

Archaeological Watching Brief,
Soil Stripping, Drummond Castle,
Muthill

CF17

**ARCHAEOLOGICAL WATCHING BRIEF,
SOIL STRIPPING,
DRUMMOND CASTLE, MUTHILL
CF17**

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ABSTRACT

Alder Archaeology conducted a watching brief (CF17) on remediation of heating fuel contamination at the rear of Drummond Castle, Muthill. Stripping of contaminated deposits revealed the deep rubble bedding for the 19th-century estate drive, and the foundations of a 19th-century tower and buttress, as well as various 19th-century and later drainage features. A finely decorated porcelain fragment might be oriental, 18th-century or earlier.

The watching brief took place on 03rd – 26th February 2020, and was commissioned by OHES Environmental Ltd.

1 Background

1.1 Introduction

OHES Environmental Ltd (now part of Adler and Allan Ltd) commissioned Alder Archaeology to undertake an archaeological watching brief on the removal of contaminated topsoil and related deposits at Drummond Castle, Muthill. The castle and adjacent mansion, directly S of the work area, are B-listed, while the gardens are A-listed. The woodland directly to the N of the work area is a Site of Special Scientific Interest. The work area is centred on NGR NN 84470 18071.

The work was carried out between 03rd and 26th February 2020 in dark and wintry conditions, often very wet, with occasional snow.

The requirement was to carry out a watching brief on removal of topsoil and underlying deposits contaminated by a large overflow of kerosene heating fuel. Special attention was to be paid to possible features connected with the formation and use of the castle, mansion and surrounding landscape.

The work was designed to satisfy the requirements set out in guidance from Perth and Kinross Heritage Trust for the conduct of the remediation works, dated 19th December 2019.

1.2 Aims and Objectives

The main aim of this investigation was to observe and record any archaeological finds, features, structures or deposits exposed during the removal of the contaminated material.

1.3 Reporting

The present document has been prepared as the final report on this watching brief. Copies will be sent to the client, The National Record of the Historic Environment at Historic Environment Scotland, and Perth and Kinross Historic Environment Record.

1.4 Acknowledgements

We wish to thank Roger Maxwell of Drummond Estates, Clare Henderson and Sophie Nicol of Perth and Kinross Heritage Trust, and Gareth Payne of OHES Environmental Ltd. We especially wish to thank the OHES site team of Allan, Doug, Will, Rhona and Tom.

2 Details of Work

2.1 The Site (Illus 1)

Drummond Castle stands in an extensive designed landscape, 2 km WNW of Muthill, 4 km SSW of Crieff, and 3 km SW of the River Earn. The castle and adjacent mansion house stand on top of a very distinctive igneous ridge, perhaps of whinstone or dolerite, with a vertical N face. Directly to the N of this, an estate drive with an asphalt surface runs approximately E – W through the estate. Between the vertical cliff face and the drive is a grassy strip of varying width. There is a formal gateway at the E end of the

drive, giving access to the A 822 from Crieff to Muthill. At the W end are some estate houses and a less formal entrance onto an unclassified road for ordinary use.

To the S, the castle overlooks the courtyards and A-listed formal gardens. N of the estate drive, the ground slopes down quite steeply into an extensive area of mixed broadleaf and Scots Pine woodland. This includes surviving elements of ancient Caledonian forest, and is recognised as a Site of Special Scientific Interest. Along the N edge of the drive, there is a low dry stone dyke and mature broadleaf trees planted at intervals. The trees are relatively small, perhaps because they are so much in the shadow of the igneous ridge on which the castle stands, but from their gnarled growth and lichen coat, it seems that they are of some age, probably early 19th century. The cliff face is in permanent shadow, at least in winter, and so remains permanently cold. Having so many thousands of tons of dense cold stone exposed in this way seems to create a sort of wintry microclimate along this part of the drive, at least in February.

The castle is laid out along the igneous ridge, with the original tower house (considerably restored) towards its W end, and the later mansion to the E. The main public buildings of the mansion face S, with a less formal aspect to the N. What is in effect a curtain wall runs along the N edge of the ridge, overlooking the drive, with occasional towers and buttresses attached to the cliff face, rising up to stabilise the N curtain wall and perhaps the weathered cliff face. The arrangement of five buttresses shown on some Ordnance Survey maps is quite schematic. The actual arrangement is as shown in illustrations 2 and 3.

The easternmost of the towers, in a baronial style but of 19th-century date, contains a large heating fuel tank in its upper storey. A filler pipe descends from the top of the tower to the level of the estate drive, along with a storm drain and a sewer pipe, all running down the W side of the tower. Just to the W of the tower is one of the stone buttresses helping to stabilise the curtain wall above. This creates a niche against the cliff face, helping to conceal the pipes from general view.

