SANGRE DE CRISTO
TRINCHERA DIVERSION
CANAL RESTORATION

RIO GRANDE INTERBASIN ROUNDTABLE

Water Supply Reserve Account

Grant Application

December 9, 2008

COLORADO WATER CONSERVATION BOARD

WATER SUPPLY RESERVE ACCOUNT
2006-2007 GRANT APPLICATION FORM

Sangre de Cristo Trinchera Diversion Canal Restoration

Name of Water Activity/Project **River Basin Location**

$50,000.00 $200,000.00	X	Basin Account	X Yes
	X	Statewide Account	No
Amount of Funds Requested	Please Check Applicable Box		Approval Letter Signed By Roundtable Chair and Description of Results of Evaluation and Approval Process

*** For the Basin Account, the Application Deadline is 60 Days Prior to the Bimonthly CWCB meeting. The CWCB meetings are posted at www.cwcb.state.co.us and are generally the third week of the month.**

*** For the Statewide Account, the Application Deadline is 60 Days Prior to the March and September CWCB Board Meetings.**

* In completing the application you may attach additional sheets if the form does not provide adequate space. If additional sheets are attached please be sure to reference the section number of the application that you are addressing (i.e., A.1. etc.).

Instructions: This application form must be submitted in electronic format (Microsoft Word or Original PDF are preferred). The application can be emailed or a disc can be mailed to the address at the end of the application form. The Water Supply Reserve Account Criteria and Guidelines can be found at http://cwcb.state.co.us/IWMD/. **The criteria and guidelines should be reviewed and followed when completing this application**. You may attach additional sheets as necessary to fully answer any question, or to provide additional information that you feel would be helpful in evaluating this application. Include with your application a cover letter summarizing your request for a grant. If you have difficulty with any part of the application, contact Rick Brown of the Intrastate Water Management and Development (Colorado Water Conservation Board) for assistance, at (303) 866-3514 or email Rick at rick.brown@state.co.us. Generally, the applicant is also the prospective owner and sponsor of the proposed water activity. If this is not the case, contact the Rick Brown before completing this application.

Water Supply Reserve Account – Grant Application Form
Form Revised May 2007

Part A. - Description of the Applicant (Project Sponsor or Owner);

1. Applicant Name(s): **The Trinchera Irrigation Company**

Mailing address: Attn: Jane Devine, Office Manager
610 Main Street
P.O. Box 41
Blanca, CO 81123

Taxpayer ID#: 84-0338590 Email address: trinirr@fone.net (trinirr@gojade.org) >12/31/08

Phone Numbers: Business: 719-379-3467
Home: 719-379-3652
Fax: 719-379-2687

2. Person to contact regarding this application if different from above:

Name: Tracy Kester – 719-206-0241

Position/Title President

3. Provide a brief description of your organization below: see "Description of Applicant" in Part 2 of Criteria and Guidance for required information.

Trinchera Irrigation Company (TIC) , comprised of 47 stockholders, manages the use of water for irrigation in the northern half of Costilla County, Colorado. TIC operates Mountain Home Reservoir, Smith Reservoir, and the Sangre de Cristo Trinchera Diversion Canal (the Canal), with a total of approximately 26 miles of canals and 45 miles of laterals. TIC is responsible for the delivery of irrigation water to approximately 100 sprinkler pivots and several thousand acres of flood irrigation. The number of irrigated acres served by the company has remained relatively stable over the years. In 1907, as Mountain Home Reservoir and its related canals were being constructed, The Trinchera Canal Company was organized to irrigate about 12,000 acres of land in northern Costilla County. Four years later that company was out of funds and the Trinchera Irrigation District was then formed, issuing $650,000 in bonds to be paid to the defunct Trinchera Canal Company for its water rights and land. By 1944 the original company went into the hands of receivers and the present Trinchera Irrigation Company was formed as a nonprofit mutual irrigation company (Attachment A). The articles of incorporation were modified in 1946, issuing a total of 12,500 shares of stock, with each share entitling the holder to irrigate one acre of land. Stock ownership was limited to owners of land or users of water within the Trinchera Irrigation District during the year 1943. Almost all shareholders have both surface water and ground water rights, with most wells dating from the 50s and 60s. TIC's operating funds are derived from assessments levied on shares of stock. These assessments are determined by dividing all operating costs plus debt service, maintaining a budget that reflects the local economy. Despite soaring fertilizer and fuel costs in the past two years, TIC has

struggled to keep assessments steady. The flexibility of TIC's irrigation system has allowed it to evolve from former hand/horse powered operations and the truck gardening of spinach, carrots and cabbage prior to the invention of refrigerated transportation, to today's center pivot operations. TIC's water in Mountain Home Reservoir is decreed for irrigation purposes, and Division of Wildlife has leased rights as a State Wildlife Area (SWA) and maintains a conservation pool of 653 acre feet. Both Smith and Mountain Home reservoirs are stocked with rainbow trout by the Colorado Division of Wildlife (DOW), providing recreational fishing and boating activities for residents and tourists. TIC's charter and its primary responsibility is to provide irrigation water. However, TIC is also committed to sustain DOW's small conservation pool in the reservoir during dry times, although at times Mountain Home has to be dried up. This Project reduces losses of water in Sangre de Cristo Trinchera Diversion Canal, reduces groundwater use from wells for irrigation, and helps to keep water in Mountain Home Reservoir.

4. If the Contracting Entity is different then the Applicant (Project Sponsor or Owner) please describe the Contracting Entity here. N/A Contracting Entity and the Applicant are Trinchera Irrigation Company (TIC).

Part B. - Description of the Water Activity – Please Refer to Criteria and Guidance Document for Eligibly Requirements

1. Name of water activity/project:

Sangre de Cristo Trinchera Diversion Canal Restoration

What is the purpose of this grant application?

[ ] Environmental compliance and feasibility study

[ ] Technical Assistance regarding permitting, feasibility studies, and environmental compliance

[ ] Studies or analysis of structural, nonstructural, consumptive, nonconsumptive water needs, projects

Study or Analysis of:

- [ ] Structural project or activity
- [ ] Nonstructural project or activity
- [ ] Consumptive project or activity
- [ ] Nonconsumptive project or activity

[X] Structural and/ or nonstructural water project or activity

Project Overview: (Inserted here for contextual orientation and clarity)

The Sangre de Cristo Trinchera Diversion Canal ("the Canal" or "the SDC Canal") is an approximately 24,000-foot-long concrete-lined segment of the Trinchera Irrigation Company system described in attached topographic maps and irrigation inventory (Attachment B). This Project replaces 2,125 linear feet of that concrete lining. The Canal takes water from Sangre de Cristo Creek and directs it approximately southwestward to Hoffman Canyon, where it joins Trinchera Creek as it re-emerges just below the dam at Mountain Home Reservoir. Both of these flows converge into Trinchera Canal with about 50% of TIC water serving the agriculturally productive southern end of the system. The Canal forms the heart of a unique and flexible system for distributing water. At Hoffman Canyon, where the flows of the Canal meets Trinchera Creek, there is a self-regulating headgate which functions as a sort of valve, where flows are regulated to continue on southward or to flow back northward, if needed, to irrigate farms north of Blanca. This critically designed element forms a highly efficient circulatory system, as it sustains TIC's Alternate Points of Diversion (APD) method for allocating water. As Water Commissioner Robert Schultz says, "I don't think there is any other system in the San Luis Valley which is as well integrated as this one." The Canal lining was installed in 1976 and is badly deteriorated, causing the canal to operate at 50% of its designed capacity. Normally, in the early part of the year and prior to irrigating, 98% of Trinchera Creek flows into storage at Mountain Home Reservoir, to be used starting in April to irrigate the southern part of the system and later in the year when Sangre de Cristo Creek runs low and stops. However, for the past ten years or so, due to declining capacity in the Canal, TIC must prematurely release water from Mountain Home Reservoir during irrigation season, tapping reservoir supplies sooner than necessary and causing shortfalls in late summer and early fall, when the need is greatest, forcing irrigators to rely more heavily on groundwater sources for their center pivots. Constrictions of flow, pooling, and leakage caused by the upthrusts, slumps and cracks in the concrete liner are seriously impacting the circulatory system and reducing the flexibility of the APD system, causing operational difficulties for TIC in delivering decreed water rights and meeting priority calls. This request for funding restores the capacity of the SDC Canal to its estimated original designed capacity of 100 to 120 cfs for the next 30-40 years. The existing concrete lining will be removed; the ditch will be filled, compacted to grade, and re-trenched; and a new float-form concrete lining will be installed. By restoring maximum capacity to the Canal, TIC gains much needed operational efficiency, reduces groundwater use, and allows water in Mountain Home Reservoir to be maximized for multiple uses in irrigation, flood control, fishery, recreational boating and fishing, and the preservation of wildlife habitat.

2. Describe how the water activity meets these **Threshold Criteria.**

1. The water activity meets the eligibility requirements outlined in Part 2 of the Criteria and Guidelines.

- TIC proposes an eligible water activity, as identified in Senate Bill 06-179, involving stabilization and structural repair of the Sangre de Cristo Trinchera Diversion Canal.
- TIC is an eligible entity in that it is a mutual nonprofit ditch company classified under the U.S. tax code under section 501(c)(12).
- TIC is requesting funds from the SB 179 Rio Grande Basin Account and the State Account, and is complying with all applicable submission, review, and approval deadlines and procedures.

2. The water activity is consistent with Section 37-75-102 Colorado Revised Statutes. The requirements/language from the statute is provided in Part 3 of the Criteria and Guidelines.

- This proposal is eligible for funding under Senate Bill 06-179 because 1) it is being submitted for approval to the Rio Grande Interbasin Roundtable pursuant to article 75 of title 37, C.R.S.; 2) this water activity will take place in the Rio Grande Basin; 3) it meets the eligibility categories described below; and 4) this proposal is submitted for approved by the Rio Grande Interbasin Roundtable in conformity with criteria and guidelines jointly developed by the IBCC and CWCB.

- This water activity meets the eligibility requirements as required in Part 2 of the criteria and guidelines as detailed above.

- The water activity is consistent with Section 37-75-102 C.R.S. because this Project restores, repairs, and upgrades existing canal courses and structures. This Project therefore does not supersede, abrogate, or otherwise impair the State's current system of allocating water within Colorado nor does it in any manner repeal or amend the existing water rights adjudication system. This Project does not affect the State Constitution's recognition of water rights as a private usufructuary property right nor is it intended to restrict the ability of the holder of a water right to use or to dispose of that water right in any manner permitted under Colorado law. By repairing, restoring and stabilizing the Sangre de Cristo Canal, this Project eliminates waste in the Trinchera Canal, preserving stored water in Mountain Home Reservoir for irrigation, fishery, wildlife, and recreation.

3. The water activity underwent an evaluation and approval process and was approved by the Basin Roundtable (BRT) and the application includes a description of the results of the BRTs evaluation and approval of the activity. At a minimum, the description must include the level of agreement reached by the roundtable, including any minority opinion(s) if there was not general agreement for the activity. The description must also include reasons why general agreement was not reached (if it was not), including who opposed the activity and why they opposed it. Note- If this information is included in the letter from the roundtable chair simply reference that letter.

    - This information is included in the cover letter from the Rio Grande Interbasin Roundtable.

4. The water activity meets the provisions of Section 37-75-104(2), Colorado Revised Statutes. The requirements/language from the statute is provided in Part 3 of the Criteria and Guidelines.

    Trinchera Irrigation Company has obtained input, advice, engineering and design services from Engineers Laurie Clark and Pete Gallegos of the USDA Natural Resources Conservation Service in Monte Vista. TIC works closely with the Trinchera Water Conservancy District and continues to have the professional counsel of Division of Water Resources District 35 Commissioner Robert Schultz, who has provided extensive technical support to this proposal. TIC has actively sought the input and advice of the Colorado Division of Wildlife, the Town of Blanca, and water users in the surrounding communities of north Costilla County including Ty Ryland, Manager of the Trinchera Ranch (formerly known as the Forbes Subdivisions) and from the Sierra Grande School district. Mike Gibson, Chairman of the Rio Grande Basin Roundtable, has toured the Canal with TIC staff and has advised TIC on issues relating to the CWCB grant process and State regulations. All stakeholders are familiar with the difficulty in obtaining decreed water rights and meeting priority calls and are committed to the success of this project.

3. For Applications that include a request for funds from the Statewide Account, describe how the water activity meets the **Evaluation Criteria**. See Part 3 of Criteria and Guidelines.

Promoting Collaboration and Cooperation

a. The water activity addresses multiple needs or issues, including consumptive and/or non-consumptive needs, or the needs and issues of multiple interests or multiple basins:

Multiple consumptive and non-consumptive needs have been identified by TIC and by the land owners, water users and stakeholders of this project, as follows:

- Helps meet agricultural irrigation water needs by reducing water losses in the Canal, thus overcoming difficulties in diverting irrigation water in priority.
- Improves fishery conditions by reducing the need to prematurely draw down water supplies in Mountain Home Reservoir.
- Limits further deterioration in the Canal for the next 30-40 years, creating many cost benefits, reducing maintenance, preventing further losses of water, and reducing the reliance on wells for irrigation.
- Improves nonconsumptive uses for wildlife by reducing premature draws from Mountain Home reservoir.
- Helps to meet Rio Grande Basin objectives for a sustainable water supply by restoring the Canal's original designed capacity.
- Promotes cost effectiveness and operational flexibility optimizing existing and future water supplies for agriculture as well as for wetland areas at Mountain Home and Smith Reservoirs.
- Directly supports the goal of the Rio Grande Basin to fulfill its mandate to more effectively manage its surface and ground water supplies.

b. The number and types of entities represented in the application and the degree to which the activity will promote cooperation and collaboration among traditional consumptive water interests and/or non-consumptive interests, and, if applicable, the degree to which the water activity is effective in addressing intrabasin or interbasin needs or issues.

- This Project brings together 28 irrigators, farmers and share holders affected by this Project through the proactive involvement of Trinchera Water Conservancy District, Colorado Division of Wildlife, Costilla County Commissioners, Colorado Division of Water Resources Division 3, Costilla County Soil Conservation District, Trinchera Ranch, and Natural Resources Conservation Service.
- The proposed relining of the Canal, and the accompanying stabilization work will restore original capacity to the Canal, increasing options for collaboration under the Alternate Points of Diversion irrigation system. In this system, the majority of TIC's water rights have been set up to be alternate points of diversion to the other company-owned water rights. This means that water can be distributed to wherever it is most needed, rather than only to where it was originally decreed (Attachment C).
- This Project directly benefits Mountain Home Reservoir, allowing longer periods of storage. It diminishes the need for premature withdrawals due to leakage and other losses in the Canal. It also addresses intrabasin and interbasin needs by conserving water supplies through increased collaboration, enabling TIC to direct water to where it is most needed. Holding water longer in Mountain Home Reservoir prevents depletion of the aquifer by preventing otherwise unnecessary dependence on ground

water for irrigation, reduces the need for curtailments, and improves collaboration with DOW's habitat conservation purposes.

Facilitating Water Activity Implementation

c. How funding will reduce uncertainty that water activity will be implemented:

- Although the need for this project has been recognized for many years, the Board of Directors has not deemed it prudent to assume additional debt in order to restore the full capacity of the Canal. This request for assistance from the Water Supply Reserve Account presents an appropriate and timely opportunity to make the repairs needed in order to maintain the integrity of the company's delivery system. Funding is needed in order to avoid further debt, to keep the cost of TIC's shares affordable, and to continue to meet the company's current obligations. Without funding from the Water Supply Reserve Account, this Project would not be possible. With funds from the Water Supply Reserve Account this project is assured.

d. Urgency of need:

- Stabilization and re-lining of the Canal is essential in order to prevent flooding and further erosion problems. With leakage and unstable structures along the rim of the Canal, the risk increases, over time, of water possibly breaching the Canal. Such an occurrence would compromise the integrity of the entire irrigation system.
- The Canal has reached the end of its designed functionality. Further deterioration of the irrigation system will severely compromise TIC irrigators in northern Costilla County to obtain their decreed water rights in priority.
- The window of opportunity to accomplish this will occur when the water recedes and the ground begins to freeze in 2009.
- The availability of the Rio Grande Interbasin Round Table's Subcommittee for technical support has provided assistance to this project which would not otherwise be available, saving money, providing timely input and advice, and facilitating a successful and informed bid process.
- Given the rising costs of all materials, particularly of concrete, it is incumbent upon TIC to complete this project as soon as possible.

e. Length of time needed to implement the water activity

- This Project will begin in the fall of 2009 and will be completed within six months.

f. Expertise and ability of applicant to implement the activity.

- Engineer Laurie Clark, with the Monte Vista NRCS office, designed the bid specifications, and TIC approached five potential contractors. Two of them submitted proposals, and, after an extensive bid review process, TIC awarded the contract to Can-Do Concrete Construction, Inc. of Greeley, Colorado. Following are the criteria most influential in making this decision:

    - Contractor is familiar with the Canal, having worked on the original concrete project in 1968.
    - Contractor has lined numerous local ditches and laterals on other Valley projects in Monte Vista, Center, Alamosa, San Luis, and Jaroso.

