

**BUREAU OF RECLAMATION
TECHNICAL SERVICE CENTER
DENVER, COLORADO**

TRAVEL REPORT

RES-3.50

Code: D-8560 **Date:** Jan 26, 2006

To: Craig Albertsen
Acting Chief, (D-8500) Water Resources Division

Travelers: Cliff Pugh (D-8560 Manager) Hydraulic Engineer, & Tom Gill (D-8560)
Hydraulic Engineer

Subject: Travel to Lahontan Basin Area Office (LBAO) in Carson City NV, Fallon Field Office (FFO) in Fallon NV, and Truckee-Carson Irrigation District (TCID) in the Fallon NV area

1. Travel period: January 18-20, 2006

2. Places or offices visited: LBAO and FFO offices and selected sites on the TCID delivery system

3. Purpose of trip: The two objectives of the trip were to: 1) meet with local Reclamation personnel as well as Desert Research Institute (DRI), and TCID personnel to discuss the re-scoping of DRI's study project seeking to identify appropriate means to improve operations of TCID's Truckee Canal; and 2) tour selected segments of TCID's Carson delivery system in the company of local Reclamation personnel and TCID personnel to become familiar with TCID's on-going canal modernization and discuss a role D-8560 might play in assisting this effort.

4. Synopsis of trip: On the morning of 01/08/06 we flew from Denver to Reno (via Phoenix). We then drove to Carson City NV for a 1:00 PM meeting at the LBAO office with Roger LeSueur and James Lively (both of the FFO). Pablo Arroyave (LBAO) joined us for a few minutes shortly before 2:00 PM. At 2:00 PM we, along with Roger, James and Pablo joined Del Smith (D-8570, Denver Office), Doug Boyle (DRI) and David Overvold (TCID) to discuss the re-scoping of DRI's Truckee Canal study. Julie Miller (DRI) participated in the meeting by conference call.

In the 1:00 o'clock meeting, Roger and James expressed interest in having D-8560 assist TCID in its modernization efforts on the Carson delivery component of the TCID system. We were provided with maps of the TCID district and a copy of the district's most recent (May, 2000) Water Conservation Plan (WCP). Roger noted that the WCP is currently past due for a 5 year update and mentioned that updating the WCP had been one of the topics addressed in discussions he had held with David Overvold earlier in the day. Roger and James also provided a brief overview of the field visit to TCID planned for the following day.

Discussion during the 2:00 o'clock meeting, focused on operating conditions for the Truckee Canal, and on alternative options for modernization compatible with these conditions. Roger pointed out that at any given time the Truckee Canal will function under one of four distinct operating conditions. Those conditions being: 1) no flow; 2) diversion for irrigation only; 3) diversion for delivery to Lahontan Reservoir only; and 4) diversion both for irrigation and for delivery to Lahontan Reservoir. The following three objectives were identified as goals of a modernization program for Truckee Canal: 1) improved ease of operations; 2) improved ability to respond to flood flows; and 3) improved ability to manage water. Under the irrigation only option, the goal is to have as close to zero flow as possible going into Lahontan Reservoir.

The tentative plan that emerged for a re-scoped study is for DRI to utilize one or more existing numerical modeling packages for canal flow (i.e. CanalMan, CanalCAD, others) to evaluate performance of various structural flow control alternatives (i.e. undershot and/or overshot gates, possibly a new spillway upstream from Fernley). Selected structural flow control alternatives could be modeled under various canal operating modes (i.e. upstream level control, constant canal-reach volume control). The study could possibly include investigating the capability of changing canal operating modes for the different operational conditions.

On Thursday (01/19/06) we were accompanied by James Lively and Robert Sevey (both of the FFO) and David Overvold (TCID). We visited numerous sites along the Carson delivery system. Among items viewed were both mechanical and electronically controlled gates for maintaining constant upstream water level, various types of flow measurement structures, and two of the District's re-regulation reservoirs. We were given the understanding that the bulk of flow rate decisions and adjustments throughout the system are handled by the ditch rider staff. [Note: At the time of our visit, the canal system was shut down for the winter.]

