GROUP A. PROJECT MANAGEMENT

A.1 Title and Approval Sheet

Quality Assurance Project Plan

Watershed Project Implementation and Post-Fire Remediation for Sapello River Watershed

Submitted by:
Renee Hernandez of Hermit's Peak Watershed Alliance

A New Mexico Environment Department Surface Water Quality Bureau Clean Water Act 319(h) Project-
NMED SUB-GRANT: 667-24319SQ-1B

APPROVAL SIGNATURES

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A.2 Table of Contents

Contents

GROUP A. PROJECT MANAGEMENT 1
A.1 Title and Approval Sheet 1
A.2 Table of Contents 3
List of Tables and Figures 4
Acronyms 5
A3. Distribution List 6
A.4 Project Organization 7
A.5 Problem Definition /Background 8
A.6 Project/Task Description 9
A7. Quality Objectives and Criteria for Measurements 16
A.8 Special Training/Certification 17
A.9 Documents and Records 17
GROUP B: DATA GENERATION AND ACQUISITION 19
B1. Sampling Plan 19
B2. Sampling Methods 21
B3. Sample Handling Custody 21
B4. Analytical Methods 22
B5. Quality Control 22
B6. Instrument/Equipment Testing, Inspection and Maintenance 22
1. YSI 6920 V2 Sonde, SWQB SOP 6.1, *Sonde Calibration and Maintenance* (NMED/SWQB. 2018a) 22
2. USGS Pygmy Current Meter, SWQB SOP 7.0, *Stream Flow Measurements* Attachment 2 (NMED/SWQB. 2015b). 22
3. Pro shot laser level will be calibrated by the manufacturer annually 22
B7. Instrument/Equipment Calibration and Frequency 22
B8. Inspection/Acceptance for Supplies and Consumables 22
B9. Non-Direct Measurements 23
B10. Data Management 23
GROUP C: ASSESSMENT AND OVERSIGHT 23
C1. Assessment and Response Actions 23
C2. Reports to Management 23
GROUP D: DATA VALIDATION AND USABILITY 24
D1. Data Review, Verification and Validation 24
D2. Validation and Verification Methods 24
D3. Reconciliation with User Requirements 25
References: 26
Acknowledgement Statement 27

List of Tables and Figures

Table 1 Distribution list, Project Roles, and Responsibilities 6
Table 2. Project Task, products, responsible party, timeline (use as applicable) 11
Table 3. Waterbody Attributes for the Project 14
Table 4. Data Records for the Project 18
Table 5. Project Monitoring Specifics 20

Figure 1. Organization Chart 7
Figure 2. Project Area Map 13
Figure 3. Project Area with Monitoring Location 14

Acronyms

AU……	Assessment Unit
DQO…….	Bank Erodibility Hazard Index
DQI……..	Data Quality Indicators
EPA……..	U.S. Environmental Protection Agency
HPWA……..	Hermit's Peak Watershed Alliance
HUC…….	Hydraulic Unit Code
NMED……..	New Mexico Environment Department
NMRAM……..	New Mexico Rapid Assessment Method
QAPP……...	Quality Assurance Project Plan
QA……	Quality Assurance
QAO…….	Quality Assurance Officer
SWQB……..	Surface Water Quality Bureau
TBD…….	To Be Determined
TMDL……..	Total Maximum Daily Load
TSS……..	Total Suspended Solids
WBP…….	Watershed Based Plan
WQPD……..	Water Quality Protection Divisio

A3. Distribution List

Table 1. below contains the distribution list, project roles and responsibilities for this project. The QA Officer will ensure that copies of this QAPP and any subsequent revisions are distributed to project staff who have signature authority to approve this QAPP. The SWQB Project Officer will ensure that copies of the approved QAPP and any subsequent revisions are distributed to the Project Manager. The Project Manager will distribute to all other project personnel listed in Table 1. All members of the distribution list who do not have signature authority to approve this QAPP will review the QAPP and sign the Acknowledgment Statement prior to initiating any work for this project. The signed Acknowledgement Statements will be collected by the SWQB Project Officer and will be given to the QA Officer for filing with the original approved QAPP.

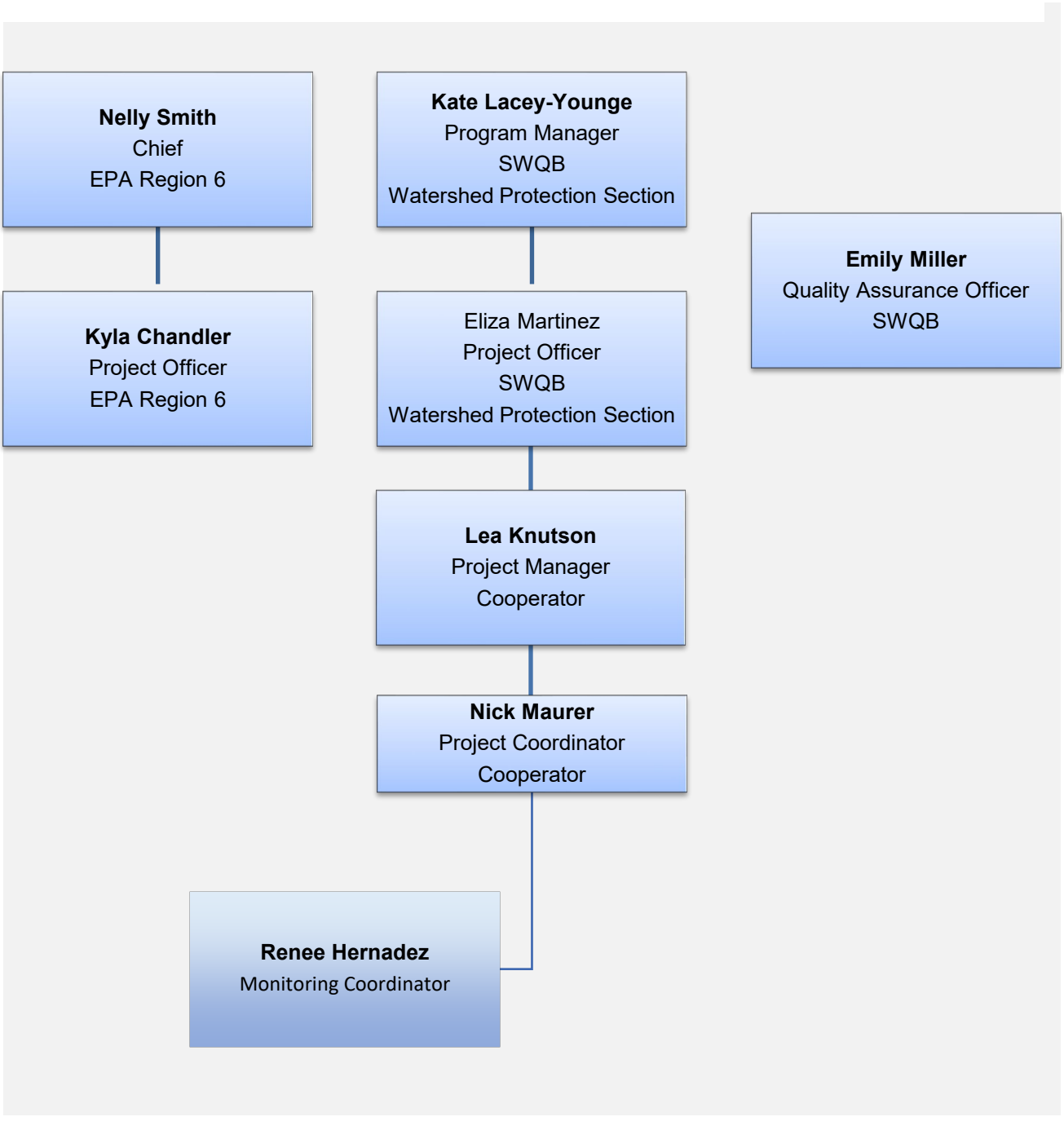
Table 1 Distribution list, Project Roles, and Responsibilities