- The CEO of the Company, Pete Gutierrez, has personal experience as General Superintendent on a 21-mile long ditch for the Sandia Indian Pueblo in Bernalillo; has worked on several multi-million dollar projects in Arizona; and has completed a ten mile concrete canal in California having a 6' bottom and a depth of 8 feet.
- Can-Do-Concrete was incorporated in 1990 and is a family-owned business, known in the region.
- Contractor made several visits to the job site, and made recommendations which slightly modified the original NRCS design, suggesting a 1.5 to 1 side slope, a bit wider than the existing plan, thus increasing stability without materially affecting cost.
- Contractor's bid package contained recommendation letters, an extensive equipment list, an endorsement from their bank, photographs of previous jobs, and a bid amount which was compatible with NRCS estimates. The proposal itself was far superior to the competing proposal. A local contracting entity which knew both bidders provided a superior referral to Can-Do-Concrete, Inc..

Photographs, bid proposal, and other data on the Contractor are enclosed in Attachment D.

g. Matching funds and/or funding from other sources

• NRCS engineering assistance and oversight (Attachment E)	$ 4,500
• Resource Conservation & Development – Maps & system inventory	$ 2,000
• TIC – demolition and removal of Concrete – (Attachment E)	$12,000
• TIC – earthfill (Attachment E)	$28,000
TOTAL MATCHING FUNDS (See Budget)	$46,500

h. Demonstrated need for financial assistance based on inability or difficulty obtaining funding elsewhere.

- Trinchera Irrigation Company's stockholders have faced enormous cost increases for crop production due to the high cost of fuel, fertilizers, labor, and the rising costs of equipment and machinery. TIC's annual budget of approximately $300,500 is based on assessments set by the members, most of whom are farmers and water users in this remote rural agricultural community. With increasing costs, assessments have increased, yet are limited by what the local economy can bear. According to statistics from the San Luis Valley's Development Resources Group, Costilla County has two times the poverty level of the State average. TIC simply does not have the funds to do this project. The company has previously borrowed funds from CWCB for prior projects, for which the company currently owes $11,017.51 on one loan to construct other concrete canals within the irrigation system. It also owes $424,513.40 on another CWCB loan to upgrade Mountain Home Dam. TIC has remained current with its payments and its Board of Directors is not willing to enter into any further debt at this time. Cash Flow and Budget and current two-year financial statements are in Attachment I.

- With credit drying up and a weakened economy, it is not likely that TIC will be able to acquire these funds from other sources any time soon. Through the Rio Grande Interbasin Roundtable TIC has obtained a broad range of technical assistance as we prepared this proposal for the funding of this Project from the Water Supply Reserve Account. TIC has made commitments to this Project to the level of its ability without compromising its ability to meet current needs. Without the financial assistance requested in this proposal, this Project simply could not be implemented.

Meeting Water Management Goals and Objectives and Identified Water Needs

i. The water activity helps complete a needs assessment, including consumptive and/or non-consumptive needs, that was not fully funded from other sources.

- TIC is a relatively small irrigation company, without the resources to do large studies or needs assessments. Although this particular Project has not emerged out of a formal needs assessment process, it complements the Rio Grande Basin's objectives as it works to develop both its consumptive and nonconsumptive needs assessments, based on the June 2006 *SWSI Water Supply and Needs Report for the Rio Grande Basin.*
- Some of the early records at the time of the construction of the concrete-lined Canal are missing, so TIC does not have specifications for its designed capacity. However, operation and maintenance records of TIC have documented the decline in carrying capacity of the Trinchera Canal over the years. Robert Schultz, Water Commissioner of Division 3, has consulted the rating table for the Sangre-Trinchera Canal in a valuable document known locally as "Wayne's Bible." Figures for 1989 show maximum Gauge Height (GH) of 3.5 ft, with a flow capacity of 85cfs, which is what the ditch could carry in that year. Commissioner Schultz notes that the ditch's staff gauge goes to about 5ft, which means that the ditch should safely have been able to carry somewhere between 4 - 4½ ft if it was in good condition, which would be well over 100 cfs capacity. In effect, this provides an informal *de facto* "needs assessment" dating from about twenty years ago.
- Engineering studies completed by NRCS are included in Attachment F. They specify the upgrades required to bring the Canal into full operation so that it can fulfill the consumptive and non-consumptive needs of the area served by TIC.
- A detailed inventory of the entire TIC system, performed by conservationist Katey Byrd of Costilla County Conservation District (NRCS/RC&D), is included in Attachment B. These studies present a current mapping of the consumptive irrigation needs of the TIC system.
- TIC's water in Mountain Home Reservoir is decreed for irrigation purposes, but the Division of Wildlife has leased rights as a State Wildlife Area (SWA) and maintains a conservation pool of 653 acre feet. Both Smith Reservoir and Mountain Home Reservoir are stocked with rainbow trout, providing recreational fishing and boating activities for residents and tourists. Although not a needs assessment in itself, the maintenance of this conservation pool attempts to address the nonconsumptive needs of Mountain Home's fishery.
- Although the stockholders have for many years recognized the problems caused by the deterioration of the Canal, and have cautioned about the potential for causing serious further damage to the system if these deficiencies are not addressed, TIC cannot provide "proof" of these deficiencies through previous studies, as none were ever done. This funding request, when granted, will finally enable TIC to bring the Canal back to its originally designed capacity, estimated at between 100 cfs and 120 cfs. This will restore full operational flexibility and function to the Canal, enabling TIC to meet both consumptive and non-consumptive needs in north Costilla County.

j. The water activity meets one or more of the nine water management objectives of the Statewide Water Supply Initiative (SWSI); helps implement projects and processes identified as helping meet Colorado's future water needs, and/or addresses the gap areas between available water supply and future need as identified in the SWSI or the Rio Grande Interbasin Roundtable's basin-wide water needs assessment done in accordance with the Colorado Water for the 21st Century Act.

The water activity meets the following water management objectives identified in the Statewide Water Supply Initiative (SWSI):

- Sustainably meets agricultural demands by increasing the ability of irrigators to divert their appropriated water right when they are in priority.
- Provides for environmental enhancements to fish habitat by helping to maintain storage levels in Mountain Home Reservoir.
- Provides operational flexibility by reducing the problems of only being able to operate at 50% Canal capacity.
- Reduces costs of maintenance from sediment and woody debris falling into the Canal caused by erosion of Canal-bank slopes.
- Enhances wildlife habitat and helps to foster a more stable wetlands area at Mountain Home Reservoir by allowing water to be stored for longer periods of time, especially during low water regimes.
- Protects the cultural values inherent in five generations of farming in a region which pioneered the establishment of Colorado's first water laws.
- Protects and enhances resources which are of high value to families who enjoy hunting, fishing, hiking, recreational boating, and outdoor activities at Mountain Home Reservoir and at Smith Reservoir.
- Helps meet Colorado's future water needs by giving a highly efficient system a new lease on life – for the next 30-40 years.
- It complies with all applicable laws, regulations, and water rights.

k. The water activity promotes water conservation and efficiency.

- This Project reduces water loss by increasing the operational efficiency of TIC, enhancing the company's ability to control flows throughout its well designed system;
- It installs a concrete lining and other structures which will enhance system stability for probably the next 30-50 years;
- It increases Canal capacity, stabilizes Canal boundaries, slows bank erosion, and prevents loss to the system.
- It assists in conserving groundwater supplies by restoring designed surface water supply.
- It romotes efficiency by ensuring full operation of the Alternate Points of Diversion system.
- It promotes water conservation and efficiency by correcting Canal instability and Canal-bank erosion, preventing flows from breaching the ditch and potentially causing flooding and irrevocable loss of integrity to the entire TIC system.

l. The applicant has an existing water conservation plan.

- Although TIC does not in itself have a water conservation plan, it supports generally recognized water conservation practices and policies of a responsible and well established irrigation company.

m. The water activity will make new water available for use.

- Although there is no "new" water made available, this Project recovers water which has repeatedly been lost, every year, due to limited Canal capacity caused by leakage and seepage.
- In this case it could be argued that "new" water becomes available for use by irrigators that benefit from this Project by recovering the other 50% of what they are entitled to. By eliminating large and repeated losses, this Project enables TIC water users to finally take their full decreed water right – something that has not happened in many years.

n. The water activity involves reoperation, enlargement, or rehabilitation of existing facilities.

- This rehabilitation project will improve the operational efficiency of the Trinchera Irrigation Company's existing distribution system, allowing all irrigators to take their full priority.
- Rehabilitation of this existing facility also enhances wetland habitat and enlarges the fishery at Mountain Home Reservoir by retaining more water for longer periods of time.
- This Project increases TIC's flexibility in administering the highly efficient Alternate Points of Diversion water distribution system – re-operating and enlarging an excellent existing facility.
- It reduces the risk of flood by stopping leaks and further structural failure and by preventing overtopping of the Canal.
- It helps to maintain property values in the Trinchera Ranch subdivision, particularly in severely eroded Canal-bank areas.

The Water Activity Addresses Issues of Statewide Value

o. The water activity helps sustain agriculture and open space or meets environmental or recreational needs.

- This water activity helps sustain agriculture in one of Colorado's most productive regions by ensuring the delivery of irrigation water, in priority, for cash crops and for livestock industry forage.
- TIC and all irrigators in this system have been entitled to this water since the early 1900s, but for the past 10 years, due to Canal deterioration, Canal-bank instability, and erosion problems, water users have not been able to divert their full decreed water right, especially when water levels are low, later in the year.
- This Project restores the capacity of the Canal so that it can optimize existing and future water supplies and sustainably meet the consumptive and nonconsumptive demands of northern Costilla County.
- By reducing the requirement to prematurely release water from Mountain Home Reservoir, this Project reduces premature or otherwise unnecessary draws upon groundwater supplies and protects and enhances the Reservoir's recreational boating and fishing areas -- recreational assets which are valued by the public and which draw tourists and vacationers to one of the most popular back-road camping and fishing areas of the San Luis Valley.

p. The water activity assists in the administration of compact-entitled waters or addresses problems related to compact entitled waters and compact compliance and the degree to which the activity promotes maximum utilization of state waters.

- When the Rio Grande Compact requirements were established, the Trinchera drainage was determined not to be obligated under the Compact. It is only in flood conditions, and only occasionally during spring runoff, that Trinchera Creek reaches the Rio Grande. Data relating to the relation between the Trinchera drainage and the Rio Grande compact is included in Attachment G.

- However, this Project, which lies at the heart of TIC's Alternate Points of Diversion system, does indeed promote the best use of State waters. As described below and as detailed in the maps which inventory of TIC irrigation system, TIC is able to maximize all water rights that are in priority by balancing how those water rights are shared between the different streams in the watershed. As the water is moved around between the Sangre de Cristo Canal, the Trinchera Canal, and Ute Creek, and as these creeks fluctuate during the year, TIC is able to switch between all these diverse sources to meet the need where the need is

greatest. Some folks in the Valley say, perhaps with a bit of envy, that the self-regulating fluidity of the Trinchera system makes it look like there is more water than there really is. This Project, therefore, absolutely assists in the administration of this excellent system, protecting groundwater supplies, enhacing wetland habitat, meeting multiple needs, and promoting maximum utilization of State waters.

q. The water activity assists in the recovery of threatened and endangered wildlife species or Colorado state species of concern.

- Mountain Home Reservoir and Smith Reservoir are both Division of Wildlife protected wildlife and fishing areas, or SWA's, comprising 1,120 acres and 700 acres respectively. Extended drought conditions, timber thinning in the region, and forest fires have challenged traditional water management entities to assist in the recovery of habitat and forage for wildlife. In 1999 a study by the Division of Wildlife mapped 22 wildlife species in Costilla County and ranked them according to the degree of impact they sustained on significant habitat. The report determined that 72% of vertebrate wildlife species in Costilla County are dependent on riparian areas and wetland habitats. Examples of these dependent species in Costilla County are the white pelican and the beaver. The study found that approximately 42% of Costilla County has a high potential for impact from development or human disturbance on wildlife habitat. This water activity assists in the recovery of these impacted areas by keeping water in Mountain Home Reservoir for longer periods of time.
- Examples of endangered or threatened species with habitat which would qualify for very high impact potential include the black-footed ferret and the Rio Grande sucker. High impact potential areas also include those where human/wildlife conflicts occur, such as interaction with black bear and mountain lion, both of which occur in this area. The 1999 study states that "developing wildlife habitat would have a significant impact on Costilla County's wildlife." Although that argument seems a bit circular, it is clear that this Project, by keeping more water for a longer period of time in Mountain Home Reservoir, addresses the spirit of that DOW report and assists in the recovery of wildlife habitat.
- This Project, upgrading the concrete liner of the Canal, does not in itself play a major role in recovery of threatened or endangered wildlife species, but its effect is positive: It increases the extent of wetland habitat, improving the grassy shoreline at Mountain Home Reservoir by reducing premature releases of water in order to meet irrigation needs. It also increases the volume and improves water quality of the entire system of laterals which irrigate the open spaces of northern Costilla County. To this extent, this project of Trinchera Irrigation Company, whose principal mandate is to meet agricultural needs for irrigation, is also contributing to habitat preservation around Mountain Home Reservoir and increasing forage and nesting opportunities in the flood-irrigated fields and the open agricultural areas throughout northern Costilla County.

r. The water activity provides a high level of benefit to Colorado in relationship to the amount of funds requested.

- As described above, this Project provides a high level of benefit to Colorado and to its downstream Rio Grande Basin neighbors by repairing structures which have failed to function as originally designed, thus saving 50% of water carried by the Canal – water which otherwise must be prematurely drawn from Mountain Home Reservoir.
- The most significant and valuable benefit of this project, in addition to those listed above, is its ability to sustainably meet agricultural needs, giving TIC the operational flexibility needed to fulfill its primary obligation -- to provide irrigation in an intensely agricultural region of Colorado.
- The amount of funds requested, $250,000, is matched by a total of $46,500 and is also matched by a continuing commitment by TIC to monitor and maintain the Canal for decades into the future.

s. The water activity is complementary to or assists in the implementation of other CWCB programs.

- This water activity supports the Rio Grande Basin's emphasis on sustainability and on recharging the Basin's aquifers by optimizing an already well designed and flexible water distribution system.
- In general and specifically, this Project supports many other CWCB programs, as follows:

    - This water activity is another beneficiary of the Rio Grande Roundtable's efforts to provide technical assistance and funding support to its members, assisting them in planning and funding projects which might otherwise be beyond their scope. Although not directly related to each other, each project benefits from the Roundtable's collective wisdom, quite often sharing technical advice and expertise across the Roundtable network. Resolving the long-standing problems with this Canal represents another milestone in forwarding the objectives of the Rio Grande Interbasin Roundtable by addressing the needs identified in SWSI, and by fulfilling the intent and the objectives of CWCB's Water Supply Reserve Account.
    - The San Luis Valley Irrigation District is completing a multi-use enlargement study of the Rio Grande Reservoir with goals that are similar to this project's. Although that project is on a much larger scale, the same principles apply in this Project.
    - The deterioration of reservoirs and spillways and aging infrastructure which bring imposed limitations on storage, and outlet mechanisms that are past their useful life are problems this project shares with Terrace Reservoir, with the Santa Maria and Continental Reservoir studies, and with Conejos Water Conservancy District's Platoro Reservoir restoration project. In all of these projects facilities are approaching the end of their useful life, and all of them have been granted SB 179 funding by CWCB.
    - Erosion, bank failures, and deteriorating irrigation structures are problems cured by a recent CWCB-funded project by the Romero Irrigation Company and Guadalupe Main Ditch Company. In this project as well, no amount of maintenance could prevent the deterioration of facilities which are near the end of their useful life.
    - Trinchera Irrigation Company's objectives in this Project echo those of the Rio Grande Basin Roundtable, the SWSI criteria, and the CWCB funding under SB 179, as stated above.

t. The water activity helps support the State's economic vitality and competitiveness in national and international markets.

- This Project preserves the integrity of irrigation flows from the Sangre De Cristo Creek, Trinchera Creek, and Ute Creek, after which the flows return to recharge the aquifer in this portion of the San Luis Valley. Although not of major national significance, this Project positively impacts the State's economic vitality and competitiveness by contributing to both the agricultural and the recreational sectors of Colorado's overall economy, with agribusiness being the number one employer in Costilla County.
- Ag inputs represent the indirect basic suppliers to agriculture including farm services, fertilizers, seeds, chemicals, finance, various types of wholesale distribution, and associated rail and truck transportation. The Town of Blanca, the unincorporated community of Fort Garland with its very popular Civil War era Fort Museum, and the comparatively affluent retirement communities in the Forbes Subdivisions of Sangre de Cristo Ranches, Forbes Park, and Wagon Wheel Park all benefit from this Project because it supports the economic vitality of north Costilla County.

