

## Briar Vale Flood Prevention Scheme – Discharge of Conditions - 19/00306/COND

This document has been prepared in response to an email message posted to the planning record for the discharge of conditions for the North Tyneside Council's (NTC) application for the Briar Vale flood prevention scheme. The [application for discharge of conditions](#) was validated on 18 March, 2019. The [application for planning permission](#) for the Briar Vale flood prevention scheme was validated on 15 December, 2016. The planning permission "Decision" document lists 15 conditions none of which had been discharged before the end of the Briar Vale work was [announced as completed](#) on 19 February, 2019. This document relates solely to condition 15 and the submission by email message listed in the application to discharge conditions, dated 17 April, 2019, from Mr Lillie to a Mr John Carlin (Capita) and copied to the case officer, Ms Julia Dawson :-

*" 15 - Prior to the discharge of any surface water from the dry storage basin to the NWL sewer network, full details of the improvement of the outfall within Marden Quarry must be submitted to and approved in writing by the Local Planning Authority. Thereafter, the development shall be carried out in full accordance with the approved details.*

*Reason: To prevent the increased risk of flooding from any sources in accordance with the NPPF."*

The text of the message from Mr Lillie: -

*" The works involved the jetting and clearing of the pond outfall pipe, the refurbishment of the adjustable penstock weir – to allow seasonable/weather event adjustment of water level and the replacement of the sealed chamber cover with a mesh grille to allow water to discharge should the inlet become blocked and be overburdened."*

I have listed below links to relevant documents previously posted to the internet by me as a record of a formal complaint to NTC about the management of Marden Quarry in general. These include some shortcuts to extracts relevant to condition 15.

Main link to complaint - <http://www.oldexmothians.co.uk/rls/temp4/MardenPark.htm>

First part of complaint account - <http://www.oldexmothians.co.uk/rls/complaint/enter.htm>

Second part of complaint account -

<http://www.oldexmothians.co.uk/rls/complaint/enter2.htm>

Installation of sandbags - <http://www.oldexmothians.co.uk/rls/temp4/MardenPark3.htm>

Footbridge and swale PA - <http://www.oldexmothians.co.uk/rls/temp4/MardenPark4.htm>

*(The land will be filled to make it a swaled area, which will result in the land being increased in height by at most 800 mm. )*

The drawing from the footbridge and swale PA -

<http://www.oldexmothians.co.uk/rls/temp4/images/Drawing2003edit.jpg>

Statement by Colin Campbell MacDonald re sluice gate -

<http://www.oldexmothians.co.uk/rls/complaint/enter.htm#gate>

Statement in legal officer's letter -

<http://www.oldexmothians.co.uk/rls/complaint/enter2.htm#Topic15>

Most recent upload about flow over penstock weir gate -

<http://www.oldexmothians.co.uk/rls/temp4/MardenPark7.htm>

It was with Mr Lillie that I first raised the problem of poor drainage from the lake in Marden Quarry in early 2013. It was he who cleared the old blocked outlet grill featured in photographs shown in the document opened by following the first link in the list above. He described the lake as a "balancing pond". It is clear from his statement in the email

