GROUP A. PROJECT MANAGEMENT

A.1 Title and Approval Sheet

Quality Assurance Project Plan
for
Lower Animas Watershed Based Plan Implementation Projects Phase 3

Prepared by
San Juan Soil & Water Conservation District
301 McWilliams Road
Aztec, New Mexico 87410

Prepared for
US EPA Region 6
1201 Elm Street, Suite 500
Dallas, Texas 75202

Submitted by:
New Mexico Environment Department
Surface Water Quality Bureau

Alan Klatt — Digitally signed by Alan Klatt Date: 2022.04.12 08:07:25 -06'00'

Alan Klatt
Project Officer, SWQB Watershed Protection Section — Date

Miguel Montoya — Digitally signed by Miguel Montoya Date: 2022.04.12 10:16:17 -06'00'

Miguel Montoya
Quality Assurance Officer, SWQB — Date

Abraham Franklin — Digitally signed by Abraham Franklin Date: 2022.04.11 16:58:33 -06'00'

Abe Franklin
Program Manager, SWQB Watershed Protection Section — Date

Kyla Chandler — Digitally signed by Kyla Chandler DN: cn=Kyla Chandler, o, ou, email=chandler.kyla@epa.gov, c=US Date: 2022.06.27 15:43:18 -05'00'

Kyla Chandler
Environmental Protection Specialist, WDAS, EPA Region 6 — Date

NELLY SMITH — Digitally signed by NELLY SMITH DN: c=US, o=U.S. Government, ou=Environmental Protection Agency, cn=NELLY SMITH, 0.9.2342.19200300.100.1.1=68001003655673 Date: 2022.07.06 14:39:54 -05'00'

Nelly Smith
Chief, State and Tribal Programs Section, WDAS, EPA Region 6 — Date

THIS PAGE INTENTIONALLY LEFT BLANK

A.2 Table of Contents

Acronyms

AWP- Animas Watershed Partnership
BMP – Best Management Practice
BOR – Bureau of Reclamation
CAP – Conservation Activity Plan
CDPHE – Colorado Department of Public Health and Environment
CFU – Colony Forming Unit
EPA – US Environmental Protection Agency
EQIP – Environmental Quality Incentives Program
GI – Green Infrastructure
GPS – Global Positioning System
HUC – Hydrologic Unit Code
LAWBP – Lower Animas Watershed Based Plan
LID – Low Impact Development
MSI – Mountain Studies Institute
NMED – New Mexico Environmental Department
NRCS – USDA Natural Resources Conservation District
PQAPP – Project Quality Assurance Project Plan
QA – Quality Assurance
QAPP – Quality Assurance Project Plan
QC – Quality Control
San Juan SWCD – San Juan Soil and Water Conservation District
SJWG – San Juan Watershed Group
SOP – Standard Operating Procedures
STEPL – Spreadsheet Tool for Estimating Pollutant Loads
SUIT – Southern Ute Indian Tribes
SWQB – NMED Surface Water Quality Bureau
TMDL – Total Maximum Daily Load
USACE – US Army Corps of Engineers
USGS – United States Geological Survey
WDAS – U.S EPA Water Division, Assistance Programs Branch, State and Tribal Programs Section
WPS – NMED SWQB Watershed Protection Section
FONC – Friends of the Nature Center

Introduction

The purpose of this Quality Assurance Project Plan (QAPP) is to document the necessary quality assurance (QA), quality control (QC), and other technical activities that will be implemented to ensure that the results of the work performed for Lower Animas Watershed Based Plan Implementation Projects Phase 3 will satisfy the stated performance criteria. Additional tasks described within this document describe the acquisition of environmental data or information from direct measurement activities, existing data, or generated by models to be used throughout this project.

This QAPP will cover project design and monitoring data collection efforts for a bank stabilization and habitat improvement project (Management Measure 1), an erosion mitigation and side channel restoration project (Management Measure 2), and a wetland restoration and riparian management education garden project (Management Measure 3) as described in the Lower Animas Watershed Based Plan Phase 3 workplan as part of NMED Clean Water Act Section 319 sub grant agreement 667-22SJWSQ-1A.

When changes affect the scope, implementation, or assessment of the outcome, this QAPP will be revised to keep project information current. The SWQB Project Manager, with the assistance of the QA Officer, will determine the impact of any changes on the technical and quality objectives of the project. The Project Coordinator will review this QAPP annually to determine the need for revision throughout the duration of this funding agreement.

PROJECT MANAGEMENT

A3. Distribution List (EPA QA/G-5)

Melissa May, San Juan Soil & Water Conservation District (San Juan SWCD) District Manager and Alyssa Richmond, San Juan Watershed Group (SJWG) Coordinator will serve as the grantee and project manager and project coordinator, respectively. Table 1 presents a list of the individuals who will receive a copy of the QAPP and their roles for the LAWBP Phase 3 Project. The Project Coordinator will require those marked with an asterisk to read this QAPP and sign the QAPP Acknowledgement Statement (Page 28).

Table 1: Distribution List and Project Roles and Responsibilities

Name	Organization	Position/Role	Responsibility for	Contact Information
Alan Klatt	NMED SWQB	Project Officer	Review and approve QAPP. Project oversight, coordination, and EPA reporting.	505-819-9623 alan.klatt@state.nm.us
Abraham J. Franklin	NMED SWQB	Program Manager	Reviewing and approving QAPP, managing project personnel and resources	505-946-8952 abraham.franklin@state.nm.us
Miguel Montoya	NMED SWQB	QA Officer	Ensure quality of work is maintained throughout project.	505-819-9882 miguel.montoya@state.nm.us

Kyla Chandler	EPA	Environmental Protection Specialist WQPD, Region 6	Review and approve QAPP.	214-665-2166 chandler.kyla@epa.gov
Nelly Smith	EPA	Chief, State and Tribal Programs Section WQPD, Region 6	Review and approve QAPP.	214-665-7109 smith.nelly@epa.gov
Melissa May*	San Juan SWCD	Project Manager	Grant invoicing and overall project management.	505-234-6040 X1 melissa.may@sanjuanswcd.com
Alyssa Richmond*	SJWG	Project Coordinator	Coordinate workplan and implementation of management measures 1-4. Review data/reports submitted by subcontractors.	505-234-6040 X3 alyssa.richmond@sanjuanswcd.com
Doug Abe*	City of Farmington	Project Partner	Coordinate with Project Coordinator and partners for management measure 3.	505-599-1407 dabe@fmtn.org
Callie Vanderbilt*	Friends of Nature Center	Project Partner	Coordinate with Project Coordinator and partners and conduct monitoring for management measure 3.	fixkin@yahoo.com
Don Hyder*	Friends of Nature Center	Project Partner	Coordinate with Project Coordinator and partners and conduct monitoring for management measure 3.	dphyder5@msn.com
Vacant*	To Be Determined	Restoration Subcontractor	Oversee construction and monitoring of management measure 1 and 2.	To Be Determined

A4. Project Organization (EPA QA/G-5)

Project Officer – Alan Klatt, SWQB/WPS, will be responsible for certifying invoices on behalf of NMED in accordance with the Scope of Work and Contract Agreement 667-22SJWSQ-1A.

Quality Assurance Officer - The Quality Assurance (QA) Officer will ensure that a high quality of work is maintained throughout the entire project. The QA Officer will ensure that copies of this QAPP and any subsequent revisions are distributed to members who have signature authority to approve this QAPP

Project Manager – Melissa May will serve as the Project Manager. Ms. May has served as the District Manager for the San Juan SWCD since 2016, was the lead sampler for the 2013-2014 Microbial Source

Tracking Study, and was the lead author of the Lower Animas Watershed Based Plan (LAWBP). She holds a BS in Environmental Resource Management and an MS in Wildlife and Fisheries Science from Penn State University's Watershed Stewardship program. Ms. May will be responsible for all contractual and financial elements of the project, oversee contractor procurement, ensure that the project budget is adhered to, and work closely with the Project Coordinator on all components of the project.

Project Coordinator – Alyssa Richmond will serve as the Project Coordinator. Ms. Richmond has served as the Coordinator of the San Juan Watershed Group (SJWG) and employee of the San Juan SWCD since 2019. She holds a BS in Environmental Sciences with minors in Sustainability Studies and Geospatial Analysis from Davis & Elkins College, West Virginia. She has successfully implemented two 319(h) Best Management Practice (BMP) grants implementing the Lower Animas Watershed Based Plan, was the lead sampler for the 2021 San Juan *E.coli* and Human Bacteria Investigation and Sampling Study, and is a co-author for the LAWBP and lead author for the Middle San Juan Restoration Plan. Ms. Richmond will be responsible for coordinating with the NMED Project Officer, ensuring the project remains on schedule, coordinating with SJWG contractors and partners, reviewing data, designs, and reports submitted by contractors and partners, preparing quarterly and final reports to NMED, facilitating stakeholder engagement, scheduling workgroup meetings, and conducting community outreach. She will review this QAPP annually to determine the need for revision throughout the duration of funding agreement 667-22SJWSQ-1A.

