Chapter 11

MORDEN MINE Historic Park

The single most dangerous action you can take on this tour is failing to pay attention while travelling on the route. Do NOT read the following chapter while actively moving by vehicle, car, foot, bike, or boat.

MORDEN MINE Walking Tour

Mike Laroque, Treasurer, The Friends of Morden Mine & **Simon Priest**, local resident/student of history

This walking tour is short (about 0.5 Km), but is packed full of mining history. If you want to extend your exercise, you can walk the old railway grade (+2 Km) from the mine to the Nanaimo River and back. By 2022, bridges should connect this trail to the village of Cedar and beyond to Hemer Provincial Park.

Coal was mined here from 1912 to 1921 and transported via rail to ships waiting in Boat Harbour to the south east. Ships took the coal to Vancouver, Seattle, and San Francisco, where it was burned for heat and steam to power electrical generators, train locomotives, and steamships. By the Second World War, coal was replaced by petroleum products like gasoline and oil. After that, coal mining in the Nanaimo Region dropped off dramatically and the industry was replaced by forestry and timber harvesting.

Morden Colliery (coal mining and sorting operation) circa 1916

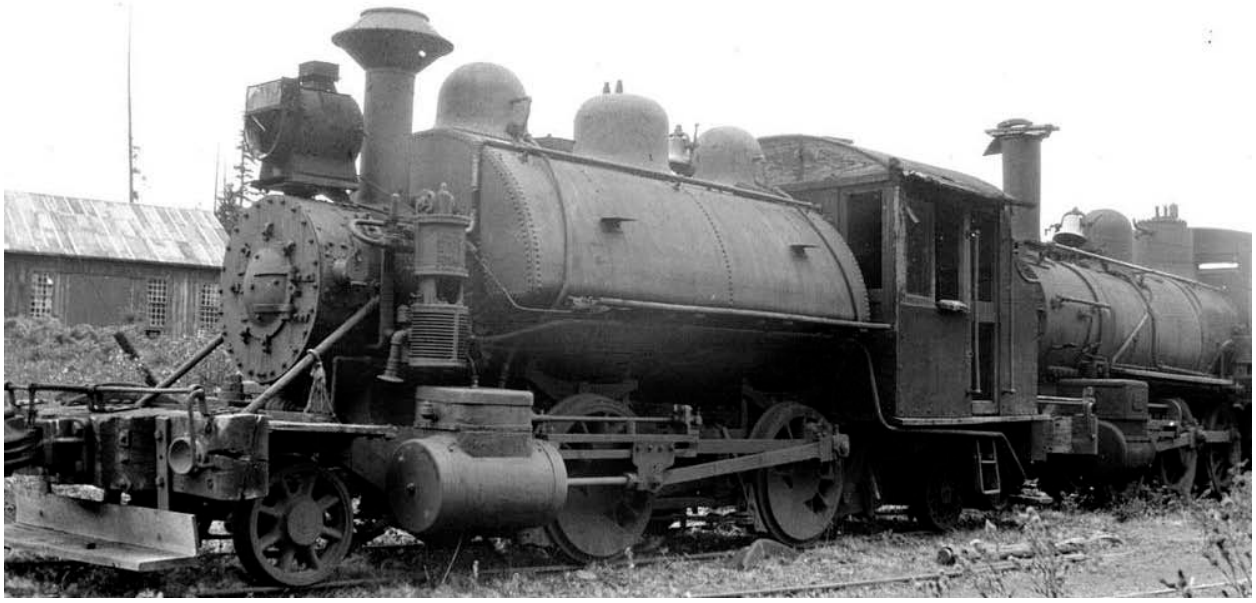
This colliery was operated by Pacific Coast Coal Mines and immediately upon locating the major seam, the mine was shut down by the Miner's Strike of 1913. The shafts flooded with water seeping in from the nearby Nanaimo River. During the shutdown, the mine was retrofitted with state of the art facilities, including the concrete headframe and tipple that you see today, making this one of the most advanced mines in Canada at that time. Today, it is the only remaining tipple on Vancouver Island and the only cement headframe in Canada. Cement headframes are also found in the USA, South Africa, and Europe.

Colliery operations here were extremely modern for their times, built of fire-proof concrete and run by electricity generated from a coal fired boiler. However, with the capacity to extract and process up to 1500 tons/shift (with 2 or 3 shifts/day), it operated at or well below 200 tons/shift due to the poor quality of coal found underground at the far eastern limit of the Douglas Coal Seam.

