Town of Grand Lake
STORMWATER MANAGEMENT PLAN

March 30, 2023

Mr. John Crone
Town Manager
P.O. Box 99
Grand Lake, CO 80447-0099

Prime Consultant Information:
AE2S
State of Incorporation: North Dakota
Principal Office: 4050 Garden View Drive, Grand Forks, ND 85201
Agent of Service: Mike Eytel
325 Lake Dillon Drive
Dillon, CO 80435

RE: Selecting AE2S to Help the Town Reduce Nutrient and Sediment Loading to Shadow Mountain Lake through an Effective Stormwater Management Plan

Dear John,

We are excited about the opportunity to work with the Town and to help you develop an effective stormwater management plan! By selecting AE2S, you'll benefit from the following:

Extensive Experience Conducting Stormwater Modelling and Resiliency Studies, Helping You Set a Solid Foundation to Build Future Development. AE2S has completed numerous stormwater management projects for communities like yours. Leveraging that experience, we know how to develop a reliable stormwater management modeling approach that will create an unbiased tool to guide infrastructure improvement projects that are sound and defendable to residents and stakeholders alike.

Local Knowledge and Understanding of the Unique Challenges for the Town of Grand Lake. Our project team will be led by me, Mike Eytel, and I have first-hand experience and knowledge of Grand County and the Three Lakes area, as well as experience managing complex projects with water quality issues. Our subconsultant, Brian Murphy, also brings a wealth of knowledge and experience working in the area. Brian Murphy and I have extensive experience working in Grand County and in the Three Lakes area. Our team's expertise, along with our institutional knowledge of local water issues, gives AE2S and River Works a unique ability to provide you with the support necessary to develop a comprehensive local solution to Grand Lake's stormwater management.

Our Team of Experts Have Experience in Post-Fire Stream Restoration and Construction of Low Impact Design and Best Management Practices. In addition, AE2S has experts in flood modeling and mitigation, stream restoration, financial planning, and public outreach & communications. With a local resource supported by a comprehensive team, we can help you be successful as we have with many of our past and present clients.

We are excited about this opportunity to partner with you, and we look forward to meeting with you to discuss how we can help you further. Please contact me at (970) 485 – 0483 or michael.eytel@ae2s.com if you have any questions.

Submitted in Service,

Michael Eytel
Project Manager

Brian Gaddie, PE
AE2S Authorized Representative to Bind Contract

Brian Murphy, PE, PhD, D.WRE
Subconsultant - River Works, Ltd.
Contact information on resume

Mary Price
Subconsultant - GCWIN
Contact information on resume

UNDERSTANDING & APPROACH

Understanding

While the population of the Town of Grand Lake may be small, the town is the western gateway to Rocky Mountain National Park, bringing in millions of out-of-town visitors to the area annually. Land disturbance and development change the physical, chemical, and biological conditions of our waterways and water resources, disrupting and altering the natural hydrologic cycle. Wildfires have a pronounced effect on the vegetation and landscape by removing plant material and soils that typically filter and return rainfall to the atmosphere through evaporation and transpiration. In addition, buildings, roads, parking lots, and other impervious surfaces further reduce infiltration of rainfall/snowmelt across the land. These changes increase flooding risk, reduce conveyance capacity through sedimentation, and impact water quality in downstream water bodies. The Town has seen these impacts, most notably through plugged culverts, sediment in Little Columbine Creek and the marina, and reduced water quality throughout the Town's lakes.

We have organized our scope and approach based on the RFP's scope of work on RFP page 5. Our proposed approach for evaluating and designing the Town of Grand Lake's Stormwater Management Plan covers five discrete tasks.

Task 1
Communication

Task 2
Public Engagement (RFP Task 2)

Task 3
Mapping, Data Collection, and Monitoring (RFP Tasks 1 and 2)

Task 4
Analysis of Existing Conditions and Design Solutions (RFP Task 2)

Task 5
Reporting, Maintenance Considerations, and Funding Options (RFP Task 3/4)

Task 1
Communication

We propose five meetings will be held throughout the project to inform you of progress and any potential hurdles. Consisting of a Kickoff Meeting, three progress meetings, and one Final Planning Session. The meetings are generally intended to review the following: schedule and budget status, public outreach, progress to date, anticipated progress, and critical or urgent matters/questions.

Effective project management is critical for your project's success. To serve your needs and provide a successful project, we commit to an approach that is:

- **Tailored** to your preferences, including frequency and format, whether written, voice, or text communications.
- **Forward-Looking** so we can plan and alert you well before crucial milestones and decision points, so you will not wonder, "What's coming next?"
- **Collaborative and Transparent** process that keeps you involved and provides peace of mind.
- **Well-Led** by an experienced and trained Project Manager (PM) who has consistently provided successful results on past projects.

When brought together by an experienced PM and backed by a talented team, these items will provide a project that mitigates budget, schedule, and quality risks and exceeds your expectations.

Our PM will make sure meetings are:

- Efficient and productive
- Founded on a well-defined agenda
- Relative to team members in attendance
- Respectful of your time allocated to the meeting
- Followed with meeting minutes and actionable items

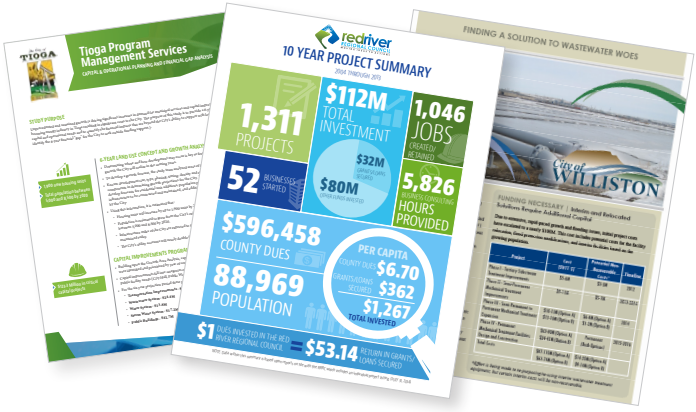
Regularly scheduled meetings will allow for proactive communication and quick decisions to keep your project on track and within budget. Further, we will use available technology as appropriate, such as Microsoft Teams or Zoom, to assemble the team no matter where they are located. Using web conference technologies cuts down on travel time and project expenses while still allowing you face-to-face access to key personnel. The use of web conferencing technology will save you money!

