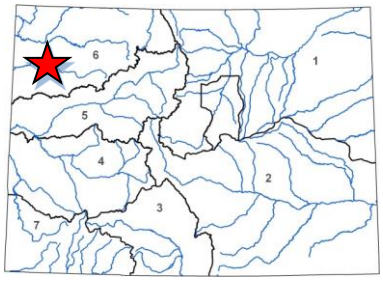
COLORADO
Colorado Water Conservation Board
Department of Natural Resources

White River Algae Study
White River and Douglas Creek Conservation Districts

November 2019 Board Meeting

Water Plan Grant Application



LOCATION	
County/Counties:	Rio Blanco
Drainage Basin:	Yampa/White

DETAILS	
Total Project Cost:	$228,550
Water Plan Grant Request:	$90,000
Recommended amount:	$90,000
Other CWCB Funding:	$33,000 WSRF
Other Funding Amount:	$105,550
Applicant Match:	$0
Project Type(s): Study	
Project Categories: Environment and Recreation and Agriculture. Recommendation to fund full amount from Env. and Rec. Category	
Measurable Result: White River is 190 miles.	

A board elected at a general election by the landowners within the District manages the Districts. The White River Conservation District has cooperated with individuals and government agencies including county, state and federal departments and agencies for over 50 years treating resource problems. The Districts formed to provide a legal entity to organize local landowners to voluntarily control soil erosion and manage natural resources such as soil, water, animals, plants and air quality. This act then enabled the Federal Government to provide technical and monetary assistance to the local agriculture community to protect private property from degradation of the natural resources. Through partnerships with NRCS, BLM, and other agencies, Best Management Practices (BMP) are planned and implemented to treat and protect the soil, water and related resources on lands within the District's boundaries. The Conservation District partnerships serve all landowners within the district by promoting voluntary conservation practices and providing technical assistance, planning, and practice installation assistance.

The United States Geological Survey (USGS) will implement the White River Algae Study Project's Scope of Work (SOW) to improve the understanding of the amount of benthic algae occurring in the White River over the past 5-7 years. The study should lead to the development of mitigation strategies and management plans for decreasing benthic algae growth in the White River. Significant data collection was performed in 2018 and 2019 in 20 semi-random sites in the White River above Meeker. The applicant expects 2020 to be the final year of data collection followed by final analysis and reporting in 2021. This grant request is for data collection and the beginning of final analysis in 2020. Data collection is expected to include the following Tasks: (#4) Scouring Flows (channel condition, form, and scouring forces); (#7) Pre-, Peak, and Post-Algae and water quality sampling events; and (#8) Analysis and initiation of Final Publications. The results of this study will be beneficial to multiple areas across Colorado as it appears this same benthic algae bloom is taking place in multiple Colorado rivers such as the Yampa and the Colorado near Palisade, CO.

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Water Plan Grant Application

Instructions

To receive funding for a Water Plan Grant, applicant must demonstrate how the project, activity, or process (collectively referred to as "project") funded by the CWCB will help meet the measurable objectives and critical actions in the Water Plan. Grant guidelines are available on the CWCB website.

If you have questions, please contact CWCB at (303) 866-3441 or email the following staff to assist you with applications in the following areas:

Water Storage Projects	Anna.Mauss@state.co.us
Conservation, Land Use Planning	Kevin.Reidy@state.co.us
Engagement & Innovation Activities	Ben.Wade@state.co.us
Agricultural Projects	Alexander.Funk@state.co.us
Environmental & Recreation Projects	Chris.Sturm@state.co.us

FINAL SUBMISSION: Submit all application materials in one email to *waterplan.grants@state.co.us* in the original file formats [Application (word); Statement of Work (word); Budget/Schedule (excel)]. Please do not combine documents. In the subject line, please include the funding category and name of the project.

Water Project Summary

Name of Applicant	White River and Douglas Creek Conservation Districts
Name of Water Project	White River Algae Study
CWP Grant Request Amount	$ 45,000 Environment and Recreation $ 45,000 Agriculture Projects **$ 90,000** TOTAL
Other Funding Sources USGS	$ 62,700
Other Funding Sources WSRF	$ 33,000
Other Funding Sources - Colo River District - Meeker Sanitation - RBC Water Conservancy District - Town of Meeker - Rob & Melani Walton Foundation - Elk Creek Ranch - Westlands Ranch - RBC Farm Bureau	$ 22,850

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- Trout Unlimited - Yampa Valley Fly Fishers	
GOCO - CPW Director's Innovation Fund	$ 20,000
Total Project Cost	$ 228,550

Applicant & Grantee Information
Name of Grantee(s) White River & Douglas Creek Conservation Districts
Mailing Address P.O. Box 837, Meeker, CO 81641
FEIN 840757034 (White River Soil Conservation District)
Organization Contact: Callie Hendrickson
Position/Title: Exec. Director
Email: callie.districts@gmail.com
Phone: 979-878-9838
Grant Management Contact: Tristan Nielsen
Position/Title: District Manager
Email: whiterivercd@gmail.com
Phone: 970-878-9838
Name of Applicant (if different than grantee)
Mailing Address
Position/Title
Email
Phone

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Description of Grantee/Applicant
Provide a brief description of the grantee's organization (100 words or less).
The Soil Conservation District Act (now Conservation District) was passed by Colorado Legislature on May 6, 1937. This act is found in Colorado Revised Statues Title 35 article 70. The Districts are managed by a board elected at a general election by the landowners within the District. The White River Conservation District has cooperated with individuals and government agencies including county, state and federal departments and agencies for over 50 years treating resource problems. The Districts were formed to provide a legal entity to organize local landowners to voluntarily control soil erosion and manage natural resources such as soil, water, animals, plants and air quality. This act then enabled the Federal Government to provide technical and monetary assistance to the local agriculture community to protect private property from degradation of the natural resources. Through partnerships with NRCS, BLM, and other agencies, Best Management Practices (BMP) are planned and implemented to treat and protect the soil, water and related resources on lands within the District's boundaries. The Conservation District partnerships serve all landowners within the district by promoting voluntary conservation practices and providing technical assistance, planning, and practice installation assistance.

	Type of Eligible Entity (check one)
	Public (Government): Municipalities, enterprises, counties, and State of Colorado agencies. Federal agencies are encouraged to work with local entities. Federal agencies are eligible, but only if they can make a compelling case for why a local partner cannot be the grant recipient.
X	**Public (Districts):** Authorities, Title 32/special districts (conservancy, conservation, and irrigation districts), and water activity enterprises.
	Private Incorporated: Mutual ditch companies, homeowners associations, corporations.
	Private Individuals, Partnerships, and Sole Proprietors: Private parties may be eligible for funding.
	Non-governmental organizations (NGO): Organization that is not part of the government and is non-profit in nature.
	Covered Entity: As defined in Section 37-60-126 Colorado Revised Statutes.