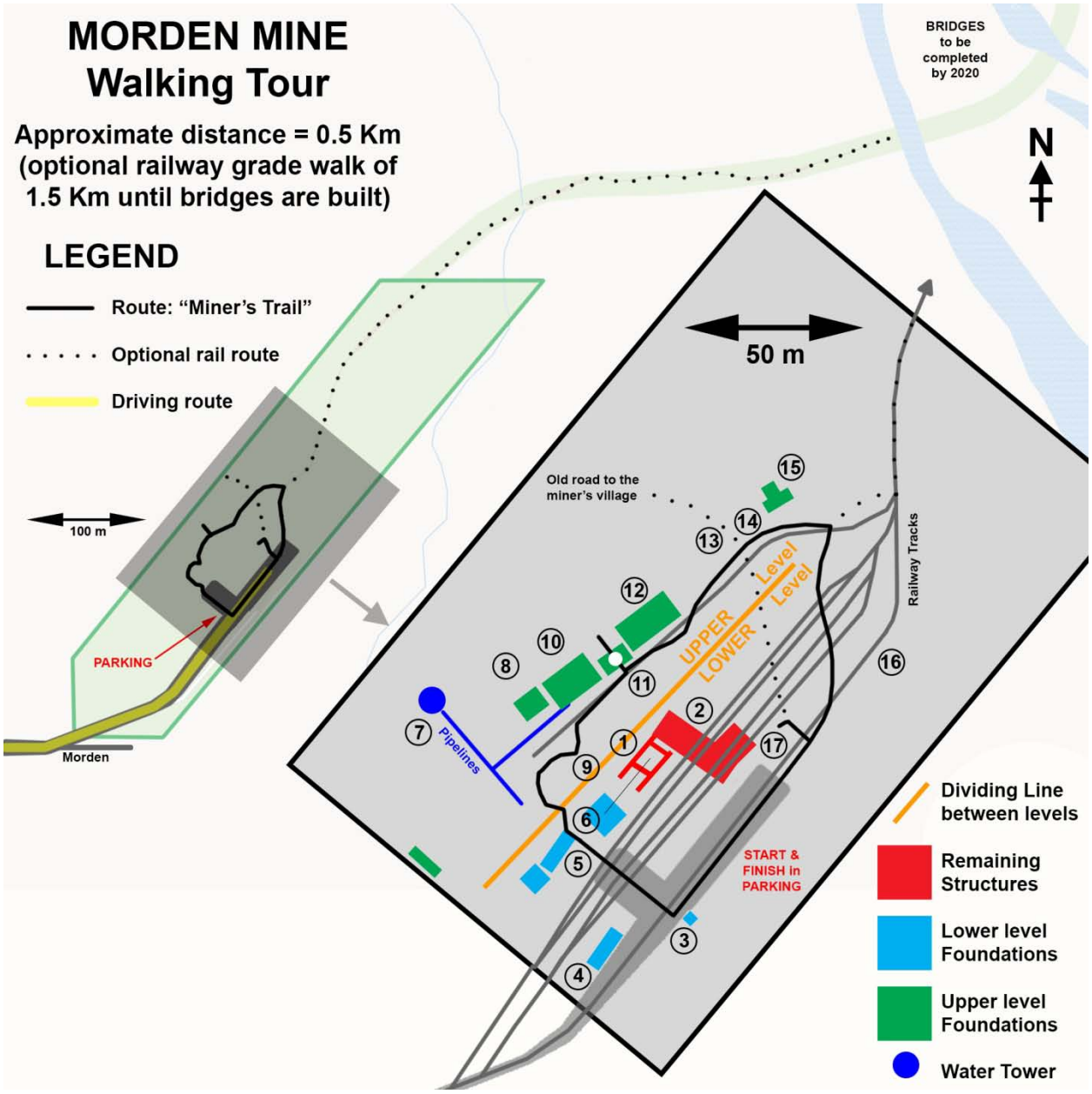
Boat Harbour Wharf for Pacific Coast Coal Mines in 1916

Unable to access Nanaimo Harbour, due to the monopoly of other companies, sorted coal was transported by a special railway, built in 1917, through Cedar Valley farmlands, to the nearest water at Boat Harbour. PCCM invested considerable funds in developing a modern transfer facility at Boat Harbour. They built several bunkers that could temporarily hold up to 5000 tons of coal each. Coal was dumped into the bunkers from the rail cars. A one metre wide rubber conveyor belt was used to move coal from the bunkers to the ships. It could vary its height to handle any type of ship under any level of tide. An optional coal washing structure was also added with water supplied from Holden Lake.

PCCM fully expected the Morden Mine and Colliery to produce abundant coal. However, the coal was sparse and of poor quality. The mine closed in 1921, with a brief and disappointing attempt to pump out flooded tunnels and restart in 1930. Cave-ins and rock insecurity led to its eventual abandonment, but a resilient concrete headframe was preserved. Unfortunately, the quality of the cement used was poor, it was inconsistently mixed, and it has begun to crumble after 100 years of weathering. Recent restoration work has been undertaken and is scheduled to be completed after 2020.



