

**Newbyres Crescent, Gorebridge
Options to Resolve Gas Migration****Report by Kenneth Lawrie, Chief Executive****1.0 Purpose of Report**

The purpose of this report is to inform Council on the issues in relation to gas penetration into 64 properties at Newbyres Crescent, Gorebridge and outline options for rectification for consideration by Council to ensure the protection of public health of our residents and long term resolution for the site.

Following the Special Council meeting of 20 May 2014 Council will be aware that in terms of the protection of public health for both the short and longer term an Incident Management Team (IMT) was established by NHS Lothian under the Public Health (Scotland) Act 2008. The IMT will review any recommendations approved by Council to address the gas migration.

Council will further recall from the meeting on 20 May 2014 that there is a requirement to comply with the statutory framework which is in existence for the management of Public Health Incidents including the utilisation of the expertise of the Care for People Group to deliver a long term solution.

The Chair of the IMT intends to produce an Interim Report which outlines the criteria that the IMT will use to determine the long term option(s) for Newbyres Crescent. The primary role of the IMT is to protect public health. Ultimately the overall responsibility the future decisions (and approved actions) for the Newbyres site is a decision for Midlothian Council after taking full cognisance of available information, guidance and advice.

It is envisaged that the Interim IMT Report will be presented to Council as soon as possible after it has been published.

2.0 Background

Two reports have previously been presented to Cabinet and Council regarding public safety and the authorisation of necessary resources to deal with the situation.

The initial report to Cabinet on 22 April 2014 and a subsequent report to Council on 20 May 2014 advised that further tests are being carried out with the installation of data loggers in all the 64 houses and this is in accordance with a programmed monitoring cycle.

Briefings to Council have also been provided by NHS Lothian Director of Public Health and Fairhurst, consultant gas technical engineers, on 29 April 2014 and 30 April 2014 respectfully.

The circumstances which have contributed to the unique situation that has been encountered at Newbyres Crescent include the following:-

- Use of vibro compaction of the ground.
- Use of vibro stone columns in the foundations.
Possibility of accidentally forming preferential gas pathways via the installation of deep boreholes.
- Exceptionally heavy rainfall in September 2013 at the same time as the grouting works for the new Border's railway.
- Potential weaknesses in the approach to ground gas investigation and monitoring and the interpretation of findings prior to the design and development of the site.
- Influence of low atmospheric pressure.
- Current air tightness standards for house construction.

Following the detection of gas issues in September 2013 the Council's primary focus has been the safety and well being of the tenants.

Accordingly in this regard:-

- Extensive monitoring arrangements have been established.
- Alarms and house buzzers have been installed in all properties.
- Dedicated teams have been introduced to respond on a 24/7 basis to activation of alarms to ensure the protection of residents' health and to offer reassurance.
- Public health advice and information has been provided regularly in conjunction with NHS Lothian.
- Where necessary tenants have been decanted.
- The Care for People Group has been activated and is considering the likely impact to the health, including physical and mental wellbeing of the residents.
- The Care for People Group has developed contingency plans that will be activated in the event of any emergency evacuation.
- Feasibility of setting up an on site information point for tenants is being reviewed.

Gas monitoring is still being carried out with a final report expected in July 2014.

An internal Council Officer Working Group has been established and has met on a number of occasions since 26 March 2014 to co-ordinate and oversee the Council's response and approach to deal with an incident of this magnitude. As indicated above, the Council has established a Care for People Group specifically to consider the issues relating to the tenants of Newbyres Crescent to develop appropriate plans to meet their needs. The Care for People Group is assessing all options including the implications arising from the option of decanting tenants.

2.1 Chronology

The significant events relating to the gas penetration at Newbyres Crescent to date have been summarised in Appendix 1.

2.2 Legal Position/Liability

2.2.1 Discussions are ongoing with the council's external legal advisers Shepherd and Wedderburn, Solicitors. The firm were legal advisors for Phase 1 of the Council's New Build Housing Project and have specialist knowledge of the contractual relationships relative to the procurement of housing on this site. Their remit is to consider the legal liability for ground gas leaking into houses and the remedies available to the Council. Whilst information gathering is at an early stage, the solicitors will review the contractual arrangements in relation to the design of the houses, the site investigations, the design of the foundations and the grouting works. A further key consideration in the assessment will be the role played by the Council in procuring the various works and the information which was provided to each external consultant or contractor. Further expert technical opinion is likely to be required to assess the extent to which it can properly be said that any of the consultants or contractors engaged by the Council failed to comply with their obligations either in terms of their contracts with the Council or at Common Law.

Interim legal opinion received advises that the Council is entitled to recover any loss which arises as a direct consequence of the fault of any person who is responsible in whole or in part for causing that loss. The Council is only entitled to recover losses which it was reasonably foreseeable would be caused by the breach. The Council is also only entitled to recover the cost of taking reasonable steps to remedy the problem. Based on interim legal opinion, the Council cannot recover the full costs of a solution which (i) gives a better outcome than the Council would have had if there had been no breach or (ii) unreasonably increases the cost of the remedial works. Legal opinion is that advice is obtained on the probability of the cost of the preferred option being recovered before a final decision on the future use of the site is taken.

In progressing any of the options considered in this report it will be necessary to preserve, so far as possible, the Council's right to recover damages from any party responsible for causing the loss.

In terms of the Housing (Scotland) Act 1987 the Council has a statutory obligation to provide permanent accommodation to those who are homeless, which can include persons who are currently living in housing which is unsuitable or unsafe.