The fuel tank is filled from the level of the drive, by a tanker lorry connected to the bottom of the filler pipe, pumping fuel up to the top of the tower. The fuel tank itself is of course completely invisible from the drive. This resulted in the tank being accidentally overfilled. Some 1,000 – 2,000 litres of kerosene overflowed into the top of the tower, and then down and through the cliff face into the ground at the foot of the tower. From here it soaked into and partly dissolved the S edge of the drive. At this point the drive and the grassy strip to the S slope gently down to the E. The kerosene soaked through the ground a considerable distance to the E, and in places passed into the storm drains and under the drive to a soakaway on the N side.

2.2 Archaeological Potential

A tower house was constructed at Drummond in the 15th Century and modified in the early 17th Century, before being sacked by Oliver Cromwell in 1653, during the Wars of the Three Kingdoms. A mansion was built alongside the tower in 1689, both structures being rebuilt in the 19th Century. Formal gardens were created in the 1630s, these also being modified during the Victorian period. The gardens are A-listed, with the tower house and mansion both being B-listed. It was possible that subterranean remains relating to one or more of these phases of construction and use persisted in the vicinity of the works.

Given the location of the work area, directly to the N of the castle and mansion, alongside the estate drive, the most likely remains were those relating to the construction and use of the towers and buttresses along the cliff face, and the laying out and formation of the estate drive and related landscape.

2.3 Method

Work began at the E limit of contamination, and worked uphill westwards to the source of the spillage at the base of the tower. A small, tracked mini-excavator and small dumper were used, carrying away the contaminated deposits to sealed skips parked to the E of the work area and removed off site from time to time. Work generally proceeded in three passes:- first to remove turf and topsoil; second, to remove a coarse gravelly deposit; and finally, to remove a deep dump of very coarse stone rubble down to a depth of about 1 metre from the surface.

It was known from boreholes that solid bedrock was about 10 m below the working surface. Obviously it was not possible or necessary to remove deposits to this depth. The decision was made by the specialists to remove the most contaminated surface deposits, to a depth of about 1 m, and to treat any slight remaining contamination below this depth in situ to accelerate biological digestion of the hydrocarbons. It was judged that deposits below this depth were relatively clean, likely to remain undisturbed in the foreseeable future, and any residual contamination was unlikely to migrate northwards under the road and cause significant harm to the adjacent woodland.

There were some adjustments of method to deal with storm drains and sewer pipes of various ages and forms, some of which were redundant, while others had to be dismantled and re-assembled as work progressed. In the case of the very coarse stone rubble, the larger masses of stone were set aside and returned to the trench, after the oily sand and gravel around them had been shaken off and removed.

North of the estate drive, a small amount of topsoil was stripped away from drainage outfalls.

The depth and extent of contamination was on most occasions obvious to the eye and nose, but was also frequently tested and sampled by the specialists. The very wet and wintry conditions on site, and the very short hours of daylight, caused by the time of year and the location in the deep shadow of a N-facing cliff restricted progress, and curtailed working hours. Wet conditions ran the risk of spreading the oily contamination further, as water ran down the slope of the drive from W to E, frequently flooding the trench. Excavating very wet deposits would have spread the contamination, and overfilled the skips with oily slurry. Work was paused on several occasions to wait for conditions to improve.

The excavations were recorded by digital photography, in general and in detail, and written notes and sketches. Given the conditions described above, it would obviously have been impractical to attempt to record fine stratigraphic detail. Fortunately this was in any case lacking. The deposits and photographs are described in detail in the appendices below. What follows here is a summary of the main features.

2.4 Results of Investigations

The deposits excavated generally consisted of three layers:- Turf and topsoil 001, about 0.1 m deep, then grey and orange stony rubble 002, and finally dumps of very coarse rubble 011 and 012, with angular fragments of stone around 0.5 m across. Towards the W end of the work area, the upper rubble layer 002 was interleaved with a band of greasy soil and charcoal 005 over brown orange sandy gravel 006. Similarly, the deeper rubble was interleaved with light brown sand, clay and rubble 013.

All the layers contained fragments of 19th-century brick, earthenware and china. Two conjoining sherds were of a very finely decorated porcelain plate or dish, probably oriental, perhaps of 18th-century date. The deep rubble 012 included some squared stone blocks, perhaps faulty building stone rejected at the quarry. There was one angular fragment with half of a drill hole, evidence of quarrying and probably of blasting.

Against the face of the cliff was a band of coarse rounded cobbles 003, about 0.5 m wide and 0.3 m deep. This seemed to be intentionally constructed, and might have been a drainage feature designed to absorb rainwater running down the cliff face, so that it drained away and did not form a puddle up against the cliff.