Task 2

Public Engagement (RFP Tasks 2 and 3)

Having input from the residents is critical to support this project. Our approach to public outreach consists primarily of two parts. Utilizing our local team member, Brian Murphy, in early June, we will conduct door-to-door outreach near the stormwater management area providing an informational flyer that describes the Grand Lake Stormwater Management Plan in development and provides notice of the future Town Hall style planning meeting (late July/August). We will reach out to the residents in this area and post flyers at local restaurants and signboards to ensure the message reaches interested parties.

The second part is a Town Hall meeting providing valuable local input on the Stormwater Management Plans' design and implementation. We will coordinate the public outreach effort with the Town of Grand Lake to assure messaging is appropriate and reaches the intended audience. We are tentatively scheduled for late July or early August 2023.



AE2S Communications is our professional in-house communications team, providing you with experts in presenting information in a clear, understandable fashion to ensure residents and stakeholders are properly educated. These professionals will be available to the Town to help with flyers, handouts, or presentations as needed.

Task 3

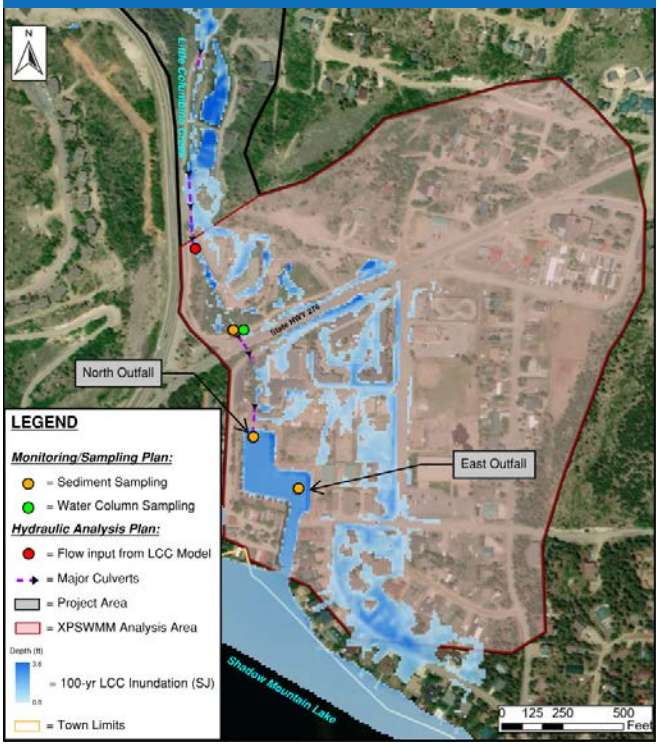
Mapping, Data Collection, and Monitoring (RFP Tasks 1 and 2)

To gain an understanding of how the current system is functioning on a hydraulic level, we will conduct a thorough inventory/survey of all existing culverts that reside within the analysis area. As part of this survey we will record the level of blockage that exists in each culvert. We will also gather any land use, terrain, water quality, East Troublesome Fire impact, and flow data from existing GIS databases and previous studies of the area. This info will be used to set up the hydraulic analyses in Task 3.

Due to the costly nature of a long-term water quality monitoring program and the limited funds available for this project, our team proposes a targeted sampling approach focused on identifying the principal contaminates and issues related to the quality of water currently discharging into the marina. Water that reaches the marina primarily comes from two sources: 1.) Little Columbine Creek (North Outfall) and 2.) the local Town drainage system (East Outfall).

We will analyze the water quality conditions of each of these sources separately by collecting sediment samples in deposition areas near each of the marina outfalls. We will also collect a third sediment sample on Little Columbine Creek upstream State Hwy 278. These sediment samples will undergo sieve and hydrometer analysis, total organic content, total phosphorous, orthophosphate, and total nitrogen.

Proposed Sampling Plan and Analysis Area



Additionally, we propose to collect two water column grab samples in Little Columbine Creek upstream of State Hwy 278. One baseline sample (May) and one storm event sample (June/July). We will partner with Grand County Water Information Network (GCWIN) to assist with the local stormwater sampling events. Their local presence will be essential to capturing data promptly and accurately. This effort will help fulfill the required monitoring parameters mentioned in the RFP.

The sediment samples will provide important insights into the types of contaminates being deposited in the marina and the level of fire impacts that still exist on Little Columbine Creek. The water column sample will then help capture any other contaminates that may not be identifiable in the sediment samples and will provide additional perspective in terms of quantifying pollutant and sediment loads. All sampling data and results as well as recommended sites for future long term monitoring, will be provided to the City as an appendix to the final Stormwater Management Plan (see Task 5).

Task 4

Analysis of Existing Conditions and Design Solutions (RFP Tasks 2 and 3)

Our team will use the previously constructed HEC-RAS 2D model from the 2022 Silver Jacket Report (see LCC results on map) to analyze the hydraulic conditions in Little Columbine Creek. To analyze the local town drainage area, we will construct an XPSWMM 2D Rain on Grid model and will include a boundary condition to introduce the flows from Little Columbine Creek (see red marker on map). This will allow us to model local hydrologic drainage conditions with accuracy while still accounting for the incoming flows from little columbine creek.