	Type of Water Project (check all that apply)
X	Study
	Construction
	Identified Projects and Processes (IPP)
	Other

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Category of Water Project (check the primary category that applies and include relevant tasks)		
	Water Storage - Projects that facilitate the development of additional storage, artificial aquifer recharge, and dredging existing reservoirs to restore the reservoirs' full decreed capacity and Multi-beneficial projects and those projects identified in basin implementation plans to address the water supply and demand gap.. *Applicable Exhibit A Task(s):*	
	Conservation and Land Use Planning - Activities and projects that implement long-term strategies for conservation, land use, and drought planning. *Applicable Exhibit A Task(s):*	
	Engagement & Innovation - Activities and projects that support water education, outreach, and innovation efforts. Please fill out the Supplemental Application on the website. *Applicable Exhibit A Task(s):*	
X	Agricultural - Projects that provide technical assistance and improve agricultural efficiency. *Applicable Exhibit A Task(s):*	
X	Environmental & Recreation - Projects that promote watershed health, environmental health, and recreation. *Applicable Exhibit A Task(s):*	
	Other	Explain:

Location of Water Project	
Please provide the general county and coordinates of the proposed project below in **decimal degrees**. The Applicant shall also provide, in Exhibit C, a site map if applicable.	
County/Counties	Rio Blanco County
Latitude	The White River above (west of) Meeker
Longitude	

Water Project Overview
Please provide a summary of the proposed water project (200 words or less). Include a description of the project and what the CWP Grant funding will be used for specifically (e.g., studies, permitting process, construction). Provide a description of the water supply source to be utilized or the water body affected by the project, where applicable. Include details such as acres under irrigation, types of crops irrigated, number of residential and commercial taps, length of ditch improvements, length of pipe installed, and area of habitat improvements, where applicable. If this project addresses multiple purposes or spans multiple basins, please explain.

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The Applicant shall also provide, in Exhibit A, a detailed Statement of Work, Budget, Other Funding Sources/Amounts and Schedule.
The White River Algae Study Project's Scope of Work (SOW) will be implemented by United States Geological Survey (USGS) to improve the understanding of why the excessive amount of benthic algae is occurring in the White River over the past 5-7 years. A better understanding based on science is expected to lead to the conception of mitigation strategies and management plans for decreasing benthic algae growth in the White River. There has been and continues to be a definite sense of urgency from the community to determine the driving forces of the excessive algae. Significant data collection has been done in 2018 and 2019 in 20 semi-random sites in the White River above Meeker. The third year (2020) of data collection will be critical for the study. We expect 2020 to be the final year of data collection followed by final analysis and report in 2021. This grant request is for data collection and the beginning of final analysis in 2020. Data collection in FY 2020 is expected to include the following Tasks: (#4) Scouring Flows (channel condition, form, and scouring forces); (#7) Pre-, Peak, and Post-Algae and water quality sampling events; and (#8) Analysis and initiation of Final Publications. The results of this study will be beneficial to multiple areas across Colorado as it appears this same benthic algae bloom is taking place in multiple Colorado rivers such as the Yampa and the Colorado near Palisade, CO.

Measurable Results	
To catalog measurable results achieved with the CWP Grant funds, please provide any of the following values as applicable:	
	New Storage Created (acre-feet)
	New Annual Water Supplies Developed or Conserved (acre-feet), Consumptive or Nonconsumptive
	Existing Storage Preserved or Enhanced (acre-feet)
Full length of White River. Approx. 190 miles	Length of Stream Restored or Protected (linear feet)
	Efficiency Savings (indicate acre-feet/year OR dollars/year)
	Area of Restored or Preserved Habitat (acres)
	Quantity of Water Shared through Alternative Transfer Mechanisms
	Number of Coloradans Impacted by Incorporating Water-Saving Actions into Land Use Planning
	Number of Coloradans Impacted by Engagement Activity

The full length of the White River	Other	Explain: This is a study. Therefore, rather than measurable results directly related to the study, we anticipate that it will identify actions that can be taken in the future to restore and protect the White River

Water Project Justification

Provide a description of how this water project supports the goals of Colorado's Water Plan, the most recent Statewide Water Supply Initiative, and the applicable Roundtable Basin Implementation Plan and Education Action Plan. The Applicant is required to reference specific needs, goals, themes, or Identified Projects and Processes (IPPs), including citations (e.g. document, chapters, sections, or page numbers).

The proposed water project shall be evaluated based upon how well the proposal conforms to Colorado's Water Plan Framework for State of Colorado Support for a Water Project (CWP, Section 9.4, pp. 9-43 to 9-44;)

CWP Water Plan Framework:

This study is a collaborative effort with a Technical Advisory Group (TAG) with 14 local, state, and federal government agencies and NGO. TAG Members: Rio Blanco Water Conservancy District, Colorado Parks and Wildlife, Colorado River Water Conservation District, Rio Blanco County, Town of Meeker, Town of Rangely, Meeker Sanitation District, White River Conservation District, Douglas Creek Conservation District, Natural Resource Conservation Service, US Forest Service, Bureau of Land Management, Trout Unlimited, and US Geological Survey (advisory)

Most of the local governments and multiple landowners have also contributed financially and with in-kind assistance on this Study. The TAG developed the Scope of Work and continues to review and refine as necessary as the Study proceeds. This Study is supported in concept and financially by the YWG Basin Roundtable because it does support 7 of the 8 BIP goals noted below. The Study's purpose is to find the cause of the excessive algae growth which would then be addressed to reduce the amount of algae to improve fish habitat, reduce costs to agriculture and municipalities for pump maintenance, and improve access to river water. The Conservation Districts are in the scoping phase of developing a potential Integrated Water Management Plan (IWMP) in which this Study will help inform the needs to be addressed in the IWMP.

CWP E&R Goals:
This study will meet all five goals stated in the Environmental and Recreational Projects and Methods section (page 6-157) of the Colorado Water Plan. It is important that this work be completed before drafting an IWMP so that we have the knowledge and background as we embark upon the IWMP. Algae blooms decrease the recreational value of the river and indicate an ecosystem that is out of balance.

This study will be integral in understanding the ecosystem better and provide tools for establishing mitigation plans. Doing so will improve the ability of the River to meet recreational, environmental, and economic needs, and allow the elaborate system of diversion, storage, treatment, use, wastewater treatment and reintroduction back into the river ecosystem to continue.

Also, by keeping water intake screens and pump inlets free of algae, artificial shortages created by fouling of systems will not occur, and the existing infrastructure will function through the full range of depth of water in the river for which it was designed.

CWP Agriculture Goals:
This study will help ag producers on the White River maintain productivity and viability by reducing the algae growth in the White River. Reduction in algal growth will reduce pump fouling which is causing

significant increase in pump maintenance and replacement as well as reduced water access. The goal of the study is to identify the cause of the algae. Once those causes are identified, and if change in agriculture practices can assist in reducing the algae growth, the Conservation Districts will provide education and seek financial assistance to help landowners implement Best Management Practices (BMP) in land and fishery management, or other identified causes.

