

**A Project to prepare the kiln at the West Settlement,
Mulchaich Farm, Ferintosh, Ross-shire for presentation
to the public**

October 2012 to September 2013



With the kind permission of the Dalgetty Family, Mulchaich Farm

**Report of a Project, undertaken by the North of Scotland
Archaeological Society, to prepare the kiln at the West
Settlement, Mulchaich Farm, Ferintosh, Ross-shire for
presentation to the public under the Adopt-a-Monument
scheme run by Archaeology Scotland**

Oct 2012 to September 2013

Members of the team

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Acknowledgements

NOSAS would particularly like to acknowledge the help and support of Morris Dalgetty, the farmer at Mulchaich, and his family.

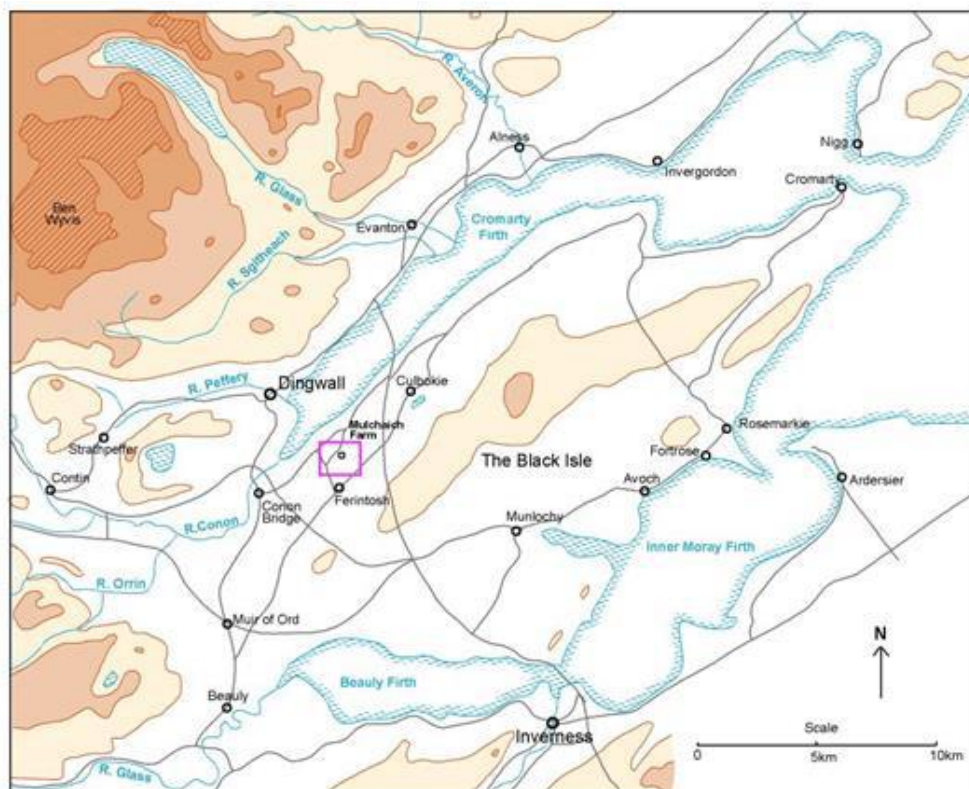
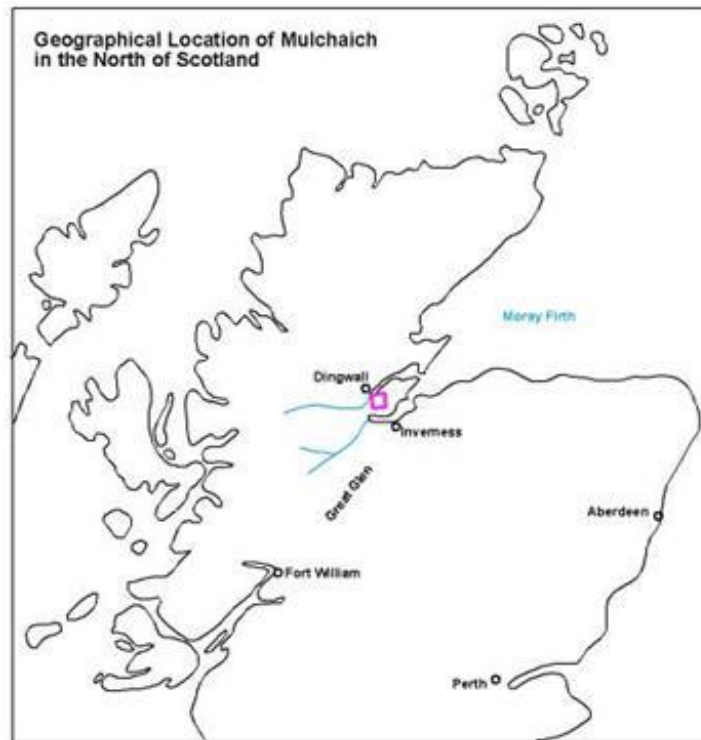
This report was compiled and edited by Meryl Marshall for NOSAS, Autumn 2013

Front cover: main picture - The kiln, post excavation, from the north and, inset, making a start on the excavation with lots of help from NOSAS members

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1. Location of Mulchaich



Location of Mulchaich Farm on the Black Isle, Ross-shire

2.1 Introduction

Mulchaich Farm, in the former barony of Ferintosh, is situated on a gentle NW facing slope above the Cromarty Firth in the western part of the Black Isle. These slopes, which face Ben Wyvis and Dingwall, are intensively farmed and Mulchaich Farm is one of mixed arable and livestock activity. To the northwest of the farm are the remains of an interesting settlement believed to be a former distillery which produced Ferintosh whisky in the 18th century. The remains are unusual in that they have been preserved in an area which has seen intensive agricultural improvement where any former townships have been destroyed by that improvement. In 2009 and 2010 NOSAS undertook a project of recording and surveying the site plus an adjacent chambered cairn, NMRS No - NH55NE 002 and scheduled by Historic Scotland, and a further settlement, 400m to the NE (see NOSAS project report 2010)



The west settlement and chambered cairn at Mulchaich Farm - an aerial photo taken from the north

Oral tradition of the site being a distillery is widely held both by local people and by the former landowner who himself is a direct descendent of Forbes of Culloden. The sheer number of distilleries known to have existed at Ferintosh in the 18th century strongly suggests that the two Mulchaich settlements were a part of this. As yet we have found no firm evidence of the site producing whisky and there is no firm documentary evidence linking Mulchaich with the production of Ferintosh whisky. But there are lots of tantalising features which lead us to believe that distilling was carried out on an industrial scale and there are vague references in documents to barley being imported to Mulchaich. Of these more is described later. It was felt that together with the chambered cairn the site would make an interesting and attractive place for people to visit. The landowners, the Dalgetty family, were happy to oblige with permission and in addition the Adopt-a-Monument Scheme hosted by Archaeology Scotland, were keen to help us with advice and limited funding, so in October 2012 we set about preparing the site for presentation to the public. Our plan was to;

- fence the area and provide a small enclosure in which sheep could graze, thereby protecting the archaeological features.
- Undertake a small excavation of the kiln with the aim of showing its features off so that the process of drying malt could be explained.
- produce explanatory leaflets
- continuing investigation of the site and relevant documents