The Council is a Category 1 Responder under the Civil Contingencies Act 2004 in relation to an 'emergency' which is defined as an event or situation which threatens serious damage to human welfare. The Council has a duty to maintain plans for the purpose of ensuring that, if an emergency occurs, or is likely to occur, it is able to perform its functions, so far as is necessary or desirable, for the purpose of preventing the emergency, or reducing, controlling or mitigating its effects, or taking other action in connection with it.

2.2.2 Insurance Position

Midlothian Council insurers have been made aware of the background and current situation at Newbyres Crescent and have advised of the potential for a Professional Indemnity claim against the consultants or contractors for claims arising from the provision of unsatisfactory professional technical services. The Council's Insurers are unable to advise further until they have additional information specifically around the cause, catalogue of events, proof of unsatisfactory advice, and an established date of loss as this will ultimately determine which insurer will deal with the claim.

Midlothian Council Brokers (Marsh Ltd) provide a team of qualified loss adjusters and claims professionals to represent the Council's interests in the event of major loss. This team will provide advice and support in the preparation of any major property, business interruption or liability claim and will negotiate settlement with insurers and their representatives.

The insurance claim is likely to be a long protracted and detailed process with a possible risk of limited recovery at completion.

2.2.3 Geotechnical Report

An independent report was commissioned by the Council from Fairhurst Consulting, Structural and Civil Engineering, experts in ground engineering issues.

Their draft report entitled 'Review of Potential Ground Gas Risk Assessment' was received by the Council in March 2014 and the key findings were reported to the Council Seminar on 30 April 2014.

Within the report there were nine recommendations, seven of which are now complete and the remaining two relating to 1) legal implications and liability are ongoing and 2) the costed remedial options, are the subject of this report.

3.0 Technical Implications

Fairhurst have made observations on each of the following options and their detailed comments are contained in Appendix 2 and should be read in conjunction with the following options.

3.1 Option 1 - Retrofit a Gas Membrane Solution in all 64 Houses

It should be noted that, while technically feasible, this option would be extremely costly and practically difficult to achieve. It is considered that this option cannot offer a 100% guarantee of success. Furthermore there is also no precedence in terms of case studies available on this option being installed on a timber frame building.

The assumptions made in arriving at an estimated cost for the works to retro fit gas membranes are as follows:-

- Whilst the works involved largely the ground floor it would be necessary to decant the complete block/house for Health and Safety reasons.
- The occupants would require to be decanted and re-housed.
- Furniture would have to be removed from all properties, stored and returned on completion of the Works.
- An air blanket installation is also required to augment the replacement membrane.
- The kitchen units, staircases and sanitary appliances would have to be removed and dismantled and refixed upon completion of the works.
- It has been assessed that the works to each unit will take in the region of eighteen weeks.
- Utility re-routing costs will be incurred.
- Garden and public areas will not be affected, except immediately adjacent to the property.
- The access road network will be closed off during the works.
- A maintenance regime for the 60 years lifespan of the building is included in the costs.
- Annual maintenance costs for the pump equipment is included at £1,500 per year, plus replacement costs every 25 years.
- External and internal fee allowances for professional and technical services.
- Monitoring costs (including alarms) to confirm that the retrofit has been successful - probably up to a 10 year period – are included in the cost.
- Tenants would be entitled to claim for Home Loss compensation if forced to leave their home in certain circumstances. Home Loss compensation is designed to compensate for the inconvenience caused by the move, not to cover the expenses of the move or the value of the home. Tenants and other applicants (including the husband/wife or civil partner who no longer lives in the property) receive a flat rate of £1,500 if their application is successful. A council tenant with rent arrears will receive a reduced sum to cover rent arrears.
- Disturbance Payments may also be payable. These are intended to cover the expenses of moving if tenants don't qualify for a Home Loss compensation payment who have not lived in the property for long enough (12 months minimum). Disturbance Payment has no set amount unlike the Home Loss payment which is determined by the Scottish Government.

3.2 Option 2 - Demolish and Rebuild the Houses Incorporating Gas Membranes in all 64 Properties

The assumptions (non construction costs) made in arriving at an estimated cost for demolition and rebuilding were as follows:

- The occupants would require to be decanted and re-housed.
- Furniture would have to be removed from all units, stored and returned on completion of the Works.
- The costs for a new gas membrane are included.

- The Construction Works will require a minimum decant period of 26 weeks.
- The decant costs are taken from Bed and Breakfast costs of £35 per person per day, which equates to £12,775 per year.
- These works will be subject to current procurement legislation.
- Home loss and disturbance payments will be due as per option 1

3.3 Option 3 – Demolish the 5 Decanted Houses and Rebuild, plus Retrofit Gas Membrane to the Remainder

It is to be noted that the Fairhurst Report together with the Data loggers installation to the properties, did not indicate that all the properties were affected by gas migration. This is expected to be complete in July 2014. There are 10 properties which require further assessment by data loggers. It appears that the decanted houses were located fairly close to the borehole investigation shafts. There are also existing houses of a different construction and foundation type surrounding the site which are unaffected.

In conducting an options appraisal, the consultants, Fairhurst, could not support this option, as they could not guarantee that the houses would not be affected in future by gas penetration.

Home loss and disturbance payments will be due as per option 1 above.

3.4 Option 4 - Leave the 5 Decanted Properties Unoccupied

There is a risk in having to secure the vacated properties to such an extent to prevent unauthorised enforced entry. There is a legal requirement and obligation on a building owner, ie the Council in this instance, to secure any building in order to ensure that access is not possible to the public and others.