BIP Goals:
Goal #2: This project will help water rights holders have better access to their water by identifying the causes of the excessive algae that is plugging intakes and pumps. Once the causes of the algae are known, they can be addressed, and we expect to improve the ability to divert the water.

Goal #3: This project will help Ag water rights holders have better access to their water by identifying the causes of the excessive algae that is plugging their pumps. Once the causes of the algae are known, they can be addressed, and we expect to improve the ability to divert the water.

Goal #4: This project is expected to help the Town of Rangely and industry have better access to their water by identifying the causes of the excessive algae that is plugging intake screens and damaging other types of diversions. Once the causes are known, they can be addressed, and we expect to improve the ability to divert the water. While the research is above Meeker, it is anticipated that the causes identified up stream will be similar to those in the Rangely area and can be addressed once identified. If the algae can be reduced up-stream, it will likely be reduced downstream as well.

Goal #5: This project will review various chemical, physical, biological, and nutrient characteristics believed to be relevant to the life cycle of benthic algae which directly impede water quality and aesthetics impacting the natural ecology and recreational uses within the White River.

Goal #6: The research will be considering the quality of water coming from the National Forest and comparing that to the locations downstream. It will evaluate water quality changes over time, evaluating the long-term data collected by USGS. Once we understand what factors contribute to excessive algae growth, we will seek to implement best management practices based on science and if necessary, through appropriate agency oversight, which would protect ambient water quality, therefore protecting future uses.

Goal #7: If the White River Basin stakeholders are unable to stem the blooms of algae, significant changes in water use, storage and distribution may be needed. In Rangely alone, continued presence of excessive algae would require the Town to add additional infrastructure to the Water Treatment Plant. A new river intake or significant modifications to the existing river intake would be required to keep algae and its toxins and metabolites out of the Town's drinking water. The existing river intake was built in 2010-2011. By attempting to understand the causes of algae blooms and mitigate them, White River users seek to maintain the ability to use their existing infrastructure.

Goal #8: This study will provide exceptional information and background for a future Integrated Water Management Plan that we anticipate developing within the next few years. It is important that this work be completed first so that we have the knowledge and background before embarking on the IWMP. Algae blooms decrease the recreational value of the river and indicate an ecosystem that is out of balance. This study will be integral in understanding that ecosystem better and provide tools for establishing mitigation plans. Doing so will improve the ability of the River to meet recreational and environmental needs, and allow the elegant system of diversion, storage, treatment, use, wastewater treatment and reintroduction back into the river ecosystem to continue. Also, by keeping intake screens and pump inlets free of algae, artificial shortages created by fouling will not occur, and the existing infrastructure will function through the full range of depth of water in the river for which it was designed.

SWSI 2010 reviewed and explored Colorado's water demands along with the state's infrastructure needs and gaps for the next 40 years. The analysis painted a broad picture, and while it provided many

useful numbers and forecasts, it included few details on climate change and other evolving issues affecting water in Colorado (Statewide Water Supply Initiative update by Schreck, 2018, Oct 5 , 2017). SWSI 18 will provide parameters that will help plan revision teams consider a variety of scenarios based on climate variance, existing supply and demands, and population growth. Data collection and analysis from this study will fill some of the aforementioned data gaps in the White River Basin. The study will look at potential impacts of a warming climate, aspects of forest ecology and fire response, as well as river system response to these regional types of change that are set apart from localized anthropogenic changes within the basin. The study may also provide case study results for scenario comparisons by the plan revision teams. Preliminary data from this study indicates temperatures in the White river are rising and that there are increases in nutrient concentrations emanating from the headwaters of the White River Basin.

Related Studies

Please provide a list of any related studies, including if the water project is complementary to or assists in the implementation of other CWCB programs.

This study is a precursor to the anticipated Integrated Water Management Plan (IWMP) on the White River which is currently in the scoping phase. We feel this study needs to be near completion before the IWMP process is initiated because it is expected to have valuable information for the IWMP to be built upon.

This study will utilize data that has been and will continue to be collected by the Colorado Parks and Wildlife (CPW) on the algae issue.

This study will also utilize data that has been and will continue to be collected by USGS in the White River Water Quality Monitoring project.

This study is also being funded through a Basin Only WSRF grant which is being used for 2019, 2020, and 2021.

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Previous CWCB Grants, Loans or Other Funding

List all previous or current CWCB grants (including WSRF) awarded to both the Applicant and Grantee. Include: 1) Applicant name; 2) Water activity name; 3) Approving RT(s); 4) CWCB board meeting date; 5) Contract number or purchase order; 6) Percentage of other CWCB funding for your overall project.

WSRF Grant 2019 - 2021

Name: White River and Douglas Creek Conservation Districts
Activity: White River Algae Research
Approved by: Yampa, White, Green Basin Roundtable
CWCB Board Meeting Date: 11/15/2018
Purchase Order #: POGG1,PDAA,201900002747
Percentage of other CWCB funding: WSRF dollars are 14% of the 2020 funding

Taxpayer Bill of Rights

The Taxpayer Bill of Rights (TABOR) may limit the amount of grant money an entity can receive. Please describe any relevant TABOR issues that may affect your application.

The White River and Douglas Creek Conservation Districts de-TABORed in 1996.

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Submittal Checklist	
	I acknowledge the Grantee will be able to contract with CWCB using the Standard Contract.
Exhibit A	
X	Statement of Work(1)
X	Budget & Schedule(1)
N/A	Engineer's statement of probable cost (projects over $100,000)
X	Letters of Matching and/or Pending 3rd Party Commitments(1) - YWG Basin Roundtable (attached) - USGS (attached) - CPW (attached)
Exhibit C	
X	Map (if applicable)(1)
X	Photos/Drawings/Reports
	Letters of Support (Optional)
	Certificate of Insurance (General, Auto, & Workers' Comp.) (2)
	Certificate of Good Standing with Colorado Secretary of State(2)
	W-9(2)
	Independent Contractor Form(2) (If applicant is individual, not company/organization)
Engagement & Innovation Grant Applicants ONLY	
	Engagement & Innovation Supplemental Application(1)

(1) Required with application.
(2) Required for contracting. While optional at the time of this application, submission can expedite contracting upon CWCB Board approval.

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Colorado Water Conservation Board
Water Plan Grant - Exhibit A

Statement Of Work	
Date:	**July 31, 2019**
Name of Grantee:	**White River & Douglas Creek Conservation Districts**
Name of Water Project:	**White River Algae Study**
Funding Source:	**Water Plan: Environmental & Recreation Projects and Agricultural Projects**
Water Project Overview:	

A group of 14 entities, have formed the Technical Advisory Group (TAG) to develop and monitor the White River Algae Study's Scope of Work (SOW) to improve the understanding of why the excessive amount of benthic algae is occurring in the White River over the past 4 – 5 years. TAG Members include: Rio Blanco Water Conservancy District, Colorado Parks and Wildlife, Colorado River Water Conservation District, Rio Blanco County, Town of Meeker, Town of Rangely, Meeker Sanitation District, White River Conservation District, Douglas Creek Conservation District, Natural Resource Conservation Service, US Forest Service, Bureau of Land Management, Trout Unlimited, and US Geological Survey (advisory)

The study will be implemented by USGS. A better understanding based on science is expected to lead to the conception of mitigation strategies for decreasing benthic algae in the White River.

