Prompt Sheet - This sheet should only be used for guidance, in order for you to complete your own risk assessment for the operation of a Bio Mass Wood Pellet Boiler

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|  | **Hazard**  Something with a potential to cause harm. | ✓  **If hazard exists**  **and who it could harm** | **Suggested action/control measure**  These are some of the measures that will help control the risks. Select the most appropriate controls for your circumstances. |
| 01. | Inappropriate maintenance regime leading to worn components, possible blockages within the system which has the potential to cause a dust concentration which could lead to an explosion and a build up of Carbon Monoxide (CO). |  | Ensure the boiler and pellet feed mechanism etc is cleaned and serviced by a competent person as specified by the manufacturers’ instructions. (usually carried out annually)  **Regular maintenance by user:** (follow manufacturers instructions)  Regular weekly visual inspection.  Regular emptying of the ash bins.  Regular greasing of induced draught fan bearings.  Manual brushing of the flueways. |
| 02. | Build-up of CO leading to Carbon Monoxide Poisoning. |  | Appropriate controls to ensure safe entry for working in confined spaces. See HSE document: [Safe Work in Confined Spaces](http://www.hse.gov.uk/pubns/priced/l101.pdf)  Implement a permit to work system as part of the working in confined spaces procedures and follow method statement for safe entry to storage area.  Suitable work activity risk assessment/method statement is in place and reviewed as necessary.  Appropriate restricted access to the storage area, e.g. interlocking key to entry doors.  Only appropriately trained competent persons in confined space procedures to enter the storage area.  Adequate ventilation of the storage area (must be ventilated at all times, either mechanically or by being designed to have a through draught).  Always ventilate fuel storage area before entry.  Do not enter the storage area until you are sure it is safe to do so.  Installation of Carbon Monoxide detectors to the plant room/boiler house and the pellet storage area. (follow manufacturers guidance for maintenance and the correct siting of detectors)  Use a portable CO detector to check the air quality prior to entry of the storage area.  If detectors highlight the presence of CO, turn the heating unit off following the appropriate manufacturer’s instructions, contact the supplier and/or manufacturer and request assistance.  If entry to the storage area is required due to a possible plant failure, re-evaluate the plan of entry on your method statement. Before entry, follow your emergency protocols, ensuring that two people are present (one for entry and one to witness the entry and raise alarm if required). If there is any reason to believe fumes may be present, then entry should not occur until 30 minutes after this has dissipated.  Ensure a safe system of work is followed at all times when working in the storage area, e.g. consideration given to duration of work time, effective communication channels, appropriate PPE such as overalls, a rated dusk mask (a disposable respirator of class FFP2 (EN149) or re-usable cartridge P2 (EN143)  Warning signs are placed on both sides of the storage access entry door(s) so that it can be seen when the door is open. The warning sign should include the following information:  **DANGER – RISK OF CARBON MONOXIDE POISONING**, there is danger to life from odourless carbon monoxide and lack of oxygen. Check atmosphere before entry. No entry for unauthorized persons. Keep children away from storeroom.  Fuel storage to be kept free from any water ingress (wet fuel leads to fermentation which can have associated risks of dangerous gas build up). |
| 03. | Danger of moveable parts, e.g. rotary arm (agitator) that sweeps the biomass fuel into the auger. |  | Procedures for an interlocking system are in place to shut off the hopper delivery and isolate the auger prior to entry.  Only competent trained persons to carry out any operational issues with any moving parts as specified by the manufacturers. |
| 04. | Explosion or fire. |  | Scheduled maintenance regime of Biomass boiler and all its components (flue ducts and chimney etc.)  Correct operating procedures as per the manufacturer’s instructions are followed.  Possible installation of a water sprinkler system (this is not a legal requirement, but is considered good practice).  Combustible materials are not stored in the boiler house.  The fuel storage area is used only for its intended purpose (no other combustible materials are stored).  There are no possible ignition sources within the fuel storage area, particularly electrical fittings.   * If it is necessary to install electrical equipment within the fuel storage area, the equipment should be suitably IP (ingress protection) rated against dust ingress (IP 50 or 60). Please note if such equipment is installed it requires ongoing maintenance, expertise is unlikely to be available from ‘local’ electricians.     Use battery operated or intrinsically safe lamps when inspecting fuel stores.  Dust concentration is effectively controlled within the wood storage area to prevent dust accumulation. Ensure that dust cannot escape into other areas such as the boiler room.  Restricted access controls are in place for the boiler house and pellet wood store.  A good quality fuel supply is purchased. |
| 05. | Possible wood gas escape from biomass boiler combustion chamber which can lead to the fuel load on the grate to gasify.  A problem is unlikely to occur providing the boiler flue has been designed to evacuate the boiler combustion chamber in the event of a total electrical failure. |  | The manufacturer’s control system is followed to shut down a biomass boiler in a controlled fashion before removing electrical power from the boiler house.  Only fully trained operators shut down the biomass boiler. |
| 06. | Combustion chamber flash-back when opening the chamber doors. |  | Regular checks of the oxygen reading on the display panel are made; reading should not be less than 3% 02 on startup. |
| 07. | Inappropriate oxygen content to the boiler to ensure full combustion process. |  | Fully trained operators only to monitor the Lambdatronic controller panel of the biomass boiler to identify faults within the system.  Only competent contractors carry out any remedial works. |
| 08. | Inappropriate moisture content of fuel for the boiler, causing the malfunction of the boiler. |  | The appropriate storage instructions as per the manufacturer’s recommendations are followed.  Good quality appropriate wood pellets from a reputable supplier are purchased. |
| 09. | Operation of boiler by unskilled personnel, leading to malfunction of boiler. |  | Only fully trained and competent persons operate the boiler.  Restricted access to boiler house and fuel storage area.  Permit to work system for maintenance activities. |
| 10. | Excessive inhalation of dust leading to respiratory disease. |  | Appropriate control measures are in place to minimise the inhalation of dust.  The appropriate Personal Protection Equipment (face mask) BS 4275 EN149 2001 FFP2/3 is used when emptying ash bins, brushing the flueways or any other dust control related tasks. |
| 11. | Manual Handling injuries. |  | All personnel receive manual handling training.  Mechanical aids are used to move heavy items.  A work activity assessment is in place for the loading/unloading of pellet deliveries. |
| 12. | Delivery Vehicle collisions with pedestrians. |  | A vehicle and pedestrian risk assessment is in place (template is available on KELSI). |