The impact on the amenity of the area of leaving buildings unoccupied and secured will potentially cause concerns for remaining residents and is not socially ideal.

The loss of the rental income stream associated with the 5 units leaving them unoccupied equates to approximately £19,000 per annum.

These residents would also require to be re-homed. This could be achieved either through Phase 2 of the Council's New Social Housing Programme or through the purchase of properties through Spend to Save requiring approximately an additional £0.703 million to be incorporated in the Housing Revenue Account (HRA) Capital Plan.

The remaining properties would continue to be monitored through the alarm activation protocol in place at present.

Home loss and disturbance payments will be due as per Option 1.

3.5 Option 5 – Demolish all 64 Properties and Market the Site as a Potential Development Site

There is potential for this site to be marketed (with Planning Consent for housing or similar classification) at an appropriate time following demolition for sale to third parties who may wish to develop the area. The Council's Housing Section has indicated that there are areas with higher demand for housing than Gorebridge. This is demonstrated by the fact that there are 8 areas with a higher number of housing waiting list applicants in Midlothian. Moreover, further investment on other sites in the area would address this reduction in units. For example, a site in Gorebridge (Stobhill Road) has been earmarked for development as part of the Council's Phase 2 Social Housing Programme and local Registered Social Landlords are also planning future development in the area.

Any capital receipt would be reimbursed to the Housing Revenue Account.

There will be loss of rental income relating to the 64 units if the site were demolished, this equates to approximately £0.242 million per annum.

Residents would require to be re-housed, again this could be achieved either through Phase 2 of the New Social Housing Programme or through the purchase of replacement properties (which would require approximately an additional £9 million to be incorporated in the HRA Capital Plan).

Alternatively, the site could be marketed to a Registered Social Landlord for social rented housing and attract a capital receipt, plus 100% nomination rights retained by the Council.

Home loss and disturbance payments will be due as per Option 1.

3.6 Assessment of Options

Taking consideration of the available options and assessing the advice provided by Fairhurst Consultants as detailed in Appendix 2 indicates that there are only two possible recommended options for the Council to progress:-

- Option 2: Demolish and rebuild the houses incorporating gas membranes in all 64 properties.
- Option 5: Demolish and market the site as a potential development site.

These are the only two options that provide a sufficient guarantee as to their effectiveness in the protection of public health of the residents.

Furthermore the IMT option appraisal of the potential solutions at Appendix 3 will incorporate to a significant degree the information provided by Fairhurst Consultant Engineers which recommends options 2 and 5.

4.0 Costs of Options

Table 1 summarises the costs involved in each of the Options described in Sections 3.1 to 3.5 above.

Table 1 – Cost of Options

Option	Narrative	Costs
Option1	Retrofit a Gas Membrane solution in all 64 Houses	£3.739m
Option 2	Demolish and rebuild the houses incorporating Gas Membranes in all 64 properties	£12.077m
Option 3	Demolish only the 5 decanted houses and rebuild, plus retrofit gas membrane to the remainder	£4.359m
Option 4	Leave the existing 5 decanted properties unoccupied.	£2.287m
Option 5	Demolish all 64 properties and market the site as a potential development site. Note: – excludes any capital receipt value from third parties.	£9.259m

Note: - all costs for all Options are based on a 60 year life cycle.

4.1 NHS Lothian Compliance

The IMT is convened in line with Scottish Government Guidance on the Management of Public Health Incidents. Authority is derived from the Public Health etc (Scotland) Act 2008 and the statutory responsibilities of the Director of Public Health for the local population. The primary purpose of an IMT is protecting public health by conducting systematic investigations to address Health Risk Assessment and to then identify appropriate Health Risk Management options for action by the relevant agencies. The IMT is led by a Consultant in Public Health Medicine (CPHM), acting with the delegated authority of the Director of Public Health.

The Chair of the IMT has overall responsibility for managing the public health aspects of the incident, co-ordinating the activities of the other agencies and obtaining independent expert advice to inform its decisions. The Chair of the IMT, in partnership with Health Protection Scotland and Scottish Government officials of the office of the Chief Medical Officer, ensures that Ministers are briefed in line with the protocol agreed with Scottish Government for the handling of public health incidents.

The Incident Management Team (IMT) have indicated that prior to providing relevant information regarding the resolution of the gas migration at Newbyres, it will consider the merits of each option against a set of criteria.

The criteria to be used by the IMT for an options appraisal of potential solutions primarily focus on four principal matters:-

- Public Health utility of the solution
- Strength of evidence for the effectiveness of the solution
- Technical or management dependency of the solution
- Economic factors.

Additional information on the criteria for option appraisal of potential is provided in Appendix 3.

4.2 Support and Protection of the Residents

4.2.1 Protecting our Residents

The Council's primary concern throughout this situation has been to ensure the safety of each household and it has relocated five households where that has been required and necessary.

It is considered that there are significant concerns regarding the possibility of further and more extensive gas emissions on the site. Accordingly officers within Environmental Health, Property Maintenance, Housing, Legal and Financial Services have expended the required resources to determine any possible course of action available to the Council if it is necessary to evacuate the residents from the site.

The Council and Health Board are developing plans together with the local residents, utilising the expertise of the Care for People group and the Joint Health Improvement Partnership. Action taken ideally should enable children to attend school and other residents who require care or support from the Council to do so from a suitable, alternative domestic environment.

