

East Portal

National Park Service
U.S. Department of the Interior

Black Canyon of the Gunnison National Park
Curecanti National Recreation Area



Workers pause for a photograph before entering the tunnel for another day's labor.

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Water is Life

Water is life: a simple concept; but in the arid west, settlers could not rely on rain to supply water to nourish their fields. The community at East Portal brought together people of various skills and backgrounds to construct a tunnel that would transfer a portion of the Gunnison River water to the fields of the Uncompahgre Valley to the west. Their labors from 1905 to 1909 drove a tunnel 11 feet by 12 feet six miles through the cliffs of the Black Canyon and helped ensure the survival of communities in the valley.

Few governments in the history of the world have given away land to their citizens. The Homestead Act directed the U.S. Government to do that in the years following the Civil War. As families moved into the valleys of western Colorado in the 1880s, they found the nearby streams to be unreliable sources of irrigation for their fields. Without water, they couldn't grow crops, and the land held no value for them.

Plans to divert water from the Black Canyon's more dependable Gunnison River were visionary. Beginning in 1894, surveys eventually revealed locations for both ends of a tunnel (in the canyon and the valley), with the intent of meeting in the middle. A road was scraped into the canyon slopes, descending to the river, and the town of East Portal (also known as River Portal) was born.



Uncompahgre Valley Water Users Association

Architects of Community

Many engineers and surveyors participated in planning the tunnel, but three were at the forefront. Their education and experiences combined to achieve success from life-threatening challenges and project-halting troubles. Their work led to the kind of community envisioned by leaders like John Bell and Theodore Roosevelt.



The jovial Ira McConnell explored the depths of the canyon. He completed surveys that pinpointed the tunnel headings and towns of East Portal in the canyon, and Lujane (luh-WAH-nah) on the valley side of the tunnel. He guided tunnel construction through the most difficult of problems.

Uncompahgre Valley Water Users Association



A graduate of Cornell University, Herbert Daniels was the superintendent of the town of East Portal. Schooled in engineering, his steady hand on day-to-day matters kept construction on schedule, the tunnel on a straight course, and the town well supplied.

Courtesy of family of Herbert Daniels

Abraham Lincoln Fellows first supervised water engineering on the Montezuma Project near Cortez, Colorado. Contacts he made after graduation from Yale University brought him west where he was thrilled to take on field surveys. His commitment to both farmers and Roosevelt's conservation principles provided perseverance needed to bring the project to life.

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About Your Visit

Getting Here

The 6.5-mile (10.5 km) East Portal Road intersects the South Rim Drive in Black Canyon of the Gunnison National Park at the entrance station. Although it is paved, the steep road has grades up to 16%. Vehicles over 22 feet (6.7 m) in length, including trailers, are prohibited. Drivers should be in their lowest gear to avoid brake damage or failure. The road is closed in winter, usually early November to mid-April.

Things To Do

Exhibits: Outdoor panels are located at the Gunnison Diversion Dam and picnic area, and other locations around the East Portal area. Exhibits further tell the story of East Portal and the building of the Gunnison Tunnel.

Fishing: A Colorado fishing license is required, and Gold Medal Waters regulations apply. Fishing is prohibited within 200 yards (183 m) of Crystal Dam.

Camping: A 15-site campground is available on a first-come, first-served basis. Walk-in and drive-in sites are available; water and vault toilets are provided. It is occasionally full in summer, and closed in winter.

Hiking: An anglers' trail downstream from the campground provides 0.5 mile (0.8 km) of river access. The road from the campground to Crystal Dam is available for hiking and bicycling. There is no public access to, or around, Crystal Dam.

Wilderness Access: Another mile (1.6 km) of river access is available for hearty hikers who brave the 400-foot (122 m) climb over Devils Backbone. Another two miles (3.2 km) of river are accessible downstream on the North River Route. Crossing the river in small watercraft to access the North River Route is permitted, but is discouraged when river flows are high. Camping is available with a backcountry permit issued from a self-registration box

at the East Portal Campground or at Black Canyon's South Rim Visitor Center. For more information, visit the park website at www.nps.gov/blca.

