STATE OF COLORADO

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TO: Colorado Water Conservation Board Members

FROM: Steve Biondo, Finance Manager
Tim Feehan, P. E., Chief
Finance Section

DATE: September 3, 2010

SUBJECT: **Agenda Item 26, September 13 - 15, 2010, Board Meeting – Severance Tax Trust Fund Operational Account Recommendations**

Introduction

The Colorado Water Conservation Board (CWCB) is entitled to an amount up to a 5% share of the Operational Account of the Severance Tax Trust Fund. In January 2010, CWCB received applications for funding that becomes available from the Operational Account in July 2011 via the Long Bill enacted by the General Assembly. CWCB Staff reviews the applications and then ranks the projects in order of High, Medium and Low. The rankings provide a means of prioritizing the projects since the exact amount that will be appropriated is unknown until Fiscal Year 2011 – 2012. Although a ranking may be high, the funds provided may be less than the requested amount when the total appropriated amount is known. The projects under review are summarized in Part C of this memo and are ranked per CWCB Staff.

Part A and Part B to this memo are presented for informational purposes only.

Recommendation

Staff recommends that the Board approve the ranking of the projects proposed for funding from the Operational Account of the Severance Tax Trust Fund as presented in Part C, Attachment B. Funding will be based upon the amount appropriated by the General Assembly and distributed by Staff as deemed appropriate to complete each project starting with those ranked as high.

Background

After July 1995, one-half of the severance tax receipts credited to the Department of Natural Resources (DNR), for the Severance Tax Trust Fund are provided to the Operational Account of the Severance Tax Trust Fund. The programs supported by the Operational Account must promote natural resource planning, management, and development related to minerals, energy, geology, and water.

The General Assembly *may* appropriate funds to the following agencies from the total amount of money in the Operational Account as follows:

Colorado Oil and Gas Conservation Commission	40%
Colorado Geological Survey	20%
Division of Reclamation, Mining and Safety	25%
Colorado Water Conservation Board	5%
Division of Wildlife	5%
Division of Parks and Outdoor Recreation	5%

CWCB requests are reviewed by CWCB and are then forwarded to the state Minerals, Energy and Geology Policy Advisory Board (MEGA Board) for review and approval. MEGA Board recommendations are then forwarded to the DNR Executive Director for further review and inclusion in the DNR's annual budget request.

The use of these moneys requires about 15-18 months advance planning. Information about our application process is available on our web site.

In the previous Fiscal Year (2009 - 2010), CWCB received requests for funding totaling $3,389,100; we received $1,275,500. For Fiscal Year 2010 - 2011, CWCB recommended $2,404,696 in funding and we received $1,275,500. This money is appropriated through the Long Bill.

Part A of this memo summarizes the completed spending for the previous Fiscal Year 2009 – 2010.

Part B of this memo summarizes the spending plan for the current Fiscal Year 2010 – 2011.

Part C of this memo outlines the requests we have received (our application deadline was January 31, 2010) and have reviewed internally to share with the MEGA Board when it meets this year. The proposals have been prioritized due to the limited amount of projected funding. *Depending on the review by the MEGA Board and the DNR Executive Director, these requests may have to be further prioritized and/or reduced.*

Attachment A to this memo details the Severance Tax Distribution Process.

Attachment B to Part C of this memo is a summary of the Fiscal Year 2011 – 2012 proposed projects and their respective ranking.

A. Previous Year Funding Status

The following table illustrates our previous severance tax expenditures. The project status was provided in the Non-Reimbursable Investments Status Report to the Directors Report of this Board meeting.

CWCB – Severance Tax Trust Fund – Operational Account – Fiscal Year 2009 - 2010

Projects Completed	**Project Allocation**
Water Supply Protection Program	
Intra-State Water Planning	$ 0
Recreation Project	$ 58,000
Elkhead Creek Transit Loss Project	$ 66,000
Water Resource Considerations of Raton Basin CBM Produced Water	$125,000
Uncompaghre Project Surface Water Irrigation System	$ 25,000
Finance Program	
Grand Mesa Regional General Permit – Fen and Wetland Project	$ 75,000
Animas La Plata Marketing Plan	$ 25,000
Stream and Lake Protection Program	
Meeting Non-consumptive Needs	$ 83,000
Dolores River Dialogue	$ 99,000
ISF Legal Protection Support	$ 40,000
Water Conservation Planning Program	
Statewide Water Conservation Initiative Project	$ 91,500
Water Education	$ 16,000
Drought Project	$ 75,000
Flood Protection Program	
Multi-Objective Watershed Restoration Projects	$139,500
Flood Mitigation and Project Compliance	$ 72,400
NRCS SNOTEL Site Installations	$ 55,000
Platte River Boat Chute Improvement & Vegetation Removal	$ 49,500
FEMA Coordinator Matching Program	$ 43,600
Water Information Program	
Colorado Water Needs and Alternatives Analysis	$ 36,000
A Remotely-Sensed Dual Coef Eval of Water Usage in the Ark River Lysimeters	$ 25,000
Intra-State Water Management Program	
Basin Needs Decision Support System	$ 33,400
Operating Expenses	$ 16,137
Total	**$1,249,037**

B. Fiscal Year 2010 – 2011 Spending Plan

Below is a list of projects and the allocated funds of $1,275,500 for Fiscal Year 2010 - 2011. The Board approved the prioritization of these projects in March 2009.

CWCB – Severance Tax Trust Fund – Operational Account – Fiscal Year 2010 – 2011

Projects	Funding Request	Revised Amounts
Water Supply Protection Program		
Intra-State Water Planning	$250,000	$130,500
Adaptive Management of Zebra Mussels	$ 50,000	$ 50,000
Recreation Project	$150,000	$ 75,000
Tamarisk Bio-Control and Vegetative Response Monitoring	$ 94,640	$ 85,000
Streamflow Forecast Improvement Study	$100,000	$100,000
Stream and Lake Protection Program		
Water Development Impacts on Yampa River Streamflow	$ 70,000	$ 70,000
Stream and Lake Protection Outreach and Education	$ 10,000	$ 10,000
ISF Case Management and Legal Protection Support	$ 60,000	$ 60,000
Water Conservation Planning Program		
Water Conservation and Drought Mitigation Planning Program	$100,000	$ 0
Drought Planning and Water Adaptation	$100,000	$100,000
Statewide Water Conservation Initiative Project	$100,000	$ 75,000
Water Education	$ 75,000	$ 50,000
Estimating the Cost Effectiveness of Water Conservation Programs	$ 50,000	$ 0
Flood Protection Program		
Flood Mitigation and Project Compliance	$250,000	$150,000
Multi-Objective Watershed Restoration Projects	$150,000	$150,000
Hydraulic Analysis of Reconfigured Stream Channels	$ 98,000	$ 50,000
Suspended Sediment and Bedload Data Collection Study	$ 38,070	$ 0
NRCS SNOTEL Site Installations	$ 30,000	$ 30,000
Integrated Evapo-transpiration Monitoring Systems	$ 49,500	$ 0
Colorado Community Rain and Hail System	$ 15,000	$ 15,000
Mobile Radar Gap Filling Project	$ 40,000	$ 0
FEMA Coordinator Matching Program	$ 40,000	$ 40,000
Water Information Program		
National Hydrography Stewardship Program	$ 25,000	$ 0
Colorado's Virtual Water Matrices	$ 25,070	$ 0
Intra-State Water Management Program		
Integration of Land Use Practices and Water Supplies	$149,416	$ 0
Interbasin Compact Process Technical Support	$250,000	$ 0
Assessing the Relative Costs/Values of New Water Supply Options	$ 35,000	$ 35,000
Totals	**$2,404,696**	**$1,275,500**

C. Fiscal Year 2011 - 2012 Requests

The following is a summary of the requests we received from constituents and developed internally.

Water Supply Protection Program

1. Intra-State Water Planning

Beneficiary/Grantee/Contractor: CWCB, Various
Amount of Request: $100,000 **Ranking:** High

Product Produced: CWCB needs funding to meet immediate needs for planning funds and to provide assistance to local entities related to water planning. This assistance has taken the form of grants that result in water planning products within one year. CWCB is implementing the statewide water supply initiative and is supporting the basin Roundtables. CWCB also has the responsibility to address other water planning needs that emerge during the fiscal year, but for which no other funding source is available. These funds are also used, in part, to help local entities meet immediate needs and to plan for the future. The funds are also used to get cooperative efforts "off-the-ground."

Water Planning Relationship: The Statewide Water Supply Initiative (SWSI) process highlighted the need for funds to support local planning efforts. This need is expected to continue.