Restoration Subcontractor – The Project Manager will coordinate with the Project Coordinator on procuring a restoration subcontractor for Management Measures 1 and 2. The restoration subcontractor will conduct initial surveys, design, receive US Army Corps of Engineers (USACE) 404 permits, and coordinate and oversee the construction activities of Management Measures 1 and 2. They are expected to have acceptable experience with hydrologic and topographic surveys, monitoring methods, and river construction.

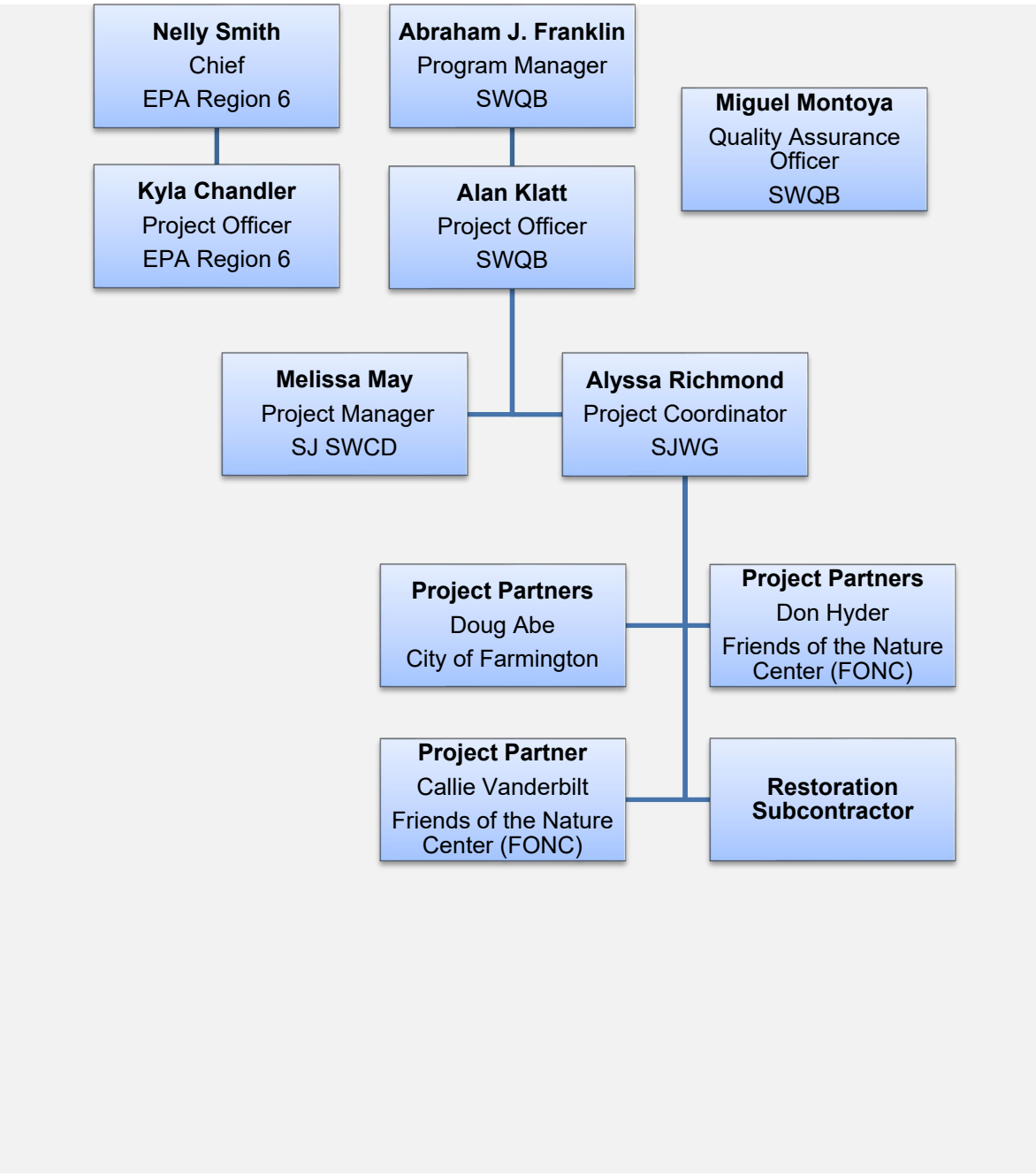
Project Partner – Doug Abe will serve as a project partner for Management Measure 3. Mr. Abe serves as the Parks Superintendent for the City of Farmington Parks, Recreation, and Cultural Affairs Department. He will be responsible for coordinating with project partners, representing the City of Farmington in short and long term project development, and facilitating city crew assistance in implementing project activities.

Project Partner – Callie Vanderbilt will serve as a project partner for Management Measure 3. Ms. Vanderbilt earned her education at Colorado State University and University of California, Davis and taught at San Juan College, Farmington for 25 years. She has conducted research projects on threatened and endangered species, habitat assessments, and metal concentrations in soil and plants. She will be responsible for assisting the Project Coordinator and project partners, represent the Friends of the Nature Center (FONC) in Farmington in short and long term project development, and conduct vegetation monitoring as described in this QAPP.

Project Partner - Don Hyder will serve as a project partner for Management Measure 3. Mr. Hyder has served as an environmental consultation and partner for mine reclamation, environmental and biological assessments, and rare and endangered species conservation. He has also taught biology, biochemistry, environmental conservation, and monitoring techniques at San Juan College for 17 years. He will be

responsible for assisting the Project Coordinator and project partners, represent the Friends of the Nature Center (FONC) in Farmington in short and long term project development, and conduct vegetation monitoring as described in this QAPP.

Figure 1: Key Individual Organization Chart



A5. Project Background, Overview, and Intended Use of Data (EPA QA/G-5)

Project Background

The San Juan Watershed Group (SJWG) has prioritized nutrient enrichment and bacteria pollution as the most problematic water quality issues in the New Mexico portion of the Animas River watershed. Nutrients were identified as a problem in the watershed in 2002, when severe algae blooms choked the river and sparked widespread concern about eutrophication. A Total Maximum Daily Load (TMDL) for nutrients was developed for the Animas River Estes Arroyo to San Juan River Assessment Unit (AU) NM-2403_A_00 in 2006 and a TMDL for total phosphorus was developed for the Animas River Southern Ute Indian Tribes (SUIT) Land to Estes Arroyo AU in NM-2404_00 in 2013. Both AUs for the Animas River was first listed for *E. coli* in 2012, indicating that the river was not meeting its primary contact designated use, which is designed to protect recreation activities "including swimming, bathing, tubing, water play by children, and similar activities where a high degree of bodily contact with water, immersion and ingestion are likely" (CWA Section 304(a)(1)). A TMDL for *E.coli* was developed in 2013. *E.coli* was delisted within both AUs of the Animas River in 2020 but continued work is still necessary to maintain this delisting. While the SJWG continues to prioritize bacteria water quality research, outreach campaigns, and watershed planning to address this concern, the group continues to address nutrient impairments and sediment contributions through the implementation of best management practice (BMP) and community outreach and education to improve community awareness and action, decrease nutrient loads, and improve assimilative capacity. The goal of the Lower Animas Watershed Based Plan Implementation Projects Phase 3 is to implement on the ground projects outlined in the LAWBP to meet these goals (SJWG 2021).

The project area is throughout the Animas Watershed within the state of New Mexico's jurisdiction. The AUs, listed from upriver to downriver, are the Animas River from the Southern Ute Indian Boundary to Estes Arroyo (AU NM-2404_00) and the Animas River from Estes Arroyo to San Juan River (AU NM-2403_A_00). The Animas watershed within New Mexico is approximately 36 miles long, 270 square miles and consists of six 12-digit Hydrological Unit Code (HUC) units. The specific HUC12 watersheds incorporated into this project are Tucker Canyon HUC 140801041003, Flora Vista HUC 140801041005, and Farmington HUC 140801041006. These sections of the Animas Watershed are characterized by low population density in the upriver reach and becoming more densely populated downriver. Most of the community is concentrated along the riparian corridor using the valley for irrigated pasture and cropland while upland land use is primarily roads systems to service oil and gas extraction activities and rangeland. Section 2 of the LAWBP provides detailed information on the lower Animas Watershed's six HUC12 units (SJWG 2021). Source activities contributing to the nutrient impairment and bacteria concern, including but are not limited to poor soil health on cropland/pastureland, loss of assimilative capacity due to bank erosion and lack of riparian vegetation, direct removal of vegetation, channelization, artificial hardening of banks, and overgrazing (more information on these source activities are provided in Section 3 of the LAWBP). Refer to Table 9 of the LAWBP for a complete list of pollutant source activities.

