Trench 1 (The Lower Dam): Results Summary
(Figs. 3-6; Pl. 1-3)

2.3.1 This was positioned at the north end of the lowest lake in the sequence. The present level of the lake is controlled by a spill-way/sluice built into a brick and concrete chamber which, with flanking walls, forms the present north edge of the lake. Traces of brick structures were visible to the north of this chamber and Trench 1 was excavated across these to attempt to establish the original line of the lake's north side and the nature of these structures.

2.3.2 The trench revealed a triangular spillway that had defined the level of the lake and which led into the upper of the two brick-built culverts the opening from which is visible on the south side of the road along the north side of the site. These culverts, one above the other, appear to be a single period of construction and are buried within the clay of the embankment forming the north side of the lake. The upper culvert took the overspill from the lake; the lower probably allowed the water level to be lowered or the lake to be drained. Via the concrete chamber, the overspill from the lake now drains into the lower culvert. Only the upper culvert could be examined in any detail and a fairly clear structural sequence can be defined. The culverts and

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[3] Brigers, J.L. 2014, 'Written Scheme of Investigation for Archaeological Evaluation, Recording & Mitigation Investigation during a Programme of Refurbishment & Conservation at Mill Wood, Goathurst, Somerset', unpub doc. in SWHT & SDC records and reproduced here as Appendix iii

[4] Somerset County Council, 2011. 'Heritage Service Archaeological Handbook'.

spillway are primary, built into the clay of the retaining bank and determining the water level of the lake. A brick-paved apron fronts the spillway below the lake waters. At some stage the clay bank is extended across the front of the spillway. A later structural phase, using hard coal-flecked mortar, is the addition of a debris trap along the front of the spillway, and the construction of a shallow arch over the spillway itself, creating a much wider access around the lake's northern side.

Pl. 1: General of excavated structures in Trench 1 from N (scale=2x1m)

2.3.3 The upper culvert (and by inference the lower) appear to be original elements of the lake, providing control of the water level. The tunnels are brick built with shallow, arched roofs and in places lias stone slab floors with a width of 0.60m. The upper tunnel is 3.60m long and at its south end, where it meets the triangular spillway there is a clear end to the brick arch of the roof. There is also a suggestion of a straight joint between the tunnel walls and the splayed walls of the triangular spillway to the south, but the brickwork here is largely obscured by limescale. The mortar used for the tunnel brickwork is comparable to that in the side walls of the spillway which suggests they may be separate elements of a contemporary build.

2.3.4 The spillway narrows from 2.10m wide against the lake edge to 0.80m internally where it enters the tunnel. It is built with a double skin of brick in soft red mortar, with a vertical south face against the lake at least 1.00m high. The internal slope down to the base of the tunnel is paved with large slabs of lias limestone, coated with what appears to be bitumen and with lime scale above. The splayed side walls and the end wall against the lake are clearly a single period of construction. The upper parts of both sidewalls have, however, been rebuilt using a hard, coal flecked mortar with the bricks angled as the base of a shallow arch above the spillway. It is not known whether this arch was a replacement of an earlier arch and it is possible that the spillway was originally open. An iron fixing in the rebuilt side wall shows the position of a metal grill across the opening. Like the tunnel, the spillway was embedded in the clay embankment that formed the north edge of the lake.

2.3.5 Excavations south of the spillway wall showed that there was a brick-paved apron immediately to the south. This was of flat-laid brick, pointed with hard, coal-flecked mortar and had been laid up to the south side of the spillway wall with consistent fall to the south and extended for at least 1.10m. A low wall of 4 courses of brick defined its eastern side, but its precise nature was difficult to ascertain because of limited access. This brick surface matches well the height of the base of the upper opening in the brick and concrete chamber to the south but access to this was limited so details could not be recorded. The brick apron was below the level of the lake as defined by the spillway and above it a band of lake sediment had formed, being reddish brown clay with numerous broken aquatic mollusc shells. The sediment was covered by a layer of compact red clay, which seems to be a dump along the face of the spillway. This may be continuous with the clay bank of the lake east and west of the spillway, and part of a general strengthening of the northern edge of the lake.

