

C M Edwards  
Pendil  
Llangollen Road  
Acrefair  
LL14 3RS

0209  
18 September 2002

Dear Sir,

**Pendil, Llangollen Road, Acrefair**

**Report on stabilisation of mineworkings.**

I enclose three copies of my report on the mining stabilisation work on this site.

This report is on work meeting NHBC D6 requirements for this site, which was previously investigated and reported to D5 standards, and the report can be used to complete Validation Report D7.

If you have any queries regarding this report, please let me know. To comply with the Indemnity Form issued by the Coal Authority, a copy of this report has been sent directly to their offices at Mansfield.

Yours faithfully,

Neil Catlow

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## **Mining Investigation Report**



### **Pendil, Llangollen Road, Acrefair**

0209

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## **extract**

This report meets NHBC D6 requirements and supplements a previous D5 detailed investigation report

The site is undermined by old workings which have now been stabilised

There is some contamination

### **Site**

A plot for a dwelling adjacent to Pendil, Llangollen Road, Acrefair

### **Stabilisation and site work by**

Neil Catlow B.Sc F.G.S Engineering geologist.

### **Remedial work**

#### **Previous detailed investigation**

Investigated by myself in August 2002, when shallow mineworkings were proved in the Yard Coal at a depth of 9.2m. There is 1.0m of colliery derived fill on the site, and the foundation soils are firm sandy clays. There were no gas emissions.

#### **Current remedial work**

A total of 8 holes were drilled into the Yard Coal workings, and subsequently grouted. See results of remedial work.

#### **Foundation design**

A raft designed to span 3.0m will be required.

#### **Contamination testing**

The results of the contamination testing carried out at the time of the initial investigation are appended.

Levels of arsenic, polyaromatic hydrocarbons, and sulphate exceed the domestic threshold but are below domestic action levels. Whilst the arsenic and PAH levels are typical for coalfield sites, sulphate is particularly high and may indicate a previous industrial use. I recommend clean imported topsoil 500mm thick is used in the gardens to prevent uptake of contaminants by vegetation and to protect children playing in the garden areas.

For Nkc Geotech Ltd

Neil Catlow, B.Sc, F.G.S

### **Method statement for remedial works**

#### **Stabilisation of mineworkings by grouting**

This work follows an initial investigation of a site which has shown that a coal seam of economic importance is present at shallow depth and has been mined. There are therefore geotechnical hazards present.

Shallow mineworkings are stabilised by drilling a grid of holes 65mm or 75mm diameter down through the coal seam on an initial 6.0m grid pattern over the bearing area of the proposed building, reducing to 3.0m spacing when open workings are encountered. The workings are grouted using 4:1:1 sand/PFA/cement ready-mixed grout injected by casing to the bottom of the hole, and pressurised to 150 - 200kN/m<sup>2</sup> when filled.

I carry out all this site work personally, and keep full records of each hole.

The report is submitted on completion is required for NHBC Validation D7.

### **Results of remedial work**

| hole | seam<br>depth* | hole<br>depth | grout<br>take | status<br>code | comments |
|------|----------------|---------------|---------------|----------------|----------|
| Bh 1 | 8.3            | 15.0          | 0.0           | sd             |          |
| Bh 2 | 7.7            | 15.0          | 1.6           | cn             |          |
| Bh 3 | 9.2            | 30.0          | 1.6           | cd             |          |
| Bh 4 | 9.0            | 15.0          | 4.0           | vd             |          |
| Bh 5 | 7.4            | 15.0          | 2.1           | cn             |          |
| Bh 6 | 8.9            | 15.0          | 1.6           | cd             |          |
| Bh 7 | 8.2            | 15.0          | 0.0           | sd             |          |
| Bh 8 | 9.5            | 15.0          | 2.0           | cd             |          |