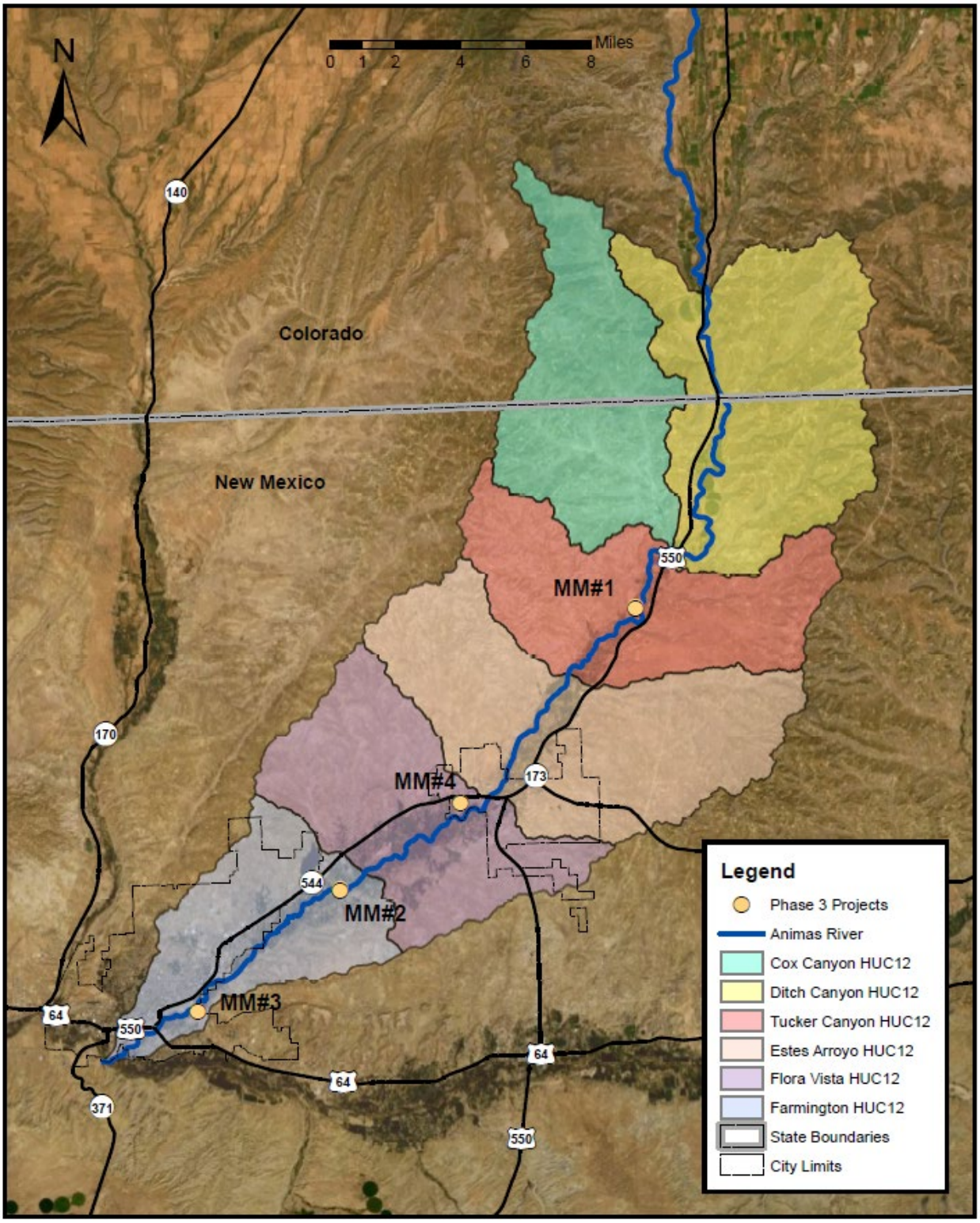
The BMPs incorporated into this project consist of a bank stabilization and habitat improvement project (Management Measure 1), an erosion mitigation and side channel restoration project (Management Measure 2), a wetland restoration and riparian management education garden project (Management Measure 3), a healthy soil campaign (Management Measure 4), and stakeholder coordination on all

project components (Management Measure 5). Management Measure 1 is located in the Tucker Canyon HUC12 (140801041003), Management Measure 4 in the Flora Vista HUC12 (140801041005), Management Measures 2 and 3 in the Farmington HUC12 (140801040006), and Management Measure 5 throughout the entire project area. As Management Measure 4 and 5 are outreach and coordination campaigns that incorporate measures of success that are not quantifiable data following specific protocols (i.e. feedback surveys, number of soil tests and stakeholder coordination), these management measures will not be described in this QAPP. More information on these Management Measures is available in the contract agreement 667-22SJWSQ-1A Work Plan. Table and Figure 2 below summarizes all management measures names, locations, and LAWBP project codes in this project.

Table 2: Project Components

Project Component Type	Management Measure Number	Name	Location	LAWBP Project Code
BMP	1	Tucker Watershed Riverbank Stabilization	Animas River	T12
	2	Flora Vista North Bank Floodplain Restoration	Animas River	CF2.F
	3	Animas Park Wetland Restoration and Riparian Education Garden	Animas Park, approximately 350 feet from the Animas River	CF7
Outreach Campaign	4	Soil Health Outreach Campaign and Workshop	Growing Forward Farm and Watershed Wide	n/a
Stakeholder Coordination	5	SJWG Stakeholder Coordination and Outreach	Watershed Wide	n/a

Figure 2: Map of Lower Animas Watershed Based Plan Phase 3 Projects



A6. Project/Task Description and Schedule (EPA QA/G-5)

As defined by Funding Agreement Number 667-22SJWSQ-1A between the New Mexico Environment Department and the San Juan SWCD, the San Juan Watershed Group will complete the following management projects as described in this QAPP. These projects will be completed in the timeline provided in Table 3. Project locations are displayed in Figure 2.

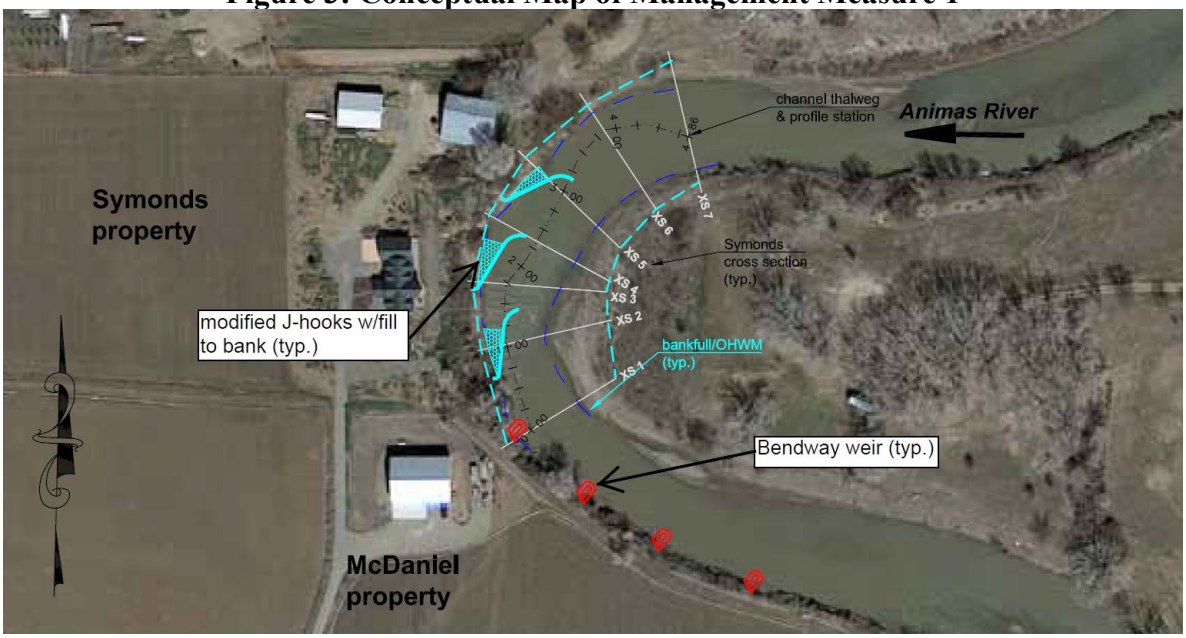
Table 3: Summary and Timeline of Grant Tasks Included in this QAPP

