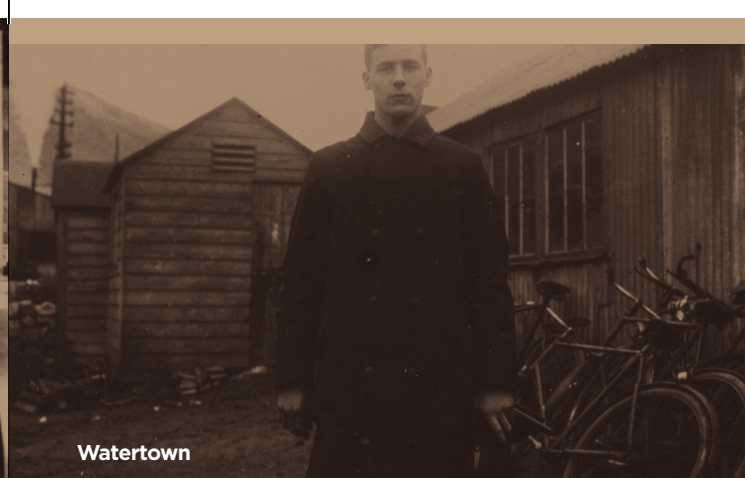




Mourne Wall



Power Station



Watertown



Cut off trench shafts

## The Silent Valley Scheme

Mr. Luke Livingston Macassey, Consultant Civil Engineer, who was local to Northern Ireland, was asked in 1891 by the Belfast City and District Water Commissioners (BCDWC) to find a future source of water for Belfast. He recommended the Mournes with a supply drawn from the Kilkeel and Annalong Rivers and a storage reservoir to be built later in the Silent Valley. The Mournes were chosen because of the quantity of water available and its purity.

Mr. Frederick William McCullough, Chief Engineer to BCDWC, drew up the design for Silent Valley Reservoir, but died before it was completed. Later Mr. McCullough's son, Mr. Richard Hamilton McCullough, also became Chief Engineer to the BCDWC.

### Stage 01 1893-1905

Purchase 9,000 acres (3,600 ha) of "water catchment area" in the Mourne Mountains and build a 22 mile (35km) boundary wall.

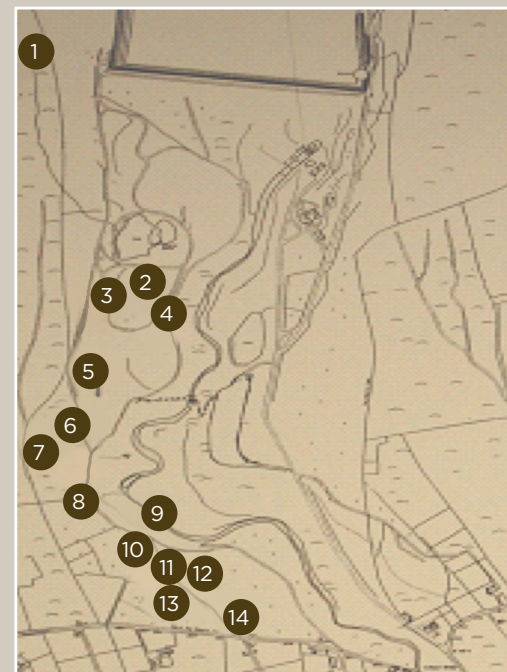
Divert water from Kilkeel and Annalong Rivers and convey it 35 miles (57km), via conduits, tunnels and pipelines to a new holding reservoir at Knockbracken, near Belfast.

## The Mourne Wall

In 1904 work began on the building of the famous Mourne Wall to define the boundary of the 9,000 acres (3,600 ha) catchment area. It stands 3m high and 1m wide, stretching for 22 miles (35km) and runs over the 17 peaks in the Mourne mountains.

- Work was carried out during April to October providing employment to men in the area skilled in the granite cutting craft.
- Work finished in 1922 taking 18 years to build. It is said to be, "a monument to the skill of the men who built it."
- The wall is a listed monument.

## Map of Watertown



- |   |  |
|---|--|
| 1. Quarry                                     | 8. Offices                               |
| 2. Steam Turbines (Electricity Generators)    | 9. Narrow Gauge Railway line to Annalong |
| 3. Inspection Pits for Steam Engines          | 10. Workers' Houses                      |
| 4. Pug Mill where puddling clay was ground-up | 11. Tennis Court                         |
| 5. Platforms for trains                       | 12. Shops                                |
| 6. Workshops                                  | 13. Recreation Hall                      |
| 7. Narrow Gauge Railway up to Quarry          | 14. Original Entrance                    |

## Watertown

- Built on the western side of the valley along the "Back Road".
- Many workers were local - carpenters, electricians, plumbers, engineers.
- Home to 600-700 people, it developed into a well planned small pioneering town.
- A total of over 2,000 people lived here.
- Wooden houses held accommodation - houses for families, foremen and dormitories for single men. At the end of the construction the houses in 'Watertown' were sold off.
- Women kept lodgers, eg **Mrs Collins** housed 12 men who slept in one room.
- Women made porridge, left it outside overnight and cut it into slices for the workers lunch or "piece" as it was known.
- A small hospital with a doctor and a nurse catered for the sick.
- A recreation hall accommodated dances, boxing, snooker competitions and acted as a "silent movie" cinema.
- **Hugh Fitzsimons** was the manager of the social club in Watertown and his son Benny grew up there with most of his brothers and his sister.
- Shops ranged from grocery and hardware to boot mender.
- A blue van, the "Tin Lizzie" would take people to Kilkeel on Fridays and Saturdays for any extra stocks they needed.
- Supplies of fresh milk, provided daily, **Kathleen Rooney** rode her bicycle strapped with two big cans of milk.
- A generator provided the first street lights in Ireland - original vacuum lamps.

