1.0 PROJECT PROPOSAL SUMMARY SHEET

PROJECT TITLE: Spanish Valley Restoration Phase III

LEAD PROJECT SPONSOR: Grand County Conservation District
Arne Hultquist, S.E. Colorado River WS Coordinator
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UDWQ Watershed Protection Section
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STATE: Utah **WATERSHED:** Mill and Pack Creek **HYDROLOGIC UNIT CODE:** 14030005

PROJECT TYPES	WATERBODY TYPES	NPS CATEGORY
[ ] Staffing & Support	[ ] Groundwater	[X] Agriculture
[X] Watershed	[ ] Lakes/Reservoirs	[X] Urban Runoff
[ ] Groundwater	[X] Rivers	[ ] Silviculture
[X] I&E	[ ] Streams	[X] Construction
	[ ] Other	[X] Resource

PROJECT LOCATION:

The projects are located within the Mill Creek watershed in Grand and San Juan Counties. The streambank restoration activities are located along the North Fork of Mill Creek, Mill Creek, and Pack Creek. The urban runoff projects and educational projects are administered and focused on Spanish Valley but they also cover the entirety of Grand County.

SUMMARY OF MAJOR GOALS:

The projects proposed for and completed in these watersheds accomplish two major goals. The first goal is to improve riparian conditions in Mill and Pack Creek and to reduce accelerated soil erosion in the watershed, therefore improving overall watershed conditions. By improving riparian conditions and reducing erosion, this project will improve water quality conditions in Mill and Pack Creek as recommended in the 2002 TMDL.

The second goal is to limit contamination from human activities upon the landscape by curbing urban and agricultural runoff and reducing waterborne pathogen contamination. These activities will also improve water quality in Mill and Pack Creek as recommended in the 2002 TMDL and will also address the more recent 305b listing of Mill and Pack Creek for E. coli contamination.

Projects performed to attain these goals will also be used to inform and educate the public regarding Nonpoint Source (NPS) pollution and the importance of maintaining and improving water quality conditions within the watershed.

PROJECT DESCRIPTION:

In an effort to improve water quality in the Mill and Pack Creek watershed, the Grand Conservation District (GCD) plans to assist City of Moab, Bureau of Land Management, Rim to Rim Restoration, Southeastern Utah Health Department, Utah State University Department of Sustainability, local land owners, private citizens and the Moab Area Watershed Partnership (MAWP) to implement improvements in the watershed. All these projects and improvements are supported by the MAWP and its watershed management plan.

The projects proposed, in progress or completed in this project implementation plan (PIP) intend to address the major goal of improving riparian conditions by repairing flood plain functionality, improving streambank stability, reducing erosion and increasing stream shading. Specific actions include: revegetating a portion of the Pack Creek flood plain, revegetating areas in Mill and Pack Creek where passive regeneration of riparian vegetation is not occurring after past invasive species removal activities, and conducting multiple improvements on BLM targeted lands along Mill Creek above Moab.

The projects proposed in progress or completed in this PIP intend to address contamination from human activities by reducing runoff from urban and agricultural lands, defining and delineating sources of contamination and establishing practices that mitigate those sources.

The financial breakdown of funding sources for projects included in this plan is as follows:

Spanish Valley Restoration Phase III:	
FY-21 EPA Section 319 Funds:	**$114,079**
Match (cash & in-kind):	**$351,091**
Other Federal Funding:	**$85,194**
Total	**$550,364**
Spanish Valley Restoration Phase II:	
EPA Section 319 Funds	$0
Match (cash & in-kind):	$127,030
Other:	$26,000
Total	$153,030
Spanish Valley Restoration Phase I:	
FY-13 EPA Section 319 Funds:	$110,548
Match (cash & in-kind):	$246,112
Total	$356,660
Spanish Valley Restoration Total budget:	
FY-13&21 EPA Section 319 Funds:	**$224,627**
Match (cash & in-kind):	**$724,233**
Other:	**$111,194**
Total	**$1,060,054**

2. STATEMENT OF NEED

The Utah Division of Water Quality (UDWQ) has listed Mill Creek on the States 303(d) list of impaired waterbodies. According to this report, Mill Creek and tributaries are currently not meeting the designated beneficial use - Class 3A, protected for cold water fishery - due to elevated temperature and Pack Creek (a tributary to Mill Creek) is currently not meeting the designated beneficial use - Class 4, protected for agricultural uses including irrigation and stock watering - due to elevated total dissolved solids (TDS). The UDWQ completed a TMDL to characterize the current load, the loading capacity, and the desired load reduction of temperature in Mill Creek and TDS in Pack Creek. According to the TMDLs, the temperature load reduction could be accomplished by planting and protecting riparian vegetation to increase shading a minimum of 11% in the lower 14 miles, maintaining minimum flows of 3.0 cfs below the Sheely Diversion, and possibly increasing water depth by narrowing the stream channel with restorative techniques in the lower 14 miles.

The TDS load reduction needed in Pack Creek occurs during low flow conditions. The TMDL suggests a site specific standard be set for this creek because of natural background and geologic sources. Recent water rights investigations and discussions with land owners adjacent to the creek indicate the water is used for watering private gardens and pastured fields. Recent data indicate the creek may be supporting its agricultural designated use. However, a TDS load reduction of 5% to 10% will assure support of its designated use.

There are other parameters of concern identified since the 2002 TMDL. One concern is E. coli in the lower sections of both Pack and Mill Creek. Both sections are exceeding water quality standards for their 2A classification. The actions in this PIP will have direct and indirect effects on E. coli concentrations. The E. coli concern can be addressed through changes in community behavior through education and informational outreach and the MAWP has and will continue to consider projects that reduce E. coli concentrations in the future.

Another concern is selenium in the lower section of Pack Creek. Pack Creek was exceeding its 3A standard for selenium. The high selenium concentrations are related to low flows and the same geologic sources that contribute to TDS loads. Decreases in TDS have been accompanied by decreases in selenium concentrations and it appears Pack Creek is now supporting it 3A standard for selenium.

The MAWP has identified several project types as a means of addressing the TMDLs and other water quality issues in the recently completed second version of the Moab Area Watershed Management Plan. Projects proposed in this PIP support the goals identified in the Moab Area Watershed Management Plan.

2.1 Project Water Quality Priority

As required by section 26-11-6 of the Utah Code Annotated 1953, Utah State waters are classed to protect against controllable sources of pollution. The Mill Creek Assessment Unit (AU) is categorized for the following designated uses: 1C, 2A, 3A, and 4 (see Table 1).

Table 1. Beneficial Use Classification*s*

1C - Protected for domestic uses with prior treatment by treatment processes as required by drinking water.
2A - Protected for frequent primary contact recreation where there is a high likelihood of ingestion of water or a high degree of bodily contact with the water.
3A - Protected for cold water species of game fish and other cold water aquatic life, including the organisms in their food chain
4 - Protected for agricultural uses including irrigation of crops and stock watering.

Two waterbodies within the Mill Creek Watershed are listed on Utah's 303 (d) list (Table 2). Impairments are elevated temperature, high TDS, selenium, E. coli and dissolved oxygen. Mill Creek is a productive fishery that supports several species of trout above the USFS boundary. Below the USFS boundary to the downstream BLM boundary, current summer time conditions are not conducive to maintaining a healthy cold water fishery and trout populations are stressed due to high temperatures. Mill and Pack Creek cannot support a cold water fishery but can to a limited extent support a warm water fishery below the downstream BLM boundary and within the urban confines of Moab and Spanish Valley. Pack Creek historically has not met its agricultural beneficial use due to high TDS. Reducing TDS in Pack Creek will also reduce selenium concentrations. Both Mill and Pack Creek are impaired for E. coli in the more urbanized sections.

