

Building the Western Valley Trunk Sewerage System

Introduction

In July, 1903, a Trunk Sewerage System was proposed and approved by Parliament to construct the Western Valley Sewerage System connecting valley communities from Beaufort and Nant y glo through Risca and Bassaleg to the Bristol Channel.

The trunk system was intended to be thirty five miles long requiring 12 inch diameter cast iron pipes at the head of the valley increasing to 2 feet 6 inches diameter at Newbridge and 2 feet 9 inches at Risca, where the pipes were to be built of brickwork and concrete. Where it had to cross the river it was made of steel pipes encased in concrete to protect it from erosion.

To prevent sewage flooding onto the fields at high tide each day the pipeline was to be much larger, at 11 feet diameter and three-quarters of a mile long so it could store the sewage until the tide ebbed. From this storage section onwards, cast iron pipes 3 feet 6 inches in diameter were to be used to the outfall (discharge point) below the bed of the Bristol Channel.

Purpose

Communities in the South Wales valleys grew rapidly during the 19th century as coalfields opened up offering employment to a workforce from former mining areas such as Somerset and the Forest of Dean.

In 1792 some 200 people lived in Risca rising to 1100 by 1842, in properties with no sanitation. As a result sewage waste and abattoir 'fluids' found their way into brooks and the rivers. Diseases such as diphtheria and cholera was widespread. A major cholera outbreak in July 1849 was a 'wake up call' but little was done. As late as October, 1910, an expert witness considered Risca brook to be '*a hot-bed of disease*'

Whilst the Gwent Valleys did little to resolve the problem one S Wales area did push forward; Pontypridd and Ystradfodwg formed a Joint Board and agreed to construct a 'trunk sewer' to the designs of Civil Engineers Geo Chatterton and Bazalgette, as early as 1889, with construction underway in May of that year.

A pipeline, stretching from Trehafod in Llanwonno Parish to the estuary at Rhymney

At the Luncheon following the laying of the first brick in May 1888, the Chairman Rev D. W. Williams told the assembled party:

'He could take them back to the days of his youth-50 years ago and more, for he was now 72—when there was no Taff Vale Railway going up the Rhondda when there was only one coalpit in the whole of the parish of Ystradyfodwg, when there were only four places of worship in that parish, and only four places where one could get a drop of plain beer. (Laughter and applause.) He remembered the time when the water came from Blaenrhondda to Pontypridd as clear as it started at its fountain head, and the people did not in those days require this great sewerage scheme.'

However after this was completed, Cardiff Council in Oct 1893 decide not to connect Cemetery Drainage into it; instead preferring it drain through the new Roath Park, as

"The pollution from the cemetery was more a matter of imagination than reality"

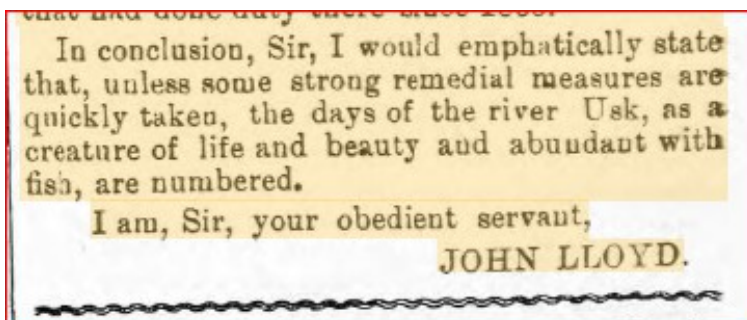
Better news the following year as Cardiff Rural Sanitary Authority do take advantage of it and connect around 8 miles of sewerage at a cost of £4,360 to serve the expanding area of Whitchurch.

Back to the Western Valley:

Monmouthshire County Council's Sanitary Review of 1900 noted:

'The sewage in most cases is discharged into the rivers and brooks, converting them, in the western portion of the County in particular, into open sewers'.

Regarding household waste it was recorded: *'In several districts [rubbish] tips are so near as to be a serious and dangerous nuisance, especially where the content of pail closets are deposited on the same tips.'*



Alderman P. W. Raffan, of Abercarn Urban District Council, giving evidence to the Parliamentary Select Committee, in 1903, reported that both Crumlin and Cwmcarn residents dispose of bucket

waste to such tips.

Despite the County Council having powers to prosecute for causing river pollution, it instead sought to get consent from local authorities to agree on a means of cleaning polluted rivers.

Funding for an inclusive sewerage system and to reduce pollution was now a major challenge.

