



## Nonpoint Source Project Implementation Plan

<b>Project Title</b>	Uncompahgre Se Control: Phase 9 Lateral Piping
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### 1.0 - Project Proposal Summary

<b>Sponsor</b>	
Organization Name	Uncompahgre Valley Water Users Association
E-mail address	<a href="mailto:sfletcher@montrose.net">sfletcher@montrose.net</a>
Mailing Address	601 N. Park Avenue
City, State and Zip	Montrose, Colorado 81401
Telephone Number	970-249-3813
Tax ID Number: 84-0340160	DUNS: 075772848

<b>Project Coordinator or Primary Contact</b>	
Name	Steve Fletcher
Title	Manager
E-mail Address	<a href="mailto:sfletcher@montrose.net">sfletcher@montrose.net</a>
Mailing Address	601 N. Park Avenue
City, State and Zip	Montrose, Colorado 81401
Telephone Number	970-249-3813

<b>Type of Entity (check on)</b>	
	Governmental Agency
<input checked="" type="checkbox"/>	Non-for-profit entity, including watershed groups
	Commercial Organization

<b>Project Start Date</b>	October 1, 2015	<b>Project End Date</b>	September 30, 2019
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<b>Project Funding</b>	
CO NPS Funds Requested *\$250,000 + Match (cash/in-kind) \$512,826 = Total Project Cost \$762,826	
*NPS Funds Requested - Phase 9 Construction & Post Project Monitoring: <b>\$230,380</b>	
*NPS Funds Received - Phase 9 Pre-Construction Activities: \$19,620	
Federal Funds: \$2,553,065 – awarded as of 9/4/2015	

<b>Project Location</b>	
WQCC Regulation River Basin and Sub-Watershed(s)	Lower Gunnison and Dolores (Regulation No. 35); Uncompahgre and Lower Gunnison Watersheds
Latitude (in decimal degrees): 38.68129069	Longitude (in decimal degrees): -107.92394134
HUC(s) - 8 or 12 digit USGS Hydrologic Unit Codes	HUC 8's =14020005 and 14020006; HUC 12's = 140200060605, 140200060606, 140200050113 & 140200050104
Impaired Segment(s) Water body ID(s)	COGUUN04b; COGUUN04c; COGUUN12; COGULG02; COGULG04a



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NPS Pollution Source categories to be addressed (Check all that apply)			
X	Agriculture		Silviculture
	Habitat Modification (drainage/filling wetlands, stream bank destabilization)		Hydrologic Modification (changes to water flow as in reservoir, diversions, etc.)
	Urban runoff/Stormwater	X	Groundwater Loading
	Mining	X	Natural Sources
	Construction		Other:

NPS Pollutants to be addressed (Check all that apply)			
	Excess Nitrogen		Pesticides
	Excess Phosphorus	X	Selenium
	Sedimentation		Temperature
	Pathogens/Bacteria		pH
	Metals		Habitat impact
	Low dissolved oxygen		Other:

Estimate Load Reduction, if checked for excess nitrogen, excess phosphorus and/or sedimentation	
# pounds of nitrogen reduced by project	Reference:
# pounds of phosphorus reduced by project	Reference:
# tons of sediment load reduced by project	Reference:
# pounds of metals reduced by project	Reference:
# pounds of selenium reduced by project : 126 to 315 lbs/Se/year	Reference: Butler, 2001. Effects of piping irrigation laterals on selenium and salt loads, Montrose Arroyo Basin

**Project Description:** The *Uncompahgre Se Control: Phase 9 Lateral Piping* project will replace approximately 11.3 miles of open, earthen irrigation delivery system laterals (GB, GBA, EO, EU and EQ laterals) with closed PVC pipe in order to reduce selenium and salinity loading caused by deep percolation of irrigation water from off-farm delivery system laterals within the federal Uncompahgre Project Area (UPA) (Appendix B – Map 1). Under current assumptions, this effort is projected to reduce from 126-315 pounds of selenium and 3,150 tons of salt per year. \*This project was given a “conditional funding recommendation” by WQCD staff in the FY13 NPS Proposal Process with a request that the project be separated into two phases. This second phase of funding (\$230,380) is for lateral piping construction implementation and post-project monitoring. A contract for pre-construction activities in the amount of \$19,620 has been secured with the NPS Program.

