, see Section 4.3.4.4. 		
5.3.2 Enclosed storage		
<p>BAT 72. 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 – lime, activated carbon, flue gas residue, and boiler ash will each be stored in silos. These will be enclosed and will be equipped with HEPA filters.</p> <p>Bottom ash will be discharged from the furnace into a water bath and then via a conveyor to the ash hall where it will be stored for a maximum of 30 days before being transferred to a collection truck using a front-end loader. All trucks leaving the facility will be securely covered to prevent any ash escaping.</p>	<p>Proposed facility – BAT to be in place prior to commencement.</p>
<p>BAT 73. 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 – all silos are designed in accordance with best practice.</p>	<p>Proposed facility – BAT to be in place prior to commencement.</p>
<p>BAT 74. 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 – No storage sheds. The bottom ash hall is part of the building and not an external storage unit.</p>	<p>N/A</p>
<p>BAT 75 BAT is to apply dust abatement and a BAT associated emission level of 1 – 10 mg/m³, 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- HEPA filter is present for the storage of activated carbon, boiler ash, flue gas cleaning residue</p>	<p>Proposed facility – BAT to be in place prior to commencement.</p>
<p>BAT 76. 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.</p>	<p>Not applicable – no organic solids in silos</p>	<p>N/A</p>

5.3.4 Preventing incidents and (major) accidents		
<p>BAT 77. 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 operate a combined Quality, Environmental, Safety and Health (QESH) Management System. The QESH policies are high level documents which define Indaver's environmental and health and safety objectives and set out the control of the possible impacts from the activities.</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.</p> <p>The proposed facility will also implement an EMS which will outline 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 new facility and will appoint safety representatives.</p>	<p>Proposed facility – BAT to be in place prior to commencement.</p>

<p>5.4 Transfer and handling of solids 5.4.1 General approaches to minimise dust from transfer and handling</p>		
<p>BAT 78. 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 – No loading/unloading activities of dusty materials occur in the open air.</p>	<p>N/A</p>
<p>BAT 79. 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 - Bottom ash will be transferred from the ash hall to a collection truck using a front-end loader. All trucks leaving the facility will be securely covered to prevent any ash escaping.</p>	<p>N/A</p>
<p>BAT 80. 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.</p>	<p>Applicable – Vehicles on site will be subject to speed limits – note no significant dust generated by the activity.</p>	<p>Proposed facility – BAT to be in place prior to commencement.</p>
<p>BAT 81. 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.</p>	<p>Applicable – All access roads are hard standing surfaces (concrete or asphalt)</p>	<p>Proposed facility – BAT to be in place prior to commencement.</p>

<p>BAT 82. BAT is to clean roads that are fitted with hard surfaces according to Section 4.4.6.12.</p>	<p>Applicable – All roads are checked and cleaned periodically.</p>	<p>Proposed facility – BAT to be in place prior to commencement.</p>
<p>BAT 83. 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.</p>	<p>Not applicable – It is not anticipated that vehicles will be dirty when entering or leaving the site during normal operations. All deliveries will be coming from the National Road Network.</p>	<p>N/A</p>
<p>BAT 84. 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.</p>	<p>Applicable - Bottom ash will be discharged from the furnace into a water bath and then via a conveyor to the ash hall where it will be stored for a maximum of 30 days before being transferred to a collection truck using a front-end loader. All trucks leaving the facility will be securely covered to prevent any ash escaping.</p>	<p>Proposed facility – BAT to be in place prior to commencement.</p>
<p>BAT 85. 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 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"> • installing baffles inside fill pipes • applying a loading head at the end of the pipe or tube to regulate the output speed • applying a cascade (e.g. cascade tube or hopper) • applying a minimum slope angle with, e.g. chutes. 	<p>Applicable – Free fall of waste into the bunker from the tipping hall. Procedures will be in place which outline how wastes are to be unloaded into the bunker.</p>	<p>Proposed facility – BAT to be in place prior to commencement.</p>

<p>BAT 86. 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"> • height adjustable fill pipes • height adjustable fill tubes, and • height adjustable cascade tubes. <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 proposed activity.</p>	<p>N/A</p>
<p>5.4.2 Considerations on transfer techniques</p>		
<p>BAT 87. 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>BAT 88. 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"> • geometric shape and optimal load capacity • the grab volume is always higher than the volume that is given by the grab curve • the surface is smooth to avoid material adhering, and • a good closure capacity during permanent operation. 	<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>BAT 89. 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>Applicable -</p> <p>The design and operation of the conveyors will be in accordance with BAT.</p>	<p>Proposed facility – BAT to be in place prior to commencement.</p>

	The conveyors are enclosed to prevent spillage.	
<p>BAT 90. 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"> • lateral wind protection, see Section 4.4.6.1 • spraying water and jet spraying at the transfer points, see Sections 4.4.6.8 and 4.4.6.9, and/or • belt cleaning, see Section 4.4.6.10. 	<p>Not applicable –</p> <p>No open conveyors outside the main process building.</p>	N/A
<p>BAT 91. 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"> • pneumatic conveyors • trough chain conveyors • screw conveyors • tube belt conveyor • loop belt conveyor • double belt conveyor <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"> • aerobelt conveyor • low friction conveyor • conveyor with diabolos. <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 will be used for the transfer of lime, activated carbon, boiler ash, and flue gas cleaning residue.</p> <p>These will be screw conveyors, trough chain conveyors, and / or loop belt conveyors.</p>	Proposed facility – BAT to be in place prior to commencement.

<p>BAT 92. 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 – No existing conventional conveyors.</p>	<p>Proposed facility – BAT to be in place prior to commencement.</p>
<p>BAT 93. To reduce energy consumption for conveyor belts (see Section 4.4.5.2), BAT is to apply:</p> <ul style="list-style-type: none"> • a good conveyor design, including idlers and idler spacing • an accurate installation tolerance, and • a belt with low rolling resistance. 	<p>Applicable The design and operation of the conveyors will be in accordance with BAT. The conveyors are enclosed to prevent spillage.</p>	<p>Proposed facility – BAT to be in place prior to commencement.</p>