Accessibility: Much of the terrain is fairly level, and most of the exhibits and restrooms are accessible.

Other Places to Visit:

Montrose County Historical Society Museum: Artifacts and displays tell more of the story of the tunnel and East Portal at 21 N. Rio Grande in Montrose, Colorado. Open daily in the summer.

Uncompahgre Water Users Association Headquarters: Open daily for people to do business with the association, but a display outside of this historical building shares more of the Gunnison Tunnel story; 601 N. Park Avenue in Montrose.

For Home and Prosperity

Reclamation, the work of bringing water to land to grow crops, had been practiced in the American Southwest for centuries before settlers arrived. Attempts to engage the federal government into the role of reclamation had been stymied for years, until Theodore Roosevelt, an avid outdoorsman, became president in 1901. He threw his support behind the National Reclamation Act of 1902. Congressman John C. Bell, from nearby Montrose, was an early proponent, and cosponsored the bill which also authorized the Gunnison Tunnel. Bell vigorously argued for its passage on the floor of the House of Representatives. Their words echo across generations for commitment to home and family.

"The basis of our prosperity is our great agricultural productions, and the stability of our institutions depends upon the home owners. The home has ever been esteemed as the basis of the government. It is the great humanizer and civilizer of the world. Can anyone doubt the good sense policy advocated by this bill in lending to the home maker a few million to enable them to help themselves?"
John Bell, Congressional Record, 1902



Denver Public Library, Western History Collection, Z-1905

John C. Bell



White House Historical Association (White House Collection)

"On June 17, 1902, the Reclamation Act was passed...for the purpose of reclaiming the arid West by irrigating lands and thus creating new homes, upon the land...it has gone far to transform the social aspect of the West, making for the stability of the institutions upon which the welfare of the whole country rests..."
Theodore Roosevelt, 1913

President Theodore Roosevelt

The act charged Chief Engineer of the new Bureau of Reclamation, Frederick Newell, to proceed with building five projects: 1) Milk River in Montana, 2) Newlands or Truckee, Nevada, 3) North Platte, Wyoming, 4) the Salt River Project in Arizona, and 5) the Uncompahgre Project in western Colorado, whose best-known feature was the Gunnison Tunnel. Newell was among Roosevelt's closest advisors on conservation.