Cut into the upper layers were a stone-built drain 007 and 018, a red brick drain 010, a large stoneware sewer pipe 017, and modern orange plastic storm drains 004 and 009. All but the sewer 017 and the modern plastic drains 004 and 009 appeared to be redundant. Between the base of the tower and the buttress was a red brick sump 008 which received modern storm drains descending the cliff face. Farther N was a more modern red brick chamber 019 with a sheet steel lid, which received the sewer 017 and other pipes from beyond the work area, and connected to a septic tank on the N side of the drive.

At the base of the tower, below the modern drain 004, the foundations 014 of the tower were exposed, about 0.2 m down, 0.2 m thick, made of two courses of stone slabs, mortar bonded. The foundation was roughly rectangular, projecting about 1.1 m N of the tower wall face. The foundation was slightly skewed in relation to the wall face, so that the forward projection reduced to the E. Foundation 014 rested on a bed of crushed rubble 015, which was observed to a depth of 1.3 m below the modern surface. Over the surface of the foundation was a spread of soft mortar 016, probably spilled when the tower was being built. This was partly cut into by the modern plastic drain 004. Directly to the W, the base of the buttress rested over the stub of the slab drain 018.

Below drain 018 was a much larger flat slab 020, possibly the base of the drain, but probably the foundation of the buttress. This was visible at the base and side of the trench, when the modern pipes 004 and 009 were temporarily disconnected.

The stripping of topsoil around drainage outfall areas N of the drive was monitored, but no archaeological features were observed.

3 Discussion

It appears that this part of estate drive was constructed (probably in the early 19th century) by laying a massive dump of quarry rubble at the foot of the crag on which the castle stands, so as to create a level terrace at the required level. This was consolidated

and smoothed over with a bed of smaller rubble and gravel. No doubt a compacted fine gravel surface would have been laid to form the carriageway, with a layer of topsoil and grass seed or turf to form the grassy area between the drive and the cliff face. The band of coarse cobbles 003 was laid against the cliff face to absorb surface water, and the stone slab and brick drains were laid to conduct away storm water as required. A dry stone dyke and a line of broadleaf trees were laid out to define and consolidate the N edge of the drive.

At some point, the tower and buttresses were added to the cliff face. These were not founded on bedrock at the foot of the cliff, by now hidden perhaps 10 m below the surface, but on broad shallow foundations, resting on the consolidated rubble which also supported the drive. Evidently the builders trusted the work of their immediate predecessors, and in fact it seems to have held up remarkably well. The buttress partly rests on the slab drain 018, confirming that some time had elapsed between the laying out of the drains and the addition of the buttress.

As the twentieth century progressed, the drive was re-surfaced with asphalt. The brick sump 008, and the stoneware sewer pipe 017 were installed to receive drains from the castle and mansion above. The brick chamber 019 with its steel lid was added to receive the sewer pipe. Finally, late in the 20th century or even the 21st, the orange plastic pipes were installed to receive storm water, and a modern brick drain 021 and cover installed at the N edge of the drive.

Although confined within 19th-century dumped material, the remediation works revealed some interesting details about the construction of the estate drive, tower and buttresses along the N face of the cliff. The experience of removing only a small portion of the rubble dump supporting the drive showed that its formation would have been a substantial piece of civil engineering, comparable to a turnpike road or a railway embankment at the same period. The quarrying probably had the benefit of explosives, a dubious blessing in the pre-dynamite (1867) days of gunpowder and nitroglycerine. There might even have been a steam shovel at the quarry. However the transportation, unloading and laying of the rubble would all have been undertaken by horse and cart and manual labour, perhaps with the help of a steam roller. Even such an unobtrusive and functional landscape feature as the estate drive behind the castle would have represented a very substantial investment of cash and labour. The fragment of possible 18th-century oriental porcelain is not unusual in a house of this rank and, like the designed landscape of which it eventually became a part, a sign of the taste, culture and wealth expected in the upper strata of 18th and 19th-century society.

Appendix 1 Context Register

No:	Description
001	Grassy topsoil. 0.1 m deep. Red brick frags and china. Contaminated with oil.
002	Grey and orange rubble dump under 001. Mostly stones. Occasional brick and china. Presumed dumping to level up for road.

