NORTH LAKE DAM RESERVOIR

Las Animas County, Colorado

Rehabilitation & Multiple Use Project

ARKANSAS RIVER BASIN ROUNDTABLE

Water Supply Reserve Account

Grant Application

Amended July, 2011

Prepared by:
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Utility Superintendent,
City of Trinidad, Colorado

COLORADO WATER CONSERVATION BOARD

WATER SUPPLY RESERVE ACCOUNT
2011 GRANT APPLICATION FORM

NORTH LAKE RESERVOIR: Rehabilitation & Multiple Use
Arkansas River Basin

Name of Water Activity/Project

River Basin Location

Amount of Funds Requested	Please Check Applicable Box		Approval Letter Signed By Roundtable Chair and Description of Results of Evaluation and Approval Process
$ 12,000.00	X	Basin Account	X Yes
$727,235.00	X	Statewide Account	☐ No

*** 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.

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

1. Applicant Name(s): **CITY OF TRINIDAD, COLORADO**

Mailing address: P.O. Box 2440
Trinidad, CO 81082

Taxpayer ID#: 84-6000625 Email address: jim@historictrinidad.com

Phone Numbers: Business: 719-846-9843
Home: 719-846-9365
Fax: 719-846-4140

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

Name: James Fernandez

Position/Title Utility Superintendent

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

Organization & History:

The City of Trinidad, Colorado, submits its application as an eligible applicant under the guidelines of Senate Bill 06-179. The City of Trinidad was incorporated in 1876 and is the County seat of Las Animas County, Colorado. The City of Trinidad is the primary provider of treated drinking water for the City, the rural area encompassing the City, the Colorado Department of Corrections State Prison, the U.S. Army Pinon Canyon Maneuver Site, and approximately 867 rural customers served through twenty-two (22) rural water associations. These entities represent a customer base of 3,759 urban and rural residential water customers and 963 urban and rural commercial customers. In addition to providing water to these customers, the City of Trinidad currently supplies untreated water from its municipal pool in Trinidad Lake for augmentation purposes to other rural customers who must augment their use of well or stream water.

North Lake is the primary source of Trinidad's drinking water located approximately 46 miles west of Trinidad in Las Animas County. The lake has a capacity of approximately 4,300 acre feet of water and is fed by the North Fork stream, all in the Arkansas River Basin of the State of Colorado. The original North Lake dam was built in the 1930's, but was expanded in 1964. It is an earthen dam with a concrete control tower and concrete spillway. The dam recently was placed on restriction by the State Water Engineer's Office requiring the lake to be lowered by five (5) feet which represents a loss of 541 acre feet of water. The State has also issued a mandate to the City that certain improvements must be made to the dam or else the water level in the lake would be lowered even further to what is deemed a "safe level". Refer to attached letter from State Water Engineer , Mr. Dick Wolfe dated June 13, 2011. Also attached is a Reservoir Capacity Table prepared by GEI Consultants.

To this end, the City engaged the services of a professional engineer, GEI Consultants, to design and rebuild the intake piping and control valves within the existing tower, installed a new drain pipe, and emergency relief outlet works at the base of the dam at a cost of **$847,232.59**. The two immediate remaining areas of work remaining to be accomplished are the reinforcement of the earthen dam as it is leaking at the groin area of the dam and the replacement of the concrete spillway with a pipe spillway. The remaining work has already been designed by the firm of RJH Consultants at a cost of **$296,317.68**. Although the design work is complete and awaits final approval by the State Engineer's Office (SEO), the construction work is unfunded. The current estimate to accomplish these mandated repairs is **$1,848,086.00**. The City of Trinidad is seeking grant funds for this project. Grant funds are being sought as opposed to a loan due to the fact that the City is presently faced with a bonded indebtedness for a previously expanded and renovated waste water treatment plant which was also an unfunded mandate from the State in 2000.

4 ***If the Contracting Entity is different then the Applicant (Project Sponsor or Owner) please describe the Contracting Entity here. N/A – Applicant will contract for this proposal.***

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

1. Name of water activity/project:

CITY OF TRINIDAD NORTH LAKE RESERVOIR:
Rehabilitation & Multiple Use Construction

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
- [X] Consumptive project or activity
- [X] Nonconsumptive project or activity

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

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

Project Summary (Inserted here for clarity):
The Colorado State Engineer has placed a restriction of water level in North Lake's storage capacity due to safety considerations. North Lake currently contains approximately 4,300 acre feet of water. The earthen dam is leaking at the groin of the dam and the concrete spillway is significantly deteriorated. The groin leak has been a serious and long-standing seepage problem on the dam. Continuing deterioration and loss of structural integrity of the dam are causing serious concerns, and thus North Lake dam is listed as a "high hazard" dam due to number of homes and ranches below the dam. The dam was originally constructed in the 1930's, but was expanded in 1964. The source of the water for North Lake is the North Fork stream through a diversion pipeline. The importance of North Lake is evident by the number of urban and rural residential customers, urban and rural commercial customers, the Colorado Department of Corrections prison and the U.S. Army Pinon Canyon maneuver site it serves. If water levels were restricted, the seriousness of this matter manifests itself in the possibility of a reduced water supply for all these customers.

