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# Pit digging and lifeways in Neolithic Wiltshire

David Roberts and Peter Marshall

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## SUMMARY

This research report is intended to support a publication of a synthesis of Neolithic pits from non-monumental sites in Wiltshire and an accompanying programme of scientific dating and chronological modelling (Roberts and Marshall 2020). The report makes available the full dataset collated for the study, alongside full details of the scientific dating. No discussion of these datasets is offered in this report, as this is covered in the associated article, as are methods of data collection.

## CONTRIBUTORS

David Roberts and Peter Marshall

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## INTRODUCTION

This research report is intended to support a publication of a synthesis of Neolithic pits from non-monumental sites in Wiltshire and an accompanying programme of scientific dating and chronological modelling (Roberts and Marshall 2020). The report makes available the full dataset collated for the study, alongside full details of the scientific dating. No discussion of these datasets is offered in this report, as this is covered in the associated article, as are methods of data collection (Roberts and Marshall 2020). It is hoped that by making these datasets available we facilitate their wider reuse in developing new understandings of the Neolithic in the region.

## PITS DATASET

We cannot claim to have studied every Neolithic pit excavated in Wiltshire, but can reasonably assert to have included all those recorded as such in the Historic Environment Record (HER) up to December 2016. The dataset (Table 1) was collected through an HER search by Wiltshire Archaeology Service staff for the following conditions:

- All monument records where Monument Type = Pit and Period = Neolithic
- All archaeological events where Feature Type included 'Pit' and Period included 'Neolithic'
- All monument records where Monument Type = Pit and Period = Undated

This combination of searches has allowed assessments of all pits recorded in the HER as Neolithic in date, all sites where both pits and features of Neolithic date were present, and all undated pits. The majority of records in the HER are drawn from 'grey literature' reports submitted to the HER as part of the planning process. The HER also records data from publications; whilst coverage cannot be complete, most monographs and all publications in the county journal are included, and a wide-ranging search of available literature has revealed further examples.

Each of the three sets of search results were reviewed and all associated grey literature and publications read. Dating evidence was reviewed, and in a considerable number of cases judged as falling short of definite. In particular, pits dated as 'Neolithic to Bronze Age' or similar based on worked flint were not included as Neolithic pits in this study. Dating was accepted as definite on the basis of calibrated radiocarbon dates from *in situ* material, Neolithic pottery (earlier Neolithic, Peterborough Ware and Grooved Ware) and definitely Neolithic worked flint. All dating assigned to flint assemblages by professional specialists has been accepted. A small number of pits were putatively dated by association with well-dated pits, but only when clearly paired/grouped and of similar morphology and/or similar assemblages existed.

As such, quite large numbers of pits previously accepted as Neolithic were rejected for this study. In a significant number of more recent excavations, only assessment reports were available, rather than full analysis reports or publications. Sometimes this is due to the project being part of continuing work, but sometimes no work beyond assessment has been undertaken despite post-excavation assessments recommending additional analytical work and publication. Whilst every effort has been made to interrogate the reports submitted to the HER for data from these sites, and some additional data has kindly been supplied by Alistair Barclay, formerly of Wessex Archaeology, it has not been possible to visit all archaeological contractors' premises and assess any additional

material culture, although samples have kindly been provided by Wessex Archaeology, Salisbury Museum and Historic England for additional scientific dating.

Furthermore, this dataset does not include pits that are part of major monuments such as henges. Pits at henges fulfil a range of functional and non-functional roles, just as elsewhere, but this study aims to understand pits away from major monuments. Whilst it is clear that pits are present on some monumental sites prior to the main monumental phases (eg. Coneybury Henge (Richards 1990, 149)), these are also omitted here.

Detailed data was collected on as many aspects of artefactual and ecofactual assemblages as possible; however, synthesising each of these categories in any detail is beyond the scope of this project. Instead, in the accompanying paper (Roberts and Marshall 2020) we set out key data patterns, outline scientific dating and chronological modelling results shedding light on the deposition of pottery and grain in Neolithic pits, and conclude with an interpretation of Neolithic lifeways based on pit data, and suggest areas for future research.

## THE CHRONOLOGY OF NEOLITHIC PITS IN WILTSHIRE

Details of all the radiocarbon dates included in our review are provided in the tables referenced in Tables 2–3. The reported results are conventional radiocarbon ages (Stuiver and Polach 1977). Full details of the thirty five radiocarbon results, which are published for the first time in this study, are provided in Table 3 (technical details for producing the results are given in Appendix 1).

The chronological modelling was undertaken using the program OxCal v4.2 (Bronk Ramsey 2009; Bronk Ramsey and Lee 2013) and the atmospheric calibration curve for the northern hemisphere published by Reimer *et al.* (2013). The chronological models for each site are described below, and are defined exactly by the brackets and OxCal CQL2 keywords on the left-hand side of the technical graphs (<http://c14.arch.ox.ac.uk/>). The posterior density estimates output by the model are shown in black, with the unconstrained calibrated radiocarbon dates shown in outline. The other distributions correspond to aspects of the model. For example, '*last\_pit\_6093*' is the estimated date when Pit [6093] was infilled at The Portway (Fig. 1). In the text and tables, the Highest Posterior Density intervals of the posterior density estimates produced by the models are given in italics, followed by a reference to the relevant parameter name and the figures in which the model which produced it is defined.

Key parameters for the chronology of Neolithic pits in Wiltshire are listed in Roberts and Marshall (2020, table 2), and illustrated in Roberts and Marshall (2020, figs 5 and 7). We begin our review by establishing our current understanding of the chronology of particular sites, considering them from east to west across the county.

### Tilshead Nursery

Tilshead is situated in a steep sided valley on the south west side of Salisbury Plain 10.5km north east of Stonehenge. Construction work at Tilshead Nursery School (SU 0351 4810) had no planning conditions for archaeological recording and the unexpected discovery of archaeological features resulted in limited emergency recording being undertaken by Mrs Susan Teale (Wiltshire Archaeological and Natural History Society, Archaeological Field Group) on the 30–31 July 2009 (Amadio 2010).



Two pits were recorded; [001] and [002] with neither of them fully excavated. Finds recovered from pit [001] included animal bone, antler, hazelnuts, flint and sarsen stone. Pit [002] produced a similar range of material and sherds of Peterborough Ware.

Three samples, all from pit [002] were submitted for dating with two, a red deer antler (GU44403) and pig tibia with refitting epiphysis (UBA-34948) both failing during pretreatment. All the antler and bone from the site appeared to have been affected by significant post-depositional minerogenic replacement. The single dated hazelnut (OxA-35987; Table 3) from the large cache provides the best estimate for the infilling of pit [002].

### **Pits outside Robin Hood's Ball**

Excavations in 1984 and 1986 following intensive collection of artefacts adjacent to Robin Hood's Ball causewayed enclosure revealed a roughly circular cluster of shallow pits (Richards 1990). The pits contained small quantities of early Neolithic ceramics and two unidentified animal bones (OxA-1400–1401) provide *termini post quos* for their infilling.

### **West Kennet Avenue**

During a watching brief on the replacement of British Telecom cable ducting and the excavation of inspection chambers along the B4003 adjacent to the West Kennet Avenue in 2005–2006 a single pit (409) was uncovered and subsequently excavated. The single fill (410) contained sherds and fragments of Mortlake-style Peterborough Ware, probably representing a single vessel, two cattle bones, and charred hazelnuts (Allen and Davis 2009). The cattle metacarpal and humerus could both be from the same individual and the dated metacarpal (NZA-23742) provides a date for the deposition of the Peterborough Ware vessel and infilling of the pit.

### **Chalk plaque pit, Amesbury**

During widening of the A303 to the east of Stonehenge between King Barrow Wood and Stonehenge Bottom in 1968 a small pit was exposed and rescue excavation undertaken that recovered Grooved Ware pottery, two engraved chalk plaques, flint tools, and animal bones (Harding 1988; Vatcher 1969). Two radiocarbon determinations (Cleal *et al.* 1994) on a broken cattle femur (OxA-3316) and shed antler from an immature/young animal with no signs of use but a broken beam and decomposition above the bez (OxA-3317) are statistically consistent ( $T=1.1$ ;  $T^*5\%=3.8$ ;  $v=1$ ) and could be of the same age. The two dates therefore provide *termini post quos* for infilling of the pit as both samples could potentially be residual.

### **Old Sarum Water Pipeline**

Wessex Archaeology undertook archaeological excavations in 2001–2 in advance of the replacement of a 4.5km section of water pipeline that runs from Camp Hill to Castle Hill Reservoirs and passing north of Old Sarum (Powell *et al.* 2005). Two of the six defined land blocks (Powell *et al.* 2005, fig 1); the Old Sarum Spur and The Portway had groups of Middle Neolithic pits that contained Peterborough Ware (Mortlake and Ebbsfleet styles), animal bones, worked flints, and carbonised hazelnuts.

At Old Sarum Spur seven pits were found near the edge of the plateau of the chalk spur that overlooks the Avon valley to the south-west, in three groups (Powell *et al.* 2005, fig 2). Two radiocarbon determinations (NZA-18416 and NZA-18338) were obtained as part of the initial post-excavation programme from pit [3020] that with pit [3005] formed Group 2 and from pit [3007] that with pit [3000] formed Group 3 (Table 3).

At the Portway, some 900m south-east of the Old Sarum Spur and located at the base of the chalk ridge formed by Castle Hill and the Old Sarum promontory six pits in two groups were excavated (Powell *et al.* 2005, fig 3). Seven radiocarbon dates have been obtained from five of the six pits, three as part of the initial post-excavation programme (NZA-18417 and NZA-18339–40; Powell *et al.* 2005, table 3) and four as part of the work reported on in this paper (Table 3).