Recommendation: Staff gives a high recommendation to funding of this project because the information produced and made available will provide a consistent, factual basis for local and statewide water planning efforts.

2. Recreation Project

Beneficiary/Grantee/Contractor: CWCB, Various
Amount of Request: $80,000 **Ranking:** High

Product Produced: The products produced will include: 1) data collection related to recreational issues that have effects on the State's ability to fully use its compact entitlements; 2) recreational studies or design work related to improving existing diversions that impact recreation, or improving in-channel diversions that are not operating in a safe and efficient manner; 3) design drawings for communities that seek to build a Recreational In-Channel Diversion (RICD) that promotes maximum utilization and that allows Colorado to fully use its compact entitlements; 4) construction of RICD structures that promote maximum utilization, prevent flooding, and allow Colorado to fully use its compact entitlements; and/or, 5) work associated with potential litigation support to the extent that an RICD water right application is filed that does not promote maximum utilization or the ability of Colorado to fully use its compact entitlements.

Water Planning Relationship: Recreational use of water is becoming increasingly important to local communities and the State. Wild and scenic rivers and RICD water rights, and the structures themselves, affect water planning in many important ways. The statutes and CWCB's policies on recreational use of water and on RICD's demonstrate a need to ensure compliance by local communities and to help protect Colorado's compact entitlements and to assure maximum utilization of Colorado's water resources. To the extent that recreational uses of water and RICD structures are designed and constructed in a manner that promotes maximum utilization of Colorado's water

resources and that allows Colorado to fully use its compact entitlements, then CWCB's missions are being fulfilled.

Recommendation: Staff gives a high recommendation to this project because the funding will help to enhance compliance with the goals of maximum utilization of water resources and promoting non-consumptive uses within Colorado, in an appropriate manner.

3. Upper Black Squirrel Creek Ground Water Model

Beneficiary/Grantee/Contractor: Local Water Users, Upper Black Squirrel Creek Designated Ground Water Management District, Martin and Wood Water Consultants
Amount of Request: $137,000 **Ranking:** High

Product Produced: This study will develop a reliable assessment tool in the form of a numerical three-dimensional groundwater flow model that can be utilized to better understand and manage the Upper Black Squirrel Creek alluvial aquifer. The work envisioned will include data development and analysis relating to the hydrology of the basin, the basin lateral extents, the hydrogeological characteristics, the nature and magnitude of the alluvial underflow, the volume of water in alluvial storage, the levels of well pumping, estimated annual recharge to the alluvial aquifer, and the net water balance. All of the data collection and analysis is aimed at development of a model that can be used as a tool to assess the impact of various projects and natural cycles within the basin.

Water Planning Relationship: The model will be used as a tool to assist with reliable and responsible long-term management of the water resources of the basin so as to provide the maximum benefit to all the users within the basin. It will assist in the efficient use of the resource, aid in drought planning, and be used as an administrative tool with the goal of maximizing cooperative and equitable water use in the basin.

Recommendation: Staff gives a high recommendation to this project because it will serve as a valuable tool that will significantly increase the understanding of the basin hydrogeology and that will be extremely helpful in managing the limited water resource to enhance the most efficient and sustainable use.

4. El Paso County Groundwater Quality Study

Beneficiary/Grantee/Contractor: Local Water Users, El Paso County Commissioners, Colorado Geological Survey
Amount of Request: $60,000 **Ranking:** Medium

Product Produced: This project would involve installation of a groundwater quality monitoring network which after several additional years of data collection would allow local governments to consider the need for additional land use regulations to protect groundwater resources.

Water Planning Relationship: Regulations, if necessary and adopted, would protect a limited and intensely used local water resource.

Recommendation: Staff gives a medium recommendation to funding for this study because groundwater quality protection is not a core function of the CWCB, and other non-CWCB funding sources would be more appropriate for this type of work.

5. TSTool Software Enhancements for Water Providers and Users

Beneficiary/Grantee/Contractor: Statewide, Riverside Technology, Inc.
Amount of Request: $60,000 **Ranking:** Medium

Product Produced: Enhancement of existing Decision Support System (DSS) data management tools to allow the public to obtain, view and analyze federally-produced water data (i.e. USGS, NRCS, USDA) along with data already available through the DSS.

Water Planning Relationship: Provide the public with increased ability to view and use water data from more sources for water management and planning.

Recommendation: Staff gives a medium recommendation to this project because of other high priorities this year. This enhancement would be a valuable addition to the DSS framework and may be funded in future years through severance tax funding or through DSS funding.

6. Recent Trends in Dust Deposition to Snowpacks in the Rocky Mountains: Influence

Beneficiary/Grantee/Contractor: Statewide, USGS
Amount of Request: $100,000 **Ranking:** Medium

Product Produced: Analysis of dust deposition in the Rocky Mountains in recent years and its estimated impact on snowmelt runoff timing.

Water Planning Relationship: Recent studies have indicated that dust deposition may be influencing snowmelt runoff timing in the Rocky Mountains. Earlier snowmelt runoff affects water management throughout the state and better understanding of the causes and trends could help water managers plan for the future.

Recommendation: Staff gives a medium recommendation to this project because of possible duplication with existing studies and tight competition for funding this year.

7. Crop Coefficients for Alfalfa Grown in the Arkansas Valley

Beneficiary/Grantee/Contractor: Statewide, CSU
Amount of Request: $75,000 **Ranking:** High

Product Produced: The project will provide another full year of alfalfa crop data using the two lysimeters at the CSU Rocky Ford research station in 2011. This would be the first full year of simultaneous use of both lysimeters with an established alfalfa crop on each. This data will be an important part of calibrating the two lysimeters before introducing new crops for study in future years.

Water Planning Relationship: The project would continue lysimeter research begun using the Board's litigation fund to get more accurate crop coefficients for use in predicting and determining crop consumptive use for Compact compliance purposes and for inclusion in the proposed Arkansas DSS, and perhaps for application in other areas of the State as well.

Recommendation: Staff gives a high recommendation to this project because of its importance to ongoing Arkansas River Compact compliance issues and the need for enhanced crop consumptive use estimates in the Arkansas Basin and statewide.

Finance Program

1. Grand Mesa Regional General Permit (RGP) – Fen and Wetlands Project

Beneficiary/Grantee/Contractor: Statewide, CWCB, Open
Amount of Request: $175,000 **Ranking:** High

Product Produced: This funding will allow CWCB to continue to support the efforts of reservoir owners on the Grand Mesa to successfully complete a Regional General Permit (RGP). The water on the Grand Mesa is protected by the Clean Water Act administered by the U. S. Army Corps of Engineers' (COE) and many of the reservoirs are located on U. S. Forest Service lands. Permits from both agencies (as well as other Federal, state, and local agencies) are usually required. An RGP will provide a more predictable and efficient permit for maintaining and improving the water supply facilities on the Grand Mesa. An RGP is a type of permit developed by the COE that is issued regionally for a common category of activity-specific projects.

Water Planning Relationship: Over the past 5 years the CWCB has approved loans to a number of water users on the Grand Mesa for reservoir rehabilitation (i.e. Bull Creek No. 4, Overland, Granby No. 12. etc). These various reservoir projects have encountered considerable delays and expenditures to address high altitude wetlands/fens associated with permitting requirements. There are over 300 active reservoirs on the Grand Mesa, which have considerable value to the surrounding communities and agricultural users. Several of these reservoirs were constructed in the early 1900's and are restricted by the State Engineer's Office or are in need of general maintenance and repair. Under the current COE permitting process, the ability of the various water users to address these repairs has been severely impacted due to permitting costs and delays.

Recommendation: Staff gives a high recommendation to funding for this project because it would provide continued funding of the RGP effort and assist the water users on the Grand Mesa by providing a cost effective permit to preserve their water decrees.

2. Cooperative Re-timing and Augmentation Enhancement Project

Beneficiary/Grantee/Contractor: Statewide, CWCB, Open
Amount of Request: $150,000 **Ranking:** High

Product Produced: This study would be a cooperative or collaborative effort between Irrigation Districts, companies or other various water users of the South Platte, to evaluate the potential benefits of re-timing existing augmentation plans to increase water availability and efficiency. In addition, this study would also evaluate the potential use of the Orphan Wells of Wiggins Augmentation Project, in various re-timing scenarios, which was funded by the CWCB Loan Program, but is currently experiencing difficulties in meeting its loan obligation.

Water Planning Relationship: CWCB over the past decade has financed a number of augmentation projects along the South Platte, from I-25 to the State Line. Providing assistance to increase water availability and efficiency for augmentation projects, through creative re-timing measures, would benefit the basin as a whole and would improve CWCB loan collateral where CWCB financing is involved. Efforts in this area are currently underway and could be further supported with additional funding.