003	Band of coarse rounded cobbles against cliff edge to S. C 0.5 m wide. Presumed drainage feature. 0.3 m deep in section.
004	Modern orange plastic drain pipe in sand-filled trench. c 150 mm diameter. Descends from base of tower to modern drain cover at road side.
005	Brown greasy soil with frequent charcoal, appearing towards W end of site.
006	Subsoil at W end of work area. Brown orange sandy gravel with red brick. Under 005.
007	Slab drain, runs NE from corner of buttress and rock face. Grey plastic pipe added. Re-appears at septic tank N of road. = 018 under buttress.
008	Brick-built drain sump in between tower and buttress. 20 th -century frogged brick. Receives modern drain pipes descending from tower.
009	Complex of orange plastic drain pipes at base of tower. Connects up with pipe 004, with storm drain descending from tower behind brick sump 008, and with pipe incoming from W.
010	Two lines of red bricks forming a culvert. Falls to E. Fragments of slate and mortar.
011	Very coarse rubble, under 002. Levelling dump for road. Occasional brick fragments.
012	Deep, very large stone rubble, with occasional red brick. Under 011. Early modern upfill. Occasional 19 th -cent china and earthenware. Includes some squared blocks, and one stone with half a drill hole for quarrying or blasting.
013	At 6 paces (5.4 m) W, large boulders give way to light brown sand and clay, with stone rubble. Occasional brick.
014	Tower foundation. Flat rubble slabs c. 0.2 m thick. Rough. Mortar bonded? Two courses deep. Founds step out about 1.1 m from wall face, about 0.2 m down.
015	Crushed rubble bedding under 014. Seen to 1.3 m down.
016	Spread of soft mortar over foundation 014. Spill from building tower. Cut by orange plastic drain 004.
017	Large (25 cm) ceramic sewer pipe from tower to septic tank, via chamber 019.
018	Stub of stone drain under buttress. = 007.
019	Brick chamber with thin steel cover. Receives sewer pipe 017.
020	Large flat stone slab under buttress and under slab drain 018. Revealed by dismantling of orange plastic drain pipes 004 and 009. Possible foundation of buttress. Only partially exposed.
021	Modern red-brick drain and cover at the N edge of the drive. Receives storm water from the drive, and connects to orange plastic pipe 004.

Appendix 2 Photographic Register

<i>No</i>	<i>Description</i>	<i>View</i>
	03 Feb 2020	
001	General, pre-start. Castle stands on whinstone dyke to L. Work area marked with tape. Road on artificial embankment. Mature trees along N edge of road. Ground slopes down to N, SSI woodland.	W
002 - 3	Starting at E end of work area. Leaves, topsoil and grass, mostly killed by oil spill.	W
004	Work area marked by tape. Castle stands on whinstone dyke to S. Curtain wall retained by buttresses. Fuel tank located in top of square tower. Filler point in angle between tower and buttress, marked by blue absorbent bags.	E
005	Detail, fuel filler point in angle between tower (L) and buttress (R). Oily sheen on rock face between.	N
006	Start of stripping at E limit of work area. Stripping grassy topsoil 001.	W
007	Exposing grey and orange rubble dump 002 under 001.	W
008	Work progressing W. Fuel tank tower slightly hidden behind rock face. Blue 'sausages' mark roadside drain cover 021.	WSW
009 - 11	Detail. Oily topsoil 001, with stones, tree roots and red bricks. C19th.	W
	04 Feb 2020	
012	Start of day's work. Topsoil 001 removed, dump 002 exposed. Modern drain cover 021 at roadside.	W
013	As 012.	WSW
014 - 15	Brown greasy soil 005 with frequent charcoal, appearing towards W end of site. Subsoil 006 at W end. Brown orange sandy gravel with red brick. Under 005	WSW
016 - 18	Working into space between tower and buttress. Brick sump 008 (L). Slab drain 007 (R), with some slabs displaced.	S
019	Detail, brick sump 008.	S
020-1	Detail, slab drain 007. Grey plastic pipe to septic tank.	S
022	Detail, brick sump with modern drain pipes descending from tower.	SE
023 - 4	Brick sump 008 and slab drain 007, with orange plastic drain pipes 009 appearing.	S
025 - 6	Brick Culvert 010. Orange plastic pipe 004 to R, under spade.	ENE
027	Starting second pass E - W, at E end of work area.	W
028	Coarse rubble dump 011 appearing under 002.	W

029-30	End of day. Dump 011 exposed. Band of cobbles 003 against rock face.	W
	05 Feb 2020	
031-4	General views to work area. Castle on whinstone dyke overlooking road, with trees and SSSI to N.	W
035	Tower and S curtain wall overlooking work area.	SSW
036	Tower and S curtain wall overlooking work area.	S
037	Castle and S curtain wall continue W of work area.	SSW
038	Castle W of work area. Second tower supported by timber shoring.	E
039	Original tower house on whinstone dyke.	SE
	06 Feb 2020	
040 - 2	Excavating deep rubble dump 012.	W
043 - 4	Exposing sand and clay 013	W
045 - 6	Detail of stone with drill mark.	S
047 - 8	Squared stone blocks.	SW
049	Detail of modern brick drain 021 and cover at road side.	W
	07 Feb 2020	
050 - 1	Excavating W from modern brick drain 021. Large stones. Some squared.	SW
052 - 3	Proceeding W of drain cover 021. Orange plastic pipe 004 connects to modern drain cover 021.	SW
054 - 5	Detail, quarried stones. Orange plastic pipe 004 and brick drain cover 021.	ESE
056 - 7	End of day. Orange plastic pipe 004 and rubble dumping.	W
	20 Feb 2020	
058 - 61	Orange sewer pipe 004 runs in front of and over tower foundations 014. Connects up with pipes 009.	S
062-3	Ledge of foundation 014 appearing below orange sewer pipe 004.	S
064	General view of tower and foundations 014.	S
	25 Feb 2020	
065 - 8	Tower foundation 014 exposed under orange sewer pipe 004.	S
069 - 70	Rubble bedding 015 under foundation 014. Large ceramic sewer pipe 017 appearing.	SW