In July, 1899, it is reported that the Sanitary Committee of Abertillery Urban District Council recommended that the medical officer and inspector of nuisances:

'be permitted to make experimental tests with one of the council's sewers respecting the purification of sewage, subject to the expenditure connected therewith not exceeding £5' -Mr C.W. Carpenter and Mr W. Thomas considered this as absurd, but they were the only ones to vote against the resolution. It is not subsequently reported what the results were!

Monmouthshire CC. persuaded the local Councils to meet to discuss a solution and as a result numerous Conferences were held at Abercarn council offices. Tredegar Council, as did Abertillery Council, in 1900, questioned the idea of the 'septic tank system, - but soon recognised they were putting off the inevitable.

In July, 1901, Risca Urban District Council confirmed that the Trunk Sewerage System was their preferred option to resolve the problem of escalating river pollution. At the next Conference all attending delegates agreed to the proposed System except one dissenter, Councillor Tilney of Abertillery, who again *'spoke in favour of the septic tank system'*.

During their July meeting, delegates once again agreed that the proposed Trunk Sewerage System scheme was the preferred and best solution, (by Beesley, Son and Nicholls, who were the initial engineers taken on at the sum of £50 to look at the solutions available).

This trunk sewer solution, in reality, was simply a much bigger way of moving the sewage downstream away from the centres of population. It does nothing to reduce the effect it has on the environment, it simply dilutes it.

However, a Royal Commission interim report into sewage disposal had been recently published so whilst the district councils discussed their proposed trunk schemes, the report suggested biological treatment was a solution in many locations.

Had this approach been adopted it would have meant constructing filter beds at various points throughout the valleys. This was discounted on the grounds of ongoing maintenance costs; valley floor space was already at a premium. Also of serious concern was the adverse effect industrial flows would have on the beneficial bacteria that were doing all the work of cleaning the water of its organic waste.

This biological treatment ('filter beds') would involve directing the sewage to large tanks where the organic waste would settle out, then the cleaner water would filter through layers of clinker, stone or blast furnace slag, where beneficial bacteria etc. would remove any remaining waste before cleaner water drained back into the river systems.

The detailed reporting of their Conference in the 'The Cardiff Times' of 17th August, 1901, records;

'Councillor W. Thomas, of Abertillery, was an advocate of the main trunk system, believing it to be the only effectual means of dealing with the sewage of the district, but still felt bound to ask for a little further time to consider the question.'

Further:

'that in Abertillery they were in a big difficulty with regard to their water works scheme, and water was quite as important as drainage. Incidentally he referred to the fact that the underground works were depleting the river of water.'

He was thus derided by Councillor G. Padfield (Risca):

'You find that you have not got enough water to send all your sewage down to Risca?'

Alderman Raffan, Abercarn, is quite vociferous in his approach to the Abertillery stance, reportedly saying that;

'Dr. Thompson, of the Local Government Board, in his report of 1896, when he said that there was a strong disinclination on the part of districts situated at the head of the valley to adopt any suitable measures of sewage disposal.'

All Abertillery seemed to wish to do was to inquire and inquire until Doomsday.'

Alderman Raffan pointed out that other districts might prosecute Abertillery council for polluting the river, and the Monmouthshire County Council might act upon their resolution asking a Local Government Board inspector to visit the district. He moved that Abertillery Council be asked to re-consider their decision:

Councillor Padfield seconded, but after several objections to his 'lecturing' and Abertillery's response, suggesting they could provide filter beds to stop their pollution, Ald. Raffan

withdrew his motion and the meeting broke up with a resolution to (yet another) delay for a further three months, effectively delaying the sewerage scheme another year as the proposal could not now get through Parliamentary timescales.

It was agreed to defer the scheme pending test of the bacterial system.

At the following monthly meeting of Abercarn District Council, with Alderman Raffan presiding, it was said:

"the sanitary condition of the district was a disgrace to the local governing bodies."

As late as March, 1902, the delegates, along with the trunk sewer designers, and Monmouthshire County Council representatives inspected a sewer system that Nantyglo & Blaina had recently installed, along similar lines to that used at Exeter.

This filter bed system served 240 houses, at a cost of £250 but Nicholls, the design engineer, advocating the trunk disposal line, made the point that this could not be scaled up to serve the valley communities as it did not deal with surface water and it was more expensive than the proposed trunk solution.

In August 1902, Monmouthshire County Council reviewed the sanitary conditions of the whole County. When the Sewerage scheme was discussed they agreed that they would make a deputation to the Local Government Board (who had the ultimate power to force the hand of the Councils to act) so that the necessary Bill would proceed to Parliament. This was necessary as the Councils had by now been meeting for a long time, with several pulling out which then put additional costs on those that remained.