Recommendation: Staff gives a high recommendation to funding for this project because of its importance to local water planning efforts.

3. Public and Private Pilot Reservoir Rehabilitation and Storage Enhancement Project

Beneficiary/Grantee/Contractor: Statewide, CWCB, Open
Amount of Request: $75,000 **Ranking:** Medium

Product Produced: This project would expand on the Restricted Reservoir Evaluation Study, conducted in 2008, that evaluated 15 restricted reservoirs across the state that could be potential candidates for a public/private partnership in reclaiming lost storage. The Public/Private Reservoir Enhancement Project would select one of those reservoirs from the previous study and investigate in detail the roadblocks and solutions in making a public/private reservoir storage enhancement project a reality. The items to be investigated would be statutory limitations and/or modifications, legal issues, funding options, ownership issues, maintenance and operations, etc.

Water Planning Relationship: CWCB has provided financing for reservoir rehabilitation projects throughout the state for almost 40 years. There are a large number of reservoirs throughout the state that have storage restrictions imposed by SEO due to various deficiencies. In some cases, the reservoir owner does not have the financial capability to rehabilitate the reservoir and remove the SEO restriction. Therefore, there are certain instances, as described in the Restricted Reservoir Evaluation Study, where the state could provide financial assistance in exchange for a percentage of the water/storage that is reclaimed. The water benefit potentially received by the state could be used for endangered species, instream flows, or compact compliance and put to use through private/public relationship.

Recommendation: Staff gives a medium recommendation to funding for this project because of the limited funding available.

Stream and Lake Protection Program

1. Instream Flow Program Case Management Support

Beneficiary/Grantee/Contractor: Statewide, CWCB, Open
Amount of Request: $50,000 **Ranking:** High

Product Produced: CWCB is a party in over 175 active water court cases. Stream and Lake Protection Section staff is responsible for protecting CWCB's water rights in these cases, or for obtaining a change of acquired water right to ISF use. This is accomplished by reviewing each court applicant's engineering and proposed rulings, and developing protective terms and conditions to be included in the resulting stipulation and decree. One staff member is responsible for (1) keeping track of and prioritizing review of all pending cases in coordination with the Section's engineer, (2) coordinating with the Attorney General's Office on meeting court deadlines and developing settlement and/or litigation strategies, (3) negotiating protective terms and conditions, (4) keeping case files organized and up to date, (5) maintaining the Section's electronic case database, (6) preparing various documents and presentations for Board meetings, and (6) numerous other substantive and clerical duties related to water court litigation. The same staff member also is responsible for the ISF Water Acquisition Program. Due to the need to fulfill all of these responsibilities, staff frequently falls behind in responding to requests for comments on proposed court rulings, which can result in water court cases taking longer to be finalized and costing more for all parties involved. Using this funding, the Section will retain a part-time paralegal to assist the

Section with ISF case management, including organizing case files, tracking court deadlines, prioritizing case review, and drafting pleadings, memos, correspondence and other documents as appropriate. This project will enable staff to focus on the more substantive duties and resolve more cases in a timely manner.

Water Planning Relationship: This project will enable CWCB staff to resolve water court cases more quickly and effectively, resulting in both savings and certainty to local water providers and other water users, many of which are located in areas impacted by energy and mineral development. Additionally, finalization of CWCB's change of water rights applications contribute toward meeting the State's nonconsumptive water needs.

Recommendation: Staff gives a high recommendation to funding for this project because of its importance to local water planning efforts and the direct tie to the ISF Strategic Plan.

2. Decades Down the Road II – Instream Flow Programs in The West Revisited

Beneficiary/Grantee/Contractor: Statewide, CWCB, Open
Amount of Request: $10,000 **Ranking:** Medium

Product Produced: In 2004, CWCB commissioned a study to compare and contrast the various approaches used by Western states to accomplish instream flow protection. Subsequent to the study's completion in 2005, many Western States continued to implement new legislative and intuitional changes to strengthen their programs. In fact, Colorado recently drafted new legislation that provided funding for acquisitions and new mechanisms that enabled farmers, ranchers and others to participate in the ISF Program. In addition, controversy continues to increase as water resources are stretched thin and States try to address both their consumptive and non-consumptive needs. In many cases, the Federal government gets involved to address stream flows on federal lands for wilderness and/or Wild and Scenic River protection.

This study will update the 2004 study with new information on instream flow programs in the West, and will compare and contrast those programs with Colorado's updated program. In addition, this revised study will put additional emphasis on the interaction between the States and the Federal government to address ISF protection. In doing so, it will also survey the outcome of Federal actions that result from instream programs that are deemed insufficient to meet stream needs.

Water Planning Relationship: This study will help to address the overall efficacy of Colorado's Instream Flow and Natural Lake Level Program, which will aid local water planning efforts as stakeholders attempt to balance consumptive and non-consumptive needs into the future. It will be especially important in addressing questions regarding the consequences of programs that do not achieve the resource protection goals of Federal agencies, particularly in the context of declining native fish species.

Recommendation: Staff gives a medium recommendation to funding for this project because of limited funding availability.

3. Native Warm Water Fish in the Dolores River: Laying the Foundation for a Comprehensive Adaptive Management and Conservation Strategy

Beneficiary/Grantee/Contractor: Dolores River Dialogue, Dolores Water Conservancy District
Amount of Request: $75,000 **Ranking:** Medium

Product Produced: Three products will be produced, which together will lay the foundation for the adoption and implementation of a comprehensive adaptive management and conservation program for the warm water fishery in the Lower Dolores River. Work on these products would be fully coordinated with the Colorado Division of Wildlife's research efforts and needs on the Dolores, and would also seek to involve the expertise and address the goals of the U.S. Fish and Wildlife Service. They are:

1) *An Assessment of the Warm Water Fishery on the Lower Dolores River.* This baseline assessment would include an evaluation of all existing data to determine the status and trends of the three native fish populations and non-native fish populations, as well as the distribution and habitat use by life stage of warm water fish from McPhee Dam to the confluence with the Colorado River.
2) *Conservation Strategy for the Native Warm Water Fishery on the Lower Dolores River.* This product would include refinement of sampling techniques, particularly low-water, deep pool, canyon reach sampling methodologies, and address challenges around consistency, sensitivity, and rigor.
3) *A Strategy and Protocols for the Effective Control of Non-native Warm Water Fish on the Lower Dolores River.* Non-native fish compete with and prey on native fish and may be a major impediment to maintaining and improving native fish populations on the Dolores River. There is currently no comprehensive program aimed at controlling non-native fish in the Lower Dolores River.

Water Planning Relationship: The native warm water fishery in the Dolores River below McPhee Reservoir includes three species found to be declining throughout the Colorado River Basin: the Bluehead Sucker, Flannelmouth Sucker, and the Roundtail Chub (Bezzerides and Bestgen 2002). In 2006, the increasing level of regional concern for these fish species prompted Colorado, Utah, Wyoming, Nevada, Arizona and New Mexico to develop a "Rangewide Conservation Agreement and Strategy for the Roundtail Chub, Flannelmouth Sucker and Bluehead Sucker." The Colorado Division of Wildlife is currently in the process of developing a Conservation Strategy for these three native species. By developing an adaptive management and conservation program, water resources in the basin can be effectively managed to meet both human and environmental needs.

Recommendation: Staff gives a medium recommendation to funding for this project because of limited funding availability and potential overlap with work being done by the Colorado Division of Wildlife.

4. Alamosa River Instream Flow Project

Beneficiary/Grantee/Contractor: Local Water Users, Alamosa Riverkeepers
Amount of Request: $100,000 **Ranking:** High

Product Produced: The Alamosa River Instream Flow Project is a two-phased, grass-roots effort led by Alamosa Riverkeepers and Terrace Irrigation Company. Phase I includes purchasing senior irrigation water rights, transferring the water rights to the CWCB, changing the use in water court to instream flow use, and designing the spillway improvements to Terrace Reservoir. Phase II involves reconstructing the Terrace Reservoir spillway, storing the acquired water rights in the reservoir, and releasing the water in early fall and early winter for instream flow use.

The Alamosa River Watershed Restoration Master Plan and Environmental Assessment (Master Plan) was funded by the Natural Resource Damage Settlement (NRDS) to ensure that the monies recovered from the litigation settlement would be used to "comprehensively addresses the restoration

needs of the Alamosa River watershed and is implemented in a manner that is fully and consistently integrated into existing and future Alamosa River projects and the Summitville CERCLA cleanup remedy."

