

**Coal Mining Risk Assessment**  
 (in accordance with guidance contained in the Coal Authority document *Requirements of a Coal Mining Risk Assessment Report*)

**Sources of information:**

- BGS borehole records available online
- Published geological mapping prepared by the Geological Survey of Great Britain: Sheets Scotland 14E, Cumnock 1976
- The Coal Authority's interactive online mapping database
- The Coal Authority Mining Report referenced: 51000746277001, dated 14<sup>th</sup> January 2015
- The Coal Authority Shaft Plan and Data Sheets referenced: 51000794213001, dated 25<sup>th</sup> February 2015
- Site Development Plan reference 14113-SK03/A, dated 02/04/14.

Issue	Hazard	Site Affected (Yes/No) (Detail – where appropriate)	Consequences (where appropriate)	Recommended Mitigation Measures (where appropriate)
1. Are there any recorded coal mine entries within the site or within 20m of the site boundary?	<ul style="list-style-type: none"> <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</li> </ul>	<p><b>Yes:</b> One recorded mine entry, Coal Authority reference: 248620-001 located north of the site, within 20m of the site boundary. A second shaft (Coal Authority Reference 247620-001), is located north of the site and is greater than 20m from the site boundary. Both shafts form part of the former Killoch Colliery and are recorded at 735m and 761m deep respectively. The Coal Authority data sheets note that both shafts are capped at surface with concrete.</p>	<ul style="list-style-type: none"> <li>• Harm to human health, injury or death of site occupiers, construction workers or members of the public crossing the site.</li> <li>• Ground subsidence</li> <li>• Sudden collapse of mine entry leading to voids or instability at the ground surface. Damage to property and infrastructure.</li> </ul>	<p>The 'best plot' location of the mine entry, its zone of plotting error and conjectured zone of potential ground instability has been confirmed. Only a small area of potential ground instability is conjectured to extend onto the site.</p> <p>Mitigation should consider one or a combination of the following:</p> <ol style="list-style-type: none"> <li>1. Layout of the site should ensure that the proposed buildings and sensitive structures lie outside the conjectured zone of potential ground instability;</li> <li>2. Ensure all construction traffic routes and infrastructure, cables etc. lie outside the conjectured zone of potential ground instability.</li> </ol>
2. Is the proposed development in the likely zone of influence of past underground mining?	<ul style="list-style-type: none"> <li>• Ground subsidence.</li> <li>• Ground instability, loss of ground, generation of crown holes.</li> </ul>	<p><b>Yes:</b> The site is in the likely zone of influence from former mine workings in two coal seams at depths of 520 and 620m, last worked in 1981.</p>	<ul style="list-style-type: none"> <li>• Bearing in mind the depth and age of these workings and the fact that they are overlain by the Mauchline Volcanic Formation, the collapse of the workings and the overlying strata will by now be complete and the workings should not be a potential source of significant future subsidence.</li> </ul>	N/A

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3. Is the proposed development in the likely zone of influence of any present underground coal workings?	<ul style="list-style-type: none"> <li>• Ground subsidence.</li> <li>• Ground instability, loss of ground, generation of crown holes.</li> </ul>	<b>No</b>	N/A	N/A
4. Is the proposed development within the likely zone of influence of underground coal workings at shallow depth (depths of less than 30m)?	<ul style="list-style-type: none"> <li>• Ground subsidence.</li> <li>• Ground instability, loss of ground, generation of crown holes.</li> </ul>	<b>No</b>	N/A	N/A
5. Is there a possibility of unrecorded shallow mine workings and/or mine entries?	<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</li> </ul>	<b>No</b>	<ul style="list-style-type: none"> <li>• Harm to human health, injury or death of site occupiers, construction workers or members of the public crossing the site.</li> <li>• Ground subsidence sudden collapse of mine entry leading to voids or instability at the ground surface.</li> <li>• Damage to property and infrastructure.</li> </ul>	Although it is unlikely that unrecorded mine entries exist as the Killoch Colliery was a modern development, the possibility remains for other mining related structures (e.g. ducts) to be present on the site. The potential for unrecorded structures to be present should be considered by all parties involved with invasive works on site, and by the Principal Contractor. The associated risks should be included in the Health and Safety File (CDM 2015) and appropriate "Toolbox Talks" and methods of working should be adopted. Appropriate contingency plans should be prepared in the event that an unrecorded mine entry is located.
6. Is there a record of mine gas emissions within the site boundary?	<ul style="list-style-type: none"> <li>• Mixtures of noxious or explosive gases reaching the ground surface via superficial deposits, faulted/broken strata or poorly filled mine entries and entering buildings, structures, confined spaces etc, when an explosive or</li> </ul>	<b>No:</b> There are no records of such gas emissions by the Coal Authority.	<ul style="list-style-type: none"> <li>• Harm to human health, injury or death of site occupiers, construction workers.</li> <li>• Damage to property and infrastructure.</li> </ul>	Mines gas should be considered a source of ground gas during the contaminated land risk assessment.

