

RECLAMATION

Managing Water in the West

TR-2011-03

Amarillo Canal Capacity Evaluation

Dates of travel: April 11 to April 13, 2011



U.S. Department of the Interior
Bureau of Reclamation
Technical Service Center
Hydraulic Investigations and Laboratory Services Group
Denver, Colorado

April 2011

BUREAU OF RECLAMATION
Technical Service Center
Denver, Colorado

TRAVEL REPORT

Code: 86-68460 Date: April 19, 2011

To: Robert Einhellig, Manager, Hydraulic Investigations and
Laboratory Services Group

From: Tracy Vermeyen, Hydraulic Engineer, Technical Service Center
Bryan Heiner, Hydraulic Engineer, Technical Service Center

Subject: Amarillo Canal Capacity Evaluation and Basin Creek flowmeter

1. Travel dates: April 11, 2011 through April 13, 2011
2. Places visited: Amarillo Canal, Farmington, New Mexico, and Basin Creek, Durango, Colorado.
3. Purpose of trip: To collect hydraulic data during a period of steady flow in the Amarillo Canal in support of hydraulic model development related to canal conveyance capacity. To install a flowmeter in Basin Creek to measure releases from Ridges Basin Dam.
4. Synopsis of Trip: On the morning of Monday, April 11, 2011, Tracy Vermeyen and Bryan Heiner flew to Farmington, New Mexico. At 2:00 p.m. we met with Mr. Darryl Good of Reclamation's Four Corners Construction Office (FCCO) in Farmington, NM. We picked up our instrumentation and went to the Navajo Agricultural Products Industry (NAPI) headquarters to discuss the field work planned for Tuesday, April 12, 2011. We met with Ms. Jeanette Joe (canal operations manager) to discuss the canal operation plan for the upcoming hydraulic field tests. We discussed our desire for a steady 50 ft³/sec flow in the Amarillo Canal from 7:00 a.m. to 11:00 a.m. with no pumping plant diversions.

After discussing canal operations, we spent Monday afternoon setting up tag lines for flow measurement and installing temporary water level loggers at four locations along the Amarillo Canal. The flow measurement sites were established in the Amarillo Canal near canal check structures at stations 1+50, 45+96, 246+70, and 436+00. At each station, we installed an onset water level logger, a gate position logger, and established a flow measurement cross section. We also installed two barometric pressure loggers that are required to convert water pressure to water depth.

On Tuesday morning we went to the Amarillo Canal to begin the hydraulic data collection and found the canal to be “turned off.” We went to the NAPI headquarters and determined that the canal operators misunderstood the operation plan. Around 8:00 a.m. the flow was started and we collected hydraulic data until about 11:00 a.m. We used a RD Instruments StreamPro to make flow measurements at the cross sections established on Monday. We had the FCCO surveyors (Bauer and Mumaw) shoot water surface elevations upstream and downstream from the check structures and at the top of each radial gate leaf. We also recorded the radial gate position gauges at the check structures. We completed data collection at 11:00 a.m. and left the project, while Darryl Good went back to arrange flow conditions for data collection on Wednesday. In the evening we confirmed that the flow conditions were unsteady in all three canal reaches.

On Tuesday afternoon we traveled to Durango, Colorado to install an acoustic flowmeter in Basin Creek in preparation for the first releases from Ridges Basin Dam. We met with Tyler Artichoker at the Animas-La Plata Construction Office. Tyler took us to the site and we installed the flowmeter in an 8 ft by 8 ft concrete culvert which passes under CR213. We installed the flowmeter and cable conduit using concrete anchors. When the installation was complete, we disassembled the flowmeter and cable for reinstallation on the day the flow test begins (estimated to be May 4, 2011). When the flowmeter is reinstalled it will be connected to a 12-volt deep cycle battery (to be provided by the Construction Office) and data collection will automatically begin. It is recommended that the flowmeter is checked frequently to assure proper operation. We completed the flowmeter installation (figure 1) around 4:30 p.m. and returned to Farmington, NM.



Figure 1. Photograph of flowmeter mount (steel channel) and the conduit clamps along the right side of the culvert (looking downstream). The flowmeter was removed until a later date to protect it from vandalism.

Wednesday morning we arrived at STA1+50 and there was flow in the Amarillo Canal. We contacted the project operators and requested that no radial gate adjustments be made until around 11:00 a.m. We began hydraulic data collection at 7:15 a.m. at STA436+00 and worked our way from downstream to upstream. The FCCO surveyors (Bauer and Mumaw) collected water surface and radial gate elevations at the same time and location where we made flow measurements. We completed the first round of data collection at 9:15 a.m. We repeated the data collection from 9:30 a.m. to 10:35 a.m. in an effort to confirm that the canal had reached a steady state with regards to flow and water surface elevation.

A cursory review of the survey and flow data showed that the flow conditions were nearly steady and water surface elevations at the check structures had stabilized. We alerted the canal operators that we completed our data collection at 10:45 a.m. We spent the next hour removing the instrumentation we had installed. Vermeyen and Heiner briefed Darryl Good about the hydraulic data collection and we left the project at 12:30 p.m. We packed our equipment and left it at the FCCO for shipment back to Denver, Colorado. Heiner and Vermeyen returned to Denver Wednesday afternoon.

5. Conclusions: A hydraulic data set at nearly steady flow was collected during the second set of measurements on April 13, 2011. These data will be provided to design engineers to validate a computer model of the Amarillo Canal.
6. Action correspondence initiated or required: None
7. Client feedback received: (N/A)

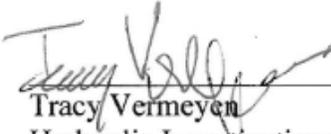
SIGNATURES AND SURNAMES FOR:

Travel to: Amarillo Canal, Farmington, New Mexico and Basin Creek, Durango, Colorado

Dates of Travel: April 11-13, 2011

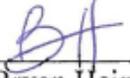
Names and Codes of Travelers: Tracy Vermeyen and Bryan Heiner, 86-68460

Traveler(s):



Tracy Vermeyen
Hydraulic Investigations and Laboratory Services Group

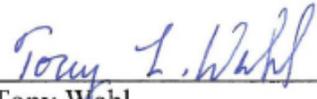
5/12/11
Date



Bryan Heiner
Hydraulic Investigations and Laboratory Services Group

5/12/11
Date

Peer Review by:



Tony Wahl
Hydraulic Investigations and Laboratory Services Group

5/11/11
Date

Noted and Dated by:



Robert Einhellig, Manager
Hydraulic Investigations and Laboratory Services Group

5/11/11
Date

cc: ALP-100 (Artichoker)
FCCO-100 (Dockter, Good, Roe)