This report describes the excavation of the kiln and the results

2.2 Aims and Objectives of the excavation

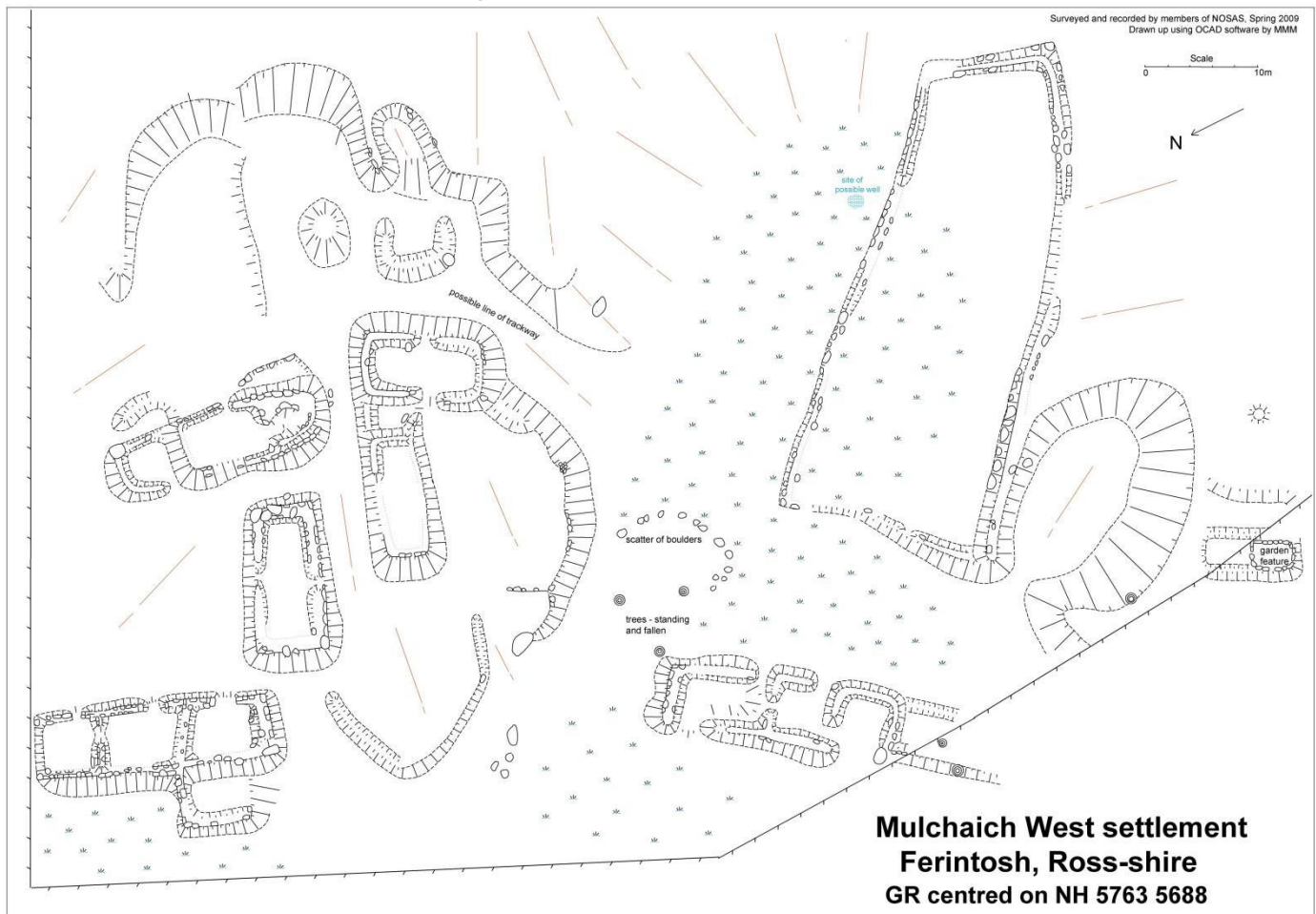
The remains of the kiln at Mulchaich were to be prepared for presentation to the public by removing the material within the bowl, identifying the kiln features and then protecting the site by consolidating the structure and making it safe. Within this broad outline the process would involve;

- that no structural material would be removed
- a photographic record would be kept
- plans and sections drawings would be taken
- where appropriate contexts and samples would be taken
- a diary would be kept
- a report would be produced and would be circulated to Highland Council Historic Environment Record, RCAHMS, Dingwall Museum, Dingwall Library and the NOSAS Library.
- In addition regular updates on progress were to be posted in the NOSAS Newsletter

2.3 A brief description of the processes involved in distilling whisky

The ingredients required for making whisky are grain, usually barley (or in earlier days bere, an ancient form of barley), a constant supply of running water and a plentiful supply of peat. The barley is steeped in water and then allowed to germinate into malt; this is then dried by gently heating it in a kiln. The dried malt is milled to make "grist", and this is then mixed with hot water to make "wort". The "wort" is fermented and the resulting "wash" is heated up in a still, preferably made of copper. The alcohol vapours given off are cooled by passing them through a "worm" which has cold water running over it and the spirit is collected from a spout at the bottom of the "worm".

2.4 The site of the Distillery at Mulchaich Farm



The site is centred on grid reference NH 5763 5688 and covers an area of approximately 100m x 70m. Originally it was overgrown with whins and vegetation but NOSAS members have cleared these so that the buildings can be clearly identified. The site comprises the remains of 7 buildings, a large enclosure and several working areas. It is situated on two steep spurs of ground which enclose a marsh; see plan for layout. Evidence suggests that the marsh which has a spring fed well would have been a pond which provided the water essential to the distilling process. The drainage of the area has been significantly altered by more recent field drains and the pond is silted up appearing now as a bog. The central part of the bog has a firm base and systematic probing of it indicates that there are the remains of an embankment in its lower part. In the upper part of the bog there is a spring which, on the First Edition OS map is marked as a well.

The remains of the seven buildings have substantial dressed stone foundations and it would seem that the majority of them have been constructed to a plan. From the solid nature of the buildings and their uniformity it is quite possible that this was one of the distilleries that John Forbes built in the 1760s or perhaps in 1782. We can only speculate as to the purpose of many of the buildings but it is possible to determine the function of some of them. The still-house was probably the building with several compartments below the pond; it is possible that a wooden lade ducted the water from the pond into this building. Almost certainly some of the other buildings would have been for storing the grain



The kiln and barn pre-excavation, viewed from the east

The kiln to be excavated is located in the north part of the site; here the barley or bere, which had been allowed to germinate, would have been made into malt by gently heating it until it was dry. Outwardly the building has the characteristics of a corn-drying kiln and it is well documented that corn drying kilns were used for malting in the 18th century. Corn drying kilns, as is evident from the name, were normally used for drying corn; they were an essential part of all Highland townships where the climate could not be relied upon to dry the corn sufficiently for it to be ground into flour or meal. The grain would have been laid out on a grid or perforated floor on top of the kiln bowl and warm air provided by a fire on the outside (but inside the kiln barn) and ducted by a small flue into the bowl, was drawn up through the grain thus drying it.

2.5 Brief Historical Background

In 1690 Duncan Forbes of Culloden (1644 – 1704) secured the privilege of distilling whisky free of duty on his Ferintosh Estate for services rendered to the Crown during the religious unrest of the late 17th century. His estate at Ferintosh had been sacked by the Jacobites in 1689. The “privilege” produced an immediate boom in the production of the spirit and Ferintosh whisky became increasingly popular and important, both because of its quality and its price.

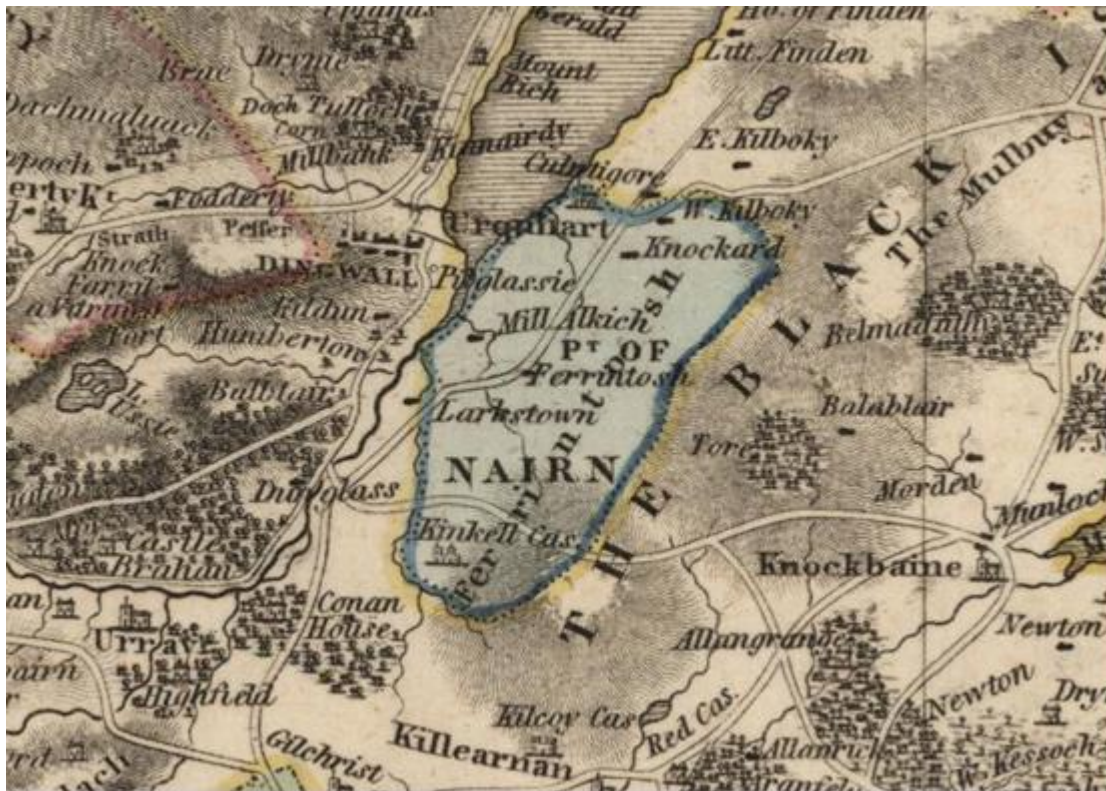
As far as evidence in the documents for distilling at Mulchaich is concerned an ongoing blind search of the warrants of registered deeds threw up the following bill Barony of Ferintosh, marked as “part of Nairn” on the (with thanks to Malcolm Bangor-Jones):

“At Cromarty 28 March 1733 Alexander Mackenzie in Mulchaich in Ferrintosh, Robert Mackenzie there, Donald Fowler there, and Colin Simson in Cromarty (of whom only Robert could sign) ‘signed’ a bill that they would on 15 May pay Mrs Margaret Mackenzie £128 Scots for “value received in sufficient bear (bere)”

The bill was protested for partial non payment on 8 November. And also by the same parties

“Cromarty 28 March 1733: to pay £170 Scots “value received by you in sufficient bear”

Almost certainly the bere was being imported to Mulchaich to make whisky.