Name	Organization	Title/Role	Responsibility	Contact Information
Kate Lacey-Younge	SWQB	Program Manager	Reviewing and approving QAPP, managing project personnel and resources	(505) 946-8863 Kathryn.Lacey@env.nm.gov
Emily Miller	SWQB	QA Officer	Reviewing and approving QAPP	(505) 660-3534 Emily.miller@env.nm.gov
Eliza Martinez	SWQB	Project Officer	Preparing and revising QAPP, distribution of QAPP, project reporting, coordinating with contractors, oversight of data collection, and EPA reporting	(505) 819-8099 Eliza.Martinez@env.nm.gov
Lea Knutson	HPWA	Project Manager	Project oversight, oversight of data management, and submittal of quarterly reports	(505) 617-1360 lknutson@hermitspeakwatersheds.org
Nick Maurer	HPWA	Project Coordinator and Project Leader	Project design and implementation, construction oversight	(419) 654-0800 nmaurer@hermitspeakwatersheds.org
Renee Hernandez	HPWA	Monitoring coordinator, education coordinator and project assistant	Field training and supervision, monitoring, data collection, record keeping, and submitting reports	(505) 310-2612 rhernandez@hermitspeakwatersheds.org
Kyla Chandler	EPA	Environmental Protection Specialist WQPD, Region 6	Reviewing and approving QAPP	214-665-2166 chandler.kyla@epa.gov
Nelly Smith	EPA	Chief, State and Tribal Programs Section WQPD, Region 6	Reviewing and approving QAPP	214-665-7109 smith.nelly@epa.gov

A.4 Project Organization

The SWQB Quality Management Plan (NMED/SWQB 2024) documents the independence of the Quality Assurance Officer (QAO) from this project. The QAO is responsible for maintaining the official approved QAPP. Figure 1 presents the organizational structure for the "Watershed Project Implementation and Post-Fire Remediation for Sapello River Watershed – Phase I" referred to in this document as the "Sapello Watershed Implementation Phase I".

Figure 1. Organization Chart



A.5 Problem Definition /Background

The purpose of this Quality Assurance Project Plan (QAPP) is to focus on the remediation of the sediment impairment in the Sapello River. While sediment data are adequate to substantiate this impairment, data on the probable sources such as the Hermit's Peak Calf Canyon fire are lacking. This QAPP addresses data collection that will help fill data gaps. This QAPP refers to the project as the "Sapello Watershed Implementation Phase I". The Sapello Watershed Implementation Phase I is being managed by the Hermits Peak Watershed Alliance.

Background

A TMDL for sedimentation/siltation approved by the EPA in 2007 states that the Sapello River (Mora River to Manuelitas Creek) exceeded sedimentation/siltation targets in multiple field tests conducted in 2002 by NMED SWQB. The TMDL recommends a total load reduction of 80.8 lbs/day of TSS. The pollutant source summary for the Sapello River (Mora River to Manuelitas Creek) identifies 56% magnitude nonpoint source pollution on the Sapello River. The TMDL at that time indicated that there was no point source pollution on the river. However, the Sapello River is currently experiencing post-fire conditions from the Hermit's Peak - Calf Canyon Fire of 2022. Due to these conditions, there has been an increase in sediment deposition.

According to the EPA Grants Reporting and Tracking System (GRTS) past 319(h) funded projects in the Mora Watershed include two implementation projects conducted by Tierra Y Montes SWCD entitled 'Sapello Watershed Restoration Project' completed in 2005 (Project 02-J) and 'Sapello Watershed Restoration Project Phase II' completed in 2010 (Project 07-F). Additionally, HPWA completed two 319 projects the 'On-the-Ground Improvement Projects for the Mora River - Upper Canadian Plateau Phase 1A '(Project 13-D) in 2016 and the Watershed Project Implementation for the Mora River-Upper Canadian Plateau Phase 1B in 2023 (Project 17-Z) This current implementation project focuses on the Manuelitas sub-watershed to reduce sediment loading to the Sapello River. HPWA will utilize and build upon the information from past projects in any efforts we undertake in the Sapello sub-watershed.

While the focus of this monitoring project is on the sediment impairment of the Sapello River, the larger Sapello River Watershed-Based Plan project includes the Rito San Jose and Manuelitas Creek as streams of interest. The Rito San Jose was listed as impaired by low flow in the *2016-2018 State of New Mexico CWA §303(d)/§305(b) Integrated Report* Appendix A. Although it is no longer listed in the 2018-2020 version of this list or the most up to date version of the list (2024-2026), HPWA will conduct general field investigation of the Rito San Jose watershed to better understand flow conditions in that tributary. Manuelitas Creek and its sub watershed will be evaluated as a potential source area for sediment to the Sapello River.

Objective

The purpose of the Project is to collect data which identifies sources of impairment for sedimentation/siltation. This data will drive goals and strategies to improve water quality during implementation phases within the Sapello Watershed (USGS HUCs 110800040201,110800040202, 110800040203, 110800040204, 110800040205, 110800040206, 110800040207 and 110800040208).

When changes affect the scope, implementation, or assessment of the outcome, this QAPP will be revised to keep project information current. The SWQB Project Officer, with the assistance of the QAO, will determine the impact of any changes on the technical and quality objectives of the project. This Project Plan will be reviewed annually by the SWQB Project Officer and HPWA Project Manager to determine the need for revision.

A.6 Project/Task Description

Description

The Project will remediate fire and post-fire flooding watershed impacts, while reducing stream sedimentation, as well as improving long-term watershed conditions with low-tech, process-based techniques. Much of the fire remediation work done by other entities does not consider the long-term watershed health and may even create problems that will require later restoration. With planning, conducting site assessments, identifying then treating severely affected properties, and doing road work, the elements for future phases of this project will come together. See Table 2 for products and timelines associated with the project.