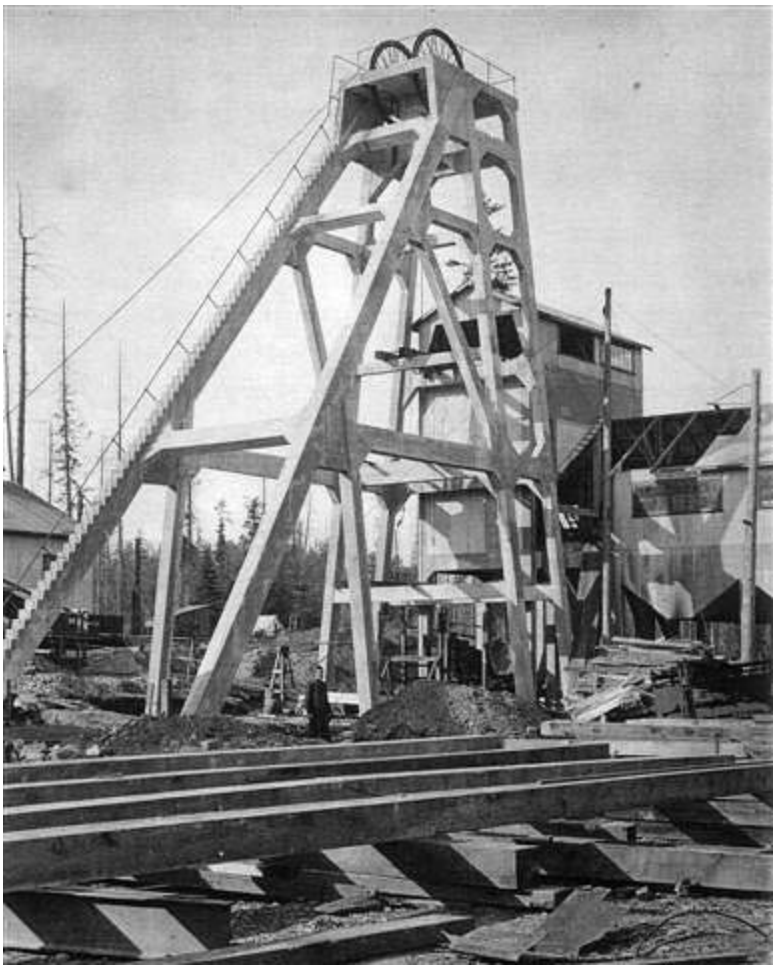
No. 2 locomotive abandoned after Morden Mine closed, circa 1929



THE TOUR

Start in the parking lot for Morden Mine Provincial Park. This used to be the main railway line to Boat Harbour. Directly ahead of you are two large imposing cement structures. The taller one on the left is the headframe (#1), used to raise buckets of coal from the mine underground. The shorter one on the right is the tipple (#2), where extracted coal was poured into railcars waiting underneath on tracks.

The cement was brought from limestone quarries at either Bamberton or Brentwood on the shores of the Saanich Inlet and 400 cubic metres (500 cubic yards) were used to build the headframe and tipple.



The reinforced concrete headframe, circa 1917

1. **Headframe**: The headframe is the A-shaped, reinforced concrete structure that supported a pulley at the top. A cable lowered and raised a suspended skip (wooden cage elevator) inside the mine shaft. The cable ran over the pulley and down to a winch in the winch house. When a skip full of coal was hoisted to the top of the headframe, it was "tipped" and its contents, up to a ton of coal, were poured into the nearby "tipple" or sorting facility. The tower, built in 1913, is 23m (75') tall.

   Beneath it, the shaft is 3 metres (9') by 5 metres (16') and was sunk 180 metres (600') to reach the Douglas coal seam in 1912. At this depth, the coal seam is about 2.5 kilometres (1.5 miles) wide and about 2.5 metres (8') in height, but the seam grows to about 9 metres (30') in height in some areas.

The reinforced concrete tipple, circa 1915

2. **Tipple**: Once in the tipple, coal was sifted through screens into different sizes and dropped directly underneath into one of four rail carriages waiting on the tracks below. The four carriages were assembled into a train on the through rail line (where the parking lot is today), then the train went down the main tracks to Boat Harbour along what is now the Morden Colliery Trail (optional walk).

The types of screens used in this tipple were 1.5 metre (5') by 20 metre (66') Marcus screens. The Marcus was a unique screen from England that shook in a random pattern and caused coal chunks to rapidly roll across it, thus not clogging the screen, while efficiently separating the chunks by size. Due to the Marcus screen vibration, each required mounting on concrete rather than wood frames.