**Note: See Applicant Proposal Signature Page in Appendix E**

### 2.0 - Statement of Need

#### 2.1 – General Watershed Information



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The topography of the lower Gunnison River Basin is highly varied, ranging from snow-capped mountains to barren desert lands. Major landforms include the Uncompahgre River Valley, the Uncompahgre Plateau to the west, the San Juan Mountains to the south, and the Gunnison uplift and adobe badlands on the east” (Uncompahgre Watershed Plan, 2012). Elevations on the east side of the Uncompahgre River Valley in the Uncompahgre Project Area range from 4,920 ft to 6,320 ft.

The majority of waters within the lower Gunnison River Basin are classified for aquatic life, recreation and agricultural uses. The primary land use is irrigated agriculture, although, urban and residential land use is increasing as the population grows. Two counties exist within the UPA: Montrose and Delta. Projections indicate that these counties are expected to double in population by the year 2040 and the potential effects of changing land use on water quality are a significant concern (*e.g.*, potential development on selenium rich Mancos shale soils, natural gas extraction, stormwater runoff, etc.).

Soils within the lower Gunnison Basin are derived from Mancos Shale which has naturally high concentrations of selenium and salts (Appendix B – Map 2). The underlying bedrock in the region consists predominantly of crystalline and sedimentary rocks, with alluvial deposits in the valleys. Weathering of these different geologic units affects water quality within the basin. The GB and GBA laterals are located in a “high” selenium soil mobilization potential area while the EO, EU, and EQ laterals are located in a “very high” area. Natural vegetation in the area of the project is sparse and is composed primarily of rabbit brush, salt brush and some sage brush.

Along the semi-arid Colorado Plateau in the lower Gunnison River Basin, rainfall may range from less than 10 inches per year to as much as 20 inches per year in higher elevation areas. Average high temperatures are 87 degrees Fahrenheit and average lows are 15 degrees. The growing season extends from approximately April 1 to October 31.

The lower Gunnison River Basin is subject to a significant degree of irrigation diversion. The U.S. Bureau of Reclamation (Reclamation) UPA draws water from the Gunnison and Uncompahgre Rivers and irrigates approximately 83,000 acres of land (UVWUA personal communication, 2014). Montrose County contains the Gunnison Tunnel, East Canal, Loutzenhizer, and Montrose/Delta, Ironstone and Selig Diversion Dams. Delta County contains the Garnet Diversion Dam. The Uncompahgre Project has over 128 miles of canals, 438 miles of laterals and 216 miles of drains (Appendix B – Map 1).

Furrow irrigation is used for the majority of row crops, sprinkler irrigation is available on a limited number of hay fields, and flood irrigation is still used on most pasture land. Drip irrigation is also used on some fruit crops. Crops produced within the basin include corn, alfalfa, beans, peppers, onions, broccoli, potatoes, squash, lettuce, melons, grapes, peaches, apples, pears, cherries, apricots, grass hay, pasture forages, wheat, barley, and oats. Livestock operations include beef cattle, dairy cattle, sheep, hogs, horses, chickens, and elk.

There are three domestic wastewater treatment facilities discharging to the Uncompahgre River (COGUUN4b) under an individual Colorado Discharge permit which including the Town of Olathe, City of Montrose, and the West Montrose Sanitation District. Other facilities operating under a general CDPS permits include the Western Gravel Concrete Facility – North R34 Pit. Facilities discharging to the Gunnison River (COGULG04a) under a general CDPS include the Elam Construction Dub’s Pit and the Western Gravel Fredlund Pit. The majority of drinking water for areas in Montrose and Delta Counties is



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provided by Blue Mesa Reservoir via Gunnison Tunnel diversions and less than 5 percent of additional water comes from Silverjack Reservoir.

Primary land use in the immediate vicinity of the GB and GBA laterals include agriculture and rural residential small farm homes. Land use surrounding the EU, EQ and EO laterals is primarily irrigated agriculture with scattered small farm houses, a small amount of commercial development (e.g. private hunting club), and potential future higher density residential development (small subdivisions).