The City has already conducted engineering, hydrological and hydraulic studies and designs of all structures to be funded by this proposal (the Project). The engineering design has identified the best approach to restore capacity to the reservoir by improving the dam and replacing the old concrete spillway. The objective of this funding will be to remove the State-imposed restrictions on storage and to restore full operating efficiencies to North Lake. This will allow Trinidad to hold and control water; and enhance its ability to provide the basic necessity of life, water, in times of drought it will also allow the City to continue to serve third parties, provide for and greatly improve fisheries, and wildlife habitat.

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

    - The City of Trinidad is proposing an eligible water activity, as identified in Senate Bill 06-179, involving the performance and implementation of existing design and engineering towards a multi-use facility in order to correct long-standing seepage problems and failing water storage and conveyance structures into resources with expanded, cultural, environmental, wildlife, and recreational uses.

    - The North Lake dam improvements project is an eligible entity, as described in SB 06-179 and this proposal is submitted in accordance with CWCB guidelines for this funding proposal.

    - The City of Trinidad is requesting funds of **$739,235.00** from the State account, and will comply with all applicable submission criteria and deadlines.

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 water activity meets the eligibility requirements 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 utilizes prior studies, implements engineering and hydrology studies which have been completed prior to structural repairs and upgrades on existing structures, and performs a multi-use project resulting in the optimization of, North Lake water supply and

recreational area. 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.

3. Evaluation and approval of the North Lake dam project water activity by the Arkansas Basin Roundtable (ABRT) is requested. The City of Trinidad is seeking general agreement by the roundtable. This information, including any opposition (if any) of who opposed the activity and why they opposed it will be included in writing from the roundtable chair.

    - This information will be submitted to the CWCB, within this proposal.

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.

    - This water activity meets the provisions of Section 37-75-104 (2) (c), C.R.S. regarding the results of SWSI in fulfilling its water use goals and storage objectives. The source of water stored by this reservoir generates from established historical and adjudicated water rights on the North Fork stream. North Lake is a multiple use facility and provides benefits to rural and urban water customers and as a recreational fishing area. The Project will provide more efficient use of consumptive and non-consumptive needs of the Arkansas River Basin. This will include the potential to store water at North Lake's maximum potential for all parties. The threat of loss of storage will be eliminated. In addition, the SWSI goal to increase non-consumptive uses associated with recreation (fishing and boating) will be met and enhanced by successful funding of this project.

    - In this process, the City of Trinidad consulted with and obtained the active support of the Purgatoire River Water Conservancy District (PRWCD), and the Colorado Division of Water Resources. For effects upon recreation, wildlife, and flood control the Boards of Commissioners of Las Animas County support this project. Letters of support express the advice and input the City of Trinidad has counted on from many stakeholders as it prepares to conduct the necessary repairs to restore North Lake Reservoir to tits full functionality and potential.

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.

This Project addresses multiple needs and issues by addressing and proposing cures to the deficiencies in a complex reservoir-stream system. The project will focus on historic consumptive and non-consumptive water use practices which have been negatively impacted by the State Water Engineer's Office. North Lake dam has been plagued by decades of leaks and seeps. Not only have these problems caused water losses and inefficient use of storage water, but also diminishes the ability to improve on

and to take advantage of potential non-consumptive resources. This work is considered a complete repair of the dam and is not just a temporary fix. Successful funding of this project will not only cure the leaks and seeps but will also address and overcome many of the limitations and adverse effects of imposed water level restrictions on a state fishing and recreational area, on wildlife, for a productive fishery, and for improving their ability to sustain and increase the natural habitat. Sustainable reservoir storage also enables the City of Trinidad to respond to water demands in case of an uncontrollable situation such as a drought. This project will afford a greater control and flexibility in the operation of the reservoir especially in a time of unpredictable snow pack and precipitation. Not only will the general public benefit from this project but it will serve the purposes of wildlife by providing a full reservoir and source of water in drought years.

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 application represents excellent collaboration between the City of Trinidad, the Department of Water Resources, the US Forest Service, and the CDOW, with open channels to address multiple non-consumptive water interests and traditional consumptive interests. The CDOW also has direct concerns regarding water availability for its non-consumptive needs associated with the North Lake fishery. This emphasizes the importance of enlarging present storage-and- release capabilities throughout the year to include transmountain water, (if any), thus promoting and maintaining fish populations and recreational activities. In addition, this will assist in the efficient delivery of water for all customers at all times of the year.

By rehabilitating the North Lake dam and maintaining its history of multiple uses, this Project addresses the present day issues and future water supplies. The City of Trinidad will conform to established bid processes and will search for the contractor best suitable to perform the work. This Project, when funded, will address storage/release for flood control and improved water supply, and will factor in the opportunity to enhance the fishery and recreation associated with North Lake. This Project will enable the City of Trinidad to operate at top efficiency and assurance that it will continue to meet its delivery obligations.