Walk left toward the park entrance. On your left is the position where the supply warehouse (#3) once stood. Bend right continuing through the L-shaped parking lot. On your left from here is the position of the lamp house (#4). A first aid and rescue hut once stood on the hill above this, near the water tower.

Supply warehouse on far right (photo taken from today's park access road), circa 1920

3. **Supply warehouse**: A small shack beside the railway contained materials and tools for maintaining the mine and railroad tracks. Today, nothing remains, but in its heyday, the supply warehouse would have held an inventory of shoring timbers, electrical wiring, and spare parts for machinery.

Lamp house on far left (photo taken from today's park access road), circa 1920

4. **Lamp house**: Light is necessary to work in the obvious darkness of a coal mine. The lamp house was an essential part of everyday life for each miner. They had to stop at the lamp house on their way into and out of the mine. They would exchange a token with their name and/or payroll number for a lamp to be used underground. This token system enabled tracking of miners in the event of a large accident. While exchanging before and after their shifts, the miners would socialize outside.

Enter the "Miner's Trail and immediately stop at the cement block on your left, the capped opening of the secondary shaft (#5), and the ruined foundations on your right, the primary winch house (#6).

Both headframes and both winch houses for the primary and secondary shafts, circa 1920

5. **Secondary shaft**: Today, a large cement block sits atop what was once the second mine shaft. It was sunk to accelerate the removal of coal during a time of high production in 1912. This second shaft was smaller than the first with dimensions of 3 metres (9') by 4 metres (12'), but also 180 metres (600') deep. However, when production decreased by 1917, inspectors noted a high prevalence of coal dust, and this shaft was used to improve airflow throughout the mine.

   Therefore, sitting atop this secondary shaft (now a cement platform) would have been the fan house with its giant ventilation fan blowing air into the mine. The foundation you see behind the capped shaft is the ruin of the secondary winch house that was operated only in emergencies, when the primary shaft was blocked or occupied and access had to be through this secondary shaft. Since the framehead for this secondary shaft was built from wood, and not cement like the primary shaft, this wooden framehead quickly decomposed after closing and had collapsed by the end of World War II.

Winch house on far left, showing double cables and dual pulleys atop headframe, circa 1929

6. **Primary winch house**: The ruins here once contained a pair of giant spools, powered by an electric winding engine. The spools would wind double cables, running to dual pulleys atop the headframe, and thus were essential to raise and lower the skip (elevator) within the primary mine shaft.

Continue on the Miner's Trail, uphill from the lower level to the upper level of the mine site. Stop at the top of the short hill, when you see a stanchion: a cement block with a notch on top where a pipeline was held to carry water from the water tower (#7) to wash coal. Look right to see a second fallen stanchion, that supported a branch line supplying water past the power house (#8) into the boiler house (#10).

Water tower on hill above the mine (building in front of water tower is first aid), circa 1920

7. **Water tower**: The clearing at the top of the hill once held an 80' (25 metre) high water tower with a capacity of 10,000 gallons (37,850 litres). The tank for this tower came from dismantling the water tower in South Wellington in 1919. This tower was built from scratch using local timbers and the tank was reassembled atop the new structure that same year.

Powerhouse (boiler house, smokestack and machine shops behind) linked to winch house, circa 1920

8. **Power house**: Water was heated in the nearby boiler house (#10) to produce steam that turned a turbine connected by an axle to an electrical generator here in the power house. The electricity created by the steam turning the turbine was used to power most of the operations at the mine.

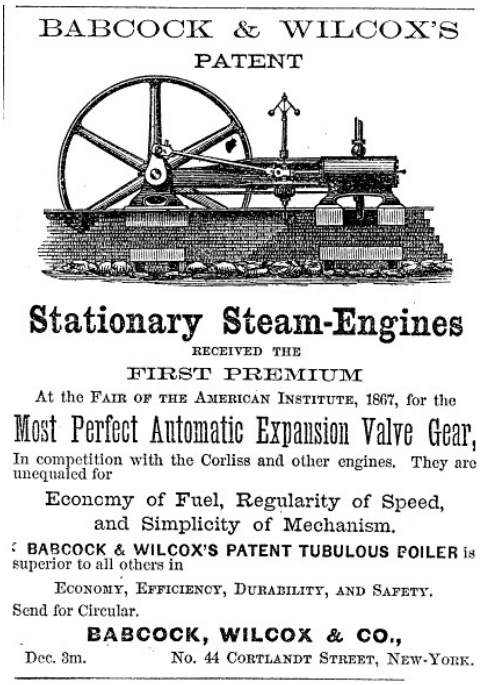
Cross to the other side of the trail for a viewpoint (#9) of the headframe (#1) and tipple (#2), then cross back onto the continuing trail for the boiler house (#10), smoke stack (#11) and machine shops (#12). Walk under the smokestack to view foundation walls, the boiler house (#10), the smoke stack (#11), and the machine shop (#12) from a different angle. Return to the main trail when ready to continue.