There are several selenium trend monitoring sites in the Uncompahgre River sub-basin near the project sites: Uncompahgre River at Colona (USGS Gage #09147500), Uncompahgre River at Delta (USGS Gage #09149500) and Loutzenhizer Arroyo (a.k.a. LZA1; USGS Gage #383946107595301). Selenium trend monitoring sites on the Gunnison River include the Gunnison River at Delta (USGS Gauge #09144250) and Gunnison River above Hartland Ditch near Delta (USGS Gauge #384617108022901).

Other NPS selenium reduction and watershed planning projects in the basin include the: 1) *Lower Gunnison Basin & Grand Valley Selenium Watershed Management Plan* (Complete 2012), 2) *Selenium Control Project: Loutzenhizer Lateral Piping* (Complete 2013), 3) *Uncompahgre Agricultural Efficiency & System Optimization Study* (On schedule and budget, closes February 2015), and 4) *Uncompahgre Selenium Control: Phase 9 Lateral Piping Pre-Construction Activities* (Contract secured).

### 2.2 –Waterbody Description

The Uncompahgre River (HUC 14020006) lies southwest of the Sawatch and Elk Mountains and is the largest tributary to the Gunnison River. The headwaters are located in the Uncompahgre National Forest and originate in Como Lake. The Uncompahgre River is a 3<sup>rd</sup> order stream, draining 1,115 square miles of the upper Colorado River Basin. The confluence of the Gunnison and Uncompahgre Rivers is in Delta, Colorado. A TMDL assessment has been done for the Loutzenhizer Arroyo (HUC 140200060606), a sub-basin affected by the proposed piping project.

Uncompahgre River high flows generally run from May through July with peak flow corresponding to snowmelt runoff (generally in May and June). Low, base-flow period runs from September to March with elevated fall flows typically in August and September due to minimal irrigation diversion and increased precipitation. Average historical peak flows in June at the Uncompahgre at Colona and the Uncompahgre at Delta are 634 cfs and 541 cfs, respectively.

The headwaters of the Gunnison River (HUC 14020005) are located on the western flank of the Continental Divide in the Sawatch and West Elk Mountains. Peak flows generally run from May to July. The Gunnison River is a fifth order stream and drains approximately 8,000 square miles of the upper Colorado River Basin. The confluence of the Gunnison and Colorado Rivers is in Grand Junction, about 50 miles downstream of the City of Delta. The mainstem of the Gunnison River, from a point just upstream of the confluence of the Uncompahgre River to the confluence with the Colorado River, has been listed for selenium impairment (COGULG02). The 2011 TMDL also provides an assessment of selenium loading for two tributaries which drain to the Gunnison River that are affected by the proposed Phase 9 Lateral Piping Project and include the Sunflower Drain (HUC 140200050113) and Peach Valley Arroyo (HUC 140200050104) (COGULG04a).

Phase 9 east side laterals proposed for piping are located in the following sub-basins: Outlet to the Uncompahgre River (GB & GBA laterals), Sunflower Drain (EU lateral) and Peach Valley (EO and EQ



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laterals). The laterals are currently, open, earthen, man-made irrigation delivery water conveyance system structures which carry water approximately 210 days/year. The GB and GBA laterals deliver water off the East Canal System. The GB lateral is 17,160 feet long (3.25 miles) and at its terminus discharges into Loutzenhizer Arroyo just upstream of the confluence with the Uncompahgre River. The GBA lateral is 1,800 ft long (0.34 miles) and provides water to irrigated lands on the west side of Highway 50 where it dead ends. Any tail water from GBA lateral deliveries likely enters the Uncompahgre River (COGUUN12, 04b & 04c).

The EO, EU, and EQ laterals currently deliver water from the Selig Canal System approximately 210 days per year. The EO and EQ laterals exist primarily in the Peach Valley drainage basin, while the EU lateral falls entirely within the Sunflower drainage basin. On-farm tail water run-off and irrigation return flow, as well as delivery system seepage losses, are captured in the Sunflower Drainage and Peach Valley Arroyo. The EO lateral is 56,920 ft long (10.78 miles) of which only 18,480 feet (3.5 miles) are currently proposed for piping and which provide water to one user with approximately 140 acres. The EU lateral is 6,970 ft (1.32 miles) and provides water to two water users to irrigate approximately 126.3 acres. The EQ is 15,260 ft (2.89 miles) and provides water to four water users to irrigate approximately 226.6 acres.