Pl. 2: View of spillway (120) & upper culvert (123) from SW

2.3.6 Probably cutting this clay, and built on the underlying sediment was the wall of a silt trap, being a narrow brick chamber built along the face of the spillway wall. A double thickness of brick, bonded with hard, coal flecked mortar, it stood to the same height as the spillway wall (though it had slumped and subsided above the sediment on which it was built) and formed a chamber only 0.25m wide along its southern side. It was internally rendered, and probably functioned as a trap for silt or debris that would otherwise enter the spillway and block the culvert.

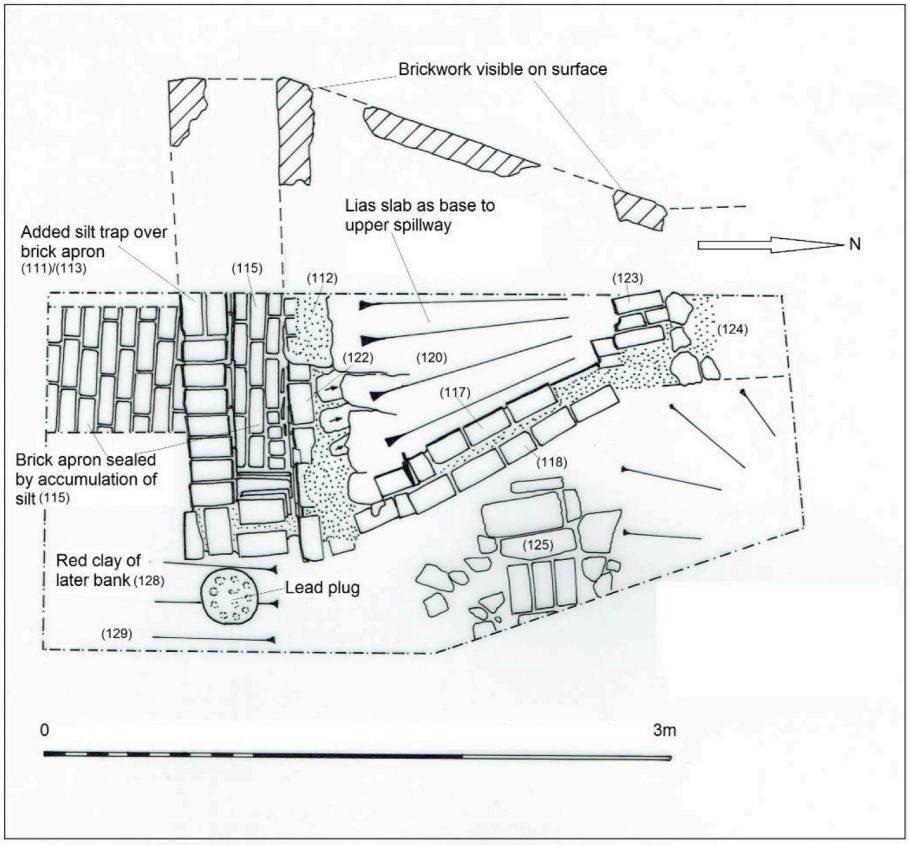

Fig. 3: Mill Wood, Goathurst. Trench 1 (Lower Dam), Final Plan

2.3.7 These structures lie within and across the red clay of the bank which formed the north end of the lake. Elements of this were exposed along the eastern edge of the trench, but no section was excavated through them. It was on the southern edge of these deposits that a large lead plug was found, with the substantial iron chain and ring to which it was attached, bunched-up beneath it. The diameter of the plug was about 1 foot (0.30m) and substantial