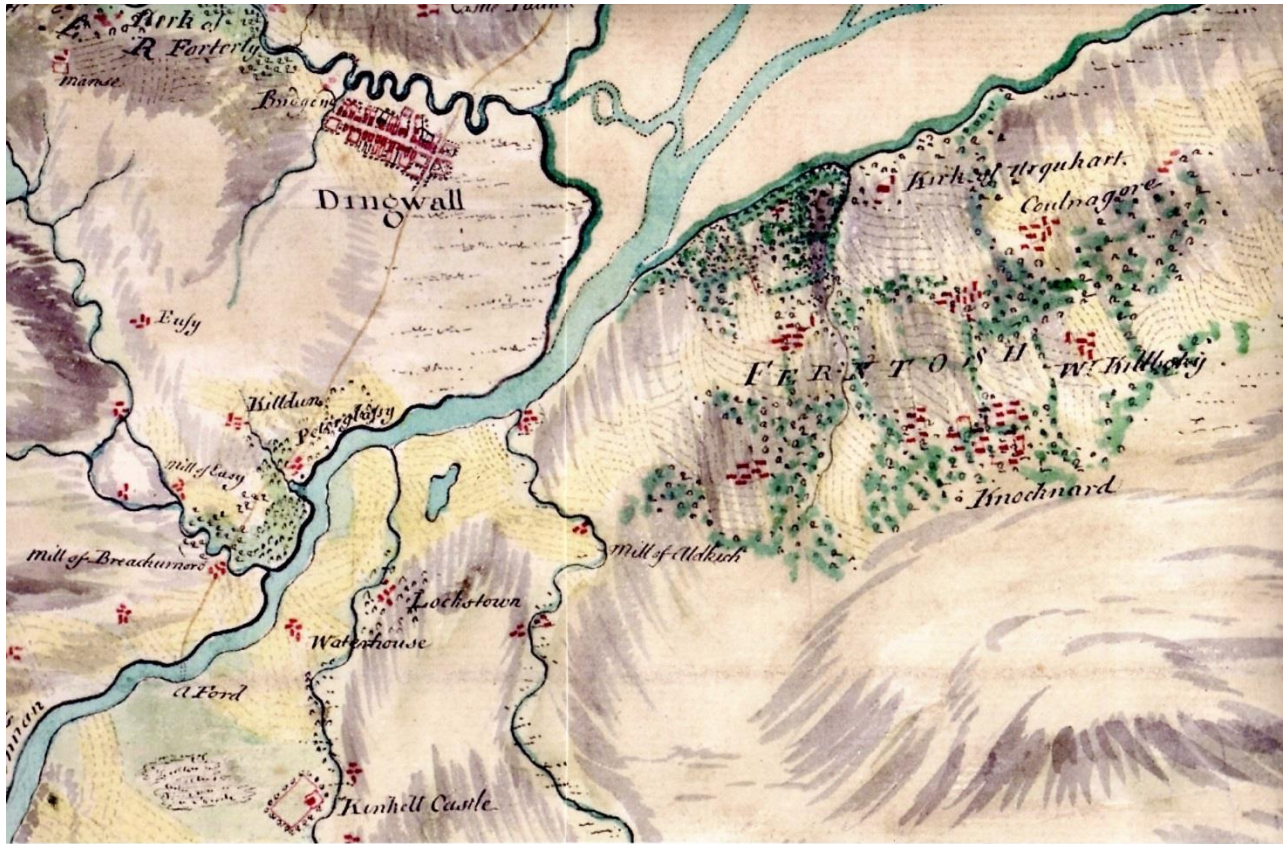
Thomson map of 1830

There was a comprehensive account of the origins and progress of the whisky industry in Urquhart Parish in the Old Statistical Account of 1791-92 with reference to the building of distilleries in Ferintosh, but there was no reference to Mulchaich specifically.

The privilege was enjoyed by the Forbes family without interruption until 1786. They continued to support the Crown at great expense to themselves throughout the turbulent times of the 1715 and 1745 Jacobite rebellions. The 5th Laird of Culloden was Duncan Forbes (1685 – 1747), a much respected lawyer, MP for Nairn and Inverness, and from 1737 – 1747 Lord President of the Court of Session in Edinburgh. He supported the Crown in the uprising of 1745 and left his estates heavily burdened on his death in 1747. In the 1760s John Forbes (1710-1772), son of Duncan, was intent on restoring the family fortunes after his fathers' death, the distillery at Ferintosh was enlarged and 3 more distilleries were built on the estate. Production grew dramatically, in 1763 the output of whisky on the estate was 41,200 gallons, in 1770 it was 89,700 and by 1780 it was 123,900 (Moss and Hume, 1981).

The population at Ferintosh grew. The Roy map of c1750 has a densely populated area at Ferintosh, with at least 7 large townships. Mulchaich is not mentioned by name but it is almost certain that the settlement to the SW is one of these townships. The Old Statistical Account of 1790-91 has;

“It was said that around 1,000 people were involved in distilling whisky with few men being left to cultivate the land”



Extract from the Roy Military map of c1750

In 1782 a further large distillery, which produced over 5,000 gallons of spirits in 6 months, is reported as being constructed at Ferintosh. This was the last straw; there was an outcry from the Lowland distillers who could not compete. In 1786 the government withdrew the privilege. Robert Burns in his poem “Scotch Drink”, 1786, devoted a verse to Ferintosh whisky, lamenting:

“Thee Ferintosh! O sadly lost!

Scotland lament frae coast to coast!

Now colic grips, an’ barkin’ hoast

May kill us a’;

For loyal Forbes’ charter’d hoast

Is taen awa’!”

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Calder, Rev. Charles. Old Statistical Account (OSA), 1790-91

Moss Michael and Hume John, The Making of Scotch Whisky 1981

Mowat, Ian R M. Easter Ross 175-1850. The Double Frontier. 2003.

3.1 Method

The excavation took place over 8 separate days in a 6 week period between August and October 2013. There was a good turnout of NOSAS members and guests to help and on the whole the weather was kind to us.



Cleaning back the flue entrance

Our intention was to excavate the kiln with minimal intervention, mostly cleaning back sufficient to demonstrate the features so that we could interpret them for visitors. We did not intend to excavate the whole area of the kiln bowl since we were constrained by time and resources and we also felt that it was not necessary to explore the west wall and the south wall of the bowl. The trench included the kiln bowl, the front/north wall of the bowl, an area of 60cms width in front of the front wall which took in a possible stone feature at the centre and the east wall of the kiln bowl where it was thought there might be the remains of an underlying wall. In essence we were restricting ourselves to approximately two-thirds of the whole kiln bowl. After laying out strings defining the trench the whole area was deturfed; later we were to extend the trench at the north by 1m.

As well as tumbled material the bowl contained a good deal of dumped material probably placed there in order to render it non-hazardous for animals. After deturfing the re-deposited material was removed using gentle mattocking and trowelling. A corn drying kiln usually has a flue in the wall between the bowl and its adjacent barn but it was not apparent from the topographical features of the kiln that a flue was present in this case. The central area in the front/north wall of the bowl was choked with debris and some of the blocking stones were quite large so that it was difficult to establish whether or not they were structural. For reasons which will become clearer later on the feature that materialised in the position of the flue, for the purposes of this description, will be referred to as “a flue”. Initially the nature and extent of the feature proved difficult to identify. This area was carefully cleaned and non-structural stones were removed; likewise the front or external face of the kiln and the central stone feature abutting the front wall of the kiln bowl.

As work progressed in the stoking and rake-out area in front of the flue entrance it became clear that there was a negative feature in the NW corner of the trench. This feature looked like the top of either a scoop or a pit. Options to investigate the feature were constrained by the trench edges and what ensued was less than a half section of what turned out to be a carefully formed pit sunk into the natural moraine.