In the western part of the site three pits [6056, 6061 and 6065] formed Group 4. Three samples were dated from pit [6056]; a hazelnut shell (NZA-18339) a carbonised wheat grain (SUERC-73424) from the primary fill (6058) that included >100 hazelnut shell fragments, sarsen stones, a large jagged flint module and part of a Mortlake bowl, and a fragment of pig skull (NZA-18417) from the secondary fill (6057). The pig skull was dated to establish whether it had been curated like some of the material in the Stonehenge ditch (Allen and Bayliss 1995) and as it could be residual it only provides a *terminus post quem* for its context. The wheat grain (SUERC-73424) is clearly intrusive.

The secondary fill (6064) that overlay a thin layer of chalky silt (6142) on the base of pit [6061] contained >10,000 hazelnut fragments with NZA-18340 providing a date for their deposition and infilling of the pit. Further fills of the pit contained Peterborough Ware sherds (including three different Mortlake and one Ebbsfleet bowls), animal bone, and a further 3000+ hazelnut shell fragments.

An antler pick (SUERC-73428) from pit [6065] is clearly much older than the dated material from the other pits (Fig 2), and given it did not contain any Peterborough Ware and is considerably shallower than all the other pits it may simply represent early Neolithic activity. SUERC-73428 has therefore been excluded from the model for Middle Neolithic activity, although it provides a date for the digging and infilling of pit [6065].

Some 16m to the south-east of Group 4 was a second cluster of pits ([6076, 6093, and 6100] that defined Group 5. Samples from all three pits were dated. Two determinations on red deer (SUERC-73429) and roe deer (OxA-35717) tools from the primary fill (6094) of pit [6093] are statistically consistent ( $T'=1.1$ ;  $T'5\%=3.8$ ;  $v=1$ ) and provide a date for its infilling and deposition of Peterborough Ware sherds (Mortlake and Ebbsfleet styles). A carbonised wheat grain (UBA-34506) from the primary fill (6101) of pit [6100] is intrusive. The infilling of pit [6076] that contained 54 Peterborough Ware sherds (from two different Mortlake bowls and one Ebsfleet bowl) is dated by a radiocarbon determination (UBA-34505) on a roe deer antler tool.

A model (Fig. 1) including the dated samples as deriving from a single uniform phase of activity (Buck *et al.* 1992) has good overall agreement ( $A_{model}=90$ ) with pit digging and infilling taking place in the second half of the fourth millennium cal BC.

### West Amesbury Farm

Excavations on the south-eastern slopes of King Barrow Ridge, 1.5 km east of Stonehenge, revealed five pits, a grave (Mays *et al.* 2018) and other features of Middle Neolithic date (Roberts *et al.* in press). The assemblages in the pits drew on a common



suite of materials – struck flint, pig, and cattle bones, Fengate substyle Peterborough Ware, and hazelnuts were present in all five pits (Bishop *et al.* in press; Worley *et al.* 2019).

A chronological model for the development of the site is presented in Roberts *et al.* (in press; fig 10). Date estimates for key parameters from this model are given in Table 4.

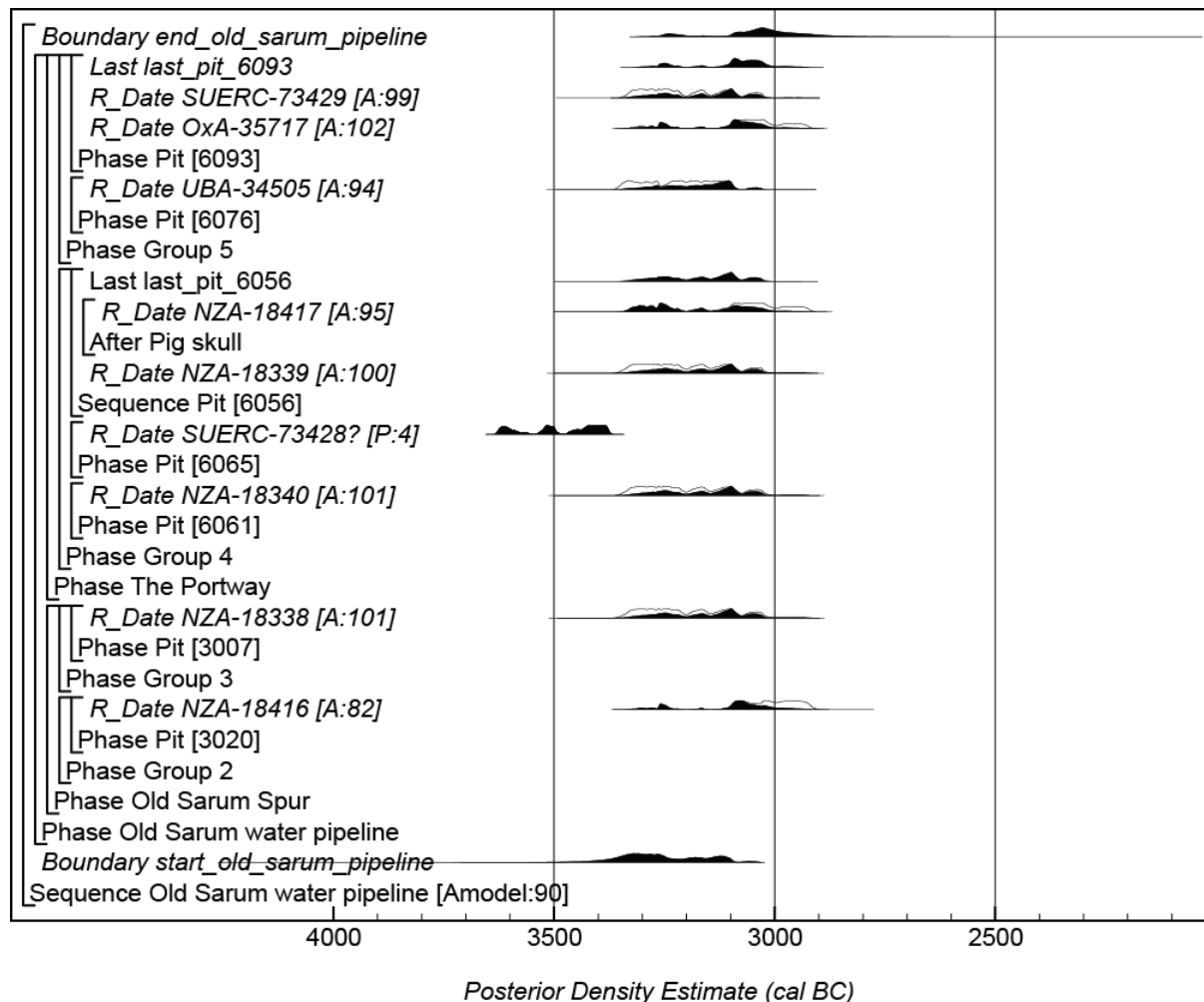


Figure 1. Probability distributions of dates from the Old Sarum water pipeline (Old Sarum Spur and The Portway). Each distribution represents the relative probability that an event occurs at a particular time. For each of the dates two distributions have been plotted: one in outline, which is the result of simple radiocarbon calibration, and a solid one, based on the chronological model used. Distributions other than those relating to particular samples correspond to aspects of the model. For example, the distribution ‘last\_pit\_6093’ is the estimated date when Pit [6093] was infilled. The measurement followed by a question mark has been excluded from the model for reasons explained in the text, and is a simple calibrated date (Stuiver and Reimer 1993). The large square brackets down the left-hand side of the figure along with the OxCal keywords define the model exactly.

### **Coneybury Anomaly**

The Coneybury Anomaly was a large pit with an occupation or feasting deposit in the primary fill (Richards 1990). The pit was filled by a series of dumped deposits (Richards 1990, fig 24) of broken vessels, animal bone and other material (lithics, charred plant remains, ash, and charcoal). Some of this material may have been placed and/or arranged and it is very likely that infilling of the pit was a short-lived event given the placements of partially articulated animal bone and nested groups of sherds.

A chronological model for the pit is presented in Barclay (2014) and Barclay *et al.* (2018). Date estimates for key parameters from this model are given in Table 4.

### **King Barrow Ridge and Countess East, Amesbury**

King Barrow Ridge and Countess East, Amesbury lie to the east of Stonehenge. Pioneering surface collection work on King Barrow Ridge was carried out in the 1930's (Laidler and Young 1938). Following further extensive collection of surface finds during 1991–2, excavation was undertaken to examine the scatters (Richards 1990). After removal of the ploughsoil from the sampled areas a number of negative features, stakeholes and pits, were revealed and subsequently excavated.

In 1993 archaeological field evaluations were carried out in relation to a possible resiting of the Stonehenge visitor centre on the east side of Countess Road at Amesbury, with a gateway facility immediately south of the A303 at King Barrow Ridge (Darvill 1995).

Finally between 1991 and 2004 Wessex Archaeology undertook a series of archaeological investigations to explore potential options for the site of the proposed new Stonehenge visitor centre and associated access routes at Larkhill, Fargo Plantation, King Barrow Ridge, Airmans Corner and Countess (east and west).

Two radiocarbon determinations were obtained on a red deer antler (UBA-34500) and sloe fruit (OxA-35721) from the fill (1205) of pit [1204] excavated at Countess East (Wessex Archaeology 2003). The determinations are statistically consistent ( $T'=2.5$ ;  $T'5\%=3.8$ ;  $v=1$ ) and could therefore be of the same actual age.