- **<u>Facilitating Water Activity Implementation</u>**

c. Funding from this Account will reduce the uncertainty that the water activity will be implemented. For this criterion the applicant should discuss how receiving funding from the Account will make a significant difference in the implementation of the water activity (i.e., how will receiving funding enable the water activity to move forward).

Funds from the Water Supply Reserve Account (WSRA) are critical for the City of Trinidad to complete this project. The City Water Department does maintain a Reserve account emergency fund. It is Board policy that this operating reserve is only to be utilized as a last resort or in the case of unforseen needs.

d. There is an urgency of need for the water activity and/or any compelling "window of opportunity" that may be missed without funding from the Account.

The Colorado State Engineer has notified the City of Trinidad of imposed water level restrictions upon North Lake storage capacity due to safety considerations. The spillway is significantly deteriorated and there is a serious and long-standing problem on the left embankment, where seepage water comes out of the embankment and runs into the face of the dam. Dam inspectors over the years have seen this as a critical deficiency, causing them to place North Lake on "conditional" storage. These problems are the principal reason for proposing this project, and to this end, specific studies, engineering design and specifications have been completed. Continuing deterioration and loss of structural integrity of the dam are major concerns to the proper operation of the reservoir. These repairs are long overdue. The longer it takes to cure the seepage problem, for instance, the greater the risk of compromising the structural integrity of the entire system.

The window of opportunity for obtaining funding imposes some urgency in bringing to fruition the current multi-use perspective of this project. The improvements are to be considered not just as an operation-and-maintenance challenge, but should be viewed in the context of a greater purpose. The hydraulic and hydrological studies represent a great deal of work as part of the overall engineering and design of North Lake dam. Although the effects of prolonged leaks and seepage rates are small relative to daily stream base flows, it is important to assess, and to project into the future, the effects upon the fishery and wildlife. More critically, the challenge of increasingly unpredictable climate in coming years emphasizes the critical role of North Lake for water storage. High snow pack years and high spring run-off, which are normally ideal conditions, would not and could not be taken advantage of in a restricted water level condition. Short term, our window of opportunity is to accomplish the timely completion of this work.

e. The length of time needed to implement the water activity; preference will be given to activities which can be implemented in the least amount of time taking into consideration the complexity of the activity.

It is anticipated that with additional funding, the Project will be completed in year 2011. However, depending on the time the work commences, plus whatever permitting time is required will determine the actual completion date.

f. The applicant has the expertise and ability to implement the proposed activity.

The City of Trinidad contracted with a professional engineering consultant to prepare studies, specifications and final design of the North Lake dam improvements. The firm of RJH Engineering has accomplished this task and will also perform construction inspection duties as part of their activities within the project. The firm's experience with other similar Colorado projects includes dams over 100 feet high, with multilevel piping outlets with varying capacities, spillways, river diversions, and related pipeline requirements. The City of Trinidad is satisfied that the engineering firm has the expertise and ability to implement all phases of this Project, and has submitted the project plans to the Stare Engineer's Office (SEO) for approval. Initial review of the plans has been completed, and minor changes or adjustments have been implemented. Accompanying this proposal is the detailed engineer's "Opinion of Probable Construction Cost" for each task in the Scope of Work.

g. The applicant is providing matching funds and the amount of matching funds or is obtaining partial funding from other sources and the amount and source of such other funds or is providing demonstrable in-kind contributions.

Based upon the engineer's Opinion of Probable Construction Cost, the cost of this project is estimated at **$1,848,086.00**. Sources of funding are as follows:

- The City of Trinidad is prepared to contribute: **$369,616.00 (20%)**
- Proposed CWCB grant funding: **$739,235.00 (40%)**
- The remaining balance: (see note): **$739,235.00 (40%)**

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$1,848, 086.00 (100%)

Note: The source of the remaining balance will be either other grant funds or low interest loan funds secured by the City of Trinidad.

h. The applicant has a demonstrated need for financial assistance based on the inability or difficulty obtaining funding elsewhere.

The City of Trinidad is not in a position to afford the entire cost of this project. The Arkansas Basin Roundtable process and the availability of S.B. 179 funds will certainly go a long way in reaching the objective to perform the North Lake dam improvements project. This proposal represents a direct request for a funding opportunity, offering the most direct and relevant way to solve a long-standing problem. The City of Trinidad has also requested funding for the implementation of this project from the Department of Local Affairs, Energy and Mineral Impact Assistance Program. However, due to State budget shortfalls, no funding has been awarded through this Office.

