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**Proposed Borders Reinforcement Phase 2:
Newhouses to Calfhill Natural Gas Pipeline.
Galashiels, Scottish Borders**

**Trial Trenching Evaluation
Data Structure Report
No. 1777**

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Proposed Borders Reinforcement Phase 2: Newhouses to Calhill Natural Gas Pipeline. Galashiels, Scottish Borders

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CONTENTS

1.	Introduction	3
2.	Methods	6
3.	Archaeological Results	6
4.	Summary	8
5.	References	9

APPENDICES

Appendix 1	Trench Register	10
Appendix 2	Context Register	11
Appendix 3	Photographic Register	11
Appendix 4	Discovery and Excavation in Scotland Entry	13

ILLUSTRATIONS (bound at rear)

Fig. 1	Location and route of pipeline
Fig. 2	Location of Trial Trenches 1-3
Fig. 3	Location of Trial Trenches 4-11
Fig. 4	Plan of south-east end of TT4
Fig. 5	South-west facing section through 006
Fig. 6	Plan of south end of TT1
Fig. 7	West facing section through 009

1. INTRODUCTION

1.1 General

1.1.1 This report presents the results of an archaeological evaluation undertaken in advance of works for a natural gas pipeline between Calfhill, near Galashiels (NGR: NT 513 387) to Newhouses, near Lauder (NGR: NT 513 448; Fig. 1), Scottish Borders. The work was commissioned by Groundwork Archaeology Ltd on behalf of Scottish Gas Networks.

1.1.2 Scottish Gas Networks (SGN) have identified a need to reinforce an existing pipeline to meet a predicted growth in demand. SGN propose to install a new 6.5km long section of gas pipeline. The archaeological evaluation was required in advance of the work by Chris Bowles, Archaeology Officer for Scottish Borders Council. A written scheme of investigation (WSI) was produced by Derek Cater of Groundwork Archaeology and agreed by Chris Bowles.

1.2 Background

1.2.1 A desk-based assessment carried out by Derek Cater during 2009 (Cater 2009) identified 53 cultural heritage assets of varying sensitivity. A gradiometer survey carried out by Headland Archaeology during 2009 (Harrison 2010) revealed one group of anomalies of both high and medium potential (the site of the former Threepwood Farm), two groups of medium potential anomalies, one to the north and one to the south of Colmsliehill farmstead and a number of low potential anomalies. Two anomalies of low archaeological potential were detected north of the current Threepwood farmstead.

1.2.2 The requirement for an evaluation arose from the results of the gradiometer survey and a re-route to the pipeline in order to avoid impacting upon the site of the former Threepwood Farm. Trench dimensions and locations are summarised in Table 1, below.

Trial Trench No.	Dimensions	Trench Locations (Coordinates listed clockwise from southernmost vertex)	Reason for Excavation
TT1	30m x 2m	351220.105/644703.871 351219.583/644733.866 351221.583/644733.901 351222.104/644703.905	Positively magnetic anomaly possibly defining post-medieval stock management feature (geophysical survey stage 2)
TT2	25m x 2m	350920.063/643455.663 350895.444/643460.008 350895.791/643461.978 350920.411/643457.633	Positively magnetic anomaly which, coupled with that sampled by TT3, could in part define a possible large curvilinear enclosure (geophysical survey stage 6)
TT3	30m x 2m	350873.722/643390.229 350865.149/643418.978	Positively magnetic anomaly which, coupled

		350867.065/643419.550 350875.639/643390.801	with that sampled by TT2, could in part define a possible large curvilinear enclosure (geophysical survey stage 6)
TT4	15m x 2m	351191.359/642397.907 351178.039/642404.803 351178.958/642406.579 351192.279/642399.683	For risk management purposes along reroute adjacent to DBA & geophysical and topographical survey site (DBA asset 53; geophysical survey stage 12)
TT5	15m x 2m	351190.376/642409.511 351188.564/642410.359 351194.922/642423.945 351196.733/642423.097	Ditto
TT6	15m x 2m	351199.758/642387.592 351197.984/642388.517 351204.924/642401.815 351206.697/642400.890	Ditto
TT7	15m x 2m	351215.979/642404.471 351202.642/642411.334 351203.557/642413.113 351216.894/642406.249	Ditto
TT8	15m x 2m	351225.572/642378.969 351212.309/642385.977 351213.244/642387.745 351226.506/642380.737	Ditto
TT9	15m x 2m	351224.102/642391.035 351222.294/642391.888 351228.693/642405.455 351230.502/642404.602	Ditto
TT10	40m x 2m	351243.895/641538.407 351222.228/641572.031 351223.909/641573.114 351245.576/641539.490	Positively magnetic anomaly possibly defining curvilinear enclosure, also sampled by TT11 (geophysical survey stage 14)
TT11	20m x 2m	351229.775/641507.771 351228.658/641509.430 351245.249/641520.598 351246.366/641518.939	Positively magnetic anomaly possibly defining curvilinear enclosure, also sampled by TT10 (geophysical survey stage 14)
TT12	25m x 2m	351156.215/641114.954 351140.201/641134.151 351141.736/641135.432 351157.751/641116.235	Negatively magnetic anomaly in part defining a possible rectangular structure, also sampled by TT13 (geophysical survey stage 17)
TT13	20m x 2m	351141.650/641096.218 351140.215/641097.612 351154.150/641111.958 351155.585/641110.565	Negatively magnetic anomaly in part defining a possible rectangular structure, also sampled by TT12 (geophysical survey stage 17)

Table 1: Trial Trench dimensions and locations.

