Level II Documentation of the Ratliff and Root Ditch (5MT23092), Montezuma County, Colorado

(OAHP # MT.R.R142)

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ABSTRACT

Woods Canyon Archaeological Consultants Inc. (Woods Canyon) conducted Colorado Office of Archaeology and Historic Preservation Level II Historic Site Documentation of the Ratliff and Root Ditch near Mancos in Montezuma County, Colorado. The ditch was documented as mitigation to the adverse effects associated with the Ratliff and Root Ditch Salinity Project. The project, which is part of the Colorado River Basinwide and Basin States Salinity Control Programs, involves the construction of a new buried water pipeline and access road, and filling in of the existing historic ditch. Some portions of the pipeline will be collocated within the existing ditch alignment and other portions will cross land adjacent to the ditch.

The location and trajectory of the ditch and its laterals were confirmed and an associated lateral (5MT23519.1) was recorded and combined under the Ratliff and Root Ditch site number (5MT23092). Nine associated ditch features were recorded, photographed, and in some cases mapped in plan and elevation to capture representative constructed elements of the ditch.

TABLE OF CONTENTS

LIST OF FIGURES

RATLIFF AND ROOT DITCH LEVEL II DOCUMENTATION

Summary Statement

The Ratliff and Root Ditch (5MT23092) is 5.6 mile long irrigation system serving agricultural properties along the eastern portions of the Mancos and Weber Valleys in southwest Colorado. The ditch diverts water from the Mancos River 1.4 miles upstream from the town of Mancos and runs northwest, west, southwest, and finally south to agricultural fields on the floodplains and benches on the eastern slope of Mancos and Weber Canyons. First appropriated in 1875 and then adjudicated 1893 with Number 2 water rights priority, the Ratliff and Root Ditch was one of the first irrigation ditches constructed near the town of Mancos, Colorado and is named after two early homesteaders with patented properties along the ditch, James Ratliff and Almarian L. Root. The Ratliff and Root Ditch was expanded by 1893 through several extensions including the Webber No. 2 Ditch Extension, the Seabury Extension, and the Olds Extension.

Over the last 127 years, short segments of ditch have been rerouted, laterals ditches have been added, and ditch features have been altered and/or added. The current manifestation of the ditch drops at a 1-5 degree slope, averages 4 feet wide and 3 feet deep, and is generally retained by a 10 foot wide berm built on the downslope side. Features along the ditch include the ditch intake gate at the Mancos River, numerous main ditch and lateral ditch headgates, Parshall Flumes, and a siphon fed stilling well. Now owned by the Mancos Water Conservancy District, the Ratcliff and Root Ditch continues to convey water down its length, crossing under several historic roads and through three associated historic homesteads.

Project Introduction

Woods Canyon Archaeological Consultants, Inc. (Woods Canyon) conducted Colorado Office of Archaeology and Historic Preservation Level II Historic Site Documentation of the Ratliff and Root Ditch near Mancos in Montezuma County, Colorado. The ditch was documented as mitigation to the adverse effects associated with the Ratliff and Root Ditch Salinity Project. The project, which is part of the Colorado River Basinwide and Basin States Salinity Control Programs, involves the construction of a new buried water pipeline and access road, and filling in of the existing historic ditch. Some portions of the pipeline will be collocated within the existing ditch alignment and other portions will cross land adjacent to the ditch.

This documentation is in support of U.S. Bureau of Reclamation Funding Opportunity BORUC-17-F003, and is being completed to support the Reclamation's Western Colorado Area Office in their obligations to consider impacts to historic properties under Title 54 United States Code 300101 et seq., National Park Service and Related Programs (formerly known as the National Historic Preservation Act of 1966). Although the project area is almost entirely on private land, it crosses several Colorado Department of Transportation rights-of-way.

Level II documentation of the Ratliff and Root Ditch expands on the cultural resource inventory and documentation of the ditch by SWCA in 2018 and 2019. Based on that work, the State of Colorado Office of Archaeology and Historic Preservation determined that the Ratliff and Root Ditch (5MT23092) will be adversely affected by the Ratliff and Root Ditch Salinity Project. To mitigate effects to the Ratliff and Root Ditch (5MT23092), Woods Canyon Archaeological Consultants conducted Colorado OAHP Level II Historic Site Documentation of the resource in September of 2020.

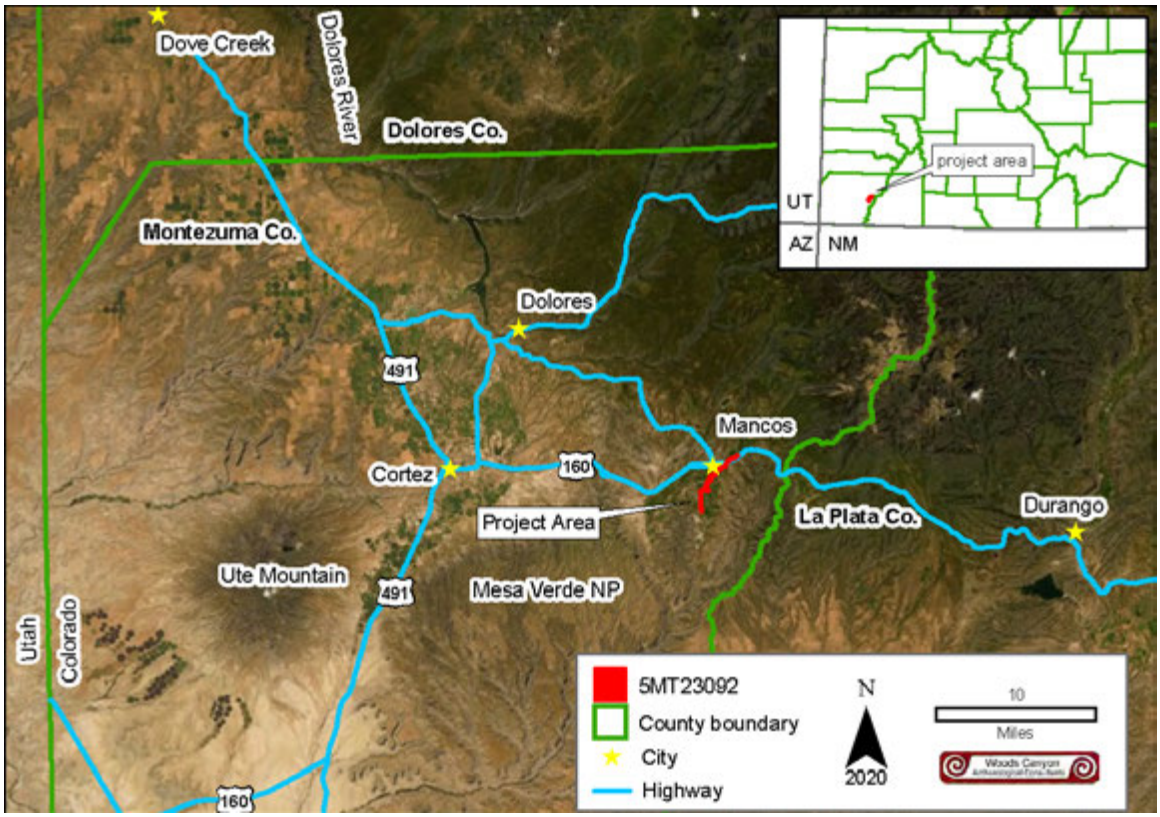


Figure 1. Location of the Ratliff and Root Ditch (5MT23092) in Montezuma County, Colorado.

This report details the results of Level II documentation of the Ratliff and Root Ditch. Shanna Diederichs conducted the fieldwork September 24 and 25, 2020. Jason Chuipka served as Principal Investigator for the project. Ernie Rheaume of the Bureau of Reclamation Western Colorado Area Office provided oversite for the project.

At the request of SHPO and Reclamation, a lateral ditch recorded as 5MT23519.1 by SWCA Archaeological Consultants during the initial survey (Eisenhauer et al. 2019) was combined with 5MT23092 and described here as part of the Ratliff and Root Ditch. Woods Canyon also identified, documented nine associated ditch features in detail, photographed, and in some cases mapped in plan and/or elevation to capture representative constructed elements of the ditch. Every effort was made by Woods Canyon staff to expand research and answer additional questions about the segment of the ditch in question, since rigorous field recordation will exhaust its data potential. The following history and site description expands on the documentation for the Ratliff and Root Ditch as initially recorded in 2019.

Historic Context (A.D. 1850-1960)

Small-scale mining operations, particularly for gold and silver, began working mining claims in southwestern Colorado beginning in the 1870s. In the early 1870s, John Moss, frontiersman, prospector, and miner from California, led two mining expeditions to the La Plata Mountains, north of the project area. The expeditions included Richard Giles, John Merritt, Thomas McElmel, John McIntire, John Thompson, John Madden, Henry Lee, and John Robinson during the first expedition, and Almarian Root, James Ratliff, Henry Lee, and John McIntire during the second

expedition, and resulted in the discovery of the Comstock Mine, the establishment of the California Mining District, and the platting of the Parrott City town site (Seyfarth and Lambert 2010). Several members of the Moss Expeditions ultimately decided to settle in the Mancos area including Almarian Root, James Ratliff, Richard Giles, John Merritt, and Henry Lee; these men established homesteads and ranches along the Mancos River in what would eventually become the town of Mancos.

As the demand for precious metals fluctuated, individual prospectors were pushed out and mining companies were established.. The prospectors who remained in the Mancos Valley turned to ranching, which began in earnest in the Mancos Valley in the mid-1870s. Ranchers made a living providing beef, timber, and other agricultural products to miners. In the vicinity of Mancos, ranchers constructed irrigation ditches that diverted water from the Mancos River to supply their ranches with water for livestock and farming. One of the earliest irrigation ditches in the area is the Ratliff and Root Ditch, which was constructed between 1874 and 1875 by two members of the second Moss Expedition who settled in the area: James Ratliff and Almarian Root. An extensive system of irrigation ditches that supported ranching and agriculture in the Mancos Valley was constructed over the next 30 years by local individuals and irrigation organizations (Stene 1994).

The population of the Mancos Valley increased significantly during the next few years, supported by the mining and ranching industries. By the early 1880s, the population was substantial enough to support a schoolhouse, a post office, and a general store in what would eventually become the town of Mancos. The town itself was incorporated in 1894, shortly after the arrival of the Denver and Rio Grande Southern Railroad in 1891. At the time of its incorporation, Mancos served as the center of commerce in eastern Montezuma County, with the railroad providing a means of transporting goods between Mancos, Durango, Dolores, and Telluride, a mining town to the north.

Cattle ranching thrived over the next 20 to 30 years: the Mancos Cattleman's Association formed in 1918, and the first locker plant, which provided for the preservation of large quantities of meat until the home freezer became popular, was opened in 1941. At the same time, increasing settlement in the Mancos Valley and the natural arid environment of the region threatened the stability of the agricultural industry. As a result, the Mancos Project, which was authorized by Congress in 1939, approved by President Roosevelt in 1940, and overseen by Reclamation, resulted in the construction of Jackson Gulch Reservoir. The reservoir, which diverts water from the West Mancos River northeast of the project area, and provides domestic water for Mancos Valley as well as for Mesa Verde National Park and the Mancos Rural Water Conservancy, was constructed between 1941 and 1949 first by the Civilian Conservation Corps and later by a group of Civilian Public Service assignees (Stene 1994). Management of the Mancos Valley water supply system was transferred to the Mancos Water Conservancy District in 1963. The Root and Ratliff Ditch Company currently operates the ditch.

History of the Ratliff and Root Ditch -- 5MT23092

The Ratliff and Root Ditch was first appropriated on April 15, 1875 (Colorado Department of Natural Resources 2019a) and was one of the first irrigation ditches constructed in the Mancos area, and is named after two of the first homesteaders in the Mancos area, James Ratliff and Almarian L. Root. The ditch was adjudicated on April 28, 1893, and assigned Number 2 in water rights priority (District Court of the Sixth Judicial District 1893). The original alignment of the ditch may be depicted on the 1877 GLO plat map for T36N, R13W, trending south from the Manco River and Parrott City Road, near the house of James Ratliff to just east of the house of

Almarian Root. However, the ditch is not labeled as a ditch, and it is unclear from the associated plat field notes if this is an alignment of the Ratliff and Root Ditch. The ditch is not identified on USGS topographic maps dating between 1956 and 2016. However, the ditch is depicted on several water rights claim maps dating to the late nineteenth century and available from the Colorado Department of Natural Resources.