- **<u>Meeting Water Management Goals and Objectives and Identified Water Needs</u>**

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

This water activity helps complete the needs assessment for consumptive and non-consumptive needs. Our approach is not simply to overcome the operation-and-maintenance problems caused by these seeps and leaks, but to look widely and creatively at all existing and potential assets, and to develop a multi-use inventory of systems which will benefit from the stability and sustainability of these resources. Many mutual benefits are obtained by meeting the consumptive water management goals traditionally expected of a City facility as well as the nonconsumptive water management goals of the CDOW, recognizing that consumptive and non-consumptive uses apply to both entities. Storage is being allowed under "restricted" status by the State Dam Inspector.

j. The water activity meets one or more of the water management objectives identified in the Statewide Water Supply Initiative, 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 Statewide Water Supply Initiative or a roundtable's basin-wide water needs assessment done in accordance with the Colorado Water for the 21st Century Act.

The Arkansas River Basin Roundtable has determined that the single most critical water issue confronting the Basin is the current unsustainable management of surface and ground water. This project optimizes, and makes sustainable, existing and future water supplies in the North Lake Reservoir. The reservoir has been and is currently being used primarily to store raw untreated water for treatment at the City of Trinidad water treatment plant for historical rural and urban customers. In addition to storage for these entities as needed, North Lake's multiple uses include spectacular high altitude recreational fishing and boating, and wildlife habitat. CDOW makes use of the reservoir reaching its water use goals and objectives. The CDOW maintains a regular fish stocking schedule for the lake. Through this project, and by mutual agreement, the CDOW will be able to continue stocking North Lake with fresh water trout for the beneficial use as a productive fishery.

With this additional reservoir storage the City of Trinidad is also in a much better position to answer water demands in case of an uncontrollable situation such as a drought. Storing additional water also allows flexibility in how and when water is distributed to different areas, depending on needs and available resources. This operational flexibility and cost effectiveness allows for the development of new ideas and practices that will ultimately be useful to wildlife as well as to the public. Cooperative and innovative efforts which effectively and efficiently provide multiple uses throughout the Arkansas River Basin system will benefit all users and should be incorporated into water management plans. In all these ways, this project effectively addresses the Statewide Water Supply Initiative's Management Objectives and the Arkansas River Basin Roundtable's concerns regarding sustainability, restoring North Lake Reservoir to optimal operational reliability, and, in the process, complying with all applicable laws and regulations.

k. The water activity promotes water conservation and efficiency.

Conservation and efficient management of water in storage has become a critical part of ensuring a safe and abundant water supply throughout the year for all beneficiaries. The drought of 2002 impressed upon the minds of our customers the need to conserve water and the individual responsibility to not waste this precious commodity. This project will allow for conservation of water which has for decades been lost to leaks and seepage. One of the most important aspects of being prepared to face drought conditions is the availability of having full reservoirs. This project therefore improves the ability of the City of Trinidad water system to hold and more effectively manage the supply of drinking water and provide for a basic recreation need at the same time, now and into the future.

l. The applicant has an existing water conservation plan.

Due to the onset of drought conditions in 2002, the City of Trinidad established a water conservation plan including water restriction schedules. The plan is a tiered system which allows for greater restrictions upon water users as drought conditions persisted or allows those restrictions to be relaxed as the water supply became more abundant. Unfortunately, one of the results of conservation was a reduction in revenues for the water department.

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

Although no actual "new" water will be produced as defined under water law, in effect, maximum use will be made of established historical water rights. Should North Lake water level restrictions be put into place by the State Water Engineer's Office, whatever that amount of water reduction becomes, would bypass North Lake and move downstream, thus reducing the capability of storing water to the maximum decree afforded to North Lake. This project captures these losses, thereby producing "new" water which becomes available for multiple uses.

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

The North Lake Dam Improvement Project reflects a rehabilitation of the dam. The reservoir has a maximum capacity of 4,300 acre feet of storage, however, that maximum level would not be sustained under the scenario of a reduced lake level as would be imposed by the SEO. Maintaining the maximum amount of water available for storage not only benefits the potable water customers, but also those who would take advantage of a high mountain fishing lake. This project epitomizes the Arkansas River Basin Roundtable goal of developing storage facilities to their highest degree and becomes a model of working towards diminishing the projected 50 year gap in water supply.

- **The Water Activity Addresses Issues of Statewide Value**

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

The source of water to North Lake reservoir is the North Fork stream direct flow water rights that date back to 5-31-1861. The lake itself has storage rights that date back to 9-14-1905. This project, in effect , protects and preserves historic senior storage rights. North Lake Reservoir has been used primarily to store raw, untreated water for its ultimate use as potable drinking water after being delivered approximately two miles downstream by pipeline to the City water filtration plant. The treatment plant originally had a capacity of only 6.0 million gallons per day, but after renovation and modification, that plant capacity is now at 8.4 million gallons per day. Although there is a secondary source of water for the treatment plant, it is considered only as a back up or emergency supply.

North Lake serves a combined population of approximately 15,000 people in the city of Trinidad and the surrounding rural communities. North Lake is not only a basic component of the region's water system, it is a vital component with so many people depending on the water that comes from the reservoir. The multiple use factor as a spectacular high altitude recreational fishing and boating facility add to its tremendous value to the area.

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.