1.3 Objectives

1.3.1 The project's aim was to evaluate the likely impact of the proposed development on any archaeological remains present at the tested locations, so that appropriate mitigation measures could be designed, agreed and implemented:

- Establish through sample excavation the presence or absence, extent, condition, importance, nature, date and depth of any archaeological remains present at the evaluated locations;
- Locate, recover, identify and conserve, as appropriate, all stratified archaeological artefacts and any unstratified finds that predate the late 20th century and have the potential to elucidate past land use;
- Locate, recover and assess any revealed palaeo-environmental, palaeo-economic and organic remains present at the evaluated locations;
- Produce a report that provides sufficient information to allow an assessment to be made as to whether the assembled data set merits further analysis and publication;
- Produce a report that provides sufficient information to constitute a standalone resource if no further work is undertaken;
- Produce a report that provides sufficient information to facilitate the devising of suitable schemes of further mitigation;
- To report recovered artefacts to the Treasure Trove Unit and facilitate possible museum uplift;
- Produce a paper and digital archive and deposit it with the RCAHMS;
- To disseminate the results of the evaluations widely by publishing a short report in *Discovery and Excavation in Scotland* and by reporting project details and uploading a copy of the assessment report via the online OASIS form.

2. METHODS

2.1 General

- 2.1.1 CFA follows the Institute for Archaeologists' Standards and Guidance and Code of Conduct.
- 2.1.2 All archaeological works were carried out in accordance with the WSI provided by Derek Cater, unless otherwise instructed.

3. ARCHAEOLOGICAL RESULTS

3.1 General

- 3.1.1 The trial trenching results are described below. The trial trenches are described in their spatial groups. Full trial trench descriptions including dimensions and grid co-ordinates are listed in Appendix 1. Context numbers are in bold and parentheses and listed in Appendix 2.

Trial Trench 1 (Fig. 1)

- 3.1.2 Trial Trench 1 was located to evaluate a positive magnetic anomaly which was thought to possibly reflect a post-medieval stock management feature. It was situated at the north end of the pipeline on open pasture on a gentle slope with a north-easterly aspect. The surface of the field was flat with faint traces of rig and furrow remains. The field immediately to the north had clearly visible rig and furrow aligned east to west with significant surface relief.
- 3.1.3 Topsoil (**001**) was 0.3m thick and was very clay-rich, indicating extensive and deep ploughing; a scenario confirmed by the farmer. Natural subsoil (**000**) (Figs. 6 & 7) was orange sandy boulder clay. Two cultivation furrows aligned east to west and situated 2.8m apart were recorded. The southernmost furrow [**011**] was largely ploughed out and was indicated better on the surface by differences in grass density. The cut in the natural survived as a barely discernable hollow c.0.4m wide and less than 0.05m deep. The northernmost furrow [**009**] was better preserved and was 1.2m wide and 0.1m deep with shallow sides and a concave base. The fill (**010**) was pale silty clay containing occasional stones.
- 3.1.4 These remnant furrows appear to be part of a wider rig and furrow cultivation system which better survives to the north. No finds were discovered.

Trial Trenches 2 & 3 (Fig. 2)

- 3.1.5 These trenches were located to evaluate a positive magnetic anomaly which was considered to possibly reflect a large curvilinear enclosure. They were located on sloping open pasture with a north-easterly aspect. The surface of the field was flat with no surface relief.

- 3.1.6 Topsoil (**001**) was 0.25 to 0.3m thick. Natural subsoil (**000**) comprised bands of shattered pale mudstone bedrock merging to a distinctive band of orange-purple sandy clay with occasional seams of bedrock. This pattern was observed in both trenches and would seem to be the source of the results of the gradiometer survey.