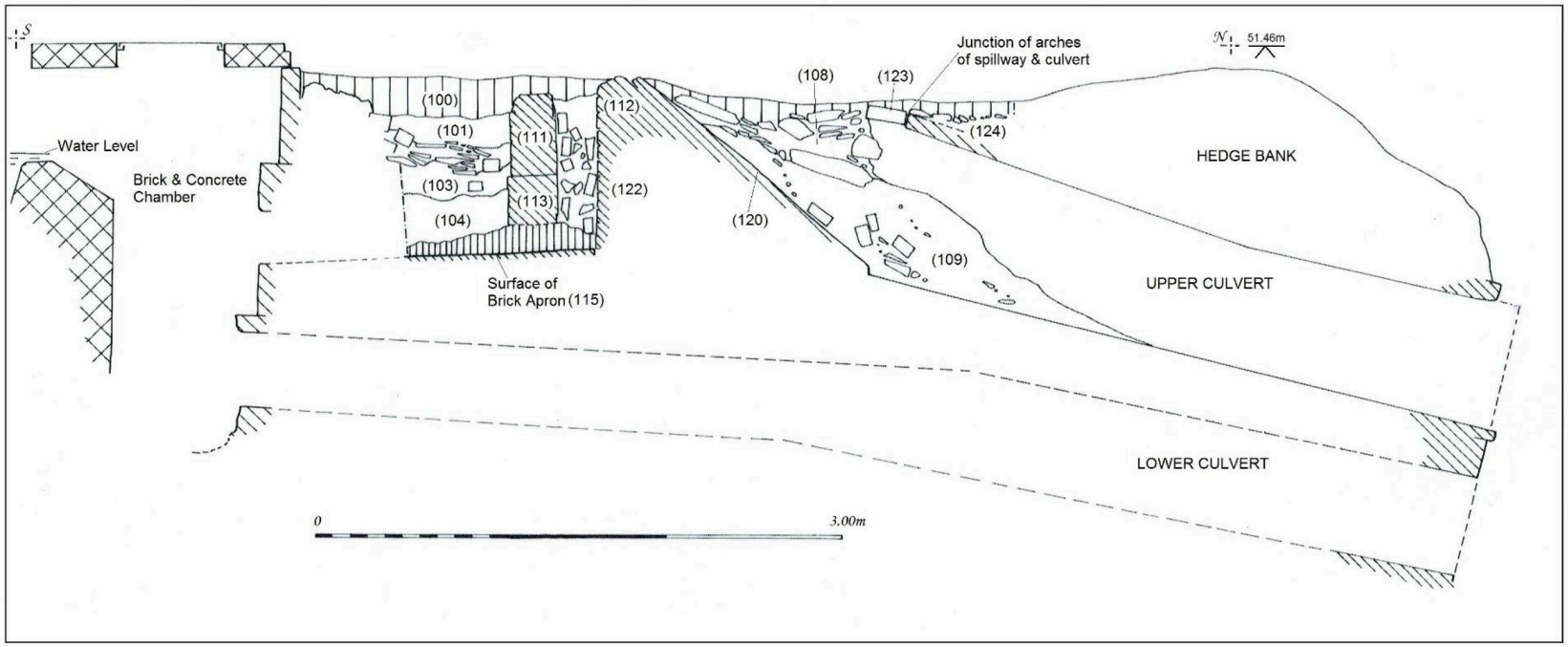

Fig. 4: Mill Wood, Goathurst. East Facing Section through Principal Structures of Lower Dam (Trench 1)