The following table summarizes Reclamation values for lateral seepage losses and salt loading for those laterals proposed for Phase 9. Estimates for selenium loading are based on previous studies.

Lateral	Length (ft)	Seepage (ac-ft/yr)	Salt Load (tons/yr)	Estimated Range of Selenium Load (lbs/yr)	No. of Users	Acres Irrigated	Flow (cfs)
GB	17,160	224	1,273	51-127	25	1,419	40
GBA	1,800	13	75	3-8	4	195	4
EO (3.5 mi)	18,480	150	854	34-85	1	140	15
EQ	15,260	128	726	29-73	4	227	16
EU	6,970	39	222	9-22	2	126	12
<b>TOTALS</b>	<b>59,670</b>	<b>554</b>	<b>3,150</b>	<b>126 - 315</b>	<b>36</b>	<b>2,107</b>	<b>87</b>
	(11.3 mi)						

### 2.3 – Type of Water Quality Problem Including Sources

In areas of the Lower Gunnison Basin, which have local geological sources of salts and selenium, application of water to the soil via irrigation water for urban landscaping or agricultural fields, leaking canals or laterals, seepage from un-lined ponds and septic leaching fields mobilizes selenium and salts and creates hydraulic gradients that can result in the discharge of non-point source polluted surface and groundwater into irrigation drains and local waterways (Appendix B – Map 2).

High selenium concentrations have been shown to cause reproductive failure and deformities in aquatic birds and fish. The lower Gunnison River, from the confluence of the Uncompahgre River, serves as critical habitat to four listed endangered fish species (razorback sucker, humpback chub, bonytail chub, and Colorado pikeminnow). Aquatic habitat health has declined due to human activities such as water diversion and encroachment into habitat (e.g., dikes or flood control structures). According to the Fish and Wildlife Service (FWS), selenium is the greatest water-quality constituent of concern to endangered fish in the Uncompahgre, Lower Gunnison, and Colorado Rivers. In addition, water depletions and diversions have



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resulted in less water for fish, loss of potential habitat, and degraded water quality since there is less water available for dilution.

The mainstem Uncompahgre River from La Salle Road to the confluence with the Gunnison River and all tributaries to the Uncompahgre River currently exceed the State of Colorado's 4.6 ppb chronic water-quality standard protective of aquatic life. The federal Uncompahgre Project Area and the Uncompahgre River Basin have been identified as the source of 60% of the selenium loading in the lower Gunnison River (Reclamation, 2006).

In 2011, the Water Quality Control Division (WQCD) completed the *Total Maximum Daily Load (TMDL) Assessment for the Gunnison and Uncompahgre Rivers and Tributaries*. According to the TMDL assessment for the Uncompahgre River at Delta which includes the Uncompahgre River and its tributaries above Delta (Loutzenhizer Arroyo, Cedar, Dry and Dry Cedar Creeks), there is approximately 5,442 lbs/year or 14.9 lbs/day of selenium loading coming from the Uncompahgre River Basin. In order to meet the in-stream chronic aquatic life water-quality standard of 4.6 ppb at the Uncompahgre River at Delta, approximately 1,680 lbs/year or 4.6 lbs/day of selenium must be controlled. Piping of the GB and GBA laterals are expected to have a positive water-quality benefit to the Uncompahgre sub-basin.

The Gunnison River from Crystal Reservoir to just above the confluence with the Uncompahgre River (GOGULG01), when assessed over its entire length, does not exceed aquatic life use based selenium standards and therefore was not included on the 2008 303(d) List. However, the lower portion, when assessed separately, exhibits elevated selenium above chronic standards and was therefore included in the 2011 TMDL assessment. Downstream ambient 85<sup>th</sup> percentile selenium concentrations for the Gunnison River at Delta below the confluence with the Uncompahgre were 7.0 ppb with a mean load of 20.1 lbs/day. Average selenium load that needs to be reduced is 6.8 lbs/day or 2,510 lbs/year (34 % of the load) (COGULG02).