The results of these hydraulic analyses combined with the sampling data will aid in evaluating design solutions and the types of stormwater BMPs that would be appropriate for improving water quality to each outfall. We will work together with you to select the most suitable BMP and will prioritize Low Impact Development (LID) options wherever possible and practical. We will use existing tools, i.e. Mile High Flood District (MHFD) BMP Design Tools, to size the BMPs appropriately and select strategic installation sites, adhering to MHFD and Grand Lake design standards. Finally, we will prepare several GIS figures documenting our findings, BMP selection, and site selection to assist in public engagement, and develop design exhibits suitable for estimating construction costs that will aid in budgeting and funding requests. Design exhibits will be to a 30% design level.

Task 5

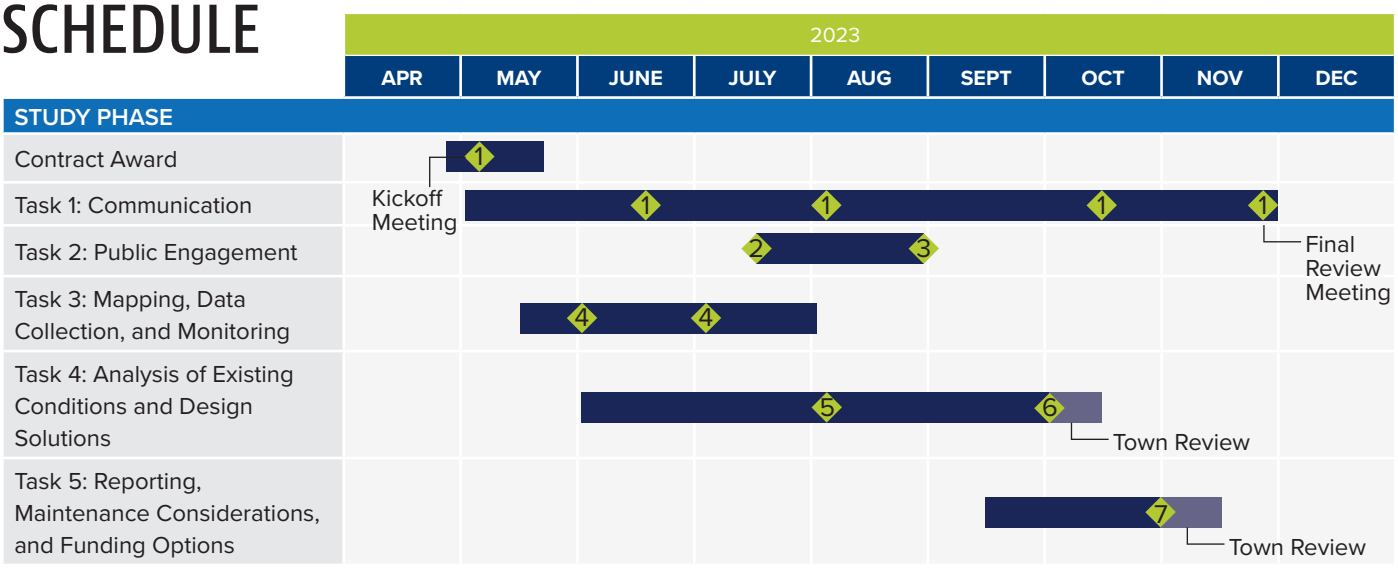
Reporting, Maintenance Considerations, and Funding Options (RFP Task 3 and 4)

Once Town staff have approved the proposed BMPs and the public has been informed, we will work with you to finalize the details of the proposed plan. As part of this process, we will provide planning level construction costs, a plan for future Operation and Maintenance (O&M) requirements, and any permitting requirements associated with the proposed plan.

At this point in the project, as requested in the RFP, we will bring in our AE2S Nexus team. AE2S Nexus, the financial division of AE2S, is a dedicated Financial and Asset Management company comprised of individuals committed to fully understanding issues such as State and Federal funding programs, project financing, utility financial health (revenue adequacy, cost of service, etc.), and asset management. This team will work with you to identify funding opportunities to expand monitoring efforts in the future and acquire the necessary funds to carry this project through final design and construction.

The final deliverable for this task will be a complete Stormwater Management Plan including all of the information gathered for this task as well as all sampling, findings, results, and figures associated with previous tasks outlined in this approach. We will plan for one review period for Town staff to provide comments prior to finalizing the report/plan. All electronic GIS/Modeling files will be provided to the town as an appendix to the report.

SCHEDULE



- Activity Duration
- Key Project Milestone
  1. Progress Meeting with Town of Grand Lake
  2. Door to Door Grand Lake SWMP Informational Flyer
  3. Town Hall Meeting
  4. Sediment Sampling and Stormwater Samples
  5. Completion of Hydraulic Analysis & Conceptual Design
  6. Completion of 30% Preliminary Design
  7. Submit Draft Management Plan, including Operations & Maintenance, Permitting, and Funding information for Town to Review

The Kickoff and Final Planning Meeting will be held in person while progress meetings will be held virtually.

Assumptions:

- Town of Grand Lake awards contract by April 11, 2023
- Notice-to-Proceed Kickoff Meeting by May 1, 2023

SIMILAR
EXPERIENCE

Grand County, Colorado
WATERSHED RECOVERY COORDINATOR

Grand County partnered with Northern Water and NRCS to administer the East Troublesome Fire (ETF) Emergency Watershed Protection (EWP) program to bring meaningful and critically needed recovery to the watersheds damaged by the ETF and Williams Fork Fire (WFF). The County hired River Works to act as the Watershed Recovery Coordinator. River Works is responsible for coordinating and administering watershed protection and recovery associated with the East Troublesome Fire and Williams Fork Fire on behalf of Grand County and in collaboration with Grand County's watershed partners. The Watershed Recovery Coordinator represents Grand County and acst as a spokesperson for the organization and manages relationships with landowners and the local community. River Works coordinates closely with Grand County's Water Quality Specialist, NRCS staff, the County's consultant and contractors, and Northern Water. River Works also administers the EWP Program including preparing paperwork for reimbursements, financial tracking, and coordination with NRCS. In the WFF burn area, River Works has led the recovery efforts with County staff and the USFS through community outreach, post-burn data analysis, and seeking opportunities to work with volunteer organizations.