Water Planning Relationship: The Alamosa Instream Flow Project is one of the key projects identified in the Alamosa River Watershed Restoration Master Plan. Additionally, instream flow use of the acquired water rights will help protect senior water rights by recharging and helping to stabilize the confined aquifer as contemplated by Senate Bill 04-222.

Recommendation: Staff gives a high recommendation to funding for this project because of its importance to local water planning efforts and its direct connection with impacts of mineral development in Colorado.

Water Conservation Planning Program

1. A Spatial Approach to Modeling and Monitoring Drought Hazard and Risk

Beneficiary/Grantee/Contractor: Local Water Users, AMEC Earth and Environment
Amount of Request: $142,000 **Ranking:** Medium

Product Produced: A time series of METRIC images for the South Platte leading into and through the 2002 drought period with extracted data and a developed process to model, map and monitor drought hazard.

Water Planning Relationship: A Spatial Approach to Modeling and Monitoring Drought Hazard and Risk project proposes fully developing and using this approach by processing a time series of METRIC images for the South Platte leading into and through the 2002 drought period. The ET, soil moisture and crop stress information extracted from this data will then be used to define processes to model, map and monitor drought hazard, and to better model drought risk to agricultural fields and rangeland by correlating spatially and temporally variable patters of drought with agricultural practice and losses suffered during the drought period. This approach has great potential to inform drought planning and management activities currently being undertaken by CWCB, support water conservation efforts by practitioners of limited irrigation agriculture, and can also contribute to the SPDSS by providing a physically-based alternative to estimating crop consumptive use of water, and also by utilizing SPDSS in drought assessment by utilizing crop classification data.

Recommendation: Staff gives a medium recommendation for funding of this project because the completion of other CWCB studies prior to the initiation of this study may help to better refine and inform the proposed effort.

2. Drought Mitigation and Response Implementation

Beneficiary/Grantee/Contractor: Statewide, CWCB, Open
Amount of Request: $150,000 **Ranking:** High

Product Produced: The creation of an improved safety net for dealing with drought throughout Colorado.

Water Planning Relationship: The Drought Mitigation and Response Implementation project seeks funds to implement the recommendations of the revised Drought Mitigation and Response Plan that will help the state 1) reduce vulnerability to drought, 2) better monitor drought to insure

prompt and timely response to drought, and 3) otherwise improve statewide mitigation and response to drought. To do this CWCB will work with other state agencies and statewide organizations that have a stake in reducing drought impacts and improving monitoring and response.

Recommendation: Staff gives a high recommendation to the funding of this project because of its importance to local water planning efforts as well as the State's initiatives and efforts to better prepare, monitor and mitigate for and against drought. These efforts are intended to help reduce the economic, environmental and social impacts experienced during times of drought.

3. Statewide Gallons per Capita per Day (GPCD) Methodology Standardization Feasibility Study

Beneficiary/Grantee/Contractor: Statewide, CWCB, Open
Amount of Request: $75,000 **Ranking:** High

Product Produced: GPCD is a means of comparing water use across water providers and predicting future demand. The purpose of this project will be to 1) Assess other Western states' attempts at standardizing GPCD methodology, specifically the State of New Mexico's efforts; 2) Determine what is involved in developing a standardized GPCD methodology in Colorado taking into consideration different water provider types and varying water sources; and 3) A report will be generated documenting the full efforts of other Western states including issues, opportunities and the relevancy of this process to Colorado.

Water Planning Relationship: Assessing the feasibility of developing a consistent GPCD methodology for Colorado will assist local planning efforts in determining more accurate future demand levels as well as assisting the ongoing SWSI efforts to determine more accurate statewide future demand levels utilizing GPCD numbers.

Recommendation: Staff gives a high recommendation to the funding of this project because there are no standards on how water providers develop GPCD numbers at present time and this project will assist CWCB to better predict future water demands through a refined GPCD metric.

4. Local Water Conservation Resource Planning Tools

Beneficiary/Grantee/Contractor: Statewide, CWCB, Open
Amount of Request: $75,000 **Ranking:** High

Product Produced: The purpose of this project is to create program tools and resources to help water providers 1) Assess appropriate conservation oriented rate structures for their service area and best practices to attain an effective conservation oriented rate structure, and 2) Assess appropriate indoor fixture strategies based on amount of existing customers vs. new customers, technological efficiencies and codes and ordinances. These water conservation planning tools will help water providers make better decisions regarding appropriate water conservation measures.

Water Planning Relationship: This project directly helps local water conservation planning by creating tools for water providers to better inform their conservation planning efforts. Better planning efforts will yield more accurate water conservation savings estimates thus creating more accurate future demand numbers. In this way, better local planning will inform more accurate statewide future demand estimates.

Recommendation: Staff gives a high recommendation to the funding of this project because water providers require more sophisticated water conservation planning tools to determine the appropriate mix of programs for their situation. As more water providers implement water conservation programs, additional support tools are needed to guide water conservation implementation choices that have favorable cost-benefit ratios for water providers and their customers.

5. The Colorado Agricultural Meteorological Network (CoAgMet): Monitoring evapotranspiration and other key elements of Colorado's climate.

Beneficiary/Grantee/Contractor: Statewide, CSU, Colorado Climate Center
Amount of Request: $50,000 **Ranking:** High

Product Produced: Develop a system and motivation for collaboration to support the collection of excellent statewide weather, climate and evapotranspiration data through the Colorado Agricultural Meteorological Network (CoAgMet).

Water Planning Relationship: CoAgMet is the sole statewide source of detailed hourly meteorological measurements of essential climate information from Colorado's principal crop growing areas. Measurements include temperature, humidity, precipitation, wind, solar radiation and soil temperature data and are used as input to models that compute and estimate evapotranspiration/consumptive use. There has already been an investment of over $1 million in the creation and expansion of CoAgMet. Now it is essential that we leverage this investment to maintain ongoing quality data collection, perform essential maintenance and instrument calibration, and provide easy access to these data. This information is essential for detecting spatial variations and regional changes in climate conditions affecting the availability and conservation of water resources in Colorado.

Recommendation: Staff gives a high recommendation for funding of this project because it leverages efforts by the state to improve drought monitoring, mitigation and response efforts and may inform adaptation efforts under potential future climate change. It also utilizes and supports the states only system of detailed hourly meteorological data.

6. Climate Change and Colorado's Prior Appropriation Doctrine

Beneficiary/Grantee/Contractor: Statewide, CSU
Amount of Request: $35,000 **Ranking:** Medium

Product Produced: Adaptation to existing economic-water resource equilibrium displacement model designed for Colorado and collaboration with water experts for application of prior appropriation under climate change scenarios. Final report will detail the results.

Water Planning Relationship: Water scarcity will increase in Colorado under scenarios depicted by climate models. With water resources already over-appropriated, water conflicts are likely to arise. This study provides stakeholders with an assessment of how the prior appropriations doctrine will allocate resources under climate change scenarios with specific emphasis on increasing consumptive use and the change in timing of water flows.

Recommendation: Staff gives a medium recommendation for funding of this project due to possible duplication of efforts with other ongoing studies.

7. Penetration and Permanence of Municipal Conservation Measures

Beneficiary/Grantee/Contractor: Statewide, CSU
Amount of Request: $35,000 **Ranking:** High

Product Produced: The purpose of this study is to better understand the efficacy and permanence of conservation tools that shape urban water demand. The study's results will help municipal water providers target conservation practices that provide the greatest marginal benefit and emphasize groups most/least likely to adopt these practices. Results will inform demand forecasting that guides water acquisition.

Water Planning Relationship: Examining the efficacy and permanence of water conservation savings directly relates to the planned demand reductions projected by water providers. Understanding what can be counted on in terms of demand reductions through water conservation is critical to predicting future demand levels statewide.

Recommendation: Staff gives a high recommendation for funding of this project because it is imperative to understand the difference between long term water conservation savings and short term drought savings. Permanency in water savings versus temporary savings due to drought is unknown at this time and will influence future statewide supply and demand projections.

Flood Protection Program

1. CWCB Flood Mitigation and Project Compliance – Statewide

Beneficiary/Grantee/Contractor: Statewide, CWCB, Open
Amount of Request: $100,000 **Ranking:** High

Product Produced: The focus of this work will be to address local requests as well as identification and design of projects that can be implemented or upgraded to reduce the flood risk. The funding will be used to provide a means of cost-sharing with local entities and other agencies to accomplish the much needed work. Cost-sharing will be emphasized when practical to leverage the funds. In some cases, some financial assistance may be provided to smaller communities to perform required one-time maintenance activities for regulatory purposes provided that the local governments and other entities benefiting from the project expend as many local resources as available to perform the work.