Other important selenium loading tributaries entering the lower portion of segment COGULC01 and all of COGULG02 which are affected by the proposed lateral piping project include Peach Valley Arroyo and Sunflower Drain. Average 85<sup>th</sup> percentile selenium concentrations for these tributaries are well above the standard at 27.8 ppb and 99.2 ppb, respectively. According to the TMDL, approximately 0.736 lbs/day of selenium from Peach Valley Arroyo enters the Gunnison River and require a reduction of approximately 85% or 0.626 lbs/day (229 lbs annually) of selenium. According to Thomas 2007, average selenium load that needs to be reduced in the Sunflower Drainage for water years 1996, 2000, and 2001 is 2.2-6.4 lbs/day during all months of the year or 1,421 lbs/year (98% of the load). According to Butler and Leib (2002), the Sunflower Drain has one of the largest measured selenium loads of all the *tributaries* to the Gunnison River between the confluence with the North Fork and the Delta gauging station. Piping of the EO, EU and EQ laterals are expected to have a positive benefit on selenium loading.

Regulation No. 93 identifies Colorado's List of 303(d) Impaired Waters & Monitoring & Evaluation List (M&E). The latest version (last updated March 2012) identifies two segments on the M&E list, Jatz Bottomland (COGULG04b) and Ward Creek (COGULG07). A portion of segment COGULG07, Tongue Creek, is on the 303(d) List.

On-going selenium water-quality data collection and data gaps are being addressed by the Gunnison Basin and Grand Valley Selenium Task Force (STF), Colorado River Water Conservation District (River District) and Reclamation. These data are available via the web on the National Water Information System (NWIS).



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### 2.4 – Water Quality Priorities

Selenium is identified as a priority pollutant in multiple sections of the Colorado NPS Program 2012 Management Plan (NPS Plan). According to Chapter 2, selenium is the “second largest impairment category” and the “second priority” pollutant that will need to be addressed over the next five years. Chapter 3.1.2 states that the NPS program will continue to “Implement selenium management efforts (including related salinity reduction practices) to reduce loading in the Arkansas, *Gunnison* (emphasis added), Colorado, and South Platte watersheds.” Chapter 6 specifically identifies the need to work collaboratively with stakeholders and to work with other state and federal funding partners to leverage multiple funding sources to maximize water-quality benefits (WQCD, 2012). The UVWUA actively leverages multiple funding sources, such as Reclamation’s Basinwide Salinity Program, to accomplish large scale piping and lining projects that address water-quality, water conservation, and endangered species concerns. The NPS Program, UVWUA and Reclamation have a history of collaborating on projects which benefit selenium reduction goals.

An updated *Lower Gunnison Basin and Grand Valley Selenium Watershed Management Plan* (SeWMP) which meets the EPA’s Nine Key Elements has been submitted to the WQCD and EPA (STF, 2012). The SeWMP identifies the Uncompahgre Project Area as one of the “focus areas” for additional piping or lining of off-farm irrigation laterals and or canals. In addition, piping and lining projects are a major component of the Selenium Reduction Action Plan (SeRAP). Chapter 4 of the Gunnison Basin Selenium Management Program Formulation Document (SMP) developed as part of the conservation measures in the Gunnison Basin Programmatic Biological Opinion (PBO) required by the FWS, clearly states the importance of supporting additional piping and lining projects on the east side of the Uncompahgre Project Area in order to accomplish selenium reduction goals (Reclamation, 2011). In addition, a SMP Science Plan was completed with the help of USGS and the SMP Science Team. The UVWUA continues to be a willing and active partner in all programs of the STF and SMP.

Most off-farm selenium reduction has been accomplished through the Salinity Control Program, as you often find selenium where there is salinity. Salinity control projects are selected based on a competitive process open to the public in the upper basin states of Utah, Colorado, New Mexico and Wyoming. In order for the UVWUA to continue to be competitive in the salt program, it is becoming increasingly important that outside funding be acquired to help off-set the cost of these large, phased projects which reduce off-farm deep percolation and greatly benefit salinity and selenium reduction, water conservation, and endangered species recovery efforts. These irrigation delivery system projects not only provide *off-farm* water quality, water conservation and endangered species benefits, but also create the opportunity for *on-farm* irrigation system efficiency improvements through the development of pressurized deliveries that may result in additional selenium and salinity load reduction.