- Ag processing includes food & kindred products manufacturing, and a portion of San Luis Valley's packing, shipping, and warehousing operations. Agriculture represents $143,637,000, or 37.9 percent of the total San Luis Valley base economy (SLV Development Resources Group - 2000). The potato warehouses and processing industries of north Costilla County represent a significant portion of this revenue.
- Tourism, based largely on the natural attractions of this area, accounts for $43,508,000, or 11.5 percent of base industry income in the Valley. Both Mountain Home and Smith Reservoir are popular fishing destinations for tourists and residents alike, drawing travelers to other local attractions such as the Great Sand Dunes National Park, the Stations of the Cross and the Museum in San Luis, and the vital cultural resources of a region steeped in the history and folklore of this region, once the most northern outpost of Spanish settlement in the Americas.
- Most relevant and most important, however is the way this Project supports the State's economic vitality and competitiveness by meeting agriculture's irrigation needs and by helping to maintain a healthy State Wildlife Area at Mountain Home Reservoir and at Smith Reservoir. This Project restores efficiency to TIC and thereby saves water for irrigation, for wildlife habitat and for recreation. Although on the surface this might appear to be a relatively small project, we feel it gives a strong boost to Colorado's economic vitality in Costilla County, addressing the diverse mix of consumptive and nonconsumptive needs outlined in this proposal.

4. Please provide an overview of the water project or activity to be funded including – type of activity, statement of what the activity is intended to accomplish, the need for the activity, the problems and opportunities to be addressed, expectations of the participants, why the activity is important, the service area or geographic location, and any relevant issues etc. Please include any relevant TABOR issues that may affect the Contracting Entity. Please refer to Part 2 of Criteria and Guidance document for additional detail on information to include.

Project Overview:

The Sangre de Cristo Trinchera Diversion Canal ("the Canal" or "the SDC Canal") is an approximately 24,000-foot-long concrete-lined segment of the Trinchera Irrigation Company system described in attached topographic maps and irrigation inventory (Attachment B). This Project replaces 2,125 linear feet of that concrete lining. The Canal takes water from Sangre de Cristo Creek and directs it approximately southwestward to Hoffman Canyon, where it joins Trinchera Creek as it re-emerges just below the dam at Mountain Home Reservoir. Both of these flows converge into Trinchera Canal with about 50% of TIC water serving the agriculturally productive southern end of the system. The Canal forms the heart of a unique and flexible system for distributing water. At Hoffman Canyon, where the flows of the Canal meets Trinchera Creek, there is a self-regulating headgate which functions as a sort of valve, where flows are regulated to continue on southward or to flow back northward, if needed, to irrigate farms north of Blanca. This critically designed element forms a highly efficient circulatory system, as it sustains TIC's Alternate Points of Diversion (APD) method for allocating water. As Water Commissioner Robert Schultz says, "I don't think there is any other system in the San Luis Valley which is as well integrated as this one." The Canal lining was installed in 1976 and is badly deteriorated, causing the canal to operate at 50% of its designed capacity. Normally, in the early part of the year and prior to irrigating, 98% of Trinchera Creek flows into storage at Mountain Home Reservoir, to be used starting in April to irrigate the southern part of the system and later in the year when Sangre de Cristo Creek runs low and stops. However, for the past ten years or so, due to declining capacity in the Canal, TIC must prematurely release water from Mountain Home Reservoir during irrigation season, tapping reservoir supplies sooner than necessary and causing shortfalls in late summer and early fall, when the need is greatest, forcing irrigators to rely more heavily on groundwater sources for their

center pivots. Constrictions of flow, pooling, and leakage caused by the upthrusts, slumps and cracks in the concrete liner are seriously impacting the circulatory system and reducing the flexibility of the APD system, causing operational difficulties for TIC in delivering decreed water rights and meeting priority calls. This request for funding restores the capacity of the SDC Canal to its estimated original designed capacity of 100 to 120 cfs for the next 30-40 years. The existing concrete lining will be removed; the ditch will be filled, compacted to grade, and re-trenched; and a new float-form concrete lining will be installed. By restoring maximum capacity to the Canal, TIC gains much needed operational efficiency, reduces groundwater use, and allows water in Mountain Home Reservoir to be maximized for multiple uses in irrigation, flood control, fishery, recreational boating and fishing, and the preservation of wildlife habitat.

Problem:

The Sangre de Cristo Trinchera Diversion Canal has lost 50% of its capacity, severely impacting Trinchera Irrigation Company's operational efficiency. Lack of capacity requires releasing water from Mountain Home Reservoir prematurely during irrigation season, tapping reservoir supplies sooner than necessary and causing shortfalls in late summer and early fall when agricultural needs are greatest. During these times irrigators tend to rely more heavily on wells, tapping groundwater supplies for center-pivot systems, which would often not be necessary if the Canal were operating at full capacity. Constrictions of flow, pooling, and leakage occur in the Canal, caused by several factors which are discussed below. Buckling, cracking and settling of the Canal, combined with sedimentation caused by erosion and woody debris from the banks of the Canal have severely reduced the designed efficiencies of TIC's circulatory Alternate Points of Diversion distribution system, causing difficulties in delivering decreed water rights and meeting priority calls. Premature draws and more frequent reductions in levels of Mountain Home Reservoir, a State Wildlife Area, reduce the size of the recreational lake and diminish the wetland area around the reservoir, creating negative consequences for recreation, fishery, and wildlife habitat.

Causes of this problem required some analysis as TIC contemplated replacement of the Canal's existing concrete liner. The most obvious cause is the predictable deterioration of the condition of the concrete liner as it approaches the end of its approximately 30-40 years of useful life. Another contributing element, however, was the fact that in certain places it appears the Canal has slumped downward by as much as about two feet since it was built in 1976 due to the generally unstable long-term effects of the Quaternary landslide block at the turning point of the Canal and other geologic activity typical of this part of Costilla County. This is shown in the documents in Attachment H. These findings raised the possibility of having to consider alternative solutions, depending on the extent and future implications of geologic studies in this area. TIC feared this might include the possibility of having to relocate the Canal, of creating additional supportive structures, or perhaps of replacing the concrete-lined canal with a pipe or other type of reinforced structure. TIC took nothing for granted, examining each of these options in the light of the lifetime of concrete structures, the long-term slow effects of ancient seismic activity, emerging new materials that could be used to enclose the ditch in a pipe, and the cost/benefit factors involved in choosing among these alternatives. Without a research budget or funds for a thorough geological analysis, Trinchera Irrigation Company, assisted by Mike Gibson of the Rio Grande Interbasin Roundtable Technical Support Subcommittee, was able to conduct its investigations with diligence, assisted by Laurie Clark and Pete Gallegos, engineering staff at NRCS; by Pete McGee of the San Luis Valley GIS-GPS Authority; by water commissioner (and amateur geologist) Bob Schultz; and by project coordinator Nicole Langley of Transforma Research & Design. Notes, excerpts from emails, maps and studies relating to this analysis are included in Attachment H – data which may be useful in future years.

After this analysis the decision was made to stay with the concrete-lined canal, as this method alone withstood all tests of time, materials, technologies, and available money.

Type of Activity:

This is a structural water project and activity involving the restoration of existing facilities.

Multiple Objectives/Purposes:

- **Sustainably meets agricultural demands** - Protect the integrity of TIC's commitment to its shareholders and water users; improve its ability to supply water to 12,000 acres of irrigated land; reduce or remove the difficulty, in dry months, in delivering surface rights into the area and getting water to the ditches in priority. Each of these points is elaborated in great detail above, in the Evaluation Criteria section of this proposal.

- **Promotes cost effectiveness** – Up to this point local land owners, TIC, the Costilla County Conservancy District, and local contractors have recognized the need to correct the problem of the deteriorated ditch lining, but there have not been sufficient funds to complete the project. In the analysis of various alternatives discussed above, TIC has approached several local contractors, but they did not have the equipment nor the cost-saving capabilities of Can-Do-Concrete, Inc., a larger contractor familiar with the project which has the equipment and the expertise to meet the technical and engineering requirements of the project. TIC has sought out the most efficient and cost-effective way to restore the Canal. By completing this project TIC restores a highly efficient system to full operation, doubles the current capacity to save approximately 50 cfs of water in the Canal, and ensures its ability to meet the irrigation needs of its members.

- **Reduces maintenance costs** – Re-lining portions of the Canal and restoring other sections will also involve stabilization of the sloping banks on the uphill side of the Canal and leveling and reinforcing its base. This will reduce or eliminate much of the sediment and debris which enters the Canal, saving long term maintenance costs and restoring the self-sustaining nature of the irrigation system. Reduced costs of maintenance are expected to continue for the next 30 to 50 years, representing a major saving in maintenance costs for TIC.

- **Restores operational flexibility** – Through improved allocation and management of water resources, all consumptive users will have better access to water, providing the flexible options and benefits of this system's unique Alternate Points of Diversion distribution system, described above. By eliminating the loss of 50% of the Canal's capacity, TIC restores its system to full operational efficiency. The benefits of this are detailed in great detail above, in the Evaluation Criteria.

- **Enhances wetlands habitat for wildlife and increases the fishery –** This project virtually eliminates the need to make premature draws from Mountain Home Reservoir, allowing TIC to store more water for longer periods of time, thus improving the fishery at Mountain Home Reservoir, enhancing the reservoir's grassy wetland areas which provide valuable habitat, and maintaining the most attractive and popular recreational fishing area in north Costilla County. The benefits to wildlife, the ability to maintain the DOW conservation pool at Mountain Home Reservoir, and the financial benefits of tourism and recreation for north Costilla County and the San Luis Valley are significant, as detailed above, in the Evaluation Criteria section of this proposal.

- **Meets Statewide objectives –** This project helps to meet the multiple objectives of the SWSI, of the Rio Grande Interbasin Roundtable, and of CWCB's Water Reserve Supply Account, enhancing both consumptive and nonconsumptive uses of water within and beyond the Trinchera Irrigation Company's system. This proposal details how this project meets these objectives in the Evaluation Criteria section of this proposal, above.

Need:

- Although the need for this project has been recognized for many years, the Board of Directors has not deemed it prudent to assume additional debt in order to restore the full capacity of the Canal. This request for assistance from the Water Supply Reserve Account presents an appropriate and timely opportunity to make the repairs needed in order to maintain the integrity of the company's delivery system. Funding is needed in order to avoid further debt, to keep the cost of TIC's shares affordable, and to continue to meet the company's current obligations. Without funding from the Water Supply Reserve Account, this Project would not be possible. With funds from the Water Supply Reserve Account this project is assured.

- The Sangre de Cristo Trinchera Diversion Canal has lost 50% of its capacity, severely impacting Trinchera Irrigation Company's operational efficiency. Lack of capacity requires releasing water from Mountain Home Reservoir prematurely during irrigation season, tapping reservoir supplies sooner than necessary and causing shortfalls in late summer and early fall when agricultural needs are greatest. Lack of capacity also causes irrigators to rely more heavily on groundwater supplies, when many such draws would be unnecessary with a fully functional Canal.

- Stabilization and re-lining of the Canal is essential in order to prevent flooding and further erosion problems. With leakage and unstable structures along the rim of the Canal, the risk increases, over time, of water possibly breaching the Canal. Such an occurrence would compromise the integrity of the entire irrigation system. The Canal has reached the end of its designed functionality. Further deterioration of the irrigation system will severely compromise TIC's irrigators in northern Costilla County to obtain their decreed water rights in priority.

Problems/Opportunities:

- The window of opportunity to accomplish this will occur when the water recedes and the ground begins to freeze in 2009. Given the rising costs of all materials, particularly of concrete, it is incumbent upon TIC to complete this project as soon as possible.

- The admittedly limited analyses involved in confirming the decision to continue with the concrete-lined canal revealed that some problems, such as addressing the instability of the Quaternary landslide block, require a contractor with an understanding of the project and with the resources and skills to complete the project in time, under budget, and according to specifications. TIC has found that contractor and therefore feels it should take advantage of this opportunity and move forward with this much-needed Project.

Service Area – Geography, Culture & History:

The service area of this Project is in the San Luis Valley of south-central Colorado. Located about midway between Denver and Albuquerque, this is the largest alpine valley in North America. The vast, flat surface of the valley floor at 7,500/ft is bordered on the east by the sharply rising Sangre de Cristo Mountains which ascend to 14,000/ft peaks, with Mount Blanca presiding over the town which bears its name, home of the Trinchera Irrigation Company. To the west are the 12,000/ft peaks of the San Juans which mark the Continental Divide.

The Sangre de Cristos ("blood of Christ") are so named for the rose hue of their snowy peaks at sunset. The great open space of the desert plain and the rugged snow-capped peaks of the Sangre de Cristos form the high plains of the Rockies, an area about 122 miles long from north to south, and about 74 miles across, or 8,193 square miles --- larger than the state of Massachusetts. The Valley has a combined Census population of 46,190, with only 5.6 persons per square mile in most of the valley and about 3 persons per square mile in Costilla County.

Landscape on the floor of the valley changes dramatically with the presence of water. The State's most extensive system of wetlands is found in the San Luius Valley, supporting a variety of wildlife and wildlife areas, including TIC's Mountain Home Reservoir and Smith Reservoir. The rise in elevation from the Valley floor substantially changes the landscape, as marked by a succession of plant and tree species shown on the schematic cross-section of the Valley, in Attachment J. This begins with Sage, followed by Pinon-Juniper, Ponderosa Pine, mixed conifers, Aspen, extensive stands of Engleman Spruce, and alpine tundra on the peaks. Streams, lakes, and reservoirs are found higher up and on the flats as well.

Cultural resources in Costilla County include major attractions such as the Fort Museum in Fort Garland, the Cultural Museum and the Stations of the Cross Shrine in San Luius, and many historic and geological sites traversed by the Los Caminos Antiguos Scenic & Historic Byway. Notable fishing areas include Sanchez, Smith, and Mountain Home reservoirs, and Culebra Creek. The county also contains the Valley's largest tracts of private lands including the Trinchera Ranch and Blanca Trinchera which focus on hunting and real estate, and mountainous region south of San Luis known as "La Sierra," where inheritors have regained some hunting and wood gathering privileges dating from the Spanish land grant era. Small villages and farms near San Luis and larger farms in Jaroso still use the *acequia* system of irrigation characteristic of Spanish land use patterns, and *La Vega* presists as a well-governed grazing commons, the last remaining true *commons* in the United States. Only fourteen miles north of these villages, in north Costilla County, the communities of Fort Garland and Blanca reflect a more "anglo" influence in their traditions, their predominance of the English language, their land-use practices, and their combined surface-and-groundwater irrigation practices.

Costilla County census figures show a per capita income of $17,778 and a county-wide unemployment rate of 9.1%, yet the County's irrigated lands contribute over $6 Million to Colorado's agricultural economy, or 21% of the San Luis Valley's ag sector. Most shareholders of the Trinchera Irrigation Company have farms growing small grains, alfalfa, potato and hay crops, and nine of TIC's stockholders raise cattle, with 2,500 to 3,000 cattle in irrigated pasture lands.

Impact, Importance, and Urgency:

In the other five counties of the Valley, several millions of acres of public land affords a variety of recreational opportunity, wildlife habitat, and protected wilderness areas with hiking trails and other amenities. In Costilla County, however, land is 99.9% private owned (SLV Development Resources Group CEDS study 2002). With almost no public lands, it is all the more important to protect the recreational and wildlife assets at Mountain Home Reservoir from premature draws on its water. This Project is important and urgent, because it

- Sustainably meets agricultural demands by increasing the ability of irrigators to divert their appropriated water right when they are in priority.
- Provides for environmental enhancements to fish habitat by helping to maintain storage levels in Mountain Home Reservoir.
- Provides operational flexibility by reducing the problems of only being able to operate at 50% Canal capacity.
- Preserves groundwater supplies by reducing premature or unnecessary use of well water for irrigation during low water regimes.
- Reduces costs of maintenance from sediment and woody debris falling into the Canal caused by erosion of Canal-bank slopes.
- Enhances wildlife habitat and helps to foster a more stable riparian area at Mountain Home Reservoir by allowing water to be stored for longer periods of time, especially during low water regimes.
- Protects the cultural values inherent in five generations of farming in a region which pioneered the establishment of Colorado's first water laws.
- Protects and enhances resources which are of high value to families who enjoy hunting, fishing, hiking, recreational boating, and outdoor activities at Mountain Home Reservoir and at Smith Reservoir.
- Helps meet Colorado's future water needs by giving a highly efficient system a new lease on life – for the next 30-50 years.

Again, the impact, importance, and urgency are covered in the Criteria portion, above.

Other Relevant Issues:

- The legal description for the Sangre de Cristo Trinchera Diversion Canal is as follows: Beginning at the headgate of the Trinchera Canal, located at a point at the center of the SW ¼ Section 35 Township 30 South, Range 72 West, 6th P.M. continuing in a northerly direction through Section 35, NE ¼ of NE ¼ of Section 34, through E ½ Section 27, and continuing into SE ¼ of Section 22, total distance from beginning being 12,030'.

- Trinchera Irrigation Company considered the option of using either concrete pipe or HDPE pipe. A summary of findings in researching these options is included at the end of this proposal, just before the Attachments.