Trial Trenches 4 to 9 (Fig. 3)

- 3.1.7 These trenches were set in a grid array pattern and were located between visibly upstanding remains of the former Threepwood farm to the south and rig and furrow to the north. They were placed to evaluate the archaeological potential of the pipeline diversion to avoid the upstanding remains of the former Threepwood farm. Trenches 4 to 7 were on the edge of a level plateau, Trenches 8 and 9 were located on a steep slope off the north edge of the plateau.
- 3.1.8 Topsoil varied from 0.2m to 0.35m thick. Subsoil (**002**) was present in Trenches 4, 5, 6 and 7, and comprised pale reddish clay-rich silt to 0.3m thick. Natural subsoil (**000**) was pale reddish gravelly clay with frequent stones and occasional red clay wedges. Archaeological remains were found only in Trench 4.
- 3.1.9 A rubble drain [**006**] aligned roughly north to south was discovered. It was 0.4m wide and 0.55m deep with vertical sides and a roughly flat base. The fill (Figs. 4 & 5) was loose voided large, sharply angular volcanic stones (**007**) ranging from 0.15m – 0.3m diameter, and loose clay-rich soil (**008**). The stones in the base of the ditch had a surface deposit of black slimy organic matter/mould, indicating damp conditions. The slot was carefully excavated and inspected to ascertain that it was a drain and not part of a palisade fence. It is unclear whether this drain is associated with the earlier Threepwood settlement although this is certainly possible.
- 3.1.10 A modern ceramic arch drain (**005**) aligned north to south was also revealed. It was set within a vertically sided cut [**003**] and backfilled with a soil and clay mix (**004**).

Trial Trenches 10 & 11 (Fig. 3)

- 3.1.11 These trenches were placed to evaluate positive magnetic anomalies which were thought to reflect part of a possible curvilinear enclosure. They were located on an area of level surfaced upland pasture on a gentle slope with a southerly aspect.
- 3.1.12 Topsoil was 0.25m thick and overlay a layer of mid-brown sandy silt subsoil (**002**) which was discontinuous and lay to a depth of 0.05m in TT11 and between 0.05m and 0.15m thick in TT10. Natural subsoil (**000**) comprised bands of pale shattered flaky gravel, purplish gritty clay and stony dark clay. The horizons between the bands were abruptly defined in TT10, less so in TT11. The different bands of natural subsoil are most likely the cause of the gradiometer survey results.

Trial Trenches 12 & 13 (Fig. 3)

- 3.1.13 Trenches 12 and 13 were placed to evaluate a negative magnetic anomaly which was considered to possibly reflect part of a rectangular structure. The trench location was on stony open pasture on a gentle slope with an easterly aspect.
- 3.1.14 Topsoil was 0.25m thick and directly overlay natural subsoil. Natural subsoil (000) was pale orange sandy clay and shattered bedrock with frequent stones. Large stones were carefully excavated to ascertain that they were natural and not in-situ archaeological remains. No archaeological remains were discovered.

4. SUMMARY

- 4.1 The thirteen trial trenches were excavated, recorded and backfilled according to the supplied WSI. Remains relating to pre-recent agricultural practices were discovered within Trial Trenches 1 and 4. No archaeological remains were discovered in any of the other trenches.
- 4.2 The evaluation on the proposed Newhouses to Calfhill natural gas pipeline route revealed the following features:
- The vestigial remains of rig and furrow cultivation in Trench 1.
 - A substantial rubble drain which is possibly associated with the former Threepwood farmstead site was discovered in Trench 4. A modern ceramic arch-topped field drain was also revealed in the same trench.
- 4.3 The anomalies revealed by the gradiometer survey appear to reflect abrupt changes in the bedding layers of natural subsoils and bedrock; in particular the high level of iron-rich bedrock observed in Trial Trenches 12 and 13.
- 4.4 The project archive, comprising all CFA record sheets, maps and reports will be deposited with the National Monuments Record of Scotland (NMRS).
- 4.5 A summary statement of the results of the evaluation, to be submitted for publication in *Discovery and Excavation in Scotland 2010* (Appendix 4) and OASIS, will be sufficient to disseminate the results of the work.

5. REFERENCES

Cater, Derek. 2009 Proposed Borders Reinforcement Phase2: Newhouses to Calfhill Natural Gas Pipeline: Cultural Heritage Desk-Based Assessment. Groundwork Archaeology Ltd Report.

Harrison, Scott. 2010 *Newhouses to Calfhill Gas Pipeline: Geophysical Survey*. Headland Archaeology Report.

Appendix 1: Trial Trench Register

Trial Trench No.	Trench Locations (NGR)	Dimensions (m)
TT1	351219.753/644733.946 351221.872/644733.606 351222.334/644704.874 351220.471/644704/634	30 x 2
TT2	350895.467/643462.450 350919.732/643458.041 350919.460/643456.152 350895.022/643460.300	25 x 2
TT3	350867.904/643419.852 350874.796/643398.901 350872.859/643389.241 350863.913/643418.372	30 x 2
TT4	351178.561/642408.122 351192.289/642400.604 351191.357/642398.514 351177.168/642405.932	15 x 2
TT5	351195.620/642425.137 351197.533/642424.267 351188.191/642410.001 351190.121/642408.951	15 x 2
TT6	351205.753/642401.933 351207.666/642401.264 351200.072/642387.428 351198.151/642388.547	15 x 2
TT7	351202.571/642412.080 351216.793/642405.412 351215.952/642403.013 351201.293/642409.761	15 x 2
TT8	351212.160/642389.037 351226.300/642381.089 351229.931/642379.070 351211.096/642386.918	15 x 2
TT9	351228.831/642406.682 351230.760/642405.772 351223.562/642390.857 351221.312/642391.946	15 x 2
TT10	351221.650/641571.961 351223.620/541573.171 351245.437/641538.511 351242.689/641537.471	40 x 2
TT11	351244.967/641519.946 351246.418/641518/066 351226/737/641507.609 351228.221/641505.370	20 x 2
TT12	351138.927/641134.396 351191.244/641134.026 351157.099/641115.922 351154.856/641114.172	25 x 2
TT13	351155.302/641111.643 351157.033/641109.323 351141.227/641095.987 351139.488/641097.047	20 x 2