Overview of entire mine site, circa 1920 (viewpoint would be at centre of building cluster)

9. **Viewpoint**: This site provides a nice look over the headframe and tipple for a different perspective. The nearby plaque commemorates the 100 year anniversary of Morden Mine. Started in 1913, its centenary was celebrated here in 2013.

Boiler of the type \ used at Morden Colliery to produce steam

10. **Boiler house**: Three 150-horse power boilers sat atop cement bases and were stabilized by bolting them to the threaded rods that still show. Each boiler was an oven through which multiple pipes ran. Water in the pipes was converted to steam by fire in the oven. This steam ran a turbine that connected to the powerhouse. A generator at the other end produced electricity to run everything on site. Smoke from the fires and any excess steam were vented through the smokestack.



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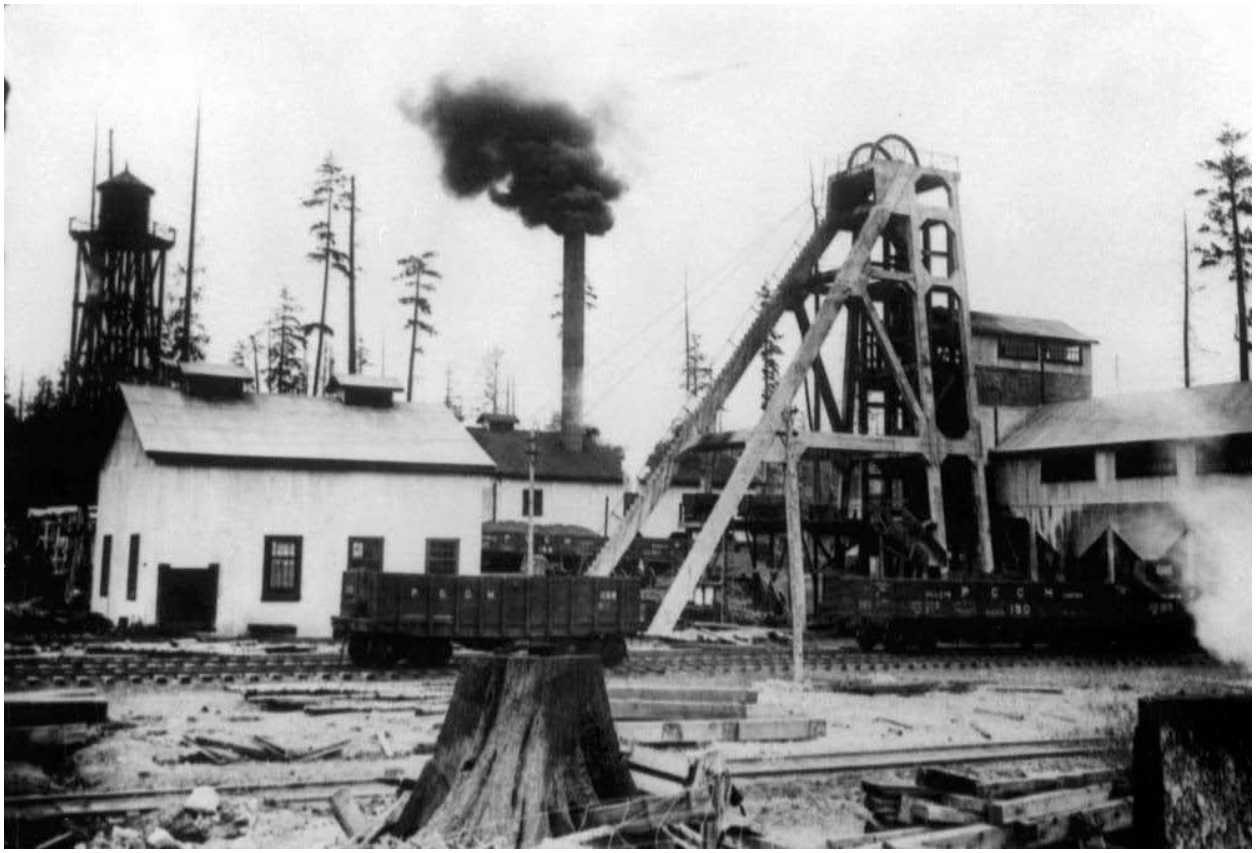


Smokestack can be seen in the background between the winch house and headframe, date unknown

11. **Smokestack**: An impressive concrete archway that formed the base of a 60’ (18 metre) high and 5.5’ (1.67m) wide smokestack still remains. A second smokestack was added, but only lasted two years. Emblazoned with the initials PCCM (for Pacific Coast Coal Mines) and the construction date of AD 1913, the archway supported a smokestack that would have been much taller than any of the trees.