- The Bid Schedule in Attachment K is the form provided by NRCS and used by TIC to solicit bids. This form refers to Specifications developed by NRCS Engineer Lauri Clark, which is also included in Attachment K. In the Scope of Work which follows, each of the eight tasks to complete the Project are listed. Not all of these required a bid, and some of these items were included as parts of other bid items. The Bid Schedule form and the Specifications did not list items in the same order, so we have done our best, using color to help make this Scope of Work easy to read and understandable.

- For thoroughness, we have included each task, and have highlighted which party will perform each independent task. Bidders provided quotes on each **BID ITEM** , i.e. on Mobilization, Concrete Lining, and Corrugated Pipe, or Bid items 1, 4, and 5 respectively. Trinchera Irrigation Company is providing Structure Removal and Earth Fill, or Bid Itsms 2 and 3 respectively, representing TIC's matching component in this request for funds .

5. Summarize Scope of work following formats provided

I. SCOPE OF WORK – TASKS

General specifications provided by NRCS are in Attachment K

Task 1 - CLEARING – To be completed by TIC personnel – Matching Funds

Items of work and construction details
(NOT A BID ITEM)

1. This item consists of clearing all vegetation from the work site only as necessary for the completion of this project.

2. Clearing shall be Class C (Refer to Attachment K for all such references). Areas to be cleared are not marked on the drawings nor are they marked in the field. The contractor shall clear that area that is absolutely necessary for the construction activities of this project. The contractor shall make arrangements with the Trinchera Irrigation Company to review sensitive or forbidden areas for clearing prior to construction. The contractor shall also make arrangements with the Trinchera Irrigation Company to establish the ditch right-of-way prior to start of construction.

3. Clearing of woody vegetation with trunk diameters greater than four inches is prohibited.

4. All cleared vegetation shall be disposed of in accordance with all county and state regulations. Disposing of waste is allowable with written consent from the landowners of the disposal area.

5. Burning of waste is not allowed.

6. No separate payment will be made for Clearing. Compensation for Clearing will be included in the payment for Bid Item 2, Structure Removal.

Task 2 - STRUCTURAL REMOVAL – To be completed by TIC personnel – Matching Funds

Items of work and construction details
NON-BID ITEM NO. 2

1. This item consists of removing the existing concrete ditch lining from STA 14+93 to STA 25+62 in Section #1 and from STA 15+36 to STA 25+90 in Section #2.

2. Only to the extent necessary, shall the existing concrete ditch lining be removed, for the installation of the new concrete ditch lining.

3. The removed concrete ditch lining shall be placed at the downstream end of the existing 24" CMP located at approximately STA 14+43 in Section #1. The Contractor shall make arrangements with the Trinchera Irrigation Company for written permission from the landowners to dump in this area prior to construction.

4. In Section 6, Measurement and Payment, Method 2 shall apply. Measurement and payment will include full compensation for all work required to remove the existing concrete ditch lining and dispose of lining in an approved location and for the related Subsidiary Items: Clearing under Specification 1.

Task 3 - MOBILIZATION & DEMOBILIZATION – To be completed by CONTRACTOR

Items of work and construction details
BID ITEM NO. 1

1. This item shall consist of mobilization of the Contractor's forces and equipment for performing the work required under the contract in conformance with Section 1 and Section 2.

2. Payment will be in accordance with Section 3.

Task 4 – WATER FOR CONSTRUCTION – To be completed by CONTRACTOR

Items of work and construction details
(NOT A BID ITEM)

1. This item shall consist of furnishing, transporting and using water for construction purposes required to install the permanent work as shown on the drawings and in the specifications.

2. In Section 2, Facilities and Equipment, the second paragraph does not apply.

3. No separate payment will be made for Water for Construction. Compensation for Water for Construction will be included with the payment for Bid Item 4, Non-Reinforced Concrete Lining.

Task 5 – EXCAVATION – To be completed by Contractor

Items of work and construction details
(NOT A BID ITEM)

A. Subsidiary Item, Excavation, Foundation Stripping, Unclassified

1. This item shall consist of the stripping of the ditch pad areas of all weeds, roots, sod, loose rock or other material not suitable for the sub-grade.

2. In Section 2, Classification, the excavation will be designated as unclassified excavation.

3. In Section 4, Use of Excavated Materials, Method 1 shall apply.

4. In Section 5, Disposal of Waste Materials, Method 2 shall apply.

5. No separate payment will be made for Excavation. Compensation for Excavation, Foundation Stripping, Unclassified will be included in the payment for Bid Item 4, Non-Reinforced Concrete Lining.

B. Subsidiary Item, Excavation, Structure Excavation, Unclassified

1. This item shall consist of the ditch excavation and shaping required to place the non reinforced concrete ditch lining as shown on the drawings.

2. In Section 2, Classification, the excavation will be designated as unclassified excavation.

3. In Section 4, Use of Excavated Materials, Method 1 shall apply.

4. In Section 5, Disposal of Waste Materials, Method 2 shall apply.

5. No separate payment will be made for Excavation. Compensation for Excavation, Structure Excavation, Unclassified will be included in the payment for Bid Item 4, Non-Reinforced Concrete Lining.

Task 6 – EARTH FILL – To be completed by TIC personnel – Matching Funds

Items of work and construction details
NON-BID ITEM NO. 3

1. This item shall consist of all the earth fill required to install the non-reinforced concrete lining as shown on the drawings.

2. Suitable materials shall be used from the required excavations of Section #1 and Section #2. Additional materials shall be obtained from material that has been brought on site from designated borrow areas.

3. Compaction shall be Class C. Each layer of earth fill shall be compacted by one of the following methods or by an approved equivalent method:

    a. At least 2 passes, over the entire surface by a pneumatic-rubber tired roller exerting a pressure of not less than 75 pounds per square inch.
    b. At least 4 passes, over the entire surface, with the track of a crawler-type tractor weighting not less than 20 tons.
    c. Controlled movement of the hauling equipment so that the entire surface is traversed by not less than one tread track of the loaded equipment.

    Materials placed adjacent to conduits or structures, in trenched or in other locations inaccessible to heavy equipment shall be compacted by means of manually controlled pneumatic or vibrating tampers or approved equivalent methods.

4. The moisture content of the fill materials shall be maintained within the limits required to: (a) prevent bulking or dilatance of the materials under the action of the hauling or compacting equipment; (b) prevent the adherence of the fill materials to treads and tracks of the equipment; and (c) insure crushing and blending of the soil clods and aggregations into a reasonably homogeneous mass. The moisture content of the fill materials shall be approved by the Engineer.

5. The maximum size rock fragment incorporated in the fill shall be 3 inches. The rock fragments shall be completely embedded in a matrix of compacted earth.

6. The maximum allowable horizontal layer thickness shall be 6 inches before compaction except within two feet of any pipe or structure. The maximum lift thickness shall be 4 inches thick before compaction.

7. In Section 9, Measurement and Payment, Method 1 and 6 shall apply. Measurement and payment will include full compensation for all work required to prepare the ditch pad.

Task 7 – STRUCTURE CONCRETE LINING – To be completed by CONTRACTOR

Items of work and construction details
BID ITEM NO. 4

1. This item shall consist of furnishing and placing all the non-reinforced concrete required for ditch lining at the locations shown on the drawings.

2. Coarse aggregate shall be size number 57 (1-inch to No. 4 nominal size) or size number 67 (3/4-inch to No. 4 nominal size).

3. Cement shall be Type II.

4. An air-entraining admixture shall be used.

5. Measurement and payment will be made in accordance with Section 23 at the contract unit price established in the contract. This will also constitute full compensation for the related Subsidiary Items: Water for Construction and Excavation under specifications 10 and 21.

Task 8 – CORRUGATED METAL PIPE – To be completed by CONTRACTOR

Items of work and construction details
BID ITEM NO. 5

1. This item shall consist of furnishing and installing the 24-inch by 15-foot Corrugated Metal Pipe Risers at each ditch lining crossing as shown on the drawings.

2. The pipe joints shall be done on annular sections of the pipe. The coupler shall consist of either a 7-inch wide neoprene or an "o-ring" type gasket set on the annular section. The coupling bands shall be compatible with annular type joints.

3. The pipe shall conform to Material Specification 551.

4. In Section 10, Measurement and Payment, Method 1 shall apply and shall include full compensation for furnishing and installing the corrugated metal pipe risers at each of the two existing ditch lining crossings.

II. SCOPE OF WORK – PERSONNEL

Corporate capabilities of Can-Do-Concrete Inc. are in Attachment D

Tasks and Bid Items to be completed by Trinchera Irrigation Company will utilize equipment and employees already in the employ of TIC. The Budget details this contribution.

The personnel involved in these tasks will include and will be supervised by Ernest Chavez, whose experience includes many years as a sucessful independent contractor in Costilla County. Mr. Chavez has also been TIC's ditch superintendent for many years, so is especially qualified to do this work.

Tasks and Bid Items to be completed by Can-Do-Concrete Inc., will be performed under the supervision

of Pete R. Gutierrez, owner of the company. Correspondence from Mr. Gutierrez provides a history of his personal experience as well as that of his company. Please see Attachment D for full details, photographs of previous jobs, list of equipment, and references of Can-Do-Concrete, Inc.

III. SCOPE OF WORK – BUDGET (next page)

III. SCOPE OF WORK – BUDGET (page 1 of 2)

Total Costs					
Task No. (Spec No.)	Labor	Other Direct Costs	Matching Funds	SB 179 Grant Funds	Total Project Costs
Task 1 – (#8)Mobilization		26,625.00		27,000.00	27,000.00
Lump Sum					
Task 2 – (#3) Structural Removal	3 x 28 hrs@ $12	1,008.00			
Equipment (see next page)		10,992.00			
Total			12,000.00		12,000.00
Task 3 – (#23) Earth Fill					
2 dump trucks/operators	6129 cy @ $3.50	21,451.50			
Earth Fill 539 cy @12.15		6,548.85			
Total (rounded)			28,000.00		28,000.00
Task 4 – (#32) Structural Concrete					
328 CY @ 581		190,568.00		191,000.00	191,000.00
Task 5 – (#51) Corrugated Metal Pipe					
30 L Ft @125		3,750.00		4,000.00	4,000.00
In-Kind Contributions					
NRCS - Engineering			4,500.00		4,500.00
RC&D - Mapping			2,000.00		2,000.00
Can-Do-Concrete Bid				222,000.00	
Cost increase estimate by 9/09				28,000.00	28,000.00
Total Matching Funds			46,500.00		
SB-179 Funding Request				250,000.00	
Total Project Costs:					296,500.00

SCOPE OF WORK – BUDGET (page 2 of 2)

THE TRINCHERA IRRIGATION COMPANY

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719-379-3467

October 7, 2008

The Trinchera Irrigation Company will remove the existing concrete ditch structure as an in-kind contribution toward the Sangre De Cristo Trinchera Diversion Canal Restoration Project. The company will remove the existing concrete ditch structure and haul/use the debris nearby. The following is a breakdown of the costs involved.

Structure Removal

Equipment	Hours	Cost/hou	Total
Excavator	28	$125.00	$3,500.00
Backhoe	28	$90.00	$2,520.00
Front end loader	28	$60.00	$1,680.00
Dozer	28	$65.00	$1,820.00
2 Trucks	28	$52.57	$1,472.00
3 men @ 28 hrs	84	$12.00	$1,008.00
			$12,000.00

Earth Fill / Haul Earth Fill

Equipment	Cubic yrds	Cost	Total
2 dump trucks/operators	6129	$3.50	$21,451.50
Earth Fill	539	$12.15	$ 6,548.85
Total			$28,000.35

The Trinchera Irrigation Company can budget and contribute approximately $40,000.00 as in-kind funds toward the project.

IV. SCHEDULE

This Project will be completed within 6 months of Mobilization, which is scheduled for the fall season of 2009

V. DELIVERABLES

Objective/Outcome: Restore full capacity (approximately 100 cfs) to the Sangre de Cristo Trinchera Diversion Canal

VI. FINAL REPORT/PROJECT DOCUMENTATION

Trinchera Irrigation Company, Inc. will submit final report for the project, together with any and all documentation required by the Rio Grande Interbasin Roundtable and by the Water Supply Reserve Account Funding program of the Colorado Water Conservation Board.

(continuing previous numbering system in the proposal form)

6. Water Availability and Sustainability – this information is needed to assess the viability and effectiveness of the water project or activity. Please provide a description of each water supply source to be utilized for, or the water body to be affected by, the water activity. For water supply sources being utilized, describe its location, yield, extent of development, and water right status. For water bodies being affected, describe its location, extent of development, and the expected effect of the water activity on the water body, in either case, the analysis should take into consideration a reasonable range of hydrologic variation.

The following data is from transcribed notes in a tour of the system conducted by Commissioner Robert Schultz. In the absence of a true hydrologic/scientific description, TIC will supply a more detailed discussion if requested.

The three major drainages in the Trinchera system are the Sangre de Cristo Drainage, the Trinchera Creek Drainage, and the Ute Creek Drainage.

The Sangre de Cristo Drainage originates high in the Sangre de Cristo Mountains near La Veta Pass. The Sangre de Cristo is tributary to Trinchera Creek and delivers water from north of Hoffman Canyon into the end of Trinchera Creek. From that point all flows go into the TIC irrigation system which includes the South Central and the North Central, with the remainder returning up the Highline canal back to the Sangre de Cristo and the Garland Headgate. The Ute Creek Drainage comes through the town of Fort Garland and across the southern base of Mount Blanca. Ute Creek is tributary to the Sangre de Cristo. The Trinchera Creek Drainage originates in Trinchera Peak with flows rarely reaching the Rio Grande.

Irrigation starts in April. In the early part of the year 98% of Trinchera Creek going into storage in Mountain Home Reservoir. The southern part of the TIC system is irrigated from Mountain Home Reservoir. Indian Creek delivers water from high elevations to Mountain Home Reservoir. Later in the year, as flows in the Sangre and the Ute drop off, TIC opens up Mountain Home Reservoir, with most of the irrigation water coming from Mountain Home storage. There are eight water holders on the main stem of the Trinchera drainage. These are in the Conservancy District. Main water right holders are the Trinchera Ranch, the Trinchera Irrigation Company members, and others with individual stand-alone water rights.

Before the Forbes subdistricts were created in the 1970s there were two major ranches – the Trinchera Ranch and the Ute Creek Ranch. In the 20s and 30s there were many decrees and lawsuits and many battles between the

ranchers and the irrigation company – with these disputes reaching the State supreme court.

It's a different situation today, with no sign of those early troubles. In the late 70s to mid 80s the water commissioner was Carl Eschman, a brilliant man who created a model that many other irrigation ditches envy. Eschman was the conceptual architect of the APD or Alternate Points of Diversion system. This is a very flexible system which allows water to be used where it is needed and when it is needed rather than limiting its use to specific cfs at certain locations. Users can take any combination of cfs at any of those locations, with a common governance over the entire system. This provides many advantages over other systems used in the San Luis Valley. The volume of water you can take out at any headgate is not limited to the decreed amount at that headgate. Another advantage is that Sangre de Cristo water can never be taken at its original point because the original ditch does not exist any more. For many of the original water rights, those rights have evolved over the past 150 years with water always taken as an APD. This is because, although the water right still exists, the original point of diversion no longer exists.

As Commissioner Schultz says, "There is no other system in the Valley as well integrated as this one." In this irrigation system the majority of the irrigation company's water rights have been set up to be alternate points of diversion to the other company-owned water rights. The Trinchera irrigation system has taken water management to another level of flexibility..

The problem now is that the Sangre de Cristo Canal, which is at the heart of this system, cannot handle the available flows during high regimes, and loses 50% of its capacity, causing severe hardships during low flows, primarily because it is the only source of irrigation for the whole southern area. When the Canal is running low or out, TIC must tap Mountain Home Reservoir. Presently TIC has to tap into the reservoir prematurely to make up for losses due to deterioration and lack of capacity of the Sangre de Cristo Canal. At the end of the system the Sangre Canal dumps into Trinchera Creek below Mountain Home dam in Hoffman Canyon. When flows are high late in April or the first part of May, TIC opens the Highline canal which returns water to the North Central irrigation area.

During normal flow regimes the Trinchera watershed does not contribute water to the Rio Grande. When they were setting up the compact requirements the Trinchera drainage was not determined to be subject to compact curtailments. It is only when spring runoff reaches flood conditions that Trinchera Creek water reaches the Rio Grande. This is why the Trinchera system has not been looked at as a contributing force from the standpoint of Rio Grande Compact curtailments. If the priority rights are being served there is not enough left over to reach the Rio Grande.

The opposite is also true. The Closed Basin Rules have little impact on the Trinchera Basin because the confined aquifer is non-existent in the Trinchera Basin, and is only found in a small corner of northwestern Costilla County where the county line leaves the river and runs toward Mt. Blanca. For the most part, the Closed Basin is hydrologically upstream from the Trinchera Basin. This is the very reason that it is so important for the Trinchera Ground Water Management District to get rolling. The State Rules for ground water management are to a large extent designed and managed to prevent confined aquifer depletions and would most likely be, at best, a bad fit for the Trinchera Basin.

7. Please provide a brief narrative of any related or relevant previous studies.

- There are no related or relevant previous studies available at this time.
- Personnel has turned over and many early records were lost.

