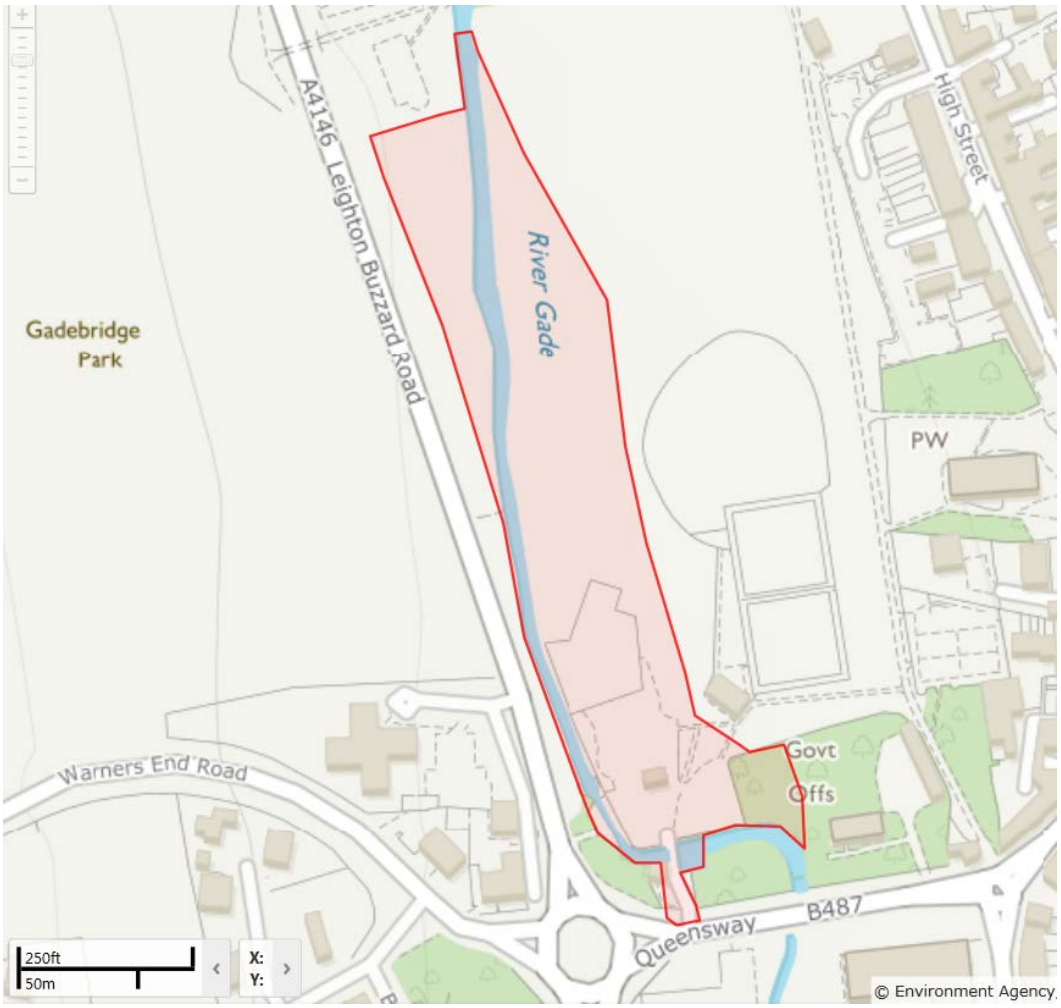
Gadebridge Park River Restoration Scheme – a summary to date - July 2018

Site



Approximate red line boundary of proposed works.