The Sapello River Watershed Based Plan (SRWBP) was accepted by the EPA on June 21, 2022. However, this plan was developed prior to the Hermit's Peak-Calf Canyon Fire which significantly affected 61.6% of five HUCS in the upper watershed (USACE, 2022 Post-Fire Rapid Hydrologic Assessment) or 70,848 acres. The majority of the Sapello River headwaters burned and most waterways were affected by post-fire flooding. Water quality was significantly affected throughout the monsoon season of 2022. Turbidity data collected by the Ecohydrology and Hydrosystems Lab at UNM (Ricardo González-Pinzón and David Van Horn, NSF grant 2054444) during pre-monsoon ranged from 0.2 to 406 FNU, during monsoon 10.7 to 1730 FNU, and post-monsoon 4.30 to 503 FNU.

The SRWBP provides vital baseline information and identifies many Management and Restoration Measures that are still relevant in a post-fire environment. However, implementation priorities and locations have shifted to focus on the upper reaches of the Sapello River, its tributaries, and ephemeral headwater channels in the burn-scar. Also, the magnitude of high priority work has expanded significantly. In spring 2023, NMED and HPWA developed a WBP alternative called "Hermit's Peak – Calf Canyon Post-Fire Mitigation Action Plan: Sapello Watershed." The plan was reviewed by staff from the Santa Fe National Forest and describes post-fire water quality protection and improvement work to address the impacts of the fire.

According to the 2024-2026 State of New Mexico CWA §303(d)/§305(b) Integrated Report the Sapello River from Arroyo Jara to Manuelitas Creek does not support its designated standard for marginal cold-water aquatic life with a cause of impairment being Sedimentation/Siltation. A probable source of this impairment is the Hermits Peak Calf Canyon Fire. While they are not explicitly listed, indications point to streambank erosion, livestock and rangeland grazing as other potential sources of impairment. Historically, the 2004-2006 State of New Mexico CWA §303(d)/§305(b) Integrated Report Appendix B 2004 Surface Water Assessment[3], Rito San Jose from Manuelitas Creek found that it did not support its designated standard for marginal cold-water aquatic life. This impairment was confirmed in the 2014-2016 State of New Mexico CWA §303(d)/§305(b) Integrated List & Report Appendix A List of Assessed Surface Waters[2]. Probable causes of impairment were low flow alterations. While they are not explicitly listed, potential sources include baseflow depletion, irrigation diversion, and groundwater pumping.

According to the 2024-2026 State of New Mexico CWA §303(d)/§305(b) Integrated List, Rito San Jose from Manuelitas Creek to headwaters was assessed in 2018. This assessment found that it did fully support all designated uses. However, potential future impairment for sediment has significantly increased due to the Hermits Peak Calf Canyon Fire in2022. Post fire conditions have shown substantial sedimentation/siltation deposition. Potential projects in this area could address this current impairment.

The TMDL for sedimentation approved by the EPA in 2007 states that the Sapello River (Manuelitas Creek to Mora River) exceeded sedimentation/siltation targets in multiple field tests conducted in 2002 by NMED SWQB. The TMDL recommends a total load reduction of 80.8 lbs/day of TSS. The pollutant source summary for the Sapello River (Mora River to Manuelitas Creek) identifies 56% magnitude nonpoint source pollution on the Sapello River. The TMDL indicated that there is no point source pollution on the river. However, a probable source of an increase in sediment deposition is the Hermits Peak Calf Canyon Fire. This sediment impairment directly affects the nutrient impairment on the Mora River as sediment loadings increase Total Nitrogen and Total Phosphorus.

By addressing the sedimentation and low flow alteration impairments, numerous other watershed health issues will benefit. Sedimentation impairments are likely related to the Hermit's Peak Calf Canyon fire of 2022, upland and streambank erosion, stream incision and degraded riparian vegetation – addressing these problems will simultaneously lessen excessive nutrients and temperature related impairments. Low flow impairments while may result from irrigation diversions, may be exacerbated by stream incision and a loss of wetlands – by improving these conditions, water storage and filtration in floodplains and wetlands will also result in improved water quality and fish and wildlife habitat.
The study/project consists of sonde long term deployment measurements and flow data. Sonde data which includes pH, specific conductivity, dissolved oxygen concentration, percent dissolved oxygen, and turbidity. Stream flow data will also be collected at each monitoring location. Morphological attributes in physical habitat measurements as well as pre/post treatment photos will also be collected. This will be elaborated in more detail in Data Generation and Acquisition section B1.

Schedule

Locations for four (4) watershed-wide monitoring sites were established in the SRWBP and were synonymous with those established by the SWQB for their long-term monitoring. Pre-treatment monitoring will occur at one location in each treated tributary. Post-treatment monitoring will occur once at the same pre-treatment monitoring locations.

According to the SWQB Mapper three (3) monitoring sites appear to be within private property, however, three (3) of these sites are located near highways and should be accessible. The HPWA will work to obtain permission to access the fourth (4) site. Pre- and post-treatment sites will have prior permission to access as part of project implementation agreements. See Table 3 for waterbody attributes and monitoring locations.

Sonde Deployment (In-situ AquaTroll 600) consists of the collection of long-term measurements for a minimum of 72 hours. Each year, sonde samples will be collected pre and post construction: once during monsoons (July – September) and once post monsoon season (October – November) done as late as possible after construction is complete. Sonde data will include turbidity, TDS, pH, temperature, DO and specific conductivity. The UNM EcoHydrology and HydroSystems Lab will continue long term

deployment at one site on the Sapello River (began immediately after the fire) and those data will be complementary to our monitoring. Sonde data will be collected in conjunction with flow.

Physical Habitat Measurements (stream morphology) will be conducted annually once per grant cycle at the three (3) watershed-wide sites (as detailed in the Schedule Section of this QAPP) from August 15-November 15, independently from sonde deployment. Physical Habitat measurements will also be conducted within the project reach before and after construction with post construction measurements taken as late as possible after construction is completed. Physical Habitat Measurements also include flow measurements.

Stream flow will be collected in conjunction with physical habitat measurements at all monitoring sites. Sediment transport in a stream varies as a function of flow. As flow increases, the amount of sediment being transported increases.

Pre/Post Treatment Photos A minimum of 1 photo point per treated tributary will be established. These photo points will be labeled on as-built maps. Photographs will be taken annually from each photo point in the established direction for the purpose of comparison with the photographs from previous years and baseline conditions. These photographs will become part of the project record to illustrate the efficacy of different treatment types. These photos provide visual evidence of the initial condition of the site and allow for direct comparison to assess the degree of improvement achieved.