CLIENT
Grand County

CONTACT INFO
Katherine Morris,
970-531-8494

KEY PROJECT ELEMENTS
- Grand County Experience
- Watershed Protection and Recovery
- Community Outreach and Engagement
- Experience and Familiarity with Various Governing Organizations Surrounding the Town of Grand Lake

Grand County, Colorado
COMPREHENSIVE WATERSHED ASSESSMENT

Learning By Doing (LBD) hired Lotic Hydrological, River Works, and others to conduct a watershed assessment, applying a comprehensive analysis of all available data in the Cooperative Effort Area (CEA) within Grand County. The watershed assessment consists of analysis, interpretation, and reporting on environmental data, including hydrology, water temperature, water quality, stream sediment, macroinvertebrates, fisheries, and riparian data, providing a comprehensive assessment of the aquatic environment, consistent with LBD's primary goal, to maintain and, when reasonably possible, restore or enhance the aquatic environment in Grand County. The consultant team is analyzing data from Grand County Water Information Network's (GCWIN) AWQMS database, US Geological Survey, Denver Water, and Northern Water. River Works' role is assisting with compilation and review of relevant background information, analysis, interpretation and compilation of available geomorphological data, developing the geomorphic characterizations of all streams in the CEA, and generation of maps and interactive data visualizations. River Works is also helping prepare the assessment report that identifies existing opportunities and constraints for promoting ecological integrity.

CLIENT
Learning By Doing

CONTACT INFO
Kayli Folk
970-725-3750

KEY PROJECT ELEMENTS
- Grand County Experience
- Watershed Assessment
- Proven Experience/Success Working with GCWIN as Teaming Partner

Aurora, Colorado

LOW IMPACT DEVELOPMENT STORMWATER BMP DESIGN

The City of Aurora contracted AE2S for the design of a new communications tower to provide necessary coverage for fire, police, and rescue operations. The tower site was located in Douglas County and was within the Cherry Creek Reservoir Watershed (a highly regulated and monitored watershed for water quality and sediment loading). The site was also located upstream of Sampson Gulch, an important tributary for the Cherry Creek Basin, and contained an existing roadway ditch that drained into said tributary downstream. Our team designed a Tier 2 Low Impact water quality BMP for the site to provide rate and volume control. We also designed stabilization measures on the existing roadway ditch to reduce sediment loads that would reach Sampson Gulch during larger storm events. Due to the project's sensitive location, both Douglas County and Mile High Flood District reviewed the proposed design, meaning the BMPs were designed to satisfy both County and MHFD design requirements.

KEY PROJECT ELEMENTS

- Experience Designing Low Impact Water Quality BMPs in Colorado While Meeting Multiple Local Colorado Standards
- Experience in BMP Design for Sediment Load Reduction in Channel Systems
- Experience with MHFD Design Tools

CLIENT
City of Aurora

CONTACT INFO
Elizabeth Carter, PE
303-619-1656

Kalispell, Montana

WATER QUALITY IMPROVEMENTS

The City of Kalispell received ARPA funding to study, design, and construct stormwater water quality improvements in three urbanized watersheds. In late 2021, the City contracted AE2S to work on the priority Ashley Creek watersheds. We started by developing a fully dynamic stormwater model for the drainages and evaluating several water quality improvement alternatives, including wet detention basin, treatment wetland, bioswale, and mechanical treatment. Due to cost and space constraints, mechanical treatment was selected. We completed final design for three hydrodynamic separators retrofitted into existing urban storm drain systems. The construction contract was awarded in early 2023 with construction anticipated to be complete by fall 2023.

KEY PROJECT ELEMENTS

- Water Quality Improvements in Urbanized Watershed
- Water Quality Improvement Alternatives
- Final Design

CLIENT
City of Kalispell

CONTACT INFO
Susie Turner, PE
406-758-7720

Woodbury, Minnesota

STORMWATER BMP MAINTENANCE PLAN

The City of Woodbury has over 1,000 BMPs that vary by type, condition, and age. The City, as an MS4, is obligated to inspect and maintain these BMPs. However, despite newer BMP technologies like filtration and underground BMPs being constructed in the City, the City lacked an understanding of how to maintain these newer types of BMPs. Further, several BMP maintenance projects were not received well by residents and lack of documentation about the why behind maintenance put City staff and the Council in a difficult position.

Our team reviewed other cities' and states' BMP maintenance plans to create a maintenance plan template and led a series of review meetings with City staff to customize the template to meet the City's goals and capacities. This became the Woodbury Stormwater BMP Maintenance Plan. In coordination with City staff, our team identified the cost needed to perform minor and major maintenance of each type of BMP. Using that unit cost data, our team prepared an overall cost estimate to implement the plan.

The City is now able to use the maintenance guide when reviewing proposed new BMPs during their development review process and when engaging with residents.

KEY PROJECT ELEMENTS

- BMP Asset Management Plan
- Private BMP Maintenance Challenges
- Public Education

CLIENT
City of Woodbury

CONTACT INFO
Kristin Seaman
651-714-3593

AE2S Communications helped the City develop a graphical summary of its Stormwater BMP Maintenance Plan to share with the community.