The effects of this project help to ensure Colorado's continuing ability to meet its Compact obligations. Maximum utilization of State waters is implied by the Arkansas

River Basin Roundtable's priority of maintaining sustainable water supplies and by ensuring that North Lake will have the operational flexibility to adapt to changing conditions. This project addresses both of those goals. The North Lake Reservoir provides a uniform and stable supply of water as a recreational tool for the CDOW and as a reliable source of storage for the Trinidad valley area.

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

Although there are no known threatened or endangered wildlife species in the North Lake region, the lake area is frequented by mule deer and elk. Eagles nest in areas near the Lake. Brown bears are common to the area as well as number of smaller species of animals. The North Fork stream area which feeds North Lake is a natural habitat for all of these creatures but in a greater number. The North Lake Reservoir by and through the agreement with CDOW promotes the maintenance of fish populations and recreational activities. Specifically, Rainbow trout, Stream Trout and German Brown trout are stocked in the lake by the CDOW. By maintaining a full and operational reservoir, the City of Trinidad will continue to meet its objectives as a supporter of wildlife. The reservoir allows the City and CDOW to add to degree of flexibility in planning for the most beneficial use to wildlife. What is now a seepage problem will become a positive condition that increases a productive fishery and increases the support of wildlife habitat and specifically assists in the protection of these many other species. The North Lake dam improvement project provides a high level of benefit to Colorado in relationship to the amount of funds requested.

The benefits of a completely full reservoir which will be accomplished by his project satisfy all of the objectives outlined in the Colorado Water Conservation Board's 2004 Statewide Water Supply Initiative Study. This water activity reduces soil erosion, enhances water supplies, improves water quality, increases wildlife habitat, and reduces potential damages which would be caused by flooding if the dam were to fail. Public benefits also include protecting the natural resources that help sustain high-value environmental quality in the North Lake area, while supporting continued economic development, recreation, and scenic beauty. The amount the City of Trinidad is requesting for this rehabilitation and multiple use project is more than offset by the high value which accrues to Colorado from this Project:

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

This water activity is another beneficiary of Arkansas River Basin 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 our network. Improving the North Lake reservoir is related, through this network, to other SB 179 projects such as the Santa Maria., Continental Reservoir which stores Rio Grande Compact water, San Luis Valley Water Conservancy District water, CDOW water, and Trans-Mountain water. The San Luis Valley Irrigation District is completing a multi-use enlargement study of the Rio Grande Reservoir, with goals very similar to this project's. The

deterioration of reservoirs and spillways, imposed limitations on storage, and outlet mechanisms that are past their useful life are problems this project shares with many other reservoirs throughout the state that have seen restrictions imposed upon them by the State Engineer's Office. Terrace Reservoir and Platoro Reservoir, are two other projects in the process of seeking CWCB assistance at this time. Another was the San Luis Valley Resource Conservation & Development project on the Alamosa River for the Alamosa River Watershed Restoration Foundation. Upcoming projects to CWCB will include proposals from Alamosa Riverkeepers and Terrace Irrigation Company to upgrade Terrace Reservoir, and a riparian stabilization project by the Colorado Rio Grande Restoration Foundation.

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

A reliable, dependable and high quality source of potable drinking water for established urban and rural residential and commercial customers is essential for economic growth and sustainability. Tourism is a main driver of the economy within t he State of Colorado and the North Lake reservoir is a component of the state's recreational attractions. This project, by restoring the integrity of the system, helps to support the State's economic vitality and competitiveness by meeting its obligations to the individuals and businesses that have come to rely and depend on this water throughout the region. The State's economic vitality is further enhanced by completing this project so that the final project, when complete, results in enhancing the diverse mix of consumptive and nonconsumptive needs and uses described above, including wildlife, fisheries, tourism, recreation, and conservation.

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.

The Colorado State Engineer has now placed North Lake dam under restriction due to safety considerations. The dam is currently listed as a "high hazard" dam due to the fact that should it fail, there would be serious property damage and perhaps even loss of life. The restriction as imposed requires the City of Trinidad to lower the lake level by five(5) feet over a five month period. This represents a loss of 541 acre feet of water.

The concrete spillway is significantly deteriorated and there is a serious and long-standing seepage problem on the dam. Continuing deterioration and loss of structural integrity of the dam are serious concerns and the City of Trinidad has not taken them lightly. The city has accepted the responsibility to ensure to its citizens that North Lake will remain a viable and dependable source of water to the City and the surrounding communities. To this end, the City previously contracted with the engineering firm of GEI Consultants to design/build the new piping system with in the reservoir including a new drain pipe within the dam and a completely new concrete outlet works. This was accomplished at a cost of **$847,232.59**.

The City of Trinidad has obtained the services of the professional engineering firm, RGH

Consultants to design the new dam reinforcement and spillway replacement project. The final design drawings and specifications have been submitted to the State Engineer's Office and we are awaiting final review and approval. The Project to be funded by this proposal is to conduct the actual construction of the dam reinforcement and replace the deteriorated concrete spillway with a new pipe conveyance. Hydrological and hydraulic studies of the structure were also completed as part of the engineering endeavor The cost for this engineering design to date is **$296,317.68**.