Appendix 2: Context Register

Context No.	Description
000	Natural subsoil
001	Topsoil
002	Subsoil
003	Cut of modern field drain trench
004	Infill of 003
005	Arch-topped ceramic field drain
006	Cut of rubble drain
007	Stone infill of 006
008	Soil within 006
009	Cut of rig furrow
010	Fill of 009
011	Cut of rig furrow
012	Fill of 011

Appendix 3: Photographic Register

Colour Slides and Monochrome Prints

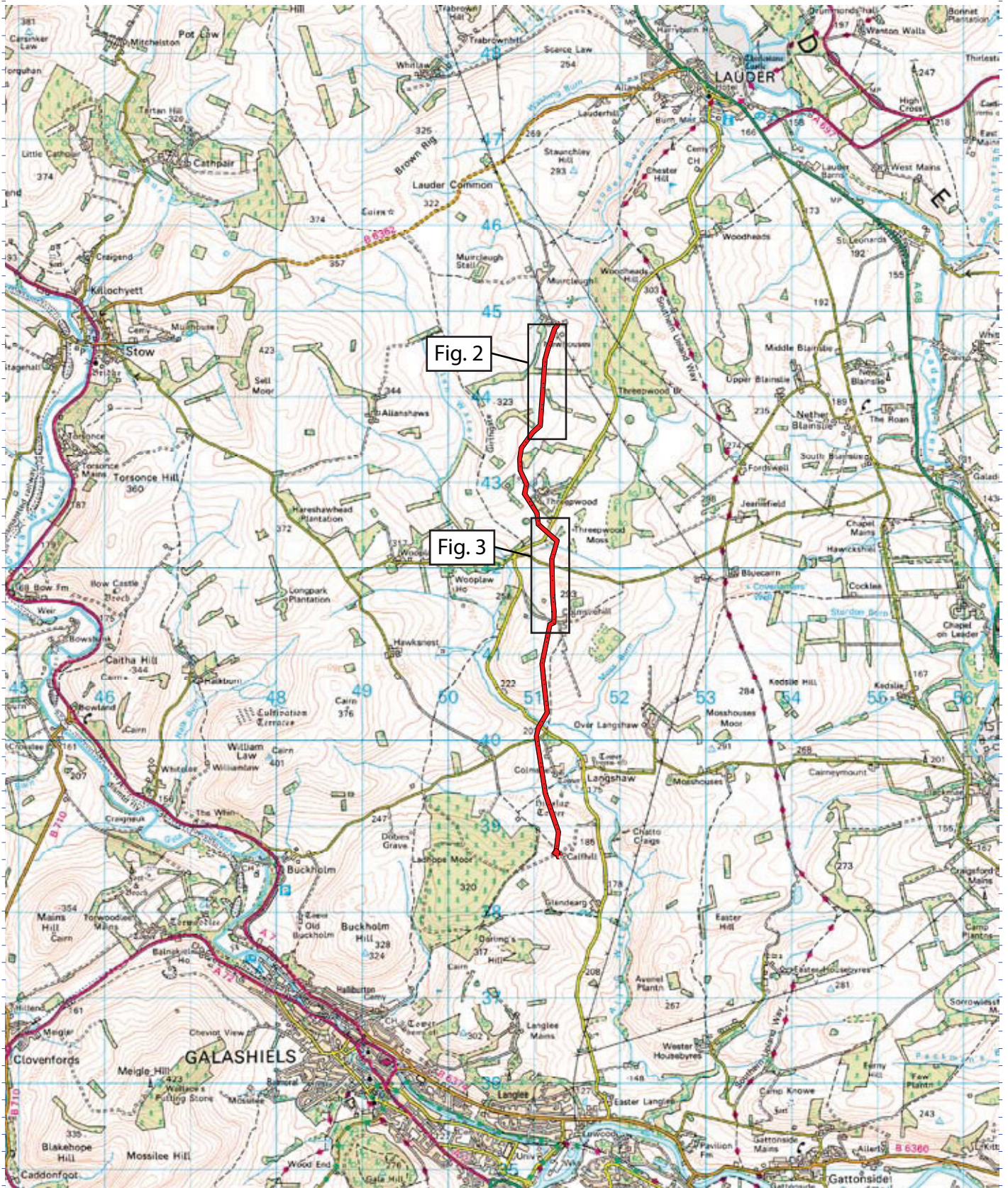
Photo No.	Description	Taken from
Film 1		
1-2	Registration	NW
3-4	Trial Trench 12	SW
5-6	Trial Trench 13	NW
7-8	Trial Trench 10	NE
9-10	Trial Trench 11	W
11-12	Trial Trench 4	W
13-14	Trial Trench 4, 003 pre-excavation	S
15-16	Trial Trench 4, 003 pre-excavation	N
17-18	Trial Trench 4, 003 in section	SW
19-20	Trial Trench 5, working shot	N
21-22	N/A	N
23-24	Trial Trench 5	S
25-26	Trial Trench 6	S
27-28	Trial Trench 4, 006 pre-excavation	W
29-30	Trial Trench 4, 006 pre-excavation	S
31-32	Trial Trench 4, 006 in section	S
33-34	Trial Trench 9, working shot	SW
35-36	Trial Trench 4, working shot	SW
Film 2		
1-2	Registration	
3-4	Trial Trench 8	E
5-6	Trial Trench 9	N
7-8	Trial Trench 7	E
9-10	Trial Trench 3	S
11-12	Trial Trench 2	W
13-14	Trial Trench 2, working shot	SW
15-16	Trial Trench 1, working shot	N
17-18	Trial Trench 1	N
19-20	Trial Trench 1, 009 pre-excavation	W
21-22	Trial Trench 1, 009 in section	
23-24	Trial Trench 1, 011 general view	NE