EXPERIENCE WORKING WITH SIMILAR SIZED COMMUNITIES

When we say we understand working with small communities, we mean it. As a firm, we were founded on serving small, rural communities and continue to look to build relationships with municipalities of all sizes. We have found the most success in working with small communities where we can provide a full suite of services. Over the course of our 30+ year history, we have worked side-by-side with dozens of communities similar in size to Grand Lake, and many tourist-centered mountain towns such as Keystone, Dillon, and Estes Park here in Colorado, and Big Sky and Whitefish in Montana.

QUALIFICATIONS

As the first step of building an effective partnership for the Town of Grand Lake, AE2S has teamed with River Works and Grand County Water Information Network (GCWIN). Our team brings you the best available combination of stormwater Low Impact Development design expertise, responsive services, and local knowledge of the Three Lakes available. This means that you can be confident that your project will be feasible and planned specifically with your needs in mind. Our local team is ready to respond to your needs and leverage our national expertise.

AE2S + RIVER WORKS + GCWIN =

- Stormwater Low Impact Development Design Expertise
- Responsive Service
- Local Knowledge

Mike Eytel
Project Manager

Amber Lefers, PE
QA/QC

PROJECT TEAM

Brian Murphy, PhD, PE. D.WRE, PMP
Stormwater BMP Planning, Public Engagement, and Local Liaison

Joey Lane, EIT
GIS/CAD

Travis McStraw, EIT
Stormwater Modeling, Planning, and Design

Abby Ritz
Funding Specialist

Mary Price
GCWIN Stormwater Sampling

This team is supported by a deep bench of water resources specialists should the need arise.

Mike Eytel
Project Manager

Mike has over 26 years of experience as an accomplished Senior Water Resources Specialist with a proven track record in western water. Mike has extensive knowledge of Federal and Colorado water policy, compact compliance, long-term project management, contract administration, and environmental regulatory compliance. In addition, he is adept in complex collaborative workgroup processes with diverse interest groups and agencies.

SPECIFIC RELEVANT EXPERIENCE

- **Grand Lake Adaptive Management, Grand Lake, CO - Senior Water Resource Specialist.** Supported the water quality monitoring and assessment of the Three Lakes Collection System. Grand Lake, Colorado's largest and deepest natural lake, is in the headwaters of the Colorado River in Grand County. A feature of the Colorado-Big Thompson Project (C-BT), Grand Lake is interconnected with Shadow Mountain Reservoir and part of the Three Lakes System, including Lake Granby. The Clarity Memorandum of Understanding (MOU) also requires the preparation of an annual report to summarize what was learned about the C-BT project operational approaches to meet the clarity goals and the resultant effects on water quality and clarity in Grand Lake. The MOU created an adaptive management process to improve Grand Lake clarity while reclamation plans complied with the National Environmental Policy Act (NEPA) requirements.
- **Upper Colorado River Recovery Program - White River Management Plan, White River, CO - Senior Water Resource Specialist.** Led the development of the draft of the White River Management Plan. The plan aids in water development within the White River to work with the Upper Colorado River Recovery Program. This includes working with stakeholders to determine the water needs for the recovery of endangered fish as part of the White River Programmatic Biological Opinion.
- **Upper Colorado River Wild and Scenic Alternative Management Plan, Upper Colorado River Basin - Senior Water Resource Specialist.** Led the development of the Upper Colorado River Wild and Scenic Alternative Management Plan. The Upper Colorado River Wild and Scenic Stakeholder Group was formed as an independent, collaborative group in 2007 to balance the protection of the Outstanding Remarkable Values (ORVs), certainty for the stakeholders, water project yield, and flexibility for water users along the Upper Colorado River.
- **Colorado River Basin Salinity Control Workgroup Member, Colorado River Basin - Senior Water Resource Specialist.** Supported the water quality efforts to reduce salinity in the Colorado River Basin by salinity standards and control measures. Recognizing the rapidly increasing salinity concentration in the Lower Colorado River and its impact on water users, the Colorado River Basin States came together in 1973 and organized the Colorado River Basin Salinity Control Forum (Forum). In 1974, in coordination with the Department of the Interior and the U.S. State Department, the Forum worked with Congress to pass the Colorado River Basin Salinity Control Act (Act). Since the implementation of the program, measures have been put in place, to reduce the annual salt load of the Colorado River by more than 1.2 million tons.

EDUCATION
Bachelor of Science, Forest Resources, B.S.F.R, Major in Soil and Water Resource Management, University of Georgia

CONTACT
Mike.Eytel@ae2s.com
T: 970-406-2697

WHY MIKE?

Mike is well-versed in protecting watershed health, water quality analysis, and working with diverse stakeholder groups. His local presence and his longstanding relationship and familiarity with the Town of Grand Lake make him the ideal Project Manager for this effort.

Amber Lefers, PE
QA/QC

Ms. Lefers has more than 20 years of consulting experience, applying hydrology and hydraulic engineering to a wide variety of water resources and civil engineering projects. Areas of specialized expertise include stormwater quantity and quality management, as well as hydrology and hydraulics of rivers and streams. Her interest in LID extends beyond her professional life – she has installed three raingardens on her personal property, converted conventional landscapes to prairie/savannah, and installed rain barrels at her roof downspouts.