The Engineer's Opinion of Probable Construction Cost identifies the amount of **$1,848,086.00** in additional funding needed for the project. Included in this dollar figure are Direct Construction Costs, Construction Engineering and Administration, Materials Testing, City Administration and Construction Contingencies. A copy of the cost estimate is attached. The requested funding from the State fund for this project is **$739,235.00 or 40%** of the project. The result of this project , if funded, will be to remove the State-imposed restrictions on storage and to restore full operating efficiencies to the reservoir. This will allow North Lake to hold and control additional North Fork stream water; improve the City of Trinidad's ability to hold and more effectively manage drinking water which will increase the system's value in and its ability to respond in times of drought; increase the City of Trinidad's options and ability to serve third parties and greatly improve and enlarge a high mountain recreational fishery and place of wildlife habitat.

Type of Activity:

This project requests construction funding to perform the actual North Lake dam improvements described above. The project addresses both consumptive and nonconsumptive water needs. The design work has already been accomplished and the State Engineer's Office is currently reviewing the plans and specifications for the project. The end result of the project will be a complete and total package which will allow the City of Trinidad to store water in the reservoir to its maximum content taking advantage of the North Fork stream which is the source of water for the reservoir. A schematic drawing of the delivery system is described in the attached drawing titled City of Trinidad Mountain Water System which alsoos tabulayes the City' water rights.

Goals and Objectives:

The City of Trinidad is requesting $739,235 in order to perform the actual construction of the North Lake dam rehabilitation and spillway replacement project as designed by the firm of RGH Consultants, thereby removing the threat of conditional storage and/or restricted water levels in the reservoir. The project will allow the full use of the reservoir up to its alloted storage right of 4,300 acre feet of water. Specific goals and outcomes of this project are as follows:

- Address the cause of seepage and resolve seepage problems at the dam.
- Return North Lake reservoir to its full storage capability
- Eliminate limitations which could be placed on the reservoir by the SEO.
- Provide stability of the dam embankment.
- Resolve questions on permeability parameters of downstream reservoir dam embankment
- Improve reservoir capacity as a primary source of water for urban and rural customers.
- Provide an economic driver as sustainable water source for residential and commercial customers.
- Maximize potential for fishery and recreation resources.

Need:

The cost of the project described herein is estimated at $1,848,086.00. The City of Trinidad has expended $847,232.59 to date on the North Lake dam rehabilitation project and simply does not have the funds to execute and complete this project. The City undertook a Waste Water Reclamation Plant expansion and improvement project in 2000 under a twenty year loan. That project was required by State of Colorado Public Health Department mandate. There are approximately nine years remaining on the note, which prevents Trinidad from additional borrowing due to bonded indebtedness. However, as part of this grant request, the City of Trinidad is committed to contribute at least 20% ($369,616.00) towards this project and may seek a low interest loan irregardless of the current bonding capacity.

Problems and Opportunities:

North Lake Reservoir is facing the problem of not being able to be used at its full available capacity. The State Water Engineer has imposed restrictions on the water level in the lake due to safety concerns. Much needed and extremely vauable storage water will be reduced. This is especially critical in times of low precipittion and drought. It appears that this portion of Southern Colorado is in a drought condition and may remain that way for a long time to come. The earthen dam is leaking and there is seepage at the groin area of the dam. Also the existing concrete spillway has deteriorated to the point where it must be replaced. Studies, plans and design specifications have been completed and are in place. The SEO has provided review of the project plans but has yet to provide its final approval. A summary of the problems follows:

(1) The Colorado State Engineer has placed a restriction on the North Fork Reservoir. Said restriction consists of lowering the lake level by five feet over the next five months. This represents a loss of 541 acre feet of water. Furthermore, if rehabilitation measures are not performed, the threat of additional water restrictions will be imposed. See attached letter from Dick Wolfe, State Water Engineere dated June 13, 2011.Rehabilitation involves reinforcement of the earthen dam with additional earth fill at the base of the dam and replacement of the existing concrete spillway.

(2). Excessive seepage through the left abutment/groin is problematic, causing concern as to present and future deterioration of the reservoir. The condition and capacity of the spillway also requires replacement. Engineering has been completed and this is basically a “shovel ready” project.

3) The designed objective of this reservoir is to store water in North Lake Reservoir up to its full capacity of 4,300 acre feet of water. Water is currently being stored under a “conditional” basis as allowed by the State Engineer’s Office. Furthermore, the dam is classified as a “high hazard” dam due to the probability of serious property damage and potential loss of life in the event of dam failure.

4) The reservoir is considered a high value fishery, with multiple opportunities to enhance fish habitat and to expand the public recreational value of the area.