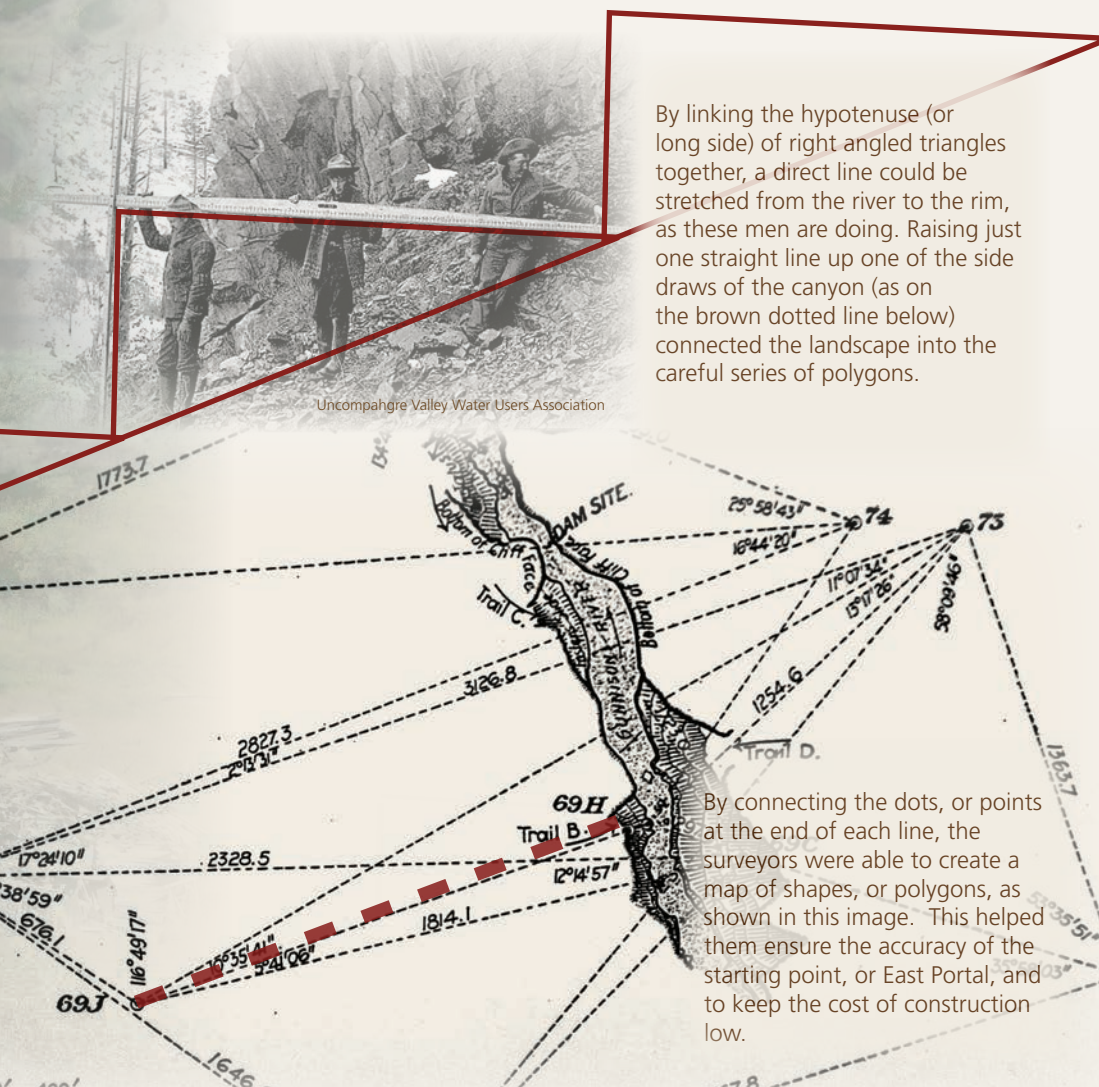


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Frederick Newell

Connecting the Dots

The idea of digging a tunnel from two sides of a mountain and meeting in the middle was not new, but survey measurements had to be precise. Using geometry, a series of polygons or shapes were mapped out from the canyon floor, up to the rim, across Vernal Mesa and out to the Uncompahgre Valley. Maintaining rigid lines and angles across the tortuous terrain was arduous.



By linking the hypotenuse (or long side) of right angled triangles together, a direct line could be stretched from the river to the rim, as these men are doing. Raising just one straight line up one of the side draws of the canyon (as on the brown dotted line below) connected the landscape into the careful series of polygons.

By connecting the dots, or points at the end of each line, the surveyors were able to create a map of shapes, or polygons, as shown in this image. This helped them ensure the accuracy of the starting point, or East Portal, and to keep the cost of construction low.

For a Safe Visit

Observe these safety precautions for an enjoyable visit:

- The river is swift and cold. Don't swim in the river.
- Watch for ticks during spring and early summer.
- Poison ivy grows in cool moist areas along the river and in the campground.
- Pets are prohibited downstream from the campground. They are permitted on a leash everywhere else at East Portal. Other restrictions in the national park apply.
- Rocks can fall anywhere along the East Portal Road, especially in rainy weather. Drive with caution, and watch for rocks.
- Special regulations apply in the backcountry. Visit Black Canyon's website at www.nps.gov/blca for more information.

