



**ACCIDENT MANAGEMENT PLAN**  
**Biomass UK No.2 Ltd**

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#### VERSION CONTROL RECORD

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# 1 INTRODUCTION

This document has been prepared for Biomass UK No.2 Ltd and forms an Accident Management Plan in support of a New Bespoke Installation Permit Application for a renewable energy generation facility that incorporates Advanced Thermal Treatment (ATT, gasification) at their site on Woodham Road, Barry.

The Advanced Thermal Treatment (ATT) plant is designed to process shredded mixed waste wood feedstocks to produce heat to raise steam in a conventional tube boiler for utilisation in a steam turbine for the production of renewable electricity with an export capacity up to 10MWe.

The Installation has been designed to process approximately 86,400 tonnes of non-hazardous mixed waste wood per annum.

This Accident Management Plan has been produced in accordance with the Natural Resources Wales guidance Document *'How to comply with your Environmental Permit'*.

It is stipulated under this guidance document that the Accident Management Plan fulfils the following four key requirements:

- Identifies events or failures that could damage the environment
- Assesses how likely they are to happen and the potential environmental consequences
- Actions to minimise the potential causes and consequences of accidents
- The actions that are required to be carried out if an accident happens.

This Accident Management Plan has been implemented and maintained at the site as part of the company's Environmental Management System and will ensure the site and all operatives within are fully prepared for such incidents.

A number of the control measures cited within this document refer the operators established suite of Environmental Procedures and new procedures which have been drafted in response to the proposed new operations at site (BUK-E01 to BUK-E08).

These documents should be referred to for detailed actions in relation to emergency response and control.

- BUK-SWP
- BUK-E01 Pre-Acceptance;
- BUK-E02 Waste Acceptance;
- BUK-E03 Waste Rejection;
- BUK-E04 Off Site Waste Transfer;
- BUK-E05 Waste Reception and Storage;
- BUK-E06 Environmental Records;

- BUK-E07 Environmental Management and Monitoring;
- BUK-E08 Infrastructure Management and Monitoring; and
- BUK-E10 Fire Prevention Plan.

The Accident Management Plan and all associated procedures will be reviewed at least every four years or as soon as practicable after an incident, with changes made accordingly to minimise the risk of occurrence / recurrence.

All of the necessary actions that are required to be taken in the event of an accident will be detailed within the detailed Site Emergency Procedures.

## 2 RISK MAGNITUDE ESTIMATIONS

The Accident Management Plan (Table 2.2 overleaf) has adopted a risk assessment approach to each potential hazard by combining the probability and magnitude of the potential risk to give an estimation of the risk prior to any mitigation measures. The risk management measures, which are designed to reduce the likelihood of occurrence, are then detailed followed by an estimation of the actual risk post-mitigation (Residual Risk Rating).

The DEFRA guide to risk assessment<sup>1</sup> indicates the approach of subjectively classifying the magnitude of potential consequences into four categories depending upon the degree of the impact that the potential risk could have and the context in which the risk is being assessed. The classification is used as a guide in this Risk Assessment.

The four categories are as follows:

- **Severe:** Possible irreparable damage to environmental resources;
- **Moderate:** Possible damage to environmental resources which are limited within a regional context;
- **Mild:** Possible effects might be transient damage to environmental resources which are commonplace on a regional basis and alternative sources are readily available;
- **Negligible:** The effects are negligible or might cause very slight temporary deterioration in the current environmental resource quality.

The matrix shown below considers the probability of the potential risk against the magnitude of the potential impact, thereby giving an estimation of the resulting likelihood of the risk occurring.

Probability of potential Risk	Magnitude of Potential Impact			
	Severe	Moderate	Mild	Negligible
High	High	High	Medium/Low	Near Zero
Medium	High	Medium	Low	Near Zero
Low	Medium	Medium	Low	Near Zero
Negligible	Medium	Medium/Low	Low	Near Zero

The qualitative risk assessment for the Accident Management Plan has been based on the matrix outlined above.

The final stage of the risk assessment is the judgement of the severity of the residual risk following implementation of the mitigation measures.

The entire plant has been subject to HAZOP and has been designed to fail safe.

<sup>1</sup> A Guide to Risk Assessment and the Risk Management for Environmental Protection, 1995.