The outer area at the base of the east wall was explored using gentle mattocking and hand trowelling. At each stage photographs were taken, plan drawings and wall sections were drawn. Finds and contexts were recorded, with four bulk samples taken. 50 levels over the whole of the site were taken and recorded on the plan drawing on completion of the excavation.

Stabilisation and Consolidation

The aim then was to consolidate the site by doing a minimum of replacing and rebuilding, whilst at the same time ensuring that the site was protected

The bowl – the wall heads of the bowl were turfed in such a manner as to shed as much rain water as possible to the outside; the sloping internal faces of the bowl and upper inside edging stones were left exposed. The cobbled surface in the base of the bowl was also left exposed although some soil was inserted between the stones

The flue and its entrance - the fragile parts of the flue walls were protected by laying strips of turf on top of one another against them. Thus covered, the whole of the reddened degraded part of the wall was then anchored by inserting wooden barbecue skewers through the turf into the wall. At the outer part of the west flue wall a couple of large stones were inserted so that the slope above was less steep and therefore safer.

The central stone structure to the east of the flue entrance was anticipated as the route by which people would descend to have a closer look at the internal features of the kiln, so it was reinforced by packing stones and earth.

The angular trench edge at the flue entrance was smoothed off and the level of the flue entrance was raised using excavated earth; but this entrance area still remains much lower than the existing surface of the barn and will potentially have a drainage problem. It will be monitored with the possibility of further measures to alleviate the problem of water retention being an option.

The outer east wall and the east part of the front wall were left exposed but the trenches at their bases were filled in and levelled off. The whole structure was sown with grass seed

4.1 Results

In retrospect we underestimated the amount of time needed for the excavation; the site proved to be more complicated than we had anticipated and it took eight days to complete the job. The majority of the work was done in the two months from mid-August to mid-October 2013



Contemplating the boulder and how to replace it in the rim of the kiln bowl

The bowl

Three large boulders identified as tumble and probably deliberately pushed into the bowl from the upper edge of the bowl were reset into their original positions. A total of about 1 metre depth of deposit was removed from the bowl before a cobbled surface was revealed and, at the exit of the flue into the bowl, an angled stone setting. The kiln bowl was very much like the many kiln bowls seen at Highland townships; roughly circular, with a sloping stone faced internal wall and cobbled base. The bowl was 1m deep and the diameter was 1.2m at the base and 1.6m at the upper lip. A section of the lower NE wall of the kiln, measuring 1m X 200mm high, was faced with natural till; in other parts around the base of the kiln bowl, flat lining stones had been laid against the cut face of the moraine; these were not supporting the stones above.



The kiln bowl, with its cobbled floor, post excavation looking west – note the exposed moraine

The kiln bowl had been constructed on a small mound of glacial till which had been levelled off to form a platform; see profiles on page 14. The platform was built up on its east side where it was reinforced with boulders; it sloped gently to the north and also to the west. The kiln bowl was partly excavated into this platform by some 200mm and the flue also together with the area in front of the entrance, by some 400mm to 500mm. A slope with a drop of 300mm to 350mm between the floor of the kiln bowl and the area in front of the flue entrance was created.

The flue

After careful cleaning and removal of the stones a vertical stone face appeared; it was assumed to be the east wall of the flue. The west wall of the flue however was unclear. There was still a significant amount of slumped material within what was thought to be the flue; it comprised not only stones but also a significant amount of earth. Could this be the remains of a collapsed turf roof?

The west wall of the flue was quite significantly angled making the exit of the flue at the south much narrower than the entrance at the north; the west wall also had a return in it. Both walls at the south end of the flue were noted as having obvious reddened and fire cracked stones in discrete areas; these were roughly oval, 40cms in height and 40-50cms in length. The wall cheeks here had been hollowed out by 75mm to 100mm due to fire cracking and crumbling of the stone work. The earth /clay bonding between the stones of the wall cheeks had been similarly affected by heat. One long sandstone slab in the W side cheek showed clear progression along its length from severe fire cracking and crumbling at the hearth centre to no heat damage in line with the outer edge of the hearth. This effect of burning rendered the walls very unstable at this point.



The east wall of the flue becomes clearer but there is still a mass of tumble



The west wall of the flue becomes more obvious



The west wall of the flue and the west part of the front wall

An unusual feature at the exit of the flue into the kiln bowl, was a sloping setting of two rows of raised stones with distinct edges. This structure measured 460mm x 360mm and tilted away from the bowl (total drop of 210mm); it would have directed the warm air coming through the flue from the fire upwards through the kiln.



The flue, post excavation, from the east with the reddened and fire cracked paved hearth and walls - note also the "tipping" stone feature to the left

In front of the tilting structure and within the flue, there was a crudely paved stone surface of random sized flat stones that formed a hearth. This hearth area was striking; there was some reddening of the paved stone surface and its outer limit was at the level of the rebate in the west wall of the flue. To the north, in the entrance to the flue, the barn floor showed clear evidence of rake out material from the fire; this comprised compacted charcoal rich ash, but only a few mm thick, suggesting that the floor had been pretty well cleared of ash before abandonment.

The beaten surface at the flue entrance, was recessed into the natural glacial till by some 400mm and bounded on its east side by the extension of the east wall of the flue. This extension formed the west wall of the central structure and would have channelled the draught into the flue from the nearby doorway in the west wall of the kiln barn. There was no evidence of burning associated with the central structure so the interpretation of it as a fireback was ruled out

The flue was quite different to the usual type seen in the corn drying kilns of Highland townships. In comparison to the usual small to moderate sized bore vent it was large and had walls that were substantially built and 650mm in height. The flue may have been covered by a lintel but, with a width of 500mm at its narrowest, it is difficult to imagine the nature of this. If it did have roof lintels, then most probably they did not extend beyond the indent in the W wall.

The front/north wall

A neat vertical stone face was exposed in the west part of the front wall, but it was evident that at least one of the corner stones had been removed, probably robbed, making it unstable at this point. A considerable amount of tumbled material was removed in front of the east part of the front wall, including one large square stone slab, to reveal a curving face of large boulders in line with the west part of the front wall. However what we thought might have been steps up to an upper platform around the kiln bowl proved not to materialise. The curving wall of boulders was sitting on a platform of natural glacial till and the floor of barn, which had a thin hard black surface, was recessed into the natural till by 200mm.

The central stone feature abutting the front wall of the kiln bowl

This slightly curving structure was aligned N-S and situated to the east of the flue entrance; it was made up of several large firmly set stones. It abutted the front wall of the bowl; one large stone was "tied" into the front wall and on the east side there was a neat column of small packing stones. On its west side the structure had a good vertical face which was a continuation of the east wall of the flue, the east face was less clear. The trench was extended by 1m to the north in an attempt to discover the extent of the structure. Its west face extended at least another 40cms but it had been robbed of its stones; these would have been set against the vertical face excavated into natural till and the cut was now all that remained. The structure was sitting on the natural glacial till at a higher level than that of the adjacent flue entrance which had been excavated into the natural glacial till by some 400 to 500mm.

The east wall of the kiln bowl

The curving outer face of the external wall appeared initially to be sitting on the straight wall of an earlier building. However on closer inspection the stones were revealed as being quite randomly placed and it was decided that they were part of the reinforcement of the platform on which the kiln had been constructed.

The possibility of a platform to gain access to the top of the kiln was considered as the thickness of the wall head around the kiln was 1.7m, but there was no evidence of an inner face to the wall and no evidence of a platform.

The pit

The negative feature in the NW corner of the trench in front of the flue entrance appeared to be the top of either a scoop or a pit. There was no sign of charcoal or burning activity. Options to investigate the feature were constrained by the trench edges. When extrapolated, the pit would have measured c1.2m in diameter at the surface.

When excavated it was revealed as being 650mm deep with steep sides sloping evenly inwards towards the bottom. Four contexts were noted. Firstly the pit cut into the moraine, then three distinct stratigraphic layers of material filling the pit. Bulk samples of the two lower fills were taken for analysis. The lowest fill of the pit, context 10, was particularly interesting in that it was entirely formed of dark organic worm casts and had undergone little consolidation. There was clearly something very tasty for the worms in the bottom of the pit.

It is reasonable to surmise that other whisky making processes were taking place in both the pit and the smooth trough revealed in the kiln barn.



The kiln and entrance area of the flue, post excavation, with the pit in the foreground



The pit viewed from the east, partly excavated, showing the "wedging" stones in situ

Resting on the bottom of the pit was an iron object, buckled and corroded but apparently a suspension device of some kind 500mm long with 3 links, the middle one of which was swivelled. It is even more difficult to explain the presence of the apparently unbroken iron object found in the bottom of the pit; it appears to be a suspension device for something quite heavy that also required to be swivelled. This object lay partly under a horizontal flat stone. Another key feature of the pit was several stones set vertically on the W side of the section all held in place quite firmly. Two of these mica schist stones were long, heavy and narrow in shape, looking distinctively like wedges; both rested on the same horizontally placed stone beneath which the iron object was found.