The discussion that led to this approach to the Local Government Board was fractious;

Alderman G. R. Harris complained of the '*unparliamentarily language*' used in the report with reference to the Nantyglo and Blaina urban district.

The report said — "*We are afraid that nothing short of an earthquake or a volcano will have the effect of this district being put into a satisfactory sanitary condition.*"

Dr. Mulligan (who presented the Report) pointed out that the reported phrase was used by the local medical officer about his own district.

When other Councillors complained of the necessary increase in the rates that the Scheme would cost Alderman Raffan said the death-rate of the valleys was so appalling that no expenditure ought to stand in the way of remedying it.

However, a month earlier at their July 1902 Conference, delegates from Abertillery, Ebbw Vale, Abercarn and Risca had before them a draft Agreement and set of Plans to review.

With one amendment, Delegates agreed that construction should start at Cwmtillery and that this revised Agreement be in the name of Abercarn UDC until the board was formed. (The Abercarn clerk being Chairman of these Conferences could not be present at this meeting)

"It would be a bad compliment to their clerk for another place to have the credit of the name after all the work he had done"

On ratification by every council, the scheme was presented to Parliament in May, 1903, and, over several days, the various parties for and against the proposal were questioned by the Parliamentary Select Committee.

Objectors

Newport Harbour Commissioners expressed their concern regarding the volume of sewage that would '*flow back*' i.e. the sewage would be carried on high tide up the Usk estuary, to Newport. However, it was reported that a 'similar scheme' in Cardiff had no adverse effect. This being the Y & P mentioned earlier.

Nantyglo & Blaina Council opposed the Bill as they wished to go down the 'bacterial treatment' route having considered it as more cost effective.

Newport Borough Council (Convers Kirby, Borough Engineer) was concerned that despite the pipeline (outfall) being 'four feet underground' i.e. in the bed of the estuary, passing shipping could severely cause damage to it and that ship-owners would be held liable, thereby decreasing the attraction of the Port of Newport compared to Cardiff, Barry or Penarth. (as they were all in competition for trading goods into and out of S Wales, this pipeline was seen as risk that could be avoided by using another Port)

However, counsel acting for the promoters steered their way through many objections and in due course the committee chairman said:

"We are unanimously of opinion that the Bill should proceed. We decline to accept the suggestion that the pipe should be stopped at 800 yards." (the outfall end point in the estuary would now continue much further out into the estuary, just as the Engineers had designed)

Various amendments to clauses were then agreed, one of which was that owners of vessels should not be liable for damage in case of injury to the outfall pipe by vessels, except in cases of a wilful act or neglect.

Two months later in July, 1903, the Lords Committee approved the Bill, unopposed.

Tredegar Council had not joined the Scheme and in their subsequent August meeting they received correspondence from Monmouthshire C.C. confirming that river pollution of the Sirhowy must cease within a three year timescale. It was reported that Tredegar Members considered the sanitary condition of Tredegar was no worse than many others of the 27 districts in the county.' **Also, that the high death rate was due in part to the Town being a centre for tramps!**

Their Clerk brought them back to the point and advised them that the sewerage matter would have to be addressed.

Proposed sewerage system design.

The proposed sewage disposal system was designed to convey waste through ever increasing diameter pipes from the heads of the valley, south, and finally discharge into the Bristol Channel.

This can only happen at or after high tide, so that the effluent is then washed away down-channel and away from population centres and ports.

Careful consideration of system capacity and waste disposal was now of major consideration and concern should further councils wish to join the scheme in the future.

Importantly, the civil engineers advised that 'Rainwater' and 'Surfacewater' was to be excluded when the local sewerage is laid, as the trunk sewer was only big enough to take sewage flows.

Tredegar Council finally approved the scheme and their application to join the scheme was proposed and accepted in May, 1906, conditional to the additional expenditure incurred.

With official legislation and permissions now in place by October, 1904, Baldwin Latham and Chatterton, were appointed to design the scheme under the auspices of the Western Valleys Sewerage Board (WVSB). They replaced the initial design engineers (Beesley).

All western valley districts, under the three years pollution remedial notice, slowly, began negotiations with the Board with a view to inclusion in the scheme.

In October, 1904, Mynyddislwyn application was approved, but this required an additional seven miles of trunk from Risca North to Pont Cwm Corrwg, necessitating an additional Parliamentary Bill.

Contractor

In November, 1904, the Board agreed to employ single contractor. A contractual commitment was also to be made to employ local labour whenever possible.

The Board also agreed that it would be a three year commitment, which would give the districts time to carry out their own local schemes and planned connections to the sewerage system proposed.