Water Planning Relationship: CWCB has identified a substantial need for identification of deficiencies to flood mitigation projects throughout Colorado. The best example of the use of these funds is the current nationwide focus on the condition of levees, which has already impacted some Colorado communities and is expected to impact many more in the coming years. Many of these levees and other flood control/mitigation projects are located in small or impoverished communities throughout the state that are in need of both technical and, in some cases, financial assistance. Funds from this program will be used to develop solutions to bring these projects back into technical or regulatory compliance.

Recommendation: Staff gives a high recommendation for funding of this project because flood protection infrastructure around the state is getting older and in need of maintenance and improvement. A small amount of funds can be leveraged with funds from local governments and other state and federal agencies to accomplish this work in a manner that is cost efficient to the State.

2. Multi-Objective Watershed Restoration Projects

Beneficiary/Grantee/Contractor: Statewide, CWCB, Open
Amount of Request: $150,000 **Ranking:** High

Product Produced: This project will provide funding to allow CWCB to support 6 to 8 Multi-Objective Watershed Restoration Planning Studies or Projects, with an emphasis on watershed restoration efforts, in watersheds throughout Colorado. In the past, CWCB's Watershed Restoration Program has funded studies in the Fountain Creek Watershed, in the Coal Creek watershed in and around Crested Butte, in the Lake Fork Watershed near Leadville, in the Gunnison River watershed in and around Gunnison, and the Ski Creek Watershed on Pikes Peak. These studies have addressed issues of mining impacts, water supply, streambank instability, and flood hazards. Using GIS and various hydraulic and hydrologic engineering tools, the studies have identified current watershed problems, causes of those problems, and strategies for addressing the problems in a short-term and long-term manner. The Statewide Water Supply Initiative (SWSI) has called for watershed restoration efforts to be combined with water supply projects, and this program can help meet that goal. Several watershed plans have been completed throughout the State. These watersheds are now entering the project phase of their watershed restoration efforts. This funding will support project prioritization and implementation efforts in watersheds that have completed planning phases.

The Colorado Healthy Rivers Fund Tax Check-off Program has identified numerous watersheds where local watershed groups are working to address a variety of watershed issues. The Healthy Rivers Fund generally does not have sufficient funds to award grants to all applicants. CWCB proposes to start with the list of unfunded applicants, with other watershed groups that have contacted CWCB about potential funding for watershed restoration planning and project activities, and with potential SWSI projects.

Water Planning Relationship: This program is statewide in nature and is intended to assist in meeting watershed restoration needs throughout Colorado. The specific candidate watersheds for this project will be derived from local applications and expressions of interest and from the list of potential SWSI projects. The purpose of each individual effort will explicitly address local watershed planning and project needs. CWCB will provide technical and administrative support to further local efforts (including SWSI efforts) that are already underway. To the fullest extent possible, these local efforts will emphasize watershed restoration needs.

Recommendation: Staff gives a high recommendation for funding of this project because it is another high priority within the CWCB Watershed Protection & Flood Mitigation Section. Much success has already been achieved in the past few years on watershed restoration projects (Roaring Fork River, Mancos River, Rio Grande, and others) with similar projects.

3. Hydraulic Analysis of the Hartland Dam Fish Passage

Beneficiary/Grantee/Contractor: Native Fish, USGS
Amount of Request: $68,000 **Ranking:** Low

Product Produced: Hartland Dam was constructed on the Gunnison River in 1881, effectively blocking native fish from reaching habitat in upstream reaches of the Gunnison River mainstem and the North Fork of the Gunnison. These fish include the Flannelmouth Sucker, the Bluehead Sucker, and the Roundtail Chub. Recently, modifications to the dam have been proposed and a preliminary design has been drafted that would create a fish passage and safer boating options through the dam while maintaining the function of the nearby Hartland Ditch diversion structure.

The proposed study will use the U.S. Geological Survey (USGS) multi-dimensional surface-water model system (MD_SWMS) to simulate hydraulic conditions in the designed fish passage under a range of discharges. Hydraulic conditions in the fish passage (flow depth, velocity, and shear stress) will be evaluated in the context of habitat needs and limitations of the native fish. Results of the surface-water model will enable the project engineers and resource managers to determine whether the designed fish passage will function as planned, thus reopening many miles of native fish habitat in the Gunnison River watershed.

The proposed 1-year funding will be used to collect the necessary geomorphic and stream flow data to calibrate and run the MD_SWMS model and interpret the simulations. Results will be published in a peer-reviewed paper. The study will increase the applicability of the MD_SWMS surface-water model to other river impoundments and structures.

Water Planning Relationship: The proposed study, and the ongoing USGS RCMAP project that the proposed study compliments, are designed to provide information to resource managers, planners, and designers on the effectiveness and durability of channel restoration techniques used for stream rehabilitation, sediment management, and flood protection. The proposed study increases the geomorphic range of applicability of the RCMAP, and evaluates reconfigured channel hydraulic conditions with a multi-dimensional surface-water model (MD_SWMS) developed by USGS.

Recommendation: Staff gives a low recommendation for funding because the Hartland Dam reconstruction will be complete before the money for this project will be available. This eliminates the possibility of a pre-construction survey. The Hartland Dam Project is funded through the Fish and Wildlife Service and the CWCB Fish and Wildlife Resources Fund. The Fish and Wildlife Service will be monitoring the project.

4. Hydraulic Analysis of the Lake Fork Channel Rehabilitation

Beneficiary/Grantee/Contractor: Local Water Users, USGS
Amount of Request: $98,000 **Ranking:** Medium

Product Produced: Channel modifications to mitigate a variety of riverine problems have become a common practice in the western United States. Numerous private entities and resource-management agencies have attempted to reconfigure stream channels by using designs based on different geomorphic classification schemes. However, assessing the channel response to and the effectiveness of these modifications over a long period is uncommon. The USGS Reconfigured Channel Monitoring and Assessment Program (RCMAP) is designed to evaluate the geomorphic stability of selected river reaches in western Colorado that are planned to, or have, undergone modification. The RCMAP also provides a physical framework to assess aquatic and riparian habitats in rehabilitated reaches.

The proposed study will expand the scope of the RCMAP to include a hydraulic analysis of the channel modifications of the Lake Fork at Lake City by using the USGS multidimensional surface-water model (MD_SWMS). It will be consistent with the previous MD_SWMS analyses of channel modifications at Muddy Creek, near Kremmling, Colorado. The proposed 1-year funding will be used to establish a monitoring site, to collect baseline data against which future data will be evaluated, and to evaluate channel hydraulic conditions with MD_SWMS. Results will be published in a peer-reviewed paper. The study will increase the applicability of MD_SWMS analysis of river response to channel modifications by including this high-altitude cobble river.

Water Planning Relationship: The proposed study, and the ongoing USGS RCMAP project that the proposed study compliments, are designed to provide information to resource managers, planners, and designers on the effectiveness and durability of channel restoration techniques used for stream rehabilitation, sediment management, and flood protection. The proposed study increases the geomorphic range of applicability of the RCMAP, and evaluates reconfigured channel hydraulic conditions with a multi-dimensional surface-water model (MD_SWMS) developed by USGS.

Recommendation: Staff gives a medium recommendation for funding of this project. Staff values the results of the proposed study and is currently working with the applicant to fund the study in Fiscal Year 2010 – 2011 with Severance Tax funding available for Hydraulic Analysis of Reconfigured Stream Channels. The original application contemplated analysis of the Hecla Wash restoration project (Hecla Wash is a tributary to the Arkansas River). Staff considers Hecla Wash a unique project in river restoration. An analysis of the Lake Fork of the Gunnison restoration project will provide data and information that is more widely applicable to river restoration projects in Colorado.

5. South Platte River – Downstream Channel Improvement Project – Operations and Maintenance (O&M) Funding

Beneficiary/Grantee/Contractor: Local Water Users, CWCB, UDFCD & USGS
Amount of Request: $250,000 **Ranking:** High

Product Produced: CWCB owns and operates the largest flood control project in Colorado, the Downstream Channel Improvement Project (Project). After the construction of the Chatfield Dam, the immediate downstream reach of the South Platte River was straightened and lined with rip rap. The Project is annually inspected by the U. S. Army Corps of Engineers (Corps). The Corps has given the Project minimally acceptable ratings for several years and staff has been working diligently to address issues named in the annual inspection report. Vegetation removal, culvert cleaning, boat chute repair, and training dike repairs are some of the recent activities. The original authorization from 1979 of $717,000 has dwindled down to just under $100,000 in FY 2010. Based on FY 2011 work, there will be little to no funding in this authorization in 2012. The work is performed by the Urban Drainage and Flood Control District and other contractors to maintain an acceptable status by the Corps. An unacceptable rating could create impacts to floodplain for Littleton, Englewood and Arapaho County increasing the need for flood insurance.