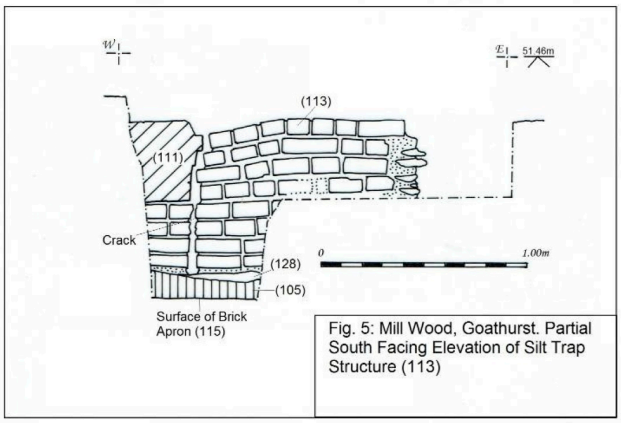

Fig. 5: Mill Wood, Goathurst. Partial South Facing Elevation of Silt Trap Structure (113)

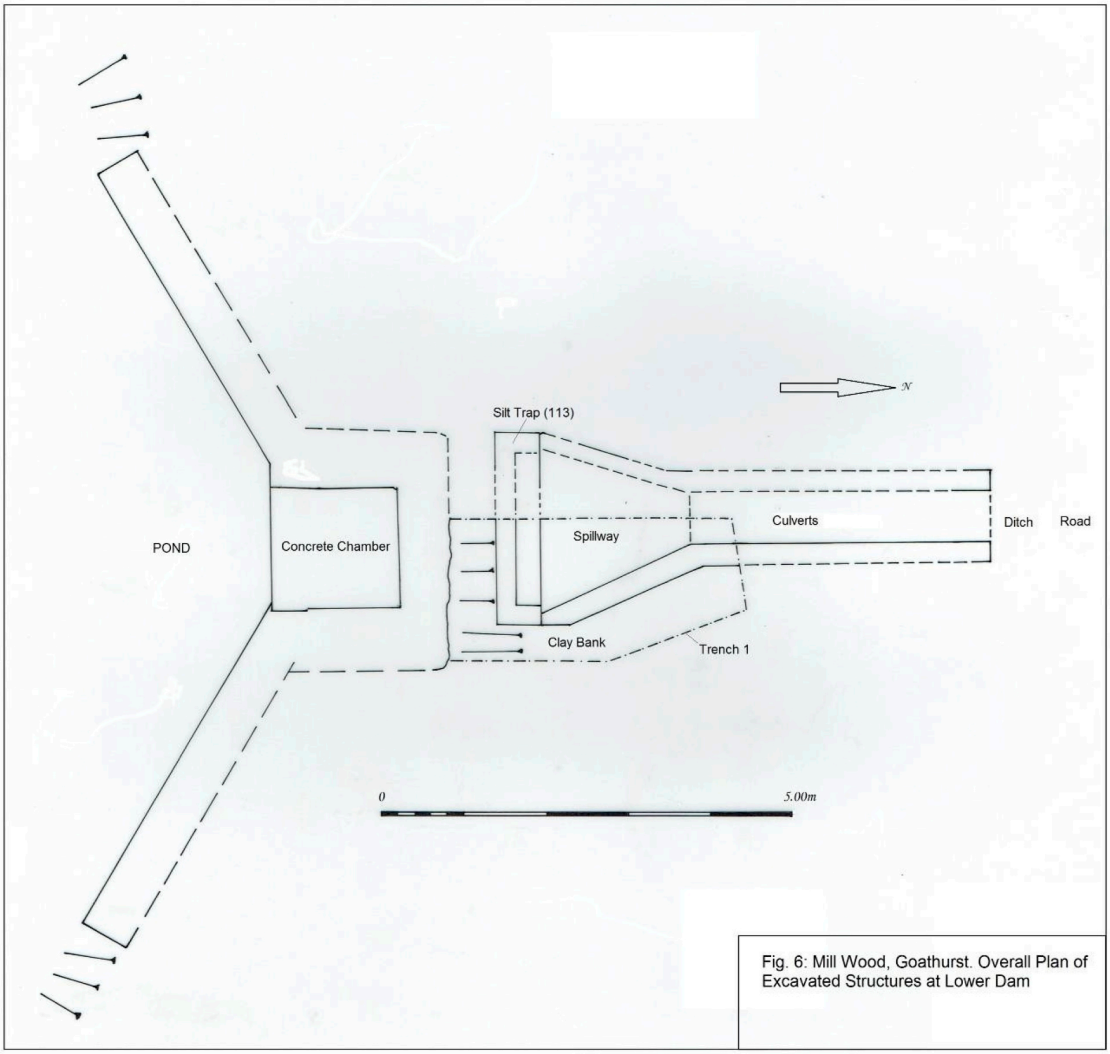

Fig. 6: Mill Wood, Goathurst. Overall Plan of Excavated Structures at Lower Dam

lead rivets through it had held a leather washer on the underside. Clearly it was the plug that lay over a hole through which the lake could be drained. It is tempting to suggest that such a hole would be in the surface of the brick apron that lay south of the spillway, and led down into the lower of the two culverts, which certainly now extends beneath it. Further work might demonstrate this.

Pl. 3: Lead plug (sf. 6) as found; view from S (scale=0.30m)

2.3.8 This was the nature of the north side of the lake until the construction of the present brick and concrete chamber to the south, with its flanking walls defining a new edge to the lake. The narrow chamber and the area south of it were in-filled with clay and rubble; the entrance to the spill way may also have been blocked, though the present infill is very recent, post-dating the collapse of the shallow arch which had covered it.

Trench 1: Detailed Descriptions

2.3.9 **The culverts:** There are two brick-built culverts, one above the other, between the lake edge and the road which forms the northern boundary of Mill Wood, where they feed into a ditch which then goes into a culvert beneath the road and away north. These culverts appear to be the original outfalls for the lakes, the upper one draining the water from a spillway that maintained a specific water level in the lake; the lower one probably being a drain to allow the lowering of the water level or even draining of the lake. They are buried in the clay of the embankment that forms this lowest end of the lake, and they may have been built on the pre-existing ground surface, reflecting the natural slope, prior to the extensive embanking that forms the northern side of the lake.

2.3.10 The culverts are internally 600m wide and 600-700mm high, with shallow arched roofs. Their end on the road is well built, with a double skin of brick forming the sides and lower arch, bonded with a fairly hard, reddish mortar. The upper arch has a single skin of brick overlain by mortared stone rubble (124) forming a capping below the earth of the present field bank and hedge. The upper culvert has a floor of squared