SPECIFIC RELEVANT EXPERIENCE

- **City-Wide BMP Maintenance Plan, Woodbury, MN - QA/QC Engineer.** Provided QA/QC for the development of a city-wide BMP Maintenance Plan to help guide the City to determine the necessary maintenance activities needed to have BMPs function properly over their design life. In addition, a cost estimation tool was developed to forecast long-term capital O&M budget costs. The project was completed by assessing the existing BMPs the City has along with the integration of newer BMPs being utilized for stormwater treatment to provide a wholistic assessment.
- **UW-Madison Arboretum Johannsen Pond Outfall Improvements, Madison, WI - Project Manager.** Prepared and obtained approval for DNR Non-Point Source Grant application. Completed hydraulic modeling of semi-offline stormwater management retrofit for large storm sewer outfall, designed prairie/wetland basin to improve water quality, and prepared constructions plans and opinions of probable cost.
- **Regional Stormwater Improvements, Kalispell, MT - QA/QC Engineer.** Provided QA/QC on the comprehensive regional stormwater planning, permitting, and design that will facilitate development growth while avoiding impacts to downstream FEMA floodplains and structures.
- **Target Infiltration Basins, Fitchburg, WI - Project Engineer.** A proposed retail center and associated commercial development had the potential to impact downstream water resources. The City required a stormwater management approach that reduced sediment loading, while controlling peak discharge and runoff volume. Proposed design included a wet detention basin that discharged to a series of LID infiltration practices, totaling almost 1 acre in size. The system has been installed for several years and has performed extremely well.
- **Stutsman County Water Resource Board Master Plan, Jamestown, ND - Project Engineer.** Stormwater Master Plan for three regions in and around the City of Jamestown for a total planning area of more than 4,500 acres. Included an analysis of existing infrastructure, public outreach, mitigation planning for existing problem areas, master planning for future development, and preparation of an Implementation and Funding Plan for proposed improvements.
- **Spring Harbor Watershed Study, Madison, WI - Project Manager.** Led the development of a watershed-wide XP-SWMM 2D analysis to evaluate numerous watershed improvements, including eight different culvert crossings as well as modifications or creations of stormwater detention facilities.
- **English Coulee Water Quality Renewal Plan, Grand Forks, ND - QA/QC Engineer.** Developed a plan for improving water quality along a highly impaired waterway. Developed a hydrologic and hydraulic model to determine changes to flow regimes that would be created from water quality improvement projects. Finally, the project involved a highly successful public outreach program which gave the municipality the confidence that the community was fully supportive for investing in the coulee.

EDUCATION
Master of Science, Civil Engineering, University of Wisconsin-Madison; Bachelor of Science, Civil Engineering, Calvin College

REGISTRATIONS
Professional Engineer: Colorado , Utah, Arizona, Montana, Illinois, Minnesota, North Dakota, South Dakota, Wisconsin

CONTACT
Amber.Lefers@ae2s.com
T: 608-572-1352

WHY AMBER?

Amber is the Water Resource Practice Leader and has managed, been the technical lead, or provided QA/QC on virtually every one of AE2S' municipal drainage and stormwater analysis and design projects. She is also incredibly passionate about LID, including installing LID practices on her own property.

Brian Murphy, PhD, P.E., D.WRE, PMP

Project Engineer, Public Engagement, and Local Liaison

Brian is a water resources engineer and fluvial geomorphologist with over 20 years of experience. He has a wide-ranging background in water resources planning and engineering, fluvial geomorphology, and floodplain and stormwater management. From his doctoral research to his consulting and nonprofit experience, Brian focuses on river health, watershed assessments, and stormwater and floodplain management. As a licensed professional engineer in Colorado, he has led and managed river engineering, watershed studies, stream management planning, and floodplain resiliency projects across Colorado—leveraging his multidisciplinary experience and expertise. He is comfortable working at the complex intersection of watershed planning and community needs, and is known for his drive to understand technical issues deeply, skills in partnership building, and enthusiasm for sharing knowledge. He also works on post-disaster projects across Colorado, emphasizing community-informed planning, nature-based solutions, and multi-benefit projects. His PhD research focused on assessing the physical condition of streams seeking to address the "wicked problems" caused by natural and anthropogenic changes on river hydrology and geomorphology. He is a subject matter expert who is skilled at conveying technical and policy information related to river processes and floodplain management.

SPECIFIC RELEVANT EXPERIENCE

- **Watershed Recovery Coordinator, Grand County, CO - Technical Lead.** Grand County partnered with Northern Water and NRCS to administer the East Troublesome Creek Emergency Watershed Protection (EWP) program to bring meaningful and critically needed recovery to the watersheds damaged by the ETF and Williams Fork Fire. As the watershed recovery coordinator, Brian directs the watershed protection and recovery efforts in Grand County, collaborating with Grand County officials, stakeholders, agencies, and landowners in addition to directing consultants and managing contractors. He also administers the EWP Program including preparing paperwork for reimbursements, financial tracking, and coordination with NRCS. Brian supports the WFF recovery efforts with the USFS through community outreach, post-burn data analysis, and seeking opportunities to work with volunteer organizations.
- **Learning By Doing Watershed Assessment, Grand County, CO - Geomorphologist and Technical Advisor.** Lotic Hydrological formed a partnership with River Works and others to deliver a comprehensive assessment of watershed conditions in the Upper Colorado River Watershed. The primary goal of the project is to assess hydrological, water rights, water quality, geomorphic, riparian, and biological function data relevant to focus streams in the project area. Brian assisted with compilation and review of relevant background information, analysis, interpretation and compilation of available geomorphological data, and generation of maps and interactive data visualizations. He is also helping prepare the assessment report that will help stakeholders understand where opportunities and constraints exist for promoting ecological integrity.
- **Beaver Adaptive Management Plan, Denver, CO - Technical Lead and Project Manager.** River Works partnered with Anabranch Solutions to develop a beaver adaptive management plan (AMP) for the Mile High Flood District (MHFD) and City and County of Denver.

EDUCATION
Doctor of Philosophy, Civil and Environmental Engineering, Colorado State University; Master of Science, Environmental Science and Engineering, Colorado School of Mines; Bachelor of Science, Civil Engineering, Santa Clara University

REGISTRATIONS
Professional Engineer: Colorado , California, Washington, Texas

CONTACT
Brian@river.works
T: 303-345-7595
2370 Kearney Street
Denver, CO 80207

WHY BRIAN?

