

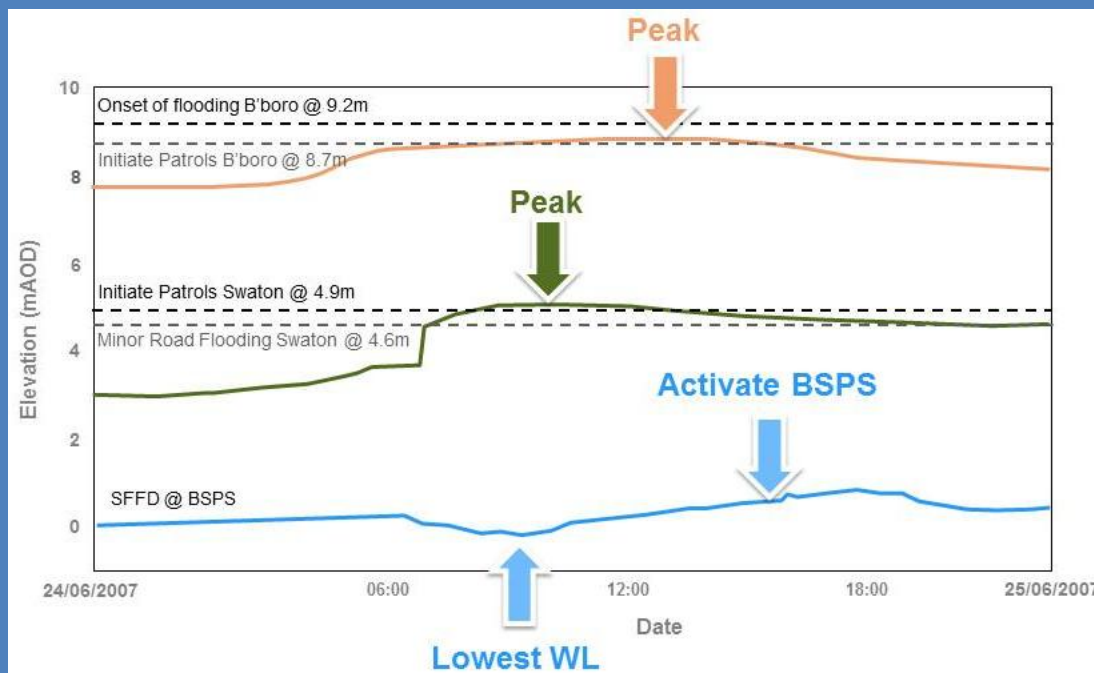
BLACK SLUICE PUMPING STATION PERFORMANCE

Upstream Benefit

The Black Sluice Pumping Station (BSPS) was built in 1946 and it comprises both pumps and gravity sluices. In 1966 the BSPS was extended and additional 2 pumps were installed. This first phase of the extension, however, was never followed up by phase two, which should have included the widening of the river to convey greater volumes of water to the BSPS.

As a result of the reduced conveyance capacity, the water cannot move towards the BSPS as quickly as the pumps can pump out the water. The pumping does help a little in reducing water levels within the downstream reach of the SFFD. However, water levels in the upstream catchment near the villages, remain unaffected by pumping.

The below figure illustrates the difference in the timing of the peak flood levels at Billingborough, Swaton and the SFFD for a significant event in June 2007. It can be seen that by the time the BSPS is activated the peak flood levels at the much higher lying villages have already passed.