The pit, post excavation, viewed from the south, showing the iron artefact in situ.



The iron artefact is 50cms in length

The pit in the area of the flue entrance cannot be explained. There was no evidence of charcoal or of burning associated with it and it was too far from the flue and the kiln bowl to be an effective source of heat, although it was directly in line and about half way between the entrance of the flue and a nearby doorway in the west wall of the barn.



The kiln, post excavation, from the north

4.2 Discussion

It is well documented that corn drying kilns in the 18th century had a dual purpose and were used for both, drying grain and malting barley or bere; malt kilns, as we know them in modern distilleries today, were not developed until the early part of the 19th century. These later industrial malt kilns had a fire directly under a much higher drying floor, with a heat deflector immediately above the fire.

The kiln bowl at Mulchaich had an unusual flue which was substantially built and much wider than the normal corn drying kiln. In addition the hearth was inside the flue and much nearer to the kiln bowl itself. Several theories have been put forward as to the nature of the drying process at Mulchaich and the position of the heat source. Two are outlined here and both have drawbacks.

1. One theory is that the hearth is in its original position; the position that it was intended to be in when the kiln was first constructed. Being close to the kiln bowl it would give the greatest amount of heat to dry what must have been a significant amount of grain/malt. But it is difficult to imagine that the hearth would have been constructed so close to the flue walls when quite clearly these walls would succumb to the heat as indeed they did. In addition, because the hearth was so close to the kiln bowl with its inflammable contents, there was a danger of the whole thing going up in flames

2. Another theory is that the fire within the flue was part of the final phase of the kiln. When the kiln was first constructed the firepit had been further back, in the position of the pit which is in a direct alignment between the doorway in the west wall of the barn and the flue. But this position had proved to produce an ineffective heat source for drying the required amount of malt/grain and the fire had been moved closer to the kiln bowl and in its present position within the flue. The problem with this theory is that apart from a few pieces of charcoal no evidence of burning was found in the pit.

The Mulchaich kiln seems to have a form somewhere in between the old corn drying kiln and the more modern 19th century malt kiln. Was it a transitional malt kiln? - a fore-runner of the later malt kilns?

If the pit which was partly sectioned was not used in the distilling process then what was its purpose? Another hypothesis is that it predates the kiln and is part of the prehistoric activity which took place in the vicinity of the chambered cairn. Supporting this theory is the fact that a piece of flint was found only 1metre away in the central stone feature abutting the front wall of the kiln. The iron object could have been inserted at a later date, perhaps by the kiln builders who wished to replicate the practices of their prehistoric forefathers.



