COLORADO
Colorado Water Conservation Board
Department of Natural Resources

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TO: Colorado Water Conservation Board Members

FROM: Joe Busto, Weather Modification Program Coordinator, Watershed Protection and Flood Mitigation Section

DATE: November 19-20, 2014 Board Meeting

AGENDA ITEM: 29b – CWCB's 2015 Project Bill – Construction Fund Non-Reimbursable Project Investments "En-Bloc" Approval Weather Modification Permitting

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Introduction

The CWCB has had grants for winter cloud seeding since 2004. Colorado River downstream water users have been matching CWCB funding since 2007. To date the CWCB has provided $1.3M and the Lower Basin has provided $1.3M. Weather modification is one of the three legs of the stool for the Colorado River drought contingency plan along with extended reservoir operations and demand management.

The CWCB WM budget has been $175,000 for the last six years. Staff is requesting an increase to $300,000 per year for the following reasons: expanding weather modification in the Colorado River is an immediate next step; the Lower Basin matches the CWCB dollar for dollar; and the Lower Basin has already increased the CWCB allocation for the upcoming winter. Most importantly the increase is to be specifically earmarked to import and deploy better equipment and continue efforts to support water users as they refine their programs for optimum efficiency.

The CWCB has helped by bringing in remote machines to Winter Park, the Grand Mesa, and near Mesa Verde. However, there are still 105 low elevation generators in operation. Modeling studies are suggested in the 2012 DNR Weather Modification Rules to evaluate program design. One was completed for the Front Range Water Council program. There is a scientific means to retire machines, import newer machines, and focus in on areas with high cloud seeding potential. This funding supports initiative by Grand River Consulting and the Front Range Water Council to optomize their program. Collectively they supply 80% of the water to our citizens. The CWCB will partner with them to implement recommendations from their program design evaluation. Other programs will follow.

Staff Recommendation

Staff recommends that the Board approve this request for the General Assembly to authorize this project and appropriate $300,000 from the Construction Fund to the Department of Natural Resources for allocation to the CWCB for the Colorado Watershed Restoration Program.

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PROJECT DETAILS	
Project Cost:	$1M+ spent all sources
NRI Funding Request:	$300,000
Funding Source:	*Construction Fund*
Project Type:	Grants, Equipment & Evals
Type of Grantee:	Grants to Sponsors

LOCATION	
Benefits:	Statewide
Water Source:	Various
Drainage Basin:	Colo., Gunnison & SW

The CWCB has had grants since 2004. Water Manager sponsored programs were developed after the drought of early 2000s. State-to-state agreements were signed in 2007 to provide grants. Each year the CWCB distributes grants from the CWCB, New Mexico Interstate Stream Commission, Southern Nevada Water Authority, Central Arizona WCD, and California Six Agency Committee and reports on the expenditures. For winter 2014-15 the Lower Basin has increased the CWCB budget from historic levels. The approved Lower Basin budget for winter 2014-15 is $192,500. New Mexico has pledged $20,000 as well. If the legislature approves the $300,000 then we have asked them to match the CWCB funds and be $300,000/year to create the new WM 2.0 grants program. A recent policy from these downstream states is to match but not exceed the state contributions to local programs.

The focus of this funding increase is new industry standard equipment like modern cloud seeding ice nuclei generators and radiometers. These are in use in good programs in other states. The CWCB goal should be to help make our programs better with our funding. There is significant research that shows that mountain valley generators are not very effective and remote operated generators sited on a ridge out of the mountain valleys are very effective. This is the direction other states have gone as well and we are playing catch up.

At right is the Idaho Power ice nuclei generator design is considered the best design in the field. Idaho Power has agreed to work with the CWCB and allow us to purchase these machines to make our programs better. The wind barrel rotates with the wind so the flame will not blow out. It is modular so parts that aren't working can be quickly switched out in the field.

Also pictured at right is a white remote sensing unit called a radiometer. It takes vertical columns of atmospheric information that is similar to weather balloons but is continuous data. They are portable, lightweight, and easy to operate. Several cloud seeding programs in other states use them to remove the guess work in cloud seeding. They see which clouds have excess liquid water and which are drier. Radiometers see atmospheric water and find ideal conditions for cloud seeding. This is much better than using forecasts and weather modeling. They will save money by not wasting silver and confining operations to periods of abundant liquid water. They can also help develop storm and basin specific climatology to characterize storms as they interact with mountainous terrain and help refine operational criteria. Operators and sponsors are excited to have a remote sensing tool like this in Colorado and are willing to share it, get trained how to use, operate it, and maintain it.

Only a few are needed and will be shared and moved around in Colorado. It is estimated that we are spending over $200,000 on seeding solutions in Colorado each year. Radiometers will help us use silver iodide solutions more effectively and save money for the all of the sponsors.

Each year about $1M is spent on cloud seeding with $175,000 or 18% from the CWCB and $175,000 or 17% from the Lower Basin and New Mexico. Currently for every dollar CWCB spends five is leveraged. This funding and funding increase is continuation to grow and develop our locally sponsored programs by importing industry standard equipment for more efficient and effective programs in Colorado.