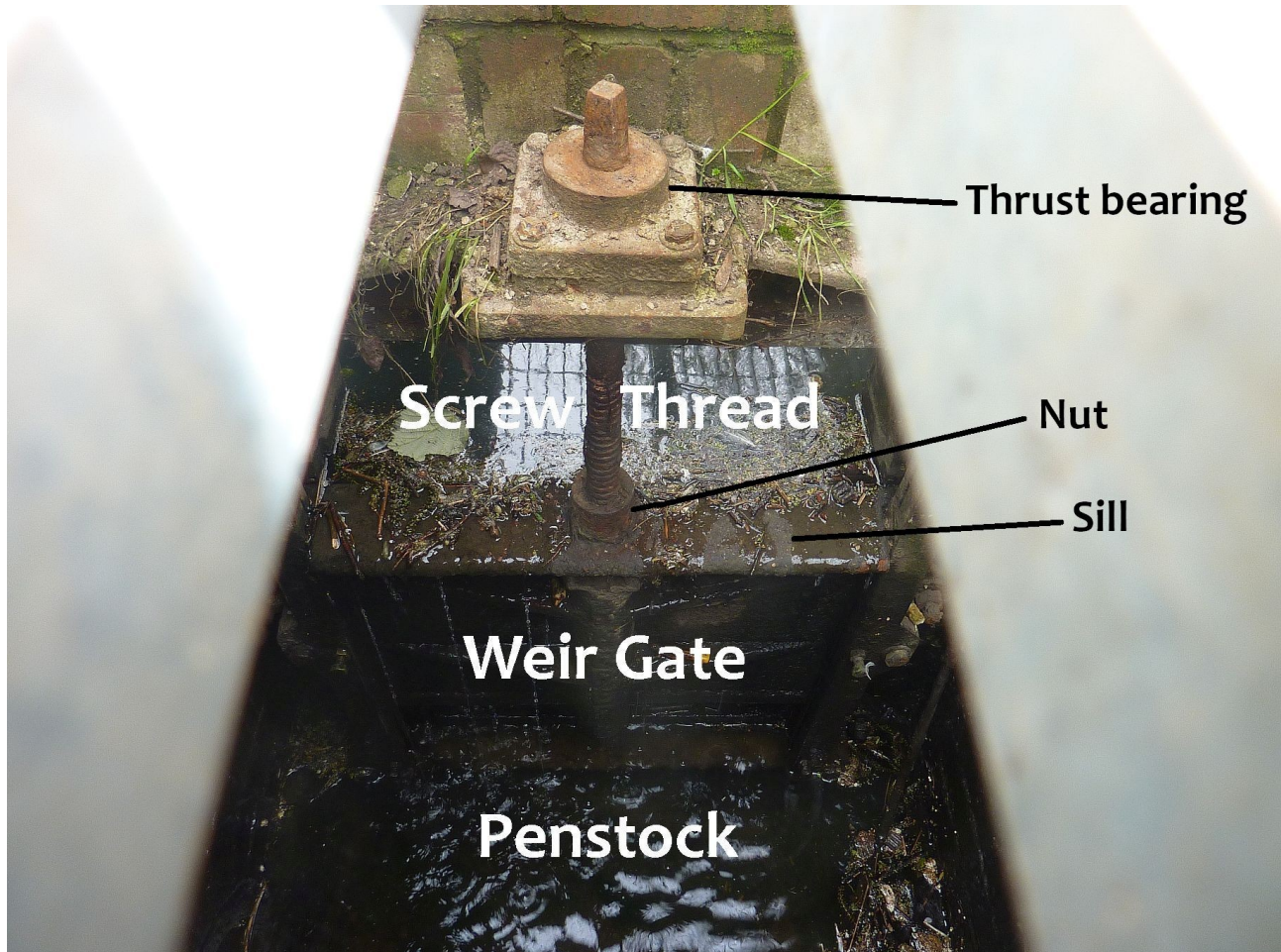
message quoted that he has not been kept fully informed of related events up to the present.

There are 2 pipes leading from the outlet chambers, 1 and 2. The main pipe is from chamber 2 and this is fed by water flow from the inlet chamber 1 over the penstock weir gate (sluice gate). The second pipe was discovered by Northumberland Water Ltd. (NWL) and referred to them as the “dry weather pipe”. This leads from the inlet chamber and joins the main pipe beneath the higher level manhole which I have numbered 3 in the video beneath the text that refers to work carried out by subcontractors to NTC on 28 September, 2017 - see <http://www.oldermothians.co.uk/rls/temp4/MardenPark6.htm#pugh>

Both normal manhole covers over chambers 1 and 2 were replaced with “mesh grille(s)” a few weeks later.

Contrary to Mr Lillie’s statement, the “adjustable penstock weir “ has remained jammed since Owen Pugh raised it by some 5cm and were unable to return it to the ‘as found’ position. The in-operability of the sluice gate has been confirmed most recently on 5 April, 2019 when workers from NWL attempted to move it (under a request from the NTC project engineer, Mr Burnett).

Mr Burnett is aware of a new problem with the outlet first reported by me to him on 12 February, 2019. The water level in both chambers 1 and 2 were the same, clearly indicating a blockage of both outlet pipes. Since then the blockage has re-occurred at least 3 times, with the most recent blockage noted on 9 May, 2019. This has remained for over a week since with a drop in the lake level of only 1cm.