Management Measure		Task		Timeline	Responsible Person(s)	Description
5	Stakeholder Coordination, Outreach, and Project Management	0	QAPP Development	Feb - June 2022	Project Coordinator	Develop QAPP and document methods to develop projects, evaluate project success, and calculate pollutant load reductions.
		5.1	SJWG Meeting and Stakeholder Engagement	Oct 2021 - Sept 2024	SJWG	Report on Management Measure process at monthly SJWG meetings, engage stakeholders to assist partners on complimentary projects, and encourage participation of new stakeholders.
		5.2	Reporting	Oct 2021 - Sept 2024	Project Coordinator	Invoices and progress and financial reports to NMED SWQB will be prepared quarterly with a final report and deliverables at the completion of the project.
		6	Update LAWBP	July - Sept 2024	SJWG	Update the LAWBP with new, pending, and in progress projects, implementation schedule, and watershed planning elements.
1	Tucker Watershed Riverbank Stabilization Project	1.1	Contractor Procurement, Project Design, and Permitting	June 2022 - Jan 2023	Project Coordinator, Restoration Contractor	A Restoration Contractor will be procured to conduct design surveys, finalize project design, acquire permits, and oversee/conduct construction.
		1.2	Project Construction	Jan - April 2023	Restoration Contractor	Project construction as per finalized and approved project designs.
		1.3	Post Construction Site Surveys	Jan - April 2024	Restoration Contractor	Establish post construction baseline data to document project success.
2	Flora Vista North Bank Floodplain Restoration	2.1	Contractor Procurement, Project Design, and Permitting	June 2022 - Jan 2023	Project Coordinator, Restoration Contractor	A Restoration Contractor will be procured to conduct design surveys, finalize project design, acquire permits, and oversee/conduct construction.
		2.2	Project Construction	Jan - April 2023	Restoration Contractor	Project construction as per finalized and approved project designs.
		2.3	Post Construction Site Surveys	Jan - April 2024	Restoration Contractor	Establish post construction baseline data to document project success.
3	Animas Park Wetland Restoration and Riparian Education Garden	3.1	Project Design, Planning, and Site Prep	Jan - Aug 2022	Project Coordinator, City of Farmington, Friends of Nature Center	Project partners will coordinate to develop an overall garden design, wetland restoration plan, and revegetation plan. Park staff will conduct necessary site preparations including mowing, invasive species control, and soi preparation. Plants and seeds will be ordered, volunteer and ecuational days will be scheduled and advertised.
		3.2	Volunteer Planting and Education Tours	Aug - Oct 2022	Project Coordinator, Friends of Nature Center	A series of half day volunteer and educational days will be hosted with multiple audiences. Surveys will be conducted with volunteers after the events to provide feedback on future volunteer events
		3.3	Vegetation Monitoring	July 2022 - July 2022	Callie Vanderbilt and Don Hyder	Establish pre and post construction baseline data to document project success.

Management Measure 1 – Tucker Watershed Riverbank Stabilization

Restoring the functional capacity of the river and adjacent floodplains is one of the best long-term solutions for abating nutrient pollution and improving assimilative capacity of pollution loads (LAWBP 2021). One of the Best Managements Practices (BMP) prioritized as a high potential for pollutant load reductions over all land use types is bank stabilization methods designed to match the degree of channel and/or riverbank erosion. Approximately two and a half river miles downstream of the confluence of Cox Canyon within the Tucker Canyon HUC12 Watershed, multiple private landowners are experiencing exacerbated river erosion endangering their homesteads, hobby farms, and irrigated alfalfa fields due to a tight-radius meander where the river thalweg has shifted directly along the river right bank. This vertical channelization of the river and disconnection of the river's floodplain was previously addressed through years of piling bank stabilization materials (i.e. riprap and debris). To remedy this problem, SJWG will work with the two landowners along the impacted reach to install a series of six to seven geomorphologically appropriate modified J-hook and bendway weir structures. Designs and US Army Corps of Engineers (USACE) 404 permits for one of the properties were already completed in 2019 at the expense of the landowner (permit expired as of March 2022, a new 404 permit for the overall project will be required), who then reached out to SJWG for implementation assistance. The existing plans will be updated to include the neighboring reach before construction through photo point photography and updated fluvial geomorphology and topography surveys (see data collection methods in Element B2). These structures will adjust the distribution of flow away from the eroding bank, promote the aggradation of material in the near-bank region, provide habitat for aquatic species, and support a rooting medium for the long-term establishment of native vegetation. Altogether, this bank stabilization BMP will assimilate sediment, nutrients, and phosphorus that was previously being introduced to the watershed through active erosion. Based on preliminary calculations from the Spreadsheet for Estimating Pollutant Loads (STEPL), bank stabilization associated with this project should result in a reduction of 179.6 tons/year of sediment, 244.2 lbs/year of nitrogen, and 96 lbs/year of phosphorus. A calculation of sediment and nutrient reductions from this project will be refined based on measurements gathered during the post construction surveys (see data collection methods in Element B2).

Figure 3: Conceptual Map of Management Measure 1



Management Project 2 – Flora Vista North Bank Floodplain Restoration

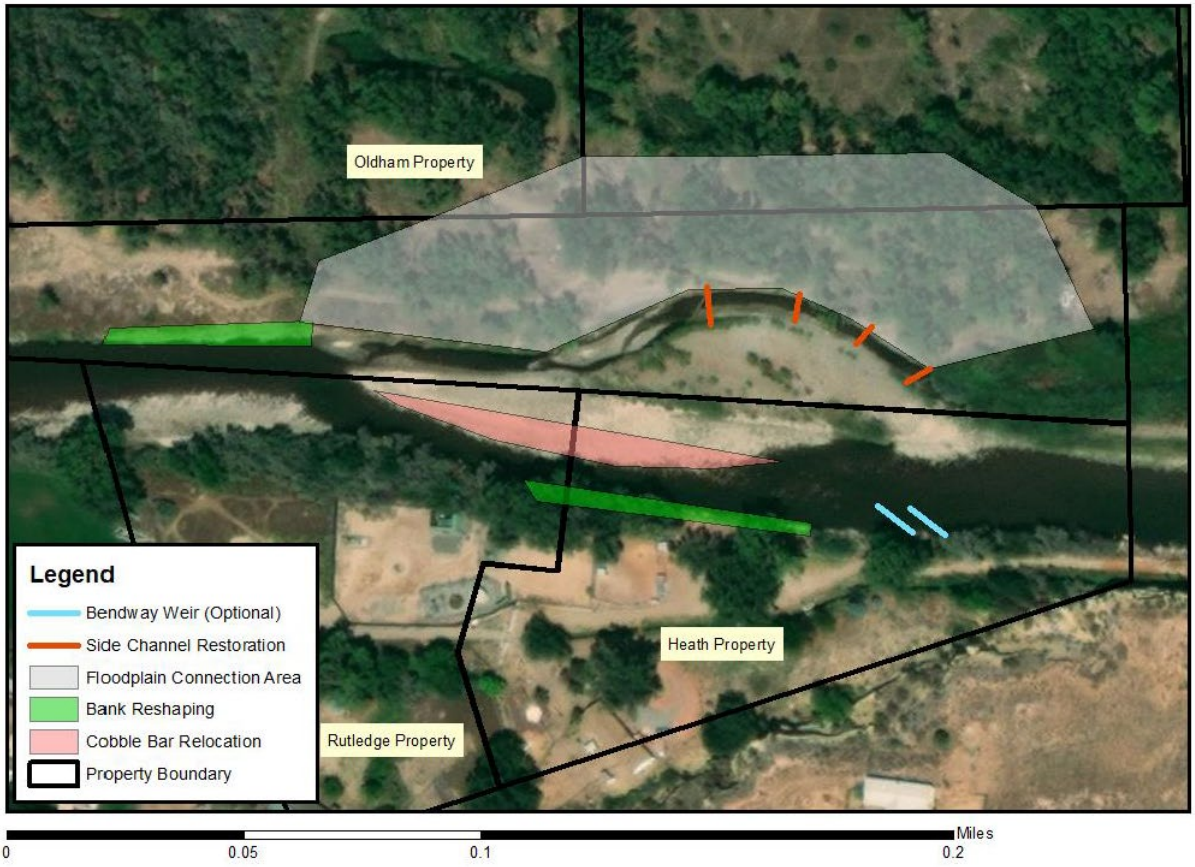
This management measure was originally included in the SJWG's Phase 1 LAWBP Implementation Project grant as a component of the Ranchman's Terrell Diversion Improvement and Flora Vista Riparian Restoration Project. While 4 out of 5 components of that project were completed in LAWBP Phase 1 and 2 (details on all components available on pages 114-116 of the LAWBP), project timing and funding were not sufficient to complete restoration of the river right floodplain approximately 0.25 river miles downriver of the new Ranchman's Terrell Diversion Structure. Before the new Ranchman's Terrell cross vane diversion structure was installed, years of cobble push-up dam diversion maintenance and washouts played a role in the aggradation of a large cobble bar. While natural and to be expected as the river morphology adjusts to the new Ranchman's Terrell diversion, the cobble bar has induced a lateral side channel along the north bank disconnecting the river from the floodplain during most low flow conditions and migrating the majority of the river's center of flow towards the south bank, which is actively eroding an already barren riverbank with minimal vegetation coverage. Not only is this inducing sediment contributions to the river during stormwater events and decreasing habitat quality and floodplain acreage, the erosion rate introduces long term risks to an adjacent natural gas facility and a subterranean utility pipe crossing the riverbed.