Samples from three pits excavated on King Barrow Ridge have been dated. Replicate measurements (SUERC-74015 and OxA-1307) on an antler pick (SF 375) are statistically consistent ( $T'=2.7$ ;  $T'5\%=3.8$ ;  $v=1$ ) and a weighted mean (SF 375:  $4698\pm 28$  BP) has been taken as providing the best estimate for its age. This measurement is though statistically inconsistent with a determination (OxA-35896) on part of a refitting spinal section of a large mammal ( $T'=6.9$ ;  $T'5\%=3.8$ ;  $v=1$ ), suggesting that the pit contains material of different ages. A single determination (OxA-1396) on an unidentified animal bone from the fill (523) of pit [418] provides a *terminus post quem* for its infilling and the predominantly Grooved Ware ceramic assemblage with Woodlands style affinities.

A single determination on a red deer antler with use-wear evidence from the fill (2004) of pit [2004] provides a date for the infilling of the pit and its assemblage of Grooved Ware (Durrington Walls substyle).

The model (Fig. 2) has good overall agreement ( $A_{model}=100$ ) with pit digging and infilling associated with the deposition of Grooved Ware taking place in the third millennium cal BC and Pit 440 dating from the mid fourth millennium cal BC.

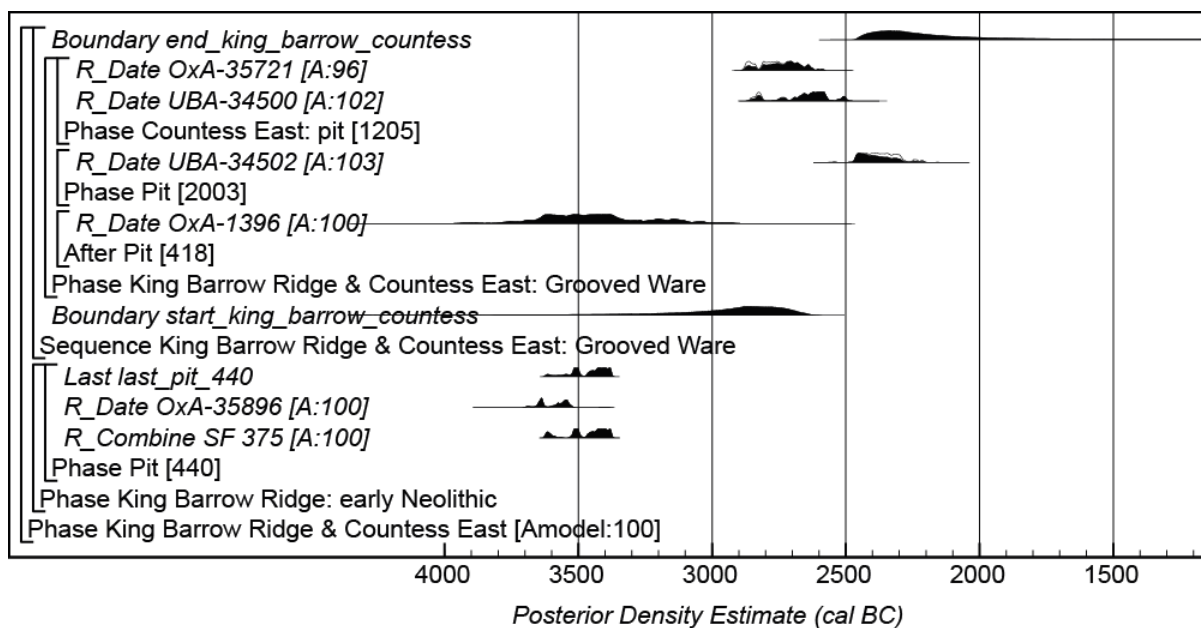


Figure 2. Probability distributions of dates from King Barrow Ridge and Countess East, Amesbury. The format is identical to that of Figure 1. The large square brackets down the left-hand side of the figure along with the OxCal keywords define the model exactly

### Harnham water supply

A watching brief undertaken by Context One Archaeology as part of works on the water supply at Harnham Road, Salisbury revealed two oval pits [5008] and [5032] that contained sherds of Peterborough Ware, Fengate sub-style, carbonised hazelnuts, worked flint, animal bones, and worked antler (Context One Archaeology 2008). Radiocarbon determinations on single fragments of carbonised hazelnut from both pits [5008; NZA-21945] and [5032; NZA-21945] are statistically consistent ( $T^* = 2.0$ ;  $T^*5\% = 3.8$ ;  $v = 1$ ) and could be of the same, suggesting the pits date to the late fourth millennium cal BC.

### ‘C’ crossing, Salisbury Plain Training Area

Wessex Archaeology were commissioned by Defence Estates to undertake an archaeological evaluation of land west of ‘C’ crossing on Salisbury Plain Training Area, Wiltshire, prior to its proposed planting as woodland. The area was an irregular shape and c. 17 hectares in area. It was located on undulating ground 1km south-west of the village of Figcheldean and was being used as pasture although one block of woodland was present within the area. The archaeological evaluation comprised 41 machine excavated trenches each measuring 50x2m in plan. Recorded features comprised 34 tree-throws, two possible postholes, four undated ditches and two pits, both of which were located on high points of the land and are probably of ritual significance. Within Trench 4 Pit [404] lay centrally between two parallel ditches (408 and 410) and contained placed antlers as well as a large amount of debitage and flint tools that appeared to be Neolithic in date (Wessex Archaeology 2001).

Four samples were submitted from Pit [404] with the carbonised cereal grain (GU44400; Table 3) failing to produce sufficient carbon for analysis. The other three determinations

(OxA-35986, SUERC-74013, and UBA-34946; Table 3) are not statistically consistent ( $T'=66.9$ ;  $T'5\%=6.0$ ;  $v=2$ ), with one of the hazelnuts (UBA-34946) appearing to be residual.

### Greentrees School, Bishopdown, Salisbury

Wessex Archaeology undertook an archaeological strip-map-and-record excavation on the proposed site of the new Greentrees Primary School, Bishopdown in 2014. The site is located at the northern edge of Salisbury, between the Hampton Park residential development to the south and the road running east from Old Sarum to Ford to the north. It lies on the south-west facing slope of the low ridge, running north-east from Castle Hill, that forms part of the watershed between the River Bourne to the east and the River Avon to the west (Wessex Archaeology 2015a). The site is to the west of excavations along the Old Sarum Pipeline (Powell *et al.* 2005) that revealed features of Neolithic to medieval date, including a number of Middle Neolithic pits containing placed deposits of Peterborough Ware pottery, flint, animal bone, antler and other materials, and a Late Bronze Age settlement with round-houses.

Evidence for a range of activities of prehistoric date was revealed including cultural material deposition in Middle Neolithic and Beaker pits (Wessex Archaeology 2015a). Samples from three (Pits [602/1010, 1060, and 1100]) of the six pits containing Middle Neolithic Peterborough Ware (Mortlake and Fengate type vessels) were dated (Table 3). A model including the three dated samples (Fig. 3) has good overall agreement ( $A_{model}=97$ ) with pit digging and filling taking place in the second half of the fourth millennium cal BC.

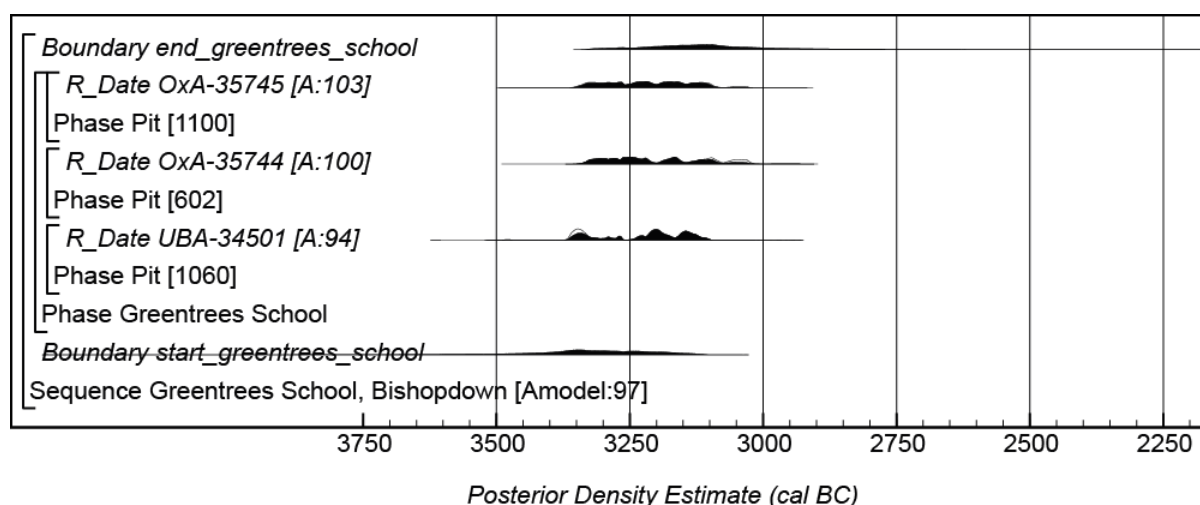


Figure 3. Probability distributions of dates from Greentrees school. The format is identical to that of Figure 1. The large square brackets down the left-hand side of the figure along with the OxCal keywords define the model exactly

### Durrington Pipeline

Watching briefs and excavations were undertaken by Wessex Archaeology in 1992 prior to and during the construction of a water main and a pesticide filtration bed at Earls Farm Down, south west of Durrington (Wessex Archaeology 1992). A small number of pits were excavated and a single radiocarbon determination (UBA-34949) was obtained on a shed red deer antler with very slight use wear from the fill (185) of pit [184]. The fill

also contained two possibly articulating pig metatarsals (MT3 and MT4) and two sherds of undiagnostic Neolithic pottery. The result provides a date for the infilling of the pit.