8. Additional Information – If you feel you would like to add any additional pertinent information please feel free to do so here.

Please see "Other Relevant Issues" on page 19.

The above statements are true to the best of my knowledge:

Signature of Applicant: (original paper copy is signed by Ttracy S. Kester)

Print Applicant's Name:

Project Title:

Return this application to: (This is the latest version of the form that we have. This info might be outdated)

Mr. Rick Brown
Intrastate Water Management and Development Section
COLORADO WATER CONSERVATION BOARD
1580 Logan Street, Suite 600
Denver, CO 80203

To submit applications by Email, send to: rick.brown@state.co.us

ALTERNATIVES CONSIDERED

Trinchera Irrigation Company considered the option of using either concrete pipe or HDPE pipe. **Mike Gibson** contacted **John Turner** of AISA Civil Contractors for information on the HDPE pipe. Mike also calculated options for a concrete pipe.

HDPE Pipe: This type of pipe has some advantages. It has been used for years to convey water and tailings in the mining industry, such as at the Climax operation in Leadville. It lays directly on the ground, is simple to install, and is flexible enough that it can bend around curves. It can expand and contract to meet varying temperatures. The joints are welded together and are stronger than the pipe itself.

48 inch @ $115.00 /ft	Installed cost of $180.00 /ft	For 2,125 feet = $385,500
63 inch @ $200.00 /ft	Installed cost of $295.00 /ft	For 2,125 feet = $626,800

Concrete Pipe : Our NRCS engineer, **Laurie Clark**, contacted **Rod Clark**, PE, Acting State Conservation Engineer for Utah in Salt Lake City, and he provided the following analysis: "We have two engineering options that address the potential instability problems. The primary cause of accelerated instability is due to seepage from the ditch. A concrete lined ditch will not eliminate all seepage and therefore would probably be designed with a drainage system to capture the free water and transport it away to a safe location. Use of an impermeable membrane underlying the concrete lining is an alternative. If deemed financially feasible, the potentially unstable section can be replaced with a closed pipe to eliminate all seepage and allow for some movement without detrimental affects. Bottom line, we may need to look at this section closer to define the extent of the potential problem…. Worst case is we monitor the site but that would only be an option if we had a few years to observe any movement. We also need to compare the life of the ditch against its expected life. I'm sure the settlement reduced the lifespan of the ditch but by how much?"

Water Commissioner **Robert Schultz** observed as follows: " If indeed this area is subject to the landslide block movement, the concrete pipe would be subject to cracking due to lateral movement. My preference would be to have an open ditch where cracking due to lateral cracking is visible and therefore fixable as soon as observed. The buried pipe would be harder to monitor and as a result, more likely to be a situation where the ditch failure is the first sign of problems. A PVC pipe would be less likely to crack due to the lateral movement, although it might be more susceptible to joint failure. A welded steel pipe would be the most effective solution (and most expensive)…. the possibility of an earthquake or land slip is remote and, considering the life expectancy [of a concrete ditch] … since the existing ditch has been in operation for over 30 years without a major failure a new ditch can be assumed to do the same."

60 inch @ $130.00/ ft	Installed cost of $275.00 /ft	For 2,125 feet = $ 584,375

Therefore, on the basis of cost, operational flexibility, the useful lifetime of concrete, and considering that we do not have the resources to do a multi-year seismic analysis or stability study of that area, TIC has confirmed its original decision to stay with a concrete-lined canal.

A T T A C H M E N T S

LIST OF ATTACHMENTS

Attachment A - History & Formation of Trinchera Irrigation Company & '76 Canal construction
Federal nonprofit designation as a 501(c)(12)
1979 Contract Amendment with CWCB to construct irrigation system
1978 Deed with CWCB defining the Canal's dimensions
1975 USDA Soil Conservation Service Canal land use treatment & map
1976 Pink Willson Co. Ditch Liners proposal for the Canal "special project"
1977 Pink Willson Co. invoice showing dimensions and dollar amounts
(no date) Work Plan – history of TIC, need for building canal & laterals
1967 Agreement for Perpetualeasement to use land & water
1961 Agreement whereby Trinchera Ranch grants to TIC an easement for Canal
1944 Certificate of Incorporation of The Trinchera Irrigation Company

Attachment B - Topographic maps and inventory of TIC irrigation system
Slide copy showing relationship of project to Highway 160 and Fort Garland
Slide copy showing Mt. Home Reservoir, Sangre de Cristo & Trinchera Creeks
RC&D GIS inventory map showing extent of the irrigation system
Slide copy showing "Area Two" and describing the irrigation flows
Slide copy of photograph showing some of the worst ditch damage
Other photos showing problems, and a lovely shot of the reservoir on a clear day

Attachment C - Alternate Points of Diversion - a flexible water distribution system
A description and history of the APD system

Attachment D - Can-Do-Concrete, Inc. corporate capabilities

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Corporate history of project construction experience

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Bid

Attachment E - TIC's matching funds - detail of costs

Other matching funds – NRCS & SLV RC&D

Attachment F - NRCS engineering studies

Location Map

Owners Statement

Utilities Statement

Table of Quantities

Project Plan View

Profile Section #1

Profile Section #2

Existing Cross Sections

Typical Ditch Pad Section

Typical Concrete Lining Section

Attachment G - Relation between Trinchera drainage & the Rio Grande Basin

USGS article, "Sources of Water to the Rio Grande Upstream from San Mmarcial, New Mexico" by Stephanie J. Mmoore, Scott K. Anderholm, Tara Williams-Sether, John M. Stomp

Attachment H - Geological data relating to seismic activity at the Canal location

Attachment I - Cash Flow and Budget 2008 & two-year financial statements

Attachment J – SLV Development Resources schematic cross section of the San Luis Valley

Attachment K – NRCS specifications

Attachment L – Letters of Support

Attachment A –

History & Formation of Trinchera Irrigation Company & ’76 Canal construction

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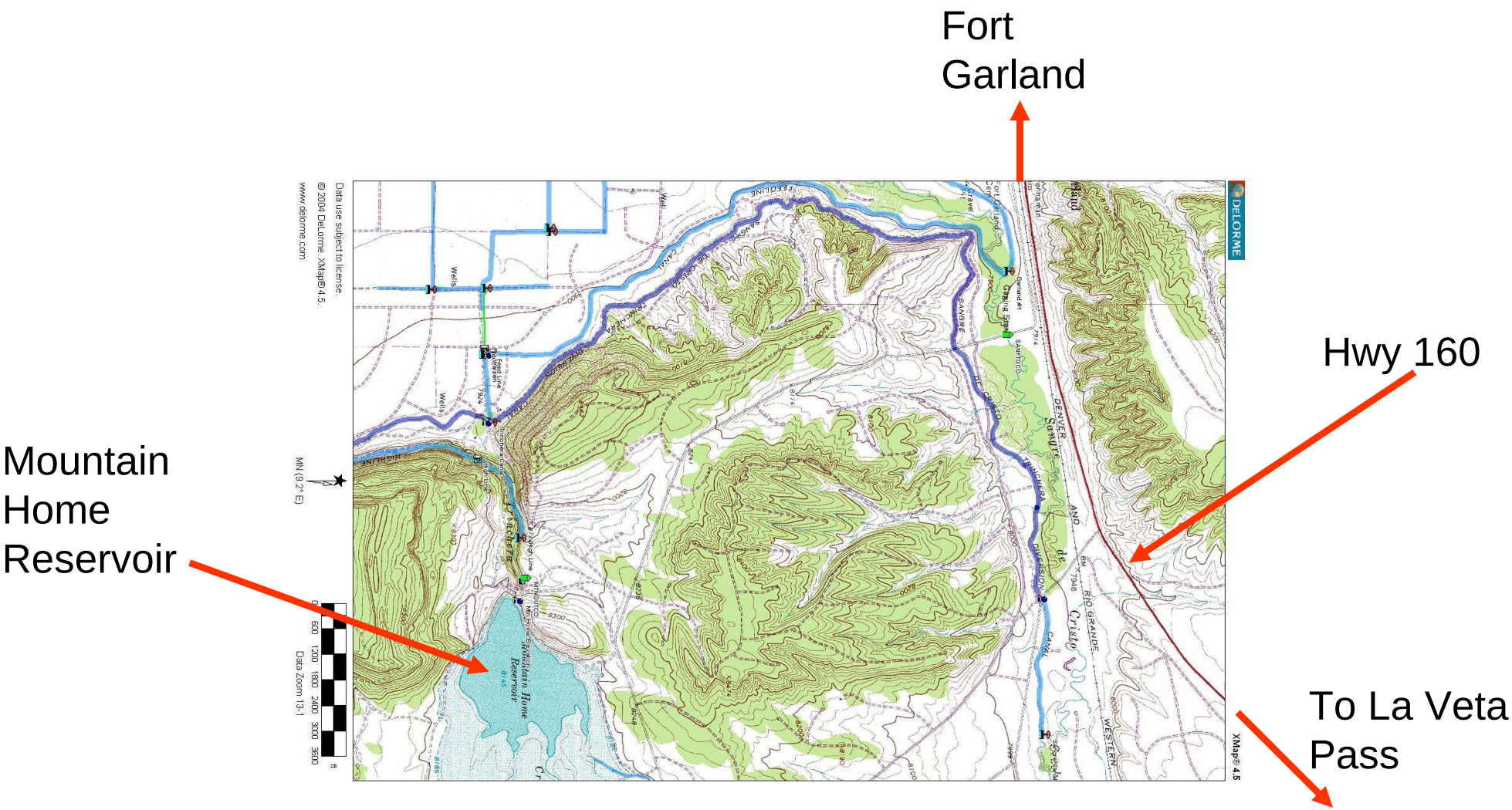
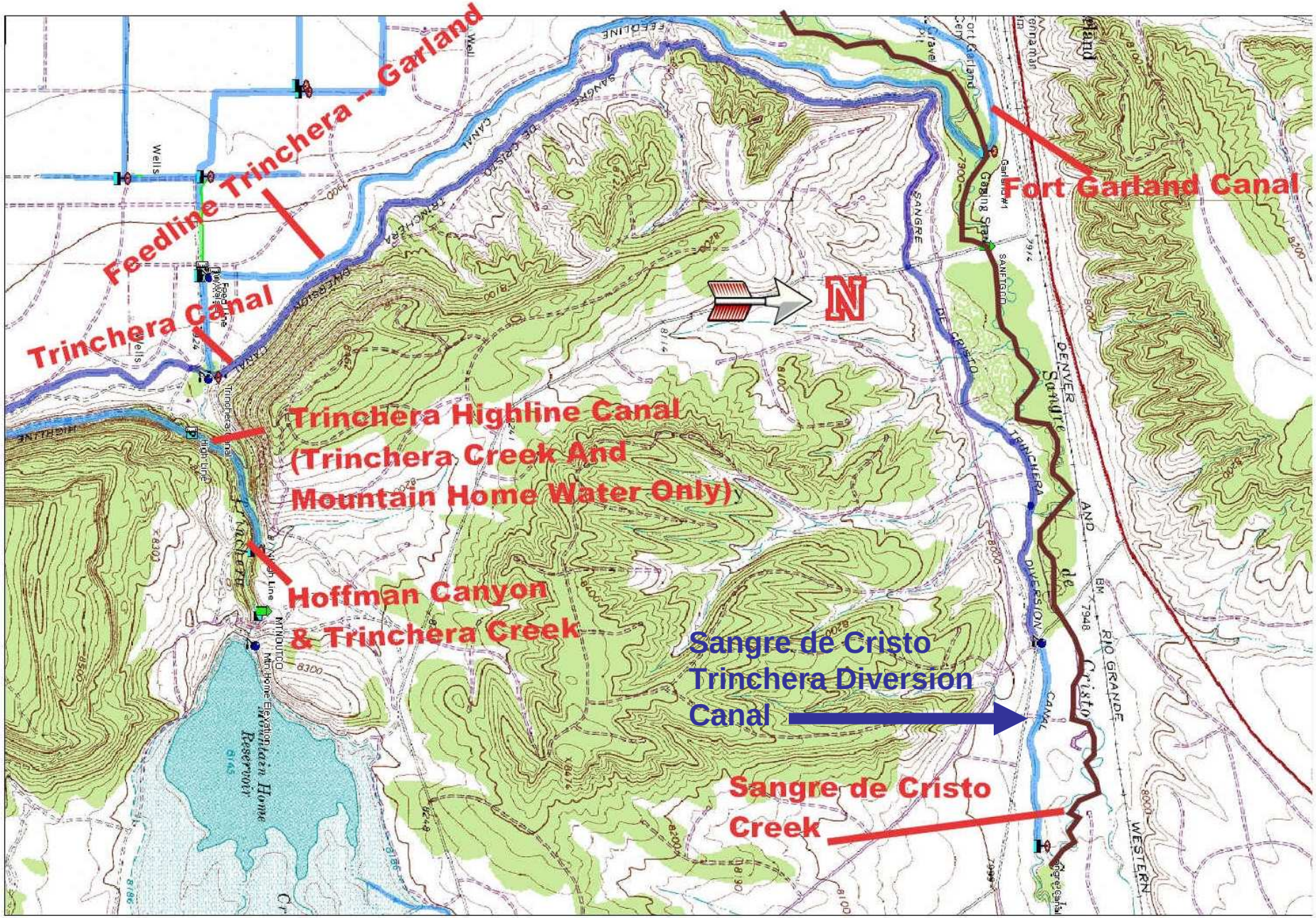
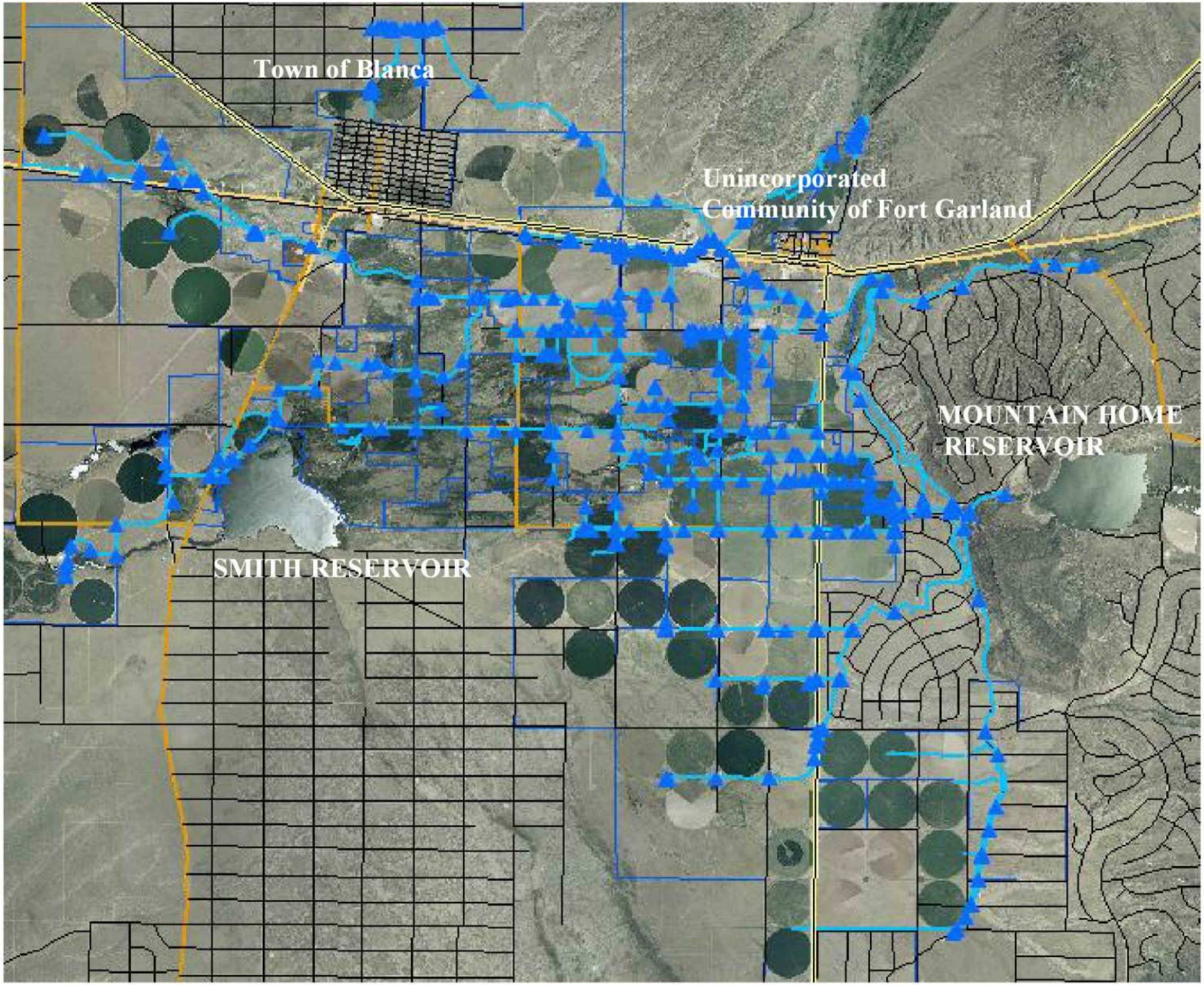
Other photos showing problems,
and a lovely shot of Mt. Home Reservoir on a clear day

Trinchera Irrigation System




Feedline Trinchera -- Garland
Trinchera Canal
Trinchera Highline Canal
(Trinchera Creek And
Mountain Home Water Only)
Hoffman Canyon
& Trinchera Creek
Fort Garland Canal
Sangre de Cristo
Trinchera Diversion
Canal
Sangre de Cristo
Creek
N


Town of Blanca
Unincorporated
Community of Fort Garland
MOUNTAIN HOME
RESERVOIR
SMITH RESERVOIR

Trinchera Irrigation System

Canal takes water from Sangre de Cristo Creek

Directs it SW to Hoffman Canyon,

Where it joins Trinchera Creek just below Mt. Home Dam.