The river right landowner has prioritized restoration assistance to improve floodplain access and provide a stable natural riparian area and aquatic habitat. The river left landowner intends to collaborate with the priority of reducing bank erosion and vegetating approximately half an acre of riparian area. In addition to these landowner goals, SJWG and intends to support a healthy floodplain with functional assimilative capacity that will reduce nutrient contributions and create sustainable terrestrial and aquatic habitat. The SJWG proposes to procure a contractor to design, permit, and implement a project that meets the above goals. Project design will be led by fluvial and geomorphological surveys as described in Element B2. The project components may be slightly altered from the project description on pages 114-116 in the

LAWBP, which were proposed five years before the new Ranchman's Terrell diversion structure was installed.

Restoration methods may include bioengineering a series of woody debris or cobble fill check dams tied into the side channel to capture sediment and debris to stabilize the channelization of the side channel, reshaping the river right bank to induce more lateral flow of water throughout the floodplain, redistribution of cobble deposits from river center to banks, removing a cobble plug at the beginning of the side channel, and revegetation with a mixture of riparian and upland native plants. Larger instream structures like cross vanes or bendway weirs will be evaluated to address the river left bank erosion as potential restoration methods but may be cost prohibitive in combination with other project components. Based on the proposed bank and floodplain restoration for this project, preliminary load reductions using STEPL have been estimated at 37.6 tons/year of sediment, 51.5 lbs/year of nitrogen, and 19.7 lbs/year of phosphorus. A calculation of sediment and nutrient reductions from this project will be refined based on measurements gathered during the post construction surveys (see data collection methods in Element B2).

Figure 4 – Conceptual Plan for Management Measure 2



Management Project 3 – Animas Park Wetland Restoration and Riparian Education Garden

In a collaborative effort with the City of Farmington and Friends of the Nature Center (FONC) the SJWG is proposing to assist these partners with a restoration and education project in the highly visible Animas Park in Farmington. Animas and Berg Parks are nested within the heart of Farmington in the

lower reaches of the Animas River corridor and include over eight miles of river trails that are used by thousands of community members every year. This beloved park, encompassing an ecologically critical connected floodplain spanning over one and half river miles within a Conservation Opportunity Area as designated by the New Mexico Department of Game and Fish, has been prioritized in the LAWBP (more information available on pages 117-118) for its high potential for increased river recreation opportunities, wildlife habitat, temperature reduction, outreach and education projects, and riparian restoration potential to reduce wildfire risk (as discussed in the 2021 San Juan Basin Community Wildlife Protection Program).

This project aims to focus on the northeast corner of the park between Riverside Nature Center and Browning Parkway, encompassing approximately 2 acres of wetlands fed by urban stormwater overflows and four adjacent acres bordered by an irrigation return canal from the Echo Irrigation Ditch. Woody invasive species (Russian Olive) were recently removed throughout the project area, which has since been colonized by herbaceous weeds (Kochia and Russian Knapweed). The FONC and City of Farmington have had the goal to establish permanent native vegetation in this area and take advantage of its highly visible location at the park's entrance to create an intentional educational garden. To meet these goals while supporting the educational potential on BMPs to improve soil health, assimilative capacity, and habitat function, the project has the following components: assess and vegetate a 2 acre wetland area as needed to act as a filter strip for stormwater flow before joining a ditch drainage outlet that flows into the Animas River; Implement a grass/pollinator mix filter strip parallel to the Echo ditch drainage as a demonstration to educate the public on the types and benefits of filter strips; support the establishment of a native habitat and pollinator garden showcasing native plant communities in an educational way; Host a series of educational volunteer days to establish the plantings and discuss healthy riparian habitat, invasive/native species, and water quality BMP principles that can be taken back home to implement throughout the watershed. This wetland and educational riparian garden aims to expand on successful environmental education efforts at Riverside Nature Center and riparian restoration projects already completed within this reach.

Farmington City Parks Department staff have offered in-kind services to design the layout of the revegetation so that it can function as both a natural aesthetic riparian area wetland and be clear to the public that it is an intentionally planted area intended as a "Children's Nature Garden." The FONC Board will assist with volunteer recruitment and hosting educational tours, with two board members volunteering to assist in the photo point and vegetation transect (monitoring methods described in Element B2). Revegetation will be conducted through a series of educational volunteer planting days that will interactively teach riparian restoration techniques, the significance of strategically planted native vegetation in improving water quality, and the importance of ongoing invasive species management to maintain the health of riparian areas. This demonstration project will be used by the SJWG, project partners, and other stakeholder groups for educational opportunities detailing healthy wetland ecosystems and urban stormwater management, functional riparian ecosystems, and encourage healthy soils practices and restoration techniques for the local community to implement on their properties throughout the Animas Watershed. Indirect benefits of the project include strengthening relationships between SJWG and the City of Farmington Parks, Recreation, and Cultural Affairs Department, FONC, and all key stakeholders, educators, and environmental stewards in the watershed. An assessment of the wetland area will be conducted following the 2016 New Mexico Rapid Assessment Field Guide for Lowland Riverine wetlands (as described in Element B2). Vegetation monitoring before and after plantings will be conducted throughout the demonstration garden to gauge

current conditions and planting success (as described in Element B2). Based on the proposed filter strip, wetland restoration, and vegetation and soil health improvement aspects of this project, preliminary load reductions using STEPL have been estimated at 0.3 lbs/year of nitrogen, 0.05 lbs/year of phosphorus, and 36.4 lbs/year of suspended solids. A calculation of load reductions from this project will be refined based on measurements pending the full implementation of this project. After a full growing season, photo point and vegetation transect monitoring will be repeated to determine revegetation success.

Figure 4 – Conceptual Map for Management Measure 3

A7. Quality Objectives and Criteria for Measurement Data (EPA QA/G-5 A7)

The purpose of this section is to specify the level of quality needed to make decisions regarding the success of the project. Many of the tasks associated with this project can only be evaluated anecdotally and the quality of the information used for this assessment will be ensured as indicated in the following data quality categories:

Precision - Duplicate or replicate sampling will not be performed as part of this project. However, precision will be ensured by consistently assigning the same people the responsibilities of collecting, recording, and analyzing data.

Accuracy – There is no known reference value available as such information and data collected for these management measures have not been conducted previously. Accuracy is based on the

use of best-available methods; however no studies have been done showing that vegetation surveys or soil monitoring accuracy can be assured.

Bias - Bias will be minimized by using professional and experienced subcontractors and partners to collect and analyze data. The restoration subcontractor will be procured with one of the bid evaluation criteria being experienced in survey methods and hydrological project design. Callie Vanderbilt and Don Hyder have extensive experience in vegetation monitoring, research, and environmental assessments making them ideal partners to conduct data collection for Management Measure 3.

Representativeness - Each sampling event, for each method listed, will be considered a complete event and no subsets will be used. Since temporal change is being documented with the proposed methods, a sample is only representative of the site where data was collected.

Comparability - Vegetation, hydrological and soils monitoring will employ established methods that can be compared to other data collected with same methods.

Completeness - Surveys will only be considered complete if all required data outlined in this QAPP have been collected. Partial surveys will not be accepted. Full and complete surveys are essential to be able to effectively assess changes before and after construction.

Sensitivity – Pre construction geomorphic data and post construction observational data will be collected and evaluated using natural channel design principals to demonstrate that the site modifications produce the results identified in the project's goals. Additionally, before and after construction photos and vegetation surveys will provide qualitative and quantitative data to assess the successfulness of restoration efforts.

A8. Special Training Requirements/Certification (EPA QA/G-5 A8)

As described in Element A4. of this QAPP, Callie Vanderbilt and Don Hyder have extensive experience in vegetation monitoring, research, and environmental assessments making them ideal partners to conduct vegetation data collection for Management Measure 3. The Project Coordinator will work with both project partners to implement the formal assessment of the wetland area in Management Measure 3. The Project Coordinator will prepare for this support through the coordination and training with the NMED Wetlands Program who established the New Mexico Wetlands Rapid Assessment Field Guide for Lowland Riverine Systems.