Table 2. 303 (d) listed streams in the Mill Creek and Castle Creek Watersheds

Water Body Description	HUC Unit	Impaired Beneficial Use	Impaired Parameter	Approved TMDL or priority
Mill Creek and tributaries, except Pack Creek from confluence with Colorado to USFS Boundary	140300050404 and 140300050402	3A	Temperature	Approved
		1C, 2B	E. coli	Low
		3A	Dissolved Oxygen	Low
Pack Creek and tributaries from the confluence with Mill Creek to the USFS boundary	140300050403	4	Total Dissolved Solids	Approved
		3A	Temperature	Approved
		3A	Selenium	Low
		1C, 2B	E. coli	Low
Castle Creek	140300050305	3B	OE Bioassessment	Low

2.2 Watershed Description

The Mill Creek watershed is nested within a larger watershed known as the Southeast Colorado River Basin in Southeastern Utah. This area is often referred to as "Canyon Country" because of the varied landscape that includes high plateaus, buttes, igneous intrusive mountains, innumerable incised sandstone canyons and long narrow valleys resulting from the collapse of ancient salt anticlines. The rugged desert terrain defining these watersheds is the result of the erosional processes that are commonly associated with the Colorado Plateau and since these erosional processes are still taking place, canyons continue to increase in depth and number.

The scenic and recreational value provided by the natural rock formations, the rivers flowing through the deep canyons, and the snow-capped mountains attracts thousands of visitors to the Spanish Valley area each year. Campsites, picnic areas, biking and hiking trails, four-wheel drive trails, and other facilities have been developed in the Canyonlands National Park, Dead Horse Point State Park, and Manti- La Sal National Forest and on lands administered by the Bureau of Land Management. Many people float on the Green and Colorado Rivers through Cataract and Westwater Canyons and in other sections of these rivers each year.

Grand and San Juan counties are the homes of two popular national parks, Arches National Park and Canyonlands National Park. Arches National Park has consistently hosted from 700,000 to 800,000 visitors annually during the last decade. The City of Moab has benefitted from its proximity to Arches and the presence of the Slickrock Bike Trail, perhaps the most renowned mountain bike destination in the world. Canyonlands National Park annual visitation trends are consistently above 350,000 visitors. The impact of tourism on the local economy in Grand County is demonstrated in traveler spending in excess of $250 million annually. According to recent adjusted economic models, tourism and travel are responsible for 5,000 jobs in the county. Hotel accommodation room tax collections have exceeded $1 million in Grand County; further verifying the impact of travel and tourism in Grand County. Traveler spending in San Juan County has exceeded $60 million annually in recent years. Tourism and travel is also responsible for 1,200 + jobs in San Juan County in recent years. Hotel accommodation revenues have been growing since 2003 and contribute more than $200,000 in tax collections annually.

Spanish Valley is the population center for Grand County and the population of Spanish Valley is approximately 8,500 including the population that resides in San Juan County. Moab is the only city in the Spanish Valley Watershed and has a current population of about 5,200. Land ownership is shown in Table 3.

Table 3: Land Ownership in Spanish Valley

Spanish Valley	BLM	USFS	State	Private	Total
Acres	28,876	39,643	11,350	12,483	92,352
Percentage	31.3%	42.9%	12.3%	13.5%	100%

The Spanish Valley Watershed encompasses 92,352 acres of which approximately 60% is in Grand County and the other 40% in San Juan County (Figure 1). Mill and Pack Creek originate in the La Sal Mountains, a laccolithic intrusion located in the southeastern part of the watersheds, with elevations of over 12,000 ft and travel across the desert and canyons before eventually

discharging into the Colorado River at an elevation of approximately 4,000 ft. The mountains provide contrast to the panoramic views of the deserts and canyons below. Mesas, buttes and sandstone fins create obvious watershed boundaries for both creeks and their tributaries.

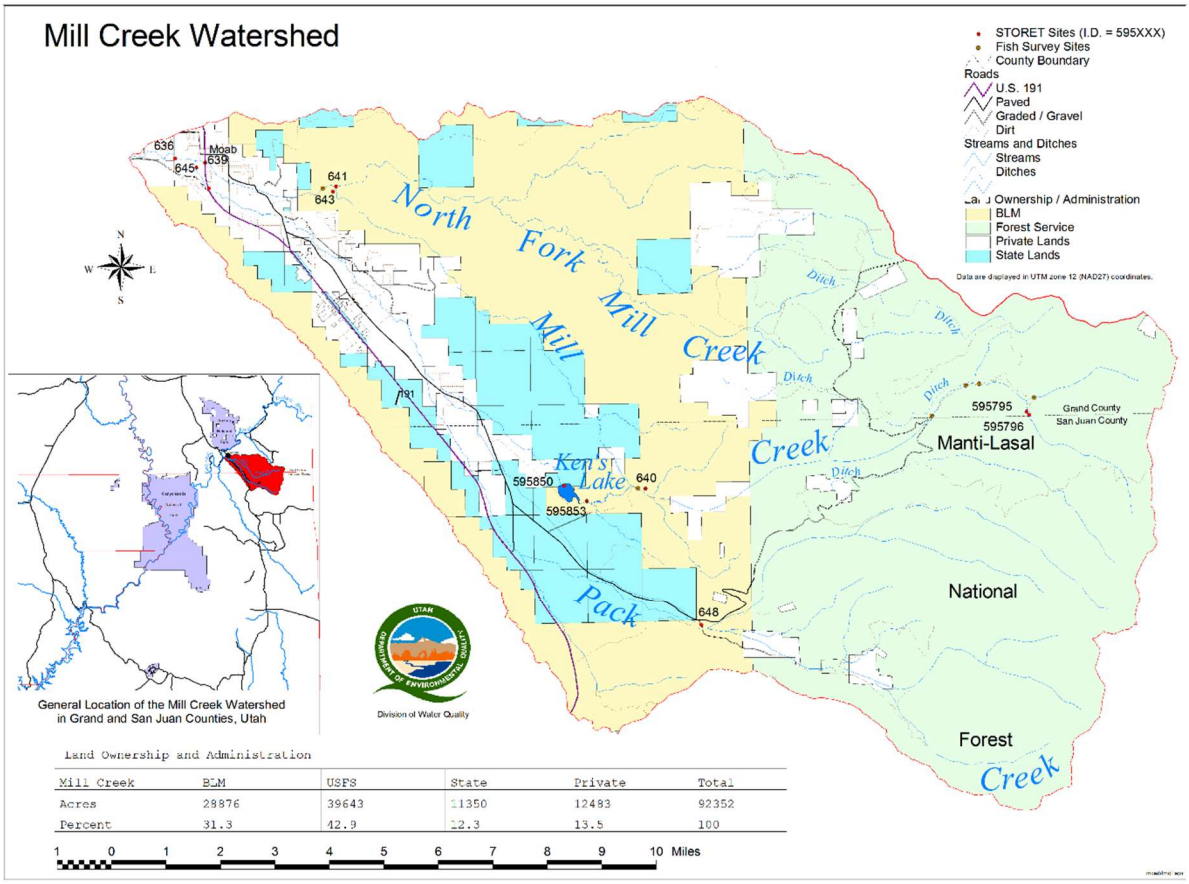

Figure 1: Spanish Valley watershed and land ownership.

Annual precipitation in the Spanish Valley watershed varies from less than 8 inches in the lower reaches near the Colorado River to more than 30 inches at the headwaters in the La Sal Mountains. The quantity of precipitation falling on the Spanish Valley watershed is estimated at 130,000 acre-feet per year. These quantities can vary substantially from year to year depending on changing weather patterns and climatic conditions.

The north part of the Mill Creek watershed is drained by Mill Creek and tributaries and the south part of the watershed, including Spanish Valley, is drained by Pack Creek (see Figure 1). The area of these 2 principal drainages is ~50,000 acres for Mill Creek and ~41,000 acres for Pack Creek. A larger portion of the Mill Creek drainage is above 6,000 feet where more precipitation occurs.

Several streams or portions of streams in the Spanish Valley watershed are perennial. The Main Fork of Mill Creek is perennial beginning at the headwaters near Manns Peak. Smaller tributary basins like Schumann Gulch, Horse Creek, and Wet Fork of Mill also likely support perennial

reaches of stream. The North Fork of Mill Creek is perennial in its lower 7 miles before joining the Main Fork. This consistent flow at altitudes lower than 6,000 feet is the result of ground water discharging from the formations of the Glen Canyon Group (Navajo Ss., Kayenta Fm., and Wingate Ss). Pack Creek is perennial above its confluence with Brumley Creek probably owing to the numerous springs in the Hell Canyon drainage. Where Pack Creek begins traversing the alluvial sediments in Spanish Valley, surface flow ceases during low runoff periods because it percolates into the unconsolidated sediments, is diverted for irrigation, and/or is utilized by riparian vegetation.