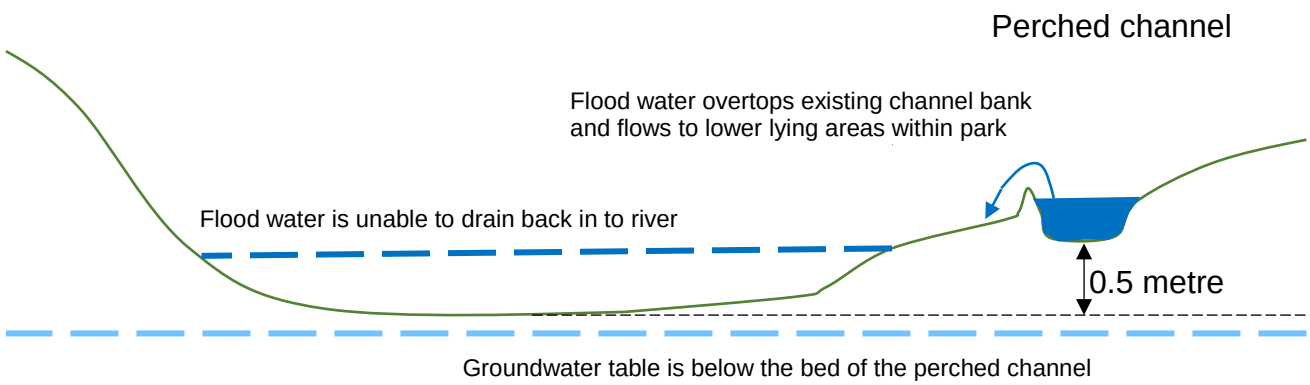
Project Partners:

- Environment Agency
- Dacorum Borough Council
- Affinity Water

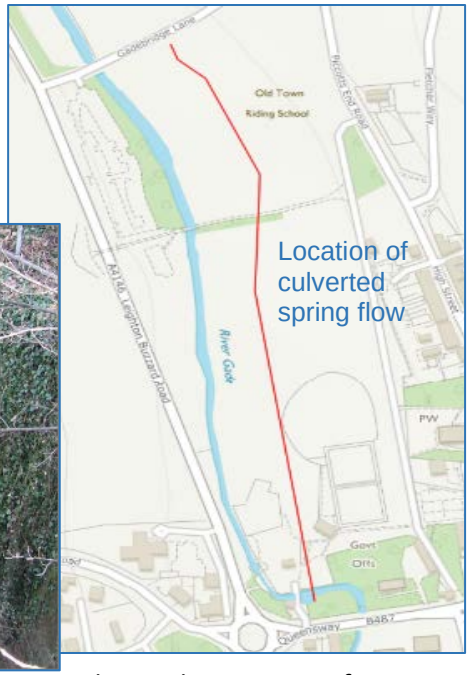
The case for change

The River Gade flows through Gadebridge Park in Hemel Hempstead. Dacorum Borough Council own the park. It is a chalk stream, but historic channel alterations (creation of mill leat and weir downstream of the EA gauging station) and over abstraction causing low flows, have had significant impacts.

The result of the mill leat and weir are that the channel through Gadebridge Park has very little gradient and is perched above its floodplain (i.e. sits at a higher level than the valley bottom). As the river is disconnected from its floodplain, in times of flood when the channel overtops or breaches, the water remains in pools in the park for long periods of time. This is because the water is unable to flow back into the channel when water levels recede (see figure below).



The channel is also disconnected from the groundwater table. For a chalk stream, where over 70% of flow is from groundwater, this can have a big impact on both resilience to low flows and also to the ecology of the channel.



There is a culvert through the park which pipes spring flow and discharges it into the flood culvert just upstream of Queensway road. The flood culvert was built to stop Hemel town from flooding and discharges into the fishing lake at Kings Langley – about 5km downstream of Gadebridge Park. This spring flow is therefore lost to the River Gade until this point.

Spring flow discharges into flood culvert →

The River Gade often suffers from low flows due to the pressure of abstraction. Affinity Water have reduced the level of abstraction as part of the Chalk Streams Programme, but low flows are still likely to cause pressure on the river, particularly to the ecology. The channel has poor resilience to drought because when levels drop the water is spread thinly across a wide expanse of channel.

The Environment Agency (EA) has a gauging station at the bottom of the park to monitor low flows and flood flows on the River Gade; a concrete flume and weir structure. The weir is too high for fish to get over, so it presents a barrier to fish passage upstream. The channel is also concrete bed and banks for about 40m and provides no habitat for river ecology in this reach.

The weir also impounds the river upstream most of the way to the white bridge. This results in the loss of gradient over this reach and reduces the diversity of flow types and habitats. The low energy flows also mean that fine sediments drop out of suspension and settle over the gravel bed. All of these things impact the ecology that the channel is able to support.

EA Bury Mill gauging station →

As a result of being a historic mill leat and previous management such as dredging, the channel is very straight and is over-wide for the amount of flow. This combined with the impoundment, mean that there is excessive vegetation growth that will readily grow across the entire channel if maintenance is not carried out. There are also remnant weir structures which have been notched (the middle removed), but which are still causing slight impoundments.