The restoration contractor approved for project implementation will be required to have demonstrated survey skills and a background in fluvial geomorphology and US Army Corps of Engineers (USACE) 404 permitting procedures, which could include university coursework, experience/training in riparian/wetland/stream ecology, familiarity with channel evolution concepts and models, or a successful project design and implementation track record in which determining the natural potential of a site was documented with professionally accepted methodologies.

The Project Coordinator will ensure that all partners conducting data collection efforts for this project will follow the methodologies described in this QAPP.

A9. Documents and Records (EPA QA/G-5 A9)

Copies of this QAPP and any subsequent revisions will be provided to all individuals included on the distribution list by the SWQB Project Officer and Project Coordinator through email coordination. The Project Coordinator will also distribute all applicable protocol documents and subsequent revisions used throughout the project to the appropriate contractors and project partners. Using a file sharing software, such as Dropbox, restoration contractors and monitoring partners will submit all field logs, datasheets, digital data, and photographs to the Project Coordinator digitally. Documents and data will be stored and utilized internally by the San Juan SWCD and SJWG on a backed-up Google Drive file management system and will be included in the final report of this project. Project documents including vegetation monitoring and wetland assessment results, hydrologic monitoring, fluvial geomorphology surveys will be submitted to the SWQB Project Officer by the Project Coordinator.

Table 4 - Reporting Format and Storage

Monitoring Technique	Reporting Format	Storage Location and Time
Wetland Rapid Assessment	Data recorded on project specific data sheets.	Electronic copies on file management system backed up on Google Drive of the San Juan SWCD and on SWQB file management system. Files will be stored indefinitely for future reference.
Vegetation Monitoring	Data recorded on project specific field sheets and excel spreadsheets.	
Hydrological Properties	Data recorded in field book. Reported in monitoring report attached to final report.	
Topographic and Fluvial Geomorphologic measurements	Data recorded in any professionally accepted field note form (laser level data collection) or text file (total station data collection).	
Repeat Photography (all aspects of project)	Paired photo points included in final report.	

DATA GENERATION AND ACQUISITION

B1. Sampling Process Design (Experimental Design) (EPA QA/G-5 B1)

Restoration Design Background and Strategy

A “natural function” approach to design seeks to identify the stable geomorphic dimensions of a channel, adjacent flood plain, and wetlands and then incorporate those characteristics into designs to meet specific objectives. By characterizing existing physical and biological parameters to evaluate existing conditions it is possible to develop specific design prescriptions that works with existing conditions, rather than against them, to adjust the system to meet enhancement needs that fits into surrounding reference conditions.

The overall goal of this plan is to develop a monitoring program that is capable of tracking change within the project site from pre-restoration condition to post-restoration condition and evaluate the effectiveness of the project's principal goal of restoring channel bed stability, vegetation diversity and soil coverage, and wetland function. The monitoring program should also be straightforward and simple enough to track project success without overwhelming data analyses, complicating procedures prone to error, and to conduct beyond the term of this project to track long term conditions. Monitoring protocols described in this plan are designed to be conducted for the duration of the grant (short-term). However, the methodologies lend themselves to long-term monitoring and can be utilized if other additional resources are available.

The monitoring components to be employed are: 1) vegetation monitoring, 2) wetland rapid assessment 3) hydrologic, topographic, and fluvial geomorphologic monitoring, 4) photographic documentation. The rationale, methods, data to be collected, and equipment are described for each component Element B2.

Vegetation monitoring will be conducted on a portion of the restored areas to track progress and determine revegetation success does employ a specific sampling design. Wetland assessments will be conducted to lead restoration design and to track progress long term. Hydrology and geomorphology monitoring and repeat photography will also occur before and after implementation; however; no sampling design is determined due to the fact that the monitoring and photography will occur directly at the implementation sites.

Sample Locations and Timeline

Monitoring activities will vary by management measure, see locations and timeline below.

Table 5 - Monitoring Activities at Restoration Project Locations

Management Measure	Name	Vegetation	Wetland Assessment	Photo Points	Hydrologic, Topographic, and Geomorphologic
1	Tucker Watershed Riverbank Stabilization			X	X
2	Flora vista North Bank Floodplain Restoration			X	X
3	Animas Park Wetland Restoration and Riparian Education Garden	X	X	X	

Vegetation, hydrologic, topographic, and fluvial geomorphology monitoring will be conducted pre- and post- restoration activities. One survey will be conducted prior to restoration and one survey will be conducted one year post-restoration. A wetland assessment will be conducted pre-restoration activities. Surveys will be scheduled during a window from July to September in 2022 to coincide with mature

vegetative conditions (ensuring successful plant identifications) and during low flow river levels (for representative topographic surveys). Post-restoration observational surveys will occur during the August to September window in 2023 (one growing season after restoration). Contractors and monitoring partners will discontinue and/or reschedule monitoring and survey activities should weather or environmental condition pose a risk to project staff or participants. Should adverse conditions persist collection activities will be ceased. Missing data will be mitigated in accordance with Element B5.

Table 6 - Monitoring Activities: Time Period, Target Condition, and Quality Control Components

Monitoring Type	Time period	Target Condition	Quality Control Components
Vegetation	July – September 2022, 2023	Grass seed-heads; mature forbs	Replicable: consistent survey team between monitoring events, fixed survey points recorded with GPS and demarcated with stake; use of tripod at established height to ensure photos are comparable between surveys.
Wetland Assessment	July – September 2022	Mature Vegetation	
Photo Points	July – September 2022, 2023	Mature vegetation	
Hydrologic, Topographic, and Geomorphologic	August – September 2022, 2023	Low flow conditions	

B2. Sampling Methods (EPA QA/G-5 B2)

Vegetation Monitoring

Management Measure 3: Animas Park Wetland Restoration and Riparian Education Garden - Line-Point intercept data will be collected in the demonstration garden project area from three to four transects established with start and end point rebar and transect that is pulled taught from these points. Rebar will remain on the site during revegetation efforts to maintain consistent transect locations and will be georeferenced through GPS. Both start and end points will be photographed with handheld paper or white board labels to ensure consistent surveys. Surveyors will follow the transect from the zero end of the transect and take measurements at a one feet interval for 100 ft at each transect. A pin flag dropped at each one foot interval will be used to document all plants, litter, rocks, and soil touching at that point to the functional group level starting with the top most level. This monitoring will be conducted both pre and post project implementation. The *Monitoring Manual for Grassland, Shrubland and Savanna Ecosystems*, developed by the Jornada Experimental Range in cooperation with the US EPA, NRCS, and BLM, establishes the protocols and datasheets for this vegetation data gathering (Herrick et al. 2009). This data will be critical to formally determine species richness, abundance, and cover pre and post implementation to determine restoration success.

Equipment: Transect (measuring) tape, two steel pins, one pin flag, GPS, camera and photo point ID card, clipboard, datasheet, pencil(s)

Wetland Assessment

Management Measure 3: Animas Park Wetland Restoration and Riparian Education Garden – The adjacent wetland that will be incorporated into the education garden design will need to be delineated and assessed for biotic, abiotic, and landscape context metrics to design revegetation and management efforts that could maintain or improve functional and educational capacity.

The pre-construction wetland assessment will be conducted in accordance with the 2016 *New Mexico Rapid Assessment Field Guide for Lowland Riverine Wetlands*. A wetland of interest delineation and sampling area within the wetland of interest will be determined through aerial imagery analysis and confirmed for accuracy via field reconnaissance by the Project Coordinator and project partners Callie Vanderbilt and Don Hyder before the field assessment occurs. For the landscape context metrics portion of the assessment land ownership, drainage patterns feeding the wetland, roads, trails, and relative distance from park infrastructure will be documented during the wetland of interest delineation phase through geospatial analysis and confirmed during the assessment survey. Vegetation vertical structure, native plant community composition, native riparian tree regeneration, and invasive exotic species cover will be documented by polygons determined at the beginning of the survey during the walkthrough of the sampling area. These field determined polygons will be georeferenced for future surveys as deemed necessary beyond the term of this project. Each polygon will be numbered in correlation to the biotic metrics worksheet and all vegetation within each polygon will be identified, measured for height, photographed, and documented in the worksheet. Abiotic metrics, floodplain hydrologic connectivity, physical patch diversity, soil surface condition, and channel mobility will be surveyed via a checklist format through the field determined upper, middle, and lower segments of the sampling area. Each segment will be surveyed in a lateral traverse from the sampling area boundary to the active channel edge. Abiotic metrics will be sketched on the printed sampling area map as necessary and documented in the abiotic metrics worksheet. All of these metrics will be compiled into the narrative of wetland function that will be provided to project partners and the NMED SWQB Project Officer to determine restoration needs and actions for this project.