There is a definite sense of urgency coming from the community to determine the driving forces of the excessive algae. Therefore, this study began in 2018. USGS identified and began data collection in 20 semi-random sites in the White River above Meeker. This grant request is for work to be done in the federal FY 2020. WSRF funding will be utilized for the study to develop a better understanding of physical and chemical properties controlling algal growth in the main stem of the White River. Details are below.

Evaluation of data collected in 2018 and 2019 will determine any necessary changes to the third year (FY 2020) of study. Given the low runoff in 2018 and high runoff in 2019, the third year will be very beneficial to the outcome of the study.

The full four-year SOW is included below with tasks #4, #7, and #8 highlighted in yellow because they will be completed in 2020.

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Project Objectives:
The objective of the study is to document and understand benthic algal occurrence, characteristics, and controls at multiple locations within the White River are of interest. Specific objectives include: 1. Conduct data mining and historical synthesis of information relevant to the timing and occurrence of nuisance algal blooms in the White River Basin (completed in 2018); 2. Develop a better understanding of physical and chemical properties controlling algal growth in the main stem of the white River. (data collection continues into 2019 & potentially 2020 with analysis and reports developed in 2021)

Tasks
Task 1 – (Data Mining and Historical Synthesis) Completed in FY 2018
Description of Task:
A literature search for algal topics and determine from the search what information is relevant to the White River. Evaluation of findings from other local studies will be completed and synthesized into a single document that is relevant to the conditions in the White River. These reports and other historical information (from local interviews and surveys) will be used to guide further investigations in the White River.
Method/Procedure:
Literature review was completed in 2018 and 2019 and therefore are not covered under this grant. However, the information gathered in this task will be documented and used to guide the remainder of this study.
Deliverable:
This information will be delivered to the White River and Douglas Creek Conservation Districts and the Technical Advisory Group (TAG). It will be utilized to inform any necessary adjustments to the current SOW. This information will be included in the final report which will be delivered to the Roundtable and CWCB.

Tasks
Task 2 – Continuous Monitoring (2018)
Description of Task:
Dissolved Oxygen and Temperature data collected at 20 sites.
Method/Procedure:

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Tasks
Intensive, continuous monitoring (at 15-min intervals) of selected water-quality parameters was completed in 2018 to address data gaps in the diurnal changes in water temperature and dissolved oxygen along the White River. This effort monitored and recorded complete diurnal cycles at 20 sites (about 7 days per site) during a three-week period in July. The water-quality monitors characterized conditions at each location and will be indicative of the range of conditions throughout the reach during peak algal growth. Monitors were deployed at each of the 20 sites in 2018. Measurement of diel variations in dissolved oxygen and water temperature identified ranges of conditions aquatic communities are exposed to as well as calculated stream metabolism using the single-site method (Hondzo, 2013). These calculations can help support findings from site-specific algal biomass measurements and identification of sites as heterotrophic or autotrophic providing additional metrics to assess stream health and function.
Deliverable:
This portion of the Study was conducted and a summary was provided to the TAG in 2018 and the information was used to inform the 2019 SOW. CWCB will be provided a copy of the final report and fact sheet including the statistical analysis information.

Tasks
Task 3 - Pebble Count (2018)
Description of Task:
Bed-material measurements were made by the USGS using standard methods to determine particle size characteristics of the channel and, if present, of the alluvial bars at up to 60 cross-sections in the White River (three cross sections at each of the 20 sites).
Method/Procedure:
Wolman "pebble counts" made in a linear traverse of the channel cross section where the channel is wadable in late summer or early fall 2018. In unwadable sections, pebble counts of the streambed were made in a random manner at one-footstep intervals in shallower areas. Sediment size characteristics were calculated from the bed-material measurements and used to determine the critical shear stress for sediment entrainment utilizing methods successfully demonstrated by Elliott and Hammack (1999, 2000).
Deliverable:
This portion of the Study was conducted and reviewed in 2018. USGS presented the findings to the TAG in late 2018. The information was used to inform the 2019 SOW. A copy of the Power Point presentation with a summary with preliminary data is available on the Districts' Website at www.whiterivercd.com. CWCB will be provided a copy of the final report and fact sheet including the statistical analysis information.

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Tasks
Task 4 - Scouring Flows (2018, 2019, & 2020)
Description of Task:
An important consideration regarding the proliferation of algae in certain reaches of the White River is peak streamflow and duration. Peak streamflow magnitude can play a crucial role in scouring benthic algae from streambeds thus decreasing or resetting total algal biomass on an annual basis (Cullis, 2011). However, streamflow peak and duration are not the only factors governing the amount of scour that occurs in a given water year. Specific channel characteristics also play a role in benthic algal control but are less apt to change from year to year. Characteristics such as bed-sediment particle size and channel form can place large controls on algal growth. Particle size of the streambed can dictate the suitability of algal attachment points and, if large enough, can armor the channel and minimize scour even during wet years. Channel form is the sinuosity, area, width and depth of the channel at a given point. These characteristics can control light penetration, stream velocity, and sediment deposition rates. Cross-section surveying and particle-size analysis in conjunction with incipient motion analysis is needed to address data gaps and promote understanding of the role of streamflow in algal proliferation. This analysis will also assist in the prediction of where algae will be most prolific (Petts, 1997)
Method/Procedure:
The USGS assessed channel condition, form, and scouring forces present at selected sites and used that information to assess the potential for channel scour present under varying streamflow conditions. Thresholds for critical flows needed to scour algae will be provided. These thresholds can be used annually by land managers to forecast conditions and verify the effect that scouring flows had on the system if critical-flow thresholds are exceeded. This task will be performed in 2018, 2019, and 2020 to provide ample data for comparison and on years with various run-off volume.
Deliverable:
This portion of the Study was conducted and reviewed in 2018 and will be repeated in 2019 and 2020. USGS will present the findings to the TAG at the end of each year. The information will be used to inform the following year's SOW. A copy of the Power Point presentation with a summary of preliminary data is available on the Districts' Website at www.whiterivercd.com . CWCB will be provided a copy of the final report and fact sheet including the statistical analysis information.