Both flows converge into Trinchera Canal

with +- 50% of TIC water serving Ag needs in S. end of system.

The Problem 1976

Attachment C –

Alternate Points of Diversion - a flexible water distribution system

A description and history of the Alternate Points of Diversion system

ALTERNATE POINTS OF DIVERSION SYSTEM

The original Sangre de Cristo Ditch, which is a highest priority water right, does not exist any more, yet the consumptive needs for irrigation from that water still exist and have, over the years, increased.

Like in many cases around here, some of the water rights go back to the 1800s, with many of them originally pertaining to a particular field or property. Over the years, as farming practices and the use of water evolved, new ways of allocating the use of water were needed.

The irrigation company went to water court back in the 80s and got a decree to be able to take its decreed water on each stream at any one or more of the decreed headgates.

Although this system is used in some other parts of the San Luis Valley, this is the most extensive use of the system. Through cooperation with the Trinchera Ranch, which uses this system on Ute Creek and on Trinchera Creek, both systems use the APD system, taking water from wherever it is available to wherever it is needed.

Strictly speaking, the Canal has a low priority water right. Without the APD system it would be dry most of the time, but by using APD water, Trinchera Irrigation Company is able to meet the irrigation needs and keep water in Mountain Home Reservoir for wildlife and recreation.

Restoring the full capacity of the Canal helps to preserve the integrity of the Alternate Points of Diversion irrigation system.

(With thanks to Water Commissioner Robert Schultz)

Attachment D –

Can-Do-Concrete, Inc. corporate capabilities

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TIC's matching funds - detail of costs

THE TRINCHERA IRRIGATION COMPANY

P.O. BOX 41
BLANCA, COLORADO 81133
719-379-3467

October 7, 2008

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Total			$28,000.00

The Trinchera Irrigation Company can budget and contribute approximately $40,000.00 as in-kind funds toward the project.

Attachment E

STAFF REQUIREMENTS -- NRCS Commitment = $40,000

Task	Duration (days)	Start Date	End Date	Lead Person
Finish Planning:	1	6/01/08	6/05/08	Gallegos
Design Survey:	2	7/08/08	7/10/08	Clark/Gallegos
Design Hydrology :	2	7/10/08	7/12/08	Clark/Gallegos
Preliminary Design:	2	7/15/04	7/17/08	Clark/Gallegos
Drawings and Specs:	10	7/22/04	7/30/08	Clark/Gallegos
Design Review:	1	8/02/04	8/02/08	Clark/Gallegos
Final Drawings and Specs:	2	8/15/04	8/15/08	Clark/Gallegos
Design Approval:	7	9/05/08	9/20/08	Andrews
Permits and Easements:	1	7/01/08	9/01/08	Gilleland
Project Agreement:	1	9/21/08	9/21/08	Gilleland
Award Contract:	1	9/25/08	9/30/08	Gilleland
Construction Inspection:	10	10/01/08	10/30/08	Clark/Gallegos
Final Inspection:	1	11/01/08	11/01/08	Clark/Gallegos
As Built Drawings:	2	11/10/08	11/15/08	Clark/Gallegos
Total Time:	43days		Estimated Completion Date: 11/20/08	

Attachment F –

NRCS engineering studies

Location Map

Owners Statement

Utilities Statement

Table of Quantities

Project Plan View

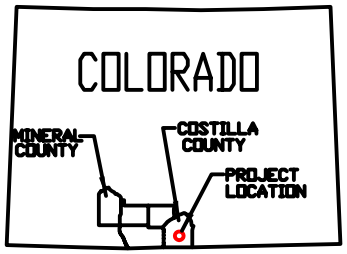
Profile Section #1

Profile Section #2

Existing Cross Sections

Typical Ditch Pad Section

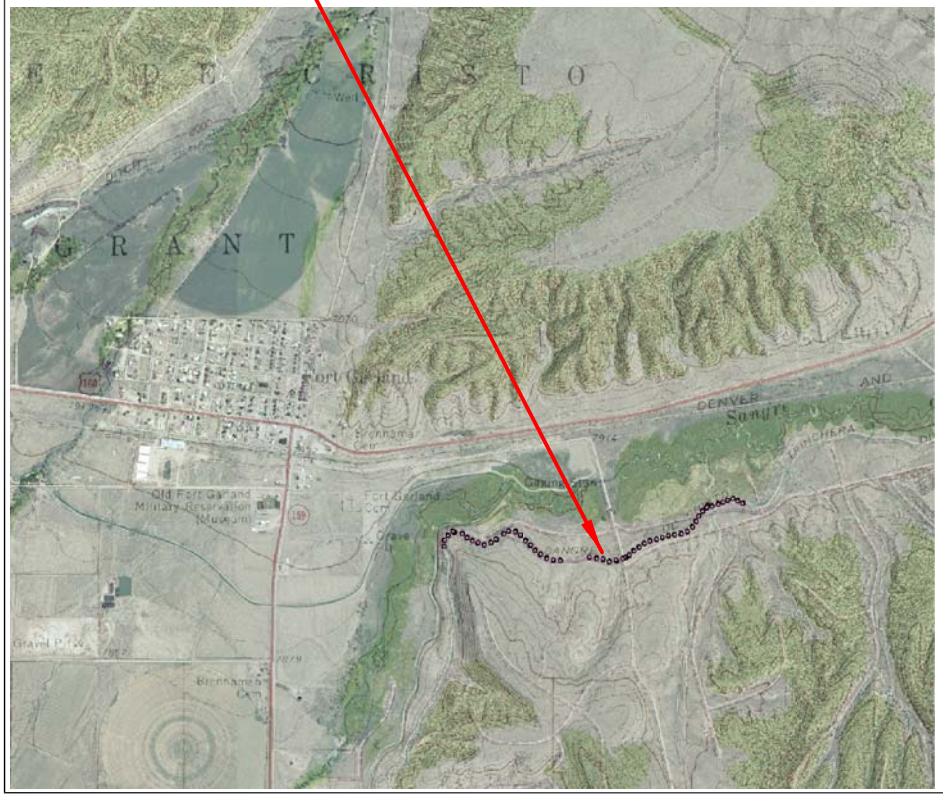
Typical Concrete Lining Section



TRINCHERA IRRIGATION COMPANY
PLANS FOR THE CONSTRUCTION OF
CONCRETE DITCH LINING REHAB
COSTILLA COUNTY

ENGINEERING JOB CLASS V

PROJECT LOCATION
CONCRETE DITCH
COSTILLA COUNTY



OWNERS STATEMENT

THIS PLAN HAS BEEN DISCUSSED WITH ME AND I AM IN AGREEMENT WITH THE CALCULATIONS AND DESIGN.

PRESIDENT _____ DATE _____

OWNERS STATEMENT

THIS PLAN HAS BEEN DISCUSSED WITH ME AND I AM IN AGREEMENT WITH THE CALCULATIONS AND DESIGN.

VICE PRESIDENT _____ DATE _____

OWNERS STATEMENT

THIS PLAN HAS BEEN DISCUSSED WITH ME AND I AM IN AGREEMENT WITH THE CALCULATIONS AND DESIGN.

SECRETARY _____ DATE _____

OWNERS STATEMENT

THIS PLAN HAS BEEN DISCUSSED WITH ME AND I AM IN AGREEMENT WITH THE CALCULATIONS AND DESIGN.

TREASURER _____ DATE _____

INDEX OF DRAWINGS

UTILITIES STATEMENT

"I realize that as a landowner, I and/or the contractor I hire, may be liable for any damage to utilities during construction. NRCS makes no representation that utilities shown on the plans are exactly located or that all utilities present are shown."

"I will provide NRCS with the Utility Notification Center of Colorado (UNCC) ticket number my contractor has acquired prior to start of construction."

LAND OWNER OR AGENT _____ DATE _____

UNCC TICKET NUMBER _____

"CALL UTILITY NOTIFICATION CENTER OF COLORADO @ 1-800-922-1987. CALL TWO (2) BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES."

TABLE OF QUANTITIES

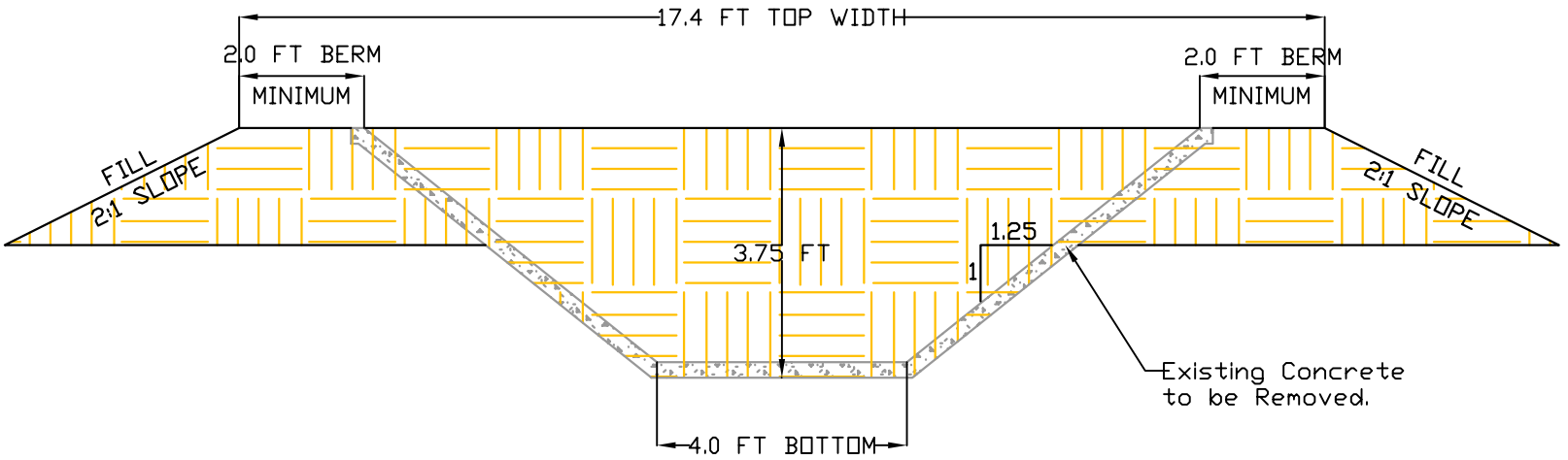
ITEM	UNIT	QUANTITY
Earth Fill for Ditch Pad	Cyds	6414
Non-reinforced Concrete	Cyds	378
36" Corrugated Metal Pipe	Feet	120

Date
Designed : L. Clark 08/2008
Drawn : L. Clark 08/2008
Checked : RDC 08/2008
Approved: RDC 08/2008

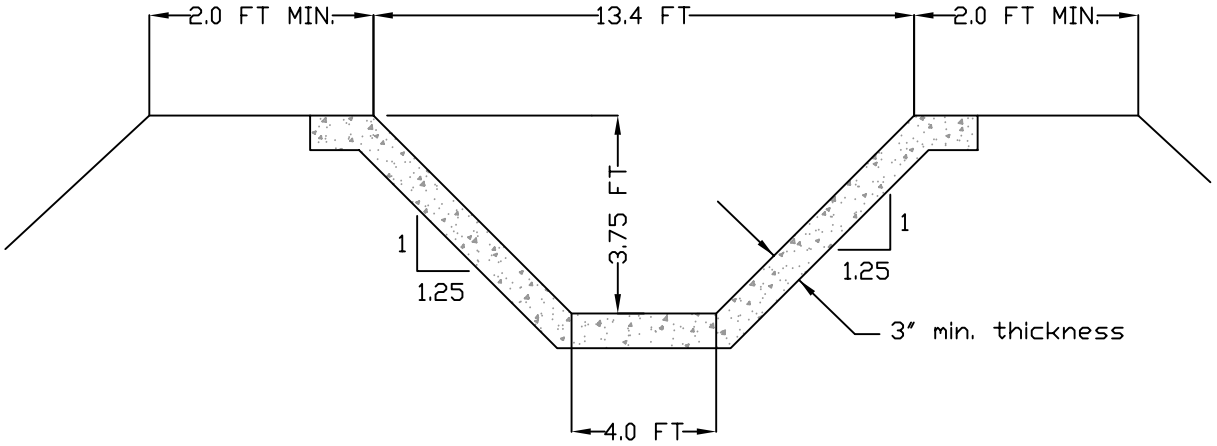
TRINCHERA IRRIGATION COMPANY
COVER SHEET
Costilla County, Colorado

United States Department of Agriculture
NRCS Natural Resources Conservation Service

File No. EP\SL\Concrt
Drawing No. plan.dwg
Sheet no. 1 of 8



TYPICAL SECTION – DITCH PAD
Scale as Shown



TYPICAL SECTION – CONCRETE LINING
Scale as Shown

		Date
Designed :	L. Clark	08/2008
Drawn :	L. Clark	08/2008
Checked :	RDC	08/2008
Approved:	RDC	08/2008

TRINCHERA IRRIGATION COMPANY
DITCH PAD & LINING DETAILS
Costilla County, Colorado

United States Department of Agriculture
NRCS Natural Resources Conservation Service

File No. EP\SL\Concrete
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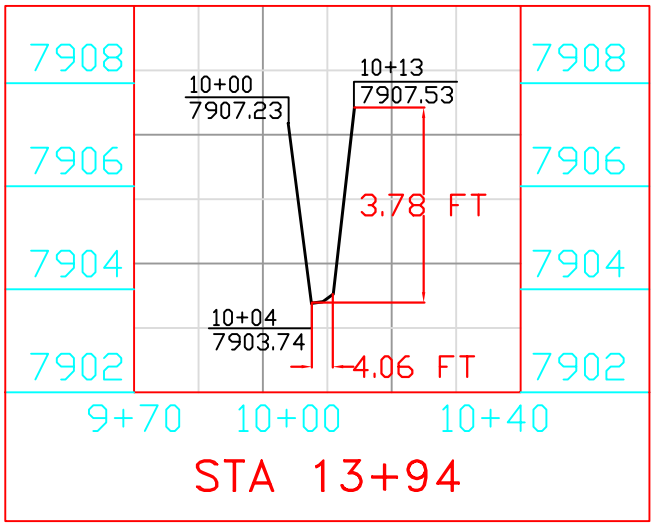

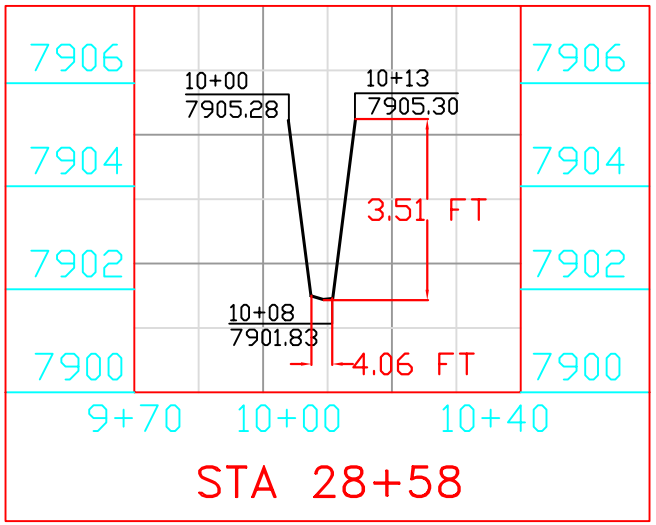

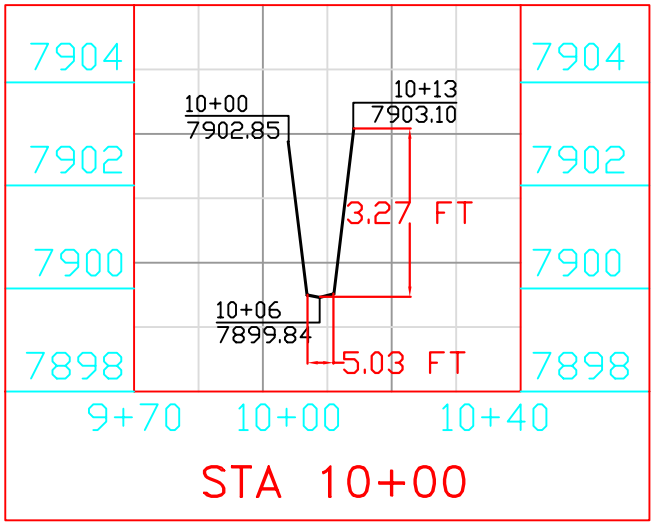

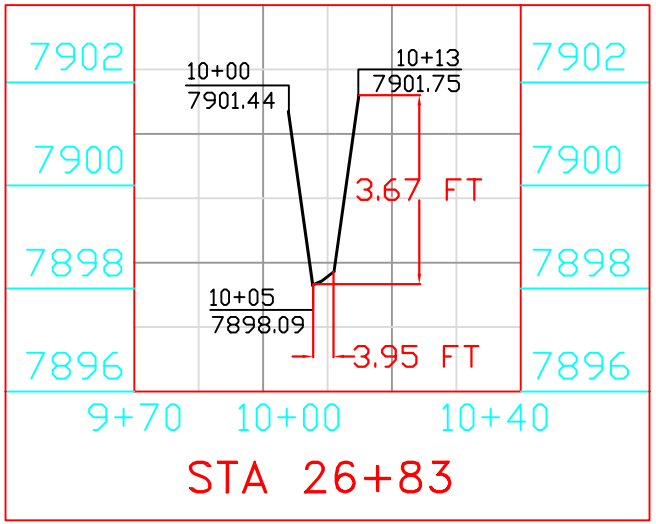

TRINCHERA IRRIGATION COMPANY
EXISTING CROSS SECTIONS
Costilla County, Colorado

		Date
Designed :	L. Clark	08/2008
Drawn :	L. Clark	08/2008
Checked :	RDC	08/2008
Approved:	RDC	08/2008