The photograph of the weir gate above has previously been forwarded to Mr Burnett with some ideas for a way to effect a repair.

Without the capability to easily open the weir gate it is not possible to maintain the lake level to avoid flooding of the surrounding area as continues to happen with or without the additional flow from the Briar Vale storage basin. The regular blockage of the wire mesh over the external grille on the lakeside of chamber 1 causes a drop in water level to the inside of the grille. This has been estimated as typically 10cm – 12cm. A long establish formula for flow over a weir reveals that the flow rate varies with the depth of the water above the sill to the power of 1.5. Thus, the flow rate for a depth of 6cm compared with 1cm is 15 times as much. This explains why the lake level drops so slowly compared as to how it was before the weir gate was jammed in the position left by the Owen Pugh work.

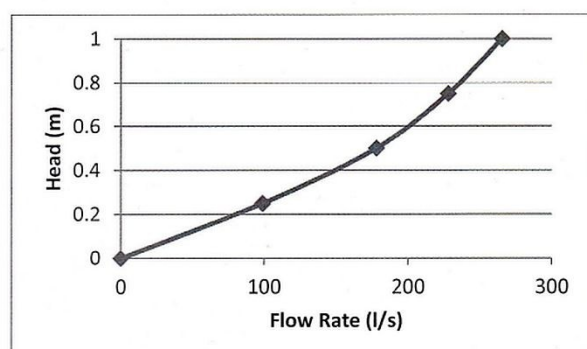


Photo taken 18 March, 2019

1. What is the variation of OUTLET flow rate with lake level over a range of lake level of zero to one metre?

(Zero is taken as the level when there is (just) no flow into the inlet (to the OUTLET) with the level as currently determined by the bottom of the hole left by the removal of the old grille that was in the inlet chamber wall. )

Head (depth in pond above outlet invert level) (m)	Discharge (l/s)
0	0
0.25	99
0.5	178
0.75	228
1	265



NWL provided the graph above in response to the question about the outlet flow rate from the lake after its re-direction to the North Sea. **It ignores any blockage of the outlet** and clearly assumes that the water level within the two outlet chambers is the same as that on the lakeside of the grill. (It ignores the position of the weir gate or assumes it to be lower than the invert of the notch in chamber 1.) **It takes no account of any drop in water level through the wire mesh and over the weir gate.**

In the years before NTC took over Marden Quarry the North Shields water company used the quarry as a reserve reservoir. The operators would have been sure to maintain the weir gate mechanism so that it could be opened when the water level became too high and raised again when the level dropped, and then relied on the “dry weather pipe” to limit the drop.

Some ideas for reducing the risk of flooding over the boundaries of the lake have previously been proffered. They should also allow a reduction in the frequency of need for clearance of the the outlet.

1. Increase the balancing pond capacity by raising the relevant parts of the lake boundary by 30cm. Currently the capacity from the minimum water observed prior to the Owen Pugh work to that which would just spill over the ‘wall’ at the north west edge is 2.3 million litres (126,000 litres per cm). 30cm would increase the capacity by 3.8 million litres.
2. Cut back much of the vegetation that overhangs the lake boundaries, particularly that on the islands. This is a major source of lake debris that blocks the outlet especially during the Autumn/Winter.
3. Improve the access to the outlet grille for whoever is assigned to clear it. Currently the access becomes very slippery during wet weather and it is not easy to brush off debris blocking the wire mesh without standing in the water on the lake side of the grille.
4. Repair and maintain the weir gate #. The maintenance should include regular raising/lowering over its full range to ensure it can be opened in the event of an impending storm in the lake’s catchment area. # - or replace it.
5. Dredge the shallower areas of the lake. These are where the algae (‘blanket’ weed) grow more quickly in sunlight.
6. Experience shows that there is little point in clearing the outlet wire mesh when the lake level falls below the level that just covers the whole surface of the jetty at the north west edge.
7. Dredge the area in front of the inlet notch of silt/sludge occasionally to the degree needed to make the invert visible. (A recent measurement indicated a depth of as much as 12cm above the invert.)
8. Provide a written, version controlled, procedure for action to maintain the outlet clear so that it may be used for reference by any person who could be asked to carry it out.

Robin Smith -17 May, 2019