Digital Photos

Photo No.	Description	Taken from
1-2	General landscape shots, Colmsliehill farm.	N
3	Working shot, Trial Trench 13	W
4	General landscape shot, Colmsliehill farm	S
5	Working shot, Trial Trench 10	SE
6	General view of Trial Trenching area, Threepwood farmstead	SW
7	Trial Trench 4, 003, pre-excavation	W
8	Trial Trench 4, 003 section	N
9	Trial Trench 4, 006 pre-excavation	S
10	Trial Trench 4, 006 pre-excavation	W
11	Trial Trench 4, 006 in section	S
12-13	Trial Trenches 4 – 9, general view	SW
14-18	Trial Trench 4, working shot	S
19	Trial Trench 3, working shot	SE
20	Trial Trench 3, detail of bedrock bands	N
21-23	Trial Trench 2, detail of bedrock bands	S
24	General landscape shot from Trial Trench 2	SW
25	Trial Trench 1, view of rig and furrow	W
26	Trial Trench 1, working shot	NW
27	Trial Trench 1, 009 pre-excavation	W

Appendix 4: Discovery and Excavation in Scotland Entry

LOCAL AUTHORITY:	Scottish Borders
PROJECT TITLE/SITE NAME:	Proposed Borders Reinforcement Phase 2: Newhouses to Calfhill Natural Gas Pipeline. Galashiels, Scottish Borders
PROJECT CODE:	CALF2
PARISH:	Lauder, Melrose
NAME OF CONTRIBUTOR:	Stuart Mitchell
NAME OF ORGANISATION:	CFA Archaeology Ltd
TYPE(S) OF PROJECT:	Evaluation
NMRS NO(S):	
SITE/MONUMENT TYPE(S):	
SIGNIFICANT FINDS:	Rig and Furrows.
NGR (2 letters, 6 figures)	NT 513 448 - NT 513 387
START DATE (this season)	26/04/10
END DATE (this season)	30/04/10
PREVIOUS WORK (incl. DES ref.)	N/A
MAIN (NARRATIVE) DESCRIPTION: (May include information from other fields)	An evaluation was carried out along the line of a proposed gas pipeline at locations where a prior gradiometer survey identified several magnetic anomalies and where the pipeline route was diverted to avoid the site of the former Threepwood Farm. The anomalies were shown to be the result of abrupt changes in the nature of the natural subsoils and bedrock. A substantial rubble drain was discovered close to the former Threepwood Farm. Vestigial traces of rig and furrow were also discovered but had been largely destroyed by ploughing.
PROPOSED FUTURE WORK:	
CAPTION(S) FOR ILLUSTRS:	N/A
SPONSOR OR FUNDING BODY:	Groundwork Archaeology Ltd for Scottish Gas Networks
ADDRESS OF MAIN CONTRIBUTOR:	The Old Engine House, Eskmills Park, Musselburgh, East Lothian, EH21 7PQ
EMAIL ADDRESS:	cfa@cfa-archaeology.co.uk
ARCHIVE LOCATION (intended/deposited)	National Monuments Record for Scotland (NMRS) Scottish Borders Council Sites and Monuments Record (SMR)



Key:  pipeline route



Fig. No: 1

Revision:

Client: Scottish Gas Networks

Title: Location and route of pipeline

Project: Proposed Borders Reinforcement Phase:2
Newhouses to Calfhill Gas Pipeline



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Scale: 0 2km

Drawn by: GC

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Report No: 1777

Key:

■ Trial Trenches

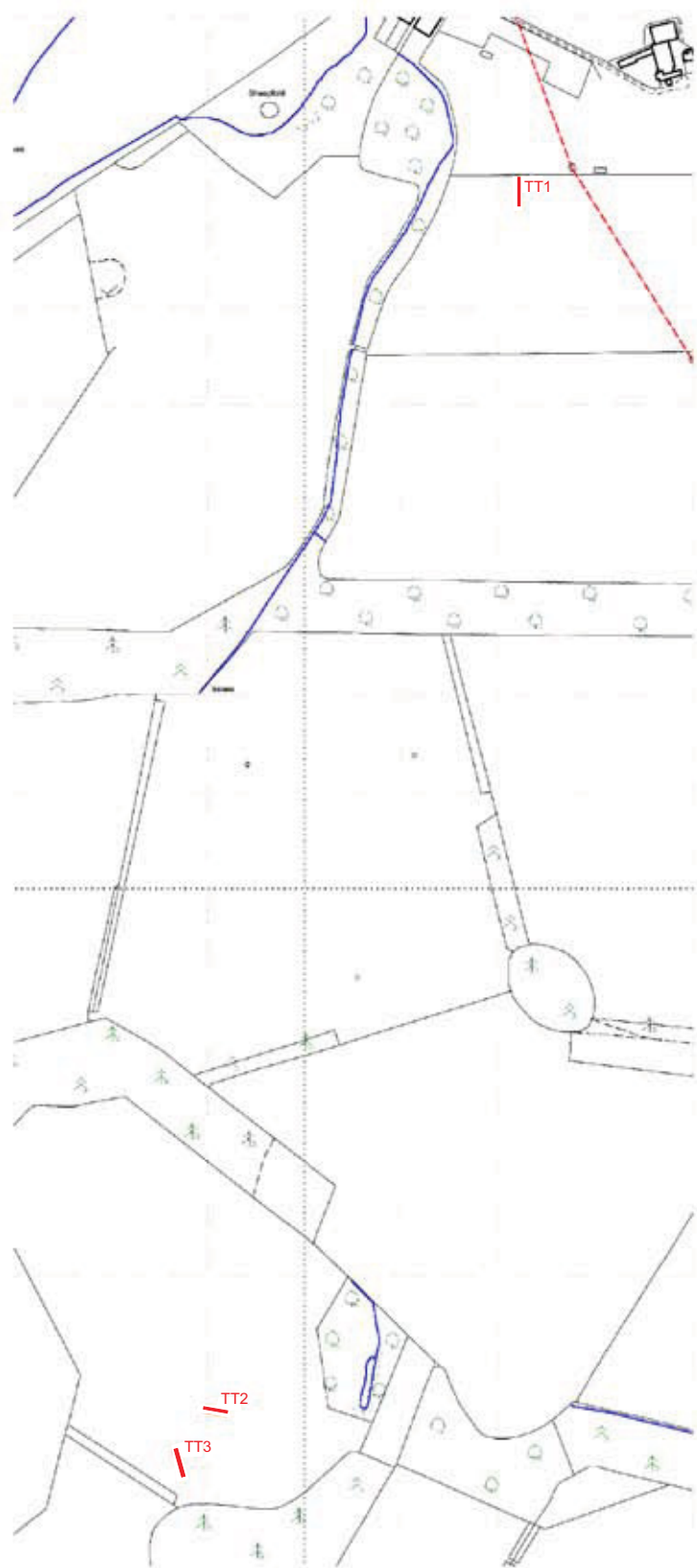


Fig. 2 Location of Trial Trenches 1-3

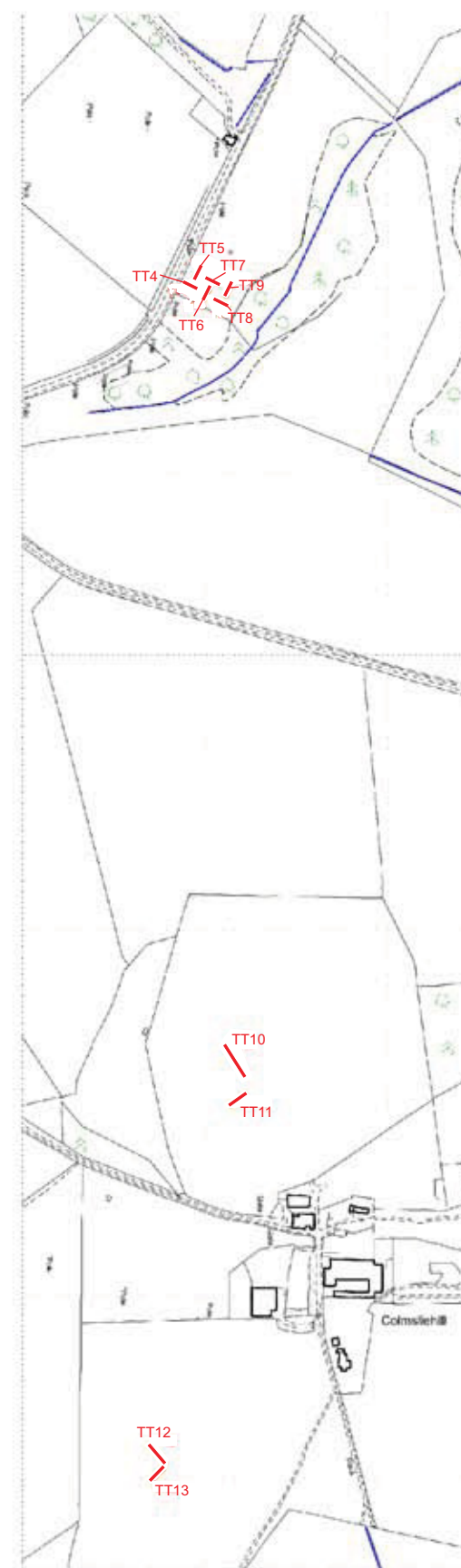


Fig. 3 Location of Trial Trenches 4-11

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Fig. No: 2-3 Revision: A