There are 47 approved surface flow/spring diversions in the Mill Creek drainage and 45 diversions in the Pack Creek drainage. Most are for irrigation and stock watering. The Moab Irrigation Company owns the right to divert water for irrigation at numerous points in the Mill Creek drainage, and in 2010 the company's total estimated diversion from Mill Creek or tributaries was about 6,380 acre-feet. The largest single diversion is for storing water in Ken's Lake, which is used for summer irrigation in Spanish Valley. In 2010 that quantity was estimated to be 3,290 acre-feet. The total quantity of surface flow now being diverted at all points of diversion in the Mill Creek watershed is uncertain.

High flows in Mill Creek has caused damage to Moab residences and destroyed the old power dam several times during the early 1900's. Peak flows in Mill Creek exceeded 1,000 cfs 18 times from 1949 to 1994 and exceeded 6,000 cfs twice during that period (USGS Gaging Station 09184000). Flows in Pack Creek have exceeded 100 cfs four times from 1954 to 1958 (USGS Gaging Station 09185000)

Ground water in the Mill Creek watershed occurs primarily in the valley fill sediments of Spanish Valley (alluvial aquifer) and in the formations that make up the Glen Canyon Group (Glen Canyon aquifer) (Navajo Sandstone, Kayenta Formation, and the Wingate Sandstone). It has been presumed that ground water in the Glen Canyon aquifer originates from precipitation infiltrating into the rocks of the La Sal Mountains and into outcrops of the formations found on the lower slopes of the La Sal Mountains, and that ground water in the alluvial aquifer of Spanish Valley originates from stream flow, irrigation water, and direct precipitation infiltrating into the unconsolidated sediments. Ken's Lake can be a source of recharge to the alluvial aquifer, but recent repairs to the reservoir have limited that source. The alluvial aquifer overlies and abuts the Glen Canyon aquifer in Spanish Valley, which leads to the presumption that ground water moves from the Glen Canyon into the alluvial aquifer.

The potentiometric contours showing the altitude of the top of the saturated zone for the alluvial aquifer and Glen Canyon aquifer in Spanish Valley on Plate 2 of Sumsion (1971) and Figure 19 of Blanchard (1990) indicate ground water moves west from the La Sal Mountains toward Spanish valley, then northwest down Spanish Valley toward the Colorado River. The ground-water flow gradient in the intensely fractured part of the Glen Canyon aquifer is approximately 0.03 ft/ft and the average gradient in the alluvial aquifer in Spanish Valley is 0.011 ft/ft in the southeastern end of the valley and 0.20 ft/ft in the northwestern end of the valley. The shape of the contours near the surface contact between the alluvial fill and the Glen Canyon Group sandstone depicts ground water moving across this interface from the west. The shape of the potentiometric contours for the alluvial aquifer indicates Pack Creek is gaining flow from the

aquifer in a 2 mile reach downstream from the Moab Golf course, and that the principal discharge area for the ground-water system is the Matheson Wetlands Preserve and the Colorado River.

Ground water in the Glen Canyon aquifer of the Mill Creek watershed exits the aquifer in several ways. Ground water discharges into the Main Fork of Mill Creek in a deep canyon between Brumley Ridge and South Mesa; ground water discharges into the North Fork of Mill Creek along a 7-mile reach upstream from the confluence of North Fork and Main Fork Mill Creek; ground water discharges from springs along the northeast side of Spanish Valley; ground water discharges into the alluvial aquifer of Spanish Valley; ground water is used by riparian vegetation where the roots of these plants extend to the top of the saturated zone; and groundwater is pumped from Moab City wells, Grand County Water Conservancy District wells, and private wells for household and irrigation use by Moab and Spanish Valley residents. The 2 public suppliers (Moab City and Grand County Water Conservancy District) pumped about 1,460 acre-feet of water in 2010. The quantity pumped by private well owners is not known.

Ground water in the alluvial aquifer exits the aquifer by discharging into Pack Creek, by discharging at springs on the southwest side of Spanish Valley, through consumption by riparian vegetation, by withdrawals through private wells, and by movement into the Colorado River. The quantity of water entering and exiting the aquifers of the Mill Creek watershed have been inferred using indirect methods. On the basis of stream base flow, measured spring discharge, consumptive use, evapotranspiration, and calculated subsurface flow using Darcy's Law, Sumsion (1971, p. 20) estimated total recharge to both aquifers in the watershed to be 22,000 acre-feet per year or about 17% of the precipitation that falls on the watershed. New methods of measuring various hydrologic parameters are available and this 40-year old estimate could be improved upon with additional investigation.

In Mill Creek 32% of the watershed is Pinyon-Juniper Woodland and Shrubland, and nearly 15% is Rocky Moutain Gambel Oak mixed montane shrub land. The remaining areas are of sagebrush and desert grasslands, as well as various Mountain vegetation types, with small percentages of bedrock and slickrock. Approximately 4% of the watershed is categorized as Aspen forest and woodland, and 4.2% is Intermountain West Aspen Mixed Conifer and Woodland Complex. Only 2.5%of the watershed is in Agriculture, with 1.1% developed at medium to high density. Nearly 1% of the Mill Creek watershed is categorizes at recently chained Pinyon-Juniper, which likely means bullhogged fire fuel treatments. Figure 2 is a pie chart of percent land cover by vegetation type in Spanish Valley.