**Table 2.2: Accident Management Plan**

Accident Scenario	Probability of Accident Occurring	Magnitude of Potential Impact	Risk Rating before mitigation	Risk Management	Residual Risk Rating (following Mitigation)
1 - Spills and Leaks / Loss of Containment / Transfer of Substances / Overfilling of Vessels	Medium	<p>Moderate to Severe</p> <p>Spillage and leakage could occur during fuel deliveries, vehicle refuelling, vehicle breakdowns/ accidents and or damage to tanks or bunds;</p> <p>Loss of containment could result in potentially polluting liquids (including oils) being discharged in surface water drainage systems and to controlled waters;</p>	Low	<ul style="list-style-type: none"> <li>The site is entirely sealed hardstanding with fully contained and sealed drainage and therefore considered to have a low potential for impacts to ground water;</li> <li>A sealed drainage and containment system for tanks containing potentially polluting liquids has been constructed so that any leaks / spills are contained;</li> <li>Electronic monitoring (i.e. level gauges, feedback loops etc) shall be installed on all vessels;</li> <li>All delivery areas are contained within a sealed drainage and containment system that incorporates bund walls, appropriate falls and drains;</li> <li>All storage vessels have been constructed to the appropriate British Standard;</li> <li>Tanks are inspected visually on a daily basis by site staff to ensure continued integrity of tanks, and identify any necessary remedial action;</li> <li>Minor spills to be cleaned up immediately, using sand or proprietary absorbent. Resultant materials to be placed in container for off-site disposal to appropriate facility, if necessary;</li> <li>Immediate action to be taken in event of major spill which is likely to cause polluting emissions to the environment to prevent liquid from entering surface water drains or any adjacent unsurfaced ground. Spillage to be cleared immediately and placed in containers for offsite disposal. NRW to be informed;</li> <li>The plant has been designed in order to include an automated shutdown facility; and</li> </ul>	Low

				<ul style="list-style-type: none"> <li>The company has established accident and emergency procedures.</li> </ul>	
2 - Vandalism	Medium	Moderate  The site could be subject to intentional vandalism and damage by intruders/ trespassers who could cause damage or harm to the plant and equipments, spills and leaks to tanks.	Medium	<ul style="list-style-type: none"> <li>On-site security measures:</li> <li>Security lighting 24 hours a day;</li> <li>Security cameras are installed at key areas of the site;</li> <li>Security fencing extends around the site perimeter;</li> <li>2m palisade or equivalent;</li> <li>Lockable gates are located at the site entrance;</li> <li>Gates will be locked whenever the site is closed;</li> <li>Gates and fencing are inspected daily by operations staff to identify deterioration and damage and the need for repair;</li> <li>Fencing and gates are maintained and repaired to ensure their continued integrity. If damage is sustained, repair will be made within the same working day. If this is not possible, suitable measures will be taken to prevent unauthorised access to the site and permanent repairs will be affected as soon as is practicable;</li> <li>All visitors to the site are required to register in the visitor's book and sign out again on exit, thereby minimising the risk of unauthorised visitors on the site; and</li> <li>Operational procedures have been implemented including regular inspections, ensuring continual monitoring of security provision at the site.</li> </ul>	Low
3 - Flooding	Low: The site lies within an area no	Moderate	Medium	<ul style="list-style-type: none"> <li>The site is equipped with a sealed drainage and bunding systems which will prevent the inflow of offsite flood water into critical areas (bunds, tanks, storage etc.); and</li> <li>In cases of extreme rainfall, only the sites SUDS measures will control and release all water falling on site such that off site flooding is minimise.</li> </ul>	Low
4 - Fire in gasification plant:  Plant malfunction;  Electrical equipment that could provide an ignition source;	Medium	Severe	Medium	<ul style="list-style-type: none"> <li>All plant is subject to a planned preventative maintenance schedule;</li> <li>The plant has significant control and safety systems all of which are interlocked to ensure a very controlled shutdown in the event that the plant undergoes operational difficulties;</li> <li>All plant has been specified to be intrinsically safe and earthed in accordance to best practice;</li> <li>All aspects of the plant and buildings are constructed of non</li> </ul>	Low