4.2.2 Care for People Group

The Care for People Group is established to comply with the responsibilities of the Council under the Civil Contingencies Act, specifically the supporting Scottish Government guidance, "Preparing Scotland, Care of People Affected by Emergencies". This multi-agency group includes representatives from NHS Lothian, Police Scotland, utilities, voluntary sector and faith groups.

Having recognised the continued uncertainty that residents are experiencing and the inevitable disruption that will occur to their lives the Care for People Group are focusing on the physical and mental wellbeing of the residents.

Matters under consideration are:-

- The move to suitable alternative permanent homes for all residents undertaken at a pace to protect health and minimise disruption.
- The effects of the disruption as a result of the move.
- The needs of children and families in terms of education.

- Medical matters and the proximity to health care settings.
- The identified needs of each individual.
- The maintenance of community connections.
- The provision of agreed information and support.

5.0 Report Implications

5.1 Resource

5.1.1 The Council will be liable for the costs associated with the preferred solution as outlined in Section 4.0 subject to any recovery of expenditure through legal/insurance liability pursuits.

The ongoing concerns regarding the possibility of further gas emissions on this site still exist and require remedial action, albeit the current situation via the arrangements established, as set out in Section 3.1 to 3.5 has been mitigated and appropriate arrangements are in place for residents.

There will be a requirement to continue to allocate significant resources to this project, and specifically on the contractual aspects which are being considered separately. External and internal resources are being expended and recorded for inclusion in any liability claim which the Council pursue.

Local Authorities are required to ensure that sufficient resources are made available to the Incident Management Team to carry out its role as was noted in the Special Council Report of 20 May 2014. This includes the requirement that actions to protect public health are not delayed for financial or contractual reasons. The Director, Resources will continue to advise Council of the financial implications arising from this incident in future reports.

Financial modelling indicated that the Housing Revenue Account could sustain the costs associated with Option 1: Retrofit Membrane, Option 3: Partial demolition/Partial Retrofit and Option 4: Unoccupied Premises, without having a significant impact on the affordability of the current HRA Capital Plan.

If Option 2: Demolish and Rebuild were to be considered then modelling suggests that the Housing Revenue Account could not sustain the costs associated with a complete re-build without affecting the affordability of the HRA capital plan. Therefore the number of units associated with Phase 2 would have to be reduced by approximately 75 units.

Option 5: Demolish and Market would also be able to be sustained through the HRA if it was decided to use Phase 2 as a method to re-house the 64 families; however this would have a negative effect by reducing the number of properties available to accommodate applicants currently on Midlothian Council's waiting list. Purchasing properties through Spend to Save as a means to re-home these families could not be sustained unless (as with Option 2) the scope of Phase 2 was reduced or Scottish Government funding provided.

5.1.2 Staff Resources

There have been considerable resources, both internally and external, expended to date since the issue was first raised in September 2013. This position is likely to remain for the foreseeable future.

Ongoing Operational resources dedicated to this situation include officers from Property Services, Housing Services, Environmental Health, Communications, Contingency Planning, Health and Safety together with relevant senior personnel.

Implementation of Options including installation of Data Loggers, alarms and the continuing monitoring and attendance at call outs of all houses will continue until a resolution to the issue is determined by the Council

Arrangements are in place to ensure that adequate cover arrangements are in place given the likely length of this ongoing incident.

5.2 Risk

A full Risk Register has been compiled and is included in Appendix 4.

5.3 Single Midlothian Plan and Business Transformation

Themes addressed in this report:

- ☒ Community safety
- ☒ Adult health, care and housing
- ☐ Getting it right for every Midlothian child
- ☐ Improving opportunities in Midlothian
- ☐ Sustainable growth
- ☐ Business transformation and Best Value
- ☐ None of the above

5.4 Impact on Performance and Outcomes

There is significant time and cost resource being expended which will impact on service delivery. Dependent upon the preferred option chosen by the Council, there will be a reduction in the number of houses able to be built by the Council in the next phase of the Council House Building programme.

5.5 Adopting a Preventative Approach

The recommended actions are intended to eradicate the gas issue problems.

5.6 Involving Communities and Other Stakeholders

Residents on the site were made aware of the findings of the investigations into the ground conditions during home visits by Council Officers. The installation of the CO₂ detectors in all homes at Newbyres Crescent was completed on 17 April, 2014 with the additional monitors also installed at Gore Avenue extra care houses and Newbyres Care home for public reassurance, although these were a separate built development.

The Council have been communicating regularly with residents and elected representatives in connection with the ongoing work around Newbyres Crescent in Gorebridge and will continue to do so.

There is considerable media interest in the situation at Newbyres Crescent.

5.7 Ensuring Equalities

A full Equalities Impact Assessment Report will be carried out to ensure that the needs of those affected will be protected, prior to the final selection of the preferred option.

The Care for People Group will assist all parties to deliver a long term solution which is fully inclusive, taking account of equalities requirements at every stage.

5.8 Supporting Sustainable Development

The outcome of this incident will influence local policy particularly with regards to the future development of brownfield sites in ensuring that any of Midlothian Council future housing developments are not adversely affected by ground gases.

Midlothian Council should ensure that future Strategic Environmental Assessments consider human health and are more closely linked to the requirement to undertake Integrated Impact Assessment.

5.9 IT Issues

There are no IT issues arising from this report.