United States Department of Agriculture
NRCS Natural Resources Conservation Service

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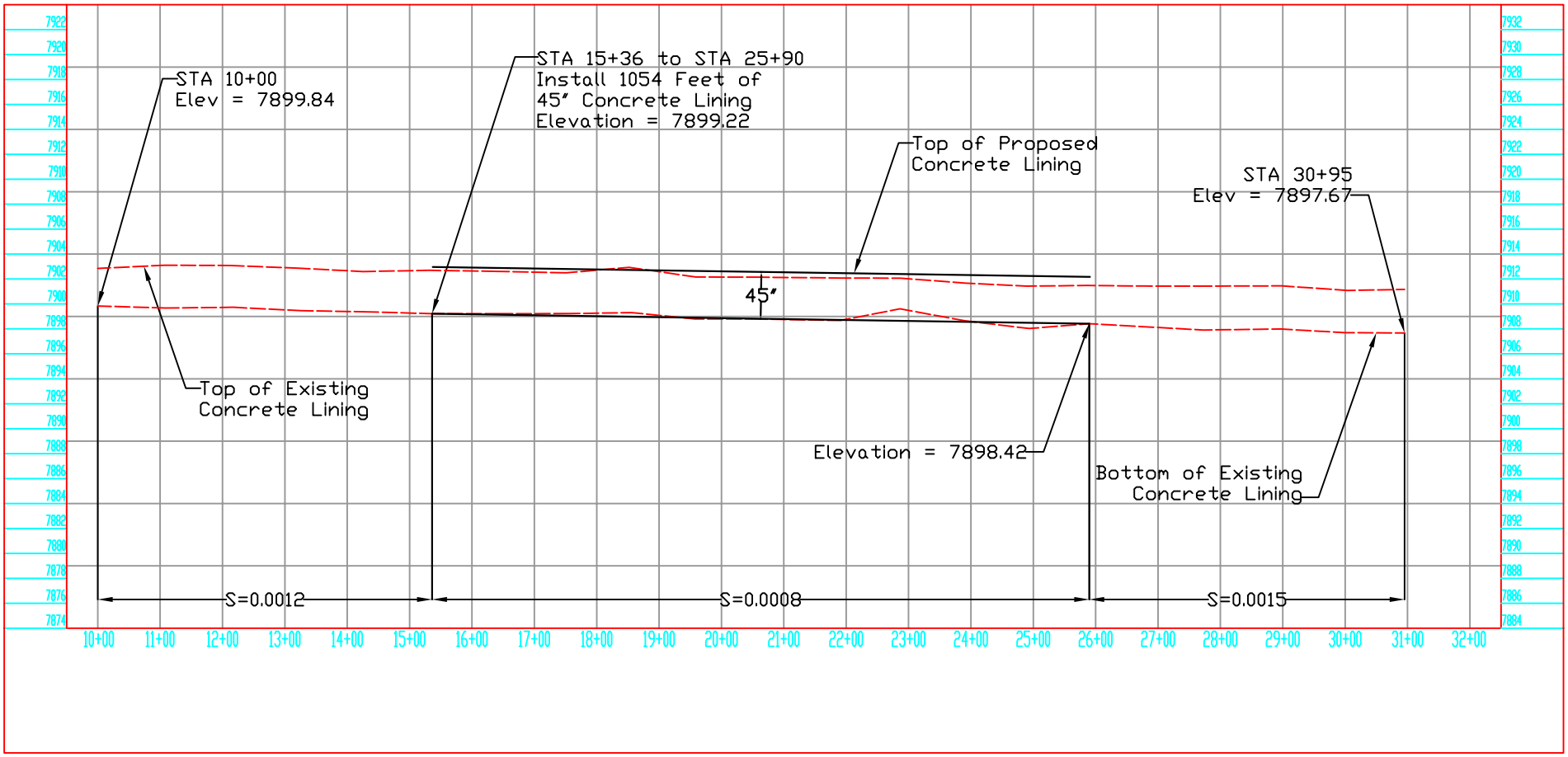


CONCRETE DITCH PROFILE STA 10+00 TO STA 30+95

PLAN VIEW

0 50 100 200

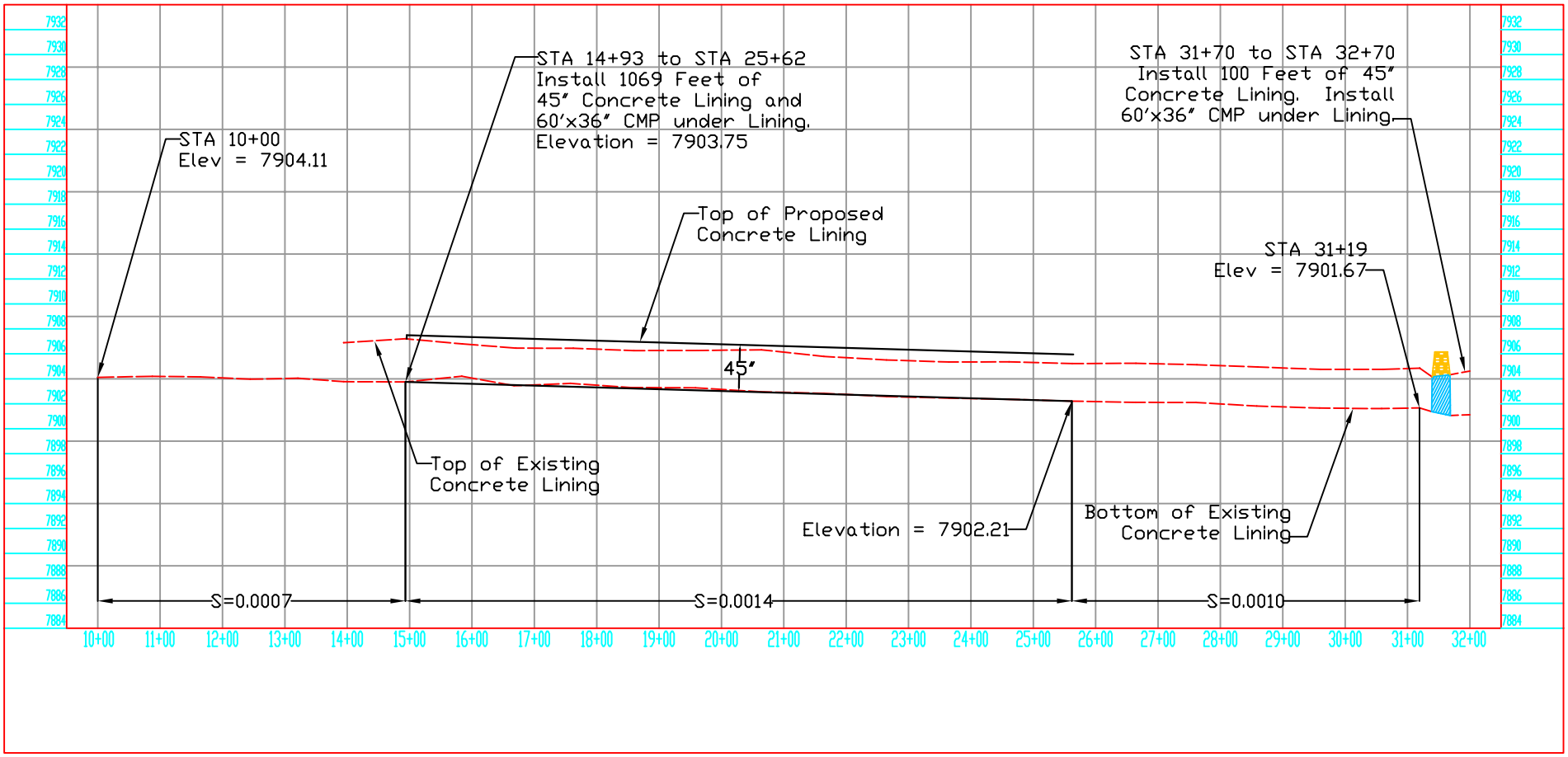
25 75

		Date
Designed :	L. Clark	08/2008
Drawn :	L. Clark	08/2008
Checked :	RDC	08/2008
Approved:	RDC	08/2008

TRINCHERA IRRIGATION COMPANY
PROFILE SECTION #2
Costilla County, Colorado

United States Department of Agriculture
NRCS Natural Resources Conservation Service

File No. EP\SL\Concrete
Drawing No. plan.dwg
Sheet no. 4 of 8



CONCRETE DITCH PROFILE STA 10+00 TO STA 32+00

PLAN VIEW

0 50 100 200

25 75

Date

Designed : L. Clark 08/2008

Drawn : L. Clark 08/2008

Checked : RDC 08/2008

Approved: RDC 08/2008

TRINCHERA IRRIGATION COMPANY

PROFILE SECTION #1

Costilla County, Colorado

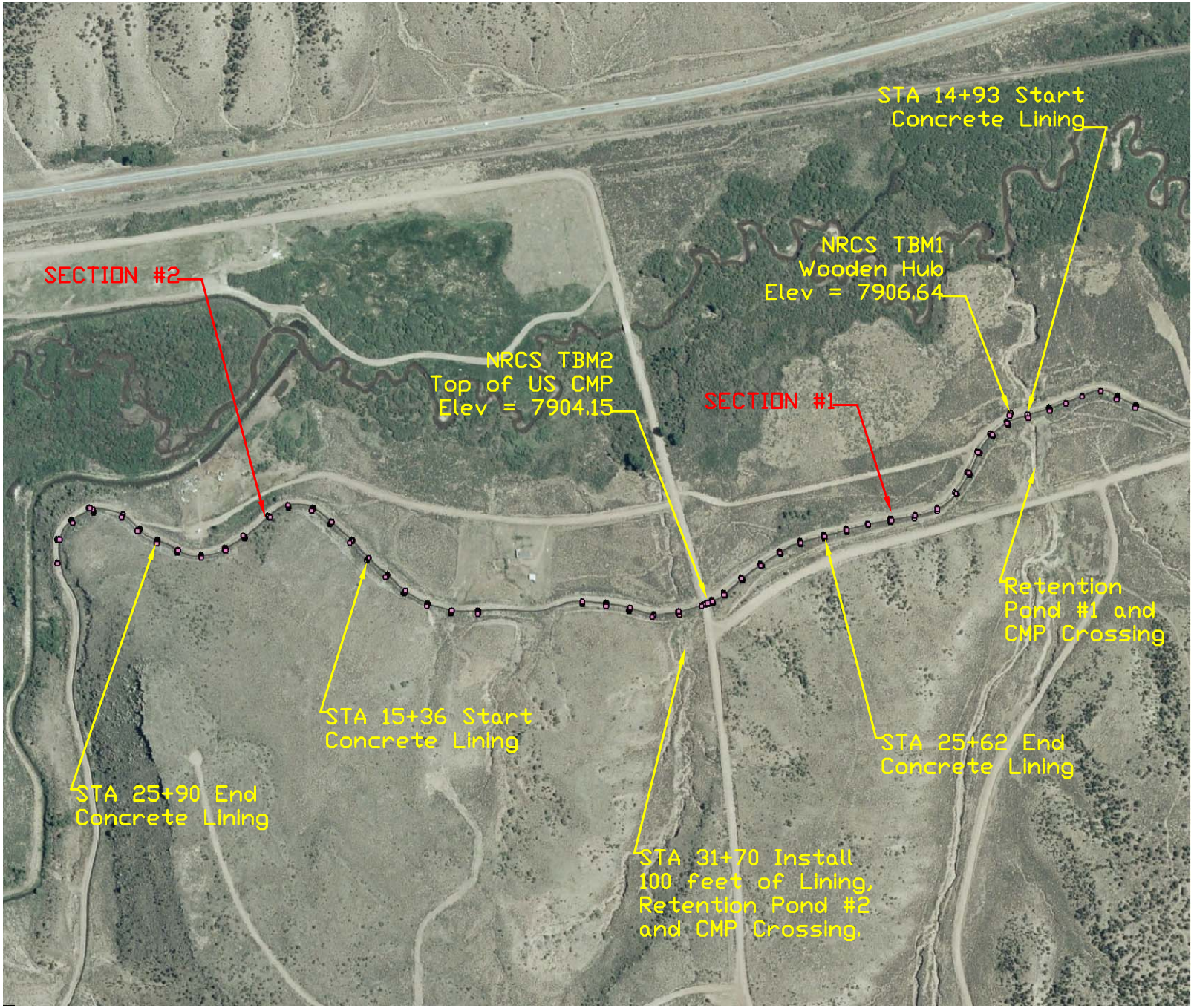
United States Department of Agriculture

NRCS Natural Resources Conservation Service

File No. EP\SL\Concrete

Drawing No. plan.dwg

Sheet no. 3 of 8



TRINCHERA IRRIGATION COMPANY
PROJECT PLAN VIEW
Costilla County, Colorado

		Date
Designed :	L. Clark	08/2008
Drawn :	L. Clark	08/2008
Checked :	RDC	08/2008
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United States Department of Agriculture
NRCS Natural Resources Conservation Service

File No. EP\SL\Concrt
Drawing No. plan.dwg
Sheet no. 2 of 8

Attachment G –

Relation between Trinchera drainage & the Rio Grande River

USGS article

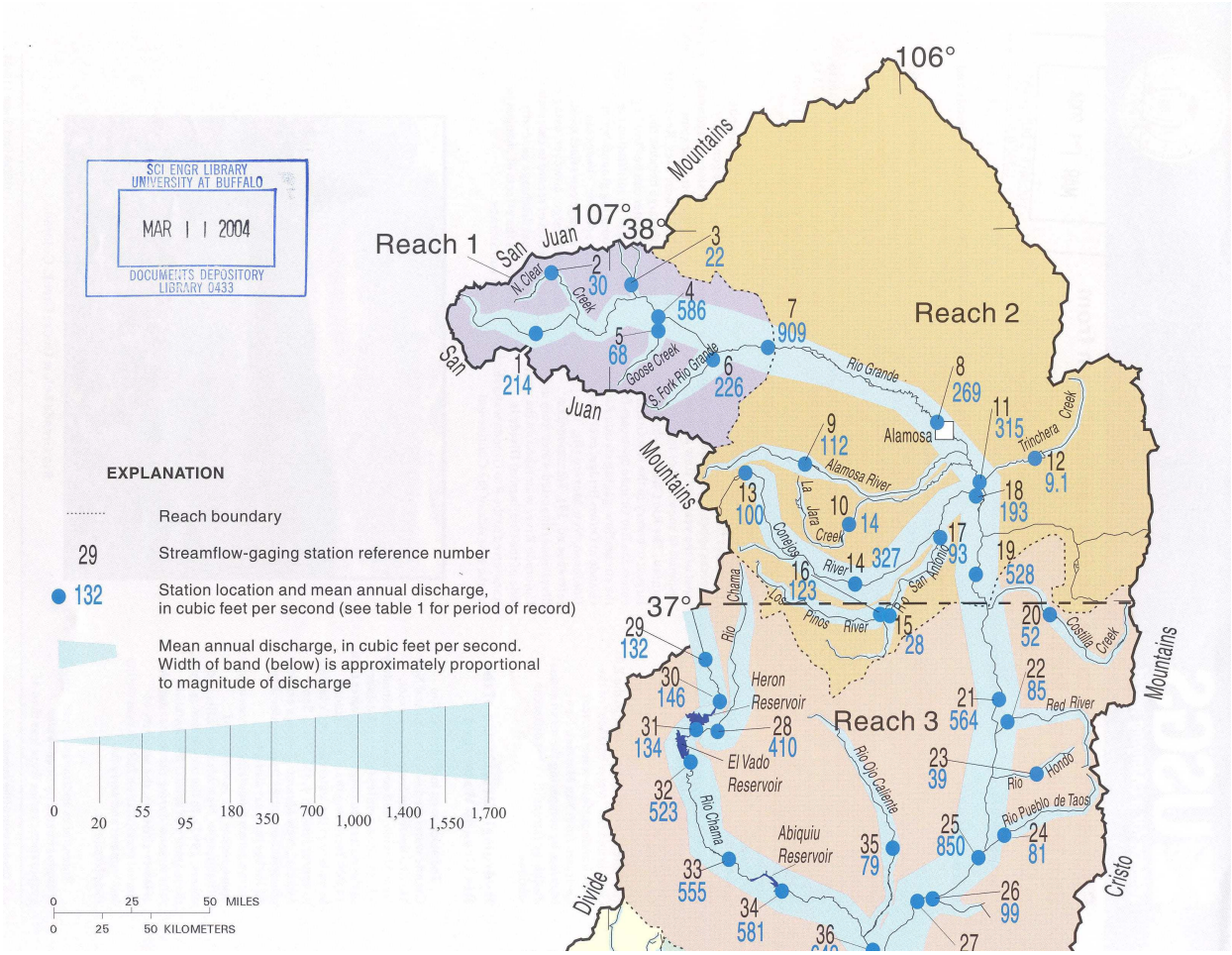
"Sources of Water to the Rio Grande Upstream from San Marcial, New Mexico" by Stephanie J. Moore, Scott K. Anderholm, Tara Williams-Sether, and John M. Stomp