### Old Dairy, Amesbury

Wessex Archaeology undertook a programme of archaeological work in advance of the redevelopment of the former Old Dairy in London Road, Amesbury, Wiltshire as the site is in an area of archaeological significance on the fringe of Amesbury and 830m east of the boundary of the Stonehenge, Avebury, and Associated Sites World Heritage Site.

Excavations revealed three previously unknown Neolithic/Early Bronze Age ring-ditches, a scatter of Neolithic pits, a Middle Bronze Age pit containing dolerite-tempered pottery, and a Final-Phase (7th–8th century) Anglo-Saxon inhumation cemetery. Three radiocarbon determinations (SUERC-54201–54203) were obtained on samples from Neolithic pits (Harding and Stoodley 2017, table 9) as part of the post-excitation programme, with an additional two (UBA-34504 and SUERC-73268; Table 3) obtained on carbonised cereal grains as part of the work reported on in Roberts and Marshall (2020) and Worley *et al.* (2018). The two grains from the fill (564) of pit [563] are clearly intrusive and not associated with the sherds of Peterborough Ware deposited in the pit.

Our model (Fig. 4) that follows the model defined in Harding and Stoodley (2017, fig. 17) has good overall agreement (Amodel=97) with pit digging clearly taking place episodically through the fourth millennium cal BC.

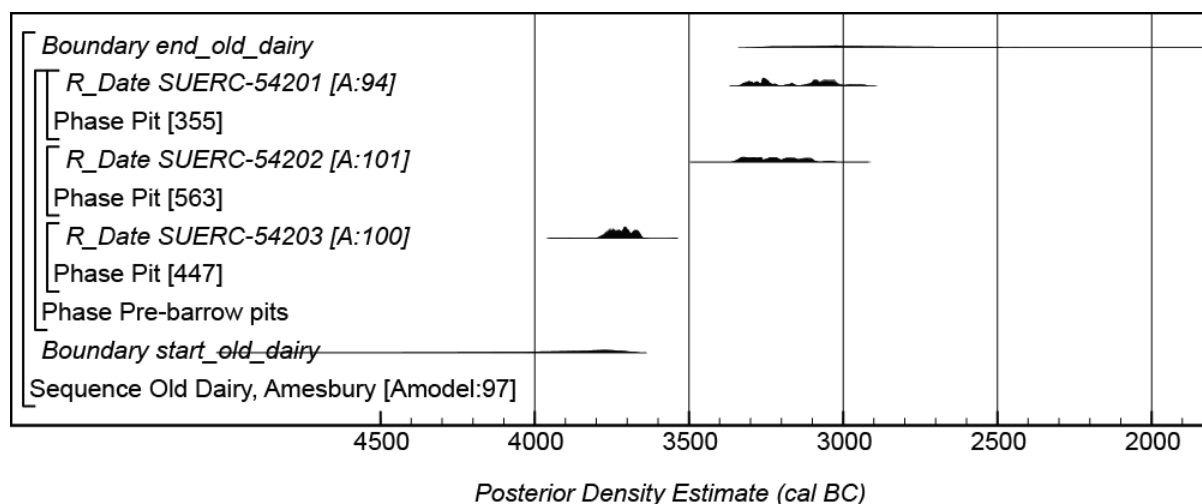


Figure 4. Probability distributions of dates from the Old Dairy. The format is identical to that of Figure 1. The large square brackets down the left-hand side of the figure along with the OxCal keywords define the model exactly

### Amesbury Down

An extended programme of archaeological evaluation, excavation, strip-map-and-record, and watching brief funded by Bloor Homes, Persimmon Homes (South Coast) Ltd and QinetiQ Ltd, was carried out by Wessex Archaeology between 1993 and 2015 in advance of house building on a 130ha development site centred on NGR 416400 140300, across a large area of chalk downland on Amesbury Down, south-east of Amesbury (Powell and Barclay in press).

A small number of Middle Neolithic pits were recorded across the site with radiocarbon samples submitted from four of them. A measurement on a hazelnut (SUERC-73267) from pit [61779] provide a date for its infilling. Carbonised cereal grains were submitted from three pits [197], [221], and [290], with one failing (GU43878) and the other two proving to be intrusive (Table 3).

In excess of 40 identifiable Late Neolithic pits were dispersed across the site, some isolated, others in loose groupings (Powell and Barclay in press, fig. 2.8). The majority were similar in size and shape, 0.6–1m in diameter and c 0.3m deep, with steep to vertical sides and flat or slightly concave bases. Predominantly they contained one or two fills resulting from deliberate backfilling, with the finds mostly distributed through the deposits rather than showing evidence for careful or formal placement.

The recorded distribution of the pits in part reflects the variable nature of the fieldwork, but most lie within a number of broad groups (Powell and Barclay in press, fig. 2.8):

- A north-western group lay along the upper part of the north-western ridge in an approximate north–south line;
- A south-western group lay on the west-facing slope of the central ridge;
- A central group had a broadly north–south distribution extending for at least 440m across the upper part of the central ridge;
- A north-western group located close to where the ridges merge with the east–west plateau at the north of the site.

Seventeen radiocarbon measurements were obtained from 16 of these pits as part of the post-excavation programme (Powell and Barclay in press, table 2.4) and a further four (Table 3), from three pits as part of the work reported here.

Replicate measurements (OxA-35720 and SUERC-73430) on a red deer antler tool from pit A-3041 part of the north-western pit group are statistically consistent ( $T^* = 3.3$ ;  $T^*5\% = 3.8$ ;  $v = 1$ ) and a weighted mean (Pit A-3041;  $4128 \pm 24$  BP) has been taken as providing the best estimate for its age. A single carbonised free threshing wheat grain (UBA-34503) from the fill (61745) of pit [61746] part of the central pit group is intrusive. A radiocarbon determination on a red deer antler (SUERC-73423) from pit [61125] provides the only scientific date from the south western pit group.

A model (Fig. 5) that includes all the dated samples as deriving from a single uniform phase of activity (Buck *et al.* 1992), apart from the single pit [61179] that contained Peterborough Ware, has good overall agreement ( $A_{\text{model}} = 79$ ) with the main episode of pit digging and infilling taking place between *2910–2685 cal BC (95% probability; start\_amesbury\_down; Fig. 5)* probably *2880–2825 cal BC (25% probability)* or *2795–2720 cal BC (43% probability)* and *2465–2335 cal BC (95% probability; end\_amesbury\_down; Fig. 5)*, probably *2460–2405 cal BC (68% probability)*.

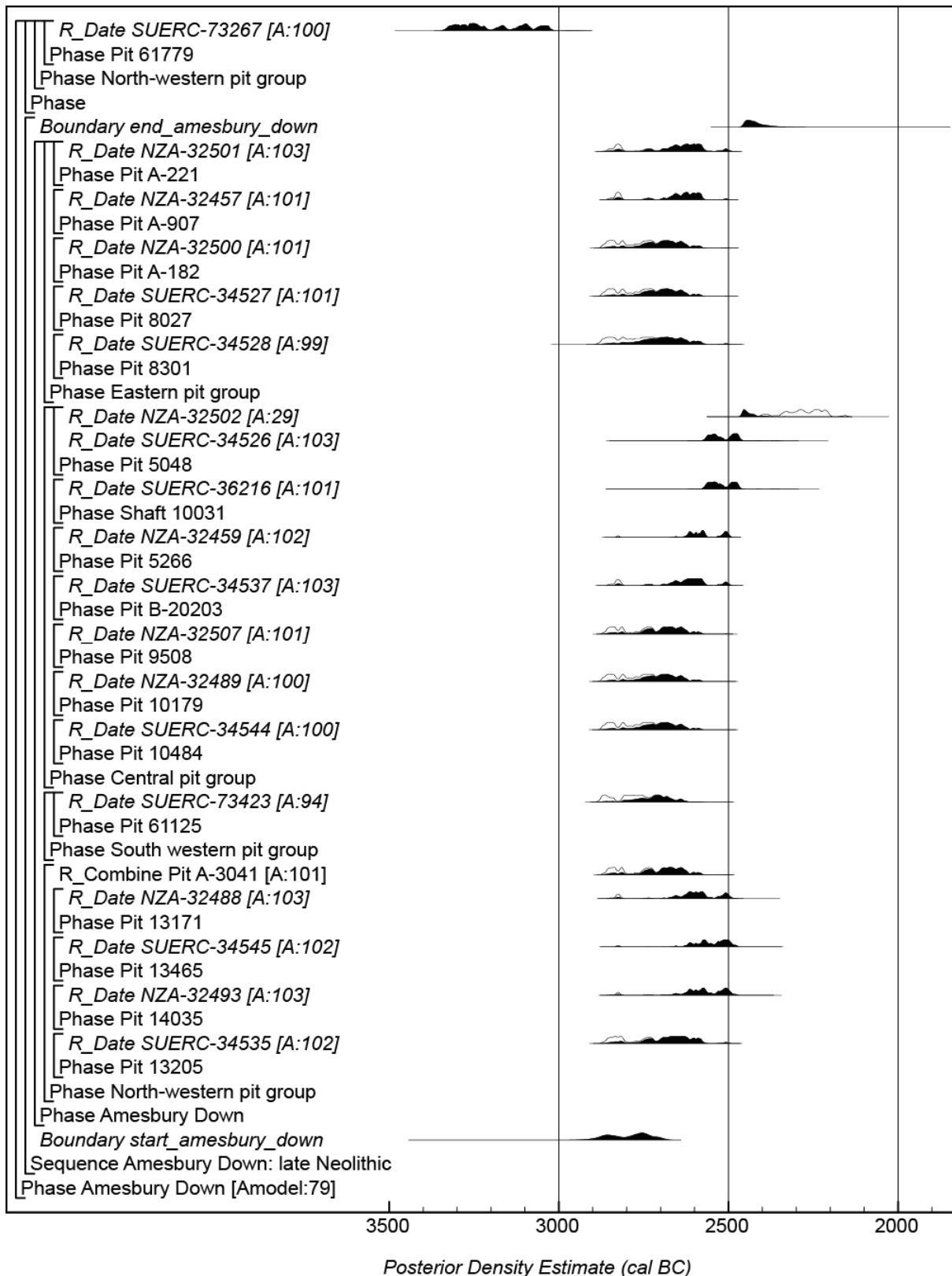


Figure 5. Probability distributions of dates from Amesbury Down. The format is identical to that of Figure 1. The large square brackets down the left-hand side of the figure along with the OxCal keywords define the model exactly.