Historic Resources

All plants, animals, rocks, and historic objects are protected by federal law. Do not damage historic or natural features. If you find an artifact, please leave it in place and notify a ranger.



East Portal is part of Black Canyon of the Gunnison National Park and Curecanti National Recreation Area. They are two of more than 430 parks in the National Park System. To learn about national parks and National Park Service programs in America's communities, visit www.nps.gov.

1892 The Dream

The idea for a tunnel is credited to Frank Lauzon, a miner, prospecting in the mountains around Leadville, Colorado and Moab, Utah. By the early 1890s he was trying to succeed at farming in Montrose. A story is told that he had a dream. Worries of making ends meet plagued him, when, in a cold sweat, he fell asleep. It was then that he saw the waters of the Gunnison River brought to the valley.

While the waters of the Gunnison River were the most reliable in the area, the river had carved through the Gunnison Uplift, which rises 2,000 feet above the Uncompahgre (un-come-PAH-gray) Valley. This created a serious barrier for farmers wanting to reach the river's waters.



Denver Public Library, Western History Collection



NPS

Torrence and Fellows

Hydrologist Abraham Lincoln Fellows, on the right in the photograph, was telegraphed from Washington, D.C. to investigate the tunnel's potential. He hired Torrence for a 9-day expedition in August, 1901. In the canyon the cliffs narrow to 40 feet. Fellows described The Narrows, "...we saw before us the mighty jaws, from which there was to be no escape, [and] a feeling of nervousness and dread came over me for the first time." Their survey readings revealed the tunnel to be feasible.



NPS

Decorative plates, sold by the local Redding Furniture Company, highlighted the original site for the tunnel, and encouraged farmers to sign up for water to pay back the cost of construction.

Early Exploration

An onsite inspection trip of Black Canyon and the Gunnison River was organized in 1900 under John Pelton, farmer, miner, and head of the local land office. Members included surveyor John Curtis, farmers Erik Anderson and Frank Hovey, and youthful William Torrence, director of the local electric company. The unexplored canyon proved to be a great challenge. At a place called "The Narrows" they abandoned their quest and clawed their way to the rim. However, the trip focused state and national attention on the proposal, and support for it increased.

1904 Choosing a Site

Initial plans for the tunnel placed it at The Narrows. Survey teams rushed over the rims of the canyon and braved troubles that challenged even the most hardy. An alternate site was eventually selected three miles upriver because the cost of construction was lower.



Postcards heralded life in the towns at each end of the tunnel. Although they were short-lived, East Portal and Lujane were noteworthy because of the work being done.



Building The Road

A road was blasted into the cliffs, and twisted its way down to the river. At grades up to 32%, the road tortured teamsters who drove supplies, including three 11,600 pound boilers for the power plant, to the emerging town at the canyon bottom.

A writer for the Montrose Press recorded, "Every vehicle that goes to the River Portal is provided with an iron "shoe" that fastens on the back wheel and secured by a chain... With the wheel securely fastened...one's hair stands on end as the horses start on a trot... so we shut our eyes, grapple the lines as tightly as possible, and trust to Providence that the vehicle will remain on the grade until a level spot is struck..."

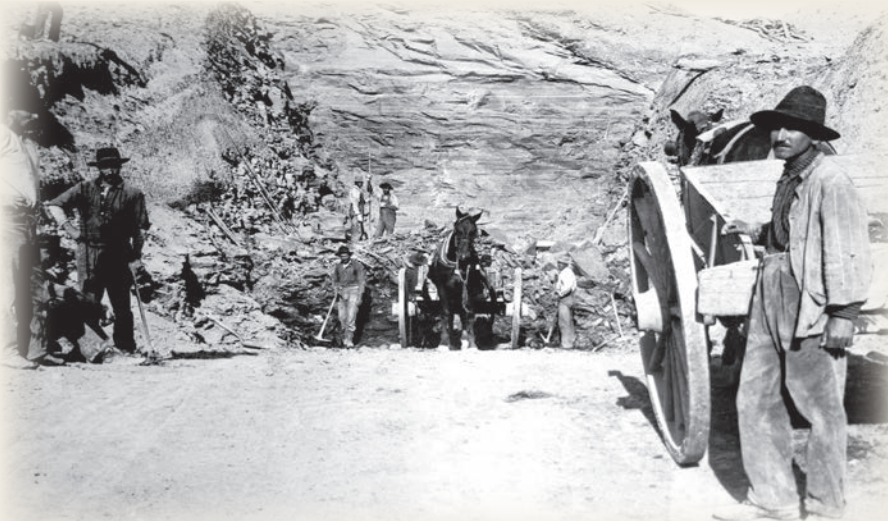


East Portal Emerges

Residents of the growing town of East Portal originally lived in canvas tents. By 1906 it was a thriving community clutching the slopes of the canyon. While it never housed more than 250 people, it did provide a dining hall and bunkhouses for single men working around the clock in three shifts. Families lived in private cabins. Other services included a hospital, post office, general store, library, billiard hall, and school. Although they were isolated, they were not unaware of national events. Like many Colorado towns that raised relief money, they gathered \$220.00 to help survivors of the San Francisco earthquake.

1906 Technological Change

Two advances in technology made work safer and easier. Jackhammers fed by a compressor replaced hand-turned drill bits to set holes for blasting charges. Dynamite replaced black powder for blasting. It was more stable, reliable, and reduced the number of injuries during the project. Construction began in January, 1905. By 1906 shifts of workers (up to 30 at a time) functioned like a well-oiled machine inside the tunnel.



While digging continued on the tunnel, a massive effort was made to extend a system of ditches to carry the water to individual farm fields. The largest of these, the South Canal, would carry water from the tunnel to the Uncompahgre River.



National Archives and Records Administration



Workers used electric-powered trains to lug the carts full of debris out after blasting. Candles and lanterns were first used to light the work, but electric lights strung along lines improved visibility in the tunnel.



Methods of Digging

To create a tunnel 12 feet tall, workers used a "heading and bench system." They initially cut a "heading" out of the rock by starting at the top of the bore. They cut down 6 to 8 feet, leaving a bench of 7 to 5 feet on which to stand. Two drillers and a helper cut deeper into the rock while standing on the bench. The bench was eventually cut out, leaving the full 12-foot height of the tunnel.



While work progressed around the clock in the tunnel, office help continued to keep the laborers supplied. Payroll, purchasing and repairs on equipment were all part of the effort.

"The camp [East Portal] is full of as fine a lot of fellows as walk the American soil and they can do anything they undertake."
 Montrose Press, June 29, 1906.

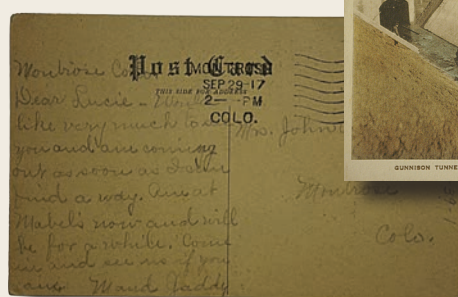
1909 Culmination

Workers digging from both ends met in the middle in July. President William Taft was vacationing in the west, and an invitation to dedicate the tunnel was made. A gala event with a parade, speeches, music, and dining supported the dedication on September 23, 1909. Taft pressed a button at West Portal, laborers opened a makeshift gate, and water flowed into the valley.



Memorial arches soared more than two stories high on Main Street in Montrose, welcoming people from around the country.

Those attending the event sent postcards marking the dedication. Commemorative pins were proudly displayed in Montrose that fall.