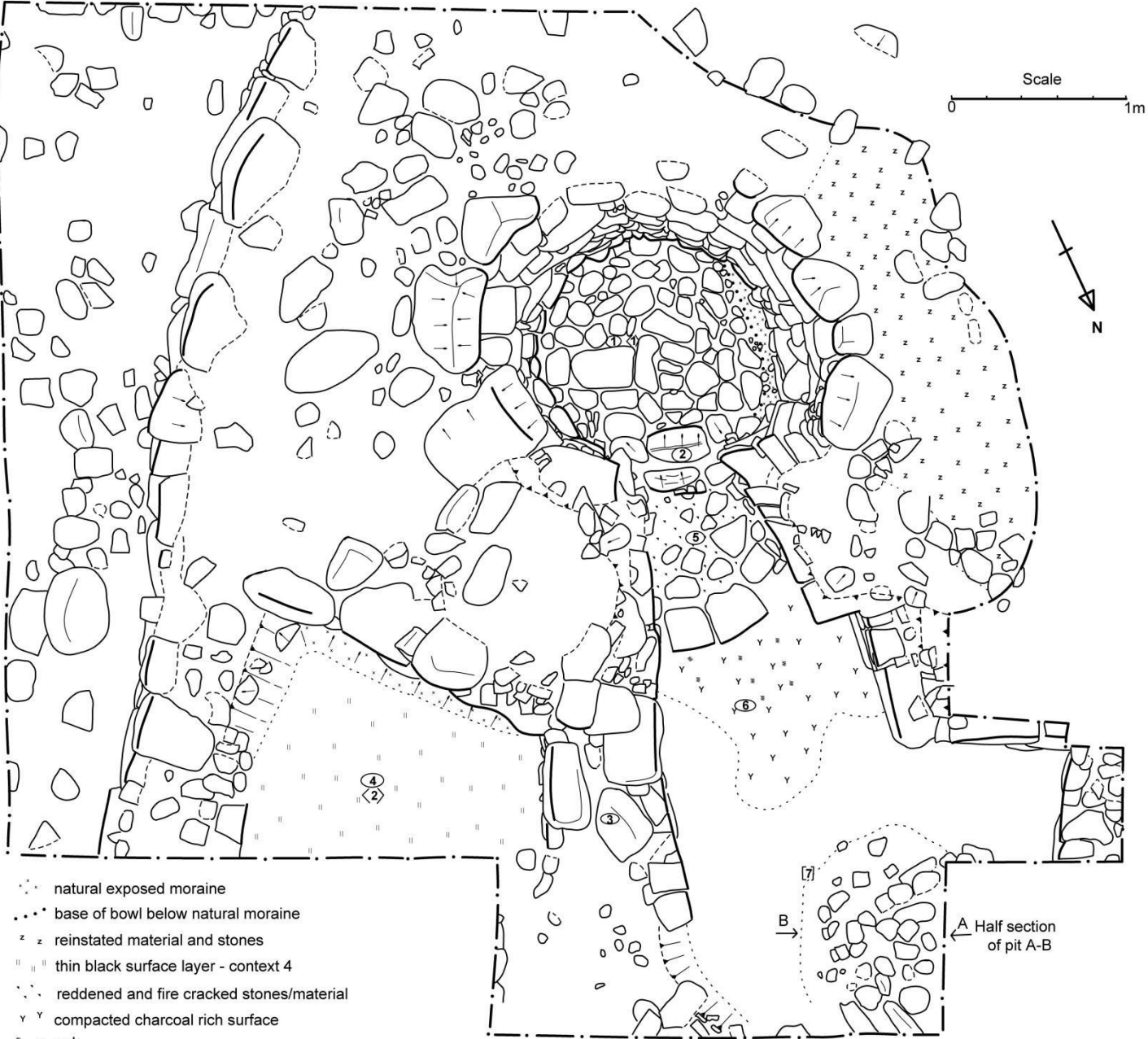
The kiln consolidated and returned

4.3 Plans, Drawings and Sections

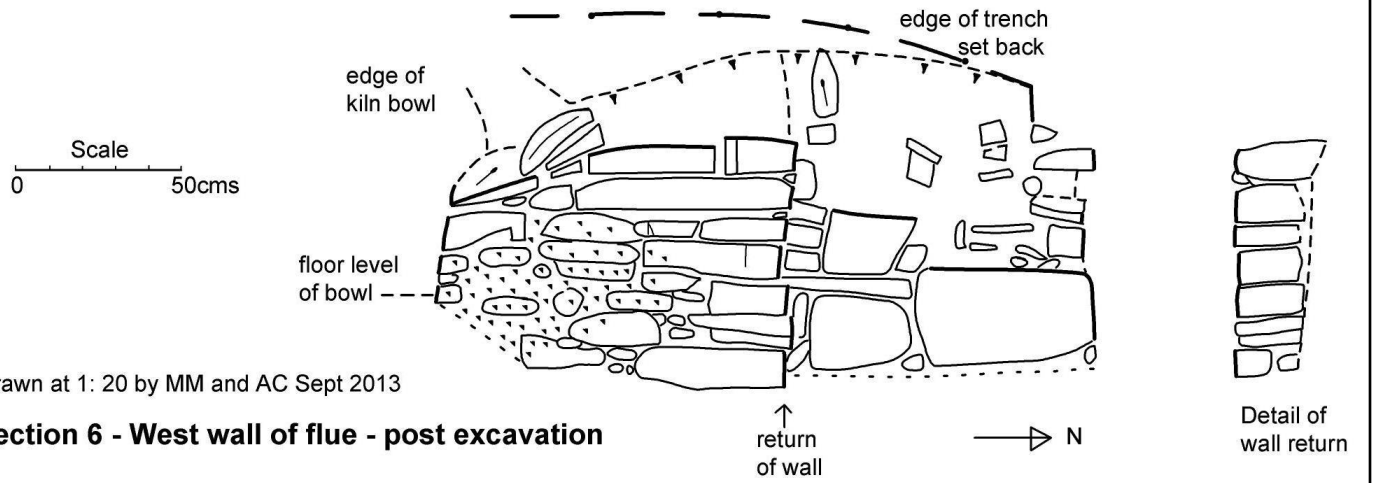
Mulchaich Kiln

Plan drawing 3 - following removal of tumble and cleaning down

Drawn at 1:20 by MMM and JW September 2013

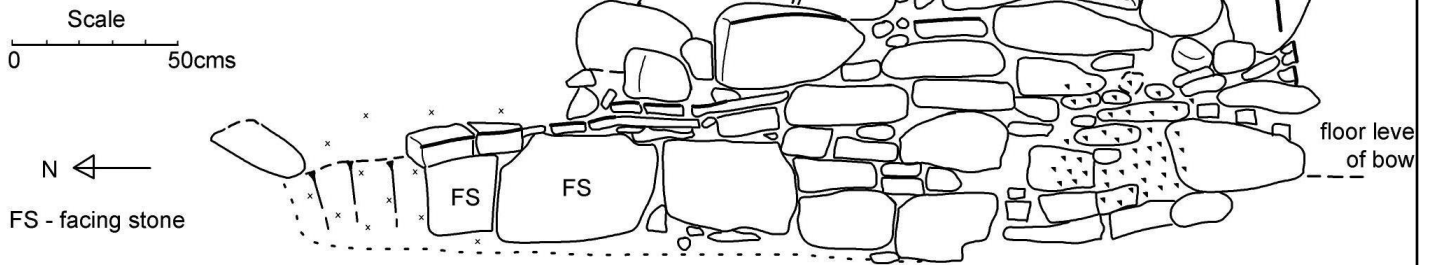


Mulchaich kiln

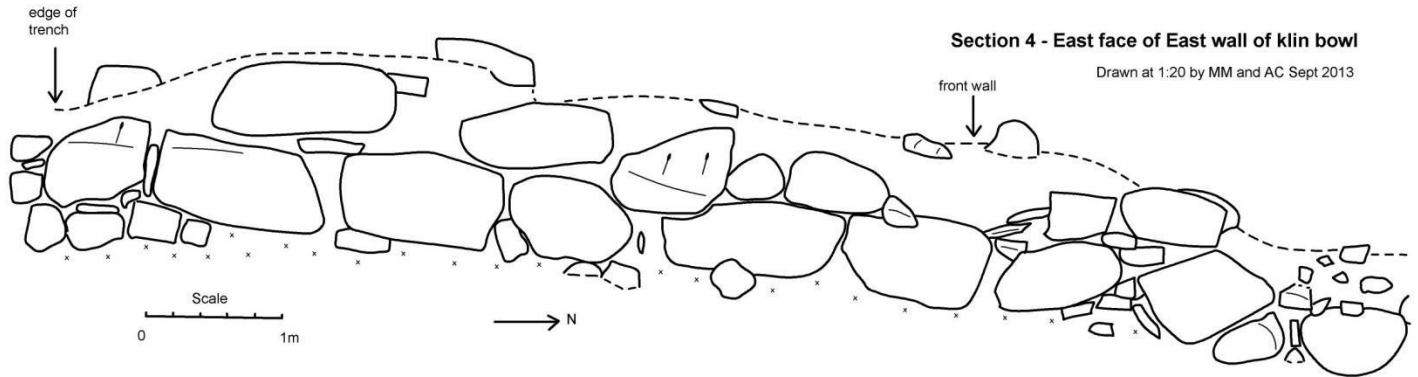


Section 7 - East wall of flue post excavation

Drawn at 1: 20 by MM Sept 2013

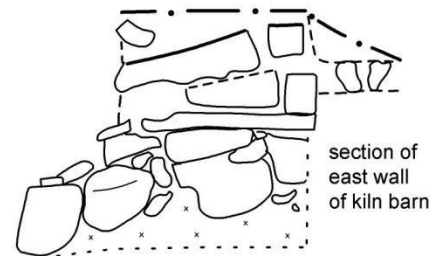


Mulchaich kiln



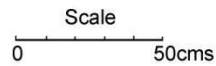
Section 5 - West part of Front/North kiln wall

Drawn at 1:20 by RJ Sept 2013



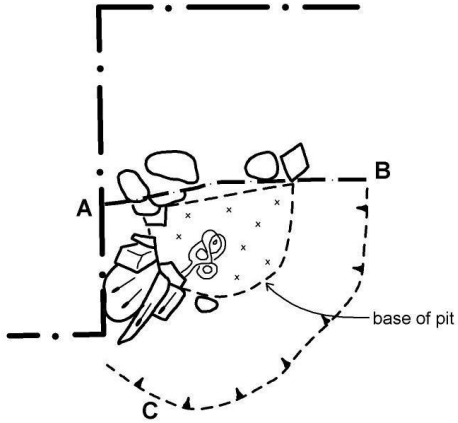
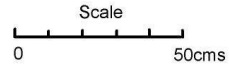
Section 2 - East part of Front/North kiln wall (above) and east face of central structure abutting (right)

Drawn at 1:20 by MM Sept 2013

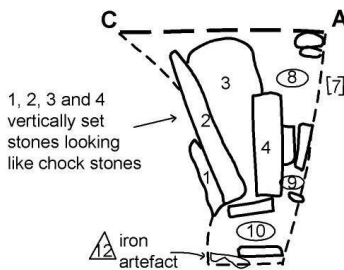
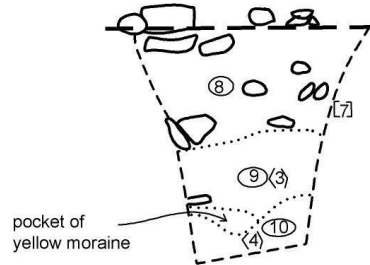


**Plan drawing 8 - Overlay of Pit to north
of flue entrance in kiln barn - post excavation**

Drawn at 1:20 by JW - 27/09/13



Pit section A-B - post excavation

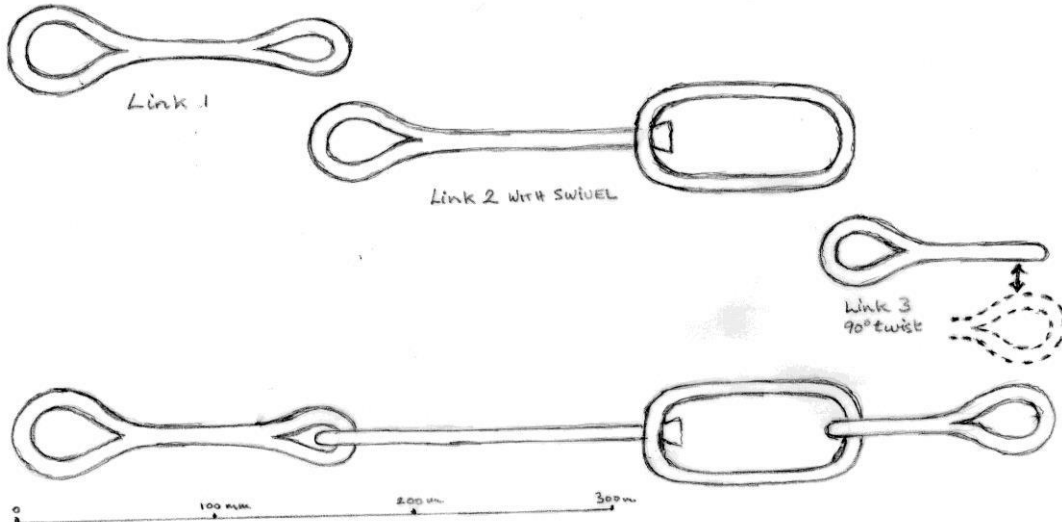


Contexts

- ⑧ - mixed stones (up to 150mm)
brown soil and orangy clay
- ⑨ - brown soil becoming mixed with 10
(sample 3)
- ⑩ - dark friable organic layer (sample 4)

Pit Section A-C - post excavation

Drawn at 1:20 by JW 27/09/13



Half Scale drawing of iron object found in kiln barn pit at Mulchaich 09/2013

Top: drawn as 3 separate links

Below: drawn as it would hang straight (reconstruction)