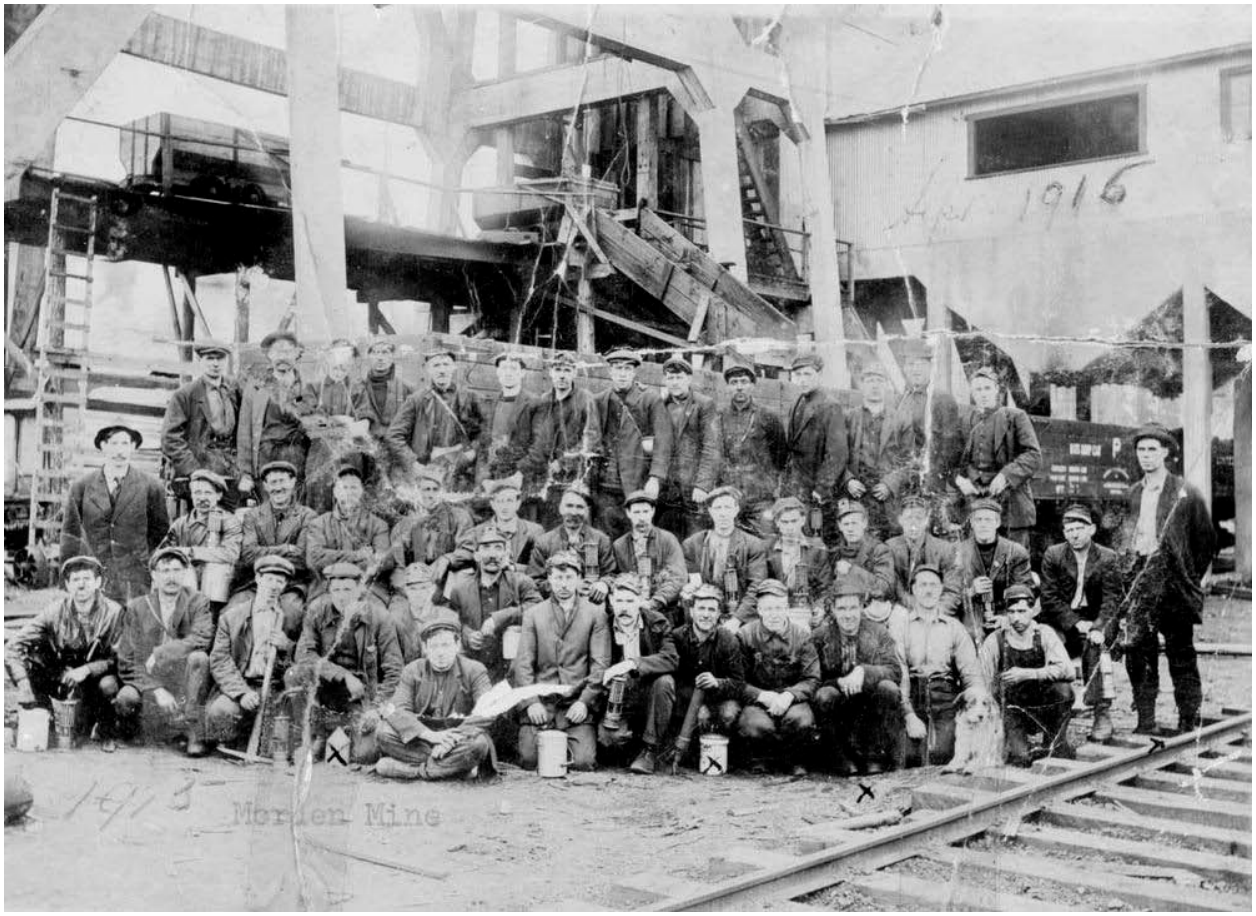
Remaining PCCM Archway in 2000.

Tipple from other side, showing machine shops on right with smokestack behind, circa 1920.

12. **Machine shop**: The repair and manufacturing of mining machinery and tools was carried out here in a combination of the carpentry (wood shop) and the blacksmith's (metal shop). The carpenter would have been responsible for repairing coal carts, constructing buildings, and preparing timbers for railway ties or shoring up the mine. The miners would be the ones to actually place the shoring timbers so that these supported the roof of the tunnels and chambers. They had to be certain that the supports were secure and could withstand deliberate explosions and accidental flood waters.