Expectations of the Participants:

A rehabilitated North Lake dam will restore the reservoir’s designed capacity, providing improved options for efficient water management of raw water which is piped to the City water filtration plant. This water facility is the only water purveyor in the entire area, serving Trinidad and multiple water user associations connected to the water distributuon system. There is an established expectancy by current rural and urban households that the water they have been accustomed to receiving will always be there. Indeed , as the regions’s only water supplier and purveyor , this reponsibility weighs heavily on the City of Trinidad. To have the reservoir level reduced from it maximum content of 4,300 acre feet could be devstating especially in timesof severe driught. As a fishery, its value

to recreation in the area and to the State of Colorado generally are of extremely high value. The requested funding in the amount of $739,235 will accomplish the folowing tasks: (See "Exhibit A" for detailed project description).

Task 1.1 Contractor mobilization, erosion and sediment control, clearing and grubbing and reservoir control.

Task 1.2 Dewatering, site access road improvements and crest earthwork.

Task 1.3 Construct new spillway structure, new spillway pipe and removal of existing spillway.

Task 1.4 Perform secondary pipe grouting, gate tower repair and outlet works disposal.

Task 1.5 Furnish and place low permeabiltiy fill, furnish and place berm fill, furnish and place filter sand and furnish and place drain gravel.

Task 1.6 Place topsoil, type M riprap, type L modified riprap and riprap bedding.

Task 1.7 Install outlet works pipe, manhole, toe drain pipe, instrumentation, seeding and oyhere remaining miscellaneous work.

Importance:

A statewide benefit of this project is that increased storage capacity in North Lake Reservoir provides new options to store and control additional North Fork stream water and expands opportunities to serve the water storage and management objectives of third parties. North Lake's multiple uses include spectacular high altitude recreational fishing and boating, and wildlife habitat. In the Arkansas River Basin, as is the case throughout most of Colorado, water is overallocated, demands are growing, and river flows and uses are vulnerable to drought and climate change. As of March, 2011, snowpack in the upper Purgatoire watershed (Whiskey Creek snotel) was approximately 50% of average. Serious drought conditions began in 2002 requiring water consumption restrictions to be put into place and it appears this patternis continuing. In the 2002 drought diversions were severely curtailed, in-stream flows were diminished, reservoir storage was reduced, and extensive diversions threatened endangered species. In such times high drought impacts have drastically reduced stream depths or caused them to be completely dry, increasing the importance of water held in storage for all users and for the protection and enhancement of wildlife potential. When water levels are sufficient to maintain minimum stream flows, the streambeds and the reservoir support good to excellent trout fisheries.

Such fluctuations in flow require North Lake Reservoir to be as stabile and to maintain optimum operational flexibility as much as is humanely possible. In coming years, just this kind of high variability in the availability of water resources is predicted. Good planning for sustainability in the management of reservoir systems requires increasing the operational flexibility of North Lake Reservoir to its maximum capability – and all reservoirs in the basin -- in order to provide a regular supply that meets water demands. By addressing and curing long-standing deficiencies in the system, North Lake provides important multi-use safeguards for the uncertain times which lie ahead. There are also other lower impact activities associated with the lake such as wildlife viewing, bird watching, outdoor photography, nature research, and related pursuits. The fall season brings an influx of hunters into the region. These activities also represent a source of income to the CDOW and offer lower management costs to public agencies. It's a very important project.

Service Area – Geographic Location:

North Lake Reservoir is located in Section 19, Range 68 West, Township 33 South, in Las Animas County, on a tributary of the North Fork stream, in the Sangro de Christo Mountain range of southern Colorado. The water

rights have a remarkable history and are listed as follows:

Priority 1, 05-31-1861, 1.59 cfs.
Priority 3, 11-30-1861, 2.00 cfs.
Priority 4, 01-01-1862, 2.35 cfs.
Priority 6, 04-01-1862, 1,78 cfs.
Priority 13, 01-01-1864, 0.45 cfs.
Priority 155, 09-14-1905, 57.6 cfs.

The storage priority water rights also dates back to 1905. The original dam was built in the 1930's, and the lake was expanded in 1964 to its present configuration. The old original dam still lies in place under the lake. The high water elevation of the lake is 8,586 feet, the crest of the dam is at 8,592 feet. The reservoir can be located on the Stonewall USGS quad topographical map.

Other Relevant Issues: (none)

TABOR issues: There are none involved.

5. Please summarize the proposed scope of work. Please refer to Part 2 of the Criteria and Guidance document for detailed requirements. On the following page there is an example format for the Scope of Work. You can use the example format or your own format, provided that comparable information is included.

The scope of work should outline by task how the water activity will be accomplished. It is important that the scope of work detail the specific steps, activities/procedures that will be followed to accomplish the water activity and the specific products/deliverables that will be accomplished. The scope of work should include but not be limited to: task description, key personnel, budget, schedule and deliverables and the final report/project documentation upon completion of the water activity.

SCOPE OF WORK

The City of Trinidad selected the best engineering and consulting firm for this proposed North Lake dam rehabilitation project. Following are the basic segments of the Scope of Work. This information is elaborated upon in the attached "Exhibit A" – RGH Consultants Design Summary Report/SEO Review Submittal.

