LEVEL II DOCUMENTATION OF A PORTION OF THE NORTH DELTA CANAL (5DT1738.6), DELTA COUNTY, COLORADO

by

Jonathon C. Horn
Principal Investigator

Alpine Archaeological Consultants, Inc.
PO Box 2075
Montrose, Colorado 81402

Prepared for

North Delta Irrigation Company
PO Box 804
Delta, CO 81416

and

Bureau of Reclamation
Western Colorado Area Office
2764 Compass Drive
Grand Junction, CO 81506

and

Bureau of Land Management
Uncompahgre Field Office
2465 S. Townsend Ave.
Montrose, CO 81401

For submission to

History Colorado
1200 Broadway
Denver, Colorado 80203

BLM Permit Number C-46920

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INTRODUCTION

The North Delta Irrigation Company (NDIC) of Delta, Colorado, is a private, non-profit, mutually funded irrigation company that manages several miles of water conveyance ditches, canals, and reservoirs in Delta County, Colorado. The NDIC plans to replace a 0.57-mile-long (3,010-ft.-long) section of the earthen North Delta Canal (5DT1738.6) with high-density polyethylene pipe. The section of the canal was recorded by Alpine Archaeological Consultants, Inc. (Alpine) during a cultural resource inventory in May and June 2014 (Millward 2019). The segment of the canal is considered eligible for inclusion in the National Register of Historic Places, and consultation under Section 106 of the National Historic Preservation Act resulted in the execution of a Memorandum of Agreement (MOA) by the Western Colorado Area Office of the Bureau of Reclamation, the Bureau of Land Management-Uncompahgre Field Office, the NDIC, and the Colorado State Historic Preservation Officer on October 29, 2019. The MOA stipulated the production of a Level II documentation report to mitigate the impacts of construction on the section of the historic canal that will be impacted by the project. The NDIC hired Alpine to complete Level II photographic documentation of the North Delta Canal (segment 5DT1738.6), which was performed by Jonathon C. Horn, Principal Investigator for Alpine on September 30, 2019. The Level II documentation focused on photographically documenting elements of the site and its setting with particular emphasis on the flume across Currant Creek. The purpose of the documentation is to provide a permanent record of the site prior to its being modified. The documentation is combined into a package that includes photography, site descriptions, a scale drawing, GIS mapping, and background historical information. It was prepared in accordance with the guidelines established by History Colorado (History Colorado 2013) and the MOA.

METHODS

The North Delta Canal (5DT1738.6) was photographically documented using a Nikon D5300 digital camera with photographs taken at extremely high resolution. Digital images were converted to black and white and printed using archival ink on archival photographic paper. Photographic points were collected using a Trimble Global Positioning System (GPS) unit capable of submeter accuracy. During the documentation, additional details about the flume across Currant Creek were collected. Historical information about the property was gathered from the records on file at the Delta County Clerk and Recorder's Office in Delta, Colorado.

DESCRIPTION

The 0.57-mile-long documented segment of the North Delta Canal (5DT1738.6) begins about 200 ft. north of the Gunnison River about 2.5 miles west of its headgate. The documented segment runs generally east to west, crosses State Highway 92, and terminates just east of Austin, Colorado. The segment is an earthen ditch about 10 ft. wide and 3 ft. deep cut into Mancos Shale hills on its eastern portion and passing through agricultural land on its western portion. The most notable element of the canal is a 190-ft.-long flume across Currant Creek. Two-track roads about 8 ft. wide are built on the top of the cut-and-fill spoil side of the canal along the southern side of the canal on both sides of the flume east of State Highway 92. No road follows the canal segment west of State Highway 92. Two headgates are on the southern side of the canal, and the canal passes through a modern concrete culvert beneath State Highway 92.

The 190-ft.-long flume over Currant Creek (Feature 2) is supported by a wooden trestle and two concrete piers. Three trestle bents are on the western end of the flume, the two concrete piers are on the west-central portion, and seven trestle bents are on the eastern end, which is built on a more gradual slope than the western end. The trestle bents are spaced at 16-ft. intervals and constructed of 6-x-6-in. post legs set on pyramidal concrete piers. The heights of the trestles vary from 2–10 ft. tall, depending on the topography, and are a maximum of 10 ft. wide. The legs slope slightly inward, are supported by 3-x-6-in. horizontal and diagonal braces, and are secured with ½-in.-diameter square-headed bolts, cast-iron collar washers, and square nuts. The two mid-span

concrete piers are of relatively recent installation and measure 2 x 14 ft. and 2 x 16 ft., respectively, and are 10 ft. tall. These were poured around makeshift wooden angle braces on the northern side of the flume that were installed to prevent the flume from collapsing. The top sides of the 8-ft.-wide semicircular sheet-metal flume are attached with iron brackets to 4-x-10-in. stringers laid on edge; 3-x-4-in. board crosspieces span the top of the flume every 3 ft., providing additional support. The stringers are supported by the tops of the trestle legs, diagonal 3-x-6-in. angle braces extending upward from the legs, and wooden posts and angle braces extending upward from the tops of the concrete piers. The deteriorating condition of the trestle required the recent addition of bracing above the central portion of the flume that extends above two of the trestle bents on the western end, the two concrete piers, and three trestle bents on the eastern end, covering a distance of 96 ft. Laid on top of the stringers are 2-x-8-in. planks set on edge that are spanned by 3-x-3-in. crosspieces through which eyebolts are attached near the ends that allow the attachment of sections of 3/8-in.-diameter wire rope that are slung beneath the sheet metal flume and secure horizontal sections of 2-x-4-in. boards along the sides and bottom of the flume. The new construction includes upright 3-x-6-in. posts that extend above each trestle bent and the two concrete piers to which paired 2-x-6-in. board diagonal braces are attached with bolts. A rather insubstantial 2-x-4-in. board railing is attached between the uprights. The flume itself is 8-ft.-diameter, semi-circular galvanized sheet metal cut into 4-ft.-long sections that are ribbed every 16 in. Flume sections are screwed together from the inside. Additional projecting screws suggest that the interior has been lined with added sections of sheet metal. Concrete entry and exit structures on the eastern and western ends of the flume are identical. These have 7-in.-thick poured concrete walls that form 8-ft.-wide channels at the connections to the ends of the flume. Extending at right angles into the banks at the flume connections are 7½-ft.-long wing walls. From the flume connections, the channels have 8-ft.-long long walls that flare outward to about 12 ft. wide that terminate in 4-ft.-long wing walls that extend at right angles into the banks. The entry structure walls on the eastern end of the flume are mostly obscured by soil and vegetation; the exit structure walls on the western end of the flume are more visible. Beneath the western end of the flume, an earlier exit structure/headwall can be seen. This is constructed of poured concrete, is about 14 ft. wide, and has diagonal wing walls extending into the banks on both sides; it now serves as a retaining wall supporting the slope beneath the western end of the flume.

About 450 ft. west of the flume is a modern headgate on the southern side of the canal (Headgate 2). It is a 16-in.-wide, bolted, angle-iron gate frame with a 10-in.-diameter handwheel on 7/8-in.-diameter threaded stem that opens into a buried pipe for which an 8-in.-diameter PVC vent pipe extends above the ground immediately south of the headgate. The gate frame is mounted to an H-shaped concrete headgate structure. The 6-ft.-tall, 4-ft.-wide structure has 6-in.-thick concrete walls with 4-ft.-long sidewalls that project 1 ft. into the canal. The handwheel is marked "WATERMAN." The headgate was manufactured by Waterman Industries of Exeter, California. Waterman was founded by W. A. Waterman in 1912 to supply water-control products to the Central Valley of California. They expanded their scope to the western United States after 1953 and internationally after 1963. It was acquired by McWayne, Inc. in 2018 (Waterman Valve, LLC 2018).

Farther west, the canal passes beneath State Highway 92 in a modern 128-ft.-long concrete culvert with a rectangular 10-ft.-wide, 4-ft.-tall opening with headwalls that extend 1½ ft. above the culvert opening (Feature 1). It has 45 degree, 1-ft.-thick wing walls that enter the canal banks on each end. The wing walls at the entry on the eastern end are 6 ft. long on the northern side and 22 ft. long on the southern side. At the exit on the western end, the wing walls are both about 9 ft. long.

About 50 ft. west of the culvert beneath State Highway 92 is a second modern headgate on the southern side of the canal (Headgate 1). Like Headgate 2, it is a 16-in.-wide, bolted, angle-iron gate frame with a 10-in.-diameter handwheel on 7/8-in.-diameter threaded stem that opens into a buried pipe. It stands about 5 ft. above the ground and does not have an evident concrete headgate

structure in association. The handwheel is marked "WATERMAN" and the stem collar is marked "W-1426-02-01," indicating that the headgate was also manufactured by Waterman Industries.

HISTORICAL BACKGROUND

The North Delta Canal was constructed by the North Delta Canal Company in 1901 and 1902. The company was incorporated in May 1901 by William H. Burnett, William F. Johnson, Daniel S. Baldwin, and Charles D. Johnson with 400 shares of capital stock worth $40,000. Directors of the company were Burnett and Baldwin along with William F. Johnson, John E. Cole, and J. F. Cole (Delta County Courthouse, County Clerk's Office, North Delta Canal Company, Articles of Incorporation, 1901, File No. 18514). The Johnsons and Coles had homesteads that were irrigated by the canal. A Location Certificate was filed for the canal that stated that construction of the canal began on March 1, 1901, that it had headgates on the northern bank of the Gunnison River in Section 4, T15S, R94W and on Tongue Creek in Section 3 T15S, R95W, and that the canal was 20 miles long and terminated in Section 4, T15S, R96W. It was 10 ft. wide at the bottom, 16 ft. wide at the high water line, 3 ft. deep, had a grade of 2.64 ft. per mile, and had a capacity of 75 cubic ft. per second (cfs). A survey of the completed canal was made from November 27 to December 15, 1902 (Delta County Courthouse, North Delta Canal, 1901, Plat and Location Certificate, Plat Book 8, Page 14). Although the canal was reportedly built to carry 75 cfs of water, 49.675 cfs was decreed on June 23, 1914 (Colorado Division of Water Rights 1914). Water for the canal was reported as having been appropriated on February 24, 1901 from the Gunnison River. At the time of the 1914 decree, the canal was described as being 18 miles long with dimensions of 8 ft. wide at the top, 3 ft. wide at the bottom, and 3 ft. deep with a grade of 2.64 ft. per mile and a capacity of 30 cfs. The discrepancy between the reported 30 cfs carrying capacity and the 49.675 cfs decree was addressed in 1954. A decree on March 20, 1954 (Colorado Division of Water Rights 1954) recognized that the canal had diverted unappropriated water from Forked Tongue Creek for many years that joined the North Delta Canal west of Cory in Section 3, T15S, R94W. Because the water from Forked Tongue Creek had not been officially recognized in the earlier decree, it was given an appropriation date of August 16, 1936 so that the water right date post-dated other competing diversions from the creek. At the same time, the amount of water carried by the North Delta Canal to its intersection with the water from Forked Tongue Creek was measured to be 30 cfs, due to seepage from the canal along the 6 miles between the diversion from the Gunnison River and Forked Tongue Creek. As a result, the water from Forked Tongue Creek was intended to supplement the water carried from the Gunnison River and bring the capacity back up to the 49.675 cfs originally decreed for the canal.

On March 10, 1905, the Riverside Power & Canal Company was incorporated by Edward P. Watson, Eugene F. Hubbard, George P. Chiles, and Merton L. Bunting with $16,000 in capital stock in 400 shares. Directors of the company were Hubbard, Chiles, Henry Hawker, William R. Lyle, and Harry W. Pierce. The company was an irrigation and power production scheme; the directors planned to draw an additional 75 cfs of water through the North Delta Canal from its headgate to Cedar Run, about 4 miles downstream. In order to handle the additional water flow, the first 4 miles of the canal was to be enlarged to 11 ft. at the bottom, 19 ft. at the high water line, 22 ft. at its top, and 4 ft. in depth. Work began on the enlargement on March 22, 1905. A plat of the enlargement was filed on June 26, 1905, suggesting that the enlargement was begun, but the current size of the canal is not of the size stipulated, so it does not appear that the project were ever undertaken (Plat of the Riverside Power and Canal Company's Enlargement of the North Delta Canal, Delta County Courthouse, County Clerk's Office, Plat Book 4, Page 43).

The end of the North Delta Canal must have extended farther than the ending point noted on the 1902 plat in Section 4, T15S, R96W, because when an extension of the canal was made in 1909, the extension began at what was the end of the canal in Section 9, T15S, R96W. The extension was 1.82 miles long and intended to carry 8 cfs of water to land in Sections 8 and 17, T15S, R96W. Owners of the canal were J. M. Gagan, J. A. Johnson, Stella B. Smith, and Ella R. Lewis, whose

lands were to be irrigated by the canal. Work on the extension began on March 23, 1909; the extension cost $1,000 to build. The extension was 3 ft. wide at the bottom, 5.8 ft. wide at the top, and 1.4 ft. deep, with a grade of 0.528 ft. per 1,000 ft. (Map of the First Extension of the North Delta Canal, Delta County Courthouse, County Clerk's Office, Plat Book 8, Page 14).

When the water right for the North Delta Canal was decreed in 1914, the canal was owned by the Northern Delta Irrigation District, a corporation owned by Roy A. Ashley, May F. Ashley, U. K. Boone, William H. Burnett, Stella C. Burnett, Irvin B. Raichart, Jason L. Welton, Lineas I. Lewis, Ella R. Lewis, Sedalia Lewis, W. H. Faulkner, Arnold Russell, and Mary Carson. Despite earlier information stating that the canal carried 75 cfs of water, it was found to have a capacity of 53 cfs and was irrigating 1,987 acres of farm land. The 1914 decree allotted 49.675 cfs of water to the canal (Colorado Division of Water Resources, Water Division 4, Montrose Colorado, Case No. CA617).

The North Delta Irrigation Company was incorporated on March 18, 1917 to purchase and operate the North Delta Canal as a mutual ditch company. The incorporation papers mention that the purchase included the extension of the canal and an inverted siphon from a tunnel east of Tongue Creek. The company was established with $84,000 in capital stock divided into 2,400 shares valued at $35 per share. Incorporators were Henry J. Coerver, Walter G. Hillman, and Albert H. Stockman, and the board of directors included the incorporators, along with Robert C. Hutchison, John W. Douthitt, I. B. Raichart, and Millard Fairlamb. The North Delta Irrigation Company has owned and maintained the canal from that time to the present.

REFERENCES CITED

Colorado Division of Water Resources

1914 *In the Matter of the Adjudication of Water Rights in Water District Number Forty in the State of Colorado, June 23, 1914.* Colorado Division of Water Resources, Case No. CA3505.

1954 *In the Matter of the Application of Holly Sugar Corporation for the Adjudication of its Water Rights to the Use of Water from the Gunnison River: and for the Further Adjudication of Water Rights in the Whole of Water District No. 40, State of Colorado, for Irrigation, Domestic Manufacturing and Power Purposed, and Other Beneficial Uses, March 20, 1954.* Colorado Division of Water Resources, Case No. CA0617.

Delta County Courthouse, County Clerk's Office

North Delta Canal Company, Articles of Incorporation, 1901, File No. 18514.

North Delta Canal, Plat and Location Certificate, 1901, Plat Book 8, Page 14.

Map of the First Extension of the North Delta Canal, 1901, Plat Book 8, Page 14.

Plat of the Riverside Power and Canal Company's Enlargement of the North Delta Canal, 1905, Plat Book 4, Page 43.

Millward, Sara A.

2019 *Cultural Resource Inventory of a Portion of the North Delta Canal for the Proposed North Delta Canal Phase I Extension, Delta County, Colorado. Alpine Archaeological Consultants, Inc., Montrose, Colorado.* On file at the Colorado Historical Society, Office of Archaeology and Historic Preservation, Denver.

Waterman Valve, LLC

2018 *Waterman: History*. Electronic document. https://watermanusa.com/about-us/ Accessed October 11, 2019.

LIST OF MAPS

List of Photographs

Subject: North Delta Canal (5DT1738.6), Delta County, Colorado
Photographer: Jon Horn
Dates: September 30, 2019

Photograph 1. Looking upstream to the southeast along the easternmost section of the documented portion of the North Delta Canal.

Photograph 2. North Delta Canal immediately upstream of the flume across Currant Creek. View is to the east-southeast.

Photograph 3. The flume crossing Currant Creek on a trestle, looking north-northeast.

Photograph 4. Looking downstream to the west across the top of the flume over Currant Creek. Note the concrete entry structure angling inward to the flume entry.

Photograph 5. Southern side of the flume on a trestle across Currant Creek, looking west-northwest.

Photograph 6. Northern side of the flume on a trestle across Currant Creek. View is to the west-southwest.

Photograph 7. Eastern end of the northern side of the flume across Currant Creek, looking west-southwest. Note the recently reinforced section of the flume in the distance.

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Photograph 11. The flume crossing Currant Creek, looking upstream to the east.

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Photograph 19. Looking west along the central portion of the North Delta Canal west of Headgate 2.

Photograph 20. North Delta Canal entering the modern concrete culvert beneath State Highway 92. View is to the west-southwest.

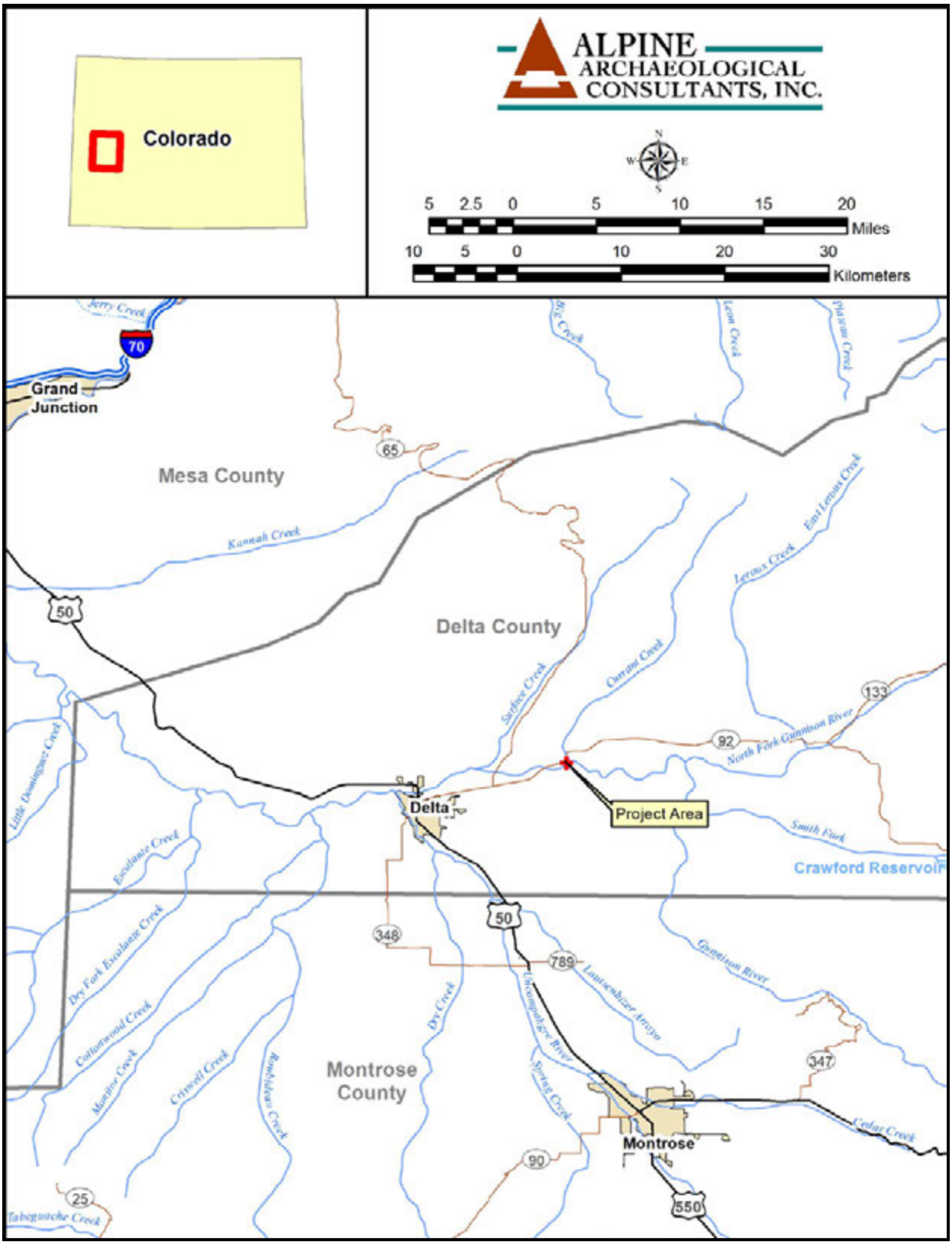
Photograph 21. Looking west at the North Delta Canal west of State Highway 92. Note Headgate 1 on the southern bank of the canal at the center of the photograph.

Photograph 22. Headgate 1 on the southern side of the North Delta Canal. View is to the south with State Highway 92 in the background.

Photograph 23. The North Delta Canal downstream, looking west of Headgate 1.

Photograph 24. Looking southeast at the western end of the documented segment of the North Delta Canal.

Photograph 25. Western portion of the North Delta Canal with State Highway 92 in the distance. View is to the east.


Colorado
ALPINE
ARCHAEOLOGICAL
CONSULTANTS, INC.
N
W
E
S
5 2.5 0 5 10 15 20
Miles
10 5 0 10 20 30
Kilometers
Jerry Creek
70
Grand
Junction
Mesa County
65
Kannah Creek
50
Delta County
Surface Creek
Currant Creek
Leroux Creek
East Leroux Creek
133
92
North Fork Gunnison River
Delta
Project Area
Smith Fork
Crawford Reservoir
Little Dominguez Creek
Escalante Creek
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Cottonwood Creek
Mountain Creek
Criswell Creek
Roubideau Creek
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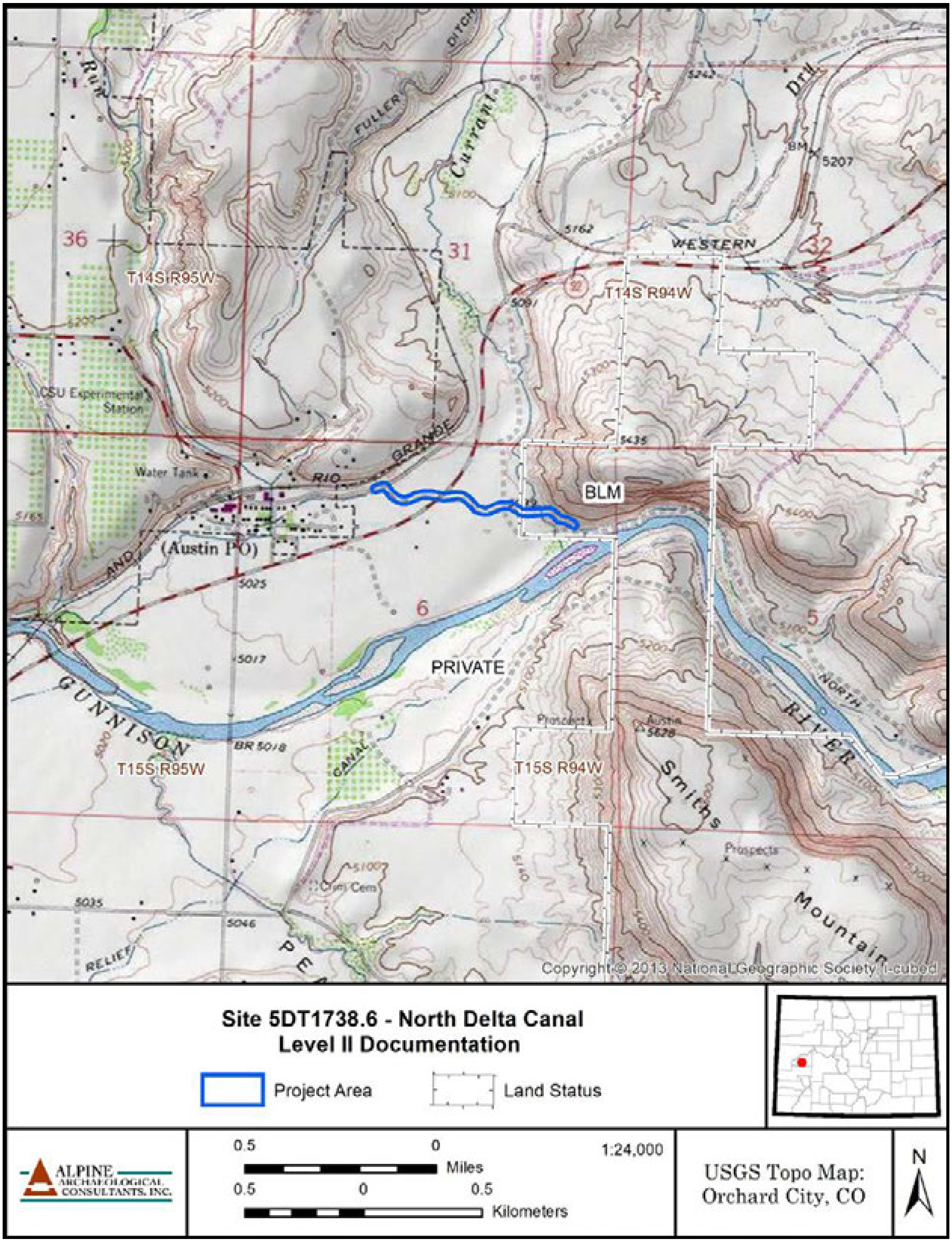
Map 1.



T14S R95W
T14S R94W
T15S R95W
T15S R94W
36
31
32
6
5
CSU Experimental Station
Water Tank
(Austin PO)
BLM
PRIVATE
GUNNISON
NORTH
RIVER
RIO
GRANDE
AND
WESTERN
FULLER
DITCH
Currant
Drl
CANAL
RELIEF
Smiths
Mountain
Prospects
Cem
BM 5207
5242
5162
5435
5025
5017
BR 5018
5035
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Copyright:© 2013 National Geographic Society, i-cubed
Site 5DT1738.6 - North Delta Canal
Level II Documentation
Project Area
Land Status
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Miles
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Kilometers
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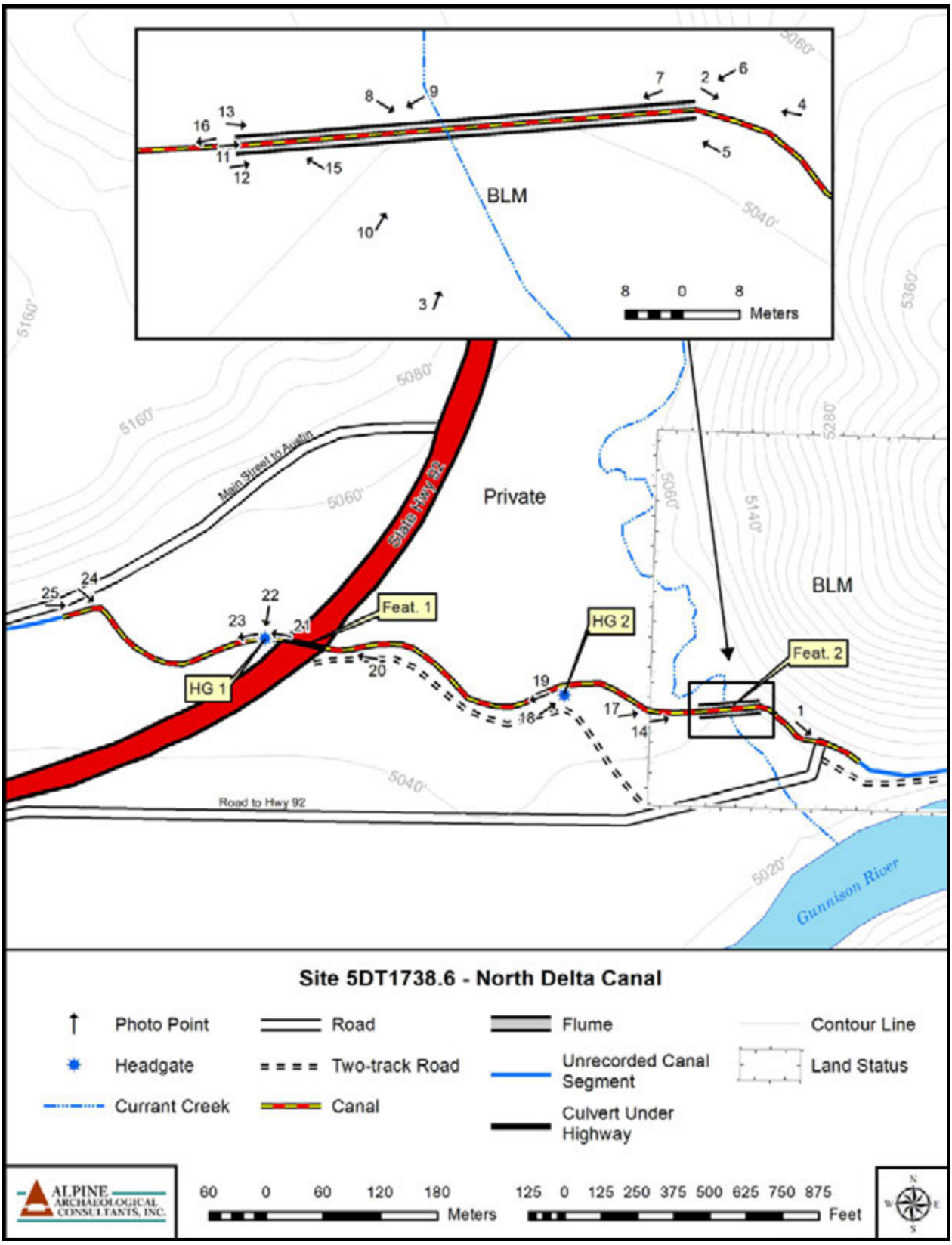
USGS Topo Map:
Orchard City, CO
N

Map 2.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State Hwy 92
Main Street to Austin
Road to Hwy 92
Gunnison River
Feat. 1
Feat. 2
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HG 2
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Meters
Site 5DT1738.6 - North Delta Canal
Photo Point
Headgate
Currant Creek
Road
Two-track Road
Canal
Flume
Unrecorded Canal Segment
Culvert Under Highway
Contour Line
Land Status
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Meters
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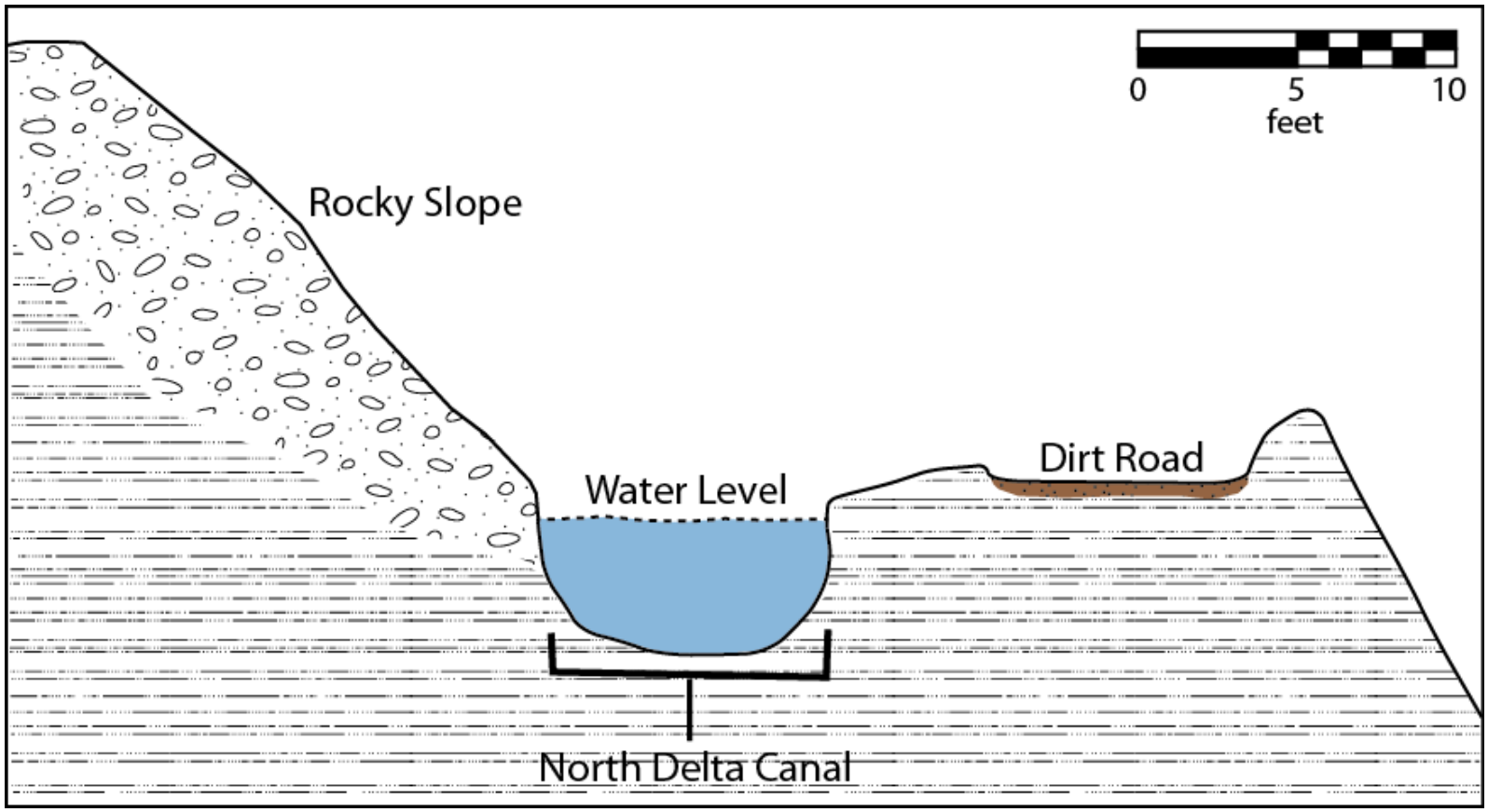
Feet

Map 3.


0
5
10
feet
Rocky Slope
Water Level
Dirt Road
North Delta Canal
Map 4.

5DT1738.6
Photograph No. 1

5DT1738.6
Photograph No. 2

5DT1738.6
Photograph No. 3

5DT1738.6
Photograph No. 4

5DT1738.6
Photograph No. 5

5DT1738.6
Photograph No. 6

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Photograph No. 7

5DT1738.6
Photograph No. 8

5DT1738.6
Photograph No. 9

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Photograph No. 10

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Photograph No. 11

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Photograph No. 14

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Photograph No. 15

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Photograph No. 23

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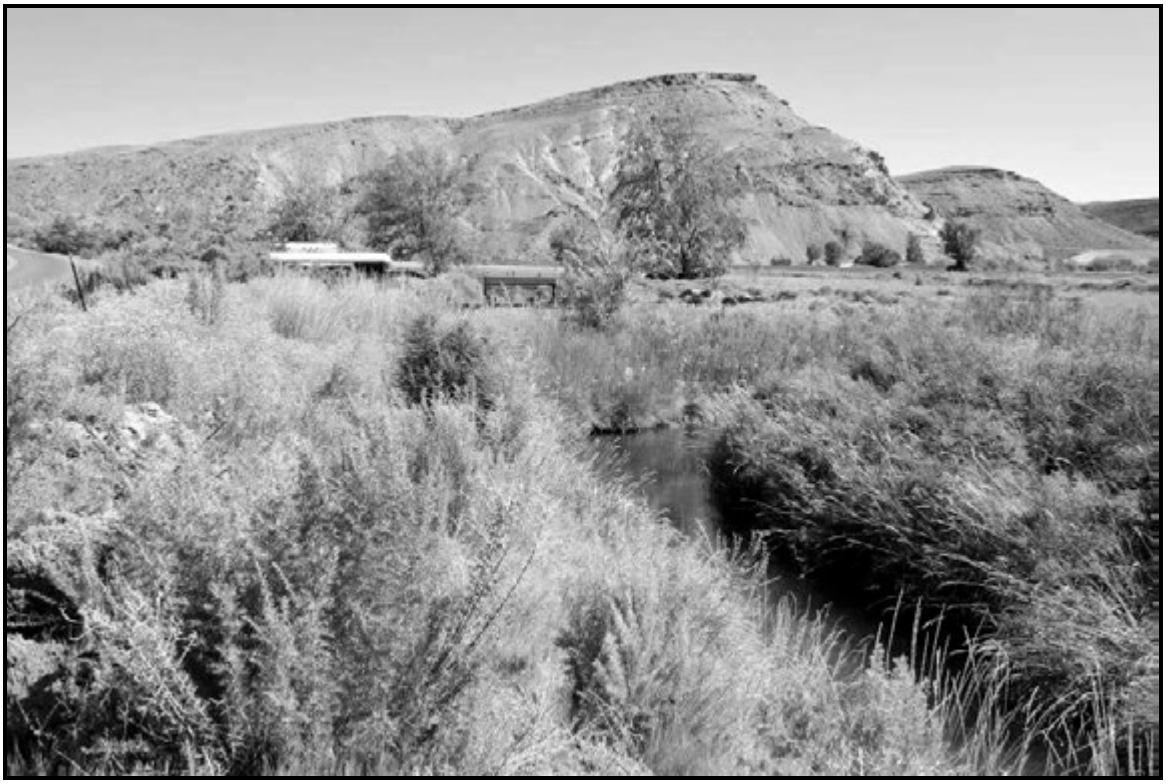
Photograph No. 24



5DT1738.6
Photograph No. 25