### Stage 02 1923-1933

Construction of Silent Valley, an impounding storage reservoir, with a capacity of 3,000 million gallons (13620 million litres).

## The dam cut off trench

- In an earth filled dam a cut off trench is required below the dam to prevent water from seeping under the dam and undermining it.
- Two critical problems were encountered during the excavation of the dam trench at Silent Valley:
  - (1) the subsoil was unstable wet silt
  - (2) the solid bedrock which was originally hoped to be found at 15m, was not found until a maximum depth of 60m was reached. The initial tests hit large boulders which were found to have been brought from Scottish glaciations.
- **Sir Ernest Moir**, the Senior Director for Pearson Ltd., decided to dig the trench by working in compressed air. The contract was renegotiated and work continued.
- Shafts, lined with cast iron, were sunk into the ground 11m apart by working in compressed air. Using the shafts the water was then pumped out from the waterlogged silt. The shafts were connected by a trench which was then filled with concrete.
- A specially made air lock "the Gazoon" was used to de-climatise the men from compressed air and so avoid "the bends".

NI Water would like to acknowledge its partners in this project.



The European Agricultural Fund for Rural Development: Europe investing in rural areas

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## Life and Times at Silent Valley

### The embankment

Above the dam trench, a watertight corewall of “puddle clay” was painstakingly built up layer by layer to prevent seepage of water through the dam. The embankment slopes were then completed with “graded rockfill”, soil and grass layered on top, with a granite block surface to the reservoir side.

#### The workers had a sense of purpose and pride in their jobs and a few nicknames tell the story:

**John Burden** - ‘Johnny the Hut’ built himself a lamp shaped like a hut to light his way home through the mountains after dark.

**Jimmy McKibben** - ‘The Clay Hog’ worked as a “clay puddler” on the embankment wall. This involved marching up and down pressing the air bubbles out of sticky clay to make it waterproof. Men were issued with a pint of linseed oil per day to prevent their boots sticking in the clay.

**Dozer Nolan** - ‘Dozer’ worked as a “nipper” on the steam engines, he once wired a chap’s tin tea mug up to a live cable for a joke.

**Dan Dooley** - the crane driver who set records for his speed and skill at working the steam excavator.

**Constable Lawless** - kept law and order.

### Stage 03 1949-1958

Build 4km tunnel - Slieve Bignian Tunnel - through Slieve Bignian Mountain to divert the water from the Annalong River into Silent Valley.

Build Ben Crom Reservoir further upstream of Silent Valley.

### Bignian Tunnel

- The tunnel linking Annalong River with the Silent Valley Reservoir through Bignian Mountain, took 4 years to build, using power drills and simple chisels.
- It is 4km long, 2m high and 2.4m in width.
- It can carry up to 90 million gallons (409 million litres) of water per day into Silent Valley.
- The tunnel was built by Messrs A.M. Carmichael, Edinburgh. Two assistant BCDWC engineers who worked on the Bignian Tunnel were **Harold McCaughan and Norman Ervine**. Two groups worked towards the tunnel’s completion, working from either side of the mountain: one from Annalong, the other from Silent Valley. They met in the middle, only 5cm apart.
- **Sam McMurray’s** job was to record the levels of the contour lines of the surrounding land from Silent Valley to Dunnywater. This determined the height of the two tunnel mouths.
- At the tunnel mouth near the head of the Valley an electric pump ran to keep the works from being flooded.

#### Quotes from the workers of the Bignian Tunnel

*I remember my father left home in Ballykeel at 4.30am each morning to cycle 4 miles to the “Valley” gates. They were all on a day shift, so for 6 months a year the only time they saw daylight was on a Sunday.*

**Robert Newell**

*A great attraction to work on the tunnel was that the pay was around half a crown an hour which was 3 pence more than local quarrying work paid. Although some of us stuck with the job for its entire duration, many men only stayed a few weeks or even days, unable to put up with the heavy work and awful conditions.*

**Sandy Heaney (Shift Boss)**

*I put the first hole that brought daylight between the two sides. I drilled that hole...there was about an inch and a half between mine and the hole from the other side.*

**Willy Davy (Shift Boss)**

*I didn’t stand in to the siding when the first shot went off and I was blown this way and that...all over the place. The blast force was tremendous. By God I stood into the side the next time.*

**Bobby Davy (Spanner)**

*Even an hour after the blast you could hardly see or breathe for the “stour”. We were spitting diesel and dynamite for weeks. The only fresh air you got was what came down the tunnel.*

**Tom Newell (Electrician)**

*About half way in we ran into flowing sand. It was unbelievable... who’d have thought in the middle of a mountain you’d have found running sand? That was a major set back that was to hold us up by 6 months.*

**Harold McCaughan (Engineer)**

### Ben Crom Reservoir

In 1954, 5km upstream from Silent Valley, work started on a new reservoir and took 3 years to complete. Unlike Silent Valley, it had a core of mass concrete and huge boulders and was founded on solid rock. It is known as gravity dam i.e. it depends on its weight for stability.

### Deaths during the Construction of Silent Valley

1. **Hugh Quinn**
2. **William Forsythe**
3. **George Phillips**
4. **Jimmy Baines**
5. **Sam Cooke**
6. **Michael (Mick) Synnott** was killed in 1925 when the steam-crane he was driving overturned. Mick pushed his workmate out the side of the crane, saving his life.
7. **John Cousins** died walking between two stationary wagons when a locomotive moved them.
8. **John Murphy** was killed in August 1929 (18 years) in a tunnel collapse.

- Construction of Ben Crom**
9. **Jim Moore**