Title:
Trial Trench locations

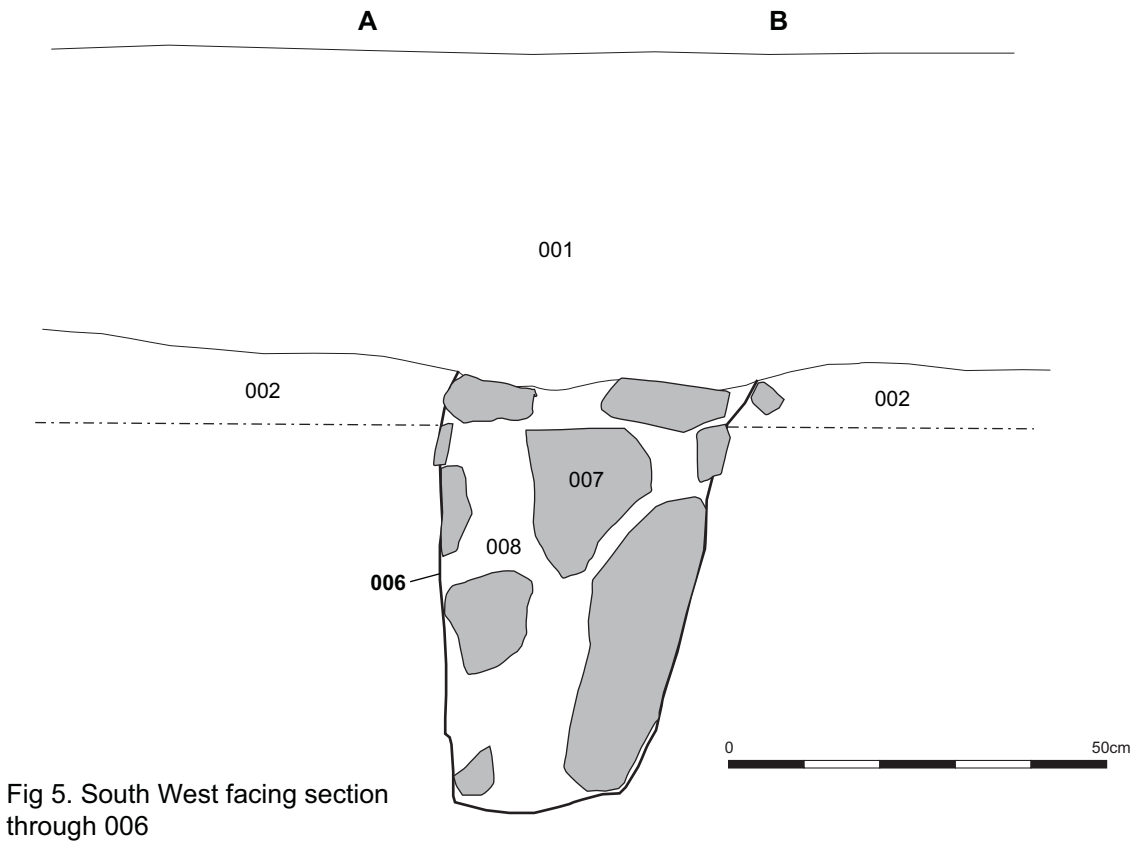
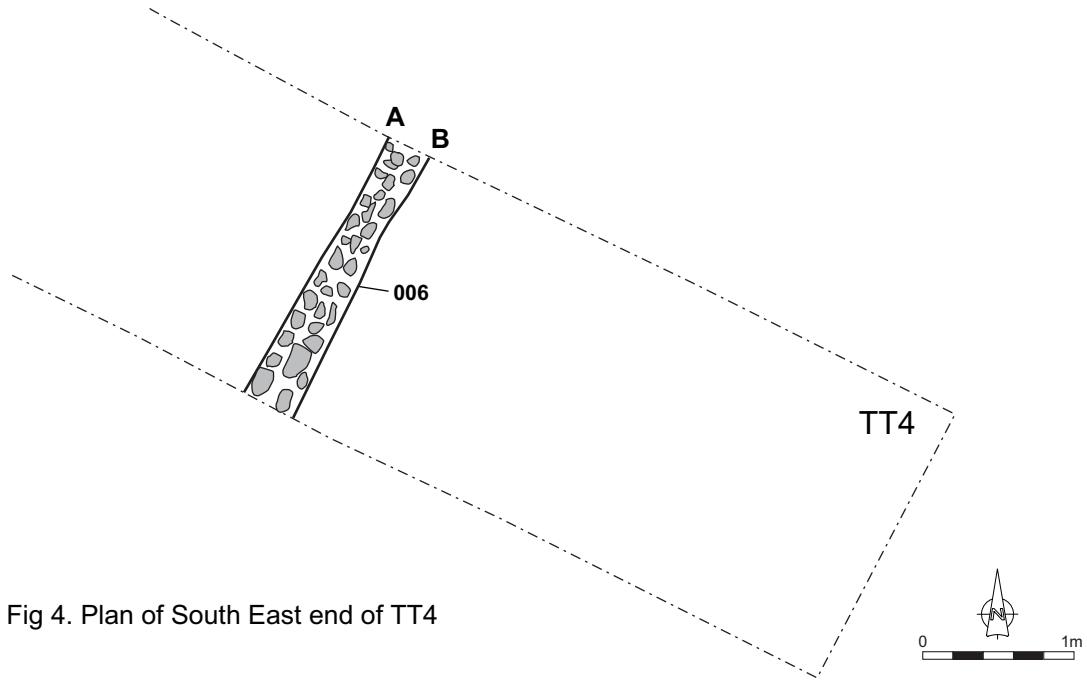
Project:
 Proposed Borders
 Reinforcement Phase:2
 Newhouses to Calfhill
 Gas Pipeline