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| Step 1  What are the hazards? | Step 2  Who might be harmed and how? | Step 3  What are you already  doing? | Risk  rating | Step 4  Is anything further needed? | Step 5  Action & review |
| Spot hazards by:   * walking around your workplace * asking those doing the task what they think * checking manufacturers’ instructions * considering health hazards | Identify groups of people, consider:   * employees * temporary / agency staff * contractors * volunteers * members of the public * children (including work experience) * lone workers * pupils * service users | List what is already in place to reduce the likelihood of harm or make any harm less serious, examples include:   * guarding * training * procedures, safe systems of work * personal protective equipment (PPE) | Trivial, low, medium, high or stop (please see matrix below) | You need to make sure that you have reduced risks ‘so far as is reasonably practicable’.  An easy way of doing this is to compare what you are already doing with good practice. If there is a difference, list what needs to be done. | Remember to prioritise Deal with those hazards that are high-risk and have serious consequences first.  List:   * actions required * who needs to do them * by when * check actions completed |

**Risk rating**

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|  | Slightly harmful | Harmful | Extremely harmful |
| **Highly unlikely** | **Trivial risk** | **Low risk** | **Medium risk** |
| **Unlikely** | **Low risk** | **Medium risk** | **High risk** |
| **Likely** | **Medium risk** | **High risk** | **STOP** |

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| **Risk level** | **Action and timescale** |
| **Trivial** | **No action required and no documentary record needs to be kept.** |
| **Low** | **No additional physical control measures are required, however monitoring is necessary to ensure that the controls are maintained.** |
| **Medium** | **Efforts should be made to reduce the risk and the reduction measures should be implemented within a defined period. Where the medium risk is associated with extremely harmful consequences, further assessment may be necessary to establish more precisely the likelihood of harm as a basis for determining the need for improved control measures.** |
| **High** | **Work should not be started until the risk has been reduced to an acceptable level. Considerable resources may be allocated to reduce the risk. Where the risk involves work in progress, urgent action should be taken.** |
| **Stop** | **Work should not be started or continued until the risk has been reduced. If it is not possible to reduce risk even with unlimited resources, work has to remain prohibited.** |

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| Activity / operation/ event: Operation of Biomass Boiler | Assessment date: |
| **Establishment:** | **Review date:** |

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| Step 1 | Step 2 | Step 3 | Risk  rating | Step 4 |  | Step 5  Action & review |  |
| **Identify the hazards** | **Who might be**  **harmed & how?** | **What are you already**  **doing?** | **trivial/**  **low / medium /**  **high / stop** | **Is anything further**  **needed?** | **Action required** | **Responsible**  **person** | **Date**  **completed** |
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| Assessor name(s): | Job title: |
| **Signature:** | **Review date:** |