Brian founded River Works, to focus on researching and addressing problems caused by anthropogenic stressors on lake and stream ecosystems. His passion for improving watershed health, his talent for community planning and public engagement, and his past experience, familiarity, and local presence with the Town make him the perfect technical expert for this project.

GCWIN
Local Partner

Grand County Water Information Network was established in 2004 as a collaborative effort to enable better decision-making through science-based water quality monitoring, information-sharing and educational programming. After its initial successes of building a strong membership base and developing its monitoring programs, GCWIN now has expanded its leadership of water quality monitoring to four main programs: Stream Temperature monitoring along the Fraser and Colorado Rivers, Secchi monitoring of Grand Lake and Shadow Mountain Reservoir, Temperature and Specific Conductivity in the Three Lakes region, and cyanobacteria monitoring in the Three Lakes region. GCWIN also has a strong focus on data management and storage. GCWIN serves many stakeholders in the region as a data "sink" by storing a variety of water quality data in our public online database. By collecting and storing this data, it allows the public and stakeholder groups to access historic water quality data for permitting, environmental studies, and operational decision making. GCWIN's field team is growing, and soon will have three field staff to collect and process water quality samples in Grand County. GCWIN has historically been a "behind the scenes" type of non-profit organization, focusing on data. As water quality issues become more and more important for our community, GCWIN aims to grow our education and outreach programs in Grand County.

Mary Price
Stormwater Sampling

Ms. Price is the Executive Director for Grand County Water Information Network (GCWIN) in Grand Lake. Mary has served as Lead Field Technician for GCWIN since 2017. During her six years at GCWIN, Mary has grown her skills, passion, and knowledge for Grand County water resources. Mary has been able to bring her technical science background to GCWIN to strengthen monitoring capabilities. As technology advances and more water quality issues arise, Mary looks forward to growing GCWIN's monitoring, technology, and database capacity to serve the community.

EDUCATION
Bachelor of Science, Environmental Studies, Florida Gulf Coast University

CONTACT
T: 970-627-8162
610 Center Drive
Grand Lake, CO 80447

WHY MARY?

Mary's local presence will be key to collecting accurate storm event water quality samples. Her expertise in monitoring technology and knowledge of the area will also be valuable in determining long term monitoring recommendations.

Travis McStraw, EIT, CFM

Stormwater Modeling, Planning, and Design

Mr. McStraw has six years of civil and environmental engineering experience in both private consulting and municipal engineering arenas and has a strong background in a variety of stormwater modeling techniques. Since the start of his career Travis has been involved in developing stormwater master plans and understands the enduring impact the plan has on City spending and operations. His technical knowledge of hydraulic modeling combined with his familiarity with municipal systems make him a valuable resource for stormwater master planning. Travis is also a Certified Floodplain Manager.

SPECIFIC RELEVANT EXPERIENCE

- **LID Stormwater BMP Design, Aurora, CO - Water Resources EIT.** Designed a Tier 2 Water Quality basin in the sensitive Cherry Creek Reservoir Watershed to provide volume and rate control as well as sediment reduction. Provided stabilization for existing roadway ditch that drained into sensitive tributary. Design was reviewed and approved by numerous organizations including Mile High Flood District and Douglas County.
- **Curry Court Flooding Analysis, Fitchburg, Wisconsin - Water Resources EIT.** Developed an XPSWMM 2D Rain on Grid model in a rural area of the city. Modeled driveway culverts and visualized overland flow paths to capture closed basin flooding. Informed the design of new conveyance ditches to help route flooding away from residential structures.
- **2015 Denver Water Quality Master Plan, City and County of Denver, Denver, CO - Engineering Intern.** Performed preliminary analysis for the Water Quality Planning Committee, including the sub-watershed analysis of Nitrogen, Phosphorus, Suspended Sediment, E-coli, and BOD pollutant loads for each of the City's subwatersheds. He performed a correlation analysis and associated different pollutants with specific land use types. Researched new strategies for Low Impact Development (LID)/green infrastructure implementation which entailed contacting numerous cities and countries. This effort played a key role in obtaining funding for the water quality master plan which was the start of the now well renowned green infrastructure department that exists at the City and County today.
- **Long-Term System Renewal Planning, Eagan, MN - Project Engineer.** Developed a comprehensive rehabilitation and renewal (R&R) plan for a wide range of City infrastructure including water quality BMPs. Worked with City to financially plan for new LID implementation projects to treat problem areas for sediment and nutrient loads as well as the increase of ongoing maintenance costs that would occur as more BMPs were installed.
- **City-Wide XP 2D Modeling and Resiliency Study, Burnsville, MN - Water Resources EIT.** Travis has been the lead modeler for the City-wide XPSWMM 2D modeling effort, covering over 22.5 square miles (14,000+ Links, 1,700+ Subwatersheds). Upon completing the 2D modeling portion of the project, Travis conducted a City-wide risk and resiliency study using GIS scripts and Info Asset Planner to determine locations throughout the City with the highest risk of flooding.
- **Flood Risk Analysis, Billings, MT - Water Resources EIT.** Developed a 2D HEC-RAS model to evaluate flood and drought risk to critical City infrastructure posed by the shifting river channel. Conducted an Ice Jam Analysis (1D HEC-RAS).

EDUCATION
Master of Science, Civil Engineering, Brigham Young University; Bachelor of Science, Civil and Environmental Engineering, Brigham Young University

REGISTRATIONS
Engineer-in-Training: Utah

MODELING SOFTWARE
HEC-RAS 1D/2D, XPSWMM 1D/2D, SRH-2D

CONTACT
Travis.McStraw@ae2s.com
T: 303-503-8307

WHY TRAVIS?

Travis is an expert in hydrologic and hydraulic analysis and has local experience in designing water quality BMPs in Colorado.