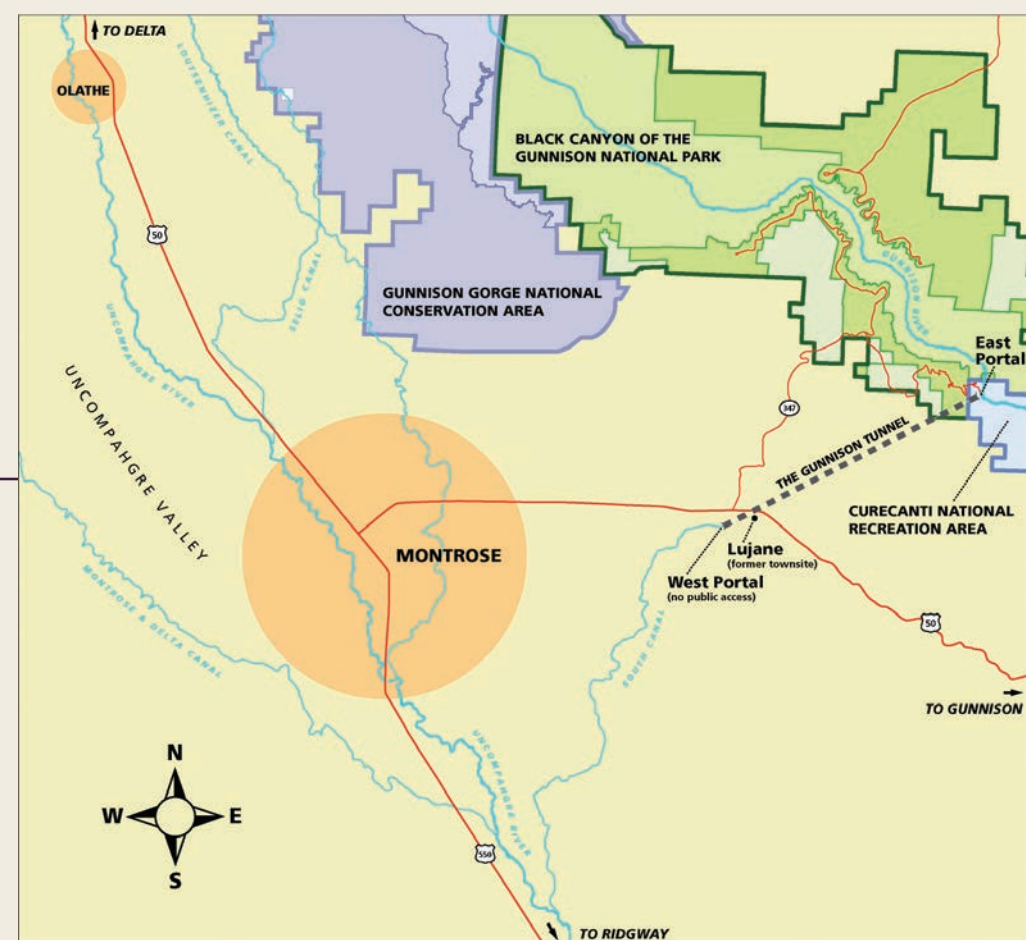
1922 Continuing the Legacy

Although the tunnel was dedicated in 1909, much work remained. A diversion dam, concrete lining of the tunnel, and finishing the ditch system were not completed until 1922. Additions have been made over the years.

Irrigation water usually flows through the tunnel from April through October. Gravity causes the water to flow from West Portal through the South Canal to the Uncompahgre River (see map at right). Like a central artery that branches out to capillaries, the river supplies six primary canals, such as the Montrose & Delta or Selig Canals. From these primary canals water flows into secondary ditches and eventually into farm fields. Today's farmers have inherited a legacy of living close to the land, and remind us of America's agricultural roots.



Gate and equipment houses provide for the workings of the tunnel at East Portal.
 NPS



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