## Bulford South, Amesbury

Archaeological evaluation on land to the south of Bulford, Wiltshire (centred on NGR 417447 143550) was undertaken by Wessex Archaeology as part of investigations associated with the Defence Infrastructure Organisation's Army Basing Programme (Wessex Archaeology 2015b).

The initial evaluation (24 trenches) undertaken in 2015 identified two probable Neolithic pits, at least 17 sub-rectangular graves, probable wartime military practice trenches, and tree-throw holes. The subsequent phase of evaluation increased the sampled area of the site to 5% through the excavation of an additional 50 trenches. The second phase of evaluation identified remains of activity dating from the Neolithic to the twentieth century. The Neolithic evidence comprised a series of pits distributed across the site containing animal bone, worked flint, and pottery, bringing the total Neolithic pits to have been recorded during the two phases of evaluation to nine. Two intercutting ring ditches (a ?Late Neolithic hengiform enclosure and ?Bronze Age round barrow) were dug on the higher flat ground overlooking the confluence of the Nine Mile River and the River Avon.

Samples from two of the nine Neolithic pits were dated; a used red deer antler pick or rake (UBA-34498) from the tertiary fill (2017) of a well-defined pit [2103] approximately 1.15m in diameter, 0.5m deep with vertical sides and a flat base, that contained burnt and worked flint and animal bone; and three from from the primary deliberate backfill (5018) of pit [5008] (Table 3). Pit 5008, contained a rich finds assemblage including Grooved Ware pottery (Woodlands style); worked flint, including refitting fragments of a polished flint axe, arrowheads, and a discoidal knife, animal bone, and antler. Radiocarbon determinations on the three samples (SUERC-73266, OxA-35718, and UBA-34499) from Pit 5008 are not statistically consistent ( $T^* = 10.9$ ;  $T^*5\% = 6.0$ ;  $v = 2$ ), with the carbonised barley grain (UBA-34499) probably earlier than the measurements on carbonised hazelnut fragments (SUERC-73266 and OxA-35718).

The model including the four dated samples (Fig. 6) has good overall agreement ( $A_{\text{model}} = 81$ ) with pit digging and filling taking place in the centuries around 3000 cal BC.

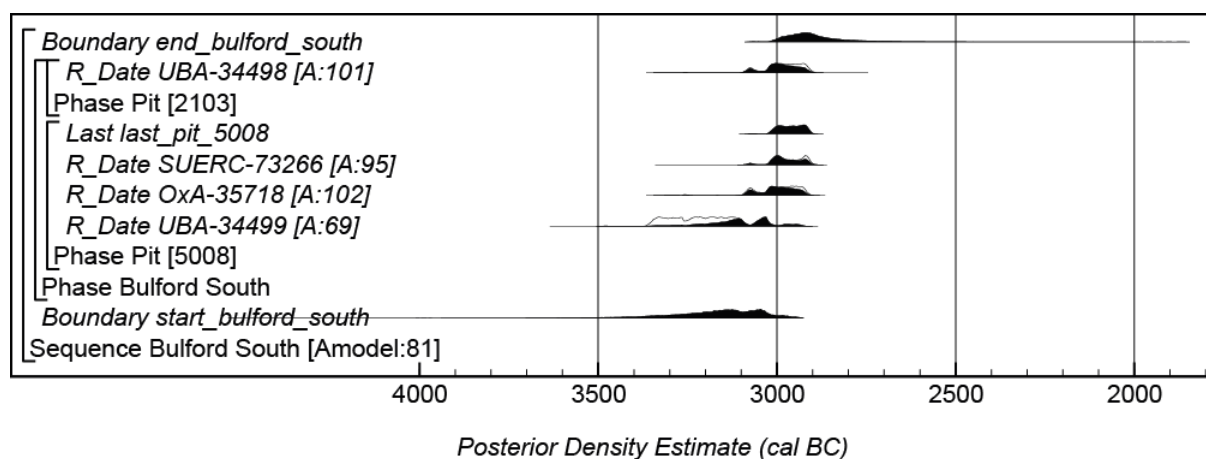


Figure 6. Probability distributions of dates from Bulford South. The format is identical to that of Figure 1. The large square brackets down the left-hand side of the figure along with the OxCal keywords define the model exactly.

## Dunch Hill

Excavations and a watching brief on an earth trackway at Dunch Hill near Tidworth produced surprisingly well preserved evidence for Middle to Late Bronze Age settlement broadly spanning the 14–8th centuries cal BC. The earliest feature was a single small pit which contained Late Neolithic Grooved Ware along with some Beaker pottery (Andrews 1996).

Two samples (OxA-35804 and SUERC-74014) were dated from this small oval pit [482] that was approximately 0.2m deep, flat bottomed and which contained six sherds of Late Neolithic Grooved Ware, five sherds of Beaker pottery, and three flint end scrapers. The two determinations are statistically consistent ( $T^* = 2.1$ ;  $T^*5\% = 3.8$ ;  $v = 1$ ) and could be of the same actual age, suggesting the material in the pit was deposited in the last quarter of the third millennium cal BC. As such they have not been included in the modelling of Neolithic pit digging activity in Wiltshire.

## Porton Down

Excavations and a watching brief by Southampton Archaeology in 2006 in advance of building work at The Defence Science and Technology Laboratory, Porton Down revealed a Grooved Ware pit, with an undated prehistoric structure 12m away formed by six postholes in a horseshoe configuration. The pit [1] a sub-circular feature 0.99m x 1.16m contained 632 sherds of an elaborate Woodlands style Grooved Ware vessel, a small number of burnt flints, animal bone (pig and cattle) and an antler pick (Garner *et al.* 2009). Radiocarbon measurements on the antler pick (NZA-29724) and a cattle pelvis (NZA-29725) are statistically consistent ( $T^* = 2.4$ ;  $T^*5\% = 3.8$ ;  $v = 1$ ) suggesting infilling of the pit took place at the end of the fourth or start of the third millenniums cal BC.

## Synthetic models

We also present a number of synthetic models which employ posterior density estimates from the site-based models just described as likelihoods.

So, for example, in the model for the currency of Neolithic pits from Wiltshire (Roberts and Marshall, fig 5) Greentrees School, is represented by the posterior density estimates for the start and end of the pit use calculated by the model shown in Figure 3 (*start\_greentrees\_school* and *end\_greentrees\_school*). This approach ensures that sites which have large numbers of radiocarbon dates are not disproportionately weighted in the synthetic model: West Amesbury Farm (with 21 measurements) is similarly weighted to Harnham Road water supply (with just two measurements). Each is represented in the model (Roberts and Marshall 2020, fig 5) for Neolithic pits from Wiltshire by two parameters, although those from West Amesbury Farm, deriving from many more data, are more precise.

A further level of synthesis is provided in Roberts and Marshall (2020, fig. 7). Here, the probability that pit digging was taking place in Wiltshire or that different types of Neolithic ceramics were being deposited in pits in a particular 50-year period is plotted by shading.