To date, the UVWUA has a total of 94.2 miles of piping contracted through Phase 8 (Phase 4 funded in part by the NPS Program). Historically, priorities for piping have been determined by finding the appropriate mix of laterals with high, med and low salt loading values that could be combined in order to arrive at a reasonable and competitive cost-effectiveness value (i.e. cost/ton of salt removed) in the Basinwide Salinity Control Program Funding Opportunity Announcement (FOA). All the laterals proposed in this project are located in high to very high selenium soil mobilization potential areas (Appendix B – Map 2).

In addition, the UVWUA is guided by a prioritized plan for irrigation modernization efforts that also result in selenium load reduction and which can be found in the *Uncompahgre Project System Optimization Study*



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(Funded in part by the NPS Program). Recommendations are part of a dynamic planning process for improving the delivery system which take into account the potential for selenium and salinity load reduction. For example, one of the recommendations was to have the upper portion of the EO lateral continue to be served by the Selig Canal, abandon the middle segment which actually serves no water users (7-8 miles), while having those users on the lower portion served by the East Canal via the GK lateral. This recommendation will be implemented under this Phase 9 Lateral Piping proposal and addresses one of the highest known selenium loading sub-basins to the Gunnison River - Peach Valley Arroyo with very few water users and significant issues with regard to delivery system inefficiency.

Waterbody ID	Beneficial Uses	WQ Impairment	TMDL Status
COGUUN04b	Aquatic Life Warm 2 ; Recreation N Agriculture	Selenium	TMDL complete January, 2011.
COGUUN04c	Aquatic Life Warm 2; Recreation E Agriculture	Selenium	TMDL complete January, 2011.
COGUUN12	Aquatic Life Warm 2; Recreation N Agriculture	Selenium	TMDL complete January, 2011.
COGULG04a	Aquatic Life Warm 2; Recreation N; Water Supply, Agriculture	Selenium	TMDL complete January, 2011.
COGULG02	Aquatic Life Warm 1; Recreation E; Water Supply, Agriculture	Selenium	TMDL complete January, 2011.

2.5 - Map of Watershed Location (See Appendix B – Maps 1 and 2).

### 3.0 - Project Description

The technical and science planning teams of the STF and SMP continue to identify the piping or lining of open, earthen irrigation delivery system laterals or canals in Mancos shale soils as the most cost-effective Best Management Practice (BMP) for reducing existing sources of selenium loading in the Lower Gunnison Basin. Other options for controlling selenium in the Lower Gunnison Basin and Grand Valley (e.g. bioreactors) were explored by the STF and Reclamation, but have very high costs associated with them given the benefit to load reduction achieved (Reclamation, 2006). Deep percolation has been identified as the primary mechanism controlling Se mobilization in Mancos shale soils in the Uncompahgre Project Area. If delivery system water is isolated from the surrounding soils through piping, deep percolation will be eliminated and selenium loading will not occur.

This *Uncompahgre Se Control: Phase 9 Lateral Piping* project will replace approximately 11.3 miles of open, earthen irrigation delivery system laterals with closed PVC pipe in order to reduce selenium and salinity loading caused by deep percolation of irrigation water from the off-farm delivery system within the federal Uncompahgre Project Area. Under current assumptions, this effort is projected to reduce from 126-315 pounds of selenium loading and control 3,150 tons of salt per year.

### 3.1 - Environmental and Programmatic Goals





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*Environmental Goal:* Improve water quality in the Uncompahgre and Gunnison Rivers by reducing selenium concentration and load by piping irrigation laterals.

*Programmatic Goal:* Implement project evaluation, outreach and administration.