Grout mix 4:1 rockdust/PFA/cement and measured in dry tonnes

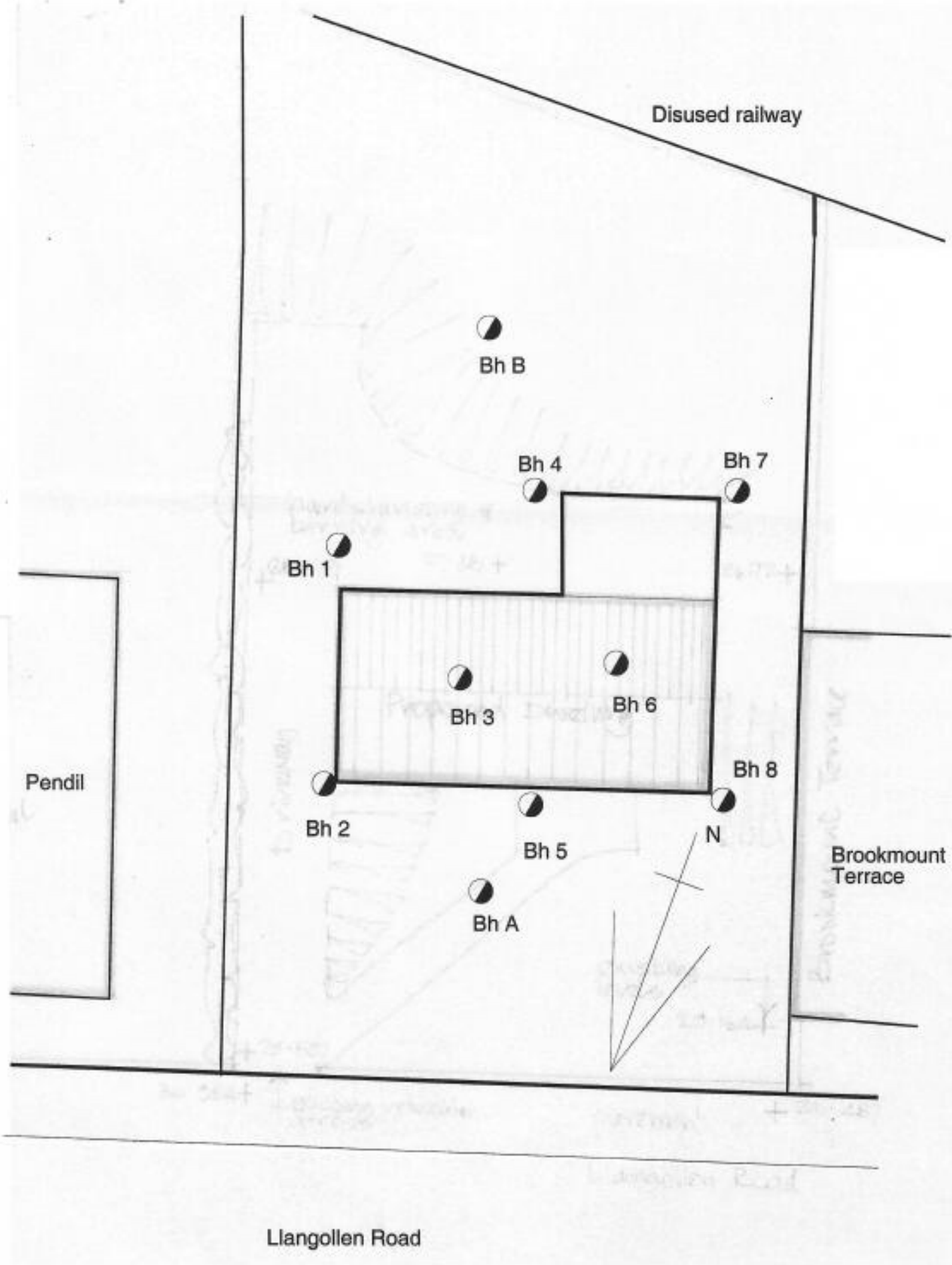
Injection pressure <150kN/m<sup>2</sup>

All work carried out by Neil Catlow B.Sc, F.G.S

Total grout take dry tonnes 12.9

\* or depth to mineworkings or migrating cavity

Status codes sd solid cd collapsed cn cavitation vd void



**Contamination tested to ICRL 59/83**

samples are taken by flight auger from 0.5m depth

|                           | Bh A   | %     | domestic<br>threshold<br>mg/kg | %   | domestic<br>action level<br>mg/kg | %    | open space<br>threshold<br>mg/kg |
|---------------------------|--------|-------|--------------------------------|-----|-----------------------------------|------|----------------------------------|
| <b>Group A toxic</b>      |        |       |                                |     |                                   |      |                                  |
| Arsenic                   | 31.0   | 310%  | 10                             | n/a | n/a                               | 77%  | 40                               |
| Cadmium                   | <1.0   | <33%  | 3                              | n/a | n/a                               | 7%   | 15                               |
| Chromium Hex              | <1.0   | <4%   | 25                             | n/a | n/a                               |      | n/a                              |
| Chromium total            | 19.0   | 3%    | 600                            | n/a | n/a                               | 2%   | 1000                             |
| Lead                      | 42.0   | 8%    | 500                            | n/a | n/a                               | 2%   | 2000                             |
| Mercury                   | <1.0   | <100% | 1                              | n/a | n/a                               | 5%   | 20                               |
| Selenium                  | <1.0   | <33%  | 3                              | n/a | n/a                               | 17%  | 6                                |
| <b>Group B phytotoxic</b> |        |       |                                |     |                                   |      |                                  |
| Boron                     | <1.0   | <33%  | 3                              | n/a | n/a                               | n/a  | n/a                              |
| Copper                    | 19.0   | 15%   | 130                            | n/a | n/a                               | n/a  | n/a                              |
| Nickel                    | 26.0   | 37%   | 70                             | n/a | n/a                               | n/a  | n/a                              |