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Tasks
Task 5 - Scouring Flow Analysis (2019)
Description of Task:
Sediment transport, or movement, in streams occurs when the forces acting on the particle exceed the resistive forces. Transport of bed material (the particles that are representative of the range of particle sizes commonly occurring along the streambed) is approximated through comparisons of boundary shear stress (a tangential stress created by flowing water acting on sediment particles resting on the streambed or other inundated alluvial surfaces) and particle size and shape. Entrainment potential for sediment on a specific geomorphic surface is estimated by relating flood generated boundary shear stress and the critical shear stress of the sediment particles.
Method/Procedure:
Bed material characteristics obtained from onsite measurements at 20 locations in the study reach will be compared to the observed high-flow conditions during snowmelt runoff, in 2018-2020. Additional measures of acoustic energy (sound) utilizing hydrophones will be used to assess the presents or absence of moving particles during field visits during high-flow each year (Marineau and others, 2015) and will be compared to separate estimate of critical shear stress made from particle-size information (shear velocity, from Simoes, 2014) and cross-section surveys (boundary shear stress, Elliott and Capesius, 2009). These three methods will provide a comparison of observed conditions (2018-2020) and particle characteristics in each reach and will inform estimates of streamflow needed to scour algae in each reach. Bed-material measurements will be made by the USGS using standard methods to determine particle size characteristics of the channel and, if present, of the alluvial bars (Wolman, 1954) at up to 60 cross sections in the White River (three cross sections at each of the 20 sites). Wolman "pebble counts" will be made in a linear traverse of the channel cross section where the channel is wadeable in late summer or early fall 2018. In unwadeable sections, pebble counts of the streambed will be made in a random manner at one-footstep intervals in shallower areas. Sediment-size characteristics will be calculated from the bed-material measurements and used to determine the critical shear stress for sediment entrainment utilizing methods successfully demonstrated by Elliott and Hammack (1999, 2000).
Deliverable:
This data will be collected and incorporated into the multivariate-regression analysis. The raw data and report will be made available. CWCB will be provided a copy of the final report and fact sheet including the statistical analysis information.

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Tasks
Task 6 - Isotope Sampling (2019)
Description of Task:
In nature, elements occur with differing numbers of neutrons, resulting in slightly different masses for any given atom. These differences in mass occur at ranges that are defined as isotopes and are recorded for each element in conjunction with their abundance on earth. Some isotopes occur in arrangements that are unstable and undergo radioactive decay; other isotopes are stable and persist in the environment indefinitely. Isotopic enrichment of heavier or lighter stable isotopes occurs at different locations in the world, and/or as a result of local geochemical or biological processes. As such, the relative abundance of measured stable isotopes from a water sample can act as a 'signature' to compare against when investigating different potential sources.
Method/Procedure:
To better understand the potential for isotopic testing to determine sources of nutrients in the White River, the USGS proposes to analyze isotopic-signatures of oxygen and nitrogen from nitrate. Samples will be collected in reaches of the North and South Fork White River as well as the mainstem channel. Sample locations will target land use activities such as forest, agriculture, aquaculture, and wastewater treatment. Where appropriate, stable isotope signatures will be obtained from the literature and compared to those observed from the mainstem of the White River. Samples will be submitted to the USGS National Water Quality Laboratory to determine nutrient concentrations and the USGS Reston Isotopes Laboratory for isotopic analysis.
Deliverable:
All results will be available to the public through National Water Information System web interface (http://dx.doi.org/10.5066/F7P55KJN). CWCB will be provided a copy of the final report and fact sheet including the statistical analysis information.

Last Updated: July 2019

Tasks
Task 7 - Pre-, Peak-, Post- Algae and Water Quality Sampling Events (2019 & 2020)
Description of Task:
Water-quality samples (primarily nutrients in the water) will be analyzed under varying conditions (pre-algal growth, peak-algal growth, and post-algal growth) as part of this study. Determination of these periods of growth will be based on local observations and flow conditions (U.S. Geological Survey, 2018).
Method/Procedure:
Pre-algal growth analysis (sampling post snowmelt runoff, prior to the onset of algal growth in mid spring) will evaluate selected water-quality concentrations in the White River at the designated 20 sites. This sampling will help determine the concentration levels present in the White River prior to uptake by algal species as a means to better understand nutrient variability. The data will be used in a statistical analysis (described below) as a variable to determine if there is a correlation between nutrient levels prior to the onset of algal growth during peak periods. The data can also be used to identify where the highest nutrient concentrations are located for the purpose of understanding possible source locations for subsequent sampling later in the summer and fall. Peak-algal growth analysis will coincide with peak algal biomass in July or early August depending on conditions observed during the summer. The sampling will also take place at the same 20 predesignated sites sampled prior to the onset of algal growth (pre-algal). Nutrient concentrations and streamflow data will be collected along with major ions. Major ions will help in the understanding of the role hardness and other ions may play in controlling algal growth as well as providing some possible conservative tracers that may help in the understanding sources as well as the proportion of nutrient uptake by algae. These data will be used in the statistical analysis to determine if there is a correlation between peak algal biomass and concentration/load data. Also, loads and concentrations will be qualitatively compared to concentration data collected prior to the onset of algal growth in the spring (pre-algal) to further improve the understanding of where nutrient sources are located. Post-algal growth analysis will consist of a low-flow, steady-state sampling effort at the same 20 sites. The post-algal growth sampling will be done during the fall when nutrients in the water column behave more conservatively and streamflow variability is minimized. This will help in the comparison of nutrient load at each site because algae uptake of nutrients at this time is expected to be minimal relative to periods of peak growth. If variability in streamflow (a condition of changing river stage or streamflow rate) is not minimized as much as possible, it is difficult to compare and interpret sources of a given constituent in a large river system. However, when streamflow variability is minimized, a large component of the variability in the loading data is removed, providing a clearer picture of where sources may be emanating from (Kimball, 2004). This analysis primarily is focused on assessing sources of nutrients but will be evaluated in the statistical analysis. Results from the analyses of streamflow, field parameters, and concentrations and loads of various constituents (including nutrients and total dissolved solids) will be presented spatially and temporally as maps and plots in the final report. Additionally, the analysis will look at correlations between various water-quality constituents and algal biomass for use in the statistical analysis. The information provided will help land managers and stakeholders gain a better perspective regarding possible temporal and spatial links between water-quality and algal productivity. These links could ultimately help with mitigation strategies designed to control nuisance algal blooms.

Deliverable:
A copy of the annual report and/or Power Point presentation with preliminary data will be provided to the CWCB. CWCB will be provided a copy of the final report and fact sheet including the statistical analysis information.

Task 8 - Analysis and Publications (2020 & 2021)
Description of Task:
An analysis of factors contributing to nuisance-levels of benthic algae in the White River will utilize multivariate-regression techniques. In this analysis, the data collection (described previously) provides a dataset designed to assess the role and importance of several potential contributing or mitigating conditions (explanatory variables: field parameters, water-column chemical properties, channel condition, channel form, and scouring forces) in controlling the range of observed conditions in algal abundance (dependent variable: chlorophyll a or ash-free dry mass).
Method/Procedure:
Simultaneous testing for a statistical relation between different conditions within the stream provides a means to quantify the relative importance of these factors and to what extent these factors predict/explain the variability observed in the algae. Once a statistically significant relation is determined, estimates of the effect of changes to these explanatory conditions can be made. These estimates can be used to identify strategies to mitigate nuisance-level algal growth. The analysis can provide context within a conceptual model for resource managers to identify best management practices (BMP's) that reduce algal growth. This approach simultaneously assesses differing covariates, providing a quantitative comparison of the importance of each in explaining algae abundance; while also evaluating how independent the effects are between covariates. In this manner, the importance of factors and processes represented by these explanatory variables can be collectively weighed to identify causes and inform decision making. As a result, interested stakeholders can identify feasible counter measures and/or best practices to reduce algae abundance.
Deliverable:
To keep the stakeholders apprised of progress as results from each of the various components of the study are completed, the USGS will provide a presentation of the interim-progress and approved preliminary data to the group, at least annually. Upon completion of the study in the final year (2021), the USGS will publish a technical document containing the methods and interpretive findings as a peer reviewed Scientific Investigations Report (SIR). This publication will serve as the primary product of this investigation. In the same timeframe, an abbreviated version of the findings will also be published as a USGS Fact Sheet. In the Fact Sheet, a 4-6 page document, the main findings of the report will be presented for a general audience. The combination of products will provide an effective means to disseminate and share the results of the investigation with different technical groups and the general public. CWCB will be provided a copy of the final report and fact sheet including the statistical analysis information.

Last Updated: July 2019

Budget and Schedule

This Statement of Work shall be accompanied by a combined Budget and Schedule that reflects the Tasks identified in the Statement of Work and shall be submitted to CWCB in excel format.

Reporting Requirements

Progress Reports: The applicant shall provide the CWCB a progress report every 6 months, beginning from the date of issuance of a purchase order, or the execution of a contract. The progress report shall describe the status of the tasks identified in the statement of work, including a description of any major issues that have occurred and any corrective action taken to address these issues.

Final Report: At completion of the project, the applicant shall provide the CWCB a Final Report on the applicant's letterhead that:

- Summarizes the project and how the project was completed.
- Describes any obstacles encountered, and how these obstacles were overcome.
- Confirms that all matching commitments have been fulfilled.
- Includes photographs, summaries of meetings and engineering reports/designs.

The CWCB will pay out the last 10% of the budget when the Final Report is completed to the satisfaction of CWCB staff. Once the Final Report has been accepted, and final payment has been issued, the purchase order or grant will be closed without any further payment.

Payment

Payment will be made based on actual expenditures and must include invoices for all work completed. The request for payment must include a description of the work accomplished by task, an estimate of the percent completion for individual tasks and the entire Project in relation to the percentage of budget spent, identification of any major issues, and proposed or implemented corrective actions.

Costs incurred prior to the effective date of this contract are not reimbursable. The last 10% of the entire grant will be paid out when the final deliverable has been received. All products, data and information developed as a result of this contract must be provided to CWCB in hard copy and electronic format as part of the project documentation.

Performance Measures

Performance measures for this contract shall include the following:
(a) Performance standards and evaluation: Grantee will produce detailed deliverables for each task as specified. Grantee shall maintain receipts for all project expenses and documentation of the minimum in-kind contributions (if applicable) per the budget in Exhibit B. Per Water Plan Grant Guidelines, the CWCB will pay out the last 10% of the budget when the Final Report is completed to the satisfaction of CWCB staff. Once the Final Report has been accepted, and final payment has been issued, the purchase order or grant will be closed without any further payment.
(b) Accountability: Per Water Plan Grant Guidelines full documentation of project progress must be submitted with each invoice for reimbursement. Grantee must confirm that all grant conditions have been complied with on each invoice. In addition, per Water Plan Grant Guidelines, Progress Reports must be submitted at least once every 6 months. A Final Report must be submitted and approved before final project payment.

Last Updated: July 2019

Performance Measures
(c) Monitoring Requirements: Grantee is responsible for ongoing monitoring of project progress per Exhibit A. Progress shall be detailed in each invoice and in each Progress Report, as detailed above. Additional inspections or field consultations will be arranged as may be necessary. (d) Noncompliance Resolution: Payment will be withheld if grantee is not current on all grant conditions. Flagrant disregard for grant conditions will result in a stop work order and cancellation of the Grant Agreement.

COLORADO
Colorado Water Conservation Board
Department of Natural Resources

Colorado Water Conservation Board

Water Plan Grant - Exhibit B
Budget and Schedule

Prepared Date:

Name of Applicant:

Name of Water Project:

Project Start Date:

Project End Date:

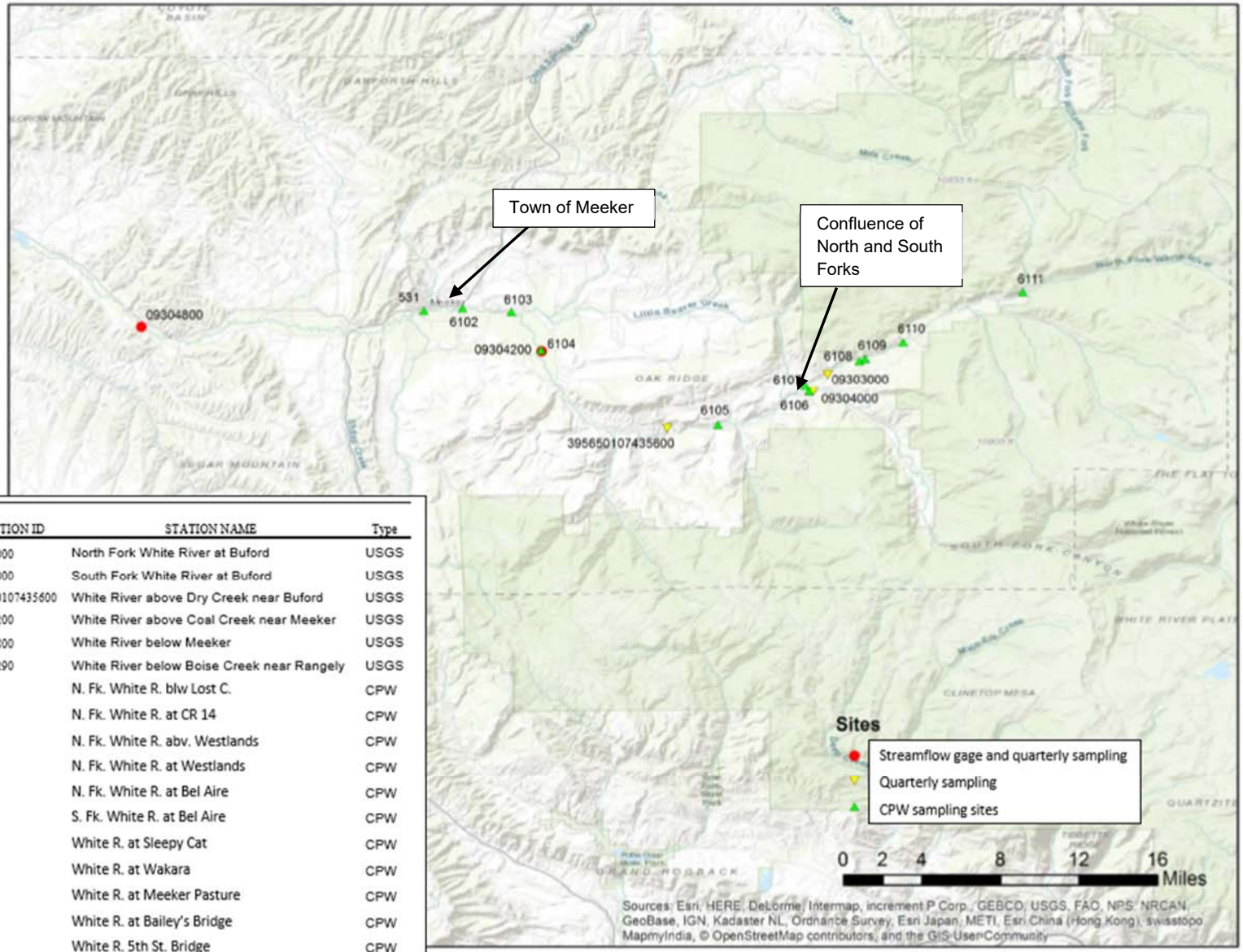
Task No.	Task Description	Task Start Date	Task End Date	Grant Funding Request	Match Funding	Total
4	Scouring Flows	4/1/2020	12/31/2020	$ -	$ 27,000	$ 27,000
7	Pre-, Peak-, Post-Algae and water quality sampling events (2020 only)	4/1/2020	12/31/2020	$ 50,000	$ 95,150	$ 145,150
8	Analysis	10/1/2020	12/31/2020	$ 34,600	$ 11,800	$ 46,400
	Admin @ 6%	1/1/2020	12/31/2020	$ 5,400	$ 4,600	$ 10,000
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -
			Total	$ 90,000	$ 138,550	$ 228,550

Colorado Water Conservation Board

Water Plan Grant - Exhibit C

Maps and Photos

Feb 16, 2018



STATION ID	STATION NAME	Type
09303000	North Fork White River at Buford	USGS
09304000	South Fork White River at Buford	USGS
395650107435600	White River above Dry Creek near Buford	USGS
09304200	White River above Coal Creek near Meeker	USGS
09304800	White River below Meeker	USGS
09306290	White River below Boise Creek near Rangely	USGS
6111	N. Fk. White R. blw Lost C.	CPW
6110	N. Fk. White R. at CR 14	CPW
6109	N. Fk. White R. abv. Westlands	CPW
6108	N. Fk. White R. at Westlands	CPW
6107	N. Fk. White R. at Bel Aire	CPW
6106	S. Fk. White R. at Bel Aire	CPW
6105	White R. at Sleepy Cat	CPW
6104	White R. at Wakara	CPW
6103	White R. at Meeker Pasture	CPW
6102	White R. at Bailey's Bridge	CPW
531	White R. 5th St. Bridge	CPW

White River

August 29, 2018

White River

At

Miller Creek

June 25, 2018

White River

At

North and South Fork

Confluence

July 2016

August 19, 2019

Chris Sturm
Colorado Water Conservation Board
1313 Sherman St., Room 718
Denver, CO 80203

Dear Chris,

Please see the attached letters of Commitment and Support for the on-going White River Algae Study.

The following letters are included:

- YWG Basin Round-table - Approval letter in the amount of $99,000 for 2019 - 2021
- USGS commitment of $62,739
- Colo Parks and Wildlife (CPW) - $20,000 commitment
- Colorado River District - $15,000 commitment
- Rio Blanco County - Letter of Support
- Trout Unlimited - Commitment of $2,500
- Meeker Sanitation District - commitment of $3,500
- Bureau of Land Management - Letter of Support

Please contact our office at 970-878-9838 with any questions

Sincerely,

Callie Hendrickson

Callie Hendrickson, Executive Director

Yampa-White-Green Basin Roundtable

October 2, 2018

Craig Godbout
Colorado Water Conservation Board
1313 Sherman St., Room 718
Denver, CO 80203

Dear Craig Godbout,

At our September 12th meeting, the Yampa White Green Basin Roundtable (YWG BRT) voted to approve the funding of the White River Algae grant request. The motion, to fund $99,000 from the basin account, passed the membership with unanimous support.

At the meeting, Callie Hendrickson presented to the Roundtable on behalf of the White River and Douglas Creek Conservation Districts and reviewed the algae problem and the history of the project. Ms. Hendrickson explained that a technical advisory group was formed in the fall of 2017 to monitor the White River's algae problem and to develop a scope of work. This effort will assist with providing a complete understanding of why the excessive amount of benthic algae is occurring in the White River, and is being implemented by the USGS. The project, as you will note in the application, has extensive financial and organizational support. It is a model of collaboration and much time and consideration has been put into creating a thorough scope of work.

Please do not hesitate to contact me with any questions, and thank you for your consideration of this request.

Sincerely,

Jackie Brown

Yampa White Green Basin Roundtable, Chair

Ken Leib, Office Chief
U.S. Geological Survey
Colorado Water Science Center
445 W. Gunnison Ave, Suite 130
Grand Junction, CO, 81501
970-628-7150
kjleib@usgs.gov

July 29, 2019

Chris Sturm
Colorado Water Conservation Board
1313 Sherman St., Room 718
Denver, CO 80203

Dear Chris,

This correspondence is sent in support of the Colorado Water Plan Grant application entitled "White River Algae Study". The USGS has committed to working with the White River Soil Conservation District on this initiative and has proposed a USGS Cooperative Matching Funds contribution in the amount of $62,739.00 to the project in water year 2020.

The mission of the USGS Cooperative Matching Funds Program is to provide reliable, impartial, and timely information needed to understand the Nation's water resources through a program of shared efforts and funding with State, Tribal, and local partners to enable decision makers to wisely manage the Nation's water resources. The proposed USGS work outlined in the White River Soil Conservation Service CWP grant is directly in-line with this mission and the USGS is dedicated to the pursuit of these types of efforts. With that said, USGS funds are subject to annual Federal appropriations, meaning that our formal commitment for funds in fiscal year 2020 will be contingent on approval of the related appropriations, anticipated to occur in calendar 2020. In the past the USGS has been able to meet our proposed commitments after a Federal budget is approved. Because the proposed grant is in-line with our mission and the work is relevant to on-going national algae issues, it is likely that the funding commitment proposed by USGS for this grant will be available.

Please feel free to contact me if you have any questions.

Sincerely,

Ken Leib, U.S. Geological Survey

COLORADO
Parks and Wildlife
Department of Natural Resources

Meeker (Area 6)
73485 Hwy 64
Meeker, CO 81641
P 970.878.6090 | F 970.878.6077

July 30, 2019

SUBJECT: Support Lett for White River Algae Study Project

To whom it may concern,

On behalf of the Colorado Parks and Wildlife (CPW), this letter is in support of the ongoing White River Algae Study. CPW has been a partner with many other agency and private entities working collaboratively to study and understand the presence of filamentous green algae that is occurring in the White River near Meeker. The White River is a valuable asset to the local community and western Colorado not only as a source of local drinking water but for the economics associated with a destination recreational resource for the residents and visitors to Colorado.

This study began several years ago with concerns from local citizens and natural resource agency personnel about the increasing presence of filamentous green algae in the White River. A working group was created to try to organize and design studies to better identify and understand the increase in this algae species. Collectively, this working group has been able to design a plan to gather information to better measure the prevalence, duration and extent of the algae. The hope is to be able to make management decisions based upon this information.

In the spring of 2019, CPW and the White River and Douglas Creek Conservation District received a funding grant from Great Outdoors Colorado (GOCO) for $20,000 to be used for the White River Algae study. These funds will be utilized for a small portion of this ongoing study. In addition, we hope this grant can be used as match with other entities like the CWCB so additional funding can be secured and so adequate data and information can be gathered to help understand this algae issue completely.

If you have any questions, please feel free to contact me.

Sincerely,

Bill de Vergie

Bill de Vergie
Area Wildlife Manager
Meeker

Colorado River District

Protecting Western Colorado Water Since 1937

August 5, 2019

White River and Douglas Creek Conservation Districts
351 7th Street
P.O. Box 837
Meeker, CO 8164

Dear Callie Hendrickson and White River & Douglas Creek Conservation Districts' Boards:

I am writing this letter on behalf of the Colorado River District in support of a funding request for the White River Algae Study coordinated by White River & Douglas Creek Conservation Districts.

Addressing this issue fits the mission of the Colorado River District, to lead in the protection, conservation, use, and development of the water resources of the Colorado River basin for the welfare of the District. Accordingly, River District staff anticipate budgeting $15,000 of new funding for 2020 to the White River Algae Study in addition to $40,000 already contributed.

Thank you for your continued leadership in addressing this issue in the White River Basin.

Sincerely,

Andy Mueller
General Manager
amueller@crwcd.org

RIO BLANCO COUNTY
BOARD OF COUNTY COMMISSIONERS
COUNTY ADMIN BUILDING, 555 MAIN STREET
P.O. BOX 599
MEEKER, COLORADO 81641
970-878-9430

August 13, 2019

Chris Sturm, Stream Restoration Coordinator
Colorado Water Conservation Board
1313 Sherman Ave, Rm 721
Denver, CO 80203

RE: 2020 White River Algae Study

Dear Mr. Sturm:

The Board of County Commissioners of Rio Blanco County, Colorado is pleased to write you in support of the 2020 White River Algae Study. In recent years the algae in the North Fork and Main Stem of the White River have interfered with recreation, agriculture, and municipal water supplies. Algal blooms also have the potential to negatively impact fish and aquatic insects in the river.

Stakeholders in the White River Valley formed a Technical Advisory Group (TAG) to help develop a scope of work (SOW) in which USGS has been contracted to fulfill. The purpose of the study is to identify factors that contribute to the algal growth so that residence might ultimately address some of those factors and reduce or eliminate the bloom.

We are unable to commit funding for this study in 2020 at this time due to our budget process taking place later this year. However, we have contributed money to the White River and Douglas Creek Conservation Districts to help with this project over the past two years for this Study and hope to continue financial assistance.

We support this Study and look forward to the findings. If you have any questions, please email us at bocc@rbc.us, or feel free to contact us at our individual telephone numbers listed below.

Sincerely,

The Board of County Commissioners
of Rio Blanco County, Colorado

Jeff Rector
Chairman
(970) 629-2614

Si Woodruff
Commissioner
(970) 942-8734

Gary Moyer
Commissioner
(970) 629-5136

JEFF RECTOR
Chairman

SI WOODRUFF
Commissioner
bocc@rbc.us

GARY MOYER
Commissioner

TROUT UNLIMITED

August 2, 2019

Colorado Water Conservation Board
1313 Sherman Street, Suite 718
Denver, CO 80203

Dear Board Members:

I am writing to you today to express Trout Unlimited's (TU) support for the White River Algae Study. For the past number of years, the North Fork and main stem of the White River have suffered from nuisance algal blooms. The most prolific of the alga, *Cladophora glomerata*, affects recreation, agriculture, and municipal water supplies. Further, it has the potential to influence aquatic organisms, such as fish and benthic macroinvertebrates.

In 2017, local stakeholders formed a Technical Advisory Group (TAG) and ultimately hired the U.S. Geological Survey to conduct a study on the algae and its contributing factors. Over the last two years, TU has contributed $7,500 in cash towards that study. Further, we have contributed cash and in-kind match through a complimentary and joint, TU-CPW study on bugs and stream temperature.

Trout Unlimited intends to contribute additional in-kind resources this fall and pledges to contribute at least $2,500 of cash in 2020.

Thank you for your time and consideration.

Sincerely,
Brian Hodge
Brian Hodge

Brian Hodge, Northwest Colorado Program Manager
Trout Unlimited
bhodge@tu.org | 970.846.0414
P.O. Box 771233, Steamboat Springs, CO 80477

MEEKER SANITATION DISTRICT

P.O. BOX 417
MEEKER, COLORADO 81641

OFFICE
265 EIGHTH STREET
PHONE: 970-878-5192
FAX: 970-878-5988

PLANT
1150 MARKET STREET
PHONE: 970-878-5345
FAX: 970-878-4794

August 7, 2019

Callie Hendrickson
Executive Director
White River & Douglas Creek Conservation District

Dear Ms. Hendrickson

The Meeker Sanitation District is committing to provide a cash contribution of $3,500.00 towards the research and subsequent findings for the health of the White River due to algae growth.

The Meeker Sanitation District also contributes $5,436.00 for the quarterly monitoring that is presently being performed on the White River by the United States Department of the Interior, and the Meeker Sanitation District contributed $1,587.50 to the water sampling project Rio Blanco County does on the White River. The District has been contributing to these two water sampling projects on the White River for many years.

It is important to the Meeker Sanitation District to help maintain the quality of the White River in and around Meeker. It is our great privilege to be of some assistance to insure the beautiful White River retains its beautiful water and surroundings.

Sincerely,
Mike Hoke

Mike Hoke
Board of Directors Chairperson
Meeker Sanitation District

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
White River Field Office
220 East Market Street
Meeker, CO 81641

To Whom It May Concern:

The Bureau of Land Management, White River Field Office, expresses full support for the White River Algae Study. In recent years the algae in the North Fork and Main Stem of the White River have interfered with recreation, agriculture, municipal water supplies. Algal blooms also have the potential to negatively impact fish and aquatic insects in the river.
Stakeholders in the White River Valley formed a Technical Advisory Committee (TAG) to help develop a scope of work (SOW) in which USGS has been contracted to fulfill. The purpose of the study is to identify factors that contribute to the algal growth so that residence might ultimately address some of those factors and reduce or eliminate the bloom.
We are unable to show support with funding, however, in past years we have volunteered time and equipment. The BLM fully supports this study and we plan to aid this research in any way.

If you have further questions, please let me know,

Sincerely,

Jessica Sanow
Hydrologist
BLM – White River Field Office
970-878-3836