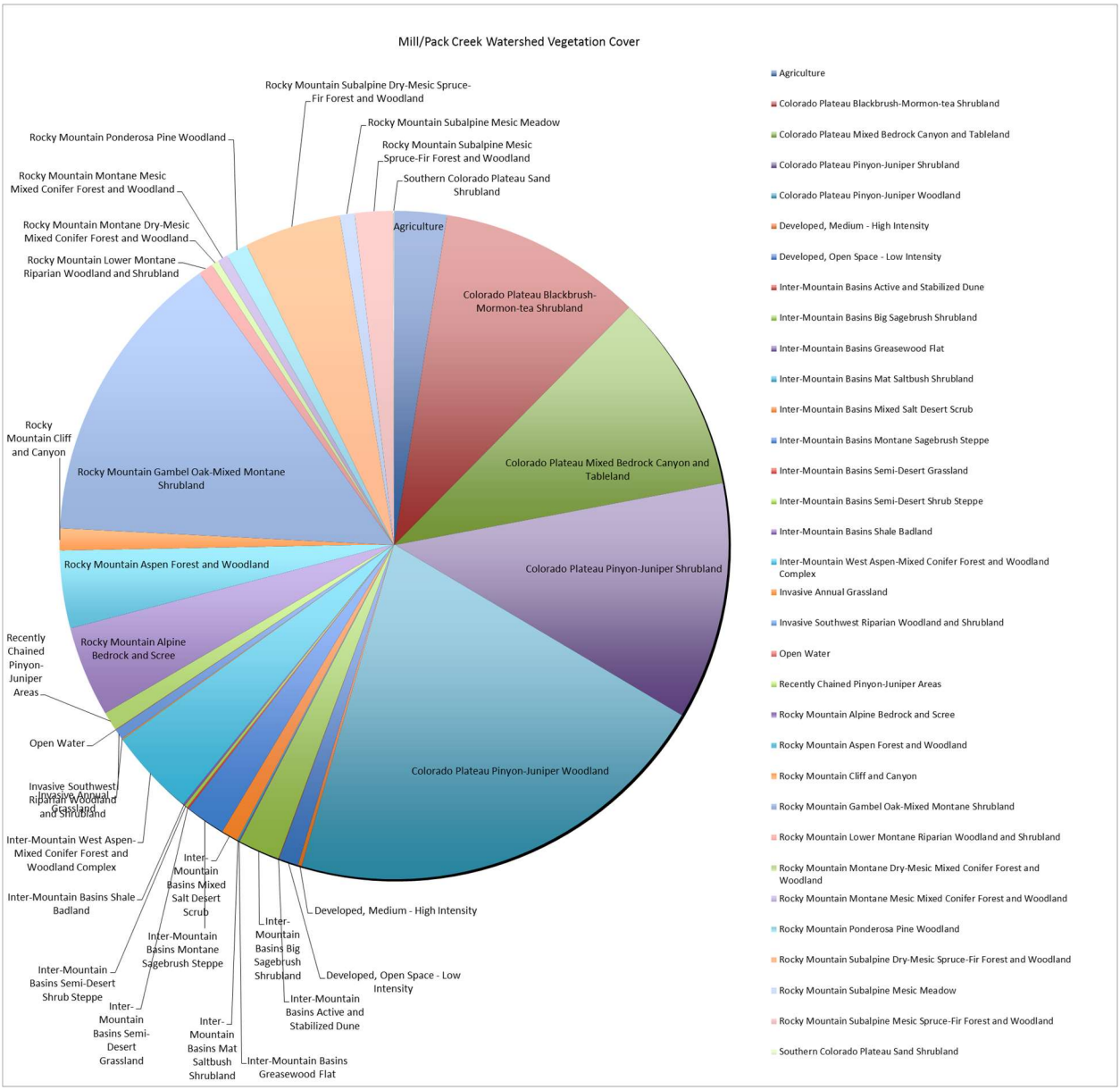

Figure 2: Pie chart of percent land cover by vegetation type in Spanish Valley

In relation to water quality and quantity, there are some areas of concern that may need further exploration as a part of the overall watershed planning process. In the lower elevations of the watersheds, development and recreation have an impact on vegetation communities especially in riparian areas. The prevalence of invasive species in the riparian areas is of concern as these plants impact flood flows and their removal, if not done carefully, may result in enormous changes in erosion in the watershed. In some cases, removal also exposes the stream to higher solar exposure, and replacing shade over the creek should be a critical component to avoid further increases to stream temperature

Two significant impacts on vegetation condition in the upper areas of the watershed include grazing and recreation. Grazing rotation has been occurring in the mountain areas due to recent

drought. It is agreed within the MAWP that there are some locations, most notably springs and some riparian areas, where fencing and water diversions needed to protect water quality.

Recreation activities have noticeably increased in these watersheds in recent years. Springs and riparian areas sensitive to these impacts are also highly attractive recreation areas. This raises concern related to soil compaction, loss of vegetation, spread of noxious weeds, and increases in erosion. The Forest Service and BLM have been addressing these issues by creating concentrated use areas that include toilet facilities as well as parking areas, within a network of planned designated trails.

2.4 The Moab Area Watershed Management Plan

The Moab Area Watershed Management Plan has been developed under the direction of the MAWP. The plan has identified several sections of Mill and Pack Creek that are not meeting their numerical standards for beneficial uses. It has also identified areas where riparian corridor maintenance and improvements are necessary. Both of these issues have been deemed a priority for the Mill Creek watershed.

3. Project Description

Mill and Pack Creek have an approved TMDL for temperature and TDS. The desired goal for the TMDL and this proposal is to meet water quality standards for the designated beneficial uses. The projects will address these issues by improving riparian conditions at multiple locations and mitigating sources of contamination through best management practices and education. The improvements include flood plain restoration, re-vegetation following invasive species removal, riparian corridor improvements, human and pet waste education, digitizing on-site waste water systems and controlling storm water runoff. A map of the proposed riparian restoration project areas is shown in Figure 3. Proposed projects that will affect the entire landscape (objectives 3 through 9) are not shown in Figure 3. Projects that are completed are also not shown in Figure 3. Conceptual projects that do not have a formal grant application or detailed project plan at this time are not shown in Figure 3. Those projects could affect the entire watershed. Additional project proposals will be added as projects and funding are identified.

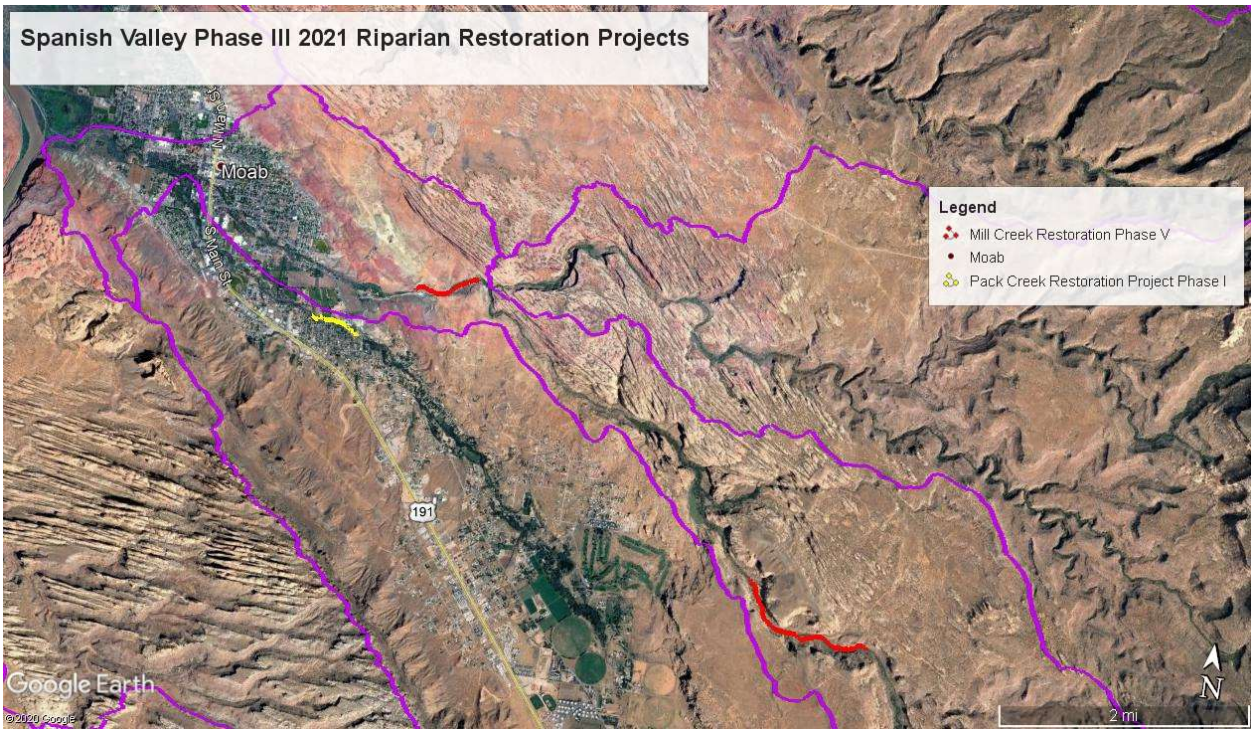

Figure 3: 2021 Spanish Valley Restoration Phase III proposed projects which have specific riparian stream segments associated with them.

3.1 Goals, Objectives, and Tasks

Main Goals:

1 Improve riparian conditions in Mill and Pack Creek by revegetating stream banks and connecting the creeks to the historic flood plain.
2 Decrease E. coli and TDS and other contaminants in the watershed.
3 Inform and educate local landowners and the community concerning non-point source pollution and the importance of maintaining and improving water quality within the watershed.
4 Administer grants associated with non-point source pollution control and monitor for improvements in water quality and habitat.

3.1.2 Proposed Goals, Objectives and Tasks for Proposed Projects

Goal 1: Improve riparian conditions in Mill and Pack Creek by revegetating stream banks and connecting the creeks to the historic flood plain

Objective 1: Pack Creek Restoration Project Phase 1.

Task 1 – Work with local land owners and regulatory agencies to gain access and required permits.

Task 2 – Engineer and install drop and bank stabilization structures on one mile of Pack Creek below 400 East in Moab, UT.
Task 3 – Restore and replant native vegetation on the aforementioned stream section.

Projected Outcome: This section of Pack Creek will attain proper functioning condition.

Total Cost: $234,941 319: $102,576 Match: $105,441 Other: $26,924

Objective 2: Bureau of Land Management Mill Creek Restoration Project Phase V.

Task 1: – Restore native vegetation on one mile of Mill Creek above Spring Canyon.
Task 2: – Reduce accelerated erosion related to roads and recreation uses along the streambanks and flood terraces in Mill Creek Canyon on BLM lands.

Predicted Outcome: This section of Mill Creek will attain proper functioning condition, receive decreased impacts from solar radiation and erosional impacts from recreation will be mitigated.