The object remains 'as found' welded by corrosion in a buckled shape

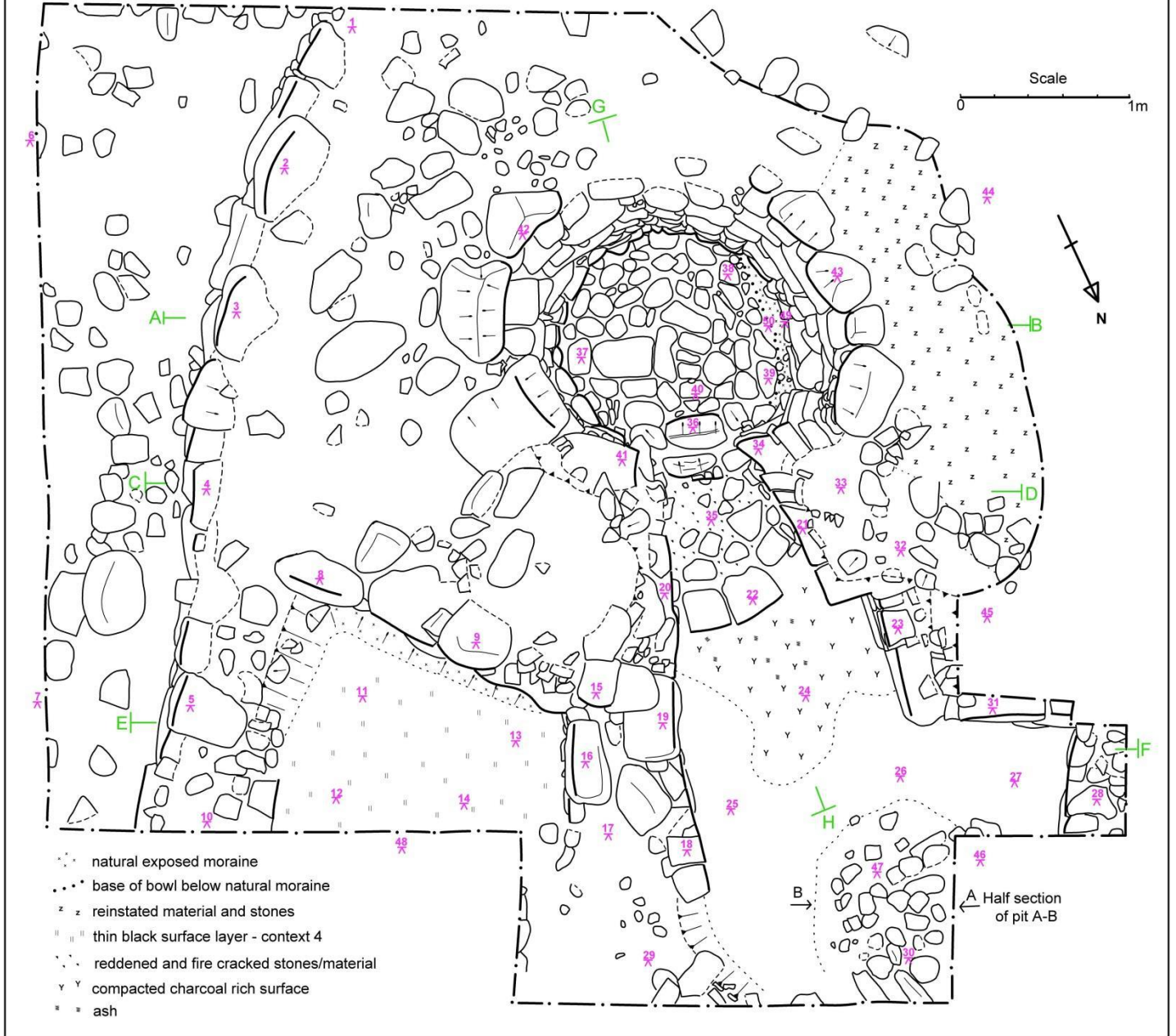
JW 09/10/2013

4.4 Levels and Profiles

Mulchaich Kiln

Plan drawing 3 - post excavation, showing position of levels and profiles

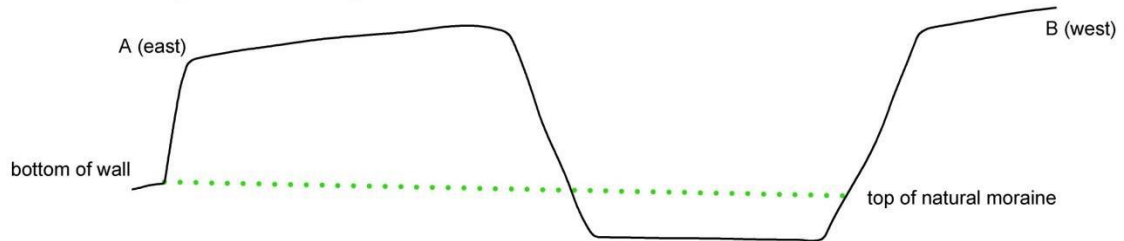
Drawn at 1:20 by MMM and JW September 2013



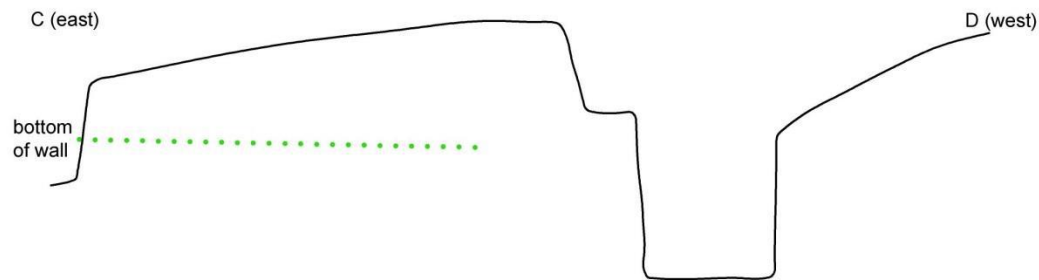
Mulchaich kiln profiles showing original level of natural moraine

..... level of natural moraine Scale 0 1m

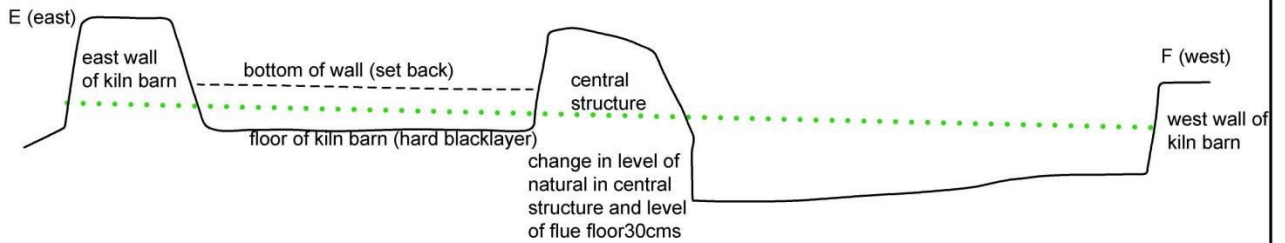
South profile A-B through kiln bowl



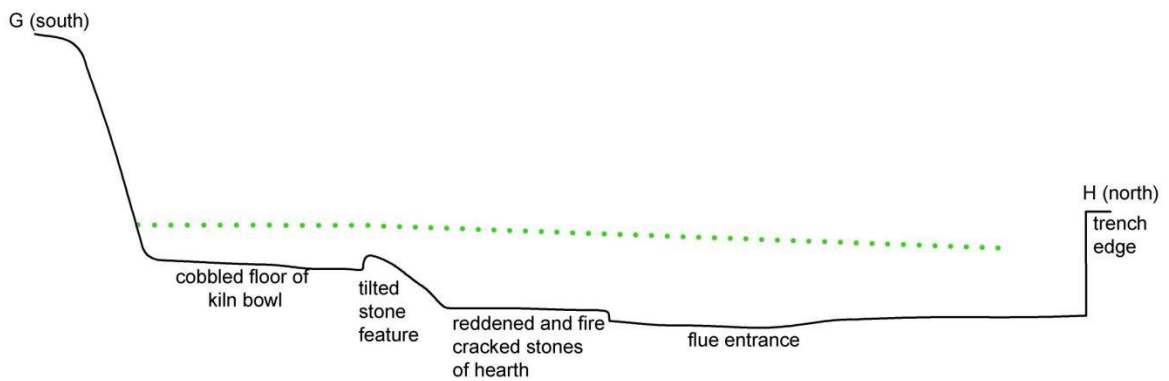
Middle profile C-D through north wall of bowl and flue walls



North profile E-F through kiln barn, central structure and flue entrance



North-South profile G-H through kiln bowl, flue and flue entrance



Products

5.1 Plans and Section Drawings

1. Plan drawing at 1:20 – west end of front/north wall of kiln bowl and apron plus entrance to flue after removal of turf and cleaning up
2. Section drawing at 1:20 – east part of front/north wall of kiln bowl and east face of central stone feature
- 3A. Plan drawing at 1:20 – of kiln bowl and flue plus front face and central stone feature (extension to east wall of flue) post excavation
- 3B. Plan drawing at 1:20 – extension to north of plan drawing 3A
4. Section drawing at 1:20 – outer face of east wall of kiln bowl following removal of tumble and cleaning down to natural
5. Section drawing at 1:20 – west part of front/north wall of kiln bowl post excavation
6. Section drawing at 1:20 – west wall of flue (facing east) post excavation
7. Section drawing at 1:20 – east wall of flue (facing west) post excavation
8. Plan drawing at 1:20 overlay of pit, post excavation
9. Section drawing at 1:20 – pit section A-C post excavation
10. Section drawing at 1:20 – pit section A-B post excavation