Equipment: Field maps, datasheets, pencil(s), GPS, camera and photo point ID cards, compass, pin flags.

Hydrologic, Topographic, and Geomorphic Monitoring

Management Measure 1: Tucker Watershed Riverbank Stabilization Project - Due to a natural tight meander of the river channel and the presence of domestic infrastructure abutting and being imperiled by this migration, vertical channelization along the river right bank has induced heavy bank erosion and a disconnection of the river's floodplain. To remove previous stabilization debris and install a series of geomorphologically appropriate J-hook and bendway weir structures that will properly support the aggradation of sediment to stabilize the bank in a hydrologically appropriate methodology, hydrologic and topographic conditions need to be documented and heavily incorporated into the final project design by the Restoration Contractor.

Management Measure 2: Flora Vista North Bank Floodplain Restoration – While natural and to be expected as the river morphology adjusts to the new Ranchman's Terrell diversion, cobble migration has further pushed the thalweg of the river towards the river left bank introducing bank erosion stressors and

plugged the lateral side channel along the north bank disconnecting the side channel from river flows. Flow fluctuations that have impeded that side channel plug has contributed to channel instability by vertically eroding the river right bank of the lateral side channel, disconnecting it from the floodplain, and encouraging further vertical channelization of said side channel. To design a project potentially incorporating river right bank re-sloping along the side channel, clearing the cobble plug at the beginning of the side channel, installing woody debris/cobble fill check dams along the river, and mobilizing excess river cobble from the cobble bar to the eroded right left bank, proper hydrologic and topographic surveys by the Restoration Contractor are needed to characterize this section of the river.

Pre-construction hydrologic data collection for both Management Measure 1 and 2 will be guided by the 2015 *Bureau of Reclamation (BOR) Bank Stabilization Field Guide.* Mean annual, low, and high flows for the project area will be determined through hydrograph data documented from United States Geological Survey (USGS) Gauge 09364010, Animas River Below Aztec, NM. This is the closest flow gauge to the project area, approximately four river miles upriver. Pre-construction topographic and geomorphological surveying will employ standard field hydrology and geomorphic vertical and horizontal methods as described in Rosgen Level II surveying and recording techniques (Rosgen, 1996). A laser level and rod will be used to determine elevations (accuracy to within 0.01', recorded to the nearest 0.1', except hub elevations) from project-set benchmarks (one on each end of the project). A line between the two benchmarks will form a baseline from which two to four perpendicular cross section transects will be established to characterize a longitudinal profile (channel bed, bankfull and top-of-bank). Transect start and end hubs will be driven into each top of bank as allowable by road, driveway, housing constraints adjacent to the site. A survey tape will be used to identify the location of individual topographic survey points along each transect. Each transect will contain up to 10 different elevation points to adequately capture the existing ground elevation including important geomorphic features such as field elevation, top of bank, bankfull, edge of water, etc. Transect location will be staked prior to surveying and its baseline stationing recorded, as measured from the downstream to the upstream benchmark. Construction plans, and post-construction topographic monitoring will utilize this same grid-transect system. Scaled topographic plots will be plotted in Army Corps of Engineers' HEC-RAS hydraulic model software. Geomorphic parameters such as channel bed and bankfull slope, bankfull cross sectional area and bankfull width will be calculated. Benchmark, transect locations and various site features will be plotted on a current Google Earth image. Field notes format will be determined by the Restoration Subcontractors professional surveying standards and a copy of said survey field notes will be provided to NMED SWQB during the project design approval process.

Post-construction monitoring will consist of hydrologic, topographic, and geomorphic observations noting the occurrence of any high flows since last site monitoring, signs of channel and bank scour or deposition, signs of structure (in)stability, and any new bank erosion within the project reach. Field notes format will be determined by the Restoration Subcontractor's professional surveying standards and a copy of said survey field notes and a report summarizing findings in comparison to pre-construction surveys will be provided to NMED SWQB.

Equipment: field log, transect rebar, transect tape, laser leveler, compass, GPS unit.

Repeat Photography

Evaluating change over time by using repeat photography is critical to provide insight into the relative

success of restoration efforts. Photo monitoring goals will include demonstrating an increase in native vegetation and channel condition functionality.

Photo point monitoring will follow methodologies outlined by the EPA (2016). Photo points will be set up at several locations within each project area to capture changes over time. Photo point markers will be carefully located and monumented with rebar pins or wooden survey hubs. All photos will be standardized for height, lens angle, and direction, which will be recorded in the metadata of each photo point. Photo heights will be standardized using the same tripod type and height for all photos. Locations will be recorded with a GPS unit. These photos will provide a broad view of the site. The azimuth and date of each photo from each photo point will be documented. Repeat photographs will be captured from the same locations using the same azimuth.

Pre-construction, as-built, and annual repeat photographs will document changes to general site characteristics. Post-construction photos will be taken at the same time as the one year post-construction vegetation, wetland, and hydrologic/topographic/geomorphic observation surveys in 2023. Both pre- and post- construction photographs will be compared side by side in a single Microsoft word document and provided to NMED SWQB.

Equipment: Digital camera, photo point ID card, compass, GPS unit, rebar pins/wooden survey hubs.

B3. Sample Handling and Custody (EPA QA/G-5 B3)

No physical samples will be obtained as part of the implementation of this project and therefore, no handling requirements are needed. All data collected will be maintained in paper and electronic copies as collected from the Restoration Subcontractor and project partners which will be provided to the Project Coordinator for review and approval. The Project Coordinator will provide survey results to the SWQB Project Officer and will be filed in the appropriate project folder in the San Juan SWCD's Google Drive backed up server.

B4. Analytical Methods (EPA QA/R-5 B4)

Sample analysis will not be conducted as part of the implementation of this project and therefore no analytical methods are needed.

B5. Quality Control Requirements (EPA QA/G-5 B5)

Quality control (QC) activities are technical activities performed on a routine basis to quantify the variability that is inherent to any environmental data measurement activity. The purpose for conducting QC activities is to understand and incorporate the effects the variability may have in the decision-making process. A high level of quality, precision, and replicability will be ensured by implementing the following practices: a) consistent staff, project partners, and contractors between monitoring events to reduce potential variability; b) verification of completeness of field forms before leaving field site; c) documentation of site conditions during each survey event to assist with the evaluation of any anomalies that occur in the data; d) demarcation of photo and survey points with fixed hard points, such as a stake, recorded GPS locations to ensure replicability, and photo point ID cards for photos of all survey points; and e) use of a tripod at an established height and azimuth to ensure each photos are comparable between surveys.

Field QC of data irregularities and verification of completeness will be performed by the Restoration Subcontractor and project partners at the time of data collection. All field data will be submitted to the Project Coordinator as soon after collection as possible. All sampling events will have two or more contractors, contractors, and/or project partners on site to ensure proper methods are followed. Analyzing replicate data and checking measurement precision will be the responsibility of the SWQB Project Officer and Project Coordinator. If it is discovered that monitoring methodologies must deviate from the approved QAPP, a revised QAPP must be approved before work can be continued.

B6. Instrument/Equipment Testing, Inspection, and Maintenance (EPA QA/G-5 B6)

The scientific instruments used to collect field measurements and documentation include a survey device (e.g. laser level, auto level, or total station depending on the contractor), global positioning system unit (GPS), rebar/stakes, field maps, transect (measuring) tapes, compass, camera, and field forms. More detailed equipment lists for each monitoring activity in Element B2. All field equipment will be inspected prior to each sampling trip. All instruments and equipment will be tested, inspected, and maintained in accordance with the manufacturer's specifications as included in the associated instrument/equipment manual.

B7 & B8. Equipment Testing Criteria, Frequency, and Responsibility (EPA QA/G-5 B7 & B8)

Before each collection effort, vegetation, hydrologic, topographic, and geomorphic, contractor, partners, and project staff will test electronic equipment in accordance with manufactures guidelines. Maintenance logs will be maintained for all contractor instruments and equipment. Consultants will use their own equipment. Results of equipment inspections will be noted in the maintenance log and/or survey report. When feasible, contractors and partners will have spare equipment while on site in case of failure or defect. Any deficiencies in equipment will be noted and reported immediately. If condition of equipment is in doubt, it will not be used.

All electronic equipment will be charged immediately after use. All electronic equipment, including backup equipment, will be checked one day prior to use to ensure full charge and spare/backup batteries are available.

