

### Coal Mining Risk Assessment

This assessment has been written in accordance with guidance contained in The Coal Authority document: *Risk based approach to development management, Guidance for developers, Version 4, 2017* and the Coal Authority website (<https://www.gov.uk/guidance/planning-applications-coal-mining-risk-assessments#the-coal-mining-risk-assessment>).

The assessment aims to:

- Provide a desk-based report of information on the coal mining issues which are relevant to the application site;
- Use the available information to identify and assess the risks to the proposed development from coal mining legacy, including the cumulative impact or issues;
- Set out appropriate mitigation measures to address the coal mining legacy issues affecting the site, including any necessary remedial works and/or demonstrate how coal mining issues have influenced the proposed development;
- Demonstrate to the Local Planning Authority that the application site is, or can be made, safe and stable to meet the requirements of national planning policy with regard to development on unstable land.

### Site Location and Description:

The site is located in Bury, BL9 8QZ with a central National Grid reference number of SD 82262 09026. It is accessed via Pilsworth Road, and the proposed development is shown on Drawing Number GM12886-001 and on the site development plan (Ref: PWS105) provided by the client. The proposed development comprises a Material Recovery Facility (MRF) approximately 0.35 hectares in size.

### Sources of information:

- Groundsure Report Ref: GS-DRR-L2Y-U6N-9JK Dated 09 May 2023;
- The Coal Authority Consultants Coal Mining Report Ref: 51003353833001 Dated 09 May 2023;
- The Coal Authority Interactive Map Viewer [online]. Available at <https://mapapps2.bgs.ac.uk/coalauthority/home.html> (accessed 09 May 2023);
- The British Geological Survey (BGS) - GeoIndex [online] geological mapping interactive mapping database. Available at: <https://mapapps2.bgs.ac.uk/geoindex/home.html> (accessed 09 May 2023).

| Identification, Assessment and Mitigation of Site-Specific Coal Mining Risk                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
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| Issue                                                                                                                                       | Site Affected (Yes/No)                                                                                                                                                                                                                                                                                                                                                                                                       | Hazard                                                                                                                                                                                                                                                                                                                                                                                               | Consequences                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Recommended Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 1. Are there any recorded coal mine entries within the site or within 20m of the site boundary?                                             | No.                                                                                                                                                                                                                                                                                                                                                                                                                          | N/A.                                                                                                                                                                                                                                                                                                                                                                                                 | N/A.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | N/A.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 2. Is the proposed development in the likely zone of influence of past deep underground mining?                                             | No.                                                                                                                                                                                                                                                                                                                                                                                                                          | N/A.                                                                                                                                                                                                                                                                                                                                                                                                 | N/A.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | N/A.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 3. Is the proposed development within the likely zone of influence of underground coal workings at shallow depth (depths of less than 30m)? | No.                                                                                                                                                                                                                                                                                                                                                                                                                          | N/A.                                                                                                                                                                                                                                                                                                                                                                                                 | N/A.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | N/A.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 4. Is there a possibility of unrecorded shallow mine workings and/or mine entries?                                                          | <p><b>Unrecorded Shallow Mine Workings:</b><br/>Yes - The site lies within a former coal mining area with the Arley coal seam conjectured to outcrop at surface. Therefore the possibility of unrecorded shallow mine workings cannot be discounted. Coal mining predates the requirement to formally record mining operations and unrecorded workings, including working at subcrop ("crop workings") are quite common.</p> | <ul style="list-style-type: none"> <li>• Ground subsidence.</li> <li>• Ground instability, loss of ground, generation of crown holes.</li> <li>• Catastrophic collapse of mine entry leading to ground instability or voids at the ground surface.</li> <li>• Settlement of the ground surface above/adjacent to the mine entry.</li> <li>• Mines gas emissions and mine water migration.</li> </ul> | <p><b>Unrecorded Shallow Mine Workings:</b><br/>Ground subsidence related to collapse or settlement processes associated with shallow underground coal workings may result in:</p> <ul style="list-style-type: none"> <li>• Ground instability and damage to new structures and infrastructure.</li> <li>• Harm to human health, injury or death of site users or construction workers.</li> <li>• Potential for mine gas migration to surface, where it may represent a hazard to development.</li> </ul> | <p><b>Unrecorded Shallow Mine Workings:</b><br/>Based upon a review of available information, there is a risk of unrecorded shallow mine workings to be present beneath the site due to the Arley coal seam conjectured to outcrop at the site. The thickness of superficial deposits is currently unknown. It is possible that should such workings collapse, voids at ground surface (crown holes) may develop.</p> <p>For the development within the planning application site boundary, it is recommended:</p> <ol style="list-style-type: none"> <li>1. Carry out a suitably designed rotary borehole investigation and on completion interpret the data and review the risk assessment.</li> <li>2. If following site investigations, any conjectured zones of potential ground instability are identified to impact sensitive development e.g. structures, plant sensitive to ground movement etc., prior to the development of the site, a programme of relict mining hazard remediation may be required over parts of the site. This is "normal" practice in many areas of former</li> </ol> |