Total: $103,075 319: $0 Match: $68,075 Other: $35,000

Goal 2: Decrease E. coli and TDS and other contaminants in the watershed by informing and educating community concerning non-point source pollution.

Objective 3: Grand County Dog Waste Initiative.

Task 1 – Identify trail heads and other recreation areas that are impacted by dog waste.
Task 2 – Acquire and install dog waste stations to provide means for waste collection.
Task 3 – Acquire and install educational signage about the negative effects of dog waste on the landscape.

Predicted Outcome: Elimination of large amounts of dog waste at 33 trail heads throughout Grand County.

Total: $34,773 319: $11,503 Match: $0 Other: $23,270

Objective 4: Southeastern Utah Health Department Human Waste Initiative.

Task 1: – Identify recreational areas impacted by human waste.
Task 2: – Acquire and install educational signage about the negative effects of human waste on the landscape and human health.
Task 3: – Coordinate with Utah State University Water Watch to promote web site educational materials.
Task 4: – Hire a Vista employee to promote proper human waste disposal on public lands.

Projected Outcome: Elimination of human waste on public lands in the in recreation areas

Total Cost: $125,000 319: $0 Match: $125,000

Objective 5: Southeastern Utah Health Department On-Site Wastewater Digitization Project Phase II.

Task 1: – Hire a Vista employee to enter hard copy on-site waste water information into an Arc info mapping database. Conduct tours on restoration work.
Task 2: – Use that information in City and County planning efforts.
Task 3: – Use that information to determine potential sources of "hot spots" for E coli contamination

Projected Outcome: A database of all active and historic on-site waste water systems that can be used to protect ground and surface water.

Total: $32,000 319: $0 Match: $32,000

Objective 6: Work with stakeholders/public to educate them on how employed BMPs positively affect water quality in the Mill Creek watershed.

Task 1: – Conduct tours on restoration work.
Task 2: – Share information via press releases, fact sheets MAWP website

Projected Outcome: A public that is informed and understands the benefits of these projects. It is envisioned that after these projects are completed there will be broad public support for these projects and future projects.

Total: $5,000 319: $0 Match: $5,000

Goal 4: Administer grants associated with non-point source pollution control and monitor for improvements in water quality and habitat.

Objective 7: Monitor Mill and Pack Creek to determine project effectiveness.

Task 1: – Collect water quality and flow data 10-12 times per year at Moab Area Watershed Partnership Valley and UDWQ ambient monitoring sites before, during, and after the contract period
Task 2: – Monitor riparian characteristics using Multiple Indicator Monitoring pre-project, post-project and five years after project completion.

Predicted Outcome: An annual report/presentation that summarizes and evaluates data. Data will also be used for Final Reports and future planning efforts.

Total: $9,000 319: $0 Match: $9,000

Objective 8: Satisfy documentation funding requirements.
Task 1: – Track project progress.
Task 2: – Provide annual and final reports to UDWQ and EPA

Projected Outcome: Efficient completion and administration of grants.

Total: $5,000 319: $0 Match: $5,000

Objective 9: Administration of funding
Task 1: Compensate Grand Conservation District for managing reimbursement, tracking match and administering the funds

Total: $1,575 319: $0 Match $1,575

Predicted Outcome: Efficient management and tracking of grants

Grand Total for Proposed Projects:
Total: $550,364 319: $114,079 Match: $351,091 Other: $85,194

3.1.2 Milestone Table for Proposed Projects

Table 4: Milestones for Mill Creek watershed proposed projects

Objectives	Output	Implementation Date
Objective 1: Pack Creek Restoration Project Phase 1.	Acquire required permits Stabilize banks and install drop structures Replant vegetation	Dec, 2020-April 2021 April 2021-April 2023 April 2023-April 2024
Objective 2: Bureau of Land Management Mill Creek Restoration Project Phase V.	Restore native vegetation on one mile of Mill Creek above Spring Canyon. Reduce accelerated erosion related to roads and recreation uses	Oct. 2020-Dec. 2022 July 2020-July 2021
Objective 3: Grand County Dog Waste Initiative.	Identify trail heads and other recreation areas that are impacted by dog waste. Acquire and install dog waste stations to provide means for waste collection. Acquire and install educational signage about the negative effects of dog waste on the landscape	Jan 2020-March 2020 April 2021-April 2023 April 2021-April 2023
Objective 4: Southeastern Utah Health Department Human Waste Initiative.	Identify recreational areas impacted by human waste. Acquire and install educational signage about the negative effects of human waste on the landscape and human health.	Aug. 2019-April 2021 July 2020-June 2023 July 2020-June 2023

	Coordinate with Utah State University Water Watch to promote web site educational materials. Hire a Vista employee to promote proper human waste disposal on public lands.	May 2021-June 2023
Objective 5: Southeastern Utah Health Department On-Site Wastewater Digitization Project Phase II.	Hire a Vista employee to enter hard copy on-site waste water information into an Arc info mapping database. Conduct tours on restoration work. Use that information in City and County planning efforts. Use that information to determine potential sources of "hot spots" for E coli contamination.	July 2019– June 2023 Ongoing July 2021-June 2023
Objective 6: Work with stakeholders/public to educate them on how employed BMPs positively affect water quality in the Mill Creek watershed	Conduct tours on restoration work and share information via press releases, fact sheets MAWP website	Ongoing
Objective 7: Monitor Mill and Pack Creek to determine project effectiveness.	Collect water quality samples, survey physical habitat, and take photos	Water Quality is ongoing. Physical Habitat: Pre-project for each project; Post-project during the growing season three years after completion and every five years after that
Objective 8: Satisfy reporting funding requirements.	Documented match records, ongoing for duration of project. Semi-annual, annual, and final reports.	Ongoing with final reports within 60 days of project completion.
Objective 9: Administration of funding	Compensate Grand Conservation District for managing reimbursement, tracking match and administering the funds	July 2020-June 2023

3.2.1 Projects in Progress

There are two projects currently funded through State of Utah Non-Point Source Program currently in progress. They are the Mill and Pack Creek Riparian Vegetation Improvements Project and the Mill Creek Restoration Project Phase IV. Both projects intend to return stream segments to proper functioning condition by increasing the percentage of native vegetation through the removal of non-natives and planting native stream bank stabilizing plants. The BLM

project will also repair dry gullies that are actively eroding. The milestones for those projects are listed in Table 5.

The on-going efforts that the watershed coordinators position is responsible for are also listed in Table 5.

Table 5: Milestones for Spanish Valley watershed projects in progress		
Objectives	**Output**	**Implementation Date**
Objective: Mill and Pack Creek Riparian Vegetation Improvements	Work with local land owners and regulatory agencies to gain access and required permits. Remove non-native vegetation and restore and replant native vegetation on the various stream sections.	July 2018-July 2019 July 2018-July 2021
Objective: Bureau of Land Management Mill Creek Restoration Project Phase IV.	Restore native vegetation on one mile of Mill Creek above and below Spring Canyon. Reduce accelerated erosion related to roads and recreation uses	July 2019-July 2022 July 2019-July 2022
Objective: Work with stakeholders/public to educate them, Monitor Mill and Pack Creek to determine project effectiveness and Administration services to track match, write progress reports and dispense funding Mill Creek watershed	Conduct tours on restoration work and share information via press releases, fact sheets MAWP website Collect water quality samples, survey physical habitat, and take photos Documented match records, ongoing for duration of project. Semi-annual, annual, and final reports	Ongoing Ongoing Ongoing

3.3 Objectives and Outputs for Completed Projects.

The objectives and outputs of projects completed since 2013 are listed in Table 6.

Table 6: Objectives and Outputs of completed projects	
Objective	Output
Mill and Pack Creek 2015 Active Revegetation Project	Non-native vegetation was removed and native vegetation was planted on six river sections totaling 1.2 miles to improve the functioning condition of these sections.
Bureau of Land Management Mill Creek Restoration Project Phase I	Non-native vegetation was removed and native vegetation was planted on Mill Creek between the BLM boundary and the confluence with North Fork of Mill Creek (about 1 mile) to improve the functioning condition of this section.