Table 2. Project Task, products, responsible party, timeline (use as applicable)

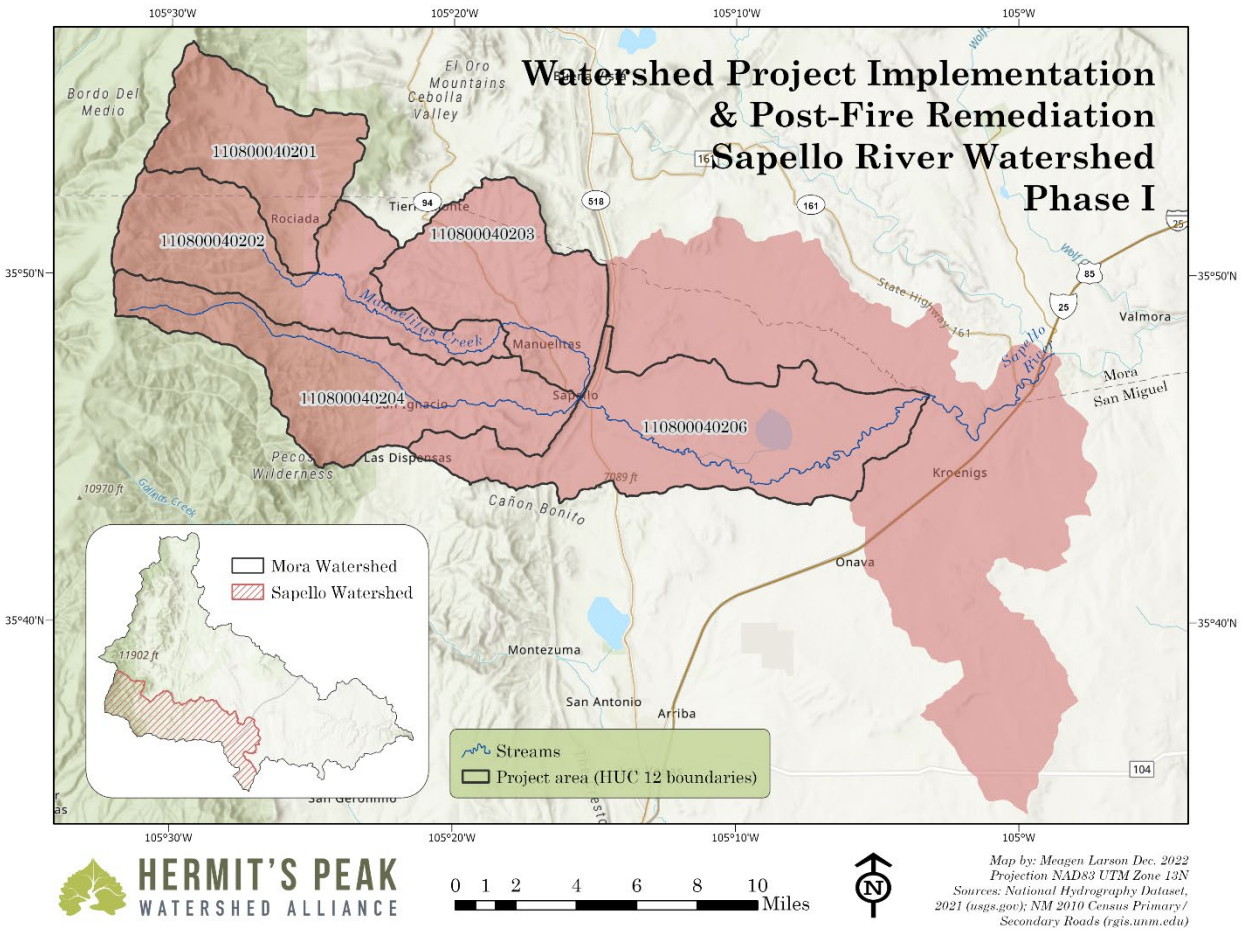
Task	Product	Responsible Party	Approximate Completion Date
Administrative	Procurement for contract	Hermits Peak Watershed Alliance	December 31, 2026
Planning	Field site visit (no data collection)	Hermits Peak Watershed Alliance	Done before start of projects
Quality Assurance Project Plan	Approved QAPP	Hermits Peak Watershed Alliance	September 1, 2024
Pre-treatment/restoration fluvial geomorphology assessment	Cross sections, longitudinal profile, pebble counts, slope, percent canopy cover and flow	Hermits Peak Watershed Alliance	Conducted before construction and once per grant cycle at the three (3) watershed-wide sites from August 15-November 15

Pre-treatment/restoration Sonde Data Collection	Stream temperature, turbidity, pH, DO, and specific conductivity	Hermits Peak Watershed Alliance	Collected pre construction: once during monsoons (July – September) and once post monsoon season (October – November) done as late as possible after construction is complete
Develop restoration design	Restoration Design	Hermits Peak Watershed Alliance	Done before start of projects
Implementation of restoration design	Restoration implementation	Hermits Peak Watershed Alliance	Done
Post-treatment fluvial geomorphology assessment	Cross sections, longitudinal profile, pebble count, slope and flow	Hermits Peak Watershed Alliance	Conducted after construction and once per grant cycle at the three (3) watershed-wide sites from August 15-November 15 after construction with post construction measurements taken as late as possible after construction is completed
Post-treatment/restoration Sonde Data Collection	Stream temperature, turbidity, pH, DO and specific conductivity	Hermits Peak Watershed Alliance	Collected post construction: once during monsoons (July – September) and once post monsoon season (October – November) done as late as possible after construction is complete
Reporting to SWQB Project Officer	Quarterly	Hermits Peak Watershed Alliance	One month after each quarter ending 2026
Reporting to EPA	Quarterly and Final Report to EPA	Eliza Martinez	December 31 2026

Project Area

The Sapello River is part of the Canadian River watershed, located in northeastern New Mexico. The Sapello River is 27.39 miles long and the watershed is 289.3 square miles. The project area (stream miles) is 79.2 miles, and the project area (upland watershed acres) is 115,013. More than half of the area is rangeland and 44% of land use is forest. The main tributary to the Sapello River is the Manuelitas Creek.

Figure 2. Project Area Map



Monitoring Location Selection Criteria

Monitoring sites were chosen to encompass both upstream and downstream areas of confluences. Each stretch above and below every confluence is clearly delineated to bracket off each reach both above and below the confluences.