| Identification, Assessment and Mitigation of Site-Specific Coal Mining Risk                                                                           |                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
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| Issue                                                                                                                                                 | Site Affected<br>(Yes/No)                                                                                                                                                                                                                                                      | Hazard                                                                                                                                                                                                                                                                               | Consequences                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Recommended Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|                                                                                                                                                       |                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | exposed coalfield and may include detailed investigation and stabilisation of shallow workings by drilling and pressure grouting. All invasive works to be designed to ensure no risk to members of the public or the environment. If required, such works would be carried out in accordance with current Coal Authority requirements and the appropriate Permit and current industry guidance contained in CIRIA C758D Abandoned Mine Workings Manual (2019). |
|                                                                                                                                                       | <b>Unrecorded Mine Entries:</b><br>Yes — Bearing in mind that the site lies within a former coal mining area with the Arley coal seam conjectured to outcrop at surface, the possibility of unrecorded mine entries being present within the site cannot be discounted.        |                                                                                                                                                                                                                                                                                      | <b>Unrecorded Mine Entries:</b><br>Ground subsidence related to collapse or settlement processes associated with mine entries may result in: <ul style="list-style-type: none"> <li>• Ground instability and damage to new structures and infrastructure.</li> <li>• Harm to human health, injury or death of site users or construction workers.</li> <li>• Potential for mine gas migration to surface, where it may represent a hazard to development.</li> </ul> | <b>Unrecorded Mine Entries:</b><br>Should any features be discovered on site, such as areas of anomalous fill, circular brickworks etc., that may represent an unrecorded mine entry, works in the vicinity of the feature should be suspended and the feature reported for investigation, risk assessment and remedial stabilisation works, if required.                                                                                                       |
| 5. Is there a record of mine gas emissions within the site boundaries?                                                                                | No - The Coal Authority have no records of mines gas emissions on or within 500m of the site requiring their action. Notwithstanding this, the site lies within an area with probably unrecorded shallow workings and mine gas emissions may potentially impact upon the site. | Mixtures of noxious or explosive gases reaching the ground surface via superficial deposits, faulted/broken strata, porous strata or poorly filled mine entries and entering buildings, structures, confined spaces etc., when an explosive or asphyxiating hazard may be generated. | <ul style="list-style-type: none"> <li>• Migration to surface, where it may represent a hazard to development.</li> <li>• Harm to human health and damage to buildings.</li> </ul>                                                                                                                                                                                                                                                                                   | Potential for mine gas should be considered in the land contamination risk assessment.                                                                                                                                                                                                                                                                                                                                                                          |
| 6. Is the proposed development in an area for which The Coal Authority is determining or has granted a licence to remove coal by underground methods? | No                                                                                                                                                                                                                                                                             | N/A                                                                                                                                                                                                                                                                                  | N/A                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | N/A                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

| Identification, Assessment and Mitigation of Site-Specific Coal Mining Risk                                                                                                                                     |                        |        |              |                                 |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|--------|--------------|---------------------------------|
| Issue                                                                                                                                                                                                           | Site Affected (Yes/No) | Hazard | Consequences | Recommended Mitigation Measures |
| 7. Are there known faults or other lines of weakness due to coal mining at the site?                                                                                                                            | No                     | N/A    | N/A          | N/A                             |
| 8. Is there a record of coal mining surface hazards within the site boundary? Has the site been subject to remedial works by, or on behalf of, the Coal Authority under its surface hazard call out procedures? | No                     | N/A    | N/A          | N/A                             |
| 9. Is the proposed development within the boundary of a surface mining/opencast site from which coal has been removed by surface mining/opencast methods?                                                       | No                     | N/A    | N/A          | N/A                             |
| 10. Is the proposed development within 200m of a surface mining/opencast site from which coal is being removed?                                                                                                 | No                     | N/A    | N/A          | N/A                             |

#### Assessment of Cumulative Impact of Coal Mining Issues:

The Pilsworth Landfill MRF site is located in an area identified by The Coal Authority as having possible unrecorded shallow workings present beneath the site related to the Arley coal seam conjectured to outcrop at the site. The thickness of superficial deposits across the site is currently recorded to be between 24 – 28m bgl; it is possible that should workings exist beneath the site, collapse may result in voids at the ground surface (crown holes) resulting in a **moderate** risk to the site of ground instability and damage to infrastructure. We therefore recommend a suitably designed borehole investigation to investigate the mining situation at the site, and on completion interpret the data and review the risk assessment. If zones of potential ground instability are identified a programme of mine hazard remediation may be required over parts of the site prior to development. This is “normal” practice in many areas of former exposed coalfield and may include: detailed investigation and stabilisation of shallow workings by drilling and pressure grouting. All intrusive works to be designed to ensure no risk to members of the public or the environment. If required, such

works would be carried out in accordance with current Coal Authority requirements, the appropriate Coal Authority Permit, and current industry guidance contained in CIRIA C758D Abandoned Mine Workings Manual (2019).

The potential presence of mine gas representing a source of ground gas is considered unlikely but cannot be discounted due to the probable shallow unrecorded workings at the site. Mine gas should therefore be considered in the land contamination risk assessment.

Prior to carrying out any works which may intersect, disturb or enter any coal seams, coal mine workings or mine entries (within the ownership of the Coal Authority), the written permission of the Coal Authority shall be obtained (<http://coal.decc.gov.uk/en/coal/cms/services/permits/permits.aspx>). The legal implications of acceptance of The Coal Authority permit conditions should be considered fully before accepting them.

#### **Risk Definitions**

For ease of reference and understanding the identified risks have been assigned to one of the following categories:

**Negligible risk** – site likely to be suitable for the proposed use in its present condition. Mining risk unlikely to be present. Further assessment not considered necessary.

**Low risk** - site likely to be suitable for the proposed use in its present condition. Mining risk may be present but unlikely to have a significant impact on the proposed use. Further assessment is required to confirm the risk and remedial action may be required.

**Moderate risk** – site may not be suitable for proposed use in present condition. Mining risk probably present and may have a significant impact on the proposed use. Further assessment is required to confirm the risk and remedial action may be required.

**High risk** – site unlikely to be suitable for the proposed use in its present condition. Mining risk almost certainly present and likely to have significant impact on the proposed use. Further assessment is required to confirm the risk and remedial action likely to be required.