    The blacksmith would be responsible for repairing rails, constructing tools, inspecting cables, and would have a constant supply of coal for his forge. At least one electrician would also have been present to replace wiring and repair electric motors or generators. Additionally, a machinist might have specialized in fixing the various machines around camp and in the coal mine.

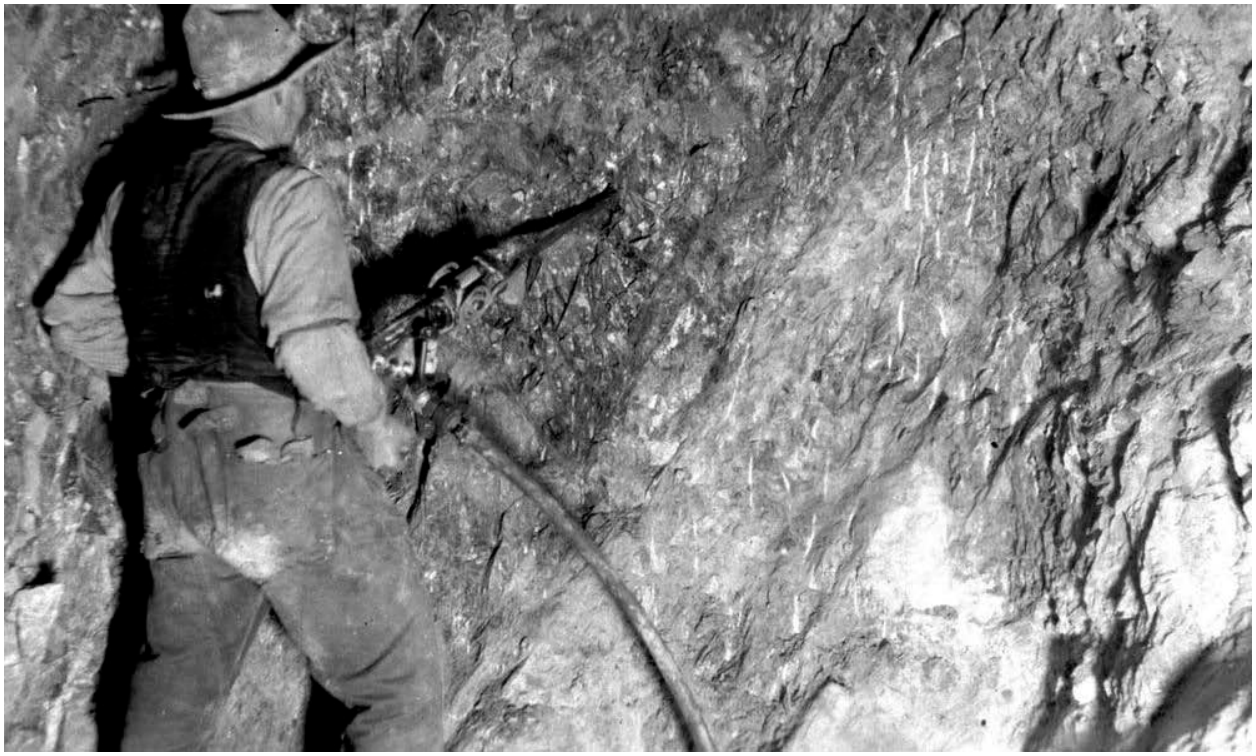
Continue on the main trail, this was once a railway spur line, ending at the pipelines in front of the water tower. Cross the old road bed (#13), pass the equipment shed (#14), and stop at the powder house (#15).



A shift of Miners gathered at Morden Colliery, circa 1915

13. **Old road bed**: The old road you are crossing connected the mine (downhill, right) with the miner's village (uphill, left). This village was known as South Wellington, named to capitalize on the high quality Wellington brand of coal found north of Nanaimo. At one time, over 400 people occupied the village and either worked in the mine directly or indirectly supported the miner's with food, goods, and services. The village contained several boarding houses, numerous miner cottages, shops and recreation halls. Other miners lived in nearby South Wellington and worked the mines near there: Fiddick, Richardson, Alexandria, and South Wellington No. 5 and No. 10 Shafts.

    By 1919, fourteen married miner cabins, two eight-room manager houses, and a boarding house for 32 single miners had been moved here from nearby South Wellington. The mine had its own town.



Working underground with a percussive drill, circa 1920.