Figure 3. Project Area with Monitoring Locations

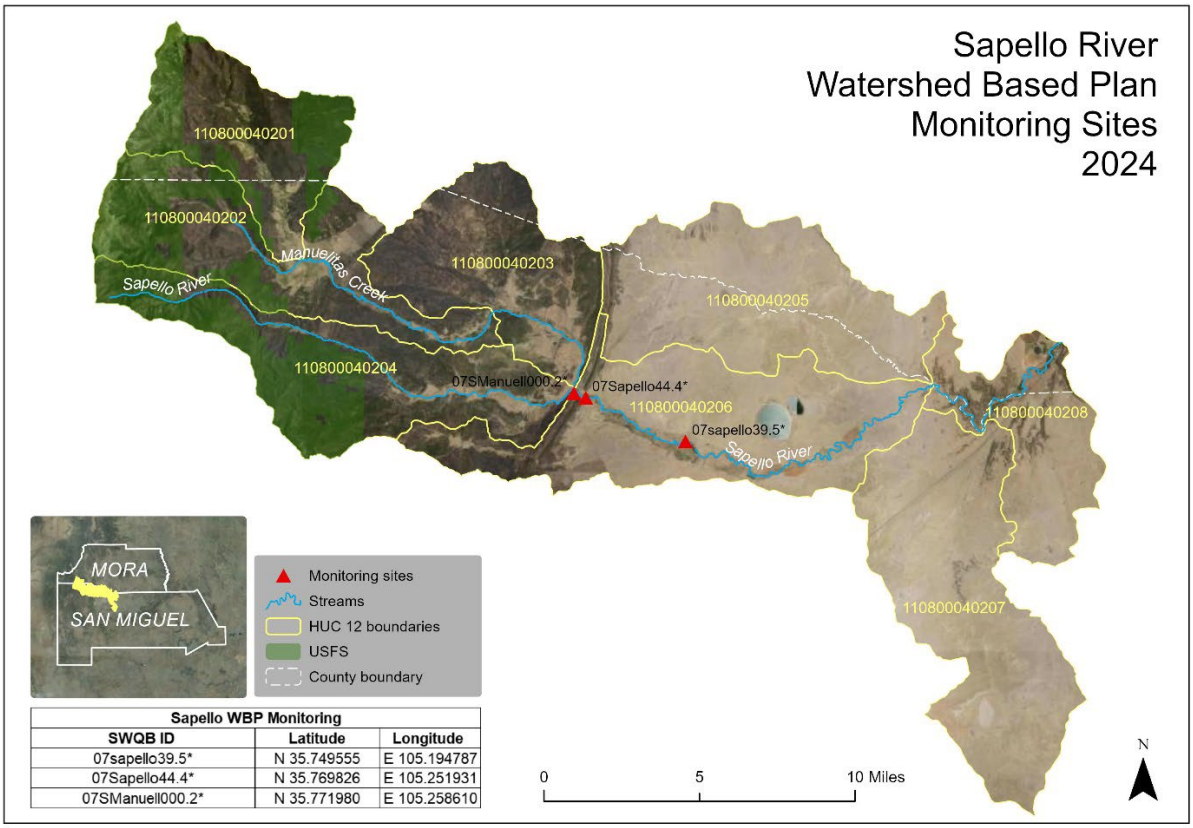


Table 3. Waterbody Attributes for the Project

Monitoring Station ID	WQS Citation	Assessment Unit ID	12-Digit HUC or Latitude and Longitude
Manuelita's Creek	20.6.4.307	NM-2305.3.A_21	Sapello River to Rito San Jose Creek
Rito San Jose	20.6.4.307	NM-2305.3.A_22	Manuelitas Creek to headwaters
Sapello River	20.6.4.307	NM-2305.3.A_23	Arroyo Jara to Manuelitas Creek
Rito de Gascon	20.6.4.307	NM-2305.3.A_24	Rito San Jose to headwaters
Manuelitas Creek	20.6.4.307	NM-2305.3.A_25	Rito San Jose to Maestas Creek
Sparks Creek	20.6.4.307	NM-2305.3.A_26	Maestas Creek to headwaters
Sapello River	20.6.4.307	NM-2305.3.A_30	Manuelitas Creek to headwaters
Maestas Creek	20.6.4.307	NM-2305.3.A_81	Manuelitas Creek to headwaters

Restoration Activities

Arrest upland erosion and rebuild healthy soils. Unusually rapid and voluminous surface water flows and excessive soil movement is the source of significant stream sedimentation and drainage channel erosion in burned areas. The loss of herbaceous and woody vegetation and soil organic material in high and moderate severity burn areas has resulted in wide-spread upland erosion, setting up the circumstances for unprecedented stream sedimentation and channel degradation. Restoring plant cover is a crucial first step in rebuilding healthy soil. Herbaceous vegetation, where it is lacking and where slopes are moderate, will be reestablished by hand seeding with a native grass mix (e.g., Land of Enchantment Mountain Blend at Curtis and Curtis Seed), cover crop (oats), and mulch (straw). Woody vegetation (native trees and shrubs) will be planted on sites with a high probability of survival (moderate north-facing slopes, moist areas). Contour felling will be done on slopes to arrest soil movement and create suitable growing environments for herbaceous and woody vegetation while reestablishing soil organic matter. Upland erosion control structures like media lunas (probably built with logs), straw bale or log flow spreaders, slash, dirt filled gunny sacks, and rock laybacks will be built to arrest surface erosion. These efforts will slow or prevent water and sediment movement downhill to cumulatively keep sediments out of water courses. We expect to work with approximately 10 landowners each year to implement this MM #1. The exact area to be treated is yet to be determined but budget figures are based on treating 200 acres over three years.

These techniques are supported by After the Fire (https://afterwildfirenm.org/post- fire-treatments) and Post-Fire Land Restoration Guides by HPWA

(https://hermitspeakwatersheds.org/3263-2/). These practices are also recommended in the SRWBP sections called Restore Upland Vegetation, Arrest and Reverse Upland Erosion, albeit with post-fire modifications.

Restore stream geomorphology. Vast areas of disturbed and bare ground in the Sapello watershed have already and will continue to cause significant degradation in most water courses. New channels have formed, channels have incised, streambanks have eroded, and floodplain connectivity has been lost. In-channel erosion coupled with upland erosion is and will continue to deliver unprecedented levels of sedimentation and related pollutants to stream courses. Using diverse, yet site appropriate tools, we will implement the following treatments to prevent further degradation and restore functionality to ephemeral, intermittent, and perennial channels, with a focus on 1st – 3rd order streams. Treatments will prevent and arrest in-channel erosion, restore appropriate channel geomorphology, and reestablish floodplain connectivity. Low-tech, process-based techniques will be used and will mostly be hand-built. Structures will include step-down log structures, log mats, rock or log rundowns, baffles, vanes, log weirs, constructed log jams, and one-rock/log dams. Machine built structures in perennial or large ephemeral channels will include constructed log jams, Post-Assisted Log Structures (PALS), post or post-less Beaver Dam Analogs, and lead-out channels that will be built by contractors. Structures will mostly be built with supplies found on the site (logs, rocks). Work will be done by contractors, trained work crews, or volunteer groups depending on the skills required. Work will primarily be done on private land, with some drainage work done on the National Forest later in the project when the USFS is ready. We expect to work with approximately 10 landowners each year for three years. The exact length of drainage channel to be treated is yet to be determined but we strive to treat 4-5 miles of ephemeral,

intermittent, and perennial channels. This in-channel restoration work is described in the SRWBP in the sections Restore Streambank and Channel Characteristics and Reconnect Streams to Floodplains.