Sources of Water to the Rio Grande Upstream from San Marcial, New Mexico

By Stephanie J. Moore[1], Scott K. Anderholm[1], Tara Williams-Sether[1], and John M. Stomp[2]

[1] U.S. Geological Survey, [2] City of Albuquerque--Water Resources Management

Most of the water in the Rio Grande surface-water system comes from tributary inflow that originates in the San Juan or Sangre de Cristo Mountains and enters the watershed upstream from Rio Grande at Otowi Bridge, near San Ildefonso, New Mexico (reference no. 39) (fig. 1). Mean annual discharge at the following gaging stations represents tributary inflow from the San Juan Mountains to the Rio Grande: Rio Grande at Thirtymile Bridge, near Creede, Colorado (reference no. 1; 214 ft^3/s), Willow Creek at Creede, Colorado (reference no. 3; 22 ft^3/s), Goose Creek at Wagon Wheel Gap, Colorado (reference no. 5; 68 ft^3/s), South Fork Rio Grande at South Fork, Colorado (reference no. 6; 226 ft^3/s), and Conejos River near Lasauses, Colorado (reference no. 18; 193 ft^3/s). Mean annual discharge at the following gaging stations represents tributary inflow from the Sangre de Cristo Mountains to the Rio Grande: Red River below Fish Hatchery, near Questa, New Mexico (reference no. 22; 85 ft^3/s), Rio Pueblo de Taos below Los Cordovas, New Mexico (reference no. 24; 81 ft^3/s), and Embudo Creek at Dixon, New Mexico (reference no. 26; 99 ft^3/s).



Attachment H –

Geological data relating to seismic activity at the Canal location

Concerning Instability of the Sangre de Cristo Diversion Canal
Due to Geologic or Seismic Effects

Nicole V. Langley
Transforma Research & Design

For this project and in order to create the bid proposal package, it was important to determine the degree to which the loss of capacity in the Sangre de Cristo Diversion Canal (the Canal) was due solely to the concrete liner having reached the end of its useful life, which is the case, and the degree to which some of that instability could be attributed to the Quaternary landslide effects in the proximity of the Canal.

Some data was provided by Pete McGee of the San Luis Valley GIS/GPS Services, and a considerable amount of research assistance was provided by Robert Schultz, Water Commissioner, Division 3, District 35.

The following graphics are derived from some of the material in the following sources.

Groundwater Hydrology of Costilla County

As Pete McGee of San Luis Valley GIS/GPS Authority said, for a lot of our questions the answer is simply "nobody knows." The Adams State College Nielsen library reference section's Colorado Room and the Colville Room provided the following sources:

Groundwater Atlas of Colorado -
G1501.C34.C6 2003
pages 157-168

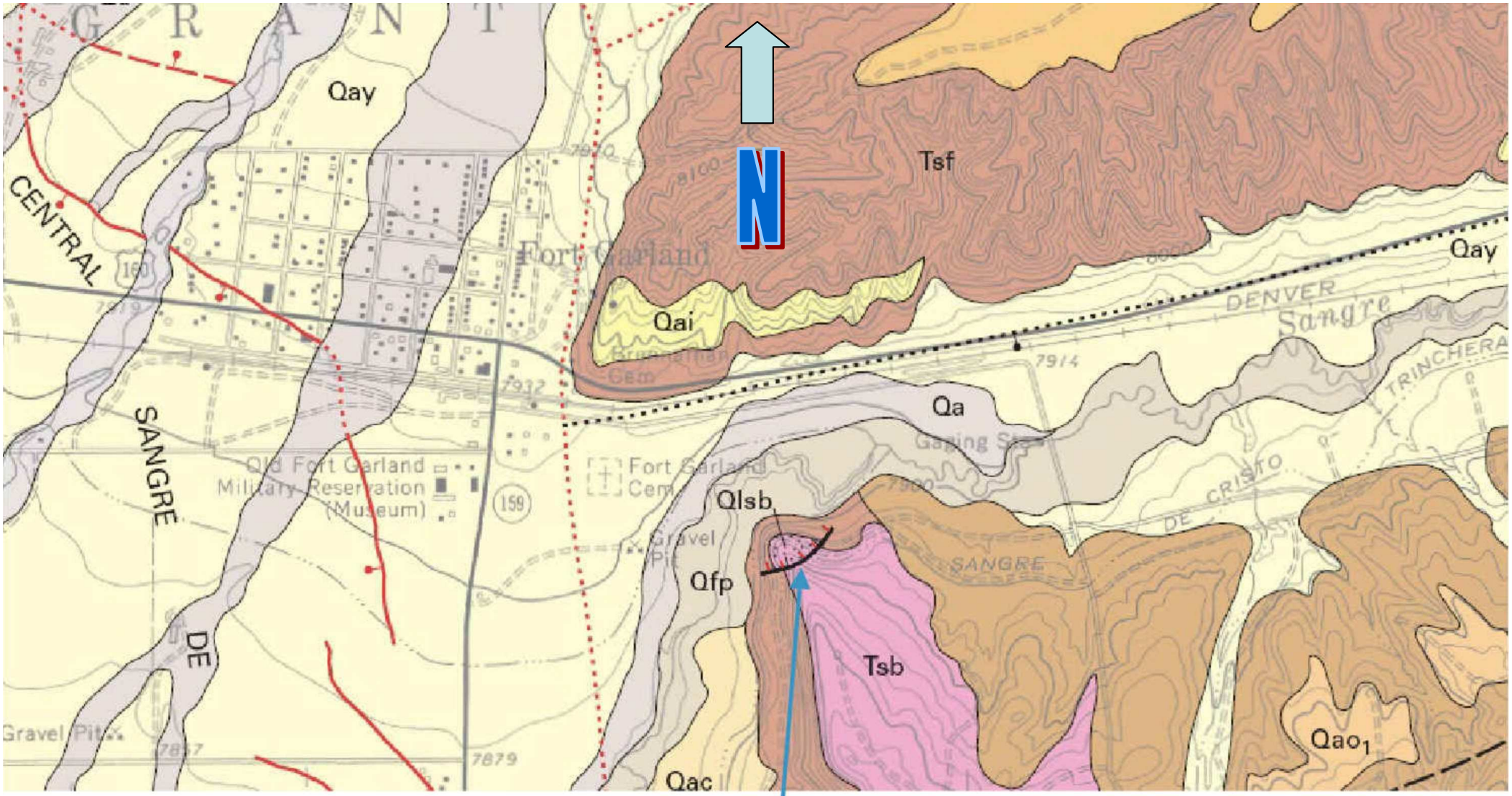
USGS - Reconnaissance investigation of ground water in the Rio Grande drainage basin, part of a larger hydrologic investigations atlas
15 colored maps on four sheets - lots of detail
G4297.R5C34.1974.K45

Administration of the Rio Grande Compact in Colorado - by Ronald I. Blewitt
KFC2246.B64 1991 with several references relating to the Trinchera

USGS - prepared in cooperation with CWCB
Hydrology of the San Luis Valley, south-central Colorado, by P.A. Emery, et al.
Two huge maps with a great deal of technical information, relief and contours shown.

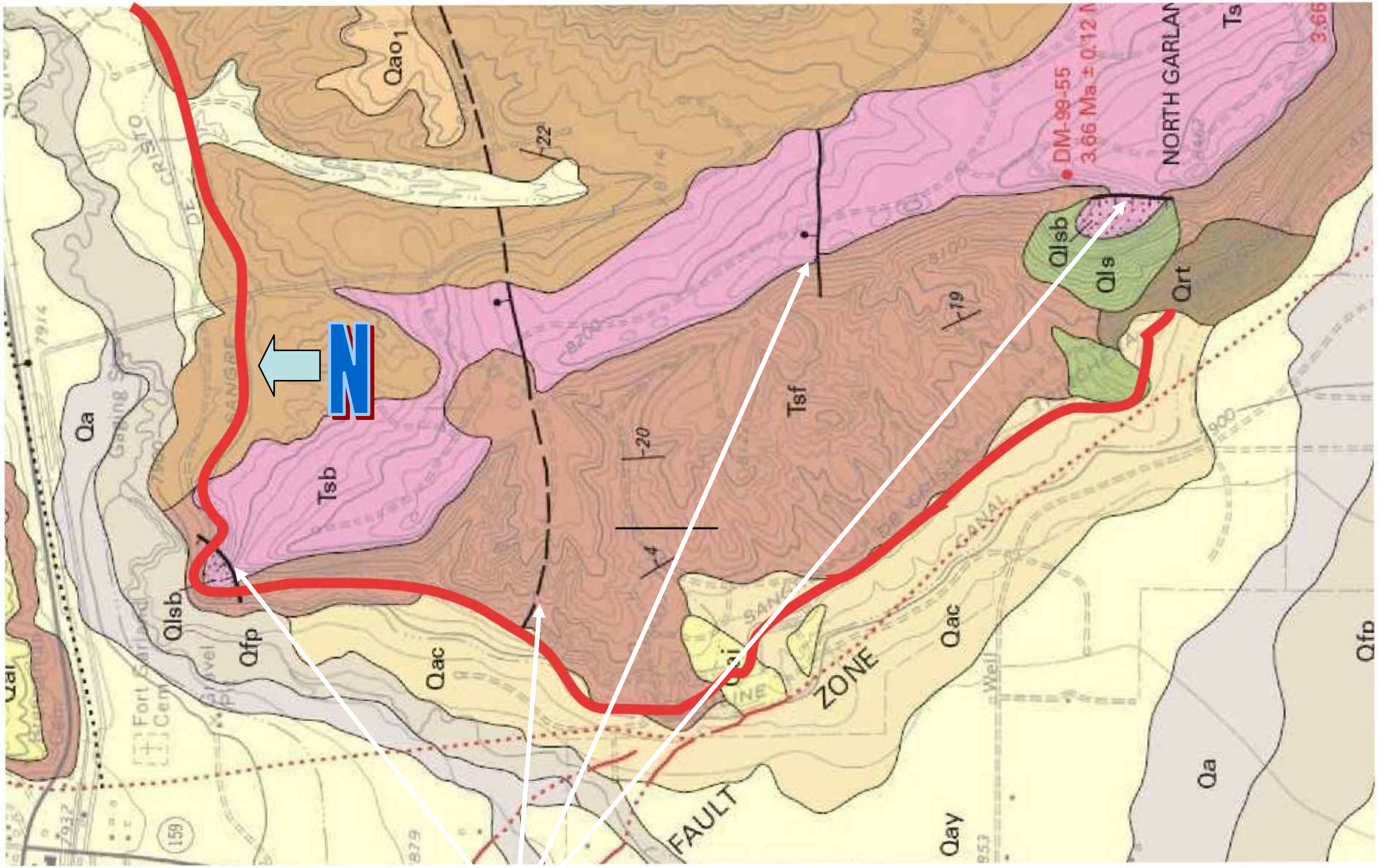
Geologic Map of the San Luis Quadrangle, Costilla County, Colorado by Michael N. Machette, Ren A. Thompson, and Benjamin J. Drenth, 2008
U.S. Geological Survey Information Services

“Quaternary land slide block”



Fault identified at this location
Fault approximated but not visible
Re-mapping in 2008 - Fault identified at this location
Re-mapping Fault approximated but not visible

Qlsb - “Quaternary land slide block” This block is slowly sliding toward Sangre de Cristo Creek. This section of the Canal is being carried slowly downhill with the landslide block, resulting in decreased capacity created by the loss of grade.

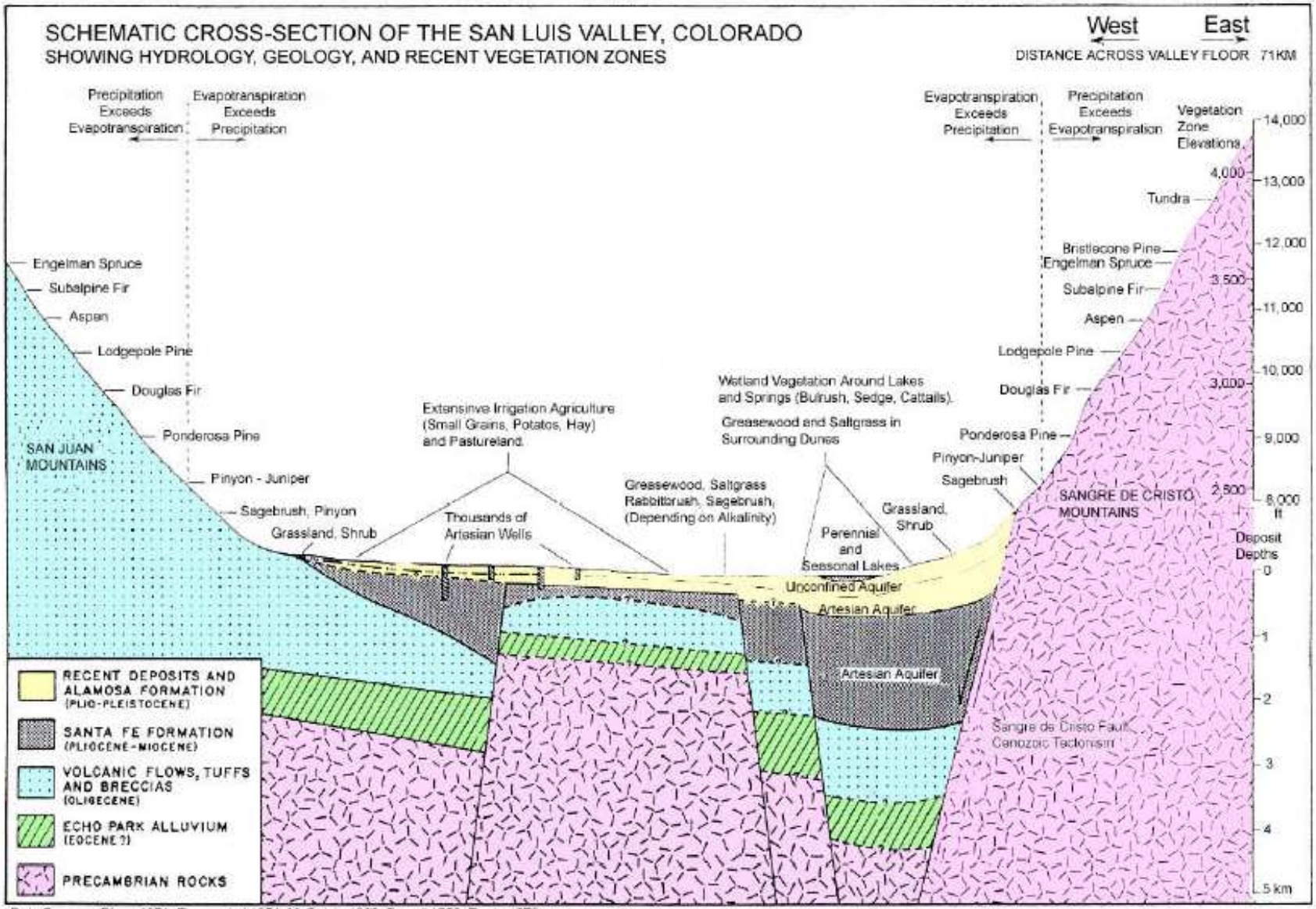


Fault Lines
Canal (Approx.)

Attachment J –

SLV Development Resources schematic cross section of the San Luis Valley

Diagram 1



Data Sources: Dixon 1971, Emery et al 1971, McCalpin 1983, Powell 1958, Tweto 1979.

Attachment K –

NRCS specifications

Attachment L –

Letters of Support