B9. Non-Direct Measurements (EPA QA/G-5 B9)

Non-direct measurements used to support this project include the using the Army Corps of Engineers' HEC-RAS hydraulic model software and USGS flow gauge data to utilize during the hydrologic survey and design process for Management Measure 1 and 2. Both will be critical to characterize hydraulic function, steady and unsteady flow calculations, sediment transport/mobile bed computations, and water quality monitoring to ensure that project designs meet best management practices that will best achieve restoration goals. The Restoration Subcontractor will be responsible to use these models and software during the pre construction design process.

Data and reports from previous project conducted in the Lower Animas by the SJWG and/or San Juan SWCD may be utilized by the current project, these projects were conducted under various Sections of the Clean Water Act and required a QAPP before implementation.

B10. Data Management (EPA QA/R-5 B10)

Data obtained for this project are maintained in paper and electronic files. Within seventy-two hours of collection, field data will be entered into spreadsheet form (e.g., Excel) by the Restoration Subcontractor, project partners, and/or Project Coordinator associated with each collection/monitoring type. Data will then be delivered to the Project Coordinator, who will review the data and then submit to the Project Manager and SWQB Project Officer. The Project Coordinator will use the data for including in STEPL modeling, which will be provided to the Project Manager for review. These data are maintained in the appropriate digital project file that is backed up on San Juan SWCD server. Upon receiving data, the SWQB Project Officer will store data on SWQB network drive in project specific folder. The SWQB network drive is backed up daily and maintained by the NMED Office of Information Technology. Electronic data files will be stored on the SWQB network drive in accordance with applicable sections of New Mexico's Disposition of Public Records and Non-Records regulation, codified at 1.13.30 Administrative Code (NMAC) and Retention and Disposition of Public Records regulations, codified at 1.21.2 NMAC.

ASSESSMENT AND OVERSIGHT

C1. Assessments/Oversight and Response Actions (EPA QA/G-5 C1)

The SWQB Project Officer provides project oversight by periodically assisting with and/or reviewing data collection efforts. A review of all management measures will occur on a quarterly basis. The Project Coordinator will submit a quarterly report for this project to the SWQB Project Officer that describes the progress of each task and justifies task tardiness if applicable. Any problems encountered during this project will be immediately reported to the SWQB Project Officer who will consult with the appropriate individual to determine appropriate action. All problems will be documented for inclusion in the project file and final report.

Data and data summary reports will be submitted by the subcontractors and project partners to the Project Coordinator for review. Project Coordinator will work with these entities to interpret monitoring results and make final conclusions as to the efficacy of the project pre construction survey, design, on the ground work, and post construction surveys and compile these conclusions into quarterly and final reports to the SWQB Project Officer. Efficacy will be evaluated by assessing re-vegetation success, derived from vegetation surveys, the stability of banks following restoration, derived from repeat photos, and geomorphological changes, derived from hydrologic, topographic, and geomorphologic observations. The final data summary will include the assessments made by the restoration subcontractor and project partners as to the survey results and the efficacy of the work.

SWQB and EPA grant managers will have the ultimate authority to terminate operations. Within the project staff, the Quality Assurance Officer, SWQB Project Officer, the Project Coordinator, the restoration subcontractor, and project partners will be in regular communication, and contractors will have the authority, internally, to stop collection or restoration activities should issues arise that inhibit the completion of procedures listed in this document, or impede the safety of subcontractors and project staff.

Any corrective actions taken by the Restoration Subcontractor and project partners will be recorded and immediately reported to the Project Coordinator. Should the corrective action impact the project or data quality, the Project Coordinator will alert the SWQB Project Officer and Quality Assurance Officer.

C2. Reports to Management (EPA QA/G-5 C2)

The Project Coordinator will produce a quarterly report detailing the activities outlined in this document. The Project Coordinator will also make recommendations for possible modifications to this QAPP, if deemed necessary for the successful completion of this project, when providing status reports.

The project partners and Restoration Subcontractor will be responsible for submitting status and monitoring reports to the Project Coordinator. The Project Coordinator will submit quarterly status reports to the SWQB Project Officer. Printouts, status reports, or special reports for SWQB or U.S. EPA will be prepared on request

If deviations from the submitted monitoring plan and this QAPP are deemed necessary as a result of on-the-ground challenges, any such deviations shall be reported to the Project Coordinator, SWQB Project Office, and the Quality Assurance Officer for review prior to implementation.

DATA REVIEW AND USABILITY

D1. Data Review, Verification, and Validation Requirements (EPA QA/G-5 D1)

Data review and verification are key steps for ensuring the integrity, suitability and usability of the data. The Project Coordinator and SWQB Project Officer will verify data following each data collection event to ensure the correct channel pattern, profile, and dimension are obtained prior to implementing restoration efforts. An elevation point will not be accepted if it appears to be out of the ordinary from the data set.

Two monitoring participants will be present during vegetation monitoring to verify vegetation species determinations. If data are questionable, the consultant will perform this monitoring once again at those locations to confirm or deny original data collected. If a species cannot be identified, a specimen in flower should be collected, pressed, and taken to an expert or herbarium for determination.

No laboratory generated analytical data will be obtained and therefore no validation procedures are required.

D2. Verification and Validation Methods (EPA QA/G-5 D2)

The Project Coordinator will ensure that valid and representative data are acquired. Data will then be provided to the SWQB Project Officer for their review, upon request. In the event questionable data are found, the SWQB Project Officer will consult with project personnel to determine the validity of the data. Results of the verification process will be included in the final reports.

D3. Reconciliation with User Requirements (EPA QA/G-5 D3)

The information gathered under this QAPP will be sufficient to assess the success of BMP projects in reducing sediment loads and improving vegetative cover. Once all data have been verified they will be reported and analyzed and incorporated in the final project report. The final report will evaluate whether data and QC requirements were met throughout the project.

Although beyond the scope of this project, this combination of qualitative and quantitative data and trend information may be used to inform future project design and may determine if additional monitoring or project work is needed at the sites monitored herein.

REFERENCES

Baird, D., Fotherby, L., Klumpp, Cassie., Sculock, S. 2015. Bureau of Reclamation Report No.: SRH-2015-25: Bank Stabilization Design Guidelines. Bureau of Reclamation Albuquerque Area Office.

Environmental Protection Agency (EPA). 2002. Methods for evaluating wetland condition: Using vegetation to assess environmental conditions in wetlands. Office of Water, US EPA, Washington D.C.. EPA-822-R-02-020.

EPA. 2016. Monitoring and Evaluating Nonpoint Source Watershed Projects: Chapter 5, Photo-Point Monitoring. Office of Water, US EPA, Washington D.C. EPA-841-R-16-010.

Herrick, J., J. Van Zee, K. Havstad, L. Burkett, and W. Whitford. 2009. Monitoring Manual for Grassland, Shrubland, and Savanna Ecosystems. United States Department of Agriculture. Las Cruces, New Mexico.

Muldavin, E.H., E.R. Milford, and M.M. McGraw. 2016. New Mexico Rapid Assessment Method: Lowland Riverine Wetlands Field Guide. Version 1.1. New Mexico Environment Department, Surface Water Quality Bureau, Santa Fe, New Mexico.

Rosgen, D. 1996. Applied River Morphology. Wildland Hydrology, Pagosa Springs, CO.

San Juan Watershed Group. 2016. Lower Animas Watershed Based Plan. San Juan Watershed Group. Aztec, New Mexico.

U.S. Geological Survey (USGS). 1982. Flood Flow Frequency. Bulletin #17B of the Hydrology Subcommittee.

U.S. Army Corps of Engineers. 1987. Corps of Engineers Wetlands Delineation Manual, U.S. Army Engineer Waterways Experiment Station, Environmental Laboratory, Vicksburg, MS.

U.S. Environmental Protection Agency, 2002. Guidance on Choosing a Sampling Design for Environmental Data Collection for Use in Developing a Quality Assurance Project Plan. EPA QA/G-5S. Accessed at: https://www.epa.gov/sites/production/files/2015-06/documents/g5s-final.pdf. Accessed on: December 15, 2007.

Acknowledgement Statement

New Mexico Environment Department Surface Water Quality Bureau

---

Lower Animas Watershed Based Plan Implementation Projects Phase 3
Quality Assurance Project Plan Acknowledgement Statement

This is to acknowledge that I have received a copy (in hard copy or electronic format) of the LAWB Implementation Projects Phase 3 Quality Assurance Project Plan.

As indicated by my signature below, I understand and acknowledge that it is my responsibility to read, understand, become familiar with and comply with the information provided in the document to the best of my ability.

_____
Signature or Electronic Signature (e-certified accepted)

_____
Name (Please Print)

_____
Date
Return to SWQB QAO Miguel Montoya