Water Planning Relationship: Flood Control and Floodplain Management is a vital part of water planning. Funding for these activities would uphold the agreements between the State of Colorado and the federal government.

Recommendation: Staff gives a high recommendation for funding of this project because of the obligations and agreements between the State and the federal government.

6. Climatology of Super Cooled Liquid Water Study Update

Beneficiary/Grantee/Contractor: Statewide, CWCB, NOAA
Amount of Request: $35,000 **Ranking:** Medium

Product Produced: This was a scientific study to characterize super cooled liquid water (SLW) in clouds through various high elevation CDOT weather stations in various regions of Colorado. SLW is the fuel needed for cloud seeding programs. This would be an update to an existing report and would have expanded the regions in terms of years and data points in the analysis. This has been a

useful tool in planning to help determine which months of winter are the best ones and where are the best areas to allocate resources for cloud seeding.

Water Planning Relationship: This is beneficial to snowpack augmentation through cloud seeding as a part of water planning.

Recommendation: Staff gives a medium recommendation for funding of this project because there is already a baseline study and other projects are a priority in this fiscal year.

7. Community Collaborative Rain, Hail and Snow Network (CoCoRaHS): Enhancing the network to improve flood forecasting, warning and assessment in Colorado

Beneficiary/Grantee/Contractor: CSU, Colorado Climate Center, Various
Amount of Request: $26,400 **Ranking:** Medium

Product Produced: The Community Collaborative Rain, Hail, and Snow Network **(**CoCoRaHS) was founded in 1998 in northern Colorado and has now expanded to several western states. It currently engages over 1,500 volunteers to measure rain, hail and snow throughout Colorado as well as to report abnormalities. For instance, a huge flash flood resulting from a highly localized intense rain storm that dropped over 14 inches of rain over a few neighborhoods in Fort Collins, Colorado, helped point out the role that volunteers can play to report weather events, track rainfall patterns, help scientists, and monitor water resources.

Water Planning Relationship: These rain gauges provide an important source of one day total rain fall volumes useful in scientific studies, models, and analysis.

Recommendation: Staff gives a medium recommendation for funding of this project because there are other important priority projects for the CWCB and limited funding.

8. Evaluating the Benefits of Radar Data for Improving Snow Melt Runoff Forecasts

Beneficiary/Grantee/Contractor: Local Water Users, NOAA
Amount of Request: $50,000 **Ranking:** Medium

Product Produced: The product produced from this field scientific study would be a report and recommendations for advances in snow science and snowpack models using mobile radar technology. This would be a collaboration with matching funding from NCAR and NOAA.

Water Planning Relationship: This provides advances in observation tools for snow science, snowpack models and water supply forecasts.

Recommendation: Staff gives a medium recommendation for funding of this project because other projects were deemed higher priority for the CWCB and there is limited funding.

9. FEMA Coordinator Matching Program

Beneficiary/Grantee/Contractor: Local Water Planners, CWCB, Various
Amount of Request: $40,000 **Ranking:** High

Product Produced: The FEMA Coordinator Matching Program which includes the Community Assistance Program (CAP) is a product-oriented financial assistance program directly related to the flood loss reduction objectives of the National Flood Insurance Program (NFIP). States and communities that are participating in the NFIP are eligible for this assistance. CAP is intended to identify, prevent, and resolve floodplain management issues in participating communities before they develop into problems requiring enforcement action. In Colorado, the program is based on a 75:25 (federal to non-federal) cost-share basis and has been in existence for over 20 years. This program has been very effective in helping communities to understand and realize the benefits of the NFIP and to assist in making sure that they follow the program guidelines for the highest benefits.

Water Planning Relationship: This work fits in centrally with the CWCB's mission of helping to protect Colorado's citizens from flooding damages, as floodplains are defined as areas of statewide interest. This coordinator position helps provide long-term benefits in the terms of greater flood awareness and reduced flood damages and susceptibility.

Recommendation: Staff gives a high recommendation for funding of this project because of the importance to flood protection and water management. This cost-share funding is crucial to assure the continued success of the program and to ensure continued federal funding for the full-time position.

10. Sago Pondweed Management Using Mid-Season Drawdown Treatments

Beneficiary/Grantee/Contractor: Statewide, CSU
Amount of Request: $24,750 **Ranking:** Medium

Product Produced: This would be a continuation of ongoing field research and the development suitable treatments for canal weeds that are plaguing Colorado.

Water Planning Relationship: Canal and weed maintenance strategies for better water conveyance contributes to water planning.

Recommendation: Staff gives a medium recommendation for funding of this project because other projects were priorities for the CWCB and funding is limited.

11. Common Reed Management in Colorado

Beneficiary/Grantee/Contractor: Statewide, CSU
Amount of Request: $23,595 **Ranking:** Medium

Product Produced: This project is similar to the Sago Pondweed to research treatment and management strategies for the Common Reed. This has been an issue in Nebraska and it is creeping its way up the South Platte River into Colorado.

Water Planning Relationship: Vegetation management strategies for better water conveyance contribute to water planning.

Recommendation: Staff gives a medium recommendation for funding of this project because other projects are a priority in this fiscal year and funding is limited.

12. Climate and Water Supply Podcasts for the Benefit of Flood and Drought Forecasting and Preparedness

Beneficiary/Grantee/Contractor: Statewide, CSU, Colorado Climate Center
Amount of Request: $40,000 **Ranking:** Low

Product Produced: The project by the CSU Colorado Climate Center is to create abbreviated versions of the summaries from the Governor's Flood Task Force and Water Availability Task Force meetings and hold them via podcast during spring run-off season.

Water Planning Relationship: This would provide water information for water planners.

Recommendation: Staff gives a low recommendation for funding of this project because of other higher priorities for CWCB and funding is limited.

13. Ecological-Economic Tradeoffs of Wetlands Created by Traditional Flood Irrigation Practices in Western Watersheds

Beneficiary/Grantee/Contractor: Statewide, CSU
Amount of Request: $50,000 **Ranking:** Medium

Product Produced: A pilot project would be conducted in the North Fork of the Cache la Poudre watershed, as a means of comparison between North Park and South Park water management schemes. Products would include spatial mapping of wetlands, including "unintentional" wetlands created by traditional flood irrigation practices. Biodiversity and ecosystem-service values associated with the wetland areas will be listed. Benefits and costs will also be developed, along with an analysis of policy options.

Water Planning Relationship: Flood irrigation has been an agricultural practice used by farmers and ranchers in the West for over a century. In addition to supporting agricultural production, leakage from pathways transporting water to irrigated fields contributes to the creation, albeit unintentionally, of wetland areas that provide habitat for biodiversity (including endangered species; e.g., Preble's meadow jumping mouse), as well as provide ecosystem services which benefit human communities.

Across semi-arid regions of the Western United States, proposed water conservation projects will result in substantial alterations to current hydrologic flow regimes, as well as changes in the availability of irrigation water that maintains these "unintentional" wetland areas. Furthermore, discussions about enhancing water-use efficiency have emphasized the need for agriculture to adopt more efficient practices. In this context, there is pressure for agricultural producers to abandon flood irrigation, as it is a more water intensive practice than alternative technologies. This pressure is often coming from urban areas where water rights are being leased or purchased to supply expanding human populations.

While there are complex ecological, economic, and social issues at play in evaluating water infrastructure investments, the potential loss of "unintentional" wetland areas – and corresponding impacts on biodiversity and ecosystem-service values – is a dimension that has received little quantification. Given the information gap that currently exists related to the value of these wetland areas, the study aims to (1) develop a conceptual framework, (2) compile supporting empirical data to inform, and (3) complete a quantitative assessment of the expected costs and benefits resulting from alternative policy options and their corresponding impacts on wetland areas maintained by traditional irrigation practices.

Recommendation: Staff gives a medium recommendation for funding of this project because rather than low, due to the currently unquantified nature of ecological and economic tradeoffs for wetlands created by traditional irrigation practices. The leveraging factor through a one to one cost-share match by the applicant is an attractive component of this proposal.