According to a Statement of Claim for the Ratliff and Root Ditch filed with the District Court of the Sixth Judicial District in 1893, the Ratliff and Root Ditch was located and constructed by Mr. Ratliff and Mr. Root in 1874 and 1875. According to Mr. Root, the men identified the ditch route in July 1874, began construction on the ditch around August 12, 1874, and completed construction of the ditch in the spring of 1875. At the time of its construction, the ditch measured approximately 5 feet wide at the top, 3 feet wide at the bottom, and was 2 feet deep. The ditch was subsequently enlarged, but no measurements are provided. Mr. Root also indicated that water for the ditch was first diverted from the Mancos River about 1 mile south of the Giles ranch, which in 1893 was owned by Mr. Meneffe. Unfortunately, the Giles ranch is not labeled on the 1877 GLO plat for T36N, R13W. In 1884, the head of the ditch was moved approximately 250 yards upstream on the Mancos River. The ditch was used to irrigate the land of both Mr. Ratliff and Mr. Root, who received land patents for the land their respective ranches were located on in 1887 and 1882, respectively (BLM 2018a: Accession Nos. CO0670_.005 [Ratliff] and CO1030_.047 [Root]). The Ratliff and Root Ditch was subsequently expanded through several extensions including the Webber No. 2 Ditch Extension, the Seabury Extension, and the Olds Extension (Colorado Department of Natural Resources 2019a; District Court of the Sixth Judicial District 1893). Today the ditch and its extension still function as an irrigation system. The ditch is owned by the Mancos Water Conservancy District.

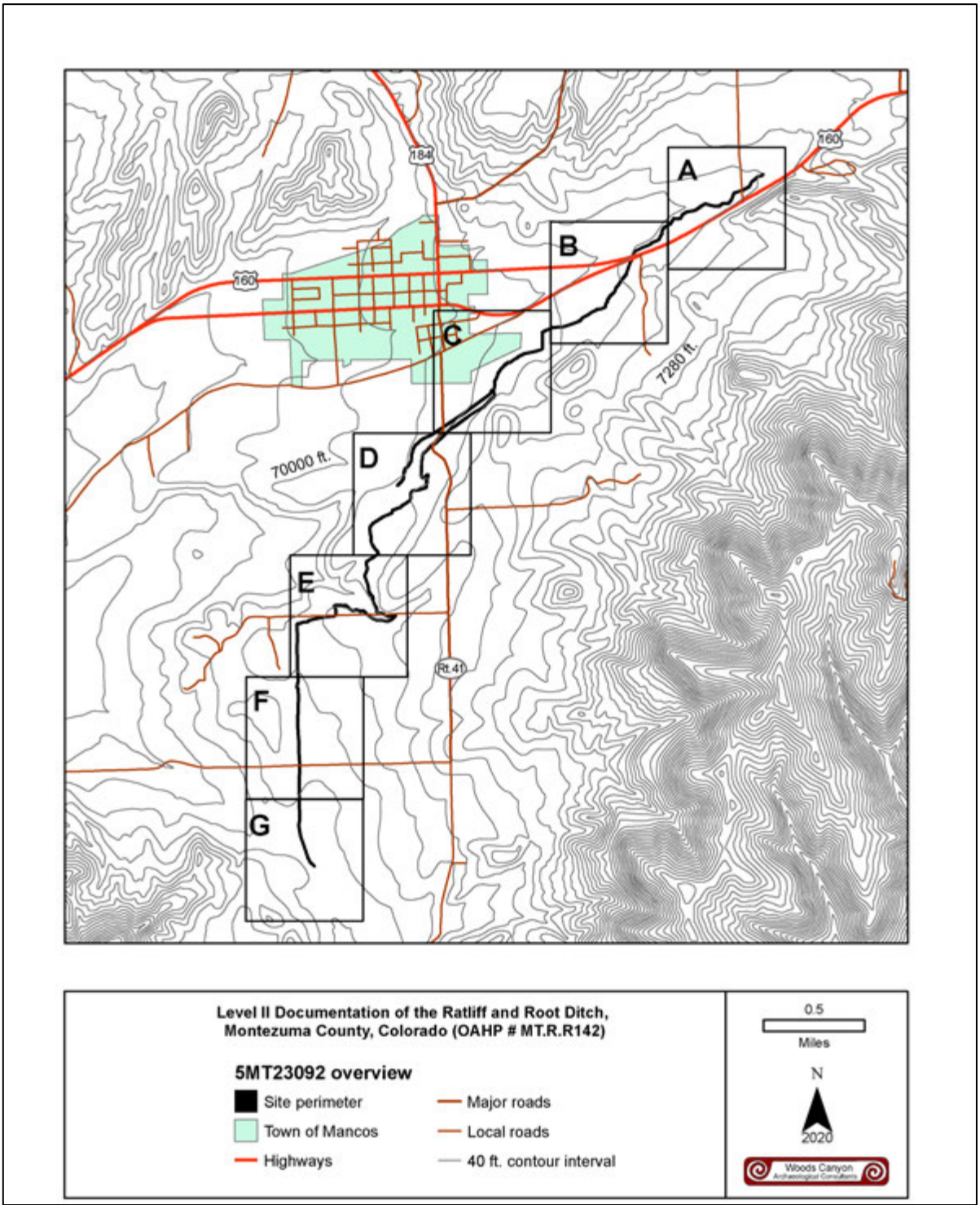
5MT23092 is one of the first irrigation systems in southwestern Colorado in the late nineteenth and early twentieth centuries and falls within the scope of the Water and Irrigation portion of the *Colorado Plateau Country Historic Context* (Hubbard 1984). The Ratliff and Root Ditch was constructed at the very beginning of the period of significance (1874–1922), and was instrumental in facilitating irrigation of the arid land near Mancos and settlement of the region, including successful cattle ranching and farming.

The ditch is representative of irrigation projects common throughout the region in the late nineteenth and twentieth centuries. Its length represents the extent to which irrigation engineers were able to divert water to irrigate large acreages of otherwise arid land. Although representative of these engineering methods, the ditch itself lacks any distinctive characteristics that would identify it as a significant example of this type of engineering.

Site Description

The Ratliff and Root Ditch is approximately 5.6-mile-long (Figure x-x). The site boundaries were determined by the ditch itself and the associated berm and by the extent of the project area on the north and south. The Ratliff and Root Ditch begins where the ditch diverts from the Mancos River, approximately 670 feet east of Montezuma County Road 43 and runs generally west-southwest until it crosses Highway 160 at the intersection of Highway 160 and Highway 160 Business Loop. The ditch then runs southwest and crosses Montezuma County Road 41 just north of the Cedar Grove Cemetery, and then continues in a more southerly direction through the historic homestead of Joseph S. Smith (5MT23084) to Montezuma County Road H, which it parallels along the north and south sides for approximately 0.5 mile until the ditch turns south. It then runs straight south, crossing Montezuma County Road G to a point 0.5 mile south of that road. A major lateral of the ditch, previously recorded as site 5MT23519.1, branches from the

Ratliff and Root Ditch one third of a mile east of its crossing of Montezuma County Road 41. This .7 mile long lateral parallels the main ditch, running along the base of the south Mancos Valley escarpment and to the southeast across the historic homestead (5MT23521) of one of the ditch founders, Almarian Root, before turning south for .2 miles and petering out at the southeast corner of an agricultural field.



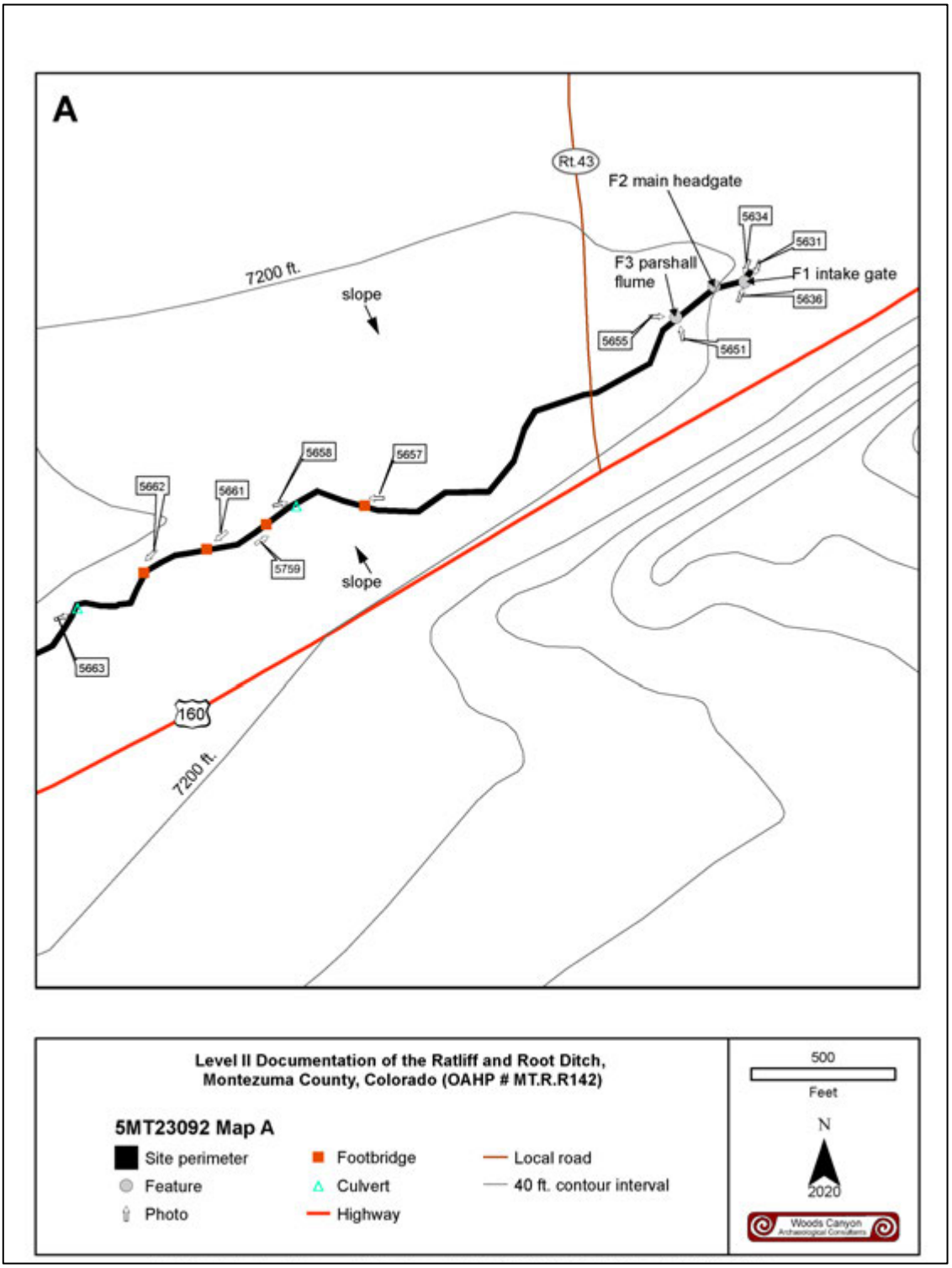


Figure 3. Detail map of Section A of the Ratliff and Root Ditch.

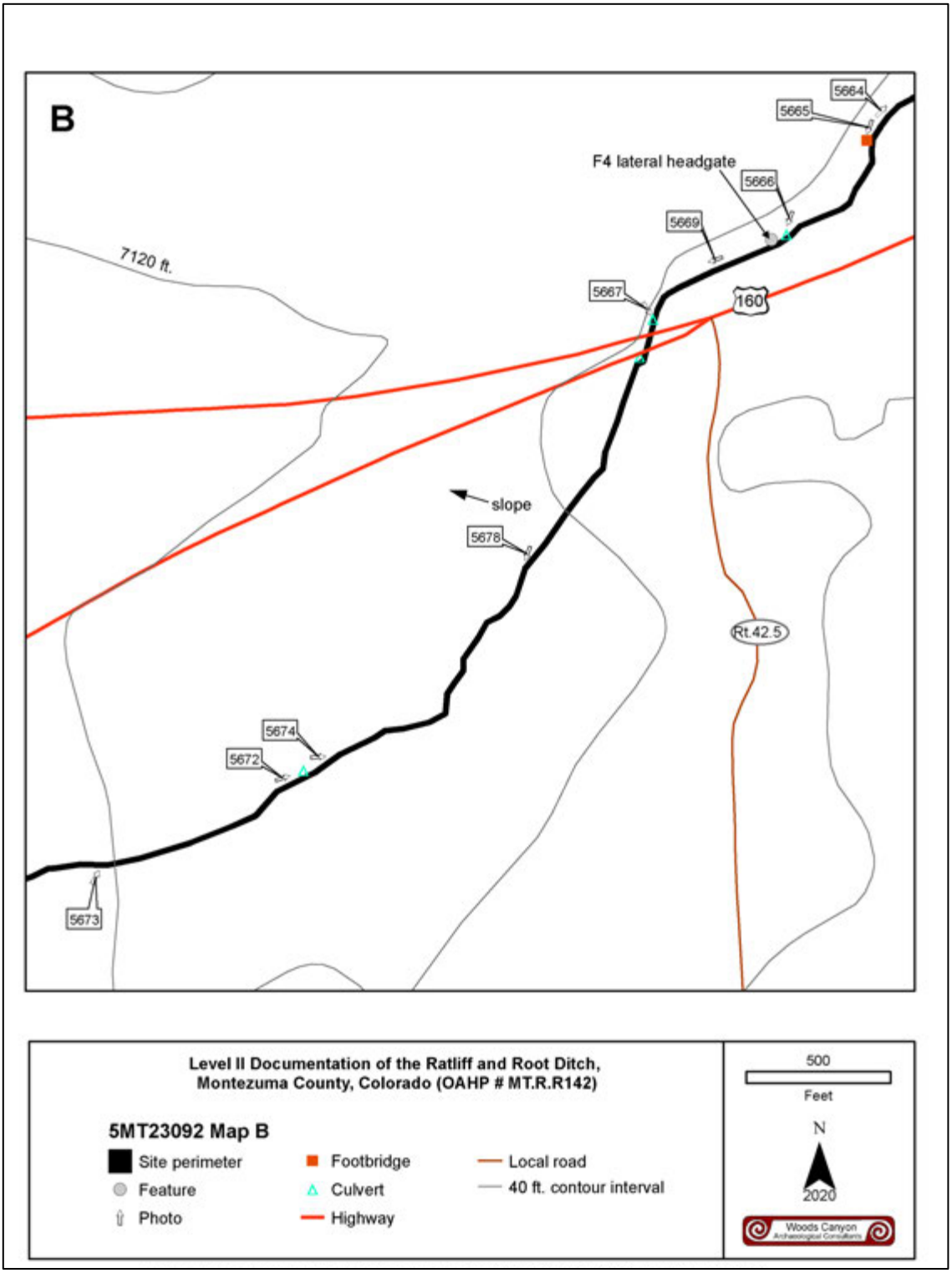


Figure 4. Detail map of Section B of the Ratliff and Root Ditch.

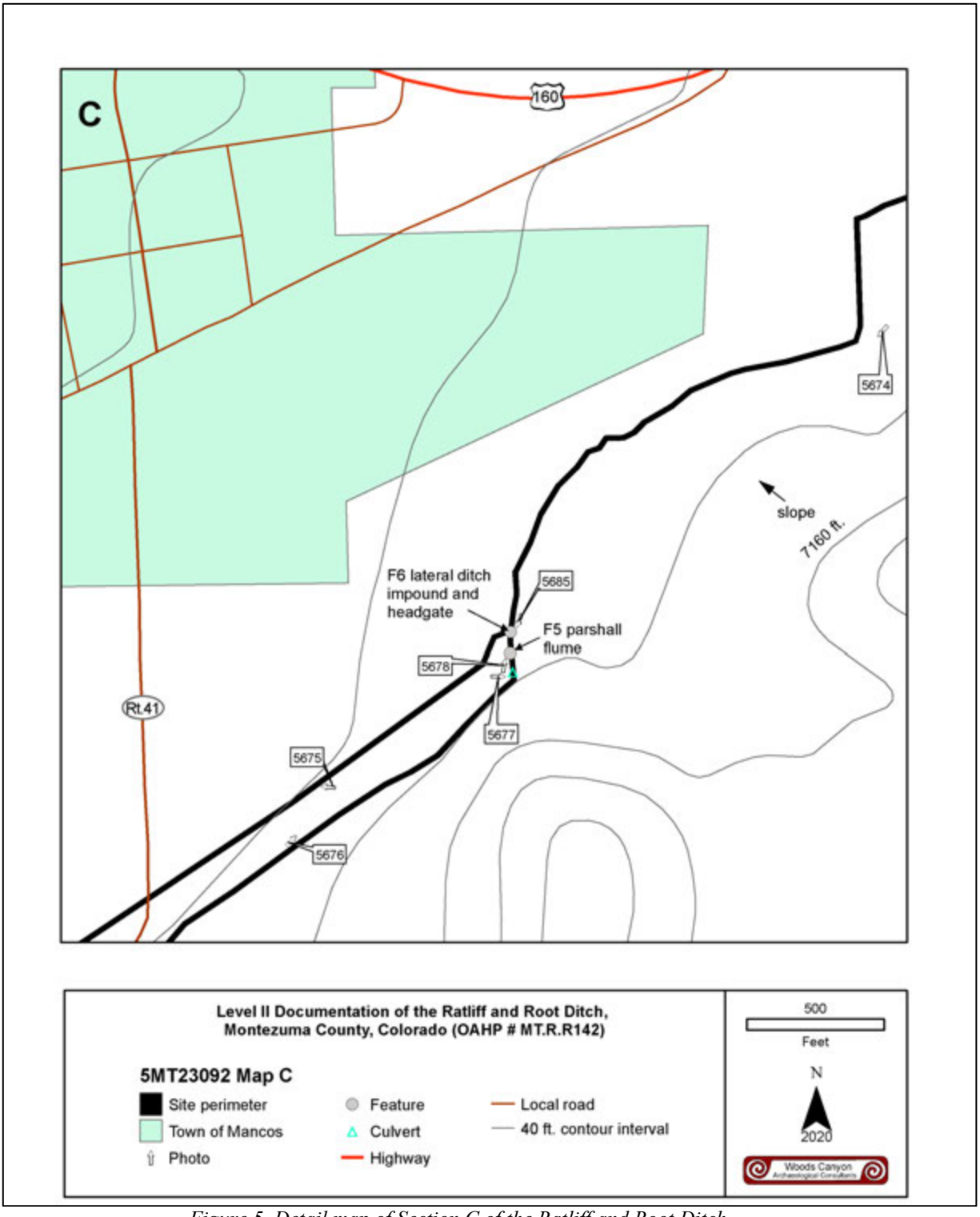


Figure 5. Detail map of Section C of the Ratliff and Root Ditch.

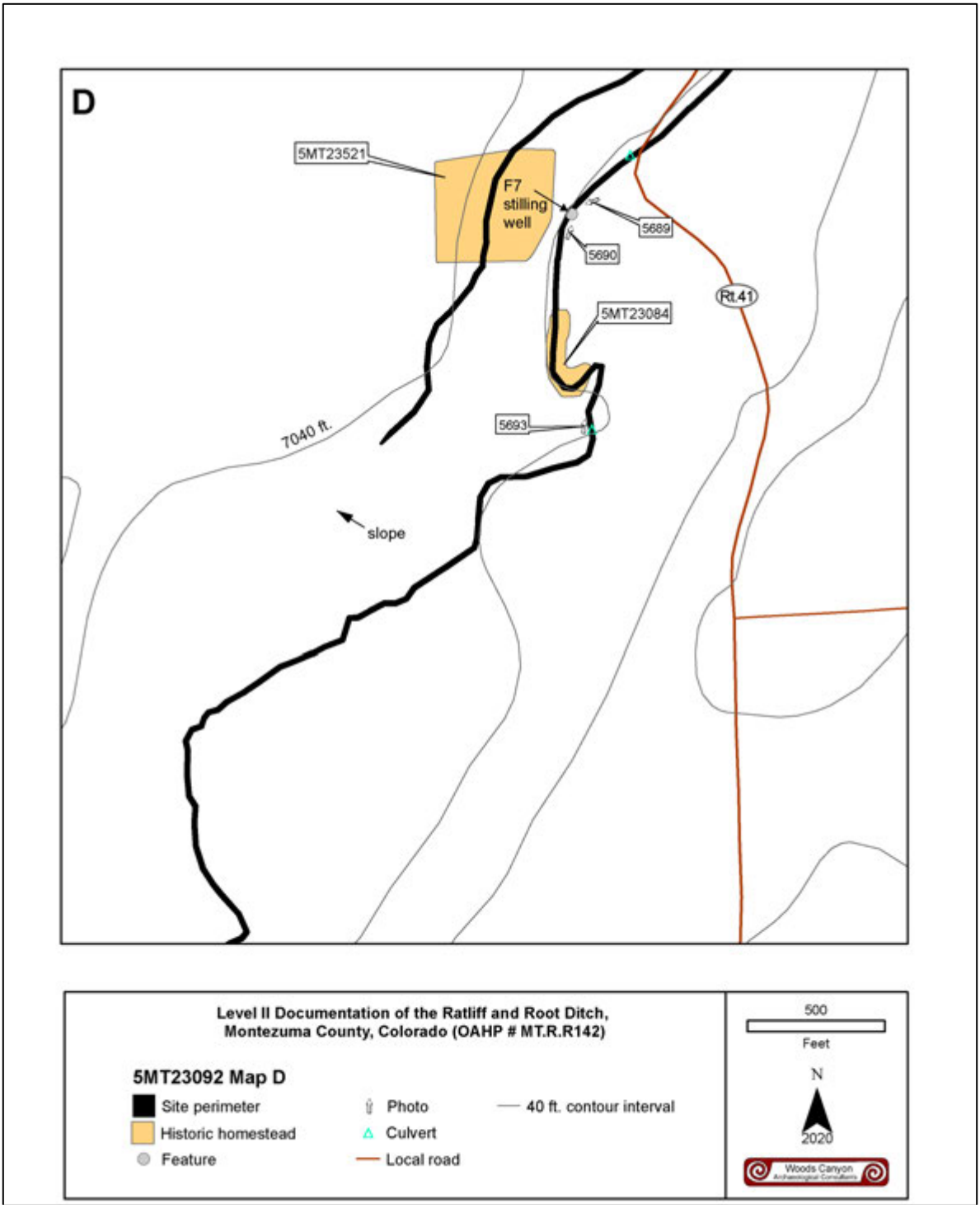


Figure 6. Detail map of Section D of the Ratliff and Root Ditch.

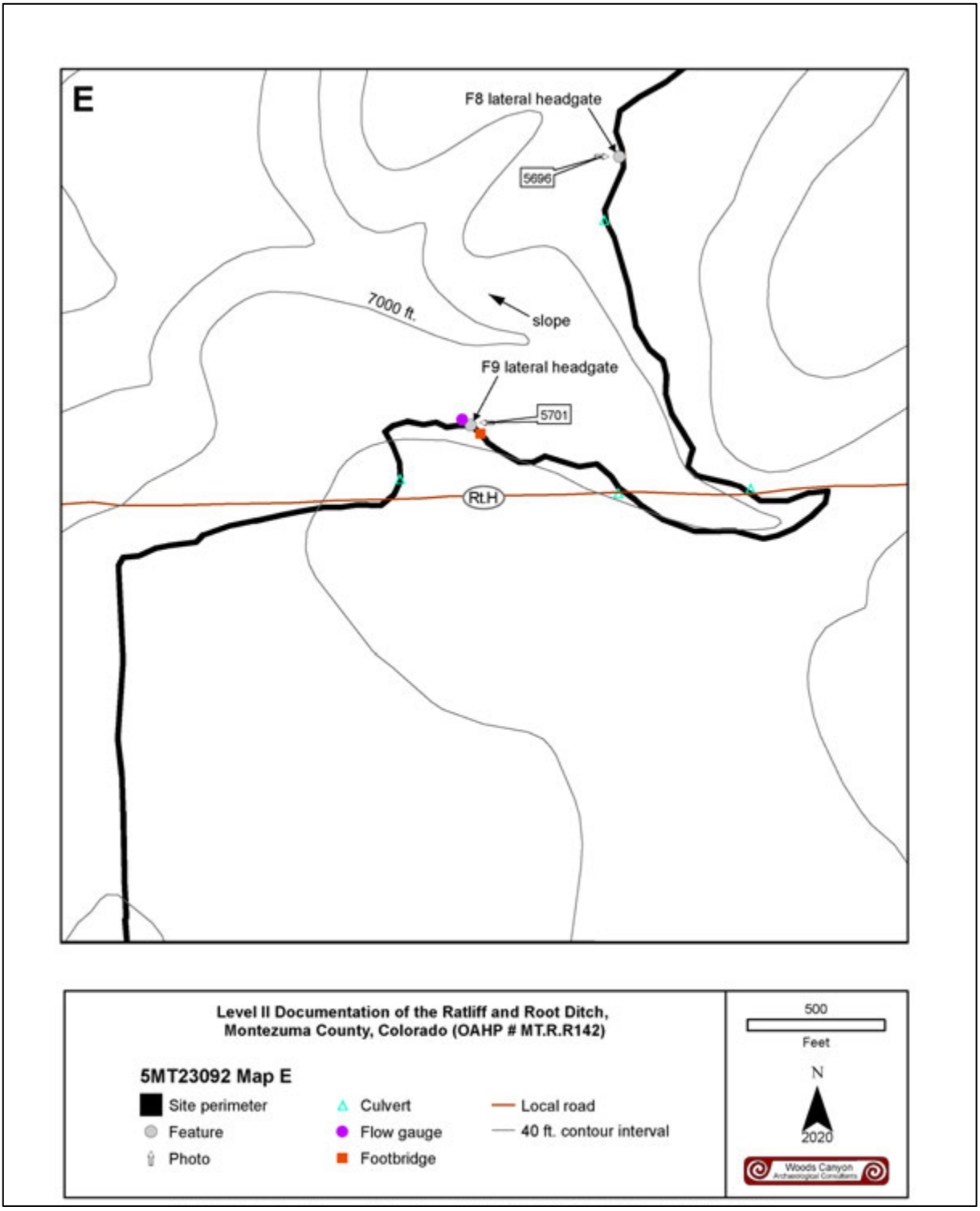


Figure 7. Detail map of Section E of the Ratliff and Root Ditch.

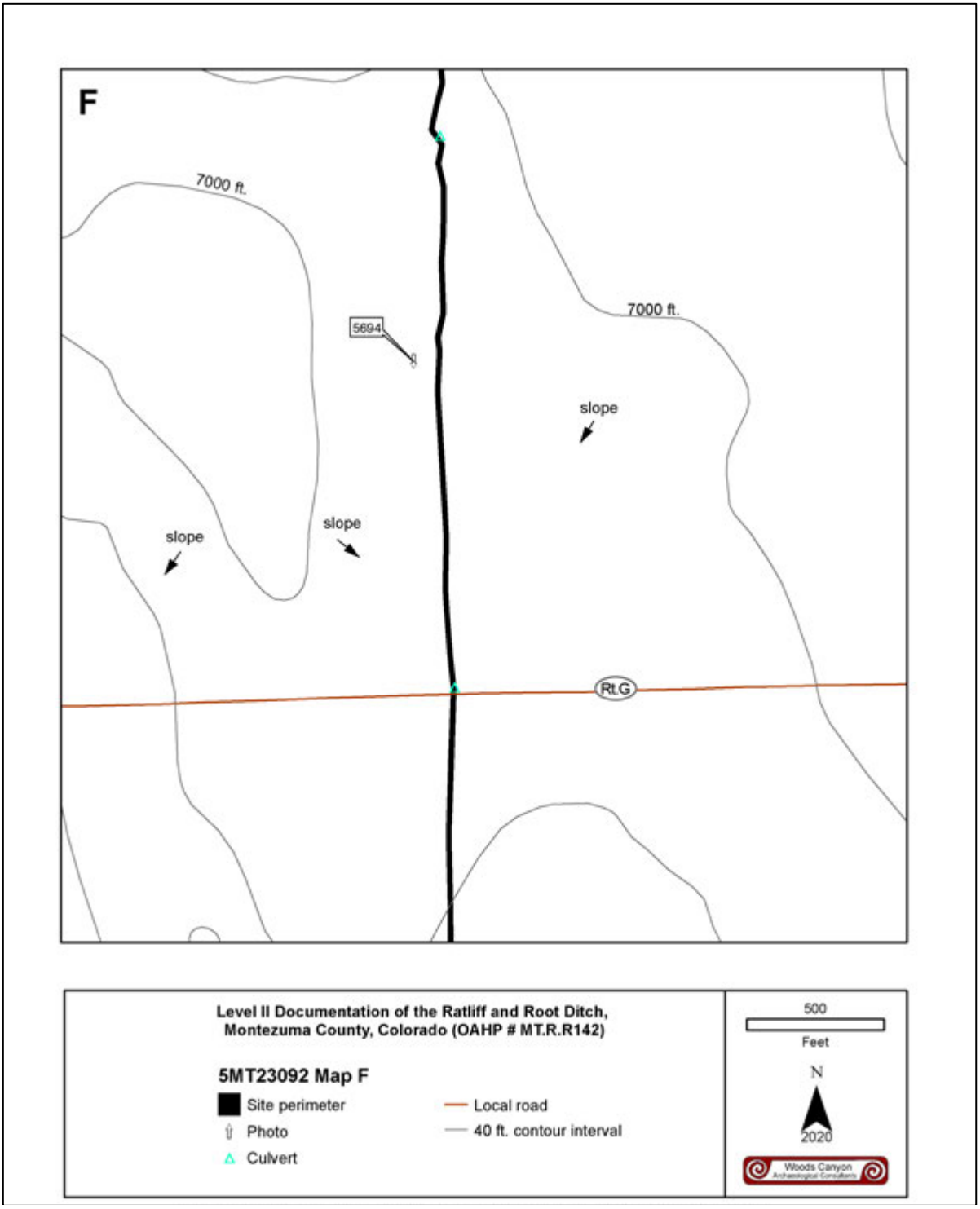


Figure 8. Detail map of Section F of the Ratliff and Root Ditch.

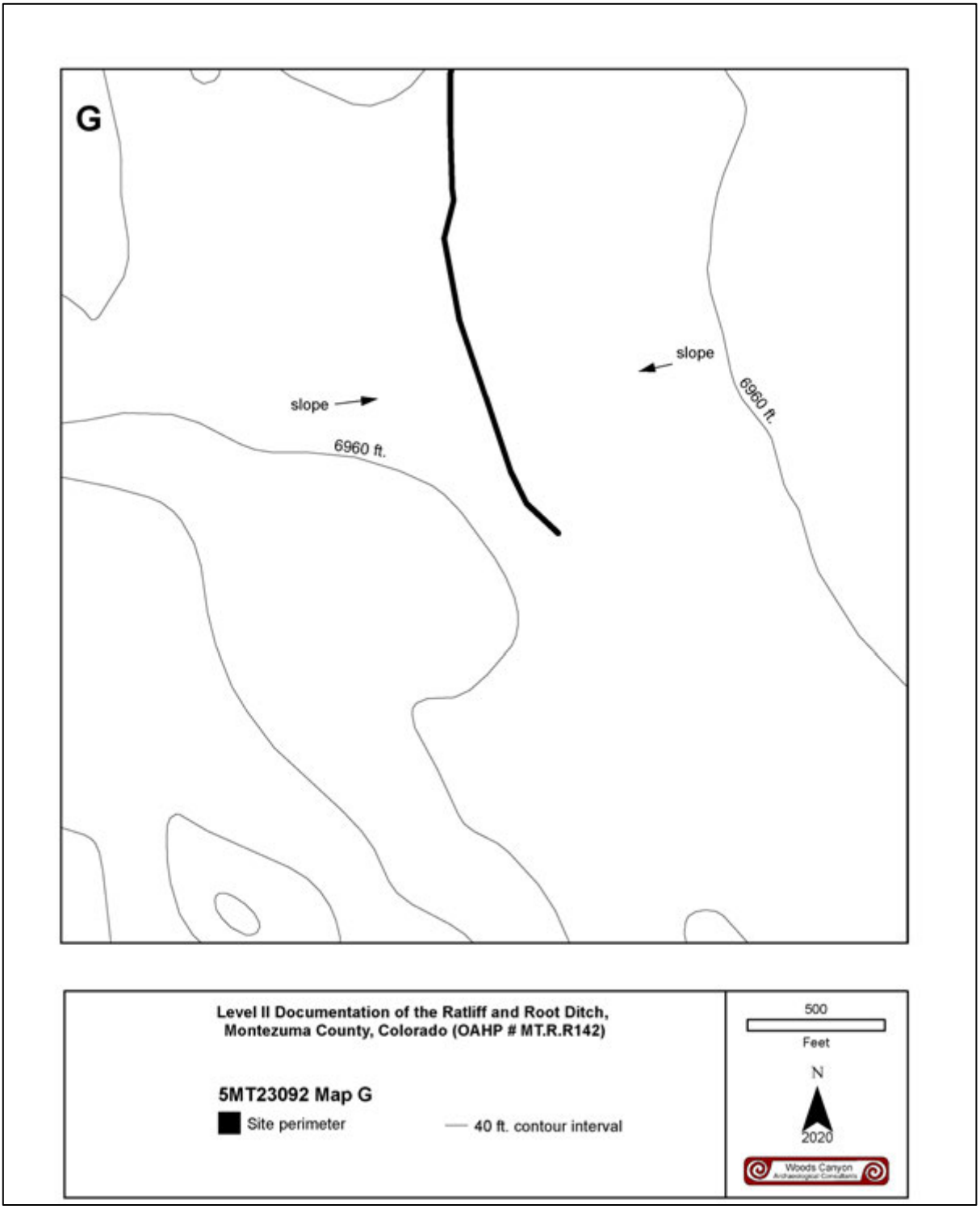


Figure 9. Detail map of Section G of the Ratliff and Root Ditch.

Figure 10. The Ratliff and Root Ditch in the foreground with the Joseph S. Smith homestead in the background.

The Ratliff and Root Ditch trends generally northeast–southwest and then south through the valley east and south of the town of Mancos. Slope is generally 1 to 5 degrees and the aspect is to the southwest and south. The ditch runs mostly through agricultural fields and occasionally through residential areas. Vegetation along the sides of the ditch is dominated by grasses with willow, serviceberry, rabbitbrush, and other forbs also present. The overstory along the ditch includes cottonwood, juniper, and elm. Ground visibility on either side of the ditch averages 5 percent, with soil along the ditch consisting of a brown silty loam.

The ditch averages 4’ wide and 3’ deep with an earthen berm along one side that in is between 2 and 8 feet high and 5’ and 12’ wide at the base depending on topography. Lateral ditches range from 1’ to 3’ feet wide with small 2’ wide berms along their downslope side. The ditch starts with a large intake gate (Feature 1) at the Manocs River followed by the main headgate (Feature 2) and the initial Parshall Flume (Feature 3) to gauge the ditch water intake. The large lateral ditch discussed is diverted from the Ratliff and Root Ditch with an impound/ headgate feature (Feature 5). Another Parshall Flume (Feature 6) gauges the water flow in the Ratliff Root Ditch below the lateral ditch take out. Features 4, 8, and 9 are additional headgates along the ditch leading to agricultural fields. Feature 7 is a rare domestic water stilling well-built off the ditch in the vicinity of the Root or Smith historic homesteads.

Figure 11. A heavily engineered section of the Ratliff and Root Ditch on a steep escarpment east of its crossing with Montezuma County Road 41.

Figure 12. Overview of a large lateral ditch (previously recorded as 5MT23519.1) off of the Root Ratliff Ditch.

Metal and concrete culverts are present along the length of the ditch and convey water under public roadways, including under Highway 160 and four county roads—Montezuma County Roads 41, 43, G, and H, which has three crossings. Historic elements of these culverts were recorded as features of the historic roadways (Eisenhauer et al. 2019). At least ten other culverts on private land are installed along the length of the ditch and its laterals to provide vehicle access across the ditch right of way. All ten of these culverts were built with 2' in diameter corrugated pipe are modern additions to the ditch. Likewise, many private landowners along the ditch have installed small footbridges as a means of pedestrian access across the ditch and its laterals. The foot bridges encountered along the ditch area all modern constructions of wood or metal corrugated pipe. Modern footbridges and culverts associated with the Ratliff and Root Ditch were mapped and photographed to contextualize the modern use of the ditch but were not recorded as associated features.

Figure 13. Example of a modern footbridge across the Ratliff and Root Ditch.

Figure 14. Example of a modern 2 foot in diameter corrugated metal culvert along the Ratliff and Root Ditch.

Feature Descriptions

Feature 1 Intake Gate

The Ratliff an Root Ditch intake gate (Feature 1) is located on the south bank of the Mancos River, approximately 1.24 miles upriver from the town of Mancos, Colorado. At the intake gate, a the builders removed a 14 ft. wide section of the river bank. The intake gate is built at a north-northwest to south-southwest angle across this gap to capture the diverted flow of water from the river. Currently 2 ft. high and 12 ft. long berm of cobbles covered by tarps angles northeast to southwest across the Mancos River to divert water into the Ratliff and Root Ditch intake gates.

The intake superstructure is built of formed concrete. Six perpendicular pillars where mounted into the ditch opening. The three upstream pillars are 12" wide and stand 4'4" tall above the water line. The north face of the pillars angle back towards the superstructure at a 45 degree angle and the angled face is armored with ½" thick metal plates. Metal brackets are mounted along the outside edge of the outer angled pillars, likely to support additional wood or metal diversion plates during flooding events. The three downstream pillars are also 4'4" high but only 10" wide. The center pillar is 4' long while the side pillars are 6' long, L-shaped, and built into the east and west banks of the opening to reduce their erosion. The ditch intake gap is bridged by a 12x12" formed concrete beam that ties together all but the central upstream concrete pillar. Additional 5' long concrete wings extend off the east and west ends of this beam into the adjacent river bank to provide additional support to the superstructure.

The intake gates were mounted on the river (north) face of the superstructure. The gates are mounted in vertical metal frames measuring 8' high and 3'6" wide. The metal frames are 2" wide and bolted to the concrete pillars with 1" square concrete bolts. The gates measure 3 by 6' with metal panels mounted on their north face and steel panels on their south face. Stacked metal plates mounted on the north face of the concrete pillars block the flow of the intake ditch on either side and between the gates. The gates are raised and lowered with a rudimentary lever system. A vertical pole is mounted into the center of each gate and screwed into a plate on the south face. This pole extends through the top of the metal gate frame and a 6" tall bracket welded to the frame. Mounted to each bracket is a 3'6" long handle attached to the pole by a swivel lever below the handle. The gate levers are accessed via a 12' long and 2' wide metal grate walkway mounted to the tops of the concrete pillars on the south side of the gates.

Figure 15. Overview of the Ratliff and Root Ditch intake gates (Feature 1) facing south.

Figure 16. Closeup of the angled pillars on the north face of the Feature 1 facing southeast.

Figure 17. South elevation of Feature 1 facing north.

Figure 18. Closeup of the gate lever system in Feature 1. View to the northeast.

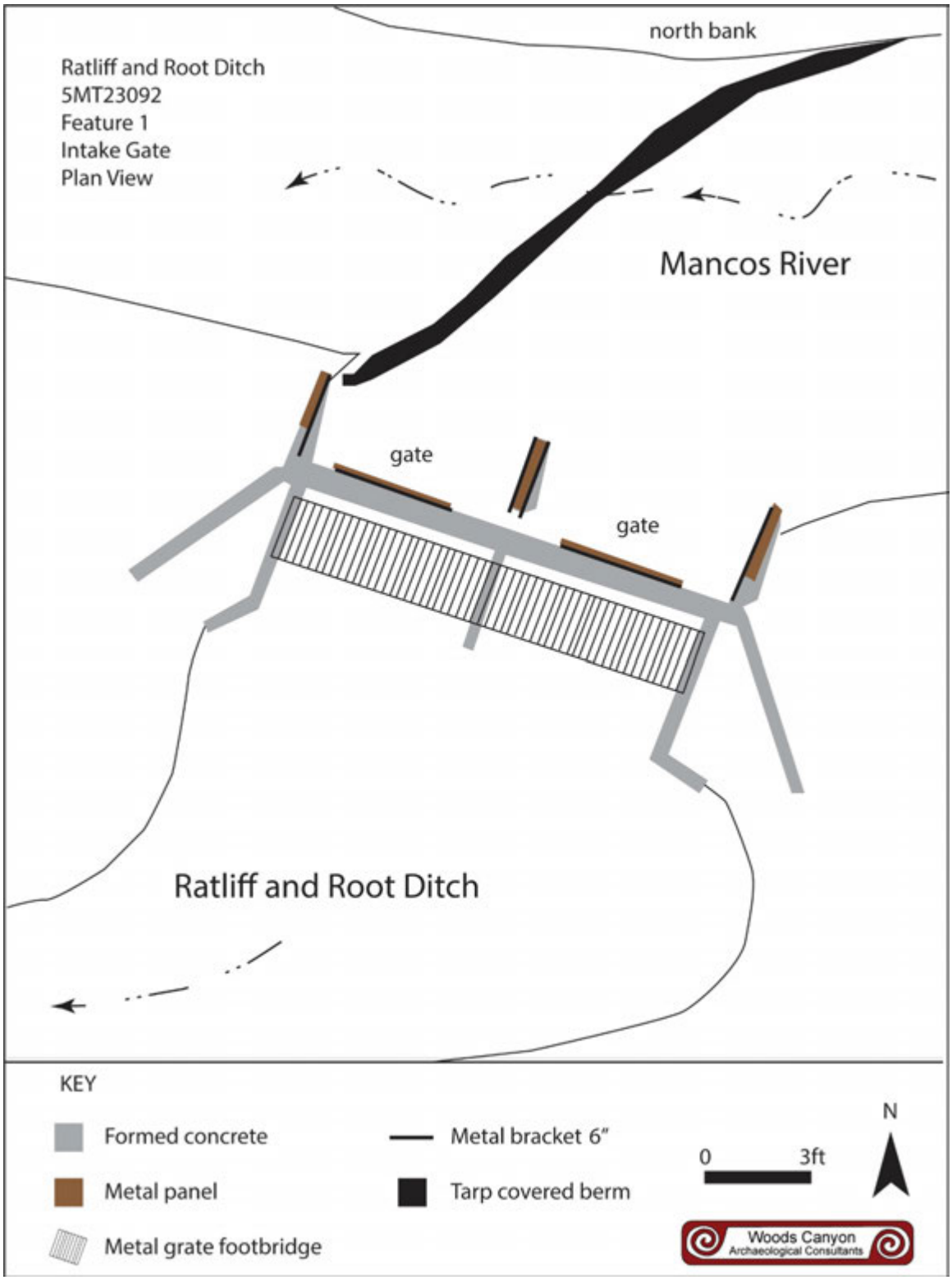


Figure 19. Plan map of Feature 1.

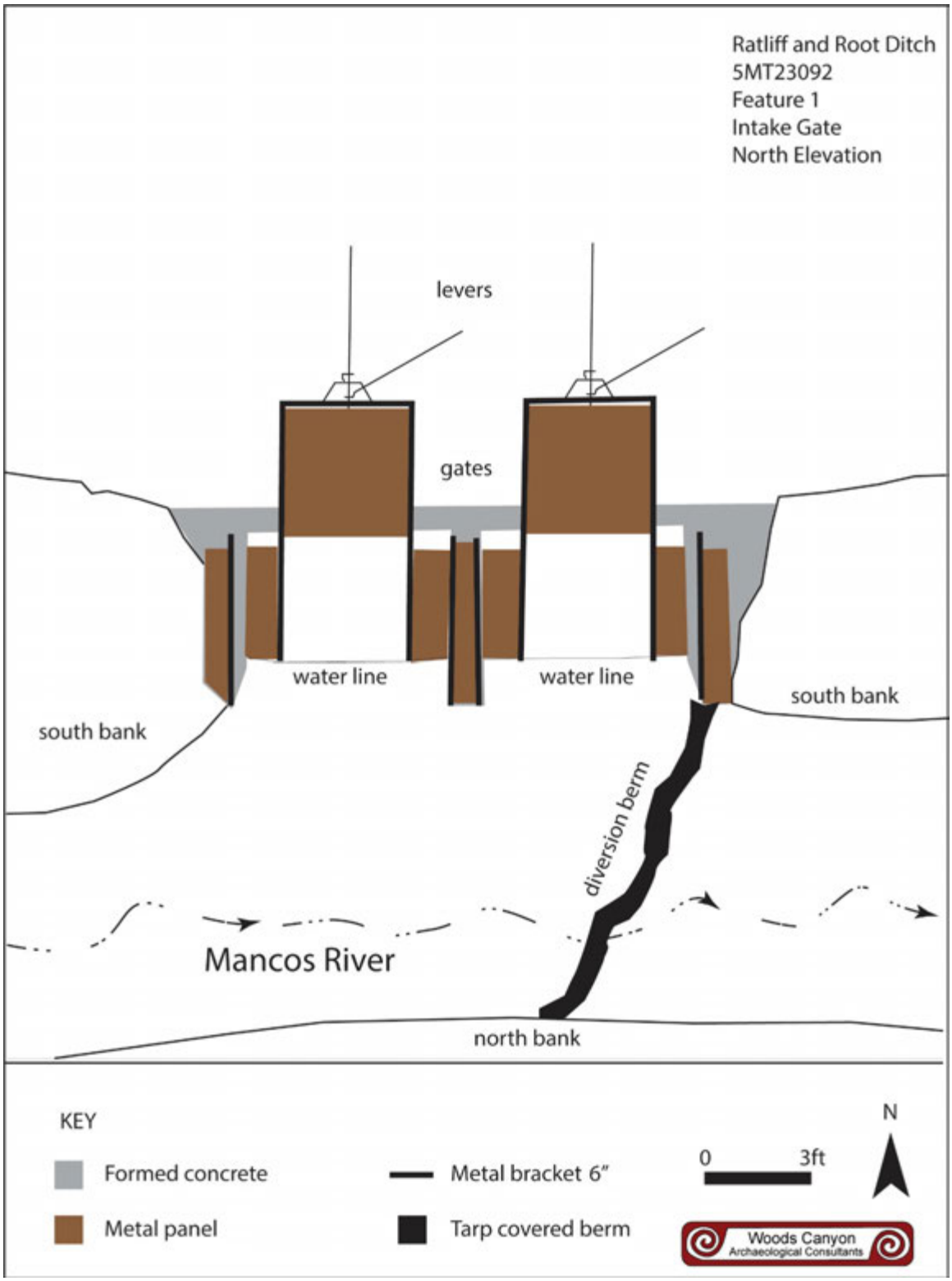


Figure 20. Scaled drawing of the north elevation of Feature 1.

Feature 2 Main Headgate

Feature 2 is the main headgate to the Ratliff and Root Ditch located about 110' west-southwest from Feature 1. The structure is built of two formed concrete wings. The south wing, which houses the headgate, was constructed in the mid-twentieth century based on a date stamp of "1948" inscribed on the top of the concrete wall. The northeast wing, which controls overflow back to the Mancos river, was added recently with a date stamp of "2007" similarly inscribed on the top of the wall. Both wings are 10" thick formed concrete standing approximately 6' tall.

Two headgates, one large and one small, are mounted into the south concrete wall. The large headgate is a 4' by 4' rectangular metal sheet mounted into a metal bracket frame bolted to the concrete wall. The gate is controlled by a 30" hand wheel stamped with the makers mark "Thompson P & S CO Denver 2155c". The wheel is locked in place with a chain and padlock. The smaller gate is mounted into a 18" wide frame 6" north of the larger headgate. The smaller headgate is controlled by a 10" diameter hand wheel which opens a circular 18" diameter metal grate. The large headgate opens directly into an 8'6" long and 2' wide rectangular inclined formed concrete drop spillway. The smaller headgate must add water to the spillway through an unseen concrete culvert. The end of the spillway flares out to a 5' by 5' stilling basin before it retracts to the standard 3' wide ditch.

The headgates are accessed along a 2' wide metal grate walkway on the west side of the south wall. The grate is supported by wooden beams laid across the spillway. A custom made headgate rake tool sits on top of the south wall next to the main headgate. This tool is 6' long made of 1" diameter metal. A loop handle is welded to the top end and an extra prong was added to the bottom to create a forked rake with slightly curing prongs. This tool is likely used to clean debris away from the mouth of the headgate.

The lower 4' of the northeast wing of the feature impounds sediment and water to channel into the adjacent headgates. An 8' wide gap in the upper 2' of the barrier provides an overflow outlet that pours over the damn into a swale that leads northwest, back to the Mancos River.

Figure 22. Overview of Feature 2 facing north-northwest.

Figure 23. East elevation of the headgates in Feature 2. View to the west.

Figure 24. West elevation of the overflow spillway in Feature 2. View to the southwest.

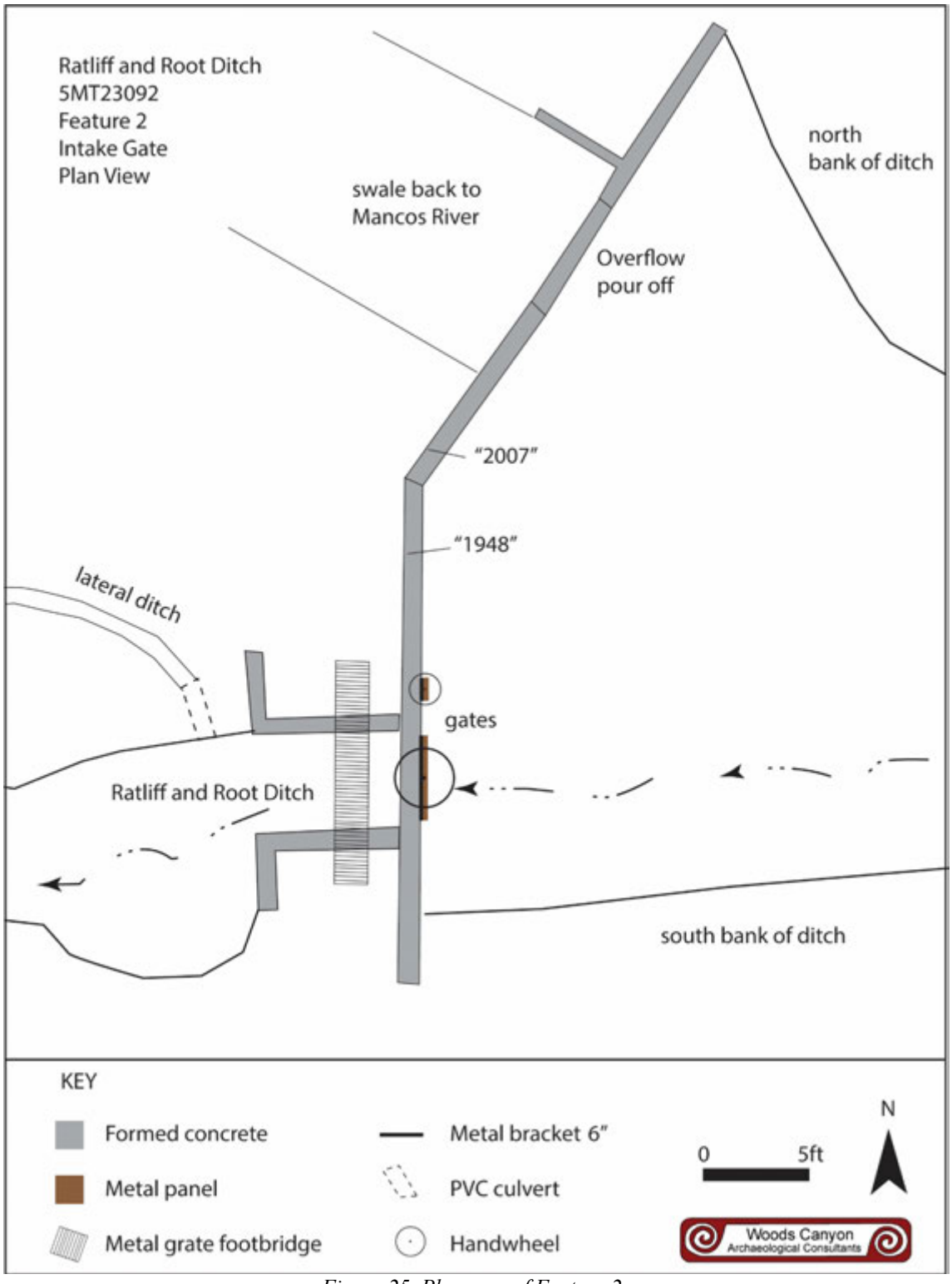


Figure 25. Plan map of Feature 2.

Feature 3 Parshall Flume

Feature 3 is a prefabricated Parshall Flume 173' west-southwest of the Feature 2 Main Headgate. The flume is 11'4" long and constructed of 3' by 3'sheet metal riveted together to form an hourglass shape. The flume opening is 5'6" wide and restricts to a 3'6" wide central shoot where the bottom drops 6" in just a couple of feet. A flow gauge ruler in cubic inches and feet is glued to the interior north face of the flume near the intake. A series of seven cross beams keep the flume from flexing. The Parshall Flume is held in place by 10" thick formed concrete buttresses mounted perpendicularly into the flume banks at all four corners.

Figure 26. Overview of the Parshall Flume in Feature 3. View to the southeast.

Figure 27. Gauge rulers on the north interior face of the Parshall Flume in Feature 3.

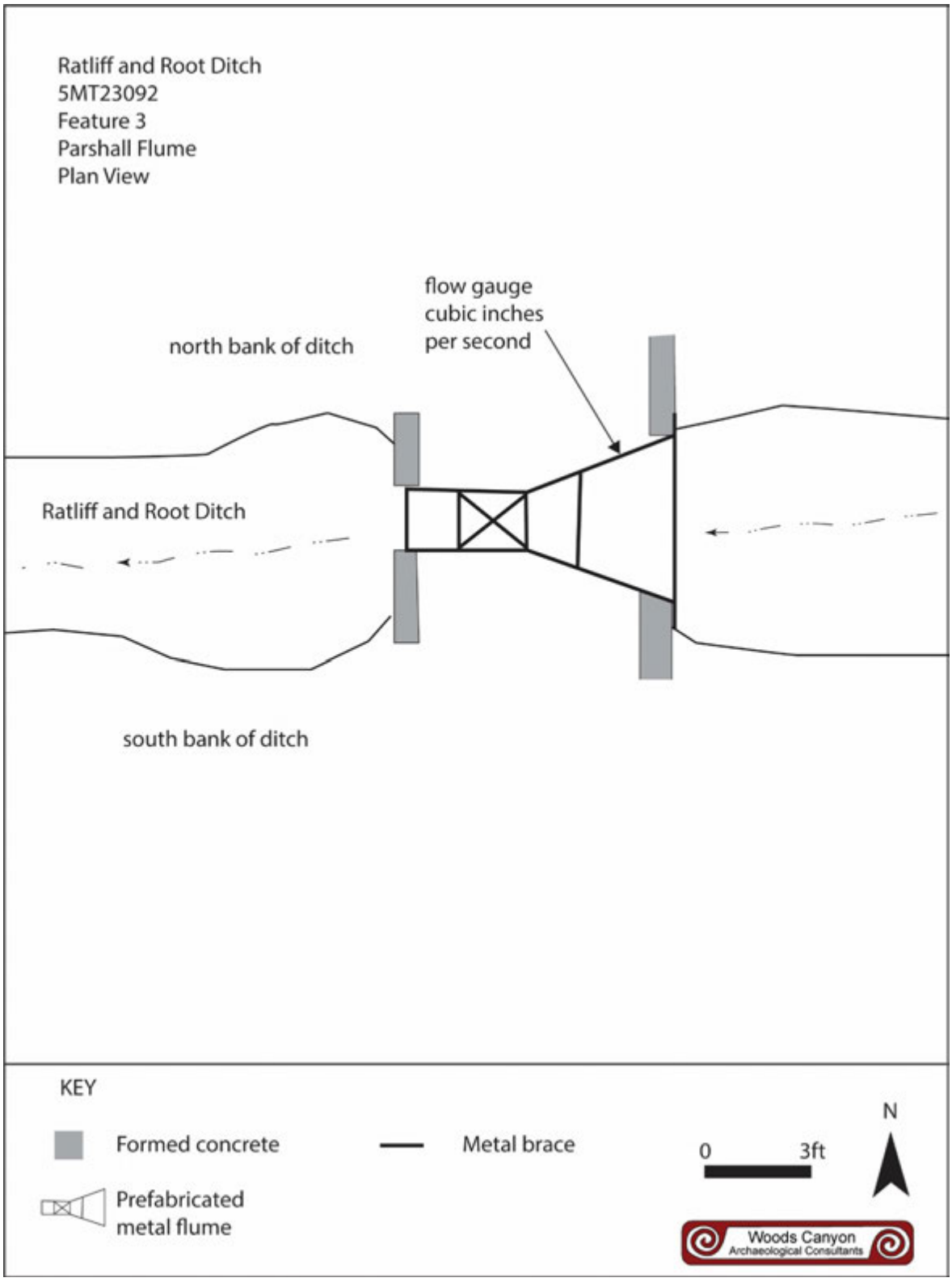


Figure 28. Plan map of Feature 3.

Feature 4 Lateral Headgate

Feature 3 is a defunct lateral headgate on the northeast side of the Ratliff and Root Ditch, 430' before it crosses U.S. Highway 160. The rectangular headgate frame is built of 3" wide metal plates bolted together to create a rectangular frame. The handwheel shaft is mounted through the top of the frame and controlled by a 10" wheel. Only the upper 2' of the headgate is currently visible. The actual gate inside the ditch has been buried by sediment. Likewise, there is no evidence of the headgate culvert or associated ditch that was fed by the headgate.

Figure 29. Feature 4 headgate with hand wheel facing south.

Feature 5 Parshall Flume

Feature 6 is a Parshall Flume installed north-south along the main Ratliff and Root Ditch 60' south of Feature 7, the headgate for a major lateral ditch. Like Feature 3, the flume 11'4" long and is constructed of 3' by 3'sheet metal riveted together to form an hourglass shape. The flume opening is 5'6" wide and restricts to a 3'6" wide central shoot where the bottom drops 6" in just a couple of feet. A flow gauge ruler in cubic inches and feet is glued to the interior west face of the flume near the intake. A series of seven cross beams keep the flume from flexing. The flume is held in place by a short 10" thick formed concrete buttresses off the northwest corner, three metal t-posts sunk along its west side, and a 8" diameter post mounted on the east side of the flume and tied to it with bailing wire. The flume exits into a shallow 14' in diameter stilling pond which opens into the standard 3' ditch off its south side.

Figure 30. Overview of the Parshall Flume in Feature 5 facing north.

Figure 31. Overview of the Parshall Flume in Feature 5 facing east.

Feature 6 Later Ditch Impound and Headgate

Feature 6 is an impound area and headgate for a major lateral ditch off the Ratliff and Root Ditch. The lateral diverts from the Ratliff and Root Ditch at the convergence of a hay field and cattle ranch before the ditch follows the topography onto the steep south escarpment of the Mancos Valley.

The ditch impound component of the feature consists of an 8' long formed concrete wall lining the west bank of the ditch, a 3' long formed concrete perpendicular buttress in the east bank, and a 5'3" wide framed opening between the two concrete stem walls. Both walls are 6" thick and stand about 3' above the current water level in the ditch. The 6' tall metal frame could be used to support a temporary impound gate made of metal or wood, which when installed would raise the water level to the height of the adjacent lateral ditch headgate.

The lateral ditch headgate is mounted into the concrete stem wall on the east bank of the Ratliff and Root Ditch. A 20" gap in the stem wall is framed with L-shaped brackets that support a 6" iron hand crank that lifts and lowers a 10" metal gate. The headgate frame is stamped with a certification mark, "MFGBY AWEPRITCW MANCOS CO 1969". Behind the gate is a trapezoidal custom built metal box measuring 12" deep, 8" long, and 17" to 22" wide. A 6" diameter open pipe runs through the center of box which controls the maximum flow of water into the lateral ditch. The flow control box is mounted in and opens into a 6'2" long and 2' deep concrete spillway.

A prefabricated Parshall Flume is mounted in the lateral ditch at the end of the concrete spillway. The flume is slightly smaller than the flumes in Features 3 and 5. The flume is 9' long a 2'8" opening on the east side and 2' opening to the west were it exits directly into the lateral ditch. Like the main Ratliff and Root Ditch, this lateral is 3' wide but is about half as shallow at about 1'6" deep.

Figure 32. Overview of Feature 6 facing south.

Figure 33. West elevation of lateral headgate in Feature 6.

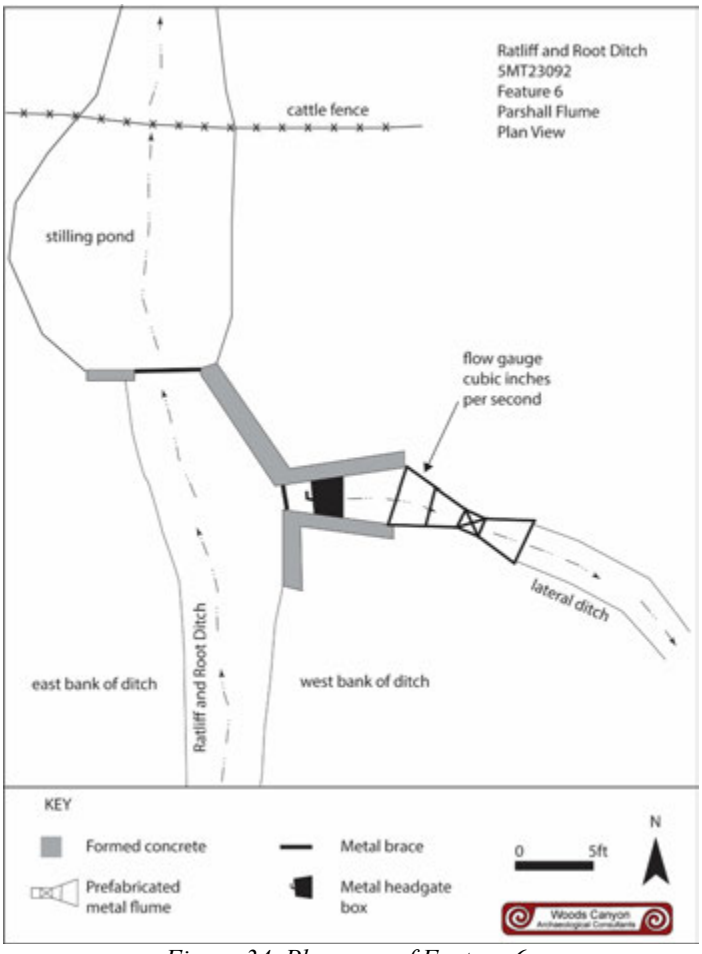


Figure 34. Plan map of Feature 6.

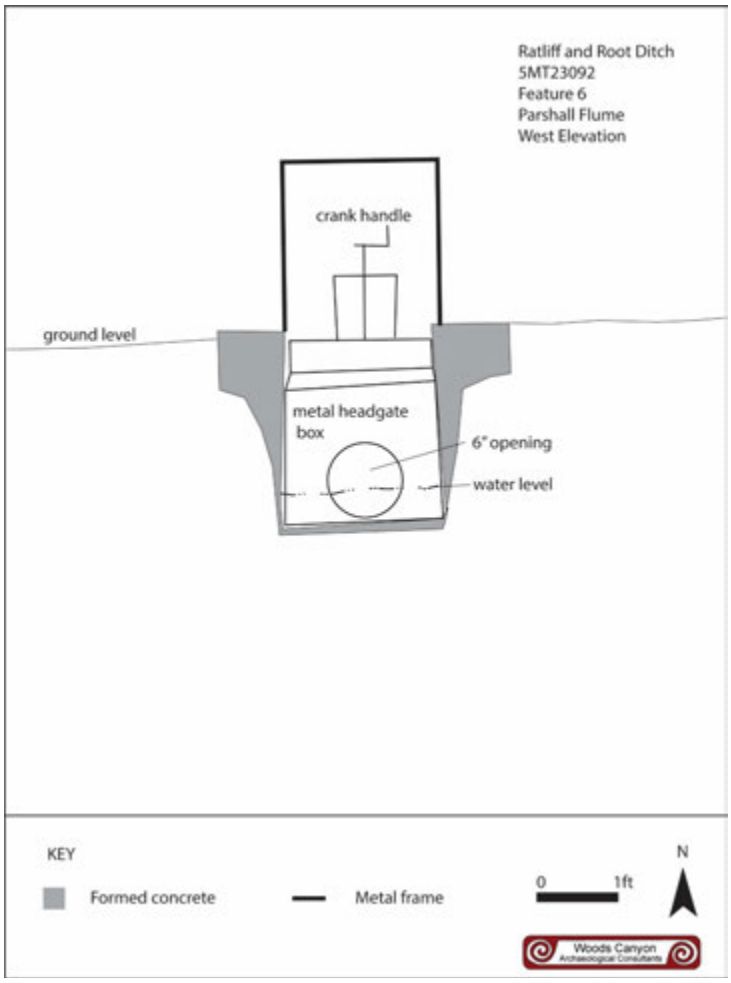


Figure 35. Scaled drawing of the west elevation of the lateral ditch headgate in Feature 6.

Feature 7 Stilling Well

Feature 7 is a historic stilling well along the central portion of the Ratliff and Root Ditch. The well was built on the uphill (east) side of the ditch between two historic homesteads (5MT23521 and 5MT23084). The 5MT23084 property was patented by Joseph Smith in 1889 who owned the property during the construction and early use of the Ratliff and Root Ditch. The 5MT23521 property was patented by one of the namesakes of the ditch, Almarian Root in 1882. The stilling well could have been used for domestic water by either party.

The stilling well is a 20" by 32" rectangular vertical well built into the slope 10' east of the Ratliff and Root Ditch. A 8" thick lip was added to the top of the well to support the frame of a hinged wooden framed screen with a clasp now locked with a keyed padlock. The well stands 2'4" above the modern ground surface and extends about 3' below ground.

A low damn of loose rocks runs across the Ratliff and Root Ditch just upstream of the well, impounding about 6" of water and directing it into a siphon culvert inlet on the east bank. Today the culvert is only discernable as a 4" gap in the bank. Despite being overgrown and nearly obscured, this culvert must be intact because it is still carrying water to the stilling well.

Between the ditch and the stilling well is a hand wrapped tin pole that stands 3' tall. Welded to the top of the pole are two 10" diameter metal disks separated by a metal washer. A short piece of bailing wire hangs from the disks. The function of this pole is unclear, but it could have been used as a pump mount to pull water from the well.

Figure 36. Overview of Feature 7 facing northeast.

Figure 37. Closeup of the hinged screen over the stilling well in Feature 7. View to the southwest.

Feature 8 Lateral Headgate

Feature 8 is a lateral headgate and an associated culvert and Parshall flume that feed an agricultural field ditch along the south central portion of the Ratliff and Root Ditch. The headgate is a clear example of the typical lateral headgate used along the ditch. The headgate system stands 52" high from its gate opening in the side of the ditch to the top of the 10" handwheel at the top. The metal frame is 9 ½" wide and houses the square 9" square metal gate. The headgate is held in place by a 6" rough cut beam mounted in the bank.

A formed 2' square concrete culvert runs through the 6' wide and 4' high berm on the downhill west side of the ditch. The culvert exits the berm into a 3'6" deep and 2'3" wide and 5' long stilling basin covered by rough cut boards. The ditch continues into a 9' long hourglass shaped Parshal Flume exactly like the one found in Feature 6. The flume opening on the east side is 2'8" and is 2' wide as it exits to the west directly into the lateral ditch.

Figure 38. Closeup of the headgate in Feature 8 facing east.

Figure 39. Closeup of the western face of the culvert and the boarded over stilling chute in Feature 8. View to the east.

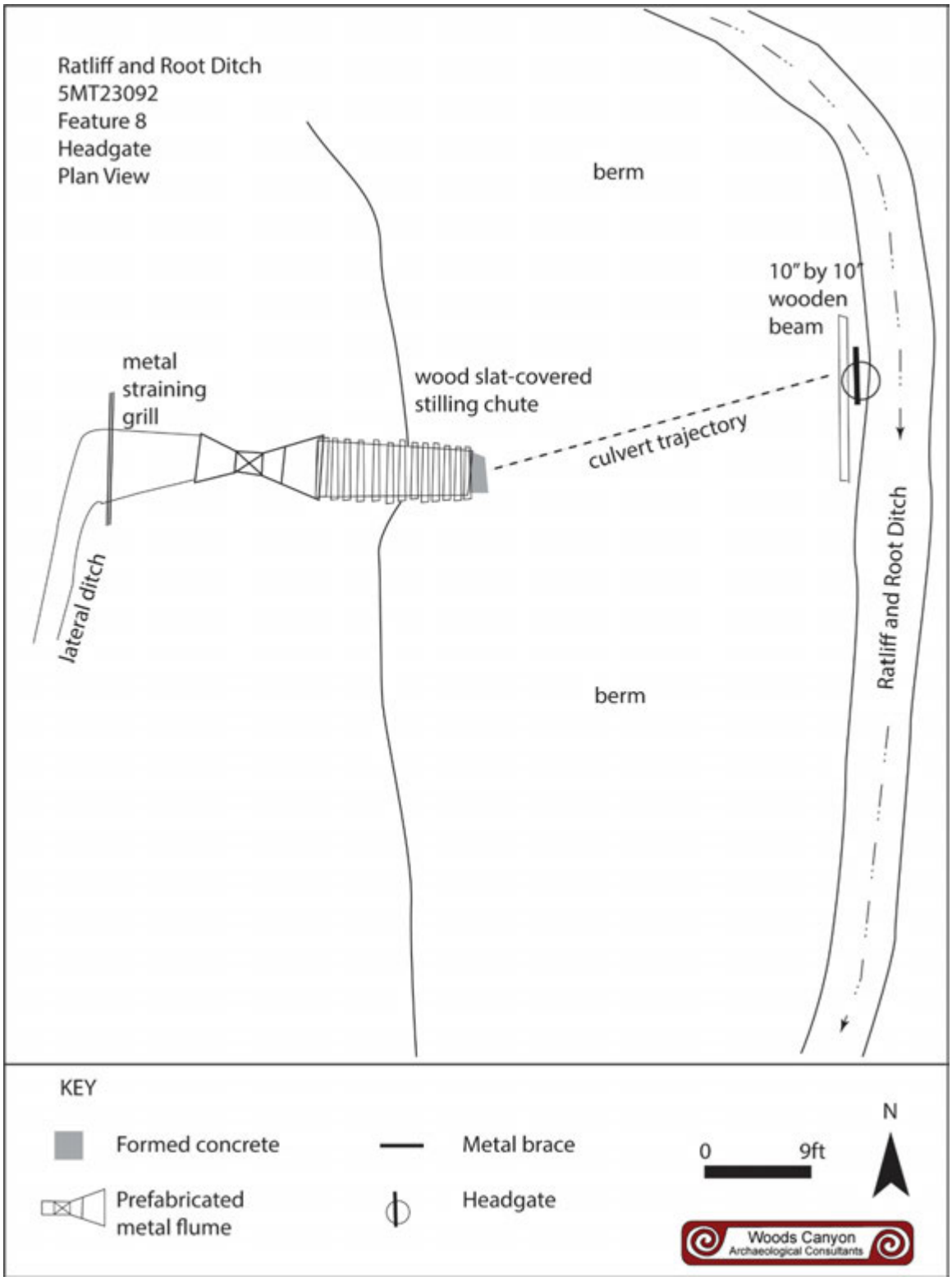


Figure 40. Plan map of Figure 8.

Feature 9 Lateral Headgate

Feature 9 is a lateral headgate leading to agricultural fields in the southern third of the Ratliff Root Ditch. This feature is similar to Features 6 and 8. Like these other features, the headgate system stands 52" high from its gate opening in the side of the ditch to the top of the 10" handwheel at the top. The metal frame is 9 ½" wide and houses the square 9" square metal gate. To divert water into the headgate, two 6" by 1" vertical metal rods with regular 2" perforations have been installed just downstream from the headgate inside the ditch. These could support impound panels to raise the water level in the ditch and divert it into the lateral headgate.

A PVC culvert directs the water from the headgate under the downslope berm to the north to the mouth of the ditch 12' to the north. Three feet down the ditch is a Parshall Flume, slightly smaller than others used along the Ratliff and Root Ditch system. The metal flume measures 5'4" long with 39" intake and 33" wide outake into a 2' wide lateral ditch that runs to directly west.

Figure 41. Overview of Feature 9 facing west-northwest.

Figure 42. Closeup of the Parshall Flume in Figure 9.

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MT.R.R142
RATLIFF & ROOT DITCH
LEVEL II DOCUMENTATION
PHOTO PAGES

Image Number 5631 A photograph showing a closeup of Feature 1, the Ratliff and Root irrigation ditch intake gate's north elevation, facing south.

Image Number 5632 A photograph showing a closeup of Feature 1, the Ratliff and Root irrigation ditch intake gate's southeast corner of the north elevation, facing southeast.

Image Number 5633 A photograph showing a closeup of Feature 1, the Ratliff and Root irrigation ditch intake's west gate, facing south.

Image 5634 A photograph showing an overview of Feature 1, the Ratliff and Root irrigation ditch intake's Mancos River diversion berm and the intake gate in the background, facing south.

Image Number 5635 A photograph showing an overview of Feature 1, the Ratliff and Root irrigation ditch intake's Mancos River diversion berm and the intake gates on the left, facing southwest.

Image Number 5636 A photograph showing a closeup of Feature 1, the Ratliff and Root irrigation ditch intake's south elevation, facing north.

Image Number 5637 A photograph showing a closeup of Feature 1, the Ratliff and Root irrigation ditch intake's gate lever, facing northeast.

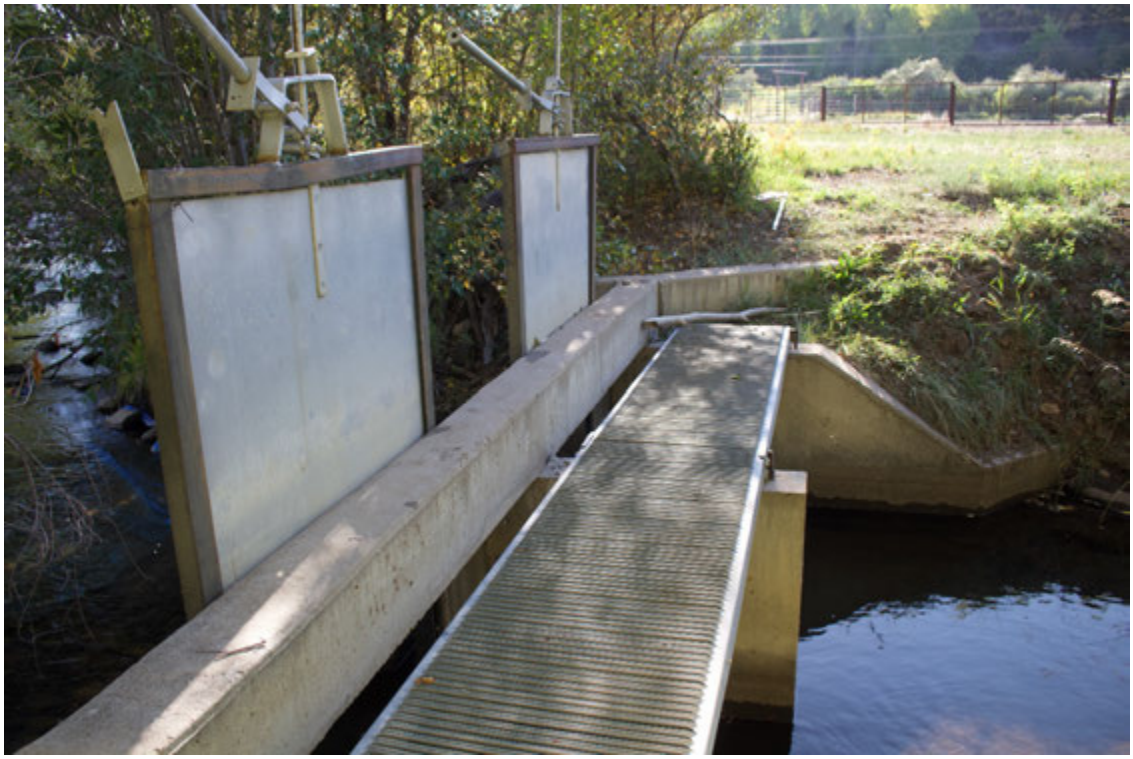

Image Number 5638 A photograph showing a closeup of Feature 1, the Ratliff and Root irrigation ditch intake's superstructure and walkway, facing east.

Image Number 5639 A photograph showing a closeup of Feature 1, the Ratliff and Root irrigation ditch intake's south elevation with scale, facing north.

Image Number 5640 A photograph showing a closeup of Feature 2, the Ratliff and Root irrigation ditch's main headgate, facing south.

Image 5641 A photograph showing a closeup of Feature 2, the Ratliff and Root irrigation ditch main headgates to the left and overflow channel to the right, facing northwest.

Image Number 5642 A photograph showing a closeup of Feature 2, the Ratliff and Root irrigation ditch main headgates' east elevation, facing northwest.

Image Number 5643 A photograph showing a closeup of Feature 2, the Ratliff and Root irrigation ditch main headgates' northeast elevation, facing north.

Image Number 5644 A photograph showing a closeup of Feature 2, the Ratliff and Root irrigation ditch main headgates' forked gate cleaning tool, facing south.

Image Number 5645 A photograph showing a closeup of Feature 2, the Ratliff and Root irrigation ditch main headgates' access and handwheels, facing south.

Image Number 5646 A photograph showing a closeup of a 1948 inscription on the formed concrete in the south segment of Feature 2, the Ratliff and Root irrigation ditch main headgates, facing south.

Image Number 5647 A photograph showing a closeup of Feature 2, the Ratliff and Root irrigation ditch main headgates' east elevation, facing west.

Image Number 5648 A photograph showing a closeup of Feature 2, the Ratliff and Root irrigation ditch main headgates' west elevation, facing east.

Image Number 5649 A photograph showing a closeup of Feature 2, the Ratliff and Root irrigation ditch main headgates' west elevation, facing east.

Image Number 5650 A photograph showing an overview of Feature 2, the Ratliff and Root irrigation ditch main headgates with Feature 1, the Ratliff and Root irrigation ditch's main intake in the background and Feature 2's overflow gate in the foreground, facing south.

Image Number 5651 A photograph showing a closeup of Feature 3, the Ratliff and Root irrigation ditch Parshall Flume, facing north.

Image Number 5652 A photograph showing a closeup of Feature 3, the Ratliff and Root irrigation ditch Parshall Flume's east elevation, facing west.

Image Number 5653 A photograph showing a closeup of Feature 3, the Ratliff and Root irrigation ditch Parshall Flume's flow rulers on the interior of the flume, facing north.

Image 5654 A photograph showing a closeup of Feature 3, the Ratliff and Root irrigation ditch Parshall Flume with lumber laying across top and utilized as a footbridge, facing southeast.

Image Number 5655 A photograph showing a closeup of Feature 3, the Ratliff and Root irrigation ditch Parshall Flume's west elevation, facing southeast.

Image Number 5656 A photograph showing the Ratliff and Root irrigation ditch's northeast end site overview in pastureland, facing east.

Image Number 5657 A photograph showing a closeup of a footbridge across the Ratliff and Root irrigation ditch, facing west.

Image Number 5658 A photograph showing a modern 24” culvert along the Ratliff and Root irrigation ditch, facing southeast.

Image Number 5659 A photograph showing a closeup of a footbridge crossing the Ratliff and Root irrigation ditch, facing east.

Image Number 5661 A photograph showing a closeup of a footbridge crossing the Ratliff and Root irrigation ditch, facing northwest.

Image Number 5662 A photograph showing a closeup of a footbridge crossing the Ratliff and Root irrigation ditch, facing west.

Image Number 5663 A photograph showing a closeup of the modern 24” culvert along the Ratliff and Root irrigation ditch, facing west.

Image Number 5664 A photograph showing an overview of the northeast section of the Ratliff and Root irrigation ditch, facing east.

Image Number 5665 A photograph showing a closeup of a footbridge crossing the Ratliff and Root irrigation ditch, facing southwest.

Image Number 5666 A photograph showing a closeup of a modern 24” culvert along the Rattliff and Root irrigation ditch, facing southwest.

Image Number 5667 A photograph showing a closeup of Feature 4, the Ratliff and Root irrigation ditch lateral headgate’s north elevation, facing south.

Image Number 5668 A photograph showing a closeup of Feature 4, the Ratliff and Root irrigation ditch lateral headgate, facing south.

Image Number 5669 A photograph showing an overview of the Ratliff and Root irrigation ditch on the north side of U.S. Highway 160, facing west.

Image Number 5670 A photograph showing a closeup of a beaver clogged culvert under U.S. Highway 160 along the Ratliff and Root irrigation ditch, facing south.

Image Number 5671 A photograph showing a closeup of concrete formed culvert under U.S. Highway 160 along the Ratliff and Root irrigation ditch, facing northeast.

Image Number 5672 A photograph showing a closeup of a modern 24” culvert along the Ratliff and Root irrigation ditch, facing east.

Image Number 5673 A photograph showing an overview of the middle section of the Ratliff and Root irrigation ditch, facing east.

Image Number 5674 A photograph showing an overview of the middle section of the Ratliff and Root irrigation ditch, facing southwest.

Image Number 5675 A photograph showing an overview of a Ratliff and Root irrigation ditch lateral ditch (previously site 5MT.23519.1), facing west.

Image Number 5676 A photograph showing an overview of the Ratliff and Root irrigation ditch's middle-section running along a steep slope, facing east.

Image Number 5677 A photograph showing a closeup of a modern 24" culvert along the Ratliff and Root irrigation ditch, facing south.

Image Number 5678 A photograph showing an overview of Feature 5, the Ratliff and Root irrigation ditch Parshall Flume No. 2, facing north.

Image Number 5679 A photograph showing a closeup of Feature 5, the Ratliff and Root irrigation ditch Parshall Flume No. 2, facing west.

Image Number 5680 A photograph showing a closeup of Feature 5, the Ratliff and Root irrigation ditch Parshall Flume No. 2, facing southwest.

Image Number 5681 A photograph showing a closeup of Feature 5, the Ratliff and Root irrigation ditch Parshall Flume No. 2 water flow gauge, facing west.

Image Number 5682 A photograph showing a closeup of Feature 5, the Ratliff and Root irrigation ditch Parshall Flume No. 2, facing southeast.

Image Number 5683 A photograph showing a closeup of Feature 6, the Ratliff and Root irrigation ditch lateral ditch impound and headgate, facing west.

Image Number 5684 A photograph showing a closeup of Feature 6, the Ratliff and Root irrigation ditch lateral ditch impound and headgate, facing southeast.

Image Number 5685 A photograph showing an overview of Feature 6, the Ratliff and Root irrigation ditch lateral ditch impound and headgate with the main ditch opening to the left and lateral headgate to the right, facing south.

Image Number 5686 A photograph showing a closeup of Feature 6, the Ratliff and Root irrigation ditch lateral ditch impound and headgate, with main ditch opening to the left and lateral headgate to the right, facing south.

Image Number 5687 A photograph showing a closeup of Feature 6, the Ratliff and Root irrigation ditch lateral ditch impound and headgate, facing south.

Image Number 5688 A photograph showing a closeup of Feature 6, the Ratliff and Root irrigation ditch lateral ditch impound and headgate's west elevation, facing south.

Image Number 5689 A photograph showing a closeup of a footbridge across the Ratliff and Root irrigation ditch, facing southeast.

Image Number 5690 A photograph showing a closeup of Feature 7, the Ratliff and Root irrigation ditch stilling well, facing northeast.

Image Number 5691 A photograph showing a closeup of the top of Feature 7, the Ratliff and Root irrigation ditch stilling well, facing south.

Image Number 5692 A photograph showing a closeup of the mount post of Feature 7, the Ratliff and Root irrigation ditch stilling well, facing southwest.

Image Number 5693 A photograph showing an overview of Ratliff and Root irrigation ditch, with the Joseph S. Smith homestead (5MT.23804) in background, facing north.

Image Number 5694 A photograph showing an overview of the south end of the Ratliff and Root irrigation ditch, facing south.

Image Number 5696 A photograph showing a closeup of Feature 8, the Ratliff and Root irrigation ditch lateral ditch headgate's west elevation, facing east.

Image Number 5697 A photograph showing a closeup of the handwheel for Feature 8, the Ratliff and Root irrigation ditch lateral ditch headgate, facing east.

Image Number 5698 A photograph showing a closeup of the west side of Feature 8, the Ratliff and Root irrigation ditch lateral ditch headgate, facing east.

Image Number 5699 A photograph showing a closeup of the west end of Feature 8, the Ratliff and Root irrigation ditch lateral ditch headgate, facing south.

Image Number 5700 A photograph showing the west elevation of the concrete line culvert (covered by the board) in Feature 8, the Ratliff and Root irrigation ditch lateral ditch headgate. The boards in the foreground cover a stilling chute before a Parshall Flume, facing west.

Image Number 5701 A photograph showing an overview of Feature 9, the Ratliff and Root lateral ditch headgate, facing west.

Image Number 5702 A photograph showing a closeup of the north elevation of Feature 9, the Ratliff and Root irrigation ditch lateral headgate, facing south.

Image Number 5703 A photograph showing a closeup of the Parshall Flume in Feature 9 of the Ratliff and Root irrigation ditch, facing east.