6.0 Summary Conclusions

The problems encountered on this development are attributable to a unique combination of a number of interrelated issues, in terms of the influence of low atmospheric pressure, CO₂ leakage through the foundations of the properties, modern day requirements to satisfy air tightness testing and the guidance from consultants and contractors including guidance around the control measures associated with ground gases.

Since September 2013, when the gas issues were first raised, detailed investigations, monitoring and decanting where necessary has been carried out and an options appraisal to address the long term health of the population and the use of the site has been developed. Matters relating to health are under the consideration of the Incident Management Team (IMT).

Five options have been identified and have been checked by the appointed consultants, Fairhurst, with a preference for Option 2 or Option 5 subject to the assessment criteria as detailed in Appendix 3. These options are considered to fully protect the health of the residents and the Care for People Group will continue to seek to identify and implement steps to meet individual needs. Option 5 would limit the liability of the Council in terms of financial outlay but would require Registered Social Landlords to build social rented housing and would attract a capital receipt. 100% resident nomination rights would be retained by the Council.

Legal opinion received advises that the Council is entitled to recover any loss which arises as a direct consequence of the fault of any person who is responsible in whole or in part for causing that loss. Furthermore, it is considered that the Council is only entitled to recover losses which it was reasonably foreseeable would be caused by the breach of contract and/or duty of care at common law. It is also only entitled to recover the cost of taking reasonable steps to remedy the problem. The Council cannot recover the full costs of a solution which (i) gives a better outcome than the Council would have had if there had been no breach or (ii) unreasonably increases the cost of the remedial works. Legal opinion is that advice is obtained on the probability of the cost of the preferred option being recovered before a final decision is taken. In addition a full EqlA will be required to meet the terms of the Equality Act 2010.

Having protected the health of our residents, in progressing any of the options considered by this report, it will be necessary to preserve, so far as possible, the Council's right to recover damages from any party responsible for causing the loss.

7.0 Recommendations

Council is recommended to:

- Note the actions established by the Council and NHS Lothian in connection with the protection of public health.
- Note the options and the recommendations to progress Options 2 or Option 5, subject to legal opinion and taking full cognisance of the IMT findings.
- Note the costs outlined with each option as detailed in section 3.1 to 3.5.
- Note that a full EqlA will be required prior to the final selection of the preferred option.
- Authorise the Director, Resources to continue to progress actions and approve resource requirements to maintain the public safety arrangements.

- Authorise the Joint Director, Health and Social Care to continue to progress actions and approve resource requirements arising from Care for People requirements including those associated with permanent relocation of all residents.
- Approve the payment of home loss and disturbance payments where appropriate.
- Note the intention to update the Council as necessary.

10 June 2014

Report Contact: Neil Davidson 0131 561 5229
neil.davidson@midlothian.gov.uk

Background Papers: Cabinet Report, dated 22 April 2014, item No 17 and to Special Council Report 20 May 2014 Item no 4.

Appendix 1: Chronology of Events
Appendix 2: Technical solutions
Appendix 3: IMT Option Appraisal Criteria
Appendix 4: Risk Register

**MIDLOTHIAN COUNCIL
RESOURCES DIRECTORATE
NEWBYRES CRESCENT**

CHRONOLOGY OF EVENTS

In September 2013 there was an incident whereby two houses, numbers 87 and 89 Newbyres Crescent, were found to have high levels of carbon dioxide.

Due to concerns for their health, the tenants were initially relocated to temporary accommodation.

Ref.	Event
1.1	The Coal Authority undertook an initial investigation on 11 September 2013 of the site. Following their report received on 1 November 2013 covering these initial investigations it was decided that more extensive investigations of the site were required.
1.2	<p>On 11 November 2013 the Head of Customer and Housing Services met with tenants of numbers 87/89 along with Councillor Jim Muirhead. The Head of Customer and Housing Services subsequently e-mailed the tenants of 87/89 on 13 November 2013 confirming that the families could not return to their homes for a period of up to a year and that they would be required to be accommodated elsewhere.</p> <p>On 19 November 2013 Fairhurst Engineers were appointed by the Council as independent Consultants and on 25 November 2013 the Head of Customer and Housing Services e-mailed all ward Councillors updating them on the situation. On 27 November 2013 the Head of Customer and Housing Services met with the families and Councillor Jim Muirhead.</p> <p>From initial monitoring by Fairhursts all the evidence indicated that only two houses were affected by high carbon dioxide levels and Midlothian Council was working to that assumption.</p>
1.3	<p>In February 2014 there was a further escalation and a number of other houses were affected and three families were moved to alternative accommodation. In accordance with statutory guidance an Incident Management Team was established by the Director of Public Health NHS Lothian. The Incident Management Team has overall responsibility for managing the public health aspects of the incident and co-ordinating the activities of the other agencies, including the Council, and obtaining expert advice to inform its decisions. The Incident Management Team has directed the ongoing monitoring of the release and accumulation of carbon dioxide and immediate action by Midlothian staff should trigger levels be reached.</p> <p>Alongside colleagues in Environmental Health, Property Maintenance Services and Housing services, a number of internal groups were also established, namely the core group to co-ordinate the Council's response under the chair of Director, Resources and the Care for People group under the Head of Adult and Social Care Chair is co-ordinating the planning of contingency and a longer term welfare response to the needs of tenants.</p>

1.4	<p>Individual meetings with tenants took place on 7 October 2013; 11 November 2013; 27 November 2013 and 18 February 2014.</p> <p>Groups of tenants met with the Head of Customer and Housing Services on 24 March 2014; 8 April 2014; 28 April 2014.</p> <p>Decanted households met with the Head of Customer and Housing Services on 8/9/15 May 2014.</p>
1.5	In relation to written communications, there were press releases on 26 and 28 March 2014; 7 and 17 April 2014.
1.6	Written communication was issued to residents on 23 January 2014; 25 March 2014; 28 March 2014/5 May 2014.
1.7	Report to Midlothian Council Cabinet on 22 April 2014 by Director, Resources and Joint Director, Health and Social Care.
1.8	First Care for People Group meeting on 22 April 2014
1.9	Response to Special Meeting of Midlothian Council on 20 May 2014 by Chief Executive.