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TABLES

Table 1. Neolithic pits in Wiltshire considered in this review

Site	Dated Neo Pits	'NEO' pits	ENEOP pits	MNEO Pits	MNEO-LNEO Pits	LNEO Pits	Undated 'Associated' Pits	ENEOP pot pits	PBW pits	GW pits	OSGB_X	OSGB_Y	NGR	Source
Lady Lamb Farm; Fairford; Gloucestershire and Wiltshire	1	1									413789	200371	SP 13789 00371	Roberts (1993)
Salisbury Livestock Market; Wiltshire	4		3			1	2	3		1	411650	129150	SU 11650 29150	Clouston (1996)
The Beehive; Salisbury, Wiltshire	3			3					3		414359	133338	SU 14359 33338	Heaton (2003)
The Croft; Winterbourne Daunsey; Wiltshire	3			3			1		3		417654	135035	SU 17654 35035	Stone (1934)
Tilshead Nursery School; Wiltshire	1			1			1		1		403510	148100	SU 03510 48100	Amadio (2010)
Porton Down Car Park 2006; Porton Down; Wiltshire	1					1				1	421401	137218	SU 21401 37218	Garner <i>et al.</i> (2009)
Boscombe Down Link Road Eval; Amesbury; Wiltshire	2			2					2		416585	139744	SU 16585 39744	Wessex Archaeology (2009)
Phase 3 Land, Kings Gate; Boscombe Down; Amesbury; Wiltshire	1			1					1		416648	140136	SU 16648 40136	Wessex Archaeology (2011)
Windmill Hill Area D	3		3				1	3			408926	171262	SU 08926 71262	Whittle <i>et al.</i> (2000)
Windmill Hill Area M	2					2	1			2	408664	171092	SU 08664 71092	Whittle <i>et al.</i> (2000)
Old Dairy, London Road; Amesbury; Wiltshire	5		1	4			15	1	3		416200	142000	SU 16200 42000	Harding and Stoodley (2017)
Bishopdown Farm; Salisbury; Wiltshire	12		1	11				1	9		415271	132581	SU 15271 32581	Wessex Archaeology (2014)
Greentrees School; Bishopdown Farm; Salisbury, Wiltshire	6			6					6		415124	132609	SU 15124 32609	Wessex Archaeology (2015a)
Strip-trench East of Knook Castle; Knook; Wiltshire	1			1					1		396144	144073	ST 96144 44073	Ellis and Powell (2008)
SRR 86 East of Knook Castle; Knook; Wiltshire	1		1					1			396719	143941	ST 96719 43941	Ellis and Powell (2008)
Old Sarum Airfield Area C; Salisbury; Wiltshire	2			2			1		1		415460	133087	SU 15460 33087	Wessex Archaeology (2015c)
The Old Sarum Spur; Salisbury; Wiltshire	7			7					7		413319	133124	SU 13319 33124	Powell <i>et al.</i> (2005)
The Portway; Salisbury; Wiltshire	6			6					5		414278	133022	SU 14278 33022	Powell <i>et al.</i> (2005)
North of Old Sarum; Salisbury; Wiltshire	1			1			1		1		413820	132950	SU 13820 32950	Algar and Hadley (1973)
W2 The Coneybury 'Anomaly'; Amesbury; Wiltshire	1		1					1			413420	141600	SU 13420 41600	Richards (1990)
Early Neo Pit; King Barrow Ridge; Amesbury; Wiltshire	1		1					1			413820	132950	SU 13820 32950	Richards (1990)
Neo Pit, 'Vespasian's Ridge'; Amesbury; Wiltshire	1	1									414500	142100	SU 14500 42100	Richards (1990)
W59 King Barrow Ridge; Amesbury; Wiltshire	7			1	5	1		1	6	6	413598	142168	SU 13598 42168	Richards (1990)
W83 Adjacent to Robin Hood's Ball; Larkhill; Wiltshire	5		5					5			410220	145940	SU 10220 45940	Richards (1990)
Pit 409, West Kennet Avenue; Avebury; Wiltshire	1			1					1		410532	169551	SU 10532 69551	Allen and Davis (2009)
The Chalk Plaque Pit, King Barrow Ridge; Amesbury; Wiltshire	1					1				1	413120	142060	SU 13120 42060	Cleal and Allen (1994) Cleal <i>et al.</i> (1994)
Southern Electricity Board Trench pits, King Barrow Ridge; Amesbury; Wiltshire	2		1			1		1		1	413258	142066	SU 13258 42066	Cleal and Allen (1994)
West Amesbury Farm; Amesbury; Wiltshire	5			5					5		413839	141768	SU 13839 41768	Roberts <i>et al.</i> (in press)
Druid's Lodge Wessex Trial Trenching; Amesbury; Wiltshire	1			1					1		410329	140856	SU 10329 40856	Wessex Archaeology (2016)
G6, Corfe Mullen to Salisbury Transfer Scheme; Wyllye; Wiltshire	1			1					1		401358	137242	SU 01358 37242	Cotswold Archaeology (2013)

Site	Dated Neo Pits	'NEO' pits	ENEOP pits	MNEO Pits	MNEO-LNEO Pits	LNEO Pits	Undated 'Associated' Pits	ENEOP pot pits	PBW pits	GW pits	OSGB_X	OSGB_Y	NGR	Source
East of Damask Way, Smallbrook Lane; Warminster; Wiltshire	1		1				1	1			387684	144163	ST 87684 44163	Robinson (2012).
Roundhouse Farm; Marston Meysey; Wiltshire.	1					1				1	412887	196268	SU 12887 96268	Lewis and Cass (2010); Cass <i>et al.</i> (2015)
Harnham Road water supply; Salisbury; Wiltshire	2			2			1		2		414055	127757	SU 14055 27757	Context One Archaeological Services Ltd (2008)
Harnham Relief Road; Harnham; Salisbury	2			2					2		414075	127641	SU 14075 27641	RPS Consultants (2003)
Chirton critical source water pipeline; Urchfont; Wiltshire	1		1					1			402993	155201	SU 02993 55201	Context One Archaeological Services Ltd (2011)
West of Salisbury Road; Marlborough; Wiltshire	1					1				1	419357	168437	SU 19357 68437	Wessex Archaeology (2012)
King's Gate Phases 1 and 2; Amesbury; Wiltshire	10					10	3			9	416206	140439	SU 16206 40439	Wessex Archaeology (2013)
West Kennet Avenue Occupation Site; Avebury; Wiltshire	3	3									410673	169271	SU 10673 69271	Pollard (2014)
Bulford South SFA Phase 2; Bulford; Wiltshire	5					5	2			4	417381	143583	SU 17381 43583	Wessex Archaeology (2015b)
King's Gate Phases 3, 4 & 5; Amesbury; Wiltshire	7			5		2			5	2	416658	140124	SU 16658 40124	Wessex Archaeology (2015d)
Bulford South SFA Evaluation; Bulford; Wiltshire	2	2									417383	143539	SU 17383 43539	Wessex Archaeology (2015e)
Summerslade Down; Monkton Deverill; Wiltshire	2		2				10	2			387697	137869	ST 87697 37869	Rawlings (1990)
Copehill Down; Shrewton; Wiltshire	1		1								401699	145315	SU 01699 45315	Richards (1988)
Latton bypass; Latton; Wiltshire	1	1									409392	195352	SU 09392 95352	Stone (1974)
East of Old Sarum; Old Sarum; Wiltshire	2			2			1		2		414161	132719	SU 14161 32719	Musty (1959)
Waden Hill; Avebury; Wiltshire	1		1					1			410380	169317	SU 10380 69317	Thomas (1955)
Knook Reservoir; Knook; Wiltshire	6		6					4			394509	143569	ST 94509 43569	Mason (2011)
King Barrow Ridge 1993 Eval; Amesbury; Wiltshire	1					1				1	413790	141919	SU 13790 41919	Darvill (1995)
Charlton Plantation; Downton; Wiltshire	1			1					1		416667	124817	SU 16667 24817	Davies (1985)
Okus Quarry; Swindon	1	1									414430	183460	SU 14430 83460	Devizes Museum; Passmore, A D, 1913
Ratfyn; Amesbury; Wiltshire	2					2	1			1	415960	142020	SU 15960 42020	Stone (1935); Cleal <i>et al.</i> (1994) Harding (1988)
East of the Avenue; Amesbury; Wiltshire	2		1	1				1	1		413970	142260	SU 13970 42260	Vatcher (1960)
Overton Down; West Overton; Wiltshire	1			1					1		411920	168351	SU 11920 68351	Smith and Simpson (1964)
Boscombe Down Sports Ground; Amesbury; Wiltshire	7					7				4	416956	140362	SU 16956 40362	Wessex Archaeology (1996)
Countess East; Amesbury; Wiltshire	2	1				1				1	415439	142664	SU 15439 42664	Wessex Archaeology (2003)
The Beehive Healthcare Centre; Old Sarum; Salisbury	1	1									414350	133243	SU 14350 33243	Whelan (2008)
Durrington Walls Reservoir and Pipeline	2	1				1	1			1	414911	144051	SU 14911 44051	Wessex Archaeology (1992)
Durrington Pipeline - Durrington Village S; Durrington; Wiltshire	1	1									415335	144025	SU 15335 44025	Wessex Archaeology (1992)
Boscombe Down Phase V Area 4; Amesbury; Wiltshire	3			1		2			1	3	416540	140230	SU 16540 40230	Wessex Archaeology (2005)
Boscombe Down Phase V Area 1; Amesbury; Wiltshire	3					3				3	416619	140575	SU 16619 40575	Wessex Archaeology (2005)
Boscombe Down Phase V Pit Circle; Amesbury; Wiltshire	2					2				2	416719	140532	SU 16719 40532	Wessex Archaeology (2005)
Boscombe Down Phase V Area 2; Amesbury; Wiltshire	2					2				2	416760	140362	SU 16760 40362	Wessex Archaeology (2005)

Site	Dated Neo Pits	'NEO' pits	ENE0 pits	MNE0 Pits	MNE0- LNE0 Pits	LNE0 Pits	Undated 'Associated' Pits	ENE0 pot pits	PBW pits	GW pits	OSGB_X	OSGB_Y	NGR	Source
Woodlands, Countess Road; Amesbury; Wiltshire	2					2				2	415193	143064	SU 15193 43064	Stone and Young (1948)

*Table 2. Summary of scientific dating evidence considered in the review of Neolithic pits in Wiltshire*

Site	No. of <sup>14</sup> C results	No. of <sup>14</sup> C results (excluded)	No. of <sup>14</sup> C results (TPQ)	References
Tilshead Nursery School	1			Table 3
Pits outside Robin Hood's Ball	2		2	Whittle <i>et al.</i> 2011, table 4.13
West Kennet Avenue	1			Table 3
Chalk Plaque pit, Amesbury	2		2	Table 3
Old Sarum water pipeline	12	3		Table 3
West Amesbury Farm	21	6		Roberts <i>et al.</i> in press table 3
Coneybury Anomaly	12			Barclay <i>et al.</i> 2018, table 2
King Barrow Ridge & Countess East	7		1	Table 3
Harnham Road, water supply	2			Table 3
'C' Crossing, Salisbury Plain Training Area	3			Table 3
Greentrees School	3			Table 3
W431 Durrington Pipeline	1			Table 3
Old Dairy, Amesbury	5	2		Table 3
Amesbury Down (Kings Gate, New Covert & Boscombe Down Sports Ground)	22	1		Table 3
Bulford South	4			Table 3
Dunch Hill	2	2		Table 3
Porton Down	2			Table 3