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	asphyxiating hazard may be generated.			
7. 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?	<ul style="list-style-type: none"> <li>• Ground subsidence.</li> <li>• Ground instability, loss of ground, generation of crown holes.</li> </ul>	<b>No</b>	N/A	N/A
8. Are there known faults or other lines of weakness <b>due to coal mining at the site?</b>	<ul style="list-style-type: none"> <li>• Ground subsidence.</li> <li>• Mixtures of noxious or explosive gases reaching the ground surface via faulted/broken strata and entering buildings, structures, confined spaces etc, when an explosive or asphyxiating hazard may be generated.</li> <li>• Stepped rockhead profiles where there has been subsidence across faults, impacting settlement of proposed structures.</li> </ul>	<b>No</b>	Escape of mines gas to ground surface could result in a build-up of gas within confined spaces that can lead to injury or death of workers.	The potential for mines gas to enter Confined Spaces shall be considered by all parties involved with invasive works on site, and by the Principal Contractor. The associated risks should be included in the Health and Safety File (CDM 2015) and appropriate "Toolbox Talks" and methods of working should be adopted.
9. Has the site been subject to remedial works by, or on behalf of, The Coal Authority under its surface hazard call out procedures?	<ul style="list-style-type: none"> <li>• Indication of past and potential future subsidence issues on site.</li> </ul>	<b>No</b>	N/A	N/A
10. Is the proposed development within the boundary of a surface mining/opencast site from which coal has been removed by surface mining/opencast methods?	<ul style="list-style-type: none"> <li>• Ground subsidence and restrictions on proposed development associated with settlement of proposed structures.</li> </ul>	<b>No</b>	N/A	N/A
11. Is the proposed development within 200m of a surface mining/opencast site from which coal is being removed?	<ul style="list-style-type: none"> <li>• Development constraints associated with environment/noise/dust</li> </ul>	<b>No</b>	N/A	N/A

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

The coal mining issues have been considered at the planning stage of the proposed development. Good engineering practice developed for mining areas shall be applied at all stages of the development. The likelihood of future underground working of coal beneath the site is considered to be remote

Two mine shafts, both in excess of 700m deep, are located immediately north of the site and are associated with the former Killoch Colliery. Both shafts have been capped at the surface with concrete. One of the shafts is located within 20m of the site (Coal Authority reference: 248620-001). An assessment of the ground stability risk of the mine entries has been made. It is recommended that mitigation should include the siting of all buildings, sensitive structures and infrastructure outside the conjectured zone of potential ground instability.

Potential unrecorded mine related structures may exist on the site. Their presence should be considered by all parties involved with invasive works on site. Risks associated with unrecorded mine entries shall be considered during the development and appropriate methods of working and site management should be adopted.

Mines gas shall be considered as a source of ground gas during the contaminated land risk assessment, during the ground investigation.

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 geological and mining settings at the site are typical for many developments in coalfield areas. There is no technical reason why the development cannot proceed providing the appropriate mitigation measures are adopted.

N/A = Not Applicable