14. **Equipment Shed**: These cement bases were the storage sheds for dedicated mining equipment such as percussive drills. Most of the time, soft coal was mined at the working face of a tunnel by hand, using pick axe and shovel. Occasionally, very hard rock would be encountered and drilling, followed by blasting, would be necessary. In order to create a deep bore hole for the explosives, a percussive drill that hammered the drill bit into the rock was used by the "borer" or driller. The percussive hammering action was created using compressed air. The air was compressed by an air compactor running off the steam-driven electrical supply from the power house. An air hose ran down the mine shaft and through the tunnel to the drill at the working coal face. Packed puffs of air caused the drill to vibrate and penetrate the rock. Pneumatic rotary drills were used in later years.

    This specialized gear was stored nearby, but separate from, the explosives (#15). The area behind here was the sawdust dump, where debris and unused materials were discarded across the road from the carpentry and blacksmith's in the machine shop (#12).

Remains of powder house, where explosives were stored.

15. **Powder house**: Explosives such as dynamite and black powder were stored in this T-shaped structure. Note the notches in the walls facing one another. Timbers were inserted here to form storage shelves that kept the explosives off the wet ground.

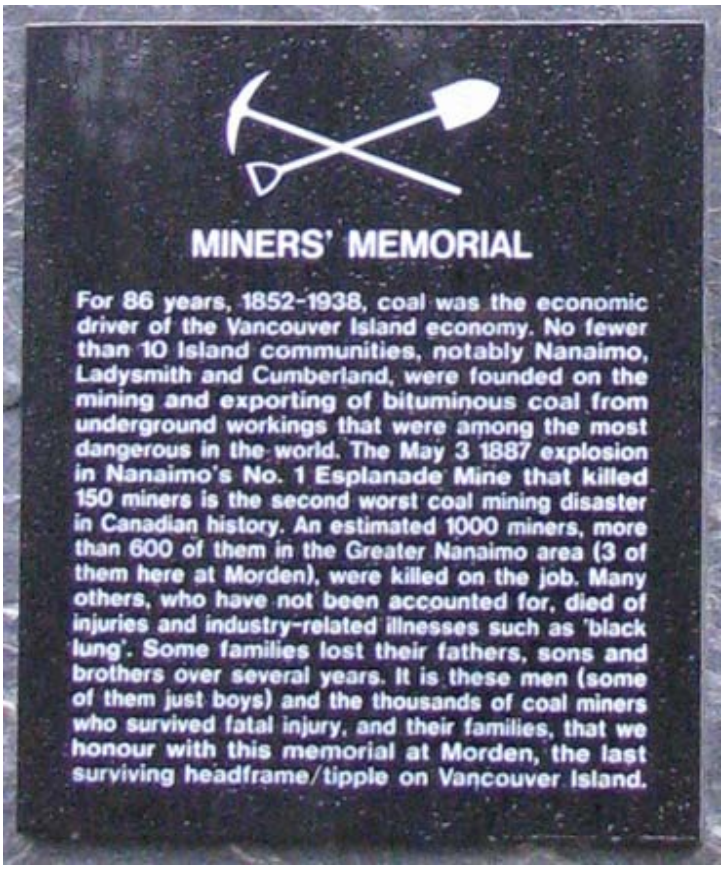
    A "shotfirer" would be accountable for the storage and use of explosives. Underground, this meant placing explosives in the holes that were drilled, priming the explosives with a fuse or detonation method, and checking to ensure everyone was out of harm's way before and after the explosion.

    Use of dynamite and black powder would become extremely dangerous when certain gases or coal dust were present in the mine tunnels. Aside from the Canary in a cage (used in coal mining until the advent of detectors in 1968), air pressure was closely monitored. A high pressure in the tunnels meant that the gases were less likely to escape than when the air pressure dropped to low levels.

Follow the main trail gently downhill to the T-junction with the Morden Colliery Regional Trail. A left turn would lead to the Nanaimo River via nature displays, footbridges, and remnants of the railway that once led to Boat Harbour. If you are not interested in this longer (1.5Km) hike, turn right and return past the railway junctions and garbage dump (#16) to finish at the Miner's Memorial (#17) by the parking lot.

Morden Mine in 1976, a few years after becoming a provincial historical park.

16. **Garbage dump**: As you walk back toward the parking lot, you cross the rail yard, where all the tracks were switched onto separate lines going under the tipple. On the other side of these tracks, mostly on private land, was where the miners put their garbage. Little remains of this dump today, since the garbage was removed well before the land acquired park status in 1972. Assorted small debris piles or ore (also called coal tailings) can also be found throughout the forest here.



Miner's memorial added in 2017

17. **Miner's Memorial**: Coal mining was, and still is, a dangerous job. An estimated 1000 Vancouver Island miner's lost their lives in minor accidents and major tragedies. A full 60% were killed in Nanaimo alone. This memorial honours those fatalities, the survivors, and their families.

Back at the parking lot, take another look at the headframe and tipple before driving onward. Imagine what life was like working above and underground over a hundred years ago!