	Trail networks were maintained and general housekeeping was performed in high use recreation areas.
Moab City's Wagner Street Flood Plain Restoration Project	552.9 tons of concrete and 1,380 Cubic Yards of soil/fill were removed and the flood plain was re-establish by contouring the slope and reseeding.
Holyoak Animal Feedlot Reconstruction	Material for feedlot was placed and graded to prevent feedlot runoff from entering Pack Creek. Water troughs, feeders and a water transfer station were installed. Finally, fencing was installed to prevent cows from entering the riparian area.
Southeast Utah Health Department 2017 Green Stormwater Infrastructure Landscape Retrofit Project	Sprinkler irrigation of landscaping strips at SEUHD were replaced with green infrastructure that diverted stormwater to the strips and the strips were revegetated with plants appropriate for the climate.
Utah State University office of Sustainability Rain Water Harvesting Project	Six holding tanks were installed with a total of 3,180 gallons of storage. Piping and irrigation components were installed to store and deliver water to a "Bee Friendly Garden". Eight educational signs were installed and USU holds one educational workshop per year.
Work with stakeholders/public to educate them, Monitor Mill and Pack Creek to determine project effectiveness and Administration services to track match, write progress reports and dispense funding Mill Creek watershed	Conduct tours on restoration work and share information via press releases, fact sheets MAWP website. Collect water quality samples, survey physical habitat, and take photos. Documented match records, ongoing for duration of project. Semi-annual, annual, and final reports.

3.4 Proposed Goals, Objectives and Tasks for Projects under Consideration

The foregoing projects will be and have been beneficial to water quality in the Mill Creek Watershed. TDS and Selenium levels have dropped in Pack Creek over the last ten years. E Coli levels in Mill Creek have also shown improvement in the last two years. Stream riparian restoration measures have improved habitat and shading.

However, the MAWP realizes the proposed, current and completed project efforts will only go so far toward achieving our water quality goals. There are several conceptual projects considered in the current Watershed Management Plan that will help us to continue to meet our goals. Those projects are listed in relatively broad language in Table 7.

Table 7: Objectives and Outputs for projects under consideration	
Mill and Pack Creek Restoration Projects	Remove non-native vegetation and restore and replant native vegetation on the various stream sections.

	Decrease entrenchment and connect the Creeks to the flood plain. Improve proper functioning condition and biological integrity
Decrease E. coli, TDS, Temperature and other contaminants in the watershed	Engage in a temperature study and biological survey to determine if the cold water use designation is appropriate and plausible for all sections of Mill and Pack Creek. Determine if alternative water withdrawal management scenarios and adaptive management scenarios could mitigate temperature exceedences in sections of Mill Creek. Use microbial source tracking to determine what and where the E. coli is coming from. Depending upon what E. coli sources are and where they are located install best management practices to mitigate the sources. That could include fencing of streams to reduce animal husbandry loading, connecting faulty on-site waste water systems to the sewer, increasing opportunities for connections to the sewer by installing pipes where they are lacking, and increasing bathroom availability on public lands. Increase opportunities to curb storm water loads to Pack Creek with bioswales and other storm water mitigation best management practices on private property and new developments.

3.3 Permits

Project BMPs will adhere fully to all state, local and federal regulations and permitting requirements regarding wetlands, cultural resources, and sensitive aquatic habitats. Any required permits will be obtained in a timely manner and maintained in project files for review by UDWQ during project inspections. The environmental permitting that we anticipate encountering during this project are: CWA Section 404 permitting if any stream alteration is to occur, cultural resource permits, and adherence to sensitive aquatic habitat guidance from EPA Region 8. Additionally, we will use native plant materials in our restoration and re-vegetation projects when possible.

3.4 Assurance of Project Operation and Maintenance

No long-term funding is planned for operation or maintenance of these projects. Long-term maintenance of these projects will be the responsibility of the private landowner; however, staff from the lead project sponsor will be available to provide assistance in the case that major repairs are required. Staff from the lead project sponsor will inspect projects annually. The operation and maintenance of the designed systems will be thoroughly explained to the landowner and they will sign a document indicating their comprehension and willingness to participate. If the landowner does not operate or maintain the system for the projected life of the practice or structure according to UDWQ typical practice lifespan, they will be in violation of their 319

contract. Additionally they may risk having to pay back the federally contributed portion of their project funding.

4. COORDINATION PLAN

4.1 Lead Project Sponsor

For the EPA FY21 funded projects the UDWQ will manage the fiscal portion of the Rim to Rim sponsored Pack Creek Restoration Phase I project and GCD will be the fiscal agent for BLM Grand County Dog Waste Initiative Project. . Both institutions are empowered by the State of Utah to devise and implement measures for the prevention of non-point water pollution. Additionally, the GCD is able to enter into contracts, receive and administer funds from agencies, and contract with other agencies and corporate entities to promote conservation and appropriate development of natural resources. Memoranda of Understanding with state, federal, and local agencies along with individual cooperator agreements empower UDWQ, GCD and individual cooperators to accomplish this work.

For the FY21 projects funded by UDWQ, UDWQ will contract with the Southeast Utah Health Department for proposed project objectives 4 and 5. GCD will contract with UDWQ and the BLM for objective 2. The Watershed Coordinator for GCCD will track and oversee the remaining objectives of, monitoring, reporting, implementation and educational activities.

4.2 Local Support

The MAWP has developed a watershed management plan and has reviewed all implementation activities associated with this proposal. The MAWP has endorsed and recommended implementation of these projects. The MAWP membership includes:

Utah Division of Water Quality
Grand County
San Juan County
City of Moab
Town of Castle Valley
Moab Irrigation Company
Grand Water & Sewer Service Agency
US Bureau of Land Management
US Forest Service
The School and Institutional Trust Lands Administration
Utah Department of Agriculture/Grazing Improvement Program
Moab Solutions
Canyonlands Watershed Council
Utah Department of Natural Resources/Forestry Fire and State Lands
Grand Conservation District
Natural Resource Conservation Service

4.3 Coordination and Linkages

The GCCD and the MAWP (the local work group) anticipate coordinating efforts with the following entities, agencies, and organizations:

- Landowners/cooperators – assist with on-the-ground implementation, provide long-term monitoring and minor repair of fencing and watering infrastructure
- Utah Division of Water Quality -- Standard program monitoring, technical and financial assistance
- Environmental Protection Agency - Financial assistance
- Utah Department of Natural Resouces - Permits as needed
- City of Moab – Permits as needed
- Bureau of Land Management Moab Field Office
- Moab Solutions
- Rim to Rim Restoration
- Southeast Utah Health Department

4.4 Public Involvement

The local watershed group will combine on-the-ground discussions with landowners within the project area, press releases, and updates to the MAWP website to inform the general public about the projects. Other potential opportunities for public interaction identified in the MAWP Watershed Management Plan may also be used.

5.0 EVALUATION AND MONITORING PLAN

5.1 Sampling and Analysis Plan

The monitoring goals of this project are: 1) to document progress in achieving improved water quality conditions as non-point source control programs are implemented and 2) to document improvement in the riparian corridor. Water quality monitoring is currently being conducted at several crucial "crick" locations on a monthly and continual basis. Riparian health will be monitored on a point-in-time basis, before and after project implementation and can be conducted relatively quickly and inexpensively. The state Quality Assurance Project Plan (QAPP) is included in Appendix A.

Work activities associated with these goals include the following:

1. Monitor long term sites (established and maintained by the MAWP and the Utah Division of Water Quality) for water quality to demonstrate sustained and overall improvements in water quality. This will be conducted by the Utah Division of Water Quality and the Watershed Coordinator.

2. Monitor riparian areas for overall improvement of vegetation, and riparian structure and function. This will be conducted by the watershed coordinator and appropriate partners, including the Division of Water Quality.
3. Review data and include data summaries in annual reports. This will also be conducted by the Utah Division of Water Quality and the Watershed Coordinator.

Water quality parameters will be tracked within and below the project area and also before and after the project start date. Water quality sampling will continue to be done monthly and will not require additional sampling funded through this project. Riparian condition will not likely be significantly different immediately after project implementation, but is expected to improve water quality over time. The long term monitoring envisioned for the Mill Creek watershed should capture those improvements and trends in water quality.