*Table 3. Radiocarbon measurements and associated stable isotope values from Neolithic pits in Wiltshire. Replicate measurements have been tested for statistical consistency and combined by taking a weighted mean before calibration as described by Ward and Wilson (1978;  $T^*(5\%)=3.8$ ,  $v=1$ )*

Laboratory Number*	Material & context	$\delta^{13}\text{C}$ (‰)	$\delta^{15}\text{N}$ (‰)	C:N	Radiocarbon Age (BP)
Tilshead Nursery School (Amadio 2010): SU 03510 48100					
<b>OxA-35987</b>	Carbonised hazelnut ( <i>Corylus avellana</i> ) shell fragment, from the fill (003) of pit [002]. The pit contained 233 pieces of bone, over 200 pieces of antler, 36 sherds of pottery (including pieces of Peterborough Ware), over 600 hazelnut shell fragments and 58 pieces of worked flint	-26.9±0.2			4495±30
GU44403	Antler, red deer from the same context as OxA-35987	Failed: insufficient carbon			
UBA-34948	Animal bone, pig tibia with refitting epiphyses, from pit [002], sample <13>	Failed			
West Kennet Avenue (Allen and Davis 2009, table 1): SU 10532 69551					
NZA-23742	Animal bone, cattle metacarpal from pit [409] that contained an assemblage of Peterborough Ware	-22.8			4378±30
Chalk Plaque pit, Amesbury (Harding 1988; Cleal <i>et al.</i> 1994): SU 13258 42066					
OxA-3316	CPP1. Animal bone, cattle, broken femur, from the fill of the pit, that contained two chalk plaques + 33 chalk lumps, 24 sherds of Grooved Ware, one end scraper and five flint flakes	-21.0			4250±80
OxA-3317	CPP2 Antler, red deer, shed antler from an immature/young animal found at the top of the lower filling. The brow and bez tines were present, but the beam was broken and decomposed above the bez. There were no signs of use.	-22.3			4130±80
Old Sarum Pipeline (Powell <i>et al.</i> 2005)					
The Portway: SU 14278 33022					
<b>UBA-34506</b>	Carbonised grain, wheat (single grain) from the primary fill (6101) of pit [6100]. Placed on the base of the pit where 48 Peterborough ware sherds from a minimum of two different Ebbsfleet and one Mortlake bowl, two of which fitted with sherds in pit [6093] and four pieces of sarsen (weighing 2.6–12kg).	-23.4±0.22			595±27
<b>UBA-34505</b>	Antler, roe deer from the primary fill (6083) of pit [6076]. A thin dark brown	-23.6±0.22	3.6±0.15	3.2	4508±35

Laboratory Number*	Material & context	$\delta^{13}\text{C}$ (‰)	$\delta^{15}\text{N}$ (‰)	C:N	Radiocarbon Age (BP)
	silt on the base contained 54 Peterborough ware sherds from two different Mortlake and one Ebbsfleet bowl.				
<b>OxA-35717</b>	Antler, roe deer (SF 8) from the primary fill (6094) of pit [6093]. Between the lower two apparently levelled backfill layers (three in total) were Peterborough ware sherds (both Ebbsfleet and Mortlake styles)	-22.3±0.2	3.3±0.3	3.2	4421±34
<b>SUERC-73429</b>	Antler, red deer (SF 9) from the same context as OxA-35717	-22.7±0.2	5.1±0.3	3.2	4471±32
<b>SUERC-73428</b>	Antler pick, red deer from the primary fill (6067) of pit [6065]. On the base where cattle and pig bones, five flints, a small fragment of sarsen stone and hazelnut fragments.	-21.4±0.2	5.3±0.3	3.1	4708±32
<b>SUERC-73424</b>	Carbonised grain, wheat (single grain) from the primary fill (6058) of pit [6056]. Placed on the base where fragments of sarsen stone 16 and 1.6kg), a large jagged flint nodule (7kg) and large sherd (0.552kg) of a Mortlake bowl.	-22.6±0.2			145±32
NZA-18339	Carbonised hazelnut from the same context as SUERC-73424	-25.3			4477±40
NZA-18338	Animal bone, pig skull fragment from fill (6057) of pit [6056]. This placed deposit included Peterborough ware sherds (Ebbsfleet style), flints, hazelnuts and animal bones (pig + sheep/goat).	-20.4			4428±45
OxA-35716	Carbonised grain, wheat (single grain) from the primary natural silting (6142) at the base of pit [6061].	-22.9±0.2			957±27
NZA-18340	Carbonised hazelnut shell from fill (6064) of pit [6061]. A deposit that contained over 10,000 hazelnut shell and kernel fragment.	-24.7			4473±40
Old Sarum Spur: SU 13319 33124					
NZA-18416	Animal bone, articulated pig ulna from predominantly left sided pig bones from the primary fill (3022) of pit [3020]. The placed deposit also included very abraded Peterborough ware sherds, 19 flints and six spherical flint nodules).	-20.5			4398±40
NZA-18338	Carbonised hazelnut shell from fill (3331) of pit [3007]. The thin ashy silt (3331) contained 13 flints and over 100 hazelnut shells.	-24.0			4473±40
King Barrow Ridge and Countess East (Richards 1990; Darvill 1995; Wessex Archaeology 2003)					
King Barrow Ridge: SU 13598 42168					
OxA-1397	Antler, red deer pick, unshed brow ridge from the fill (519) of pit [440] (SF 375). Fills (516/519) are rubbish deposits.				4500±120
SUERC-74015	Replicate of OxA-1397	-21.5±0.2	3.9±0.3	3.2	4706±28
SF 375: $^{14}\text{C}$ : 4696±28 BP, T'=2.7					



Laboratory Number*	Material & context	$\delta^{13}\text{C}$ (‰)	$\delta^{15}\text{N}$ (‰)	C:N	Radiocarbon Age (BP)
OxA-35896	Animal bone, large mammal thoracic vertebrae, plates unfused, probably part of a refitting spinal section, one refitting and ?one refitting plate from same context as OxA-1397	-21.6±0.2	3.2±0.3	3.1	4822±38
OxA-1396	Animal bone, unidentified, from the fill (523) of pit [418]. The fill contained several flint cores and predominantly Grooved Ware ceramics with Woodlands style affinities.	-21.0			4700±150
UBA-34502	Antler, red deer, from the fill (2004) of pit [2003]	-22.5±0.22	6.4±0.15	3.2	3883±35
Countess East: SU 15439 42664					
<b>UBA-34500</b>	Antler, red deer, from the fill (1205) of pit [1204]	-22.2±0.22	7.1±0.15	3.2	4086±36
<b>OxA-35721</b>	Carbonised plant remains, sloe fruit from the same context as UBA-34500	-26.2±0.2			4165±34
Harnham Road, water supply (Context One Archaeological Services 2008): SU 14055 27757					
NZA-21945	Carbonised hazelnut shell from pit [5008], that contained an assemblage of Peterborough Ware				4443±41
NZA-21942	Carbonised hazelnut shell from pit [5032], that contained an assemblage of Peterborough Ware				4525±42
'C' Crossing, Salisbury Plain Training Area (Wessex Archaeology 2001): SU 14680 46350					
GU44400	Carbonised grain, cf cereal indeterminate (single grain) from the middle fill (406) of pit [404]. The fill contained a large group of Neolithic flintwork and 12 sherds of pottery	Failed: insufficient carbon			
<b>OxA-35986</b>	Antler, red deer, from the same context as GU44400	-22.1±0.2			4308±30
<b>SUERC-74013</b>	Carbonised hazelnut ( <i>Corylus avellana</i> ) shell fragment, from the same context as GU44400	-25.2±0.2			4260±30
<b>UBA-34946</b>	Carbonised hazelnut ( <i>Corylus avellana</i> ) shell fragment, from the same context as GU44400	-23.5±0.22			4702±48
Greentrees School, Bishopdown (Wessex Archaeology 2015a): SU 15124 32609					
<b>UBA-34501</b>	Carbonised hazelnut ( <i>Corylus avellana</i> ) shell fragment, from the fill (1055) of pit [1060]. The primary fill contained 69 sherds (190g) of Peterborough ware (Mortlake style).	-24.3±0.22			4548±42
<b>OxA-35744</b>	Carbonised hazelnut ( <i>Corylus avellana</i> ) shell fragment, from the primary fill (605) of pit [602]. The primary fill contained 66 sherds (216g) of Peterborough ware, including rims from three vessels (one Fengate and one Mortlake style).	-21.1±0.2			4463±31
<b>OxA-35743</b>	Antler, red deer, from the fill (1101) of pit [1100]. The fill contained one	-23.0±0.2	2.7±0.3	3.2	4494±32