071 - 2	Slab drain stub 018 under buttress. Brick chamber 019, Founds 014. Large ceramic sewer pipe 017 appearing.	SW
073 - 4	General. Founds 014. Large ceramic sewer pipe 017. Orange pipe 004 disconnected from 009 to allow access. Base of slab drain 018 under gap between orange pipes 004 and 009. Perhaps also foundation 020 of buttress	SW
075	Tower above founds 014 and pipes. Base of slab drain 018 under gap between orange pipes 004 and 009. Perhaps also foundation 020 of buttress	SW
076-9	Foundations 014 offset at angle to tower. Ceramic sewer pipe 017 runs N from brick sump. Orange plastic pipe 004 runs over foundations 014. Drain slab / foundaton 020 under orange pipe 009.	ENE
080	As 076 -9	E
081 - 2	As 076 - 9. Plastic drains 004 and 009 re-assembled and re-connected.	ENE
083	As 081 - 2.	S
084	As 081 - 2. Detail of foundations 014 and ceramic sewer pipe 017.	S
085	Coarse rubble exposed back to E limit of work area.	E
	26 Feb 2020	
086	Orange drains 004 and 009, ceramic sewer pipe 017 and foundations 014 exposed.	ENE
087 - 90	Distant view of work area at base of tower.	E
091	Work area at base of tower. Orange drains 004 and 009, ceramic sewer pipe 017 and foundations 014 exposed.	SE
092	Detail at base of tower. Orange drains 004 and 009, ceramic sewer pipe 017, foundations 014 and filler pipe. Drain 009 connects to descending storm drain behind brick sump 008.	SE
093	As 092	S
094	Ceramic drains 017 and another converge on chamber 019 with thin steel cover.	NNE
095 - 101	General views	
095 - 6	General view of work area as excavated. Large rubble blocks.	E
097 - 8	Ceramic drains converge on chamber 019 with thin steel cover.	NNE
099 - 101	Ceramic drains 017 and another converge on chamber 019 with thin steel cover. Orange drains 004 and 009 and tower founds 014. Brick sump 008. Stub of slab drain 018 under buttress. Buttress foundations 020 under orange drain 009?	S
102-6	Clearing drain outfall N of road.	E
	Porcelain	