<p>Waste products / raw materials that may support combustion.</p>				<p>combustible materials;</p> <ul style="list-style-type: none"> <li>• The plant has been designed to shut down (fail safe) in the event of an emergency (all gases will be directed to Emergency Flare);</li> <li>• Containment system: all tanks and vessels containing flammable and potentially polluting liquids are constructed so that any leaks/spillages are contained and responded to in accordance with established emergency procedures;</li> <li>• Fire suppression, detecting and monitoring systems have been installed;</li> <li>• Separation of combustible materials from the source prior to processing: <ul style="list-style-type: none"> <li>– All waste feedstock is stored within the reception area of the wood storage building.</li> <li>– All flammable process consumables shall be stored in bunded tanks.</li> </ul> </li> <li>• In the event of a fire, the following actions will be taken: <ul style="list-style-type: none"> <li>– The fire brigade will be notified immediately and the NRW as soon as practicable.</li> <li>– All containment valves and systems will be closed.</li> <li>– The site will be immediately evacuated.</li> </ul> </li> <li>• Records of fire incidences will be kept on site together with a summary of remedial action taken;</li> <li>• The NRW will be advised of all incidents of fire as soon as is practicable;</li> <li>• Smoking will not be permitted in the operations areas of the site;</li> <li>• Automated fire detection and control systems have been installed.</li> </ul>	
<p>5 - Incompatible Feedstock/ Unwanted Reactions: Some of the raw materials and waste inputs at the site could contain impurities that impede / prevent the gasification process.</p>	<p>Low</p>	<p>Moderate / Severe</p>	<p>Low</p>	<p>The following methods will be implemented to ensure that incompatible feedstocks do not compromise the safe operation of the plant:</p> <ul style="list-style-type: none"> <li>• All wastes accepted onto site have been subject to 'pre-acceptance' in accordance to established procedure BUK-E01;</li> <li>• All incoming wastes are inspected in accordance with established procedure BUK-E02;</li> <li>• When in the waste reception area, any non conforming waste</li> </ul>	<p>Low</p>

				<p>will be removed prior to acceptance in accordance with established procedure BUK-E03; and</p> <ul style="list-style-type: none"> <li>Records of incidents involving incompatible compatible will be kept on site together with a summary of the remedial action taken.</li> </ul>	
<p>6 - Failure of Mains Services: Failure in the mains services, water or electricity.</p>	Medium	Low	Low	<p>In the event that mains services of water and electricity supplied to the site are unavailable, the following actions will occur:</p> <ul style="list-style-type: none"> <li>In the event of sudden disconnection of the grid the ID fan will cease to operate, thus no emissions will be released to atmosphere;</li> <li>All conveyors will cease operating so no further transfer of material can occur;</li> <li>The software control systems are all backed up with an Unlimited Power Supply system that will ensure that a controlled shutdown takes place; and</li> <li>The boiler plant shall shutdown, thus rendering the plant inoperable.</li> </ul>	Negligible
<p>7 - Operator Error / Failure of Equipment:</p> <p>The unexpected breakdown of any part of the plant could result in short term build up of waste in the reception area or the incomplete treatment of waste.</p> <p>The result of operator error could result in the plant not functioning efficiently.</p>	Medium	Low	Low	<p>The plant has been designed with a number of fail safe and automatic shutdown systems, where appropriate.</p> <ul style="list-style-type: none"> <li>The design of the plant only includes sufficient storage capacity for approximately 3 days' production and waste storage;</li> <li>Should the above storage capacity be exceeded, incoming waste will be diverted to landfill as per current/historical practice.</li> </ul> <p><i>The above capacity measures allow waste to be received while equipment repairs are affected.</i></p> <ul style="list-style-type: none"> <li>All equipment is subject to a Planned and Preventative Maintenance Programme (PPM), to minimise unplanned failures (BUK-E08 Infrastructure Monitoring and Management Programme)</li> <li>The plant also has in place a number of Emergency Shutdown Controls to ensure safe shut down in emergency.</li> </ul>	Negligible

### 3 SUMMARY & CONCLUSION

This document has been prepared to meet the requirements pertaining to Accident Management Plans within the Natural Resources Wales (NRW) guidance document '*How to Comply with your Permit*'.

It is concluded that despite the Installation having the potential for a low-moderate environmental impact to the environment, the mitigation measures incorporated into the design of the plant and the site infrastructure are sufficient to mitigate the risks.

The design of the site has been subject to a number of detailed design review processes including HAZOP. The findings of the HAZOP assessment have all been incorporated into the design of the plant.

The company will operate using a suite of procedures for the control and management of all materials and plant in use at the facility.

These procedures will detail the required actions to be taken in the event of an emergency and should be used in the first instance for any accident and emergency at site.