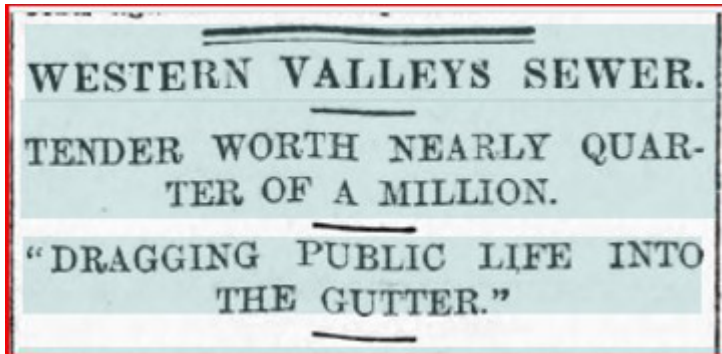
Choosing a contractor was no easy matter as twenty tenders were received and opened in May, 1905. A bid of £210,121 was received from Thomas Taylor of Pontypridd, and £194,682 from Firth & Co.; a York based company. The Board's recommendation was however to accept the higher Taylor bid and not the lowest one.

Both Abercarn and Ebbw Vale Councils voted against awarding the Contract to Taylor, but Abertillery Council narrowly voted to accept the Boards recommended Contractor.

Abertillery Councillor William Thomas, later followed by Councillors Jones and Pritchard, resigned from the Board as they could not accept voting for a higher tender.

However, this support for a higher Tender brought public rebuke for both the Board and Abertillery Council.

Tender approval took time and added to contract delays. The lowest bidder (Firth and Co.) decided to pull out of the bidding causing the Board to be, once again, ridiculed by the local Press.



Revised tenders were invited.

Despite this re-tendering process, in July, 1905, the Board still voted 13 to 6 to award the contract to Thomas Taylor of Pontypridd.

Signing the contract on the 28th August, 1906, the Board proposed three starting locations; Crumlin, Bassaleg and Risca, and on 4th Oct, 1905, that the formal sod-

cutting event was held at Risca.

Chairman of the Board, Ebbw Vale Councillor, Alfred Jones, performed the opening ceremony, stated *“This is a very important scheme I think we can say one of the most important ever taken in hand in this county as it deals with one of the most popular valleys in the country”*

He predicts that for such a large sum of money and higher rates there will be,

“better health and longer life”

A little later on talking about the decreased death rates in recent decades he points out that:

“Much of this is due to most stringent sanitary laws. Men are now hale and hearty at sixty years of age.”

He does however say more needs to be done in terms of adequate housing in these industrial areas,

“...after all it is almost useless putting people in new houses if you allow foul drains and bad smells to exist around them. It is no use having a flower garden in front if you allow a cesspool to be at the back door.”

Lunch followed at the Albert Hotel, Risca.

Work commences.

At the November, 1905, Board meeting the scheme’s civil engineer reported that *‘fair progress was being made’* and that delays at Risca were due to *‘experiments with cement’*. Consequently it is reported that they took on 24 men that month with 100 to follow shortly.

By Christmas of that year, 200 workmen were employed and *‘fair progress’* was being made at Pontymister and Cardiff Road. Some 200 yards of tunnel had been excavated at Bassaleg and the contractor promised the number of workmen employed would shortly rise to 1000.

January, 1906, brought adverse weather conditions which flooded the workings. Only a further 50 workmen were employed during this month.

The contractor starts work in three more locations and employs another 100 men at each site, namely: Crumlin, Llanhilleth and Abercarn.

The wet winter delayed progress despite reportedly having over 800 men working by March, 1906. Progress steadily improved in the drier months, with a mile of pipes being laid in a month. The contractor reported that the workforce rose to 1340 by June that year.

However work did not go '*without a hitch.*' as Councillor Alfred Jones had hoped on the 4th of October 1905.

At the end of March, 1906, workman John Brown lost his life at the Cardiff Road crusher (a powerful piece of equipment which reduces large lumps of rock to suitable size for use in the construction work) when a cart fell on him. In August that same year Thomas Edwards, a 50 year old site Inspector from Risca, died when a crane jib collapsed on him as he crouched over a trench as a pipe was being lowered.

The contractor was also expected to deal with all such compensation claims and negotiate directly with claimants individually, as per agreed contract.

Wet weather and the high water table, particularly in the tunnel section, costs him a considerable sum (£6,000) in coal for driving the pumping equipment.