Scale:
 1:7,500 @ A3



Client:
Scottish Gas Networks

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Key:
 stone

Scale:

Fig. No:	4-5	Revision:		Client:	Scottish Gas Networks
Title:					
Project:	Proposed Borders Reinforcement Phase:2 Newhouses to Calhill Gas Pipeline				

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Fig 6. Plan of South end of TT1

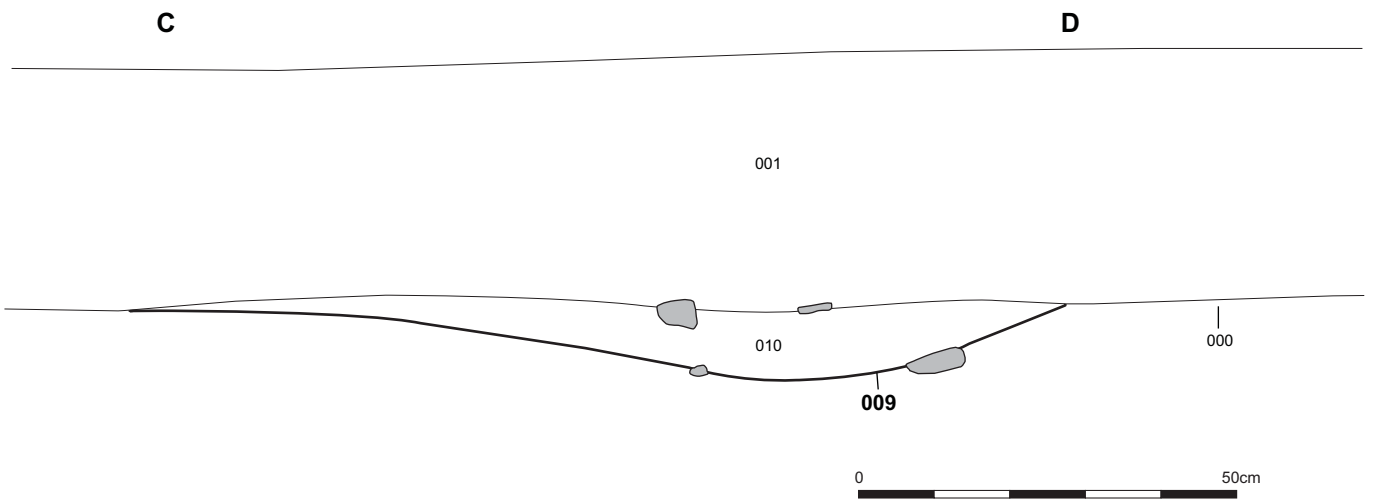
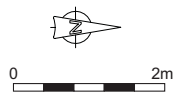


Fig 7. West facing section through 009

Key:
 stone

Fig. No: **6-7** Revision: Client: **Scottish Gas Networks**

Title:

Project: **Proposed Borders Reinforcement Phase:2
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