### 3.2 - Objectives, Tasks and Products (*Costs are presented in the Budget Table*)

#### I. **PHASE 9 LATERAL PIPING CONSTRUCTION & POST PROJECT MONITORING**

Objective 1: Implement post-project monitoring program to determine the effectiveness of piping irrigation laterals at reducing or eliminating deep percolation and selenium load to local streams in the Uncompahgre Project Area and Lower Gunnison River Basin.

- **TASK 1** – SAPP (Completed in Pre-construction Phase)
- **TASK 2** - Collect two years of *post*-project ground water depth and water-quality chemistry data as defined in the SAPP (irrigation season and non-irrigation season).  
Products: Groundwater deep percolation and water-quality chemistry data from wells (e.g. dissolved selenium and salinity); water chemistry and flow data from the monitored lateral proposed for piping.  
Responsible Parties: NPS Director/Sub, STF, and USGS
- **TASK 3** – Upload data to DSN and prepare a water-quality summary report to document changes in deep percolation and selenium concentration and load achieved by the project.  
Products: DSN upload confirmation and water-quality summary report.  
Responsible parties: NPS Director/Sub

Objective 2: Complete design, engineering and clearances for Phase 9 laterals.

- **TASK 4** – Design and engineer Phase 9 laterals.  
Products: Engineering plans and specifications.  
Responsible parties: Reclamation and UVWUA
- **TASK 5** – Conduct cultural resources survey and submit to the State Historical Preservation Office (SHPO) and conduct environmental assessments of impacts associated with the piping project and obtain all necessary environmental clearances as required under the National Environmental Policy Act (NEPA).  
Products: SHPO concurrence letter and Reclamation Finding of No Significant Impact (FONSI)/Categorical Exclusion Checklist (CEC)  
Responsible parties: Reclamation, UVWUA, NPS Director/Sub
- **TASK 6** – Develop and implement a plan for habitat replacement as required by the Salinity Control Program.  
Products: Habitat Replacement Plan (HRP)  
Responsible parties: UVWUA and Reclamation
- **TASK 7** - Document lateral alignment and ROW.  
Product: ROW recorded with local county government(s).  
Responsible parties: UVWUA and Reclamation



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Objective 3 Pipe 11.3 miles of the Phase 9 laterals for selenium and salinity reduction benefits, clean-up construction site and install any necessary fencing.

- TASK 8 - Pipe 11.3 miles of the Phase 9 laterals.

Products: Seepage reduction of 554 ac-ft/year and 126-315 lbs/year of selenium and 3,150 tons/year of salt controlled (Final selenium load reduction target to be determined during SAPP development. Selenium credits claimed by NPS Program and salt credits claimed by Reclamation). Any old lateral alignments will be abandoned and backfilled, project area will be cleaned of construction debris, and landowner fencing will be replaced as needed.

Responsible Party: UVWUA

Objective 4: Increase stakeholder awareness and encourage public involvement in addressing selenium water-quality issues in the basin.

- TASK 9 - Develop a public outreach and education program focused on local selenium water-quality issues.

Products: Newspaper article highlighting project benefits to addressing selenium and salinity water-quality issues; collaborate and coordinate with local entities in distributing education information; articles in annual UVWUA newsletters; presentations at local conferences or other public meetings; public outreach to elected officials; and webpage project highlights.

Responsible parties: UVWUA, NPS Director/Sub, SMP & STF. Cooperating parties: Conservation Districts, Natural Resources Conservation Service (NRCS), Colorado State University Extension (CSU Extension), and Uncompahgre Valley Soil Health Project.

Objective 5: Carry out regular and effective grant administration activities as required under the NPS Program to ensure a successful project outcome.

- TASK 10 – Administer project kick-off meeting and communication with all program funding partners and technical subcommittees; prepare semi-annual reports and submit by March 15 and September 15; track all in-kind match and federal contributions; submit regular reimbursement requests on a quarterly basis; and write final report.

Products: Documentation of project kick-off meeting (e.g. agenda and minutes), progress and semi-annual reports, final report, reimbursement statements, and final report.