Possible Remedial Option	Fairhurst Technical Support for Option (Y/N)	Probability of guaranteed interruption of Source-Pathway-Receptor linkage (Low/Moderate/High)	Risk of solution breakdown and recurrence of Source-Pathway-Receptor linkage	Strength of evidence-base on effectiveness of the proposed solution: e.g. <ul style="list-style-type: none">Peer reviewed / published scientific trials = highRecognised expert opinion = mediumCommercial opinion = lowNone = zero	Level of dependency on ongoing support to monitor the integrity of the solution (e.g. equipment / hardware, people, requirement for ongoing maintenance, technical complexity etc, etc.)	Technical or practical difficulty in delivery of solution	Likelihood of satisfying IMT requirements
Option 1 Retrofitting of Ground Gas Membrane and Installation of Air Blanket Initially as pilot in small number of properties rolling out to all 64 properties thereafter	(N) Fairhurst would consider that the technical difficulties associated with delivery of the option are a significant hurdle to achieving 100% guarantee of success	Low to moderate probability of guaranteed interruption of SPR linkage: Through consultation with retrofit designers and installation contractors, the installation of a membrane that prevented ingress of ground gases into properties with a 100% guarantee could not be provided. The clean air blanket system would also be installed underneath all structures on site.	There are possible scenarios in which breakdown or failure could occur and dual redundancy would require to be designed into the system and be carefully managed. These possible scenarios are; power failure, backup system failure, vandalism, bankruptcy of suppliers & maintenance providers.	Low- very few case studies or empirical evidence available to show successful deployment in residential setting. Expert opinion states that the system will work- however, with caveats (that the contractor has not divulged as there is currently no contract that I do not feel would convince the IMT of the viability.	A high degree of dependency on technical support and maintenance for the air blanket and replacement every 10-20 years of main parts of the system.	It is very difficult to practically deliver the gas membrane. To achieve this, major structural alteration to the building would be required. The alterations are not ‘standard construction techniques’ and following consultation with specialists, it is highly unlikely that this is practicable to be considered further.	It is highly unlikely that the IMT would accept a pilot project would have to be launched to demonstrate with a high degree of confidence that over a long time period that the technique could provide a successful solution. This may take up to five years and with any discrepancy in post remediation monitoring, the IMT may reject the effectiveness of the solution. Highly unlikely that IMT would accept the remaining properties to remain under occupation for up to a 5yr pilot & LA would struggle to maintain the level of response to alarm activation
Option 2 Demolish and Rebuild all the Units incorporating Ground Gas Defence System – 64 properties	(Y) Fairhurst consider that demolition and rebuild incorporating ground gas defence systems to CS3 will provide a site suitable for use	High probability of guaranteed interruption of SPR linkage If the site was to be reused and the homes reconstructed a CS3 ground gas defence systems with a ventilated void would require to be incorporated into the construction of the new build properties by a specialist installer in accordance with CIRIA, BRE and BS8485 documentation. With appropriate levels of workmanship and independent verification of the membrane.	If the design, construction and verification of the ground gas defence measures were undertaken in accordance with appropriate guidance, then the SPR linkage is likely to be broken and the site could be made suitable for use. It is highly unlikely that the SPR linkage would reform.	High- research papers from recognised scientific bodies and wide track record of successful application	Following construction and verification, there is very little or no ongoing maintenance required	The techniques are widely used and technically feasible	The IMT are likely to require specifications and performance models for the proposed gas defence systems and a demonstration of their possible effectiveness. It is likely that the IMT would accept the decision, however, would have ongoing involvement in the reconstruction and verification process. If the IMT do not accept that installation of ground gas membranes in new build properties on gas affected land is an adequate form of treatment then this would have far reaching consequences for development of any future brownfield / ex coal land across Scotland
Option 3 demolish the decanted units and rebuild and retrofit to remainder	(N) Fairhurst cannot support this option or make comment upon it as it does not address the wider risk to remainder of the other properties						
Option 4 Decant 5 properties (87/89/4/6/30 NBC) with elevated Gas readings and remain unoccupied	(N) Fairhurst consider that this would remove the Source-Pathway-Receptor linkage, however Fairhurst cannot support this option or make comment upon it as it does not address the wider risk to remainder of the other properties	The pollutant linkage would remain however the primary receptor (human users of the properties) would no longer be present with the properties, therefore the SPR linkage would be broken, however, this is subject to maintaining the security of the properties and preventing permanent access and therefore the probability of maintaining a broken SPR linkage is reduced	The probability of maintaining a broken SPR linkage is directly linked to maintaining the security of the properties and preventing permanent access.	None required	Ongoing requirement for monitoring and maintenance to prevent access to property	Difficult to feasibly police security at site at all times	It is possible that the IMT may accept this proposal if guarantees were offered over future security however, may refuse this option if they are not satisfied with the proposals. This is likely to blight the area and possibly the IMT may comment on health and wellbeing on mental health of surrounding residents.
Option 5 Demolish and market the site as a potential development site	(Y) Fairhurst consider that this option would remove the Source Pathway Receptor linkage but formal agreements are recommended making CS3 gas protection a requirement in any future redevelopment	High probability of guaranteed interruption of Source-Pathway-Receptor linkage	This would remove the receptor from the site, therefore, the SPR linkage would no longer exist	None required	No dependency once demolition has taken place	Technically feasible	The IMT have already indicated that they would be satisfied with the demolition proposal in IMT meeting 26/05/2014