5.2 Profiles

- A – B E/W across the bowl of the kiln
- C – D E/W across the east front wall and the flue
- E – F E/W across the central stone structure and the flue entrance
- G – H N/S through the kiln bowl and flue

5.3 List of finds

1. Assorted ceramics, glass, iron fragments, cartridge case – from bowl interior 16.08.13
2. Clay marble or bottle stopper – from bowl interior 16.08.13
3. Clay/?Mortar bonding – from SE wall of kiln bowl 16.08.13
4. Ceramics – from bowl interior 30.08.13
5. Metal/iron fragments – from bowl interior 30.08.13
6. Assorted ceramics and glass plus old biro – from front face exterior of bowl 30.08.13
7. Ceramics and glass – from exterior of bowl 2.09.13
8. Flint – from structure 3 east of flue entrance 6.09.13
9. Degraded wood – flue entrance 6.09.13
10. Ceramics and glass – from bowl exterior front 6.09.13
11. Lumps of clay – from flue floor 6.09.13
12. Iron object – bottom of pit 27.09.13

5.4 List of contexts

1. Deposit – soil from bottom of kiln bowl/matrix in between cobbles (sample 1)
2. Structure – tipping stone structure at exit of flue/entrance to bowl
3. Structure – stone structure to east of flue entrance
4. Surface – hard thin black layer at foot of east part of front wall of bowl (sample 2)
5. Structure – hearth/paved floor within flue
6. Surface – flue floor
7. Cut – of pit in front of flue entrance
8. Deposit – upper pit fill
9. Deposit – middle pit fill (sample 3)
10. Deposit – lower pit fill (sample 4)

5.5 List of Samples

1. Matrix between cobbles at bottom of bowl – context 1
2. Hard thin black surface east of structure 3 – context 4
3. Middle pit fill – context 9
4. Lower pit fill – context 10

5.6 Levels (on plan 3)

TBM - 2.15 (lowest stone of 3 c8m to west)

1.	1.27	14.	2.08	27.	2.30	40.	2.17
2.	1.10	15.	1.34	28.	1.86	41.	1.53
3.	1.21	16.	1.58	29.	2.13	42.	1.08
4.	1.38	17.	2.02	30.	2.39	43.	1.09
5.	1.45	18.	2.01	31.	1.61	44.	0.95
6.	1.82	19.	1.63	32.	1.37	45.	1.20
7.	2.06	20.	1.62	33.	1.46	46.	1.95
8.	1.17	21.	1.63	34.	1.72	47.	3.01
9.	1.22	22.	2.32	35.	2.34	48.	1.84
10.	1.75	23.	1.87	36.	2.09	49.	1.90 (top of natural)
11.	2.05	24.	2.43	37.	2.08	50.	2.11 (bottom of natural exposed moraine)
12.	2.07	25.	2.39	38.	2.05		
13.	2.06	26.	2.37	39.	2.08		

5.7 Photographs – listed in chronological order

5.7.1 General pre-excavation views

1. AP of site from NW
2. AP of site (bottom right) from SW
3. Kiln from the east
4. Kiln from the east
5. Initial start on emptying kiln bowl in Dec 2012 – from west

5.7.2. 16th August 2013

1	Bowl	From west	Showing three tumbled boulders
2	Bowl	From east	
3	Flue area	From N	
4	E front wall	From N	
5	East wall	From N	
6	Bowl	From S	
7	Bowl	From NE	
8	Flue	From N	
9	W front wall	From N	
10	W front wall	From NE	

5.7.3. 30th August 2013

1	Bowl	From N	
2	Bowl	From W	
3	Flue	From N	
4	Flue	From W	
5	Flue	From N	Showing blocking stones
6	Flue	From S	Showing blocking stones
7	Flue	From N	Blocking stones removed
8	Flue	From W	Blocking stones removed
9	Bowl	From N	
10	Bowl	From W	
11	Flue exit	From S	
12	Flue exit	From S	
13	Flue	From N	
14	Flue	From W	
15	East wall	From S	
16	E wall	From N	
17	Bowl floor	From N	

18	Bowl	From N	
19	Bowl	From E	
20	Bowl	From S	

5.7.4. 2nd September 2013

1	W front wall	From N	
2	W front wall	From N	
3	E front wall	From N	
4	E front wall	From N	
5	Flue	From N	
6	Flue	From W	
7	Flue	From E	
8	Flue	From E	
9	Flue	From S	
10	Flue W wall	From SE	
11	Bowl	From S	

5.7.5. 6th September 2013

1	Flue W wall	From E	
2	Flue W wall	From W	
3	Flue	From N	
4	Flue W wall	From E	
5	Flue	From N	
6	Flue W wall	From NE	Also W front wall
7	Flue W wall	From E	Post excavation
8	Flue W wall	From NE	Post excavation
9	Flue	From N	
10	Central structure	From N	
11	Central structure	From NE	
12	Central structure	From NW	
13	Bowl cobbled floor	From E	Post ex
14	Bowl cobbled floor	From W	Post ex
15	Bowl cobbled floor	From S	Post ex
16	Bowl cobbled floor	From N	Post ex
17	Central structure	From NE	Detail
18	E front wall	From N	
19	E front wall and central structure	From N	
20	Kiln East wall S part	From E	
21	Kiln East wall	From N	
22	Kiln East wall N part	From E	
23	Kiln East wall	From S	
24	West front wall	From N	Post ex
25	West front wall	From NE	Post ex
26	E front wall	From N	Part excavated showing black layer, context 4
27	E front wall	From E	Part excavated showing black layer, context 4
28	Flue and entrance	From N	

5.7.6. 20th September 2013

1	East wall of flue	From W	Showing redness and fire cracking
2	Flue	From N	Showing redness and fire cracking in floor and walls
3	Flue	From S	Showing redness and fire cracking in floor

4	East wall	From S	
5	East wall	From NE	
6	Flue	From N	Showing redness and fire cracked wall
7	Flue floor	From S	Showing redness and fire cracking
8	W wall of flue	From E	Showing redness and fire cracking

5.7.7. 26th September 2013

1	W wall of flue	From E	Post ex
2	E wall of flue	From W	Post ex with fire cracking cleaned up
3	Flue walls and floor	From N	Post ex showing paved area
4	Kiln East wall	From N	Post ex
5	Kiln E wall N part	From E	Post ex
6	Kiln East wall N part	From NE	Post ex
7	Flue floor	From N	Post ex
8	Flue paved floor	From N	Post ex
9	Flue entrance	From SE	
10	Flue and entrance	From E	Post ex
11	Flue entrance floor	From E	Post ex – with area of stones defining pit
12	Flue entrance floor	From W	Post ex
13	Flue and entrance	From SW	Post ex
14	Flue and entrance	From SE	Post ex
15	Entrance area	From SW	Post ex showing discrete area of stones defining pit
16	W wall of flue a central structure	From W	Post ex
17	Flue	From N	Post ex
18	E wall of flue	From NE	Post ex
19	Area at foot of E front wall	From E	Showing black surface layer – context 4, post ex
20	Area at foot of E front wall	From N	Post ex showing black layer, context 4
21	Pit	From S	Part ex
22	Pit	From E	Part ex showing “wedge” stones
23	Pit	From E	Part ex
24	Pit	From S	Part ex – showing stones
25	Pit	From S	Post ex – showing iron object
26	Pit	From S	Post ex – showing iron object
27	Pit	From SW	Post ex – showing iron object
28	Iron object		Post ex
29	Pit bottom		Post ex and post removal of iron object
30	Pit bottom		Post ex and pre removal of iron object

5.7.8. 10th October 2013

1	Kiln bowl and flue	From N	Post ex with pit in foreground
2	Kiln bowl and flue	From N	Post ex with pit in foreground
3	Kiln bowl and flue	From N	Post ex
4	Kiln bowl and flue	From N	Post ex
5	Kiln bowl and flue	From N	Post ex with pit in foreground
6	Kiln bowl	From S	Post ex
7	Flue	From E	Post ex
8	Flue	From W	Post ex
9	Tipped structure at flue exit	From N	Post ex
10	Kiln	From N	Post ex, consolidated and returned
11	Kiln	From N	Post ex, consolidated and returned