Responsible parties: NPS Director/Sub and UVWUA

### 3.3 - Environmental Permits

In accordance with National Environmental Policy Act (NEPA) requirements, Reclamation completed an Environmental Assessment (EA) in 1985 related to lateral piping on the east side of the Uncompahgre Project Area for the purpose of reducing salinity loading. The EA determined “no significant changes in impacts to the human environment would result from implementation of the project.” Reclamation environmental compliance staff from the Western Colorado Area Office (WCAO) in Grand Junction, Colorado, will conduct a re-evaluation of the environmental impacts associated with the Phase 9 piping projects, including NEPA and Endangered Species Act (ESA) coordination and compliance, and wetland inventories.

Colorado River Basin Salinity Control Program 1974 guidelines require that habitat values lost by salinity control projects are mitigated by development or enhancement of replacement habitat with oversight by the FWS. Maps of wetland areas impacted by the project will be provided once NEPA activities commence. The expectation is that a Categorical Exclusion Checklist (CEC) will be completed and if necessary, an EA process will be undertaken. According to the Joint Rule released by EPA and the Army Corps of Engineers



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in March 2014, construction or maintenance of agricultural irrigation ditches are exempt from the need to obtain a CWA Section 404 permit. The UVWUA will work closely with Reclamation to ensure that all necessary permits are in place prior to construction.

### 3.4 - Lead Project Sponsor Qualifications

The UVWUA is the appropriate entity to implement this project because they are a 501(c)(12) not for profit entity eligible for receiving NPS 319 funds. They are contracted by Reclamation to operate and maintain the Uncompahgre Project irrigation delivery system facility and maintain their own workforce to do so. The UVWUA is experienced in managing and constructing large lateral and canal piping and lining projects and employs professional project managers, field superintendents, laborers, and administrative staff. These skilled professionals have first-hand knowledge of the water, soils, canal and lateral systems, experience working collaboratively with land owners in the area, and have demonstrated sound fiscal management of multiple, large selenium and salinity control piping projects. Finally, having UVWUA construct the project means significant labor savings versus hiring a private for-profit construction company, resulting in a greater project scope and therefore greater water-quality benefits.

### 3.5 – BMP Operation and Maintenance

Maintenance of the canal and lateral systems is the responsibility of the UVWUA and is conducted at their expense. Irrigation lateral piping projects reduce required maintenance due to reduced sedimentation, vegetative encroachment, aquatic moss growth and ditch bank stability issues. Piping projects are estimated to have a 50 year or greater economic life and a 75-100 year useful life.

## 4.0 - Coordination Plan

### 4.1 - Lead Project Sponsor and Cooperating Organizations (See Appendix C)

The UVWUA is the grant sponsor and project applicant for this proposal and has extensive experience managing large and small construction projects. The UVWUA manager, financial manager, water masters, and crew foremen interact directly with funding partners and landowners to carry out all aspects of the piping project.

The UVWUA has hired a NPS Project Director, Sonja Chavez de Baca of SC Environmental. SC Environmental will be responsible for project communication, tracking all in-kind, cash, and federal contributions, coordinating education and outreach activities and the monitoring program, and conducting semi-annual and final project reporting. SC Environmental is currently responsible for carrying out the STF's facilitation/coordination duties, monitoring and education and outreach programs and is well-informed of on-going selenium and salinity control activities in the basin.

The STF is a consortium of public and private stakeholders whose mission is, "to evaluate, assess, and actively address elevated selenium issues while maintaining the area's economic viability, quality of life, and agricultural heritage". The SMP, a stakeholder driven group lead by Reclamation, has two goals which include meeting in-stream chronic water-quality standards for selenium in the Gunnison and Colorado Rivers and the recovery of endangered fish species. The STF and SMP are guided by action plans that place great emphasis on canal lining and lateral piping projects to meet specified goals. The UVWUA has been a willing and active stakeholder/partner in both processes.

Reclamation continues to be a strong cooperating partner in local selenium reduction efforts. Reclamation and the UVWUA have significant experience coordinating multiple aspects of 8 previous, separate phased piping and lining projects in the Uncompahgre Project Area. Reclamation will assist with design,



## Nonpoint Source Project Implementation Plan

engineering, NEPA compliance activities, cultural resources clearances, and the coordination of right-of-way issues. In addition, the STF, Reclamation and CO River District will coordinate in carrying out the project water-quality monitoring program through their on-going basinwide selenium water-quality monