

**Summary Report of the Level I Documentation of
Two Segments of the Highline of the Grand Valley Canal,
Mesa County, Colorado**

by

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In support of the
Canal Improvement Grant 2012/GS 530 SEC 5-Extension

January 2017

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INTRODUCTION

The Grand Valley Irrigation Company (GVIC) has been funded through the Bureau of Reclamation's (BOR) Colorado River Basin Salinity Control Program to line two sections of the Highline of the Grand Valley Canal with a polyvinyl chloride and geotextile liner covered with shotcrete and to replace headgates with new concrete structures with punch-plate trash screens. The purpose of the project is to reduce the amount of salt and selenium entering the Colorado River. The project area is on private lands in Mesa County, Colorado. Because the project is a federal undertaking and is federally funded, various cultural resources laws apply, including Section 106 (54 U.S.C. § 306108) of the National Historic Preservation Act (54 U.S.C. § 300101 et seq.). These laws require that all significant cultural resources be identified prior to planned development, and are intended to insure that historic and prehistoric cultural resources important to our national heritage are not inadvertently harmed or destroyed by federally initiated or authorized actions. The canal was inventoried by Alpine Archaeological Consultants, Inc. (Alpine), of Montrose, Colorado, in 2017 (Harrison 2017). A Memorandum of Agreement between the BOR, GVIC, and the Colorado State Historic Preservation Officer (SHPO) stipulated Level I Documentation as mitigation for adverse effects to 0.91 miles (mi.) (1.46 kilometers) of the Highline of the Grand Valley Canal system. The specifications for Level I Documentation are presented in History Colorado Publication No. 1595 (History Colorado 2013). The GVIC hired Alpine to conduct the Level I Documentation and supplemental narratives and to present these data in a summary report.

Level I Documentation is the most basic form of site documentation and closely follows the survey and recordation requirements established by the Office of Archaeology and Historic Preservation, with the additional specification that the documentation is prepared on archival bond paper and that photographic materials be archival. Photographs are stipulated to be black-and-white prints or digital images printed on fiber paper or archival-quality resin paper. Although prints are acceptable in 3-x-5-inch (in.) or larger sizes, 4-x-6-in. prints are preferred by History Colorado (2013).

METHODS

The information used in the preparation of the Level I Documentation was gathered during the Class III cultural resource inventory by Abbie L. Harrison of Alpine on June 14, 2017 (Harrison 2017). The 0.91 mi. of the Highline of the Grand Valley Canal system to be lined, including all of the associated water-control structures, was recorded using a Global Positioning System unit capable of sub-meter accuracy. Documentation also included photographs and descriptions of the canal that focused on water control features. A list of maps and photographs are included in Appendix A. The maps and reproductions of photographs, themselves, are included in Appendix B.

LOCATION AND ENVIRONMENTAL SETTING

The inventoried canal segments are on private lands managed by the GVIC, located just north of Fruita, in Mesa County, Colorado (Figure 1). Elevation in the project area ranges from 4,600 feet (ft.) (1,402 meters [m]) to 4,685 ft. (1,428 m). The entire project area is within the Grand Valley of the Colorado Plateau physiographic province. The canal segments are underlain by Cretaceous-age sedimentary Mancos shale (Tweto 1979). Along the more gentle terrain to the west, the shale is capped by soil that may be remnants of Pleistocene glacial deposits. The land south of the canal consists of Pleistocene gravel terraces of the Grand Valley. This is the rich farmland that was made productive by irrigation from the Grand Valley Canal system. Grand Junction has seen a great deal of development and growth since the 1970s. As a result, the project area in the vicinity of Fruitvale and Grand Junction has largely been converted from farmland to a combination of rural residential and rather high-density residential and commercial use. Vegetation away from

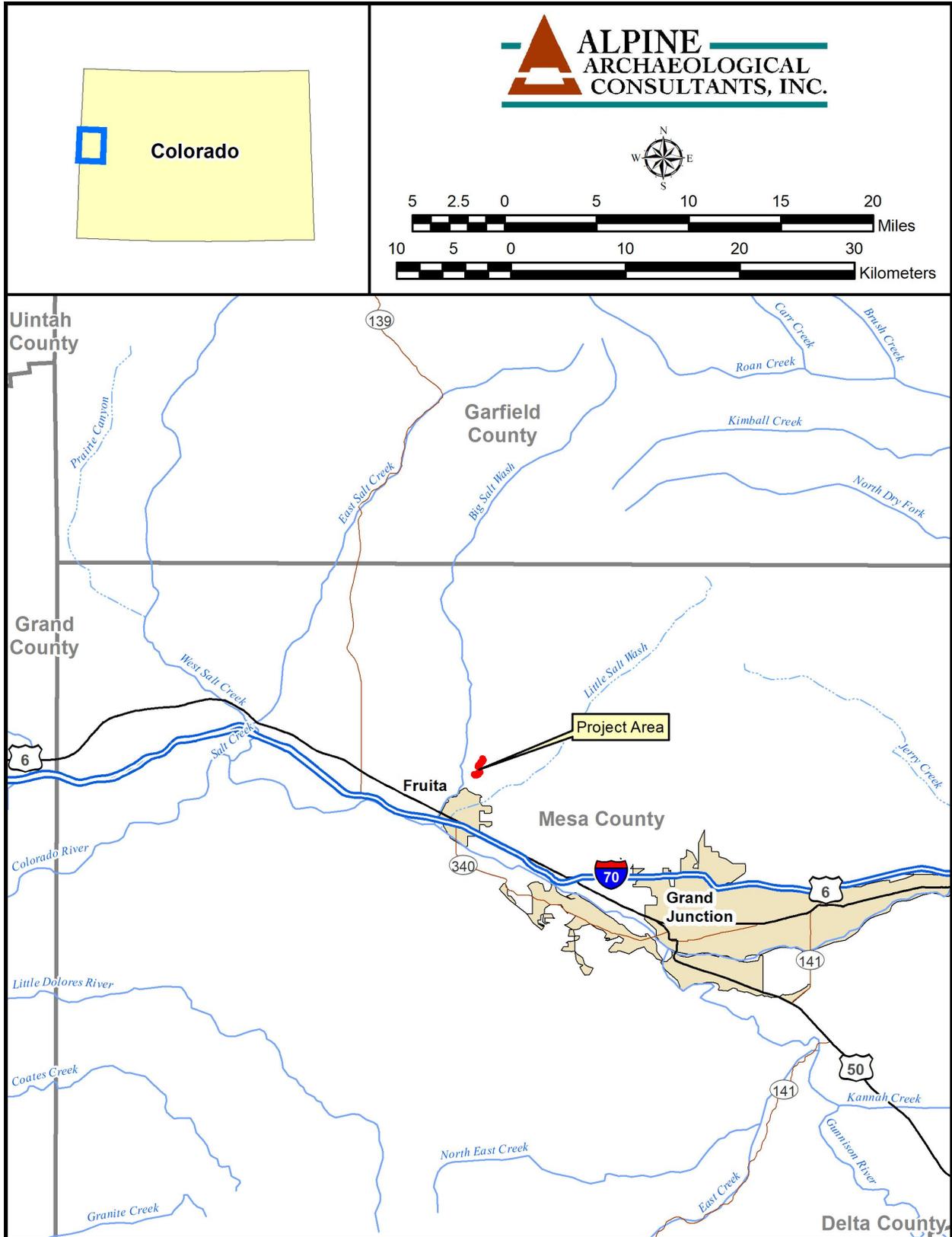


Figure 1. General location map of the project area.

commercial and residential development comprises mostly weedy species that thrive in disturbed contexts, including cheatgrass and kochia. Vegetation along the canal is heavily managed to prevent it from becoming invasive, and no trees have been allowed to grow along the canal banks in an effort to maintain the banks' structural integrity. Cottonwood, tamarisk, and Russian olive grow in riparian areas near the canal. The canal banks are primarily grass covered, but include areas of cattail, phragmites reed, kochia, horsetail, yarrow, heracleum, wild rose, aster, clover, thistle, and morning glory.

REGIONAL OVERVIEW OF CULTURE HISTORY

The following culture history is a brief synthesis of historical and prehistoric occupation in the Southern Rocky Mountains, including the current project area. It is based upon archaeological and historical work undertaken in and around the Southern Rocky Mountains. For more detail, see the Colorado prehistoric context for the northern Colorado River basin (Reed and Metcalf 1999) and the Colorado historical archaeology context (Church et al. 2007).

The mountains of Colorado may have been first inhabited, to a limited degree, as early as 10,000 B.C. by big game hunters representative of the Paleoindian Tradition. Evidence of this early Pleistocene occupation is rarely encountered in the region. With the end of the Pleistocene came climatic conditions very similar to those of the present. By about 5500 B.C., coinciding with this climatic moderation, there was a transition in subsistence and material culture to a new lifeway, termed the Archaic Tradition. Archaic peoples exploited a greater variety of plant and animal foodstuffs and manufactured tools that were quite distinct from those of their predecessors. The Archaic period is very well represented archaeologically in the region. At the time of Euroamerican contact, the primary aboriginal group in the project area was the Ute, living an Archaic-like lifestyle. The Utes were Numic speakers, who may have arrived in western Colorado as early as A.D. 1500. As a result of Euroamerican contact, the Utes acquired the horse and underwent rapid culture modification, similar to the assimilated Plains Indian tribes.

Western Colorado was designated as a reservation for the Utes as a result of the Treaty of 1868. In 1873, the San Juan Mountains were removed from the reservation as a result of the Brunot Agreement. The Brunot Agreement ultimately increased hostilities between Utes discordant with the removal and the Euroamericans responsible, culminating in the Meeker Massacre in 1879. The Meeker Massacre served as the catalyst for removing the White River and Uncompahgre (Tabeguache) Utes from western Colorado. By the end of 1881, the last of the Utes were restricted to reservations in northwestern Utah and southernmost Colorado.

The removal of the Utes from most of western Colorado opened the Grand and Uncompahgre valleys to settlement by Euroamericans; the increase in Euroamerican population in the area led to the founding of Montrose, Delta, and Grand Junction, followed by the expansion of the Denver and Rio Grande Railroad line from Gunnison through these new towns in 1882. Farming and ranching quickly took hold. The use of irrigation in the Grand Valley was vital to increase the fertility of the semiarid valley.

Prior to the construction of the Grand Valley Canal, 520.81 cubic feet per second (cfs) of water was appropriated on August 22, 1882 from the Colorado River for the purpose of irrigating the Grand Valley. The Grand River Ditch Company started construction of the Grand Valley Canal on January 10, 1883 to make use of the appropriated water (Grand Valley Irrigation Co. 2008). The company quickly ran out of money and was purchased by T. C. Henry, with the backing of the Travelers Insurance Company, and the project was completed in 1884 (Holleran 2005). The original diversion from the Colorado River was a wooden structure. The initial 17.12 mi. of the canal is now known as the Upper Mainline. When constructed, it was 25 to 30 ft. wide and carried water at a depth of 3 to 4 ft. At the end of the Upper Mainline, the canal was split into two canals by a

structure referred to as a divider. From this point, the northern branch of the canal continued along the same contour elevation to a point 3 mi. northwest of Fruita as the Highline, and the southern branch dropped 22 ft. and continued westward as the Mainline to its terminus at Big Salt Wash. These canals were completed by Henry in 1884. Later that year, the Mesa County Ditch was constructed, supplied by a feeder canal midway along the route of the Upper Mainline. Also constructed in 1884 was the Independent Ranchmen's Canal, which took water from the Mainline, a short distance below the divider. All of the canals were consolidated under the ownership of the Grand River Ditch Company in 1886, which was controlled by the Travelers Insurance Company. Financial difficulties resulted in the incorporation of the GVIC on January 7, 1894 to acquire the holdings of the Grand River Ditch Company, the Grand Valley Canal Company, the Mesa County Ditch Company, and the Independent Ranchmen's Ditch Association from the Travelers Insurance Company. The GVIC was organized as a cooperative, mutual ditch company, comprised of individual water users as shareholders of water stock; it continues to function in this manner to present day.

During 1898 and 1899, the Kiefer Extension Ditch was constructed from the end of the Highline westward for 16 mi. Construction of the Kiefer Extension Ditch required enlargement of the Highline in 1901, so that additional water could be delivered to the Kiefer Extension. During the winter of 1900–1901, the wooden diversion on the Colorado River was replaced by a stone masonry diversion (Grand Valley Irrigation Co. 2008; Mead 1902). As a result of increased demand for water by irrigators, an additional 119.47 cfs was appropriated from the Colorado River on April 26, 1914 for delivery through the canal system (Grand Valley Irrigation Co. 2008). The canal system appears essentially the same as it did upon its completion in 1884 and as it did with the addition of the Kiefer Extension in 1898–1899 (Mead 1902). The extension was constructed by the Kiefer brothers (Frank, Ben, and Joe) of Loma and was predicated, not only by the need for water, but by the brothers' disappointment with the water prices being charged by the GVIC (Likes and Likes 1997). The Kiefer brothers devised a plan to utilize the waste water of the Grand Valley Canal to provide water to the western end, allowing an additional 10,000 acres of land to be brought under cultivation. The Kiefer Extension Canal was completed by the brothers in 1898. Although the water for the Kiefer Extension Canal was owned by the GVIC, the canal, itself, was controlled by a private organization owned by the Fruita Canal and Land Company. The Kiefer Canal remained a separate organization until January 1979, when it merged with the GVIC to better utilize water resources (Grand Valley Irrigation Co. 1994).

The Grand Valley Canal is a functioning water delivery system of 1880s design and engineering. Although maintained and upgraded in places through the years, the majority of the canal system operates and appears as it did when first constructed. Within the portions of the canal system inventoried for this project, the only differences from the original construction are modern sliding headgates for delivery to users along the route and concrete lining of the canal in a few locations. Through time, the growth of Grand Junction has altered the landscape through which the canal passes. When built, in the early to middle 1880s, the Grand Valley was just beginning to become settled, and the canal facilitated agricultural development. The growth of Grand Junction since the 1970s has resulted in the greatest change in the canal setting within the current project area, with residential and commercial development expanding outward from the core of the city and replacing agricultural farmland.

DESCRIPTIONS OF THE HIGHLINE OF THE GRAND VALLEY CANAL

5ME4680.73 Site Description

Site 5ME4680.73 is a 0.38-mi.-long (0.61 km) segment of the Highline of the Grand Valley Canal. This segment starts north of M Road, about 0.4 mi. (0.64 km) west of 18½ Road, and runs in a generally southwestward direction until turning northward approximately 0.08 mi. (0.13 km) before the terminus of the segment. Elevations range from about 4,600 to 4,640 ft. (1,402 to 1,414

m), and the canal is generally 25 to 30 ft. wide. Five headgates and two associated pipe intake structures were recorded along the segment (Table 1 and Table 2). Four modern culverts were also mapped along the canal segment.

Vegetation along the banks includes some grass cover, cattail, phragmites reed, horsetail, and yarrow, as well as weedy species, such as cheatgrass, kochia, and Russian thistle, along more barren segments of the two-track access roads and pull-offs. Trees have not been allowed to grow along the canal, but cottonwoods, Siberian elm, and Russian olive are present along the banks of the access roads. Water is taken from the canal by water users through modern sliding headgates that open into buried pipe. In some instances, the water is pumped using modern expedient equipment of a nonpermanent nature, such as automatic irrigation pumps with PVC attachments. The canal is entirely of earthen construction. The canal was full at the time of the inventory, with the high water within 2 or 2½ ft. of the top of the canal. A 12–16-ft.-wide dirt or gravel road runs along the northern and southern sides of the canal segment for its full length. Grass cover is the primary form of vegetation on the banks along the length of the canal.

Table 1. Observed Modern Headgates along Segment 5ME4680.73 of the Highline of the Grand Valley Canal.

Headgate No.	Canal Side	Gate Width	Handwheel Diameter	Stem Diam.	Notes	Markings
HL-430	South	12 in.	10 in.	¾ in.	4-ft.-long, 2-x-12-in. plank on 2-x-4-in. board frame with metal grate and metal enclosure surrounding the headgate.	
HL-440	South	10 in.	10 in.	¾ in.	Modern concrete structure (54 in. wide) with a metal punch-plate trash screen.	ARMCO LC 49; 2012 inscribed on concrete
HL-441	South	10 in.	10 in.	¾ in.	4-ft.-long, 2-x-12-in. plank on two support posts.	ARMCO 8017
HL-442	South	9 in.	10 in.	¾ in.	5-ft.-long, 2-x-12-in. plank on two support posts.	ARMCO LC 49
HL-445	South	6 in.	10 in.	¾ in.	4-ft.-long, 2-x-12-in. plank on two support posts.	WATERMAN OPEN

Table 2. Pipe Intake and Other Structures Associated with Headgates on Segment 5ME4680.73 of the Highline of the Grand Valley Canal.

Headgate No.	Canal Side	Description
HL-430	South	Rectangular concrete pipe intake structure with metal debris screen within the structure. Cement structure walls are approximately 12 in. thick.
HL-440	South	Concrete pipe intake structure containing two concrete drops inside the structure. Width of the structure varies between 1 and 5 ft. Cement structure walls approximately 12 in. thick. Two metal fences are on top of the structure.

The canal and the primary access roads along the northern and southern sides run on contour with the topography. The southern end of the segment is in a rural residential and agricultural area, and the fields north of the canal are used primarily for cattle grazing. The northern and southern sides of the canal are heavily disturbed by grading, which was performed to level the surface for the access roads and to create a berm between the road and the fields located to the north. Headgates and other associated structures are consistent with those along other recorded sections of the Grand Valley Canal. Some headgate structures have had typical maintenance upgrades.

Historical Background

The Highline portion of the Grand Valley Canal was part of the original water delivery system constructed in 1884. See historical information in the Regional Overview of Culture History section, above, for a detailed historical background.

5ME4680.74 Site Description

The 0.53-mi.-long (0.85 km) segment of the Highline portion of the Grand Valley Canal (5ME4680.74) is located approximately 1.89 mi. (3.04 km) north of Fruita, Colorado. This segment begins approximately 0.5 mi. (0.80 km) north of M Road, about 0.4 mi. (0.64 km) east of 17½ Road, and runs in a generally northward direction. The terminus of the segment is at a modern concrete bridge that is within an open lot, adjacent to M¾ Road. Elevations range from about 4,600 to 4,640 ft. (1,402 to 1,414 m) and the canal is generally 25 to 30 ft. wide. Only three modern culverts were observed along the segment; no headgates or other features were present.

Vegetation along the banks includes some grass cover, cattail, phragmites reed, horsetail, and yarrow, as well as weedy species, such as cheatgrass, kochia, and Russian thistle, along more barren segments of the two-track access roads and pull-offs. A 12–16-ft.-wide dirt or gravel road runs along the eastern and western sides of the canal segment for its full length. Trees have not been allowed to grow along the canal, but cottonwoods, Siberian elm, and Russian olive are present along the banks of the access roads. Grass cover is the primary form of vegetation on the banks along the length of the canal. The canal is entirely of earthen construction. The canal was full at the time of the inventory, with the high water within 2 or 2½ ft. of the top of the canal.

Historical Background

The Highline portion of the Grand Valley Canal was part of the original water delivery system constructed in 1884. See historical information in the Regional Overview of Culture History section, above, for a detailed historical background.

SUMMARY

The Level I Documentation was performed on two segments totaling 0.91 mi. (1.46 km) of the Highline of the Grand Valley Canal system in advance of lining the canal with a polyvinyl chloride and geotextile liner covered with shotcrete and replacing headgates with new concrete structures with punch-plate trash screens. This undertaking is part of the BOR's Basinwide Salinity Control Program. Along one segment of the Highline of the Grand Valley Canal (5ME4680.73), five headgates and two associated pipe intake structures were documented; no headgates or other features were documented along the other segment of the Highline of the Grand Valley Canal (5ME4680.74). A list of maps and photographs are provided in Appendix A; maps and reproductions of photographs are included in Appendix B. Original archival black-and-white photographs are included with the documentation package to the Colorado SHPO.

REFERENCES

- Church, Minette C. , Steven G. Baker, Bonnie J. Clark, Richard F. Carrillo, Jonathon C. Horn, Carl Späth, David R. Guilfoyle, and E. Steve Cassells
2007 Colorado History: A Context for Historical Archaeology. Colorado Council of Professional Archaeologists, Denver.
- Grand Valley Irrigation Co.
1994 100 Year History of the Grand Valley Irrigation Company. The Grand Valley Irrigation Company Current Events Newsletter 2 (5):1-2.

2008 Bureau of Reclamation Basinwide Salinity Control Program, GVIC Canal Lining Project 2008, Grand Junction, Colorado. Prepared by Grand Valley Irrigation Company, Grand Junction.
- Harrison, Abbie L.
2017 Cultural Resource Inventory of Two Segments of the Highline of the Grand Valley Canal, Mesa County, Colorado. Prepared by Alpine Archaeological Consultants, Inc., Montrose, Colorado. Prepared for the Grand Valley Irrigation Company, Grand Junction, Colorado.
- History Colorado
2013 Historic Resource Documentation, Standards for Level I, II, and III Documentation. Colorado Historical Society Publication No. 1595. Colorado Historical Society, Office of Archaeology and Historic Preservation, Denver.
- Holleran, Michael
2005 Historic Context for Irrigation and Water Supply. Colorado Center for Preservation Research, University of Colorado at Denver and Health and Sciences Center.
- Likes, Homer C., and Phyllis C. Maluy Likes
1997 Route 1, Mack, Colorado: A History of the Communities of Mack and New Liberty. Likes Publishing, Orem, Utah.
- Mead, Elwood
1902 Report of Irrigation Investigations for 1901. U.S. Department of Agriculture, Office of Experiment Stations Bulletin No. 119. Government Printing Office, Washington.
- Reed, Alan D., and Michael D. Metcalf
1999 Colorado Prehistory: A Context for the Northern Colorado River Basin. Colorado Council of Professional Archaeologists, Denver.
- Tweto, Ogden
1979 Geological Map of Colorado. U.S. Geologic Survey, Department of the Interior, Washington D.C.

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APPENDIX A

Level I Documentation: List of Maps and List of Photographs

List of Maps

Map 1: The Highline of the Grand Valley Canal (5ME4680.73) showing photographic points for headgates and the landscape. Headgates HL 430–HL 445.

Map 2. The Highline of the Grand Valley Canal (5ME4680.74) showing photographic points for the landscape.

List of Photographs

Subject: The Highline of the Grand Valley Canal (5ME4680.73) and (5ME4680.74).

Photographer: Abbie L. Harrison Dates: June 14, 2017.

Photographs of the Highline of the Grand Valley Canal (5ME4680.73)

Photograph 1. Overview of the Highline of the Grand Valley Canal (5ME4680.73). View is to the southwest.

Photograph 2. Looking to the southwest at Headgate HL430.

Photograph 3. Pipe intake structure associated with Headgate HL430. View is to the east-southeast.

Photograph 4. Overview of the Highline of the Grand Valley Canal (5ME4680.73) facing west-southwest.

Photograph 5. Looking northward at an overview of the Highline of the Grand Valley Canal (5ME4680.73).

Photograph 6. Overview of the Highline of the Grand Valley Canal (5ME4680.73). View is to the east-northeast.

Photograph 7. Looking to the north-northwest at Headgate HL440.

Photograph 8. Pipe intake structure associated with Headgate HL440. View is to the east.

Photograph 9. Looking to the north-northwest at Headgate HL445.

Photograph 10. Headgate HL 445 with Headgates HL442 and HL441 in the background. View is to the east-southeast.

Photograph 11. Overview of the Highline of the Grand Valley Canal (5ME4680.73) facing south-southeast.

Photographs of the Highline of the Grand Valley Canal (5ME4680.74)

Photograph 1. Overview of the Highline of the Grand Valley Canal (5ME4680.74). View is to the northeast.

Photograph 2. Looking to the south at an overview of the Highline of the Grand Valley Canal (5ME4680.74).

Photograph 3. Overview of the Highline of the Grand Valley Canal (5ME4680.74) facing southwest.

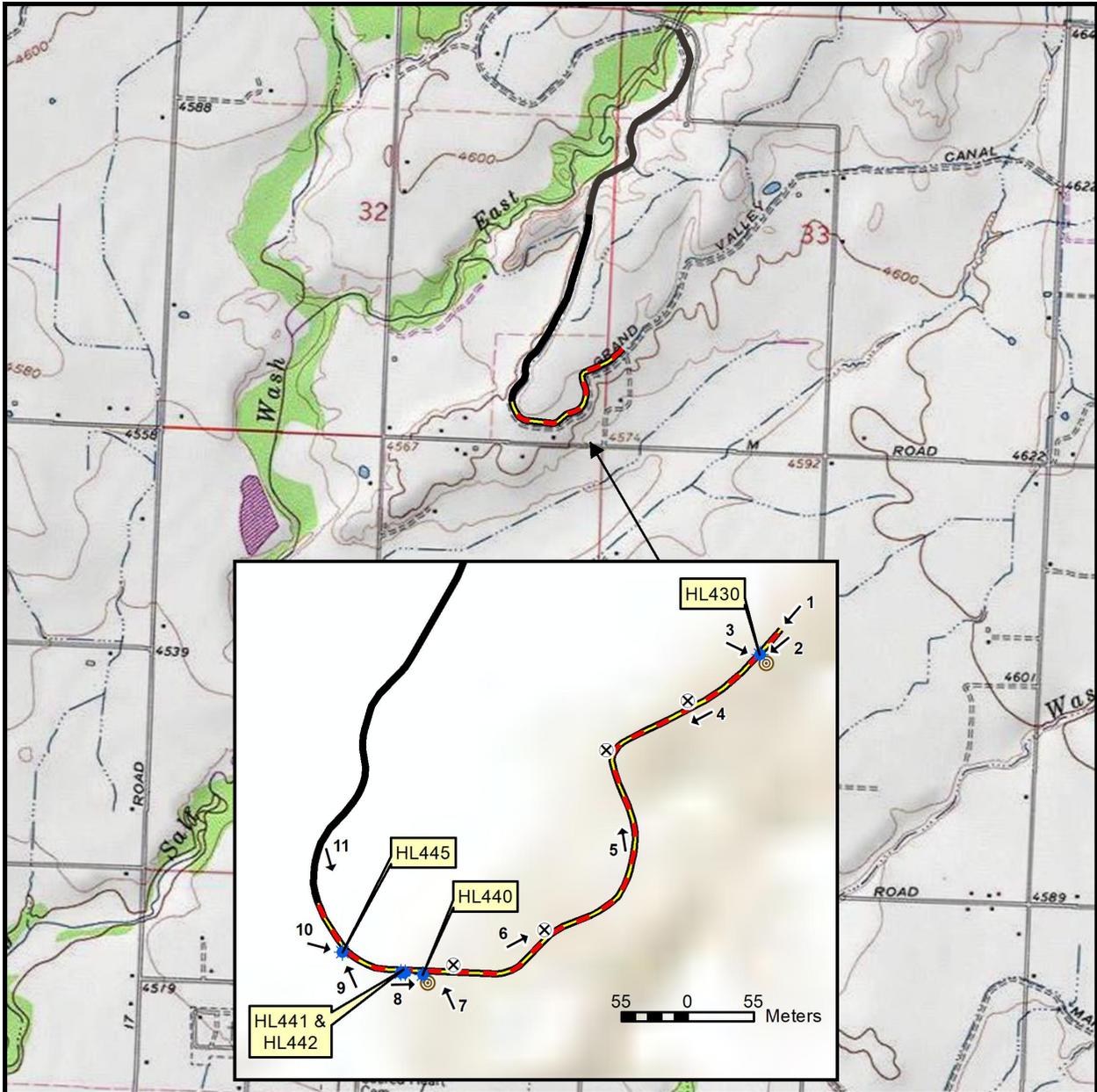
Photograph 4. Looking to the northeast at the Highline of the Grand Valley Canal (5ME4680.74).

Photograph 5. Looking to the northeast at an overview of the Highline of the Grand Valley Canal (5ME4680.74).

Photograph 6. Overview of the Highline of the Grand Valley Canal (5ME4680.74). View is to the south.

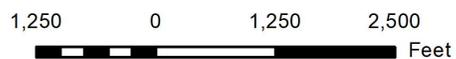
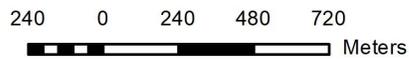
APPENDIX B

Level I Documentation: Maps and Photographs

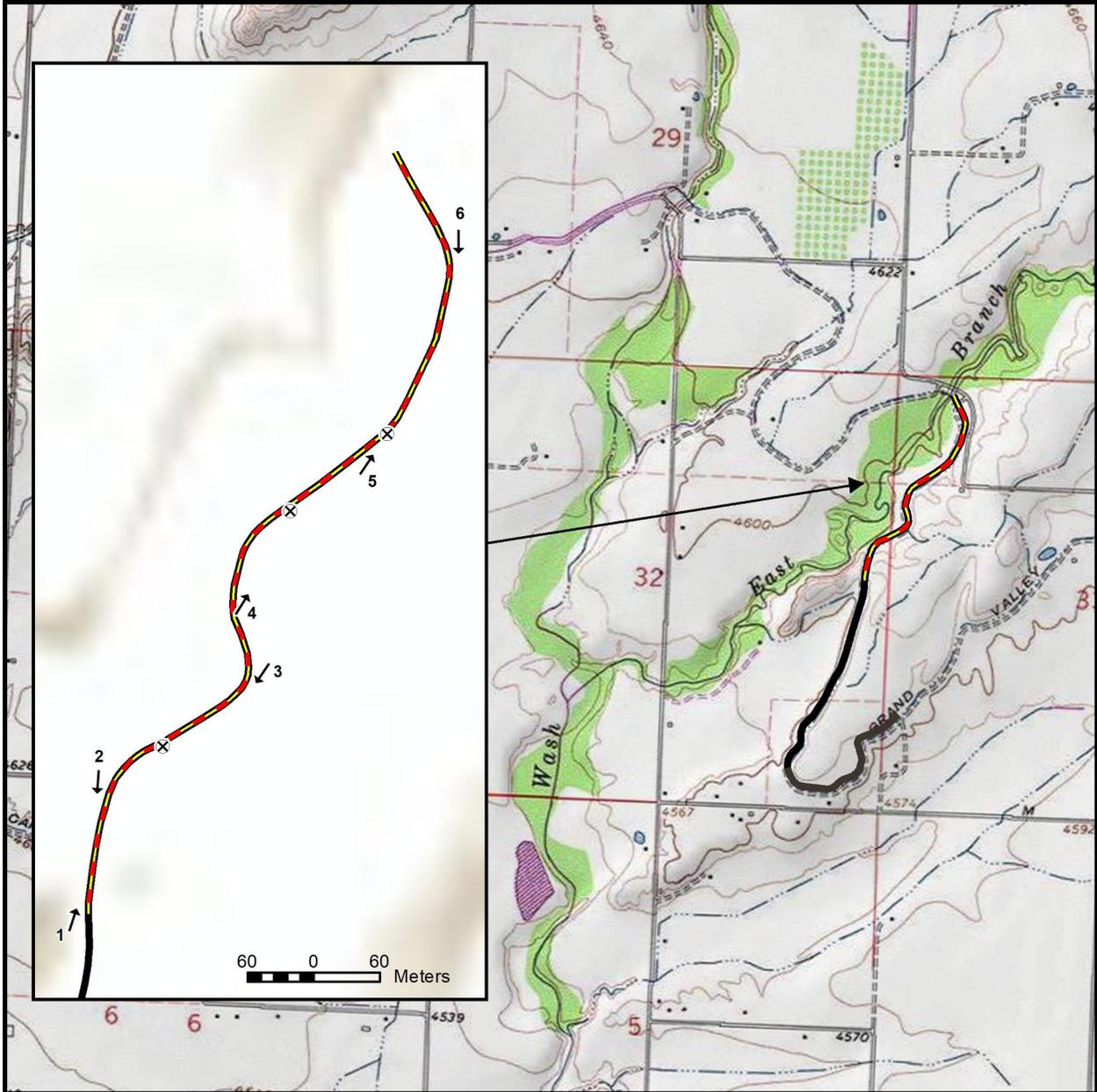


Site 5ME4680.73

- | | | | | | |
|---|-------------|---|----------------|---|--------------------------|
| ↑ | Photo Point | ⊙ | Intake | — | Linear Site |
| ★ | Headgate | × | Modern Culvert | — | Previously Recorded Site |

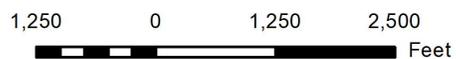


Map 1.



Site 5ME4680.74

↑ Photo Point × Modern Culvert Linear Site Previously Recorded Site



Map 2.

Highline of the Grand Valley Canal (5ME4680.73)



Photograph 1.



Photograph 2.

Highline of the Grand Valley Canal (5ME4680.73)



Photograph 3.



Photograph 4.

Highline of the Grand Valley Canal (5ME4680.73)



Photograph 5.



Photograph 6.

Highline of the Grand Valley Canal (5ME4680.73)



Photograph 7.



Photograph 8.

Highline of the Grand Valley Canal (5ME4680.73)



Photograph 9.



Photograph 10.

Highline of the Grand Valley Canal (5ME4680.73)



Photograph 11.

Highline of the Grand Valley Canal (5ME4680.74)



Photograph 1.



Photograph 2.

Highline of the Grand Valley Canal (5ME4680.74)



Photograph 3.



Photograph 4.

Highline of the Grand Valley Canal (5ME4680.74)



Photograph 5.



Photograph 6