5.2. Water Quality Monitoring for Spanish Valley

UDWQ and the watershed coordinator have developed a long term Sampling Analysis Plan (SAP) for Spanish Valley. Details of the SAP can be found in the Moab Area Watershed Partnership's Watershed Management Plan. The SAP was developed to capture information about parameters of concern in Spanish Valley. The sites were chosen such that the data collected complements data collected by the UDWQ during their intensive monitoring efforts and are also located at critical points in the watershed. The sites are shown in Figure 4 and are listed in Table 8 with their associated water quality and quantity components. Water quality and quantity components being sampled include:

- Field Parameters: Temperature, pH, Conductivity, Salinity, Dissolved Oxygen, Percent Dissolved Oxygen Saturation; Instantaneous Flow;
- Biological Parameters: Total Coliforms and E. coli
- Continuous monitoring: Pressure Transducers (Pressure Transducers also measure temperature concurrently)

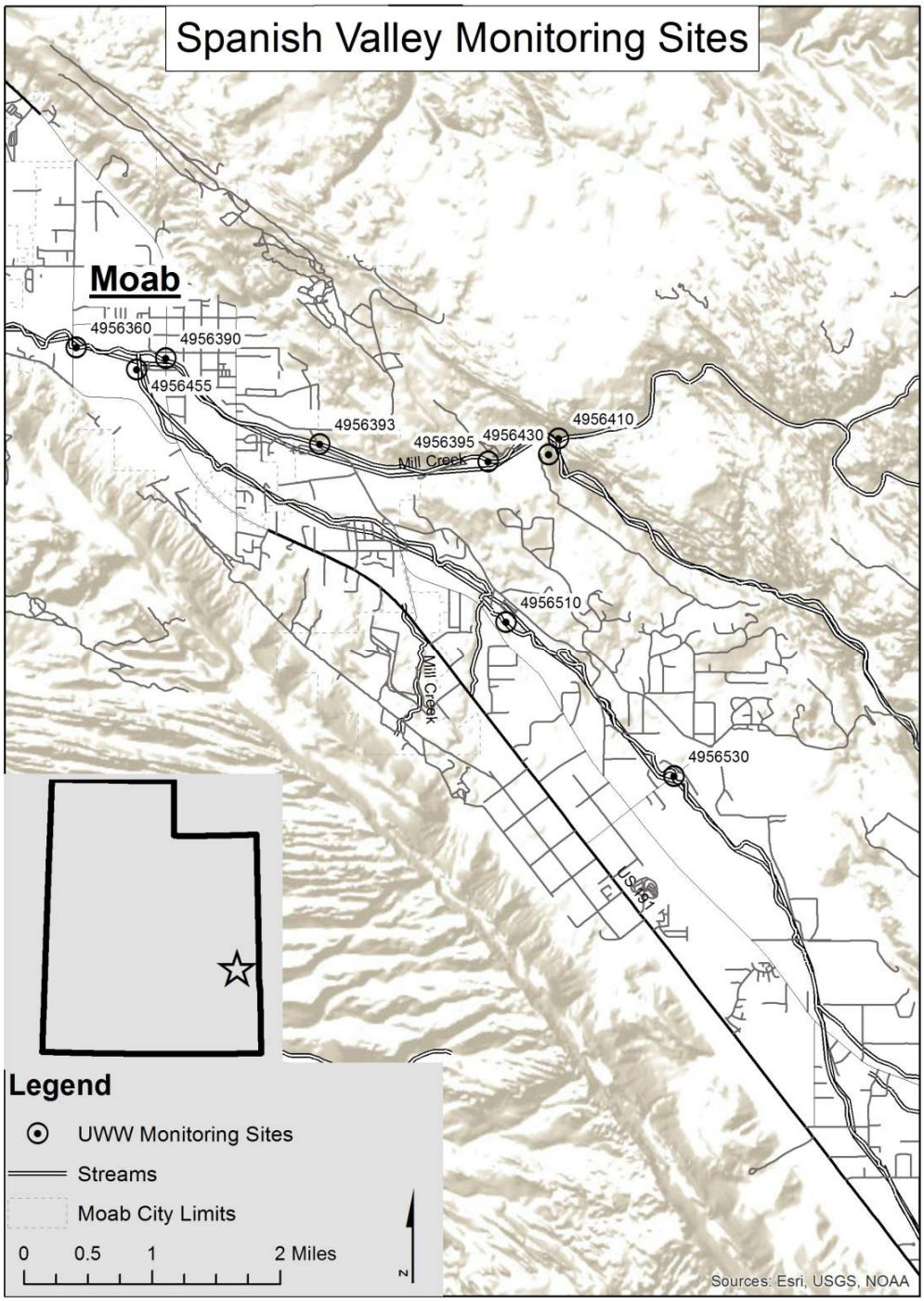

Fig. 4 Monitoring Locations –

Table 8: Monitoring parameters at long term water quality monitoring sites in the Moab Area Watershed's Partnership's Watershed Management Plan.		
Site Name	AWMQS Monitoring ID	Monitoring
Mill Creek bl Pack Creek	4956360	Field Parameters Biological Parameters

Mill Creek at US 191 and ab Pack Creek	4956390	Field Parameters Biological Parameters Continuous monitoring: Pressure Transducer
Mill Creek at Mill Creek Drive	4956393	Field Parameters Biological Parameters
Mill Creek bl Power Dam	4956395	Field Parameters Biological Parameters
North Fork Mill Creek ab Mill Creek	4956410	Continuous Monitoring: Pressure Transducer
Mill Creek ab North Fork	4956430	Continuous Monitoring: Pressure Transducer
Mill Creek ab Spring Canyon	4956437	Continuous Monitoring: Pressure Transducer
Pack Creek at 200 west ab Mill Creek	4956455	Field Parameters Biological Parameters Continuous monitoring: Pressure Transducer
Pack Creek at Pack Creek Campground	4956510	Field Parameters Biological Parameters
Pack Creek at Spanish Trail Road	4956530	Field Parameters Biological Parameters Continuous monitoring: Pressure Transducer

Table 6: Water Quality Parameters being collected at each site.

5.3 Riparian monitoring methods

The MAWP has agreed to use the Multiple Indicator Monitoring protocol developed by the BLM to measure riparian project effectiveness. Monitoring will take place between May 1 and June 30 at the project sites pre-project, post project and five years after project completion.

Additional monitoring may include parameters appropriate for the specific project. Such parameters may include acreage (of plantings, seeding, or weed control), or linear feet of streambank stabilization. Upland projects in this project implementation plan have previously been monitored by Rim to Rim Restoration and there monitoring design will be used post project and five years after project completion.

5.4 Data Management, Storage, and Reporting

The water quality data collected from the Spanish Valley SAP is eventually entered into the UDWQ database. That data is uploaded to the Water Quality Exchange (WQX) database and is available via the internet to all interested parties and organizations. Quality Assurance and Quality Control will be conducted according to the guidelines established in the Utah Water Quality Monitoring Manual. Only those data that meet QA/QC standards will be entered into the project database.

Field measurements are entered into the Excel spreadsheets by the collector or watershed coordinator. The data is provided to UDWQ where it is uploaded to the assessment data base.

Coliform data is entered by the analyst or the watershed coordinator into spreadsheets provided by UDWQ. The spreadsheets are sent to UDWQ for uploading to the UDWQ database.

Measured flow data, pressure transducer data, flow curve generation files, and generated flow tables will be maintained by the watershed coordinator and sent to the UDWQ coordinator annually.

Multiple Indicator Monitoring data is recorded directly into a spreadsheet while being collected. The watershed coordinator and the project sponsor will each maintain a copy of file. UDWQ is also provided with these files and assures long term storage and back up of these files.

5.4 Models Used

It is not anticipated that mechanistic models will be used in developing or evaluating the projects. However, models such as STEPL or other empirical models may be used to estimate annual load reductions for TDS, phosphorous, nitrogen, and sediment and will be reported annually to UDWQ. The Utah Animal Feedlot Risk Index may also be used when calculating load reductions from feedlots.

6.0 Budget

6.1 Funding Sources for Proposed Projects

Funding Sources	Cost for FY21 Proposed Projects
EPA Section 319 Funds	$114,079
State and Local Match	$105,441 WRI & Stan Holland (Rim2Rim) $35,000 WRI/Volunteers (BLM Mill Ck) $50,000 SEUHD (Human Waste) $13,000 SEUHD (On-Site) $147,650 UDWQ
Other Federal Match	$26,924 NRCS (Rim2Rim) $35,000 BLM (Mill Ck) $23,270 BLM (Dog Waste)
Total	$550,364

6.2 Funding Sources for Objectives of Proposed Projects

Work Element	Total Costs	319 Funds	Match	Other	Source of Match/Other

Objective 1: Pack Creek Restoration Project Phase 1.	$234,941	$102,576	$28,459 $76,982	 $26,924	Landowners WRI NRCS
Objective 2: Bureau of Land Management Mill Creek Restoration Project Phase V.	$103,075	$0	$33,075 $30,000 $5,000	 35,000	UDWQ WRI Volunteers BLM
Objective 3: Grand County Dog Waste Initiative.	$34,773	$11,503	$0	$23,270	BLM
Objective 4: Southeastern Utah Health Department Human Waste Initiative.	$125,000	$0	$75,000 $30,000 $15,000 $5000		UDWQ SEUHD Volunteers Travel Council
Objective 5: Southeastern Utah Health Department On-Site Wastewater Digitization Project Phase II	$32,000	$0	$19,000 $13,000		UDWQ SEUHD
Objective 6: Work with stakeholders/public to educate them on how employed BMPs positively affect water quality in the Mill Creek watershed	$5,000	0	$5,000		UDWQ
Objective 7: Monitor Mill and Pack Creek to determine project effectiveness.	$9,000	$0	$9,000		UDWQ
Objectives 8: Satisfy reporting funding requirements.	$5,000	0	$5,000		UDWQ
Objective 9: Administration of funding	$1,575	0	$1,575		UDWQ
Total	**$550,364**	**$114,079**	**$351,091**	**$85,194**	

Appendix A

Document Title: **Quality Assurance Project Plan for the Mill Creek Watershed**

Date: July 31, 2020

Cooperating Organizations and contacts:

1. Grand County Conservation District
   Watershed Coordinator
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QAPP Approval:

_____ _____

Jody Gardberg
Watershed Protection Program Manager
Utah Division of Water Quality

Date

_____ _____

Toby Hooker
Quality Assurance Officer
Utah Division of Water Quality

Date

2. Table of Contents (A-2):

3. Project/Task Organization (A-4):

Please refer to Figure 2 in the State of Utah QAPP for an organization chart detailing the agencies and entity relationships. At the sponsor and field level, primary involvement will include the watershed coordinator for Grand County Conservation District who will oversee monitoring, data collection, data storage, restoration activities and evaluate projects and BMPs.

4. Problem Definition/Background (A-5):

Please refer to Section 2.1 in the Spanish Valley PIP for a full description of water quality problems.

5. Project/Task Description (A-6)

Please refer to section 3 in the Spanish Valley PIP for a full description of project goals and tasks.

6. Data Quality Objectives and Criteria (A-7)

Specific data quality objectives for accuracy, precision and completeness for laboratory analyses are discussed in the Division of Laboratory Services Quality Assurance Program Plan (QAPP), appendix 13 of the Quality Assurance and Standard Operating Procedures Manual. Specific tasks identified for the Spanish Valley Watershed are highlighted in the monitoring matrix (Table 1). In addition, habitat and other biological data may be limited to areas in the watershed where projects are being implemented.

Table 1. Sample project task identification and description (monitoring matrix).

Activity	Schedule	Responsible Agency	Methods
Sample Water Quality for Escheria and Total Coliform. Sampling will be conducted at seven sites selected upon review of existing data.	Ongoing, Monthly from May through September.	DWQ, GC Watershed Coordinator	Refer to Utah DWQ's Standard Operating Procedures and see SAP in Moab Area Watershed Management Plan.
Field water quality parameters to including Temp., Conductivity, Dissolved Oxygen, Flow and pH.	Ongoing, Monthly and year round	DWQ, GC Watershed Coordinator	See SAP in Moab Area Watershed Management Plan.
Monitor Riparian Habitat: channel geomorphology, substrate size, riparian greenline and transect vegetation, stream shading and photopoints.	Pre and Post-Project and five years after project completion, unless site specific response necessitates frequency adjustment.	DWQ & MAWP Team	Trend analysis for channel adjustment data, riparian vegetation transect data to document BMP effectiveness, and habitat quality improvement according to MIM monitoring SOPs.
Determine flows at five sites, calculate flow curve, and produce flow tables.	Monthly and during high water periods, produce table annually.	DWQ & GC Watershed Coordinator	Refer to Utah DWQ's Standard Operating Procedures and see SAP in Moab Area Watershed Management Plan.
Evaluate chemical water quality data to document BMP effectiveness to improve water quality.	Every five years DWQ monitors selected sites in Spanish Valley monthly for one water year.	DWQ	Examine chemical data against beneficial use criteria, trend analysis.
Consolidate chemical, biological and physical data for reporting process	Annually and as needed for project FINAL REPORT	Watershed Coordinator & DWQ	Report at November MAWP meeting
Evaluate monitoring program and determine where and when additional water quality monitoring may be needed to document BMP effectiveness	Annually	MAWP & DWQ	Feedback loop analysis

7. Sampling Process Design (B-1)

Table 1 lists all the parameters, frequency of sampling, referenced SOPs and responsible agencies for each task.

A total of 9 water quality sampling sites have been established to support projects. See Section 5.1 of the Project Implementation Plan for the Mill Creek watershed or the MAWP Sampling analysis plan in the MAWP's Watershed Management Plan for a full description of each site. These sites are located at long term sites that are representative of defined stream segments and

are also part of the Intensive Basin Rotational Sampling that was performed for water year 2018-19. At least one site will be established inside each project area for riparian monitoring.

8. Sample Methods Requirements (B-2)

Sampling methods, equipment used, sample containers and preservation requirements are listed in DWQ's approved QA/QC Manual that also addresses SOPs in Section 4 of the Quality Assurance and Standard Operating Procedures Manual, and Section 7 the Division of Laboratory Services QAPP.

9. Sample Handling and Custody Requirements (B-3)

Please refer to Section 14 in the State of Utah Guidance For Sampling and Analysis Plans/Quality Assurance Project Plans (QAPPs).

10. Analytical Methods Requirements (B-4)

Analytical methods for this project utilize standard methods as identified in the Division of Laboratory Services QAPP. This QAPP is in Appendix 13 of the DWQ's QA/QC Manual.

11. Quality Control Requirements (B-5)

Please refer to Sections 8 and 11 in the State of Utah Guidance For Sampling and Analysis Plans/Quality Assurance Project Plans (QAPPs).

12. Instrument Calibration and Frequency (B-7)

Please refer to Appendix 13 of the Quality Assurance and Standard Operating Procedures Manual and the State of Utah Guidance For Sampling and Analysis Plans/Quality Assurance Project Plans (QAPPs).

13. Assessments and Response Actions (C-1)

All field and laboratory procedures may be reviewed by state and EPA quality assurance officers at any time or as requested. Any identified procedural problems will be corrected based on recommendations from DWQ's QA Officer. This may include more frequent instrument calibration, additional training of field or laboratory personnel, etc.

14. Data Review, Validation and Verification Requirements (D-1)

Data reduction and reporting are presented in Section 16 of the DWQ's QA/QC Manual. Data procedures, flow charts, and example of reports are detailed in that document. Laboratory validation and verification processes are detailed in the Division of Laboratory Services QAPP.

15. Validation and Verification Methods (D-2)

Please refer to the State of Utah Guidance For Sampling and Analysis Plans/Quality Assurance Project Plans (QAPPs).

16. Reconciliation with Data Quality Objectives (D-3)

Results from the monitoring activities will be routinely scrutinized in a timely manner against the data quality objectives established for 319 projects. The NPS monitoring coordinator will be responsible for determining whether the objectives of the nonpoint source monitoring effort have been attained and whether to reestablish new data quality objectives based upon the

data collected from the projects. Sections B-7 and D-1 in this document and Sections 16, 17, and Appendix 13 and 14 in the QA/QC Manual list appropriate equations used to assure representative and accurate data are and have been collected.