| Zinc                      | 59.0   | 20%   | 300                            | n/a | n/a                               | n/a  | n/a                              |
| PAH                       | 297.0  | 594%  | 50                             | 59% | 500                               | 30%  | 1000                             |
| Phenols                   | <0.1   | <2%   | 5                              | 0%  | 200                               | 2%   | 5                                |
| Cyanides free             | <2.5   | <10%  | 25                             | 0%  | 500                               | 2%   | 100                              |
| complex                   | <2.5   | <1%   | 250                            | 0%  | 1000                              | 1%   | 250                              |
| Thiocyanate               | 1.0    | 2%    | 50                             | n/a | none                              | 2%   | 50                               |
| Sulphate                  | 5100.0 | 255%  | 2000                           | 51% | 10000                             | 255% | 2000                             |
| Sulphide                  | 26.0   | 10%   | 250                            | 3%  | 1000                              | 10%  | 250                              |
| Sulphur                   | 0.2    | 0%    | 5000                           | 0%  | 20000                             | 0%   | 5000                             |
| Acidity                   | 7.5    |       |                                |     | 3                                 |      |                                  |

**Contamination tested to ICRL 59/83**

samples are taken by flight auger from 0.5m depth

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| Boron                     | <1.0   | <33%  | 3                              | n/a | n/a                               | n/a  | n/a                              |
| Copper                    | 19.0   | 15%   | 130                            | n/a | n/a                               | n/a  | n/a                              |
| Nickel                    | 26.0   | 37%   | 70                             | n/a | n/a                               | n/a  | n/a                              |
| Zinc                      | 59.0   | 20%   | 300                            | n/a | n/a                               | n/a  | n/a                              |
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| Sulphur                   | 0.2    | 0%    | 5000                           | 0%  | 20000                             | 0%   | 5000                             |
| Acidity                   | 7.5    |       |                                |     | 3                                 |      |                                  |