Excessive vegetation growth

Remains of old weirs, and evidence of siltation on river bed

River restoration

Our objectives for the river restoration scheme are to:

- Improve the river and the adjacent parkland for wildlife
- Improve the opportunities for amenity and recreation around the river
- Improve resilience to low flow events and climate change
- Improve the ecology of the river so that it supports “Good Ecological Status” under the European Water Framework Directive
- Improve floodplain connectivity, but reduce the impact of flooding – so water can come onto the floodplain when it needs to, but that it doesn’t sit on the parkland for long periods of time
- Address the impact of our gauging station
- Reduce the maintenance burden of the current channel

Feasibility study and preferred option:

From 2016-18 JBA Consulting carried out an initial feasibility study, in consultation with the project partners and key stakeholders. The outcome of this study was to identify a preferred option for the river restoration in Gadebridge Park. An indicative landscape plan of the preferred option is inset to the left. More detailed drawings of the preferred option are available on request.

The images below show what the channel is likely to look like from the white bridge (facing south) and depict the indicative route of the new channel through the park:

Gadebridge Park: River Gade Restoration Scheme

Views of proposed realigned River Gade (illustrative only)

The following is included in the preferred option:

- Realignment of the river from downstream of the white bridge, back to valley bottom through the park, before re-entering the Gade just before the flood culvert. This will reconnect the river to its floodplain and to groundwater through the reach.
- Spring flows which are currently in culvert will be re-routed into the new channel to provide additional flow to the river, providing resilience to the river particularly in times of low flows.
- The existing EA Bury Mill flow gauging station will be decommissioned and a new gauging station constructed on the new channel. The details for this are still to be confirmed, but will likely be sited in the same location as a new bridge proposed across the realigned channel. The new gauging station will be passable to fish, and have much less impact on the river channel than the present gauging station.
- There will be new footpaths and as mentioned above, a new bridge across the realigned channel. There is also likely to be another crossing point over the new channel – location and type are still to be confirmed.
- A new wetland/nature area is proposed in the line of the existing River Gade channel through the park

Site constraints / anticipated issues:

- Main event space within Gadebridge Park
- Car parking – locations and access routes
- Bowls club building and greens
- Part of realignment through Hemel Old Town Conservation Area
- Trees – loss of trees due to realignment of channel, including within Hemel Old Town Conservation Area at the southern end of the park
- Seating and picnicking space – may be some loss due to realignment of channel
- Flood risk and flood culvert
    - A large flood culvert was built to protect Hemel Town from flooding. There is a side spill weir just downstream of the gauging station (left hand picture on page ….) which takes high flows and discharges them in Kings Langley – central map shows the route of the culvert.
    - We need to ensure that the scheme does not increase flooding to the park or off site. We also need to ensure that the flood culvert remains functional.
- Gauging station
    - Long term flow record - very important so we can compare current and future flows to historic data.
    - Continuity of data is important. The data is used for flood warnings and also to assess the impact of abstraction pressure. We will also need it to help us understand the results of Affinity's abstraction reductions.

- Thames Water infrastructure/outfalls
  - Foul water sewer - There is a Thames Water foul sewer which runs through the middle of the park. Whilst it is quite deep underground, it will likely constrain the design of the scheme.
  - Existing surface water outfalls will need to be re-routed to the new channel. There may be potential for surface water outfall retreats (outfall into small pond feature before entering channel) to improve water quality.
- BT service line – there is a BT line running to the bowls club which the new river line will cross. This will need to be addressed as part of delivery
- Listed white bridge
  - The white bridge is a listed structure. It was built in c.1840 and was constructed with a bamboo design echoing the Chinese styles popular at the time.
  - We do not want to adversely impact it, or its setting within the park landscape.
  - The proposals leave a 15m buffer between the downstream side of the white bridge and the start of the realigned channel.
- Potential archaeological interest affecting excavation work for new channel
- There will need to be new boundary treatment between the park and Leighton Buzzard Road (currently provided by the existing channel)

What's next?

The Environment Agency is currently tendering a contract to carry out all surveys and investigations required to address the potential issues identified above and to produce detailed designs ahead of construction.

Affinity Water and Dacorum will be consulted throughout the process as joint partners on the project.

We hope to obtain full planning permission for the site by May 2019.

Construction of the scheme is currently planned for late 2019 (October onwards).