Laboratory Number*	Material & context	$\delta^{13}\text{C}$ (‰)	$\delta^{15}\text{N}$ (‰)	C:N	Radiocarbon Age (BP)
	sherd of Peterborough ware with multiple fingernail impressions				
W431 Durrington Pipeline (Wessex Archaeology 1992): SU 15335 44025					
<b>UBA-34949</b>	Antler, red deer, shed, some very slight use wear, from the fill (185) of pit [184]. The fill also contained two possibly articulating pig metatarsals (MT3 & MT4), plus two sherds of Neolithic pottery	-22.6±0.22	5.4±0.15	3.5	4429±40
Old Dairy, Amesbury (Harding and Stoodley 2017): SU 16200 42000					
<b>SUERC-54201</b>	Antler, red deer, ON 24, from the fill (358) of pit [355].	-22.8±0.2	4.9±0.3	3.3	4437±30
<b>SUERC-54202</b>	Carbonised hazelnut ( <i>Corylus avellana</i> ) shell fragments, from pit [563]. The pit contained 18 sherds of small and variously abraded Peterborough Ware, from at least six vessels, including one Mortlake bowl	-22.5±0.2			4495±30
<b>SUERC-54203</b>	Carbonised hazelnut ( <i>Corylus avellana</i> ) shell fragments, from pit [447]. The pit contained 44 sherds of diagnostically early Neolithic ceramics	-26.5±0.2			4950±30
<b>UBA-34504</b>	Carbonised grain, barley (single grain) from the fill (564) of pit [563].	-24.3±0.22			557±25
<b>SUERC-73268</b>	Carbonised grain, wheat (single grain) from the same context as UBA-34504	-22.5±0.2			654±28
Amesbury Down (Powell and Barclay in press)					
New Covert (Wessex Archaeology 2000): SU 16484 40900					
<b>OxA-35720</b>	Antler, red deer, from the fill (3042) of pit [3041]	-23.1±0.2	3.1±0.3	3.2	4173±34
<b>SUERC-73430</b>	Replicate of OxA-35720	-22.8±0.2	3.4±0.3	3.1	4088±32
Pit A-3041: $^{14}\text{C}$ : 4128±24 BP, $T^{\circ}$ =3,3; $^{13}\text{C}$ : 3.3±0.2‰, $T^{\circ}$ =0.5					
Boscombe Down Sports Ground (Wessex Archaeology 1996): SU 16956 40362					
<b>UBA-34497</b>	Carbonised grain, barley (single grain) from the fill (222) of pit [221]	-21.9±0.22			1108±26
GU43878	Carbonised grain, wheat (single grain) from the fill (290) of pit [291]	Failed: insufficient carbon			
<b>OxA-35719</b>	Carbonised grain, wheat (single grain) from the fill (197) of pit [648]	-23.1±0.2			963±27
Kings Gate (Wessex Archaeology 2013): SU 16206 40439					
<b>SUERC-73423</b>	Antler red deer, right-side and includes the pedicle, burr, beam, brow and trez tines, with use wear, from the fill (61126) of pit [61125]	-22.5±0.2	3.9±0.3	3.1	4169±32
<b>UBA-34503</b>	Carbonised grain, free threshingwheat (single grain) from the fill (61746) of pit [61745]	-20.3±0.22			406±31
<b>SUERC-73267</b>	Carbonised hazelnut ( <i>Corylus avellana</i> ) shell fragment, from the fill (61781) of pit [61779]	-23.4±0.2			4462±29
Bulford South (Wessex Archaeology 2015b; 2015e): SU 17381 43583					

Laboratory Number*	Material & context	$\delta^{13}\text{C}$ (‰)	$\delta^{15}\text{N}$ (‰)	C:N	Radiocarbon Age (BP)
<b>SUERC-73266</b>	Carbonised hazelnut ( <i>Corylus avellana</i> ) shell fragment, from the fill (5018) of pit [5008]. The pit contained 39 sherds (154g) from two shell tempered Grooved ware (Woodland type) vessels	-23.8±0.2			4346±26
<b>OxA-35718</b>	Carbonised hazelnut ( <i>Corylus avellana</i> ) shell fragment, from the same fill as SUERC-73266	-23.9±0.2			4383±32
<b>UBA-34499</b>	Carbonised grain, barley (single grain) from the same fill as SUERC-73266	-25.2±0.22			4505±41
<b>UBA-34498</b>	Antler, red deer, pick or rake, from the tertiary fill (2107) of pit [2103]. The pit contained burnt and worked flint and animal bone	-22.9±0.22	2.7±0.15	3.2	4364±35
Dunch Hill (Andrews 1996): SU 2050 4860					
<b>OxA-35804</b>	Carbonised hazelnut ( <i>Corylus avellana</i> ) shell fragment, from the fill (481) of pit [482]. The fill contained six sherd of Grooved Ware, five Beaker sherds and three flint end scrappers	-25.7±0.2			3692±27
<b>SUERC-74014</b>	Charcoal, Pomoideae (single fragment), from the same context as OxA-35804	-25.5±0.2			3710±30
Porton Down car park (Garner <i>et al.</i> 2009): SU 21401 37218					
NZA-29724	Antler pick from pit [1] that contained 632 sherds of fragmeneted Grooved Ware, Woodlands style				4343±35
NZA-29725	Animal cattle cattle pelvis from pit [1] that contained 632 sherds of fragmeneted Grooved Ware, Woodlands style				4419±35

\* The laboratory numbers in bold indicate the radiocarbon measurements were obtained as part of the Historic England project to better understand the chronology of Neolithic pit digging in Wiltshire

Table 4. Key parameters for Neolithic pit digging activity in Wiltshire: site-based chronological models.

Parameter name	Parameter description	Highest Posterior Density interval (95% probability unless otherwise stated) cal BC	Highest Posterior Density interval (68% probability unless otherwise stated) cal BC
Old Sarum water pipeline (Old Sarum Spur and The Portway): model shown in Figure 1			
<i>start_old_sarum_pipeline</i>	Boundary* parameter estimating the start of pit digging activity	3450–3090 (93%) or 3075–3040 (2%)	3365–3240 (48%) or 3195–3165 (7%) or 3150–3100 (13%)
<i>end_old_sarum_pipeline</i>	Boundary parameter estimating the end of pit digging activity	3280–3130 (15%) or 3120–2830 (80%)	3245–3230 (2%) or 3100–2930 (66%)
West Amesbury Farm: model shown in Roberts <i>et al.</i> in press, fig. 10			
<i>start_west_amesbury_farm</i>	Boundary parameter estimating the start of pit digging activity	3370–3155 (94% or 3135–3120 (1%))	3340–3220 (63%) or 3190–3170 (5%) cal BC
<i>end_west_amesbury_farm</i>	Boundary parameter estimating the end of pit digging activity	3325–3310 (1%) or 3295–3255 (2%) or 3235–3055 (92%)	3180–3090
Coneybury Anomaly: model shown in Barclay <i>et al.</i> 2018, fig 10			
<i>start_coneybury</i>	Boundary parameter estimating the start of pit digging activity	3835–3700	3775–3710
<i>end_coneybury</i>	Boundary parameter estimating the end of pit digging activity	3710–3605	3695–3635
King Barrow Ridge and Countess East, Amesbury: model shown in Figure 2			
<i>start_king_barrow_countess</i>	Boundary parameter estimating the start of pit digging activity	4360–3810 (2%) or 3800–2620 (93%)	3115–2665
<i>end_king_barrow_countess</i>	Boundary parameter estimating the end of pit digging activity	2465–1470	2450–2065
Greentrees school. Bishopdown: model shown in Figure 3			
<i>start_greentrees_school</i>	Boundary parameter estimating the start of pit digging activity	3865–3100	3410–3165
<i>end_greentrees_school</i>	Boundary parameter estimating the end of pit digging activity	3335–2590	3275–3255 (2%) or 3240–3000 (66%)
The Old Dairy, Amesbury: model shown in Figure 4			
<i>start_old_dairy</i>	Boundary parameter estimating the start of pit digging activity	5035–4885 (4%) or 4680–3660 (91%)	4110–3765
<i>end_old_dairy</i>	Boundary parameter estimating the end of pit digging activity	3300–2155 (91%) or 1975–	3260–2705

Parameter name	Parameter description	<i>Highest Posterior Density interval (95% probability unless otherwise stated) cal BC</i>	<i>Highest Posterior Density interval (68% probability unless otherwise stated) cal BC</i>
		<i>1820 (4%)</i>	
<b>Amesbury Down ((Kings Gate, New Covert &amp; Boscombe Down Sports Ground):model shown in Figure 5</b>			
<i>start_amesbury_down</i>	Boundary parameter estimating the start of pit digging activity	<i>2910–2685</i>	<i>2880–2825 (25%) or 2795–2720 (43%)</i>
<i>end_amesbury_down</i>	Boundary parameter estimating the end of pit digging activity	<i>2465–2335</i>	<i>2460–2405</i>
<b>Bulford South: model shown in Figure 6</b>			
<i>start_bulford_south</i>	Boundary parameter estimating the start of pit digging activity	<i>3590–2930</i>	<i>3275–3015</i>
<i>end_bulford_south</i>	Boundary parameter estimating the end of pit digging activity	<i>3080–3045 (1%) or 3025–2540 (94%)</i>	<i>3000–2850</i>

\* Text in *Courier* font denotes an OxCal keyword.

## APPENDIX 1: RADIOCARBON DATING METHODS

### Laboratory methods

The samples dated at Scottish Universities Environmental Research Centre (SUERC) were pretreated and measured by Accelerator Mass Spectrometry (AMS) following the methods outlined in Dunbar *et al.* (2016). The samples dated at the <sup>14</sup>CHRONO Centre, Queen's University Belfast were pretreated and measured by AMS following the methods described in Reimer *et al.* (2015). Samples measured at the Oxford Radiocarbon Accelerator Unit (ORAU) were pretreated and combusted as described in Brock *et al.* (2010), graphitised (Dee and Bronk Ramsey, 2000) and dated by AMS (Bronk Ramsey *et al.* 2004).

### Quality assurance

All three laboratories maintain a continual programme of quality assurance procedures, in addition to participation in international inter-comparisons (Scott *et al.* 2010). These tests indicate no laboratory offsets and demonstrate the reproducibility and accuracy of these measurements.



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