Task Description:

1. Specific tasks which have been accomplished and or completed by the engineering firm of RGH Consultants: Performed the necessary hydrologic, hydraulic geotechnical, seismic, structural and conduit evaluations and other work to determine required spillway size and method of reinforcing the earthen dam. Determined the hydrologic/hydraulic adequacy of spillway, according to State's regulations, so as to lift current restrictions. In addition, completed a complete construction report with recommendations to accomplish the work at hand. A copy of the report is included as "Exhibit A" attached herein.

2. RJH Consultants have prepared complete written specifications, design drawings of the necessary dam improvements to mitigate leakage and seepage through the dam groin area, new spillway design and other appurtenant work tasks. Engineering expenses to accomplish these tasks are just under $300,000 to date.

3. Following the acquisition of funding, the task will be to actually construct the project. The engineer's "Opinion of Probable Construction Cost" identifies a total amount of $1,848,086.00. A crucial component of this expense is the Construction Engineering and Administration costs for the Engineering firm's representatives to be on site during construction. This factor has an estimated cost of $260,000, included in the total amount.

II. Key Personnel:

Robert Huzjak, professional Engineer, RGH Consultants and representatives; State Engineer's Office dam inspectors; City of Trinidad utility department personnel.

III. Budget:

The City of Trinidad has previously expended funds in the amount of $847,232.59 towards the rehabilitation of the North Lake dam. That work consisted primarily of replacement of pipes and valving in the control tower and construction of new outlet channel at the base of the dam. The preliminary cost estimate to accomplish the remaining dam rehabilitation is $1,848,086.00. The City of Trinidad is prepared to contribute to $369,616.00. towards the project which equates to 20% of the total cost. The funding request herein from the State Water Supply Reserve Account is $739,235.00 or 40% of the total. The remaining balance is $739,235.00 (an additional 40%) which will be funded by additional grant requests by the City of Trinidad, most likely requested through the Energy and Mineral Impact Assistance Program of the Department of Local Affairs (D.O.L.A.), or through a low interest loan. A copy of the engineer's "Opinion of Probable Construction Cost" is included and attached as "Exhibit B".

IV. Schedule:

Assuming the grant request is approved and funding is obtained by this fall, the project will then be advertised for construction with bids to be received this winter. It is anticipated that actual construction would begin in the Spring of 2012.

V. Final Report/Project Documentation:

Upon completion of the work by a suitable and qualified constructer, the details of the project will then be summarized in a written report with to include photographs of the work efforts. A number of original documents will be created, one for the engineering firm's record, several for the City of Trinidad's records, and several for the entities awarding the grant funds (CWCB, DOLA, etc.)

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.

Water supplies to North Lake Reservoir include flows from the North Fork stream which also includes the old priorities of Burroughs Ditch and Clark No. 1 and Clark No. 2. The only direct flow to

North Lake is through a diversion canal from the North Fork over and into North Lake. Flows from this mountain stream are primarily regulated by the Water Commissioner for Division 2 of the Arkansas River Basin. Flows are based on reservoir requirements and storage rights within the reservoir. The effect of this water project will be to increase storage at North Lake Reservoir and to provide a full lake which is an extremely important component as a fishery for the CDOW. This Project has the effect of increasing the flexibility of CDOW to use the lake more effectively and to the greatest benefit for a variety of wildlife and wildlife habitat. Water stored in the reservoir is released to meet residential and commercial needs of both urban and rural customers' needs of potable drinking water after the reservoir flow is treated at the City's Water Filtration Plant. A secondary multiple use is for fish propagation as administered by the CDOW. Recreational fishing and boating, deer and elk big game wildlife, and waterfowl nesting are sustained and kept in balance with a full reservoir.

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

As detailed above, the engineering firm of RGH Consultants has already prepared the hydraulic and hydrological studies, the geotechnical and seismic studies and the analysis of the existing structure and conduits that enabled them to prepare a complete set of written specifications and a complete set of design drawings for the construction of the North Lake dam rehabilitation project. Engineering cost to date total $296,317.68.

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

Additional information is provided for the North Lake dam rehabilitation project by several attached documents as follows:

1) "Exhibit A" – RGH Consultants Design Summary Report/SEO Review Submittal.
2) "Exhibit B" – Engineer's Opinion of Probable Construction Costs.
3) "Exhibit C" – EIAF Report of previously expended funds.
4) "Exhibit D" – Letters of Support.
5) "Exhibit E" – Map of the City of Trinidad Mountain Water System
6) "Exhibit F" – Topographical map of under water survey of North Lake
7) "Exhibit G" – Letter from Dick Wolfe, State Water Engineer and North Lake Reservoir Capacity Table.

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

Signature of Applicant: _____

Print Applicant's Name: Jim Fernandez, Utilities Superintendent

Project Title: North Lake Dam Rehabilitation Project

Date: July, 2011 (Amended)

Applicant's Telephone/FAX/E-Mail Address: Office : 719-846-9843, ext 122
Fax: 719-846-4140
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Return this application to:

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
To submit applications by Fax, send to: (303) 894-2578