A7. Quality Objectives and Criteria for Measurements

Question/Decision
The baseline data collection and monitoring components of the Sapello River Watershed Implementation Phase I are intended to answer the following questions: (1) Does the Sapello River still have a sedimentation/siltation impairment, (2) Where are potential sources of sediment coming from, (3) Are these sources natural or anthropogenic, and (4) Where are the high priority areas for future restoration work to reduce sedimentation loads on the Sapello River?

Stated as a decision: 1) The information gathered as part of the Sapello River Watershed Implementation Phase I will be used to determine the drive goals and future implementation that will potentially improve water quality within the watershed. If future restoration work is successful, sedimentation/siltation in the Sapello River will be reduced, satisfy the TMDL requirements and lead to a delisting of the impaired AU.

Data Quality Objective (DQO)
The quality of the data will be adequate to provide a high level of confidence in determining the effectiveness of restoration efforts, identifying trends, and making informed decisions for future restoration on the Sapello River. The quality of the data will be collected according to Standard Operating Procedures (See section B2). and be designed to contribute to NMEDs data collection as appropriate. Data quality ensures consistency and reliability in measurements and observations. To ensure data quality HPWA will be conducting both implementation and effectiveness monitoring. Implementation monitoring will track completion of Management Measures including the number of landowner partners, acres treated, stream length treated, acres fenced with virtual fencing, structures built, road miles treated, road structures built, and match dollars accumulated. Effectiveness monitoring will be both watershed-wide and treatment site specific and will focus on monitoring sedimentation and stream geomorphology in the Sapello River Watershed Implementation Phase I.

Data Quality Indicators
The measurement quality objectives will be sufficient to achieve the DQO and will be in conformance with those listed in the SWQB's QAPP. The Data Quality Indicators listed in the SWQB's QAPP and applicable to the data collected for this project are precision, bias, accuracy, representativeness, comparability, completeness, and sensitivity.

DQI	Determination Methodologies
Precision	will be ensured by using the standardized procedures identified in this QAPP. Having two trained field team members present at all times while collecting data.
Bias	is to reduce the systematic or persistent distortion of any measurement process, bias will be minimized by using professional and experienced staff to collect and analyze data.
Accuracy	the basis for determining accuracy will be staff's expertise of the survey method for collecting data and ensuring the accuracy of the equipment being used is within the range of a particular survey.
Representative	monitoring locations will be chosen based on proximity of assumed probable sources and potential impact in water quality with emphasis on identifying potential sources of impairment.
Comparability	monitoring locations will be monumented for repeat sampling events to compare pre and post treatment data. Methods listed under this QAPP for data collection are standardized and reproducible with the intent to be comparable to other studies.
Completeness	Surveys and methodologies will be completed in their entirety as identified in the QAPP
Sensitivity	Sensitivity is the ability to discern the detection of a parameter within a sample set from null in order to meet the decision criteria and is based on the method being used in regard to the sensitivity of the instrument, potential interferences with other parameters, training to collect and analyze the sample, as well as the processes needed to calibrate within an acceptable.

A.8 Special Training/Certification

This project will be primarily implemented by HPWA personnel who will be trained by the SWQB Project Officer in accordance with procedures identified in SOPs referenced in this QAPP. Data collection and monitoring for this project will be implemented by HPWA personnel with technical assistance and oversight from the SWQB Project Officer. HPWA may hire a contract to conduct specific activities required by this project and is the responsibility of HPWA to ensure their contract is conduct the work appropriately. Volunteers will be trained by HPWA personnel or the monitoring contractor and will be supervised at all times by HPWA personnel or monitoring contractor in the field during data collection of samples or field measurement efforts. HPWA and any contractor conducting work for the project will review this QAPP and sign the acknowledgment statement prior to initiating any work for this project. The singed acknowledgment statements will be kept on file with original QAPP by the QAO.

A.9 Documents and Records

The SWQB Project Officer will make copies of this approved QAPP and any subsequent revisions available to the Project Manager. The Project Manager will distribute to all individuals on the

distribution list who do not have signature authority for approving the QAPP. When changes affect the scope, implementation, or assessment of the outcome, this QAPP will be revised to keep project information current. The SWQB Project Officer, with the assistance of the QAO, will determine the effects of any changes to the scope, implementation, or assessment of the outcome on the technical and quality objectives of the project. This Project Plan will be reviewed annually by the SWQB Project Officer and the Project Manager to determine the need for revision.

Project documents include this QAPP, field notebooks, calibration records, validation and verification records, recorded field data, records of analytical data in hard copy or in electronic form, and QC records. Also included are project interim and final reports. Project documents and data captured on a global positioning system (GPS), camera, smart phone, tablet, or laptop will be downloaded to a HPWA personnel or monitoring contractor's computer at the end of each day. Copies of project documents and data will be made and stored separately from the original data on an external hard drive or upload to a network/cloud.
All digital project data will be kept in a project file on a HPWA personnel or monitoring contractor's computer and on a separate external backup hard drive at the HPWA's office. Hard copy project documents will be kept in a project folder in a locked filing cabinet at the HPWA's office. All hard copy documents will be digitized and stored on a HPWA computer, google drive and backup hard drive (see Table 5). Copies of the data will be distributed by HPWA to NMED SWQB Project Officer after each field season, typically at the end of November.

Table 4. Data Records for the Project

Document	Type of Form	Storage Location	Field Sheet Used
QAPP	Electronic (.doc) & Hard Copy	HPWA external hard drive, google drive and locked filing cabinet	EPA Requirements for Quality Assurance Project Plan. Projects funded by FFY2024. Located at: https://www.epa.gov/system/files/documents/2024-04/quality_assurance_project_plan_standard.pdf
Calibration Records	Electronic (.doc) & Hard Copy	HPWA external hard drive, google drive and locked filing cabinet	Sonde Calibration Worksheet. https://www.env.nm.gov/surface-water-quality/sop/. Under related SOP forms for SWQB SOP 6.1.
Physical Habitat Field sheets (cross-section, longitudinal profile, pebble count, slope, and percent canopy cover	Electronic (.xls) & Hard Copy	HPWA external hard drive, google drive and locked filing cabinet	Physical Habitat Field Forms. Located at https://www.env.nm.gov/surface-water-quality/sop/. Under related SOP forms for SWQB SOP 5.0
Sonde Deployment Form	Hard Copy	Locked filing cabinet	Sonde Deployment form. Located at https://www.env.nm.gov/surface-water-quality/sop/. Under related SOP forms for SWQB SOP 6.1.