Water Information Program

1. Establishment of a Groundwater-Level Monitoring Network in the South Platte Alluvial

Beneficiary/Grantee/Contractor: Local Water Users, USGS
Amount of Request: $91,000 **Ranking:** Medium

Product Produced: Groundwater levels in the South Platte alluvial aquifer have been measured by various Federal, State, and local agencies beginning in the 1940's and continuing to the present (2010). While many of these water-level data have been compiled in the Colorado Division of Water Resources database, Hydro Base, many current and historical measurements also reside in the USGS National Water Information System (NWIS) database, and there are databases maintained by individual agencies. At a recent meeting of groundwater users and administrators, there was consensus that a centralized and publicly available repository of water-level data would be of benefit to all data users. An established groundwater level network based on review and interpretation of the available data would also be advantageous to further understanding of spatial and temporal variation of the water table and to avoid duplication of efforts. The overall objective of this project is to establish a regional water-level monitoring network for the South Platte alluvial aquifer. Specific tasks for funding are: (1) develop and publish up to 5 interpretative water-table maps for the alluvial aquifer for selected time periods as well as maps of water-level change between the selected time periods; (2) recommend water-level monitoring locations and wells on the basis of the interpretative maps to establish a long-term groundwater level monitoring network for the South Platte alluvial aquifer; and (3) establish field and data management procedures to coordinate future water-level data collection by various agencies.

Water Planning Relationship: The proposed project will contribute to data availability and understanding of spatial and temporal variability in groundwater availability in the South Platte alluvial aquifer. The results can be compared to the South Platte Decision Support System (SPDSS) alluvial aquifer modeling results to improve model calibration and enhance management of Colorado's water resources in the South Platte River Basin.

Recommendation: Staff gives a medium recommendation for funding of this project because of potential overlap with ongoing CDSS activities. Hydro Base includes all USGS water level measurements in Colorado, refreshed on an annual basis, and CWCB and DWR staffs are working on procedures to include annual updates from other entities measuring water levels in the South Platte Basin.

2. Denver Basin Groundwater-Level Monitoring in Rural Douglas County

Beneficiary/Grantee/Contractor: Local Water Users, USGS
Amount of Request: $62,600 **Ranking:** High

Product Produced: Water supply for the growing population of Douglas County, Colorado, is provided primarily by groundwater pumped from confined aquifers in the Denver Basin bedrock aquifer system. Outside of municipal service areas, rural residents rely on self-supplied groundwater

from domestic wells, and there is concern for the effects of continued municipal and domestic pumping on groundwater availability. The Douglas County Rural Water Authority, established in 2009 to represent rural water users in Douglas County, and the USGS are currently (2010) in the planning stages of developing a cooperative groundwater monitoring network for rural areas of Douglas County. The planned study will establish a groundwater-level monitoring network, measure water levels, and develop potentiometric surface maps on a quarterly basis in 2010 and early 2011. Funds would be used to continue quarterly water level monitoring and evaluation through June 2012.

Water Planning Relationship: The proposed project will contribute to data availability and understanding of spatial and temporal variability in water levels in Douglas County where the growing population depends on groundwater for water supply. The data would complement the existing annual groundwater-level measurement program conducted by the Colorado Division of Water Resources. The results can be compared to the USGS Denver Basin bedrock aquifer groundwater flow model to improve model calibration and enhance management of Colorado's water resources in the Denver Basin.

Recommendation: Staff gives a high recommendation for funding of this project because of the importance of accurate and ongoing water level measurement in managing and planning for this finite groundwater resource.

3. Local Grid Refinement of the SPDSS Alluvial Aquifer Groundwater Flow Model

Beneficiary/Grantee/Contractor: Local Water Users, USGS
Amount of Request: $98,700 **Ranking:** Medium

Product Produced: A calibrated regional groundwater flow model of the South Platte alluvial aquifer is currently being developed as part of the South Platte Decision Support System (SPDSS). While the SPDSS model will accurately represent regional groundwater flow conditions, spatially refined models may be needed in some local areas to improve simulation accuracy. For example, refined grids may be needed in regions where hydraulic gradients change substantially over short distances, as would be common near pumping or injecting wells, rivers, and drains or in regions requiring detailed representation of hydrogeologic heterogeneity. Often, it is advantageous to refine more than one area of a model. This proposed demonstration project would apply the Local Grid Refinement (LGR) package of MODFLOW-2005 to a selected subarea of the SPDSS alluvial aquifer model, working in conjunction with CWCB and DWR staff.

Water Planning Relationship: The proposed project will demonstrate the use of local grid refinement for a regional groundwater flow model to simulate hydrologic processes (stream flow, ditch flow, pumping, and recharge) with refined spatial detail within the larger scale SPDSS alluvial aquifer groundwater flow model. The results will provide more accurate water-budget calculations for the refined study area than can be calculated with the regional SPDSS model and can used to enhance management of Colorado's water resources in the South Platte River Basin.

Recommendation: Staff gives a medium recommendation for funding of this project because of the possibility of obtaining future funding through the Colorado Decision Support System (CDSS) for the project.

4. 2010 Irrigated Lands Refresh Project

Beneficiary/Grantee/Contractor: Statewide, CWCB, DWR

Amount of Request: $50,000 **Ranking:** High

Product Produced: Every 5 years, the CWCB, with the assistance of DWR, compiles spatial data for the irrigated lands of the state. Data collected includes acres irrigated and associated crops. The final data product consists of GIS coverage for each water division which is loaded into Hydro Base.

Water Planning Relationship: Irrigated lands and crop data are used in water planning models developed under the CDSS program. This data aids in compact compliance efforts, and other facets of water resource management at a state and local level.

Recommendation: Staff gives a high recommendation for funding of this project because most of the work will be done in house. However, there may be costs to acquire satellite imagery and aerial photography which is used to determine irrigation status and crop type. Funding will also be used if needed, for hiring a contractor to assist with the large volume of work required to map the approximately 2.5 million irrigated acres in Colorado.

5. Paleohydrology of the Lower Colorado River Basin

Beneficiary/Grantee/Contractor: Local Water Users, CSU
Amount of Request: $50,000 **Ranking:** Medium

Product Produced: A report that will include a comprehensive reconstruction of the Lower Colorado River Basin annual streamflows, extending back at least 500 years, using tree rings. This paleohydrologic reconstruction would provide better understanding of the natural variability of streamflows in the Lower Basin and a basis for assessing the water supply risk resulting from this variability.

Water Planning Relationship: The State of Colorado draws a substantial portion of its water supply from the Colorado River, the reliability of which is a function of natural hydrologic variability, notwithstanding anticipated changes in future climate which will be superimposed on this variability. The basin's water managers are increasingly assessing the resilience of Colorado River storage and the capabilities to meet the complex and often competing directives that constitute the Law of the River. Thus, it is extremely important to understand the range of this natural variability in the basin streamflows so as to obtain a robust assessment of the water supply risk, and inform effective management and planning strategies. Observed streamflow records, 100 years long at most, cannot provide the full range of variability. Paleohydrologic reconstructions of annual flow using tree rings, however, provide much longer (500-1000+ years) records of past natural variability, and thus a more complete sampling of potential flow sequences, including severe and sustained droughts of greatest concern to water managers.

While the long-term natural variability of the Upper Colorado River Basin has now been well-described by high-quality multi-century reconstructions of the annual flow of the Colorado River at Lees Ferry, Arizona, there has been no equivalent effort for the whole of the Lower Colorado River Basin (LCRB), that is, the mainstem and tributaries above the Northerly International Boundary (NIB), including the Gila River. The contribution of the Lower Basin to overall basin flows is roughly 15% on average (about 2.5 MAF), although this contribution varies enormously from year to year. The Colorado River District, which will collaborate with the investigators, acknowledges the need to include all of the Lower Basin in paleohydrologic reconstructions to develop a more complete picture of the natural variability of the entire Colorado River Basin. With this information, the risk to Colorado's water supplies of that variability, given both the Lower Basin's and Upper Basin's obligations under the Law of the River can be more meaningfully assessed. As with recent

studies for the Upper Basin, the paleohydrologic record would be combined with scenarios of climate change to assess the joint risk of past climate variability and future climate change, in effect asking, "What would happen if the droughts of the past recurred in a future (warmed) climate?"

Recommendation: Staff gives a medium recommendation for funding of this project because of the limited funding available.

Intra-State Water Management Program

1. Irrigated Agriculture, Water Transfers and Economic Activity

Beneficiary/Grantee/Contractor: Statewide, CSU
Amount of Request: $35,000 **Ranking:** Low

Product Produced: The study requires secondary data collection that includes a time series of economic indicators for rural economies and a proper accounting of irrigated agriculture's economic activity. This information will be compiled in a brief report that discusses trends in rural counties and agriculture and published as a Department of Agriculture and Resource Economics fact sheet.