**MIDLOTHIAN COUNCIL
RESOURCES DIRECTORATE**

IMT OPTION APPRAISAL OF POTENTIAL SOLUTIONS

Criteria for option appraisal of potential solutions

i) Criterion		Assessment				Other Item
		Zero	Low	Medium	High	
Public Health utility of the solution	Probability of guaranteed interruption of Source-Pathway-Receptor linkage					
	Risk of solution breakdown and recurrence of Source-Pathway-Receptor linkage					
	Probability of requirements for ongoing monitoring of: a) CO ₂ gas levels b) Population health					
Strength of evidence for effectiveness of the solution	Strength of evidence-base on effectiveness of the proposed solution: e.g. <ul style="list-style-type: none">• Peer reviewed / published scientific trials = high• Recognised expert opinion = medium• Commercial opinion = low• None = zero					
Technical or management dependency of solution	Level of dependency on ongoing support to monitor the integrity of the solution (e.g. equipment / hardware, people, requirement for ongoing maintenance, technical complexity etc, etc.)					
ii) Criterion				Costs		
Economic Factors	Total estimated cost of actual solution over total lifetime – <u>excluding</u> replacement / modification costs (capital spend)					
	Total estimated costs of actual solution over total lifetime – <u>including</u> replacement / modification costs (capital spend)					
	Total costs of any ongoing maintenance, equipment replacement, monitoring systems, etc etc. (current spend)					

MC40 Newbyres Crescent CO² Project Risk Register

Risk Code	Risk Identification	Ownership Managed by	Risk Control Measures	Likelihood	Impact	Risk Evaluation
MC40-01	Ill Health to individuals from properties in Newbyres Crescent with a regular CO² build up above the 2000ppm level set.	Head of Customer and Housing Services	Tenants in this situation have been re-housed until the matter is full addressed. Access to these homes has been restricted by boarding up of properties.	5	4	20
Linked Actions Code	Linked Action	Linked Actions Latest Note		Assigned to	Due Date	Status
MC40-01-01(A)	Incident Management Team (IMT) has been set up under Director of Public Health, NHS Lothian & is investigating the options for the future of the site and the housing development with the assistance of independent expert advisors.	Interim report from the Chair of IMT to be prepared in June 2014.		Environmental Health Partnership Manager	June 2014	Live
MC40-01-02(A)	Fairhursts have been commissioned to advise the Council on remediation options.	Options Report which will take cognisance of any IMT recommendations will be provided at the Council Meeting on 10 June 2014.		Head of Property and Facilities Management	14.6.14	Live
MC40-01-03(A)	Fairhursts and Lawyers to be commissioned to compile a Report identifying how this situation arose and options to remedy. (Note paper presented to Special Cabinet 20 May 2014 re legal status)	Further Report will be provided.		Head of Property and Facilities Management	tbc	Live

Risk Code	Risk Identification	Ownership Managed by	Risk Control Measures	Likelihood	Impact	Risk Evaluation
MC40-02	CO ² build up within Council house at Newbyres Crescent from a historical mine works source, travelling a pathway and affecting receptors at up to 62 residential properties presenting potential health impact.	Head of Customer and Housing Services	<p>CO² monitors with alarm capability installed within all potentially affected properties at Newbyres Crescent, Gore Avenue, Gore Avenue Extra Care Housing and Newbyres Care Home. Enhancements being made to level dB level of warning as it was considered too low. Solution linked to Telecare system for those 3 addresses identified with hearing impairments.</p> <p>Written procedure, approved by IMT, for Tenants and Council staff to follow in the event of alarm activation, including info on temporary decanting or longer term evacuation.</p> <p>Recommendation from IMT to set alarm trigger at 2000ppm. (3000ppm lower than the occupational exposure limit for an 8 hour period)</p> <p>Council staff on 24 hour standby to respond within 1 hour to calls from tenants following all reported alarm activation.</p> <p>CO₂ levels in living areas monitored and reported to Environmental Health who reports to the Chair of IMT.</p> <p>Officers attending wear O₂ depletion monitors and are trained to decant all personnel if O₂ alarm sounds.</p> <p>Chair of IMT has been asked for guidance on 'forced' decant if necessary, Environmental Health legislation, Public Health (Scotland) Act 2008 does not provide such powers.</p>	5	2	10
Linked Actions Code	Linked Action	Linked Actions Latest Note		Assigned to	Due Date	Status
MC40 -02-01(A)	Data logging of CO ₂ and air pressure within affected/potentially affected housing using a set of 10 data loggers	Results being gathered to build a clear evidential based picture of the extent of CO ₂ build up within the group of houses in Newbyres Crescent.		Maintenance Manager		Live
MC40 -02-	Fairhursts have been commissioned to	Options Report which will take cognisance of IMT		Head of	14.6.14	Live

02(A)	advise the Council on remediation options.	recommendations will be provided at the Council Meeting on 14 June 2014.	Property and Facilities Management		
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Risk Code	Risk Identification	Ownership Managed by	Risk Control Measures	Likelihood	Impact	Risk Evaluation
MC40 -03	Residents unclear of: <ul style="list-style-type: none"> the action to take in the event of alarm activation or progress with the situation at Newbyres Crescent how to request re-housing on health grounds 	Head of Customer and Housing Services	<p>Written briefing provided to Tenants to follow in the event of alarm activation, including info on evacuation.</p> <p>Regular briefings are provided to tenants and weekly to elected Ward Members.</p> <p>Tenants advised how to request re-housing on health grounds in accordance with Housing Allocations Policy.</p>	3	9	9
Linked Actions Code	Linked Action	Linked Actions Latest Note		Assigned to	Due Date	Status
MC40 -03-01(A)	Tenants regularly briefed regarding on going/developing situations	<p>Press releases/web site and social media 28 March 28 March 7 April 17 April 28 April 7 May Written communications to tenants 23 January 25 March 28 March 5 May Council Officers home visits to all households 2 April 17 April 25 April</p>		Head of Customer and Housing Services		Live
MC40 -03-02(A)	Elected members briefed on a regular basis.	Briefing issued on a weekly basis.		Head of Customer and Housing Services		Live
MC40 -03-03(A)	IMT monitoring situation and providing advice.	IMT meets on a 2-3 week basis.		Head of Customer and Housing Services		Live

Risk Code	Risk Identification	Ownership Managed by	Risk Control Measures	Likelihood	Impact	Risk Evaluation
MC 40-04	Exposure to Oxygen depleted Environment when Council staff are responding to Alarm Activation.	Head of Property and Facilities Management	Trigger level for alarm activation to alert tenants set to 2000ppm. Employees entering premises in response to activation advised of significant hazards and control measures provided with protocol to follow as part of safe system of work. Employees provided with 5 gas monitor and personal monitors to give early warn of depleted oxygen levels.	5	2	10
Linked Actions Code	Linked Action	Linked Actions Latest Note		Assigned to	Due Date	Status
MC40-04-01(A)	Fairhursts have been commissioned to advise the Council on remediation options.	Options Report will be provided at the Council Meeting on 10 June 2014.		Head of Property and Facilities Management	14.6.14	Live
MC40-04-02(A)	Fairhursts and Lawyers to be commissioned to compile a Report identifying how this situation arose and options to remedy.	Further Report will be provided.		Head of Property and Facilities Management	tbc	Live

Risk Code	Risk Identification	Ownership Managed by	Risk Control Measures	Likelihood	Impact	Risk Evaluation
MC40-05	Loss of confidence by Council House Tenants regarding quality/safety of Council Housing. Loss of public confidence more widely	Director, Resources	The Council are re-housing tenants where a specific risk is identified due to CO2 levels or existing medical conditions in accordance with Housing Allocations Policy. The Council is giving affected residents and their locally elected representatives regular briefings and updates on developments.	5	3	15
Linked Actions Code	Linked Action	Linked Actions Latest Note		Assigned to	Due Date	Status
MC40-05-01(A)	Longer term communication strategy being progressed to with a view to demonstrating an open and	Communications Manager tasked with bringing forward strategy.		Communication Manager	tbc	Live

	transparent approach to public information associated with this issue aimed at giving confidence in the remedial action taken.				
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Risk Code	Risk Identification	Ownership Managed by	Risk Control Measures	Likelihood	Impact	Risk Evaluation
MC40-06	Pressure on existing financial and staffing resource within the Council to respond to this issue.	Director, Resources	The Director of Resources has asked members of the Newbyres Crescent Project Group to highlighted any resourcing issues.	5	4	20
Linked Actions Code	Linked Action	Linked Actions Latest Note		Assigned to	Due Date	Status
MC40-06-01(A)	Newbyres Crescent Project Group asked to highlight any issues associated with resourcing a response to the issues at Newbyres Crescent.	Group members to advise John Blair directly in advance of next group meeting		All Project Group Members	tbc	Live

Risk Code	Risk Identification	Ownership Managed by	Risk Control Measures	Likelihood	Impact	Risk Evaluation
MC40-07	Unauthorised access to boarded up properties with high concentration of CO2 (Potential to be fatal).	Head of Property and Facilities Management	Properties boarded up with Warning Notices displayed.	3	5	15
Linked Actions Code	Linked Action	Linked Actions Latest Note		Assigned to	Due Date	Status
MC40-07-01(A)						

Risk Code	Risk Identification	Ownership Managed by	Risk Control Measures	Likelihood	Impact	Risk Evaluation
MC40-08	Responding Service personnel at risk of exposure to elevated CO2 in affected properties.	Head of Customer and Housing	Emergency Services Alerted by ****	3	5	

		Services	<ul style="list-style-type: none"> • Police • Fire & Rescue • Ambulance • GP's 			15
Linked Actions Code	Linked Action	Linked Actions Latest Note		Assigned to	Due Date	Status
MC40-08-01(A)						

LIKELIHOOD	Consequent Impact				
	1 Insignificant	2 Minor	3 Moderate	4 Major	5 Critical
5 Almost Certain	5	10	15	20	25
4 Likely	4	8	12	16	20
3 Possible	3	6	9	12	15
2 Unlikely	2	4	6	8	10
1 Remote	1	2	3	4	5

Very Low (1-3), Low (4-9), Medium (10-16), High (20), Critical (25)