Sonde Data	Electronic (.xls)	HPWA external hard drive and google drive	Long Term Data Management Form. https://www.env.nm.gov/surface-water-quality/sop/. Under related SOP forms for SWQB SOP 6.4.
Photos	Electronic (.jpg)	HPWA external hard drive and google drive	Photo log.
Interim and Final Reports	Electronic (.doc) & Hard Copy	HPWA external hard drive, google drive and locked filing cabinet	NA

GROUP B: DATA GENERATION AND ACQUISITION

B1. Sampling Plan

The study design will consist of three (3) watershed-wide monitoring sites established originally by the SWQB and possibility a fourth (4) (dependent on access); monitoring sites are located upstream and downstream of tributary confluences on the Sapello River. These three (3) monitoring sites will be utilized during the course of this project. Monitoring will be conducted at specific locations representative of ambient stream conditions, generally in the transition between a riffle/run and a pool, or at the toe of a pool, rather than in shallow riffles or deep pools.

Field Team will collect long-term measurements with sonde at all three (3) watershed-wide monitoring sites in accordance with the SWQB SOP 6.1, *Sondes* (NMED/SWQB. 2024b) for a minimum of 72 hours. The sonde will provide long term measurements of the following field parameters during sampling events: temperature, pH, specific conductivity, dissolved oxygen concentration, percent dissolved oxygen, and turbidity.

The Field Team will collect stream morphology attributes in accordance with the SWQB SOP 5.0, for *Physical Habitat Measurements* (NMED/SWQB. 2023). The Field Team will always consist of at least two people while conducting surveys. Pebble count will be conducted using the pebble count procedure identified in the SWQB's SOP for Physical Habitat Measurements will include thalweg profile, cross-section, large woody debris tally and slope. Cross-sections used to determine efficacy of restoration will be monumented with rebar pins (right bank and left bank) for repeatability. Rebar locations will be recorded with a GPS unit for accuracy and verification for later sampling events. Cross sections will be modified to include measurements necessary to calculate entrenchment ratio. Modifications will comprise additional measurements of flood prone width and bank full width. (Rosgen/Applied River Morphology.1996) Physical habitat measurements will also be collected at each of the three (3) long-term monitoring location during base flow conditions between August 15- November 15, as well as pre and post construction at restoration project locations with post construction measurements taken as late as possible after construction is completed.

The Field Team will collect stream flow at all three (3) watershed-wide monitoring locations after long term sonde measurements have been collected and recorded. Flow data is fundamental to accurately

calculating and managing TMDLs in stream restoration. It provides the necessary information to understand the stream's capacity, estimate pollutant loads, identify pollution sources, and adaptively manage restoration efforts. Stream flow will also be collected in conjunction with all physical habitat measurements. Stream flow will be collected with a USGS Pygmy Current Meter in according to applicable sections of SWQB SOP 7.0, *Stream Flow Measurement* (NMED/SWQB. 2022).

The Field Team will establish at least one photo point for each treated ephemeral tributary and labeled on as-built maps. Photographs will be taken annually from each photo point in the designated direction, allowing for comparison with previous years' photographs and baseline conditions. These photographs will be included in the project record to demonstrate the effectiveness of various treatment types. They will provide visual evidence of the initial site condition and enable direct comparison to assess the extent of improvement achieved.

Field team will collect pre and post construction photo points: once during monsoons (July – September) and once post monsoon season (October – November) done as late as possible after construction is complete. In channel restoration efforts aim to restore streambank and channel characteristics and reconnect Streams to Floodplains. HPWA will hire a contractor to construct machine-built structures in perennial or large ephemeral channels that will include constructed log jams, Post-Assisted Log Structures (PALS), beaver dam analogs with or without posts, and lead-out channels. These structures will be primarily constructed using on-site materials, such as logs and rocks. Contractors will handle the construction, which may also involve trained work crews or volunteer groups, depending on the required skill levels.

The Pollutant Load Estimation Tool (PLET) will be used to determine load reduction annually for the duration of the project.

If a monitoring location becomes inaccessible during the project, a new site will be selected that best represents the goals and objectives for the project.

Table 5. Project Monitoring Specifics

Responsible Party	Monitoring	Location	Frequency
HPWA	Physical habitat Assessment	Three monitoring sites (long-term monitoring locations) and within the project reach pre/post construction	Conducted annually once per grant cycle at the three (3) watershed-wide sites from August 15-November 15. Also be conducted within the project reach pre/post construction with post construction measurements taken as late as possible after construction is completed

HPWA	Sonde Deployment	Three monitoring sites (long-term monitoring locations)	Once per year annually for a minimum of 72 hours : once during monsoons (July – September) and once post monsoon season (October – November) done as late as possible after construction is completed
HPWA	Stream Flow	Three monitoring sites (long-term monitoring locations)	Collected in conjunction with sonde deployment and physical habitat measurements at all monitoring sites
HPWA	Photo points	Treated tributaries	A minimum of 1 photo point per treated tributary will be established and taken annually in the established direction

B2. Sampling Methods

Physical Habitat data will be conducted in accordance with SWQB SOP 5.0. *Physical Habitat Measurements* (NMED/SWQB. 2023). All applicable sections of SWQB SOP 5.0 will be adhered to during data collection for pebble counts, cross sections, longitudinal profiles, woody debris estimates, slope and percent canopy.

Sondes will be deployed at monitoring locations in accordance with the SWQB SOP 6.2 *Sondes* (NMED/SWQB. 2024b). Sonde Deployment protocol will follow the Step-by-step Process section identified in SWQB SOP 6.2 and will gather measurements in accordance with section pertaining to long term measurements (All Units). Long term sonde deployment will be a minimum of 72 hours at each site annually.

Stream flow will be collected with a USGS Pygmy Current Meter. Stream flow will be collected in according to applicable sections of SWQB SOP 7.0, *Stream Flow Measurement* (NMED/SWQB. 2022).

Photo points and photo log according to the Project/Task Description in this QAPP

PLET modeling will be done in accordance with the instructions provided on the US EPA website. Data collected will used for load reduction modeling.

B3. Sample Handling Custody

Because there are no plans to collect water quality samples for laboratory analysis, there are no handling requirements.

B4. Analytical Methods

Because there are no plans to collect water quality samples, no analytical methods are needed.

B5. Quality Control

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. Additionally, the results obtained from the QC analysis, or data quality assessment, may identify areas where the variability can be reduced or eliminated in future data collection efforts, thereby improving the overall quality of the project being implemented.

Quality Control mechanisms are implemented as described under the Quality Objectives and Criteria for Measurement Data as well as the sampling methodologies identified under this QAPP. Additional Quality Control includes the professional expertise of the personnel working under this project.

B6. Instrument/Equipment Testing, Inspection and Maintenance

The primary equipment needing maintenance, testing and inspection are a sonde, flow meter and laser level. Requirements and procedures are specified in the SWQB SOPs (below) and manufacture specification for Pro Shot Laser Level.

1. Sonde, SWQB SOP 6.1, (NMED/SWQB. 2024b)
2. USGS Pygmy Current Meter, SWQB SOP 7.0, *Stream Flow Measurements* (NMED/SWQB. 2022).
3. Pro shot laser level will be calibrated by the manufacturer annually. Last calibrated April 2024.