lias limestone slabs and both tunnels have a fall to the north of about 1 in 3. There is no evidence of more than one period of construction. The upper culvert is 3.60m long to the point where it joins the spillway to the south. The lower culvert is longer, extending for 7m, where it opens into the present outfall chamber on the north edge of the lake. None of its structure could be examined closely, and its original extent southwards is unknown.

2.3.11 Between the arch above the upper culvert (124), and the remains of the arch over the spillway to the south (123), there is a clear straight joint in the brickwork. In the east wall of the culvert there is the suggestion of a corresponding straight joint between culvert and spillway, but this is not certain; lime scale has obscured the surface of the bricks, and there is a subsidence crack in the wall at this point.

2.3.12 **The spillway:** The south end of the upper culvert meets the spillway, which is a triangular structure, its southern side being a vertical brick wall (122), about 2.40m long and over 1m high, against the waters of the lake. It is two bricks thick, with alternate courses of headers and stretchers and 11 courses visible on its southern face. The extant top lies between 51.20m aOD It is bonded with the angled side wall (118) which narrows the spillway to meet the tunnel, and all the brickwork is set in a hard reddish mortar flecked with white. The spillway's south wall (122) defines the edge of the lake and determines its level; immediately behind it, there is a slope downwards towards the tunnel, with small sloping slabs of Mort Slate set in the same reddish mortar (121). This was only visible at the top of the slope and was overlain by the large, tooled lias limestone slabs (120) that form the present surface of the spillway. These slabs have been set on a hard, grey mortar flecked with coal and there is a bituminous coating extant over the lower part of the slope. Where they meet the floor of the culvert there is a step down. Above the side wall (118) there are several angled bricks (117) that formed the springing for an arch over the spillway. These are bonded with a hard, coal-flecked, grey mortar, as are the bricks at the south end of this wall into which an iron spike has been set. A remnant of the arch remains over the north end of the spillway (123) using the same, hard grey mortar.

