

Caves of the Upper Amphitheater – Additional Significant Cave Development on Bureau of Land Management Lands Near the Mid-Continent Quarry Expansion

**A Report to the Bureau of Land Management,
Colorado River Valley Field Office**

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EXECUTIVE SUMMARY

In the spring of 2020, members with the National Speleological Society investigated a little-known region of natural caves on Bureau of Land Management land high above the No Name community in Glenwood Canyon. This cave region is above the historic Cave of the Clouds, a privately-owned cave that was the first commercially-shown cave in the Glenwood Springs region, and to the east of the abandoned Marblehead Quarry.

This region has had little attention by cavers despite its close proximity to Cave of the Clouds and Drapery Den on private land, and Amphitheater Cave and Upper Amphitheater Cave on Bureau of Land Management land. At the turn of the 20th century, prospectors searched the region and found indications of mineralization. This mineral content was exposed on the surface in the Mississippian-age Leadville Limestone strata, often associated with caves and former hot springs outlets.

The Upper Amphitheater is a large Leadville Limestone outcropping, trending north to south along the dip of the White River Plateau monoclinal uplift. Prospectors of the late 19th and early 20th centuries closely examined this region, and excavated a small cave into a larger tunnel extending into the strata. This tunnel intercepted a larger natural cave chamber with mineralization, boxwork and flowstone.

Along this cliff are three or four additional caves of note, one being significant. The largest caves are two that almost certainly will connect through exaction of a large pack rat midden of probably substantial antiquity that blocks a major passageway. Each cave has about 75 feet of large walking passage, along with some active dripstone. These caves, Green Eyed Lady Cave, and Triclops Cave, suggest major outflow of rising hot spring water in the past.

Below Green Eyed Lady Cave is another solution cave, a large shelter, named Green Guano Grotto. An ascending passage in it is blocked by a sizable pack rat midden.

During the Memorial Day weekend, 1960, cavers with the Colorado Grotto in Denver visited the outcropping and examined these caves. They prepared a report for the Colorado Grotto newsletter, *Caving in the Rockies*. They examined the mine tunnel, Triclops Cave (they named it Swallow Cave), and Green Eyed Lady Cave (no name given).

The investigation of these little-known caves provides additional geological evidence that the current Glenwood Hot Springs once emerged from higher elevations. In reviewing the elevations of the caves, it is clear that as the Colorado River slowly eroded Glenwood Canyon, rising hot mineral water emerged at the top of the water table from caves. The lowering of the water table through the down-cutting of the river left higher outlets dry, but lower caves then served as outlets along the ancestral Colorado River.

Geologists now can see that Witches' Pantry Cave is the oldest known hot spring outlet in the Glenwood Springs region. As time passed, Mabel's Room, high above I-70 east of No Name, served as an outlet. Next were the caves of the Upper Amphitheater, followed soon thereafter with Glenwood Caverns. As down-cutting through the strata continued, caves such as Upper Amphitheater and Amphitheater Caves served as outlets, then Drapery Den, Cave of the Clouds, and Cave of the Chimes. Today, the Vapor Caves on both sides of the Colorado River at Glenwood Springs are active outlets for the hot springs.

KNOWN AREA CAVES

In 1886, railroad survey teams projecting future lines through Glenwood Canyon east of the City of Glenwood Springs spotted a curious feature high above the camp. From the viewpoint on the ridge above today's tunnels for I-70, the feature appeared to be a landslide in an odd location on the north side of the Colorado River, about 700 feet or so above the canyon floor.

Investigating, the surveyor found the entrance to an unknown natural cave that contained large chambers and exquisite stalactites, stalagmites, flowstone, and draperies unlike anything known in Colorado. This man, E.R. Alexander of Denver, decided to develop the cave after the surveying project was completed. It became known as Alexander's Cave, later renamed to Cave of the Clouds.

Shown to the public as an attraction from 1887 until about 1897, the cave was shuttered owing to competition from Fairy Cave, a natural cave discovered in July, 1895 near the summit of Iron Mountain to the west. Within a few years of the cave's closing to the public, vandals broke open the Cave of the Clouds secured entrance door. Over the following century, the cave's exceptional decorations were badly damaged or removed. In 2018, this once-beautiful, 650-foot-long cave was secured with a steel entrance gate installed by cavers with the National Speleological Society and the property's new private owners.

West of Cave of the Clouds, on the eastern rim of an unnamed gully leading north from the eastern portal to the I-70 tunnels, is Drapery Den. This cave, also known as Creek Cave, is on private land preserved today along with Cave of the Clouds by the Defiance Cave Preserve. It consists of a single large chamber entered from the canyon rim above. The cave has about 450 feet of passage, mostly the large room, but a steeply-ascending passage leads to a small upper-level chamber with large draperies.

Above and to the north of Cave of the Clouds is a natural feature called the Amphitheater. This prominent Leadville Limestone outcropping is a long, high cliff with two known caves. Just above the base on its western side, a short technical climb leads to Amphitheater Cave. This modestly decorated, mostly-crawling, cave has about 200 feet of passage, and is on Bureau of Land Management land. Above this cave near the top of the cliff is the rarely-visited Upper Amphitheater Cave. The upper cave also has about 200 feet of passage, ending in dirt fill.

Above and to the east of the Amphitheater is Big Entrance Cave, a large shelter cave that can be seen from the floor of the canyon. This cave on Bureau land is best known for a former resident, Gary Petkus, who was found dead in the cave in 2008. The cave has been the scene of occasional clean-up projects by cavers, removing huge quantities of trash left by Petkus from his nearly 30-year residency.

With the documentation of the Upper Amphitheater Caves east of the abandoned Marblehead Quarry, it is clear there is significant cave development along this steep slope following the Leadville Limestone strata as it climbs to the high White River Plateau to the north.

INVESTIGATION OF THE UPPER AMPHITHEATER CAVES

The City of Glenwood Springs has a long history of offering recreation and relaxation to visitors to the community at the western portal to scenic Glenwood Canyon. Members of the Ute Tribal Nation frequented the region for millennia, enjoying the hot springs and natural vapor cave on the south side of the Colorado River. With the forced removal of the Ute Nation in the summer of 1881 for reservation lands to the west, the region was opened for settlement and subsequent commercial development by European Americans.

While the hot springs, the caves, and the canyons and mountains were increasingly-popular recreation destinations for visitors, there was some effort to locate valuable mineral deposits. In 1891, newspapers excitedly reported of prospecting north of the City. The October 9, 1891 *Avalanche Echo* from Glenwood Springs included one report.

“While the district around Glenwood Springs has been justly noted for its beauty and health-giving characteristics, including its warm springs, but little attention has been paid to the deposition of mineral at that point. The fact that this district is right in the line of the eruptive forces that have doubtless been largely instrumental in the deposition of silver and gold-bearing ores, has been known, and the further fact that some of these eruptive dykes, or masses of a porphyritic nature, cross the planes of stratification of the limestones of that region, is also known, still no organized effort to prospect that district has been made, and it is only lately that individual effort has been put forth to determine the commercial value of any of the streaks of mineralized matter that has been met with. There are, however, a number of prospectors now in the field, some of whom have worked in Leadville mines, and are familiar with the features here, and in a few instances most encouraging results have been obtained.

From one property, located about two miles from the town of Glenwood, on Oasis creek, a good vertical vein of silver-bearing rock has been found, on which some considerable amount of development work is now going forward. This is met with in the quartzite, and is being opened by a tunnel, from the face of which stuff is being taken that already carries about twenty-three ounces of silver to the ton. This property has been named the Bertha, and is owned by Mr. Chas. Feist and others, of Glenwood, and the tunnel, owing to the topography of the country, will gain about 200 feet of vertical depth in about that number of feet of horizontal driving. There is disclosed in the quartzite a vein some 4 feet wide, though the streak from which the silver-bearing ore comes is about 20 inches in width.

Other properties further to the south in the lime belt, are being opened up, and it would not be surprising if to her other pleasant attractions, Glenwood added that of a mining camp of some commercial value. – *Leadville Herald Democrat*.”

Owing to the low quantity of minerals, work on these claims were discontinued until late 1900. The December 15, 1900 edition of the *Glenwood Post* provided an update.

“Every old resident of Glenwood remembers the excitement caused by the rich prospects discovered on the Grant-Breene claim on Mineral mountain [an alternate name for Iron Mountain - RJR] some eight years ago, and for which the owners at one time refused to consider an offer of \$20,000. They also remember how financial reverses overtook the principal

owner and the work with promised great things was suspended. Grant secured Breene's interest in the claim, which has lain practically idle, though of undoubted promise. The claim is also known as the 'Jim Blaine,' and is located up the mountain back of the Hotel Colorado, a little west.

Ex-Sheriff Thomas, himself an authority on mining matters, has long been confident of a future for the 'Jim Blaine' and neighboring properties, and is now actively at work organizing a company for its development. He has so far met with flattering success, and a very considerable sum has already been raised, which, if slightly increased, will insure active operations in the near future. Speaking to the POST yesterday Mr. Thomas said:

'Though all around Glenwood are exceptionally fine indications of ore bodies, we have selected as the one on which to begin operations that which we believe gives the most promise. There is already a shaft down 40 feet on this claim which has opened a vein of iron 15 to 30 feet in width. Specimens of this ore were analyzed by a Denver expert who pronounced it 68 per cent iron, with other materials which rendered it especially valuable for fluxing. This alone would pay the expenses of operating the mine, with always the possibility of richer strikes the farther in we go. There is an old Cornish saying, that "iron caps all other metals." I am confident this will be found true in this case, and that at a distance of say 250 feet we will open a producer of more valuable minerals.'

The Post in its February 16, 1901 edition provided an update on the mining.

"According to the terms of the contract Carr & Hayes agree to drive a tunnel and have the same wholly completed on or before five months from and after the signing of the agreement, in Iron mountain, to the north of the town, of the dimensions and in the manner prescribed by the plans and specifications, beginning work at or near the line common to the Washington Lode mining claim and the north line of town, where an excavation or tunnel has already been started, and drive said tunnel from thence in on said lode as provided by plans and specifications.

They agree to prosecute the work continuously, working not less than two shifts every twenty-four hours, each shift to work not less than eight hours, except Sundays. Also to drive said tunnel to pay ore or to the large vein of iron matter or 400 feet, and furnish all tools, explosives, labor and materials necessary and needed in doing and performing the work, except that the company will furnish T-rails and dump cars at Glenwood."

The June 21, 1901 edition of the *Fairplay Flume* offered additional information regarding the mining efforts north of the city.

"A Glenwood correspondent writes to a Denver paper that a four-foot vein of pure oxide of iron has been encountered at a depth of 150 feet in Iron mountain, and a sample has been sent to a prominent paint maker for his inspection with the view that it may be utilized as one of the chief ingredients for paint. It is a dark red, and is free from foreign matter. The largest pieces can be crumbled to dust in the palm of one's hand. The writer states that while oxide of iron has been found at different sections throughout the state, silica and lime have composed a larger part of it, so that this discovery is without a parallel in Colorado mining."

It is uncertain as to where these tunnels and shafts were located north of Glenwood Springs. The deep shaft to the west of the Transfer Trail is probably the shaft mentioned in the 1901 Fairplay newspaper report. What is clear, however, is that the region was carefully walked by prospectors seeking minerals, and that mine tunnels were excavated at various locations on the mountain where a bit of color had been seen.

The 1960 Colorado Grotto Investigation

During the long Memorial Day weekend, in May 1960, 13 National Speleological Society members with the Colorado Grotto traveled west from the Denver area to Glenwood Springs. Their objective was to seek potential caves in Glenwood Canyon near the long-closed Cave of the Clouds. Since grotto members had been discovering extensive new sections in nearby Fairy Cave on Iron Mountain, it seemed worthwhile to carefully explore the canyon wall near Cave of the Clouds, just to the east. In the April-December 1960 edition of the Colorado Grotto's *Caving in the Rockies* newsletter, a report of the holiday weekend investigation accompanied with a sketch map of approximate locations was published.

The team successfully located several new caves. These included Drapery Den, also known as Creek Cave, and Amphitheater Cave. Dick Simpson came upon Drapery Den while following the eastern rim of the gully north of the aqueduct's high bridge. Meanwhile, others investigated the prominent natural amphitheater northwest of Cave of the Clouds, declaring the namesake cave as the only one of note.

Farther up on the mountain, team members came upon a group of caves. The first cave had two entrances, and led to the east. This cave had a single room 60 feet in diameter. Rat droppings and sticks covered the floor. The cavers noted two leads; one leading back toward the second entrance and daylight, the other ascending and filled with organic rubble.

Next was Swallow Cave, the only cave of the group to be named by the team. It consisted of a "[s]eries of small rooms formed by a combination of fallen blocks and solution." The cave was mostly in daylight, with some speleothems present. It ended in a large descending passage blocked by organic fill. "Most of us thought this was Clouds Cave before reaching it," the report noted, undoubtedly owing to the large size of the entrance. A rope was used to safely climb to the entrance, though it was not required. However, "all of the party used it," reported Robert Ayre.

About 200 feet on the slope below Swallow Cave, the group found a mine tunnel and a shelter cave. "A great deal of aragonite is filled up on the outside of the mine," Ayre noted. "Most of it is specimen quality." The mine entrance was boarded up, so it is uncertain whether any of the cavers entered for a more thorough investigation.

In his 1973 Pruitt Publishing book, *Caves of Colorado*, the Colorado Grotto's Lloyd Parris included these caves in his chapter about the Glenwood Springs area. Unfortunately, a typographical error changed the name of Swallow Cave to Shallow Cave, leading to considerable mystery over the next four decades as a shallow cave was sought, but never found, by searchers near Cave of the Clouds.

The 2020 Investigation

The steep gully adjacent to the Upper Amphitheater outcropping descends more than 1,200 feet to Interstate Highway 70 and the Colorado River. It is easily reached by following a series of old roads that climb out of the abandoned quarry. Many of these were apparently created when the Marblehead Quarry was under development. The quarry operators, Basic Chemical Corp., sold Leadville limestone they removed from the strata for road aggregate, flux, dust for coal mines, and for lime manufacturing at the Glenwood Springs lime facility. To transport the rock, the operators constructed a dramatic cabled tramway from the quarry to a loading station in lower Cascade Creek above U.S. Highway 6, where waiting dump trucks would be loaded from a tippie. The tramway towers and tippie, abandoned for about 40 years, still stand, rusting and neglected.

In Mid-May, 2020, cavers from the National Speleological Society followed various single lane tracks on the way through the old quarry, topping out, then descending along an older, mostly overgrown road that switchbacks steeply down the western wall of the gully.

One caver found a steep route that allowed him to climb down a fairly direct route along the western edge of the rock outcropping to the base of the Upper Amphitheater. Along this route, he came upon the first cave of the day. This short cave was solutional, leading to a chamber with an ascending lead blocked with a pack rat midden and light at the far end – a potential through trip if anyone wants to dig out the midden.

Another route to the Upper Amphitheater leads from the old road west of the gully floor. Here, an open, grassy route leads down the slope. Reaching the floor below the Upper Amphitheater, a fairly reasonable route leads back up through moderately-thick scrub oak led to its base. At the outcropping's northwestern point, a cave larger than a simple shelter, with a large passage leading southeast that ends in a pack rat midden, is found. It is solutional, and not simply a fracture cave, and has some interesting mineralization in adjacent pockets of the bedrock.

Traversing to the south along the cliff base, then climbing up the slope, leads to the next cave, perhaps the most impressive of the outcropping. It has probably 75 feet of mostly walking-size passage, and two entrances side by side. This cave's main passage is 15 to as much as 25 feet in width, with a ceiling ranging from five to eight feet high. The entrance chamber heads east for 30 or so feet, with a lower-ceilinged side passage leading to the second entrance to the south. The main passage ends in a mammoth guano and amberat pile which would be an exciting dig if it was not in guano.

To the south on the traverse is a large cave entrance reached by a climb. A safety rope is required to ascend and descend without fear of falling. A few feet to the west of this climb is a smaller, oval cave entrance. This was investigated, with about a body length or so of passage to a pack rat midden. Potentially, an ambitious visitor could knock down the midden and use this cave as a route to climb to the larger cave above.

Continuing south, the next feature was an abandoned mine tunnel entrance. The miners appeared to follow mineralization exposed in a low cave-like pocket on the south side of the entrance. About 50 feet in, the walking-height mine intersects a larger natural cave chamber. This chamber has extensive iron-related minerals covering several walls. Shallow boxwork adorns the ceiling above a descending passage leading northeast, where wooden beams are found on the floor, possibly the beginning of a more

extensive vertical excavation that never happened. The miners apparently probed this room, as drill holes can be found here and there.

On May 30, a team of cavers returned to the area for additional investigation.

Two cavers followed the old road to the top of the Upper Amphitheater outcropping. There, they rigged a rope to rappel to the best remaining lead. Following a short rappel, the cavers found themselves at a significant cave. Pulling out their survey gear, the cave was surveyed, and found to have about 75 feet of mostly large walking passage.

This was named Triclops Cave after the cave's three entrances, all in close proximity to each other. Almost certainly, this is Swallow Cave as described in the 1960 *Caving in the Rockies* report. The interior passageway is comfortably large, and up to 17 feet in height. It descends to the northwest, ending in amberat blockage they found to be strongly inhaling.

Meanwhile, other cavers examined Green Guano Grotto, the shelter cave at the northwest corner of the outcropping. It has about 30 feet or so in two passages. The southern, righthand passage is more significant, and ends in green and shiny black amberat that greatly impressed members of the team.

The next destination was the large, two-entranced cave that had greatly impressed the team during the earlier investigation. Within the cave, there are small soda straws along a single ceiling joint, some of which were actively dripping. At the back of the main passage, a large passage that leads southeast was carefully examined. This passage has very noticeable wind issuing from it. It felt chilly for those who sat below the amberat.

The team believes this passage directly connects to the descending passage in Triclops Cave, above and to the southeast. This would explain the breeze, being a simple chimney-effect wind between an upper and lower entrance.

A connection can be made between the caves through carefully excavating a route through the guano. The combined cave should have 150 or more feet in passage length, with five known entrances.

From the back of the lower cave, the team enjoyed a splendid view down the passage to the west, out of the two entrances side by side. They looked like eyes to the outside world, with green trees and grassy slopes visible beyond. The name "Green Eyed Lady Cave" was suggested, thinking of the memorable 1970 song by Boulder rock band Sugarloaf. The lower cave is most likely the unnamed cave Robert Ayre described in his 1960 Colorado Grotto report. One team member spotted the signature of "Ken" in a back wall (no last name or date), so it is clear others have visited it.

Traversing to the mine tunnel, cavers spotted inside two sleeping bats. The first appeared to be a Townsend's Big-Eared Bat, with one ear extended, hanging from the ceiling of the excavated entrance tunnel. The second was roosting in the intersected cave chamber, perched on a wall. It appeared to be a *Myotis*.

While observing the second, inner bat, a member of the team spotted a large centipede ascending the cave wall, headed in its direction. Shining lights on the centipede for photography encouraged it to turn around, toward the darkness at the chamber floor. It is not known if the centipede would have interacted with the bat if it had continued on its original route.

Outside, below the tunnel entrance in scrub oak, an observant team member spotted the remains of the mine's entrance fence. It is wooden with slats, and was constructed on a wood frame that probably had been fitted to the entrance. Since it is understood the wall had been in place in 1960, at some point thereafter, visitors pulled it down and tossed it down the slope. It has been on the ground long enough that a large scrub oak has grown around and through it. The wall was examined closely, and found the carpenter had used machine-made round nails, which were widely introduced and available from hardware stores by about 1890. This Wooden Door Mine is almost certainly from the 1891 or the 1901 mining era.

GEOLOGICAL CONSIDERATIONS

Even though the caves at the Upper Amphitheater overlooking Glenwood Canyon are not lengthy, the large physical dimensions of the passages, rounded solution-surfaces, and cupolas within Triclops and Green-Eyed Lady Caves suggest they once contained rising hot mineral water.

Approximate altitudes of these caves are roughly comparable to the elevation of Glenwood Caverns to the west, and to Mabel's Room to the east. Mabel's Room is the prominent single-chambered cave on the cliff high above Interstate Highway 70 on the south side of the river. This elevation correlation suggests that there had been a period of relative stability in the water table, and the level of the Colorado River flowing through Glenwood Canyon, when these caves were filled with water and served as outlets for the hot springs.

Glenwood Caverns may be significantly larger than other caves in the area, owing to a focusing effect of the faults that surround the caverns. One geologist suggests these faults may have concentrated rising water flow to the highest point of a tilted triangular block of the limestone, that was once at river level but now forms the top of Iron Mountain. The major West Glenwood Fault bounds Iron Mountain to the west, extending from below the Colorado River near Iron Mountain Hot Springs, northeast to the slope north of the Marblehead Quarry. This same fault boundary, and the No Name graben, may also have helped concentrate water and cave development in the vicinity of Cave of the Clouds and the Upper Amphitheater caves.

The Leadville Limestone extends north of the Upper Amphitheater caves, as it does above Iron Mountain. This is indicative of the monoclinal uplift of the southern White River Plateau. Spring snowmelt and water from rain showers sink into the fractured limestone at elevation, draining south along the strata, reaching the faulted regions. These faulted zones direct the slow flow of water downward to the water table beneath the Colorado River.

These caves suggest that development in this region of the southern White River Plateau monocline is more common than geologists had previously understood. Along with Witches' Pantry Cave, and Fountainhead Cave and Surprise Pit to the northwest along the eastern Oasis Creek rim, caves and indications of prior spring flow through chemically-altered rock indicate rising water has flowed through the Leadville in this area for millions of years.

During the long ascent from as deep as 5,000 feet below the surface, the hot water picks up sulfate, sulfide, and carbon dioxide from evaporates and other buried strata. This water – heated by the depth it reaches and not by volcanics – is very aggressive to the limestone, much like the water that created Carlsbad Cavern and Lechuguilla Cave in southern New Mexico's Guadalupe Mountains.

The dissolved hydrogen sulfide contained within the rising hot mineral water comes out of solution when emerging into cave passages. Mixing with dissolved oxygen found in near-surface ground water, the sulfide is oxidized to sulfuric acid, which reacts directly with the surrounding carbonate limestone rock. This chemical reaction precipitates gypsum, layers of which are found within Glenwood Caverns, Hubbard Cave in Glenwood Canyon above the Shoshone Power Plant, and Groaning Cave on Deep Creek.

At great depth and pressure, this flowing hot water sometimes naturally fractures the limestone strata, like current-day fracking by mineral extraction companies cracks and breaks rock containing oil and natural gas. At one point in the Leadville Limestone strata exposed by the man-made tunnel entrance passage to the Barn at Glenwood Caverns, a striped, banded rock called zebra rock can be viewed. This is limestone that has been altered to dolomite by the hot magnesium-rich water at significant depth. The rock is fractured, and chemically altered as a result of this process.

Regarding the mineralized zones that excited the 19th century prospectors who explored the White River Plateau, these regions are geologically ancient in origin. These were created during the Laramide Orogeny, which was 80 to 40 million years ago, tens of millions of years before the solution of today's caves. This mineralization follows fault and fracture zones within the strata, and occasionally ancient paleo-caves within the Leadville Limestone. When these mineral deposits are exposed to air, such as at the Marblehead Quarry, the iron rusts into a yellow-orange limonite. Similar deposits can be found deep within Premonition Cave on Deep Creek, and in adjacent small caves that are likely former hot spring outlets.

This region north of Glenwood Springs is along the far western side of the Colorado Mineral Belt, a wide band of extensive mineralization that extends from west of Durango northeast to the mountains west of Boulder. With the White River Plateau being on the side of this zone, mineral deposits are significantly less than the core regions. The resulting minerals are mostly sulfides, and usually not profitable for extraction owing to the low quantities.

While mining was a major economic engine for Colorado during much of the latter 19th century, in the Glenwood Springs area, the tourism industry has served as the primary source of income. Mining at and near Glenwood has always been minor. The most significant of these mining efforts were the early 1880s Defiance Camp along the eastern rim of Grizzly Creek, and the Carbonate district near the head of Canyon Creek. Despite these camps ultimately being disappointing, prospectors continued to search the White River Plateau for potential lodes, opening a few low-grade mines in No Name and Elk creeks.

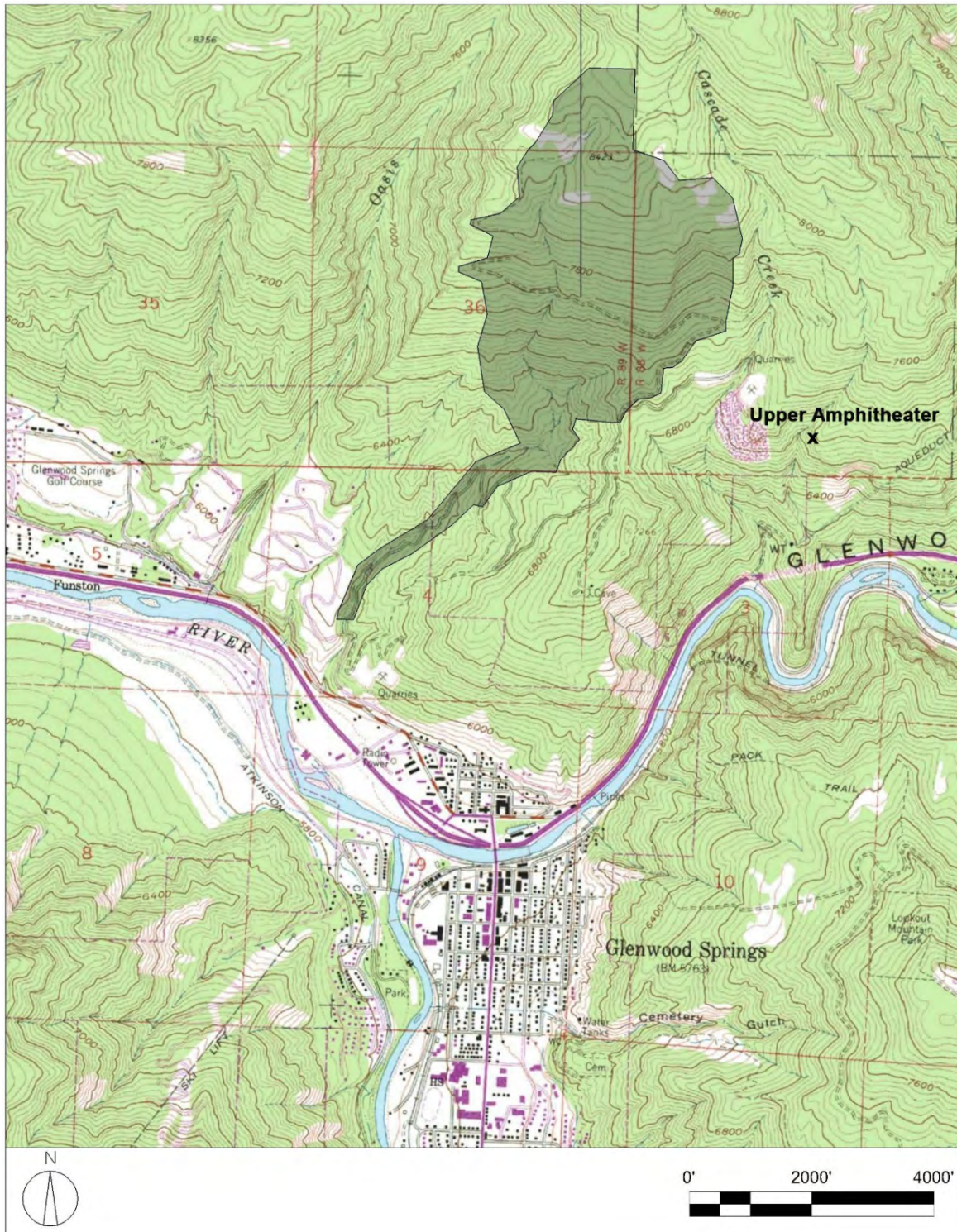
During the 1891 and 1901 mining eras, prospectors extensively searched the southern Plateau just north of Glenwood Springs. Accustomed to the rich ore veins with gold, silver, lead, and zinc found in the Leadville, Aspen, and Gilman districts, these men were thrilled when they spotted the yellow limonite in the Leadville outcroppings above the city. While the enthusiasm of a potential prospect could gain some financial support by eastern financial speculators, the subsequent lack of viable minerals resulted in a loss of ongoing funding. The two caves of the Upper Amphitheater region that show excavation undoubtedly generated some excitement. But the absence of valuable minerals probably led to abandonment within only a few months.

Further exploration of the extensive Leadville outcroppings north and northeast of Glenwood Springs could potentially reveal additional caves, particularly in regions that are isolated and difficult to reach. Another possibility to consider is that the uniform ascent of the monocline to the high altitudes of the Plateau could mean that cave entrances are isolated or very small, particularly if they are on the slope and not exposed in cliffs. Consider that Fairy Cave's entrance was only an inch in diameter until July of 1895, when changing air pressure allowed wind emerging from within the cave to whistle at C. W. Darrow, who happened by chance to be riding by on horseback. Without this fortunate coincidence, the three-plus miles of Glenwood Caverns would probably still be unknown to this day.

While we cannot count on caves proactively alerting us of their presence by whistling at us, knowledgeable cavers can study area geology to identify regions most likely to hold caves. A review of available geologic maps and past scientific studies, along with mindful walking of the terrain, can be ultimately productive in finding caves and karst features.

ACKNOWLEDGEMENTS

Thanks to Donald G. Davis and Harvey DuChene for their assistance in this report, and for the cavers who provided skilled assistance in the exploration and documentation of the caves of the Upper Amphitheater outcropping in western Glenwood Canyon.



Location map showing the Upper Amphitheater in relationship to Glenwood Springs, the abandoned Marblehead Quarry, and the proposed Mid-Continent Quarry expansion footprint.



Cave features of the Upper Amphitheater outcropping as seen from the abandoned mining road leading east of the closed Marblehead Quarry. No Name and Glenwood Canyon are to the right in this view. Richard Rhinehart photograph.



**Interesting breccia and mineralization at the entrance to one of the caves in the Upper Amphitheater outcropping.
This is probably the result of hot spring activity. Richard Rhinehart photograph.**



A view of the eastern entrance to Green Eyed Lady Cave. The larger, walk-in entrance to the cave is beyond the tree to the far left in this image. Richard Rhinehart photograph.



Looking out of Green Eyed Lady Cave. Photograph by Kay Cochran.



Cavers within Green Eyed Lady Cave. Photograph by Kay Cochran.



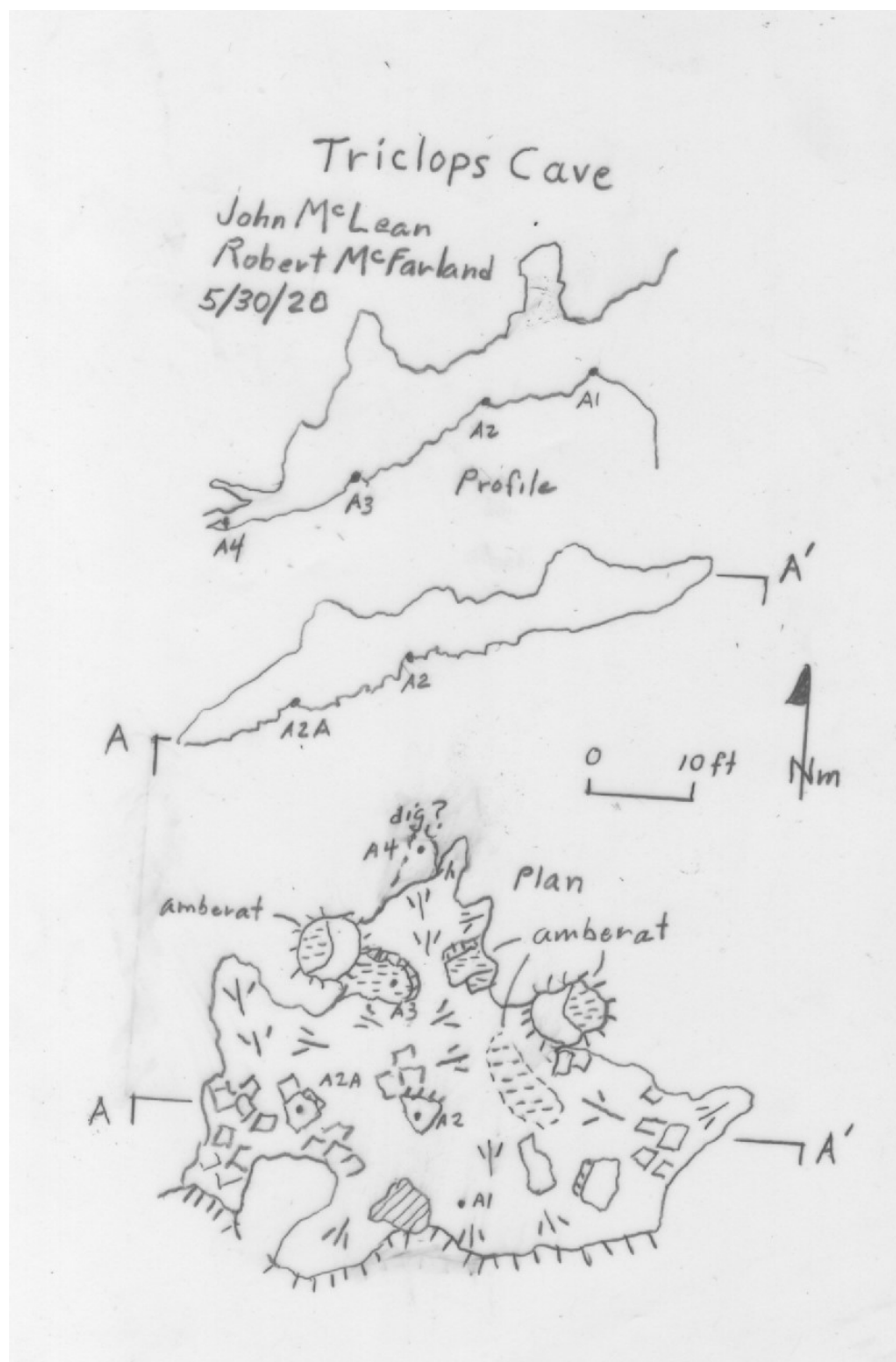
**Within Triclops Cave, looking southwest. Notice the rope from the rappel to the entrance, on the left of this view.
John McLean photograph.**



Amberat deposit within Triclops Cave. John McLean photograph.



Surveying within Triclops Cave. Rob McFarland photograph.



Survey map of Triclops Cave. Plan and profile sketch by John McLean.



Excavated tunnel at the Wooden Door Mine/Cave. Photograph by Richard Rhinehart.



Iron mineralization within the Wooden Door Mine/Cave. Photograph by Richard Rhinehart.



Boxwork in the natural chamber within the Wooden Door Mine/Cave. Photograph by Kay Cochran.



Sleeping Townsend's Bat within the Wooden Door Mine/Cave. Kay Cochran photograph.



Millipede on the wall of natural chamber in the Wooden Door Mine/Cave. Photograph by Kay Cochran.

QUESTIONS

Please feel free to contact me if you have any questions regarding these caves on Bureau of Land Management lands in western Glenwood Canyon.

On behalf of the National Speleological Society, local Colorado members look forward to working with our partners at the Bureau of Land Management in further studies and documentation of these important cave features on the White River Plateau.