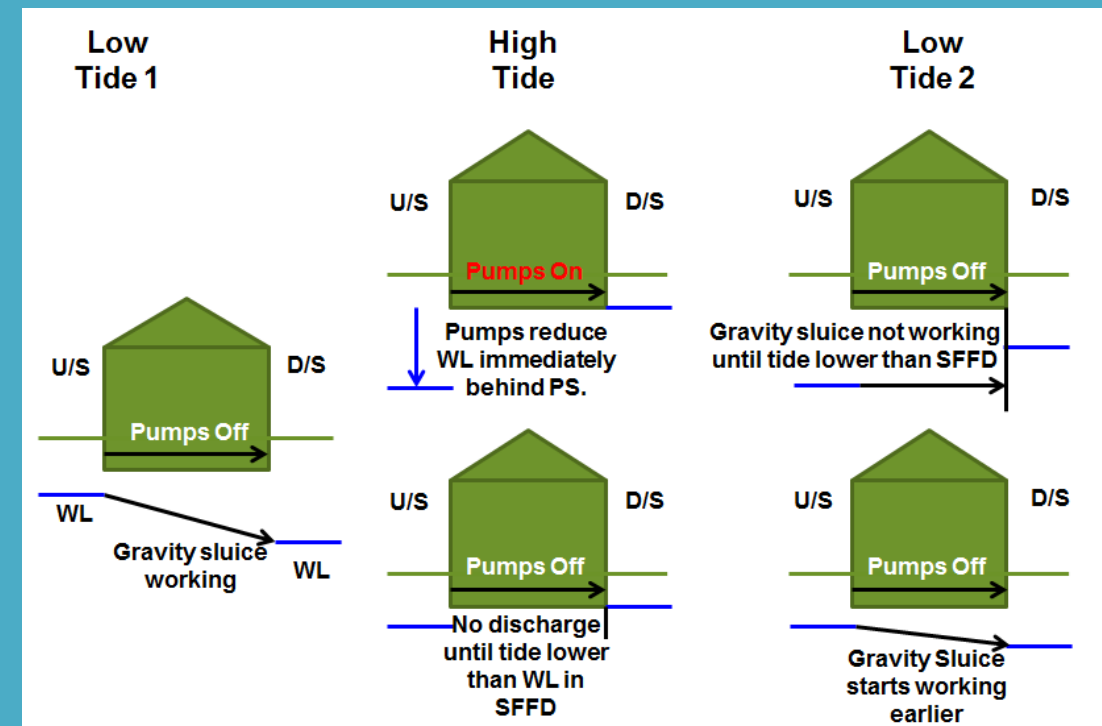


BSPS Operational Time 1999 to 2011

Total Pump Duration: **769hrs**
Average Annual Usage: **2.9 days**

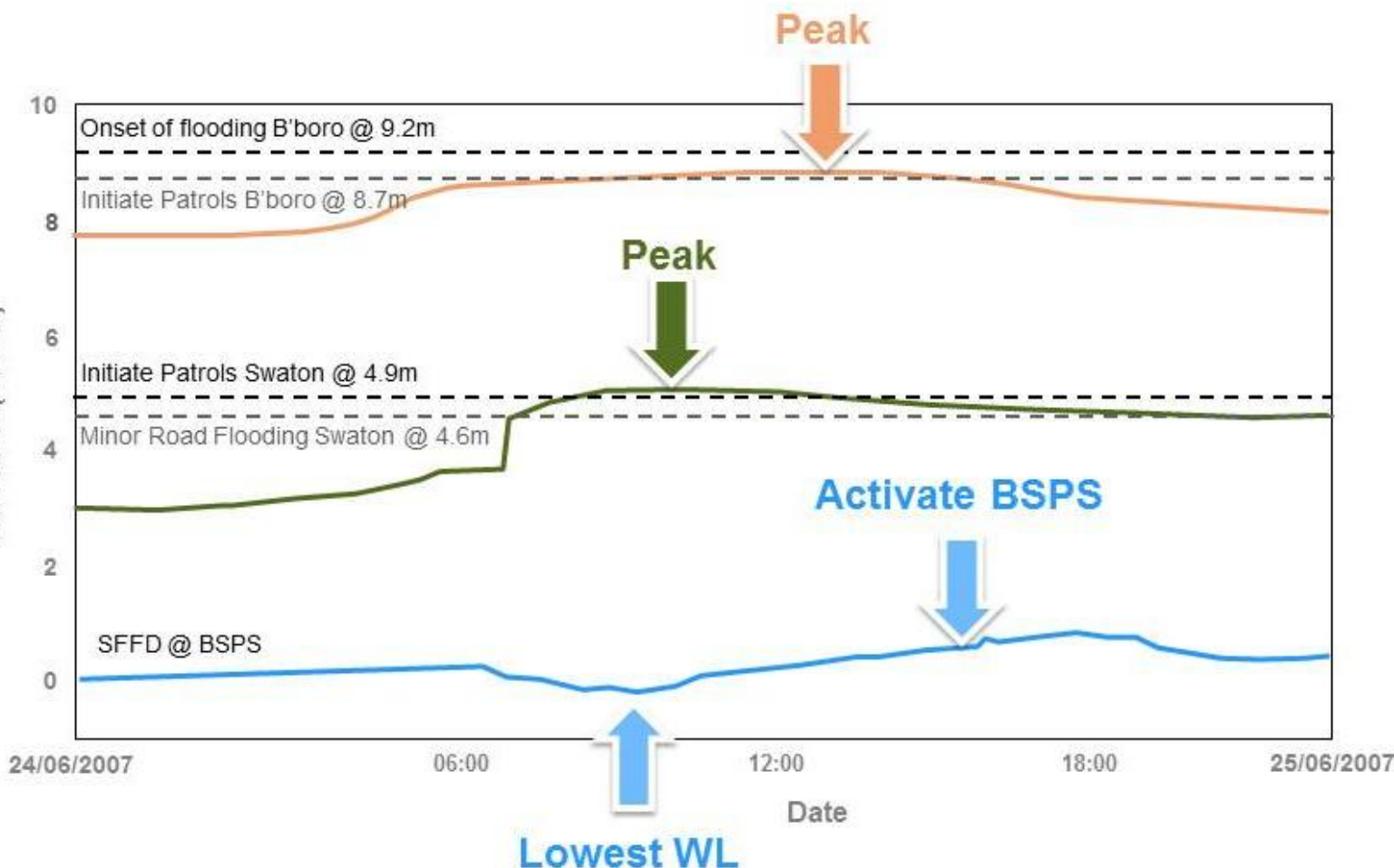
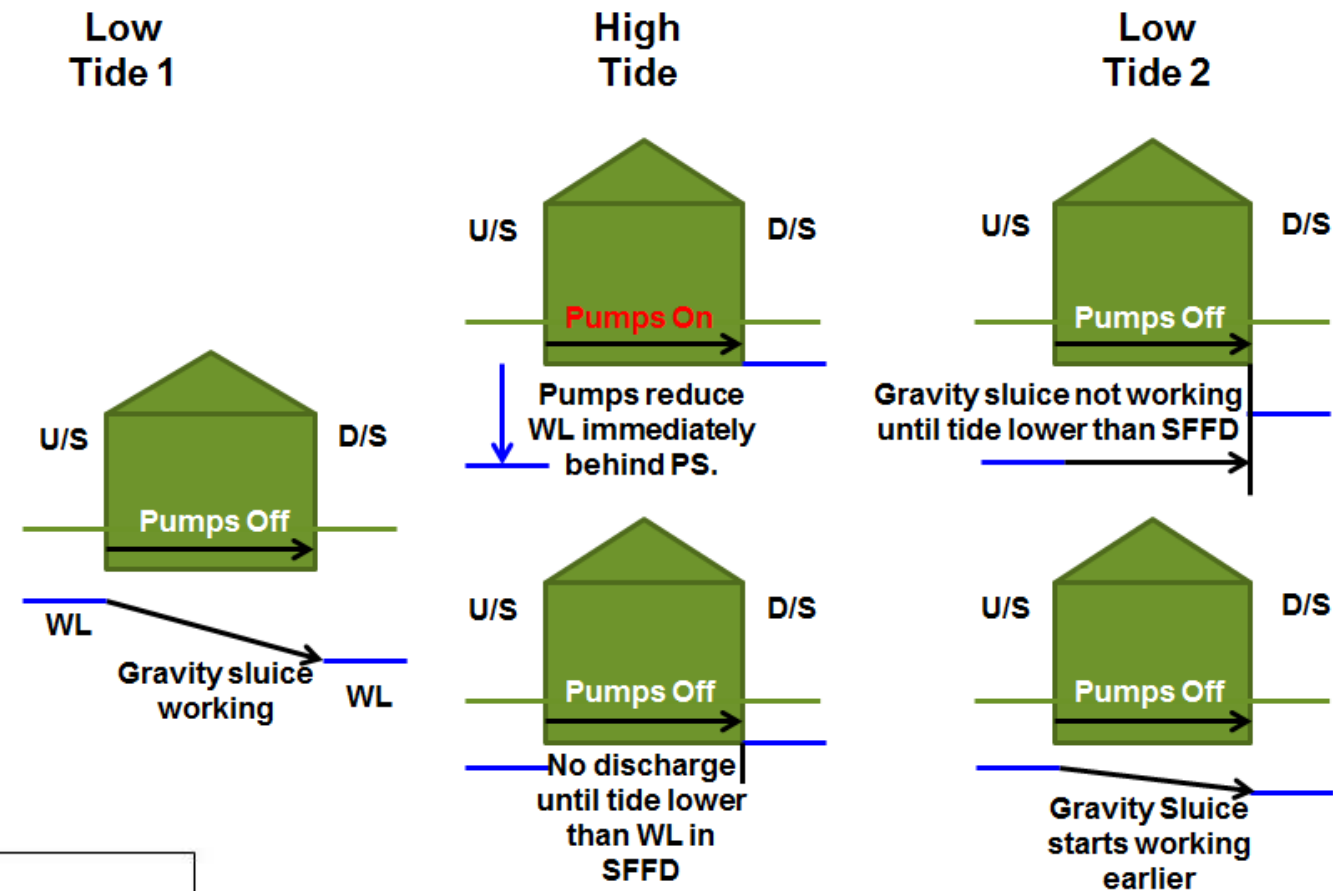
Gravity Discharge

During normal conditions the gravity sluices discharge the flows from the SFFD whenever tidal conditions allow (Low Tide 1). When high fluvial flows and tide-locking coincide, the BSPS operates to pump out fluvial flood water into the Boston Haven (High Tide). Pumping during tide lock is not fully effective as it reduces the amount of flow through the gravity sluices on the next low tide (compare upstream water levels at Low Tide 2).



Are The BSPS Pumps Effective?

At the second low tide, the water level will be too low to discharge the water by gravity from the SFFD if the pumps are switched on during the high tide. If the pumps are not used during the high tide, the gravity sluice will become operational much sooner.



The flood peak at Swaton and Billingborough occurs when the water level at the SFFD is at its lowest point. The pumps at the BSPS have no impact on the villages in the upper catchment.