B7. Instrument/Equipment Calibration and Frequency

It should be possible to show that all data was collected with monitoring devices that can be shown to have been properly calibrated. For this project, specific calibration requirements apply to sondes, flow meters, and laser levels. The calibration of flow meters, and laser levels will be checked annually (before deployment and after retrieval) using the methodology described manufacture specifications. Sondes will be calibrated prior to deployment utilizing in the SOP 6.1 *Sondes* (NMED/SWQB. 2024b). Laser level and flow meter will be maintained and calibrated annually to manufacture specifications. Documentation of calibration and verification will be maintained by HPWA staff or monitoring contractor.

B8. Inspection/Acceptance for Supplies and Consumables

Consumables that have potential to affect the quality of data collected during the project are calibration standards solutions. HPWA staff will visually inspect calibration standard solutions for contamination

and ensure expiration date has not been exceeded before each use. Calibration standard solution will be stored in conditions as specified by manufacturer specifications.

B9. Non-Direct Measurements

Existing Pre/Post Treatment Photos and PLET model from the Hermit's Peak Watershed Alliance, will be used to become part of the project record to illustrate the efficacy of different treatment types. These photos provide visual evidence of the initial condition of the site and allow for direct comparison to assess the degree of improvement achieved. The PLET model will be used to calculate load reduction estimates in project areas. The annual loading will be calculated based on the runoff volume and the pollutant concentrations in the runoff water, as influenced by factors such as the land use distribution and management practices.

B10. Data Management

HPWA Project Coordinator will be responsible for data management. All data will be converted to electronic format, stored and backed up by HPWA Project Coordinator. Computer hard drives are backed up monthly or will be backed up on external hard drives, respectively. Hard copies of field sheets will be maintained in a project binder organized by assessment and date and stored in a key protected filing cabinet in the office of the HPWA.

Data will be sent to the SWQB Project Officer by the end of each field season by HPWA Project Coordinator, typically by the end of November. Upon receiving data, the SWQB Project will store data on SWQB network drive. The SWQB will retain project documents in accordance with applicable sections of New Mexico's Disposition of Public Records and Non-Records regulation, codified at 1.13.30 New Mexico Administrative Code (NMAC) and Retention and Disposition of Public Records regulations, codified at 1.21.2 NMAC.

GROUP C: ASSESSMENT AND OVERSIGHT

C1. Assessment and Response Actions

The Project Officer will provide project oversight by periodically assisting with and/or reviewing data collection efforts. A review of the baseline data collection and monitoring efforts by the SWQB Project Officer will take place at the end of each monitoring season. The SWQB Project Officer will assess project progress to ensure the QAPP is being implemented, including periodic audits by the QAO, as needed. Any problems encountered during the course of this project will be immediately reported to the SWQB Project Officer who will consult with appropriate individuals to determine appropriate action. Should the corrective action impact the project or data quality, the SWQB Project Officer will alert the QAO. If it is discovered that monitoring methodologies must deviate from the approved QAPP, a revised QAPP must be approved before work can be continued. All problems and adjustments to the project plan will be documented in the project file and included in the final report.

C2. Reports to Management

Annual reports will be submitted by the HPWA Project Coordinator to the SWQB Project Officer and will include progress of project and any available data. Printouts, status reports or special reports for SWQB or EPA will be prepared upon request. The final report will be submitted to the SWQB Project Officer by HPWA Project Manager. An initial report after field work has been completed will be filed by HPWA Project Coordinator with the SWQB Project Officer no later than 4 weeks following completion of the field data collection. This will include days spent, data collection locations, raw data files, and any factors which may have affected data quality (personnel substitutions, equipment malfunctions, inclement weather, etc.).

Quarterly reports are submitted by the HPWA Project Manager to the SWQB Project Officer and include progress of project implementation and any available data. Printouts, status reports or special reports for SWQB or EPA will be prepared upon request. A monitoring report will be provided and included in the final report. The SWQB Project Officer will be responsible for maintaining project progress in the EPA Grants Reporting and Tracking System and the final report, and all other required project deliverables to be submitted to the EPA under this grant. The SWQB Project Officer will be responsible for submitting the final project deliverables to EPA through their Grants Reporting Tracking System.

GROUP D: DATA VALIDATION AND USABILITY

D1. Data Review, Verification and Validation

Data will be reviewed by the HPWA Monitoring Coordinator for erroneous data, incomplete data and transcription errors prior to demobilization from the field site. Data will be considered usable if the requirements of this QAPP were followed and the data is within acceptable range limits as defined under this QAPP. Data that appears incomplete or questionable for the parameter will be flagged for review. Flagged data will be discussed with the SWQB Project Officer to determine the potential cause and usability. If a reasonable justification for use of the data cannot be attained, those data will not be used in analysis and implementation of activities listed under this QAPP unless the data can be recollected and assessed for usability.

D2. Validation and Verification Methods

The HPWA Project Coordinator will ensure that valid and representative data are acquired. Verification of field sampling and analytical results will be performed by the HPWA Project Coordinator according to applicable sections of SWQB SOP 15.0 for *Data Verification and Validation* (NMED/SWQB. 2023b) utilizing the SWQB Data Verification and Validation Worksheets. Verification and validation (V&V) of data will occur after every field season using the attached V&V worksheets. In the event questionable data are found, the SWQB Project Officer will notified and will consult appropriate personnel to determine the validity of the data. Results of the verification and validation process will be included in the final reports.

D3. Reconciliation with User Requirements

The user requirement is a restatement of the data quality objective: The quality of the data will be adequate to provide a high level of confidence in determining whether the Sapello River Watershed Implementation Phase I is meeting the project goals, as stated in the approved scope of work.
If the project's results do not meet this requirement, then additional monitoring may be necessary to fill in data, which may include an extension of the monitoring period to measure effects that were not apparent during the project period.

References:

Rosgen, Dave. 1996. Applied River Morphology

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(WARSSS). Rosgen, D.L., 2006, Watershed Assessment of River Stability and Sediment Supply

(WARSSS), Wildland Hydrology Books, Fort Collins, CO, 648 pp.

New Mexico Environment Department Surface Water Quality Bureau (NMED/SWQB). 2024. Quality Management Plan for Environmental Data Operations. Available at: https://www.env.nm.gov/surface-water-quality/protocols-and-planning/

NMED/SWQB. Standard Operating Procedures (SOPs). Available at https://www.env.nm.gov/surface-water-quality/sop/

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Acknowledgement Statement

New Mexico Environment Department Surface Water Quality Bureau

Sapello River Watershed Implementation Phase I
Quality Assurance Project Plan Acknowledgement Statement

This is to acknowledge that I have received a copy (in hard copy or electronic format) of the "Sapello River Watershed Implementation Phase I" 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 Emily Miller