Water Planning Relationship: As the competition for scarce water increases, stakeholders, policymakers and the public must adopt strategies in order to meet both short-term and long-term water resource needs. This study would encompass one such strategy involving water transfers and their impact to the economy.

Recommendation: Staff gives a low recommendation for funding of this project because the Water Supply Planning section is funding an effort to that is studying a very similar effort. Specifically, through the Alternatives to Permanent Agricultural Water Transfers grant program, CWCB has funded the development of an economic model that will help determine whether there is a correlation between the loss of irrigated agricultural lands and the associated rural economies. This ultimate goal is to determine whether there is a certain amount of irrigated lands that sustains a rural economy and if there is a "tipping point" where any further reductions in irrigated lands have a significant negative effect.

A summary listing the projects and the recommended rankings follows as Attachment B.

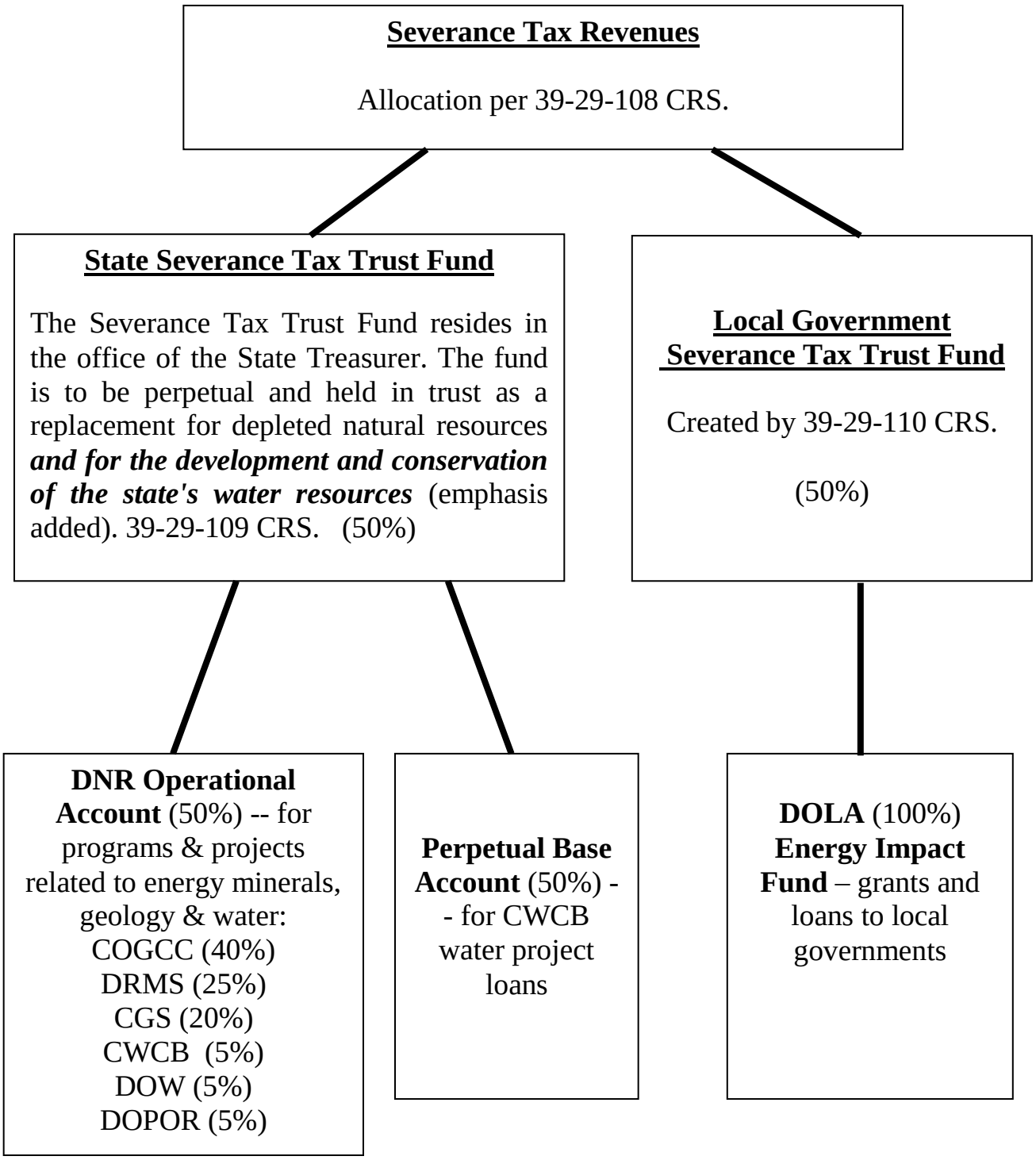
FINAL RECOMMENDATION:

No action is needed on Part A or B.

With respect to Part C, we recommend that you approve the staff ranking for each project and direct us to allocate funding based on the amount of Severance Tax available within the CWCB's five-percent share. We will not know exactly how much funding will be available until the Executive Branch and the General Assembly act on proposals to divert a portion of Severance Tax to the General Fund, place a cap on contribution into the Operational Account, or keep agency funding static for other budgetary reasons.

Attachment A

Severance Tax Trust Fund Distribution Chart



Attachment B to Part C

COLORADO WATER CONSERVATION BOARD
SEVERANCE TAX TRUST FUND OPERATIONAL ACCOUNT
Covering July 2011 thru June 2012

Projects	Funding Request	Staff Ranking
Water Supply Protection Program		
Intra-State Water Planning	$100,000	High
Recreation Project	$ 80,000	High
Upper Black Squirrel Groundwater Model	$137,000	High
El Paso County Groundwater Quality Study	$ 60,000	Medium
TSTool Software Enhancements for Water Providers and Users	$ 60,000	Medium
Recent Trends in Dust Deposition to Snowpacks	$100,000	Medium
Crop Coefficients for Alfalfa Grown in Arkansas Valley	$ 75,000	High
Finance Program		
Grand Mesa Regional General Permit – Fen and Wetlands Project	$175,000	High
Cooperative Re-timing and Augmentation Enhancement Project	$150,000	High
Public & Private Pilot Res Rehab & Storage Enhancement Study	$ 75,000	Medium
Stream and Lake Protection Program		
ISF Program Case Management Support	$ 50,000	High
Decades Down the Road II	$ 10,000	Medium
Native Warm Water Fish in the Dolores River Project	$ 75,000	Medium
Alamosa River Instream Flow Project	$100,000	High
Water Conservation Planning Program		
Spatial Approach to Modeling Drought Hazard and Risk	$142,000	Medium
Drought Mitigation and Response Implementation	$150,000	High
Gallons per Capita per Day Methodology Standard Study	$ 75,000	High
Local Water Conservation Resource Planning Tools	$ 75,000	High
Colorado Agricultural Meteorological Network Expansion	$ 50,000	High
Climate Change and Colorado's Prior Appropriation Doctrine	$ 35,000	Medium
Penetration and Permanence of Municipal Conservation Measures	$ 35,000	High
Flood Protection Program		
Flood Mitigation and Project Compliance	$100,000	High
Multi-Objective Watershed Restoration Projects	$150,000	High
Hydraulic Analysis of Hartland Dam Fish Passage	$ 68,000	Low
Hydraulic Analysis of Lake Fork Channel Rehab	$ 98,000	Medium
Chatfield Reservoir Downstream Channel Improvement Project	$250,000	High
Climatology of Supper Cooled Liquid Water Study	$ 35,000	Medium
Community Collaborative Rain, Hail and Snow Network	$ 26,400	Medium
Evaluating Benefits of Radar Data for Snowmelt Forecasts	$ 50,000	Medium
FEMA Coordinator Matching Program	$ 40,000	High
Sago Pondweed Management Using Midseason Drawdown Tools	$ 24,750	Medium
Common Reed Management in Colorado	$ 23,595	Medium

Projects	Funding Request	Staff Ranking
Podcasts for Flood & Drought Forecasting	$ 40,000	Low
Ecological-Economic Tradeoffs of Wetlands	$ 50,000	Low
Water Information Program		
Groundwater-Level Monitoring Network in So Platte Alluvial	$ 91,000	Medium
Groundwater-Level Monitoring n Rural Douglas County	$ 62,600	High
Local Grid Refinement of SPDSS Alluvial Aquifer GW Model	$ 98,700	Medium
Irrigated Lands Refresh Project – 2010	$ 50,000	High
Paleohydrology of Lower Co River Basin	$ 50,000	Medium
Intra-State Water Management Program		
Irrigated Agriculture, Water Transfers and Economic Activity	$ 35,000	Low
Total	**$3,152,045**	