

## Trent Valley Pumping Station

Since South Staffs Water commenced supplying water to the Black Country towns in 1858, the Company found themselves continually seeking additional sources of water to keep up with the insatiable demand of its ever growing customer base. This quest continued unabated for well over 100 years culminating with the construction of the Hampton Loade Treatment Works and its associated storage reservoir at Chelmarsh alongside the River Severn, near Bridgnorth in Shropshire.

Following the introduction of its first source at Sandfields in Lichfield, further supplies were obtained from the extensive sandstone aquifer underneath Cannock Chase in the 1870s. As the end of the 19<sup>th</sup> Century approached groundwater sources in the Kingswinford area to the west of Dudley were developed, swiftly followed by the sinking of wells and boreholes in an area extending from Fradley to the north of Lichfield southwards through Shenstone and Aldridge. Professor Lapworth LL.D F.R.S., F.G.S, an eminent geologist based at Mason College, Birmingham (later to become the University of Birmingham) submitted a wide ranging report to the Company in September 1892 suggesting locations where groundwater, suitable for human consumption, would be found. Included in his report was the following recommendation: -

*The eastern half of the Lichfield district is already tapped to the extent of one million daily by the deep well at Fradley, which passes through the Marls into the water-bearing sandstones below.*

*But there is a circular area of water-bearing rock, having its centre on the canal side, half-a- mile west of Freeford, which is still untapped. A pumping station at this point, or in the neighbourhood of Trent Valley Station, might reasonably be expected to yield fully as much as that of Fradley.*

This was the trigger for the Company to start drilling two boreholes in August 1899 on a site adjacent to the premises of the Lichfield Brewery. Professor Lapworth's predictions were soon realised. In his report to the directors on 29 August 1901 the Engineer in Chief, Henry Ashton Hill stated: -

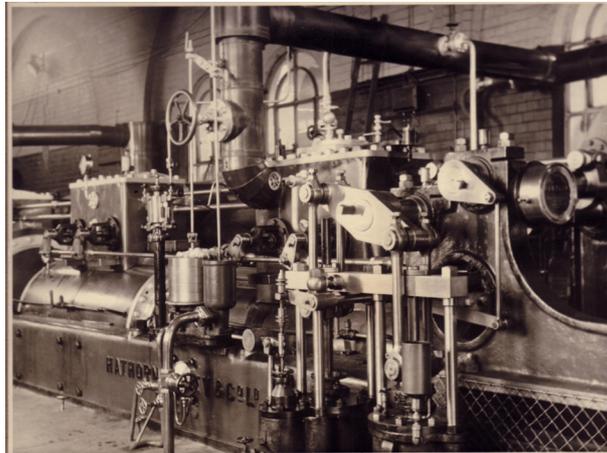
*“The engine at this station was started on the 10<sup>th</sup> inst. and we are now getting a million gallons per day”.*

Encouraged by this good yield instructions were issued in 1904 for drilling a further two boreholes these were completed in 1905.

The site selected for Trent Valley Pumping Station was an ideal location for two principal reasons. Following the acquisition of the Burton on Trent Waterworks in 1864, the Company had laid an 18” water main from Sandfields in Lichfield to Burton. This main was routed along the Burton Old Road alongside the new Pumping Station. From the outset therefore, the station was able to supply water to both Burton on Trent and to Walsall via Lichfield. The Lichfield Brewery already had railway sidings from the Trent Valley line these were extended to the rear of the pumping station to enable coal to be delivered for firing the boilers.

In 1899 the only choice for motive power to drive the pumps for raising water from the boreholes and delivering it into supply was steam. Although both the internal combustion engine and electric motor had been invented towards the end of the nineteenth century neither was developed sufficiently to drive pumps of the size required at Trent Valley. Indeed the Company would continue to use steam power well into the twentieth century, only decommissioning the last engine in the 1970's

The steam engines selected by Henry Ashton Hill were of the horizontal triple tandem differential surface condensing type. This was a relatively advanced design of engine in 1899 and the three (hence triple) cylinders operating together ensured that a high proportion of energy stored in the steam was converted to useful mechanical energy. The engines and pumps were manufactured by the Hathorn Davey Company of Leeds. This would eventually be absorbed by Sulzer Bros. who continued to supply the Company with pumps right through to the 1980s.



The two engines and boilers, for raising steam, were housed in a building erected by Thomas Lowe and Sons. Although not especially architecturally interesting, the station with its tall chimney stack remained a landmark for railway passengers travelling between Lichfield and Burton on Trent until Dr Beeching axed the service in the 1960s.

The station continued to operate on steam through to the late 1950s. By this time the engines were worn and in need of major remedial works, the boilers were also giving cause for concern. Electrification of the steam stations had commenced in 1936 with the conversion of the Bourne Vale station at Aldridge and Huntington at Cannock. This programme would continue to April 1972 when the last steam station, Maplebrook, was shut down in readiness for electrification. At Trent Valley a new building was erected to accommodate four vertical electrically driven Sulzer booster pumps and following removal of the steam driven bucket pumps from the four boreholes, electrosubmersible pumps were installed in their place. A new contact tank was built to ensure that the water was adequately sterilised by the addition of chlorine. The former steam engine house was used to accommodate a standby diesel generating set to provide electric power when the mains supply failed.

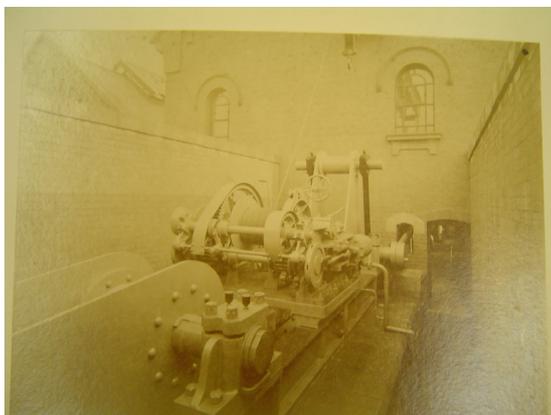
In the post war years the Company's chemists began to notice a steady increase in the level of nitrates in a number of its groundwater sources including Trent Valley. It was eventually realised that this was due to the intensive application of nitrate based

fertilizers to farmland, a practice which had been encouraged by government agencies since the 1940s. A World Health Organisation recommended that the nitrate level in drinking water supplies should not exceed 100 mg/l (which is equal to 100 parts per million). In the early 1980s this did not present the Company with any problems, however the European Union, somewhat arbitrarily, introduced a mandatory maximum admissible concentration of 50 mg/l. As some of the Company's sources already exceeded this level and others were rapidly approaching it, immediate action was necessary. At Trent Valley it was decided to adopt a blending arrangement, whereby water from this source would be pumped to the nearby Seedy Mill Treatment Works. Here Trent Valley water would be mixed with the larger volume at Seedy Mill thereby reducing the nitrate concentration and a similar amount of water would be pumped back to Trent Valley and into the existing 18" trunk mains. The capital works necessary for the scheme were carried out in two phases. Initially in 2002 two 500 mm diameter trunk mains were laid between Trent Valley and Seedy Mill. Then, in 2006 the four borehole pumps and control gear were replaced with units matched to the new duty.



Dave Smith Shuts Down Trent Valley booster pumps for the last time on 29 July 2002

The original construction cost of Trent Valley Pumping Station, including all the buildings, was £32,563. The cost to replace the pumping plant and control equipment one hundred years later was £482,000.



Boreholes 1 & 2 in 1906



Boreholes 1 & 2 in 2006