One of the sites visited was identified as check AC3. A mechanical automatic gate designed to maintain upstream level was installed at this site during the past season. To date, the district has been unable to get this gate to function properly. (A similar gate installed elsewhere on the system has apparently functioned reasonably well.) There appears to be a significant drop at the AC3 site (~ 10 ft). The

possibility of installing a micro hydroelectric system at this site was discussed as a source of power, should the district opt to install a motorized gate at this site in lieu of the mechanically automated gate.

Following our field visit, we spent Thursday night in Reno NV. We returned from Reno to Denver on the morning of Friday, 01/20/05.

Conclusions: DRI's study will focus exclusively on the Truckee Canal segment of the TCID system. D-8560's involvement in the DRI study of the Truckee canal will be limited to providing assistance on an as-requested basis to DRI (Julie Miller) – possibly including providing resource information and/or contacts for DRI's selection of modeling packages to be used and selection of flow control structure alternatives that might be considered as part of the study.

In preparation for providing assistance on continued modernization of the Carson delivery system, D-8560 staff will review the background information furnished including the May, 2000 TCID WCP and maps of the TCID district. More detailed information identifying interconnections of the respective canals and laterals on the Carson delivery system, along with locations where flow measurement capabilities are in place and locations where motorized and/or automated control structures are in operation will help the D-8560 staff gain a better sense of current operations and issues.

To date, it is our understanding that all control structure automation measures that have been adopted on the TCID system function to maintain upstream level control. David Overvold indicated that TCID considers the upstream level control operations to be effective where this mode of operation is being utilized. Upstream level control has enabled TCID to provide improved service to irrigators in the form of steady turnout discharge rates.

With upstream level control, supply/demand mismatches are passed downstream. To avoid delivery shortages (which can cause significant economic losses for irrigators through crop stress), districts using upstream level control typically must over-supply canals (administrative spill.) To achieve better water efficiency it is necessary to "capture" the supply excesses at a point in the system where the captured flow can be re-regulated and utilized productively.

For reaches of TCID's Carson branch of the delivery system where upstream level control is being utilized, flow excesses can either be captured in re-regulation reservoirs, or become inflows to other elements of the conveyance system. (i.e. This is the case for the mechanically automated gate at Lewis Drop, where spill is returned to the river at a point where it can be re-diverted at a downstream location.) TCID's re-regulation reservoirs have the desirable aspect of functioning "gravity in" – "gravity out", thus no pumping costs are incurred in capturing and re-regulating supply-demand excesses from the upstream level control automation.

Significant portions of TCID are located in areas downstream from existing re-regulation reservoirs and/or downstream from sites where flows can be intercepted by other elements of the delivery system. An example seen during the site visit is the area served by the S-line canal that is downstream from Harmon Reservoir. David Overvold suggested that canal reaches such as this may be candidate areas for a canal operating system based on meeting downstream demand as opposed to operations geared to maintain constant upstream level.

Action correspondence initiated: D-8560 will work with the FFO to identify scope and schedule for D-8560's assistance in the ongoing modernization of TCID's Carson delivery system. An appropriate approach may be to assess of the current state of TCID's operations, capabilities, and long-term operational goals. From such an assessment, a step-wise plan for moving forward with modernization efforts can be developed that features realistic and achievable tasks that can be providing benefits for TCID even as the modernization process continues. To this end it would seem logical for D-8560's assistance efforts and for work on the five-year update for TCID's WCP to be performed in harmony.

cc: Roger LeSueur (USBR FFO), Pablo Arroyave (USBR LBAO)

SIGNATURES AND SURNAMES FOR:

Travel to: Carson City and Fallon Nevada area

Date or Dates of Travel: January 18-20, 2006

Names and Codes of Travelers: Cliff Pugh and Tom Gill, D-8560

Traveler: _____
Cliff Pugh, D-8560 **Date** _____

Traveler: _____
Tom Gill, D-8560 **Date** _____

Noted and Dated by:

Craig Albertsen, Acting Division Chief **Date** _____

Travelers: Cliff Pugh and Tom Gill

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Date: Jan 23, 2006

D-8500 Water Resources Services