01-20	Views of oriental porcelain fragment.	-

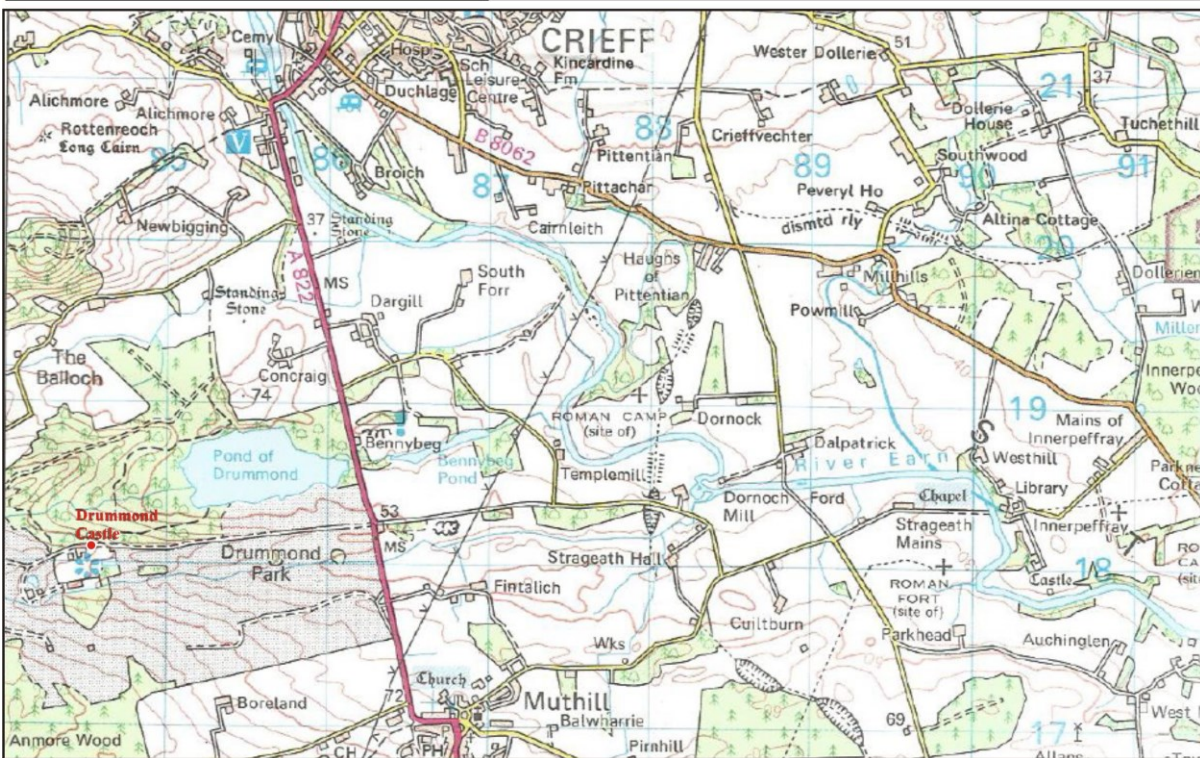
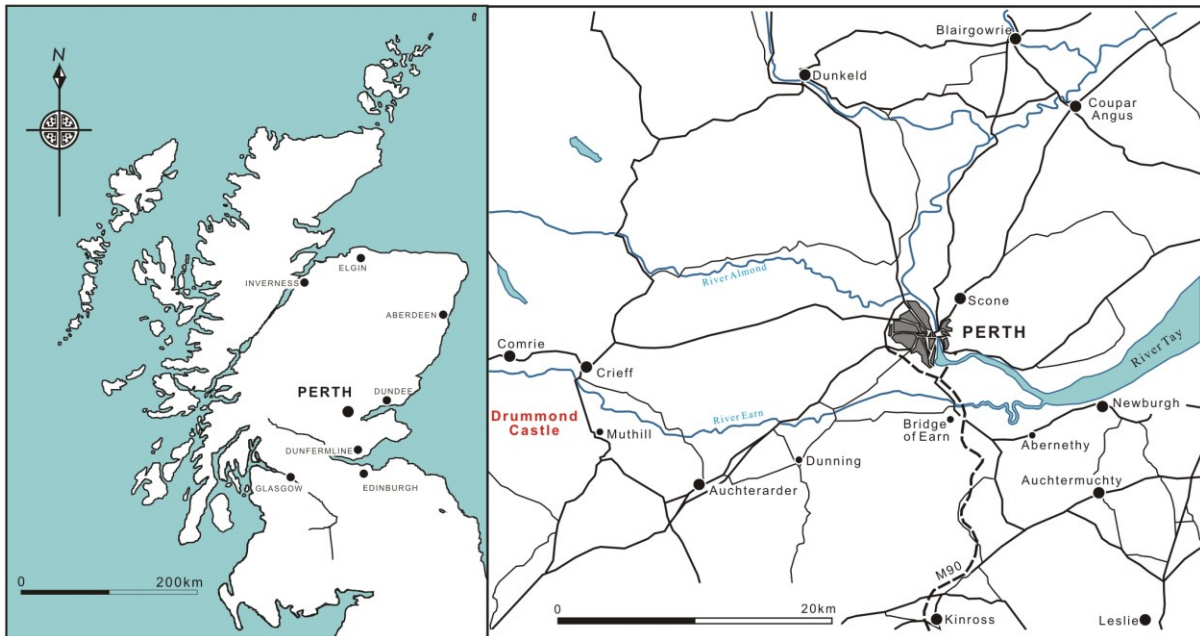
Appendix 3 Finds Register

<i>Context</i>	<i>Material Type</i>	<i>Details</i>
-	Ceramic	Two conjoining rim sherds. 40 mm x 35 mm x 1 – 2 mm. High-fired hard white porcelain, clear white fabric. Everted rim of plate or shallow dish. Upper surface decorated with foliage in brown, pale green (two shades) and matt white (unglazed). Hand painted. Gilded detail, including rim. Underside plain white, glossy glaze. Perhaps oriental, 18 th -century or earlier.

Appendix 4 Discovery & Excavation in Scotland Entry

LOCAL AUTHORITY:	Perth and Kinross
PROJECT TITLE/SITE NAME:	Drummond Castle
PROJECT CODE:	CF17
PARISH:	Muthill
NAME OF CONTRIBUTOR:	David Bowler
NAME OF ORGANISATION:	Alder Archaeology Ltd
TYPE(S) OF PROJECT:	Watching Brief
NMRS NO(S):	NN81NW2
SITE/MONUMENT TYPE(S):	19 th Century tower and designed landscape features
SIGNIFICANT FINDS:	-
NGR (2 letters, 8 or 10 figures)	NN 84470 18071
START DATE (this season)	03 Feb 2020
END DATE (this season)	26 Feb 2020
PREVIOUS WORK (incl. DES ref.)	
MAIN (NARRATIVE) DESCRIPTION: (May include information from other fields)	<p>Alder Archaeology conducted a watching brief (CF17) on remediation of heating fuel contamination at the rear of Drummond Castle, Muthill. Stripping of contaminated deposits revealed the deep rubble bedding for the 19th-century estate drive, and the foundations of a 19th-century tower and buttress, as well as various 19th-century and later drainage features. A finely decorated porcelain fragment might be oriental, 18th-century or earlier.</p> <p>The watching brief took place on 03rd – 26th February 2020, and was commissioned by OHES Environmental Ltd.</p>
PROPOSED FUTURE WORK:	n/a
CAPTION(S) FOR ILLUSTRS:	
SPONSOR OR FUNDING BODY:	OHES Environmental Ltd.
ADDRESS OF MAIN CONTRIBUTOR:	Alder Archaeology Ltd, 55 South Methven Street, Perth PH1 5NX
EMAIL ADDRESS:	director@alderarchaeology.co.uk
ARCHIVE LOCATION (intended/deposited)	HES (intended)

Illus 1 Drummond Castle, Muthill. Location



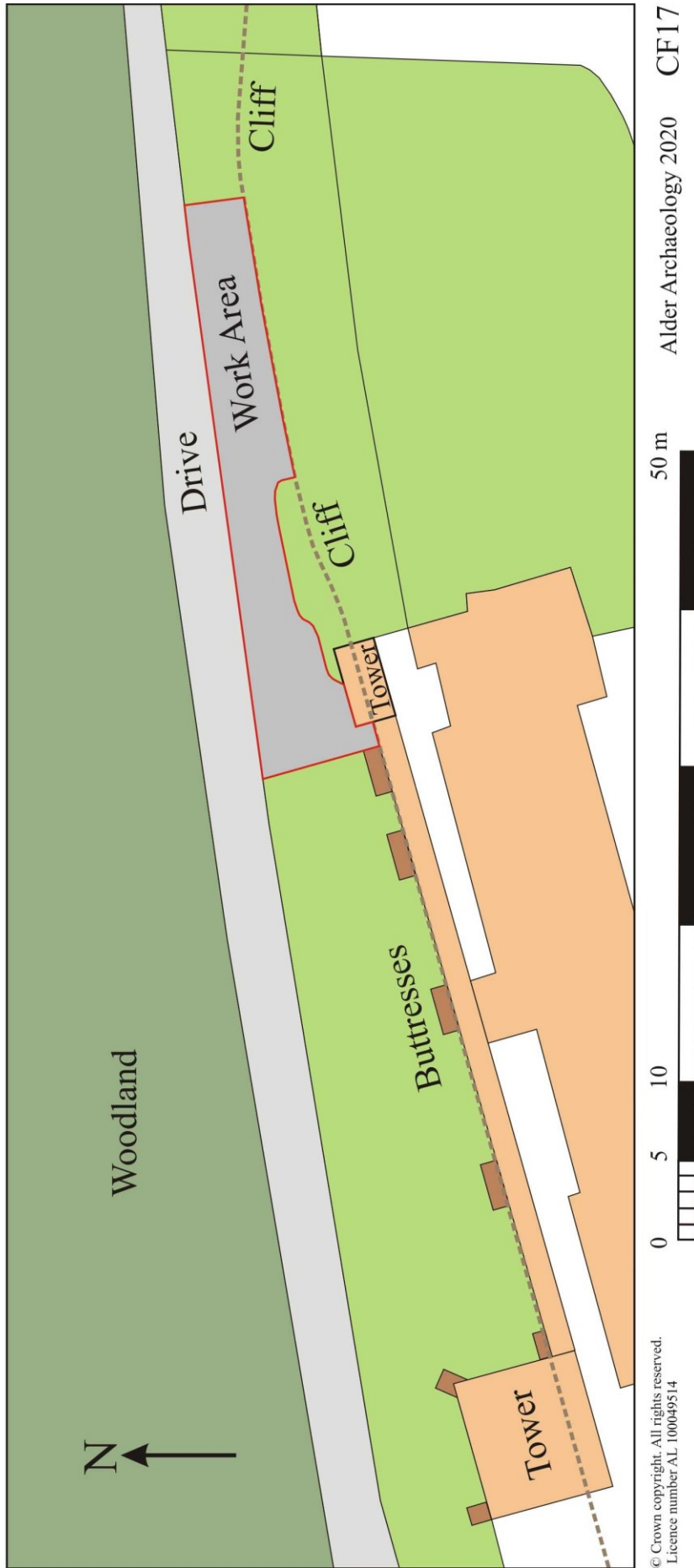
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Illus 2

Drummond Castle, Muthill. Layout



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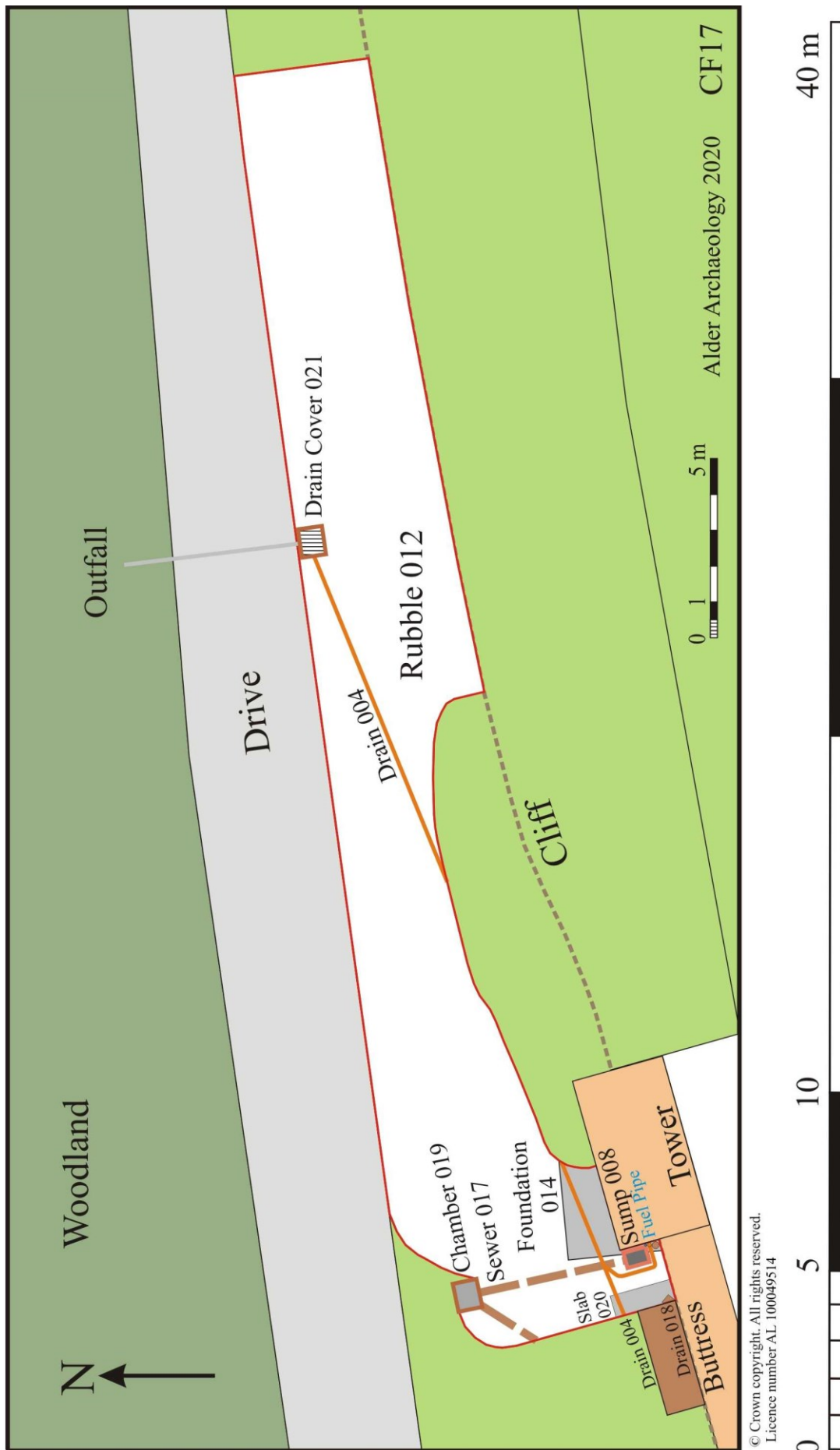
0 5 10 50 m

Alder Archaeology 2020

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Illus 3

Drummond Castle, Muthill. Work Area



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Illus 4 Tower and buttresses against cliff face.



Illus 7 Foundation 014 and slab 020 under tower and buttress.



Illus 5 Stone with drill hole in rubble 012.



Illus 8 Foundation 014 and slab 020 under tower and buttress (R). Bedding 015 and rubble 012 under foundation 014.



Illus 6 Squared quarried blocks in rubble 012.



Illus 9 Rubble 012 extent.



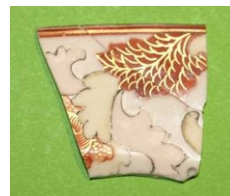
Illus 11 Foundation 014 and slab 020 under tower and buttress. Oily cliff face. Fuel filler pipe on side of tower.



Illus 10 Tower and buttress on foundation 014 and slab 020.



Illus 12 Clearing around outfall on N side of drive.



Illus 13 Porcelain fragment from rubble. 18th century? Oriental?