2.3.13 The fabric of the spillway shows two periods of construction, defined by two very different mortars. Both the lias slab surface of the spillway and the arch over it appear to be rebuilds or repairs of the original structure. It is indeed possible that the original spillway was an open feature, in which the cascade of water from the lake was visible until it entered the culvert.

2.3.14 The brick structure of the spillway, like that of the tunnels, lies across and within the clay embankment that formed the northern side of the lake. At least initially, its wall face formed the edge of the lake with a depth of up to 1m of water against it.. The precise sequential relationship between the deposits that make up the bank, and the excavated brick structures, is described and discussed below.

2.3.15 **The brick apron:** The brick facing wall (122) of the spillway stood to a height of about 1m above the surface of a brick floor or apron (115) that lay to the south of it . This floor was of red bricks, generally set flat though one course seemed to be on edge, in courses aligned east-west and it had been laid up to the face of wall (122), with a narrow gap filled with small cut fragments of brick. Its eastern side lay up to a low wall extending south from the face of wall (122). This wall (116) comprised only four courses, alternate header and stretcher, and butted up to the south face of wall (122). Its extent southwards is unknown and details of it could not be recorded simply because it was almost impossible to get at. The full extent of the floor was not revealed, only a small area being excavated down to its surface but it extended southwards for at least 1.10m, with a consistent slope downwards to the south (i.e. away from the wall), falling from 50.31m aOD to 50.24m. Its level seems to correspond with a brick surface at the base of the upper opening visible in the present outfall chamber of the lake, but until this area can be more fully examined, the significance of this is unclear.

2.3.16 **Lake sediments:** Above the brick surface (115) and running up to the face of walls (122) and (116) is a layer of lake sediment altogether up to 150mm thick, layer (105). This was a soft, reddish brown silty clay which contained concentrations of numerous, broken-up water snail shells. It clearly represents the silting-up of the lake over a period of time but whether it represents neglect, covering as it does the brick surface, is unclear.

2.3.17 **Silt Trap:** Built above the sediments described above and probably cut through the overlying clay as well (described below), was a three sided structure of brick, butted against the south face of the spillway wall (122) to form a long, thin rectangular chamber internally 2m long by 250mm wide. Built of a double thickness of coursed brick, 113, with a mixture of

headers and stretchers, it was bonded with a hard, pale grey lime mortar with flecks of coal/charcoal. It had not been toothed in to the earlier structure and had subsided away from it. Its middle had also subsided into the sediments, causing a vertical crack through the brickwork. The internal faces of (113) had been rendered with a similar hard mortar. The only probable purpose for this structure is as a trap for silt and other debris that would otherwise enter the spillway. It seems to have been constructed after the clay bank was extended across the face of the spillway, and may be the same period of construction as the arch over the spillway itself, which may have significantly restricted the opening, which was protected by an iron grid.

2.3.18 **The clay bank:** Excavation of the clay bank that formed the north side of the lake was limited to its exposure along the east side of the brick structures, and a number of questions remain about its development and exact relationship with that sequence of structures. Logically, the double tunnel described above, as the primary structure, was buried within and contemporary with the construction of the clay bank. Within the scope of the trench, however, this could not be demonstrated. A similar relationship with the bank might be expected for the brick spillway, but where elements of the bank were excavated at the spillway's south-east corner, there was some suggestion that it had been built into a pre-existing bank (this itself might show that the brick spillway was added to the tunnel and replaced an earlier arrangement). Two layers of clay were revealed east of the spillway corner; (129), a compact, dark red-brown clay with numerous small slabs of blue-grey mudstone scattered within it and (127), a compact red-brown more loamy (?weathered) clay above it. Both layers may have been cut through to build the brick spillway but this was far from conclusive in the small area excavated. Both layers, however, clearly represent the lake side of a substantial bank, formed of clay and mudstone dug from elsewhere. This bank lay east (and west) of the spillway and presumably sloped down beneath the lake waters. The low wall (116) built south from the face of the spillway, may have retained the lower edge of this bank, as in front of the spillway, above a brick apron, there was open water. It was over this apron and against the front of the spillway that lake sediments (105) eventually formed.