It was reported that Lord Tredegar had previously planned to convert his fishpond to gardens due to siltation problems and lack of a water supply. However finding that engineer Taylor is pumping excess water away from the excavations, Lord Tredegar has pipes laid so that the water is drained to his fishpond and there it remains to this day.

Extensive work was required to lay the outfall pipeline, taking around 18 months, from January, 1907, until the summer of 1908. Here work was very slow as they could only work at low tide and the ground was thick marine silts and clays.

At the annual Western Valley Sewerage Board meeting held June, 1908, the large 11 feet diameter Bassaleg Tunnel is nearing completion and Alderman Raffan, a long-time supporter of the scheme, is appointed Chairman of the Board.

In August, 1908, the Board is advised the project is almost complete.

In that same month, Dr Rocyn Jones, Monmouthshire CC Medical Officer, in a published report comments on the appalling state of a local house in Lancaster Street, Abertillery, and that the following day, after the housewife has been given a warning, he sees the *vermin infested mattresses floating down the river!*...it's not just sewage in the River Ebbw at this time!

By December the contractors reported that the project was complete and an opening ceremony was arranged for January, 1909.

So on Wednesday 13th January, 1909, in pouring rain, a much reduced programme of visits to the works was conducted and after Chairman Raffan turned a large valve on Trunk Sewer located at Coedkernew. (this was probably one of the valves used to hold the flows in the Tunnel when the tide was low, but this would have been simply ceremonial as there would have been an empty pipeline at this point in time as no sewage had been connected).



Lunch was taken at the Tredegar Arms, Bassaleg, followed by customary speeches. The event was widely reported in the Press along with attached photo and schematic layout of the pipeline.

The report of the opening includes the scheme details as follows:-

Thirty-five miles of sewer had been laid in 3 years comprising:.

- 12" cast iron pipes at the head of the valleys increasing to
- 2'6" at Newbridge and
- 2'9" by the time it gets to Risca.
- The tidal storage tunnel is 3/4mile long, 11' in diameter and will hold
- 3,000,000 gallons against the tide.

Total cost: £300,000 to serve a population of 50 to 60,000.

Cutting from *The Weekly Mail*, 16th Jan 1909



Completion of this section of the Trunk was not the end for the Board

Initially Tredegar, Bedwellty and Mynyddislwyn districts, at the outset, decided not join the scheme.

To bring these areas into the trunk system additional Parliamentary legislation, was required.

Once in place the Board contracted Messrs W Underwood & Bros, (Dukinfield), for the sum of £66,519, in December, 1907, to construct the Sirhowy arm of the WVTS; a further 15 miles of trunk sewerage.

Subsidiary sewers also had to be connected to the trunk, requiring approvals and supervision by the Board's engineering staff.

In March, 1909, Abercarn U.D.C. sought approval for three miles of local sewerage at Celynen, Glyndwr, Newbridge and Abercarn, as did Rogerstone, whilst in Risca a connection was already underway at Station Road, though here the contractor ended up in Court as he was found to be letting groundwater into the Trunk Sewer.

By August, 1909, Ebbw Vale Council were seeking approval to borrow £28,850 for a local sewerage scheme to be connected to the trunk sewer.

The WVTS Board reported nine new connections during November, 1909, with a total of 44 connections reported to date.

Whilst connections were slowly being made to the Ebbw Trunk Sewer, the Sirhowy Scheme progressed well and in September, 1910, there was a 'completion ceremony' at Nine Mile Point, when an additional fifteen miles of trunk sewer was ready to serve the valley.

If you keep your eyes open it's still possible to come across references to the Western Valley Sewerage Board occasionally (WVSB)





Notes/Acknowledgments.

This article is done during 'Lockdown', solely from National Library of Wales website, <https://newspapers.library.wales/> and will require much further research at Gwent Archives when conditions permit.

Many thanks to Malcolm Johnson, OHHS Archivist for his review and revision of the original draft, along with permission to include his statistics on Risca population.

Also worth pointing out that Latham's initial design was to preclude groundwater and surface water run-off, but this didn't always happen. (hence the Risca Contractor ending up in court)

As a result this Trunk sewer became overloaded at certain times and much later on it was duplicated locally, to resolve the issues. (Contractor: Dobbies, in late 50's/early 60's? tbc)

This original Trunk construction detailed here was referred to as the 'Old Western Valley Trunk' and the later scheme the 'New Western Valley Trunk' by operational staff.

A similar Trunk was later completed to serve the Rhymney Valley and it along with the WVTS was diverted by 2000 to a major new treatment works on Rover Way, Cardiff.

The Board ceased to exist only on 1st April, 1974, when the Water Authorities were formed, with employees choosing to transfer to the new organisation or the Local Authorities.