Balancing Lakes

Before the construction of Milton Keynes, much of the land that the city was built on was undisturbed countryside. This meant that when it rained, the water soaked slowly into the ground and then ran into the rivers and streams. Occasionally during heavy rainfall, villages near the river valleys would flood.

Large areas of land have now been covered with concrete and other hard surfaces. This means that rainwater cannot soak into the ground. Instead it runs off very quickly and is carried by surface water sewers straight into the rivers.

To cope with this sudden increase in the volume of water, storm water has to be stored until river levels have fallen. It can then be released at a slower, controlled rate.

A series of balancing lakes have been created along the rivers into which the storm water can be diverted.

The balancing lakes in the Ouzel Valley receive most of their water directly from the river, although they are also fed from surface water sewers and small streams.

Loughton Brook has four balancing lakes located along its length

- Furzton Lake
- Teardrop Lakes
- Lodge Lake
- Bancroft (normally dry, only becomes a lake after heavy rain).

Furzton lake

Teardrop Lakes

Lodge lake

There are four main gauging stations in the Ouzel Valley flood control system that measure the amount of water entering, flowing through, and leaving the City. These are on the River Ouzel and Waterhall in Bletchley, Caldecotte Lake, Willen Lake and Broughton Brook.

This information together with data on the river and lakes levels, is transmitted to Anglian Water's central control where it is processed by a computer which automatically controls the rivers gates and sluices.

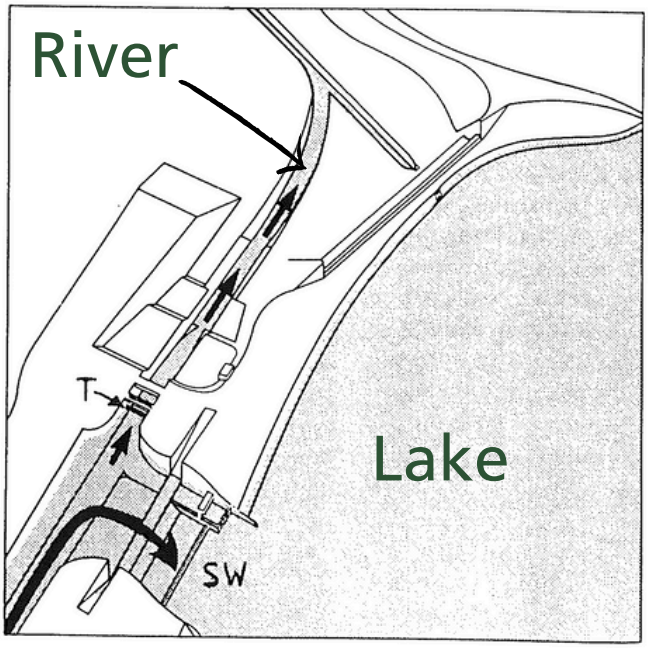

Diagram showing how water levels are controlled.

In normal conditions, river water flows along the river channel alongside the lake and the gate (T) rests out of sight on the bottom of the river.

Under flood conditions, the Anglian Water computer instructs the gate (T) on the bed of the river to be lifted up. The water in the river then 'backs up' against it. When it gets to a certain height it overflows the concrete side weir (SW) into the lake.

The level of the lake rises and the water is stored here until the river level falls. The gate can then be dropped down again and the stored water gradually re enters the river over the side weir.

As Anglian water control the gates and weirs using a computer system, we don’t know when they will be are opened or closed, raised or lowered. There is no warning given and the water levels can change dramatically and quickly when the gates open, this makes these areas extremely dangerous.

Occasionally, after extremely heavy rainfall, if the lakes can't hold any more water, it begins to flow out over the emergency overspill into the river valleys and surrounding parkland. Accurate calculations in the land levels during the construction of the lakes and parks ensure that this flood water is contained within specific areas, so the houses nearby are saved from flooding.

It is worth noting that some of the older areas on the edge of Milton Keynes such as Stony Stratford and Newport Pagnell were built before the balancing lake system. They can still have problems with houses flooding when we have extreme periods of rain.

The main role of these lakes is to provide temporary storage during heavy storms, most of the balancing lakes have been constructed to form large permanent water areas, with imaginative shaping and landscaping. They also provide valuable recreation and amenity facilities. The lakesides have been planted with vegetation which adds to their beauty, provides refuge for wildlife and reduces shoreline erosion.

Questions

1. Are the balancing lakes natural or man made?

2. Why were the balancing lakes necessary in the design of Milton Keynes?

3. Write an explanation of how the balancing lakes work, in no more than 30 words. You could include a diagram to aid your explanation.

4. What are the dangers of the balancing lake system?

5. Does the balancing lake system mean that the water is always contained in rivers or lakes?