2.3.20 Above these sediments was a layer of dumped clay (104)/(128), being a firm red-brown clay lacking the Morte Slate of layer (129). It lay specifically to the south of the narrow brick chamber along the south side of the spillway and over and against layer (129) to the east (although differentiation between these layers was difficult). It was excavated in a small area in the south-west corner of the trench where access became very difficult with the increasing depth. Elements of the clay, however, appeared extant beneath the base of wall (113) which suggested that this clay had been dumped against the face of the spillway wall and had later been cut away to construct the narrow chamber of the silt trap. The clay is therefore an extension of the clay bank against the front of the spillway, perhaps an element of a more general re-facing and thickening of the bank.

2.3.21 **Later changes/maintenance:** The brick structures and the clay bank which eventually faced them as described above formed the final shape of this end of the lake until the major changes of the 1970s, when the new outfall chamber, with its flanking walls was built, redefining the north edge of the lake and moving it more than 3m to the south. Before this took place, however, there was one period of activity when the lake level was lowered for a while and then restored, perhaps during the war-time use of the house and land. A rounded trench about 0.60m wide was dug northwards through the clay bank (104)/(128)to the face of the silt trap wall (113). This wall was then broken through to a depth of 0.60m below the top of the spillway and then the spillway wall (122) was broken though to a depth of 0.30m. Elements of the sloping spillway surface were probably removed though this cannot be seen. This would have lowered the water level of the lake by about 0.30m and perhaps improved the efficacy of the narrow chamber as a debris trap. Both walls were, however, subsequently repaired using hard engineering bricks in Portland cement (brickwork (111) and (112)). The render on the inside of the chamber was also repaired (110), so clearly its original function was restored. The trench leading to the now repaired opening in the wall was refilled with clay (103).

2.3.22 **The lead plug (sf. 6):** Lying on the top of the clay bank (129), just east of the end wall of the narrow chamber, was a heavy circular lead plate up to 310mm in diameter. It was

25mm thick and had been pierced for numerous heavy lead rivets, which had fixed a thick, leather washer to it, of which traces remained beneath the flattened top of the rivets. An iron staple was bolted through one side of the plate, attaching it to a long chain and ring. The chain was folded up beneath the plate, which had been laid down leather side up. This object was clearly a plug that would drain the lake when removed and somewhere the drain hole may be intact, probably leading into the lower culvert. When the plug was removed and lost is not clear. It seems simply to have been left lying on the bank where it later became covered with the debris spread during the construction of the present outfall chamber.

2.3.23 **Modern Changes:** The construction of a concrete and brick chamber to the south of all the earlier structures, completely changed the drainage and control of the lakes. A date in the top of the concrete shows it was constructed in 1973. This chamber was deep and incorporated a spillway to define the water level, considerably lower than the original spillway. In the base of the chamber there is an opening into the lower of the two culverts through which all the water from the lake exits. There appears to be a higher exit in the chamber wall, but no detail of the north wall of the chamber could be seen because access was too risky given the cascade of water into it from the lake. Once this chamber and its flanking walls had been constructed the area to the north was levelled up with clay and rubble (layers (101), (102), (107) and (106). Following the collapse of the arch over the spillway, this area too became in-filled and blocked with layers of loam and rubble (108) and (109).