Joey Lane, EIT
GIS/CAD

As a recent graduate, Mr. Lane has already started to form a reputable resume as a CAD drafter and design engineer. He is backed by applicable internship experience, a sound knowledge of CAD software and stormwater design principles, and experience with multiple projects within Colorado mountain communities. Joey is passionate and experienced with drafting, designing, and constructing natural stormwater Best Management Practices (BMPs) to create functional and esthetically pleasing design solutions.

SPECIFIC RELEVANT EXPERIENCE

- **LID Stormwater BMP Design, Aurora, CO - EIT.** Developed an erosion control plan set to minimize the amount of disturbance and sediment generated on the job site. Assisted in selecting temporary and permanent water quality BMP locations on the job site to minimize sediment mobilization before and after project construction. Efficiently worked through multiple review sessions with Douglas County to get County approval before the project went out to bid. Developed opinion of probable cost for the erosion control plan.
- **Wild Ridge Booster Pump Station and PRV Improvements, Avon, CO - EIT.** Designed erosion control plans to reduce the impact of construction services on the surrounding sites in accordance with Town and county specifications. Assisted in selection of BMP methods and installation locations for temporary and permanent applications. Assisted in drafting of civil site, grading, and utility piping plans for pumping station and PRV improvements sites. Provided opinion of probable cost on all aspects of civil improvements.
- **Schoolmarm Pipeline, Snake River Water District, Keystone, CO - EIT.** Provided construction collaboration services between Owner and involved contracting services. Reviewed shop drawing submittals and ensured materials proposed by contractor comply with District and any additional required specifications. Attended pre-construction planning meetings to help provide supplemental knowledge of design plans.
- **Fish Passage Culvert Replacement, Haines, AK- Engineering Intern.** In December 2020, a devastating storm cycle caused catastrophic flooding in southeast Alaska resulting in major damage to the rural infrastructure. Designed three temporary fix culverts with permanent solutions that would withstand similar storm hydraulic capacity and abide by Alaska fish passage standards. Responsible for hydrologic analysis of three culvert sites in order to find the required hydraulic capacity of each culvert and assisted with hydraulic calculations for each culvert. Also responsible for all CAD design drawings.
- **I-405 NE 132nd Interchange and Fish Passage, Kirkland, WA - Engineering Intern.** Construction of a new interchange consisting of an on and off ramp and two roundabouts, as well as the restoration and rehabilitation of the stream that ran under the interchange through a small circular culvert. New stream included a reconstructed stream bed with fish habitats on the up and downhill ends with an open channel design through box culverts under the interchange. Provided grading and assisted in construction of new storm sewer pipe relocation, eco block retaining walls, and the open channel stream restoration and fish habitats. Worked closely with foreman, project engineers, and operators out in the field on the site every day.

EDUCATION
Bachelor of Science, Civil Engineering, Washington State University

REGISTRATIONS
Engineer-in-Training: Colorado

CONTACT
Joey.Lane@ae2s.com
T: 970-406-2697

WHY JOEY?

Joey's CAD experience, his background in designing and constructing naturally aesthetic stormwater BMPs, and his history of working with small Rocky Mountain communities will all contribute to an efficient design process for this project.

Abby Ritz
Funding Specialist

Ms. Ritz's focus is on funding development and supporting a variety of Nexus' rate study efforts. She has played an integral role in securing funding for numerous projects for clients throughout the region, through programs such as USDA Rural Developments' Water & Waste Disposal loan and grant program, and State Revolving Funds. In 2020 alone, she helped secure over $90 Million in loan and grant funding for our clients. Her focused efficiency and attention to detail are invaluable qualities for coordinating with multiple funding sources and ensuring all program requirements are met.

SPECIFIC RELEVANT EXPERIENCE

- **City-Wide Infrastructure Improvement Project, Larimore, ND - Financial Analyst.** City-wide water, sewer, stormwater, and street replacement effort. Ms. Ritz developed a project funding plan, household impact projections, funding applications, community education resources, and project reimbursement requests. Funding development efforts evaluated state and federal funding sources and applications to all applicable programs. Among those programs were the US Army Corps. of Engineers' Section 594 Environmental Infrastructure Program and the US Department of Transportation's BUILD Grant Program. These applications required conducting benefit cost analyses and working with local officials and congressional representatives to secure community and political support for the project.
- **Water Rate Study, Estes Park, CO - Financial Analyst.** Cost of service and rate design study for the Town's water utility. A primary objective of the study was to develop a prudent financial plan to fund the $30M+ replacement of one of the Town's two water treatment plants. In addition to the capital planning, the project also included an in-depth review of all other utility revenue requirements and an analysis of the Town's fixed versus volumetric revenue generation to ensure stable utility funding.
- **Specific Funding Development Experience**
  - Drinking Water and Clean Water State Revolving Funds
  - Community Development Block Grant
  - North Dakota's State Water Commission Cost-Share Program
  - North Dakota's Capital Financing Program
  - US Army Corps. of Engineers' Section 594 Environmental Infrastructure Program
  - USDA Rural Development's SEARCH Grant
  - USDA Rural Development's Predevelopment Planning Grants
  - USDA Rural Development's Community Facilities Loan Program
  - USDA Rural Development's Water and Waste Disposal Loan and Grant Program
  - USDA Bureau of Reclamation's WaterSMART: Water Marketing Grants
  - FEMA's Hazard Mitigation Assistance Programs
  - US DOT's BUILD Grant
  - US EPA's WIFIA Program

EDUCATION
Bachelor of Business Administration, Investments, University of North Dakota

CONTACT
Abby.Ritz@ae2s.com
T: 701-221-0530

WHY ABBY?

Abby supports many of our funding initiatives and provides a breadth of knowledge for developing the details on funding - a key component for transforming plans into reality. She will actively engage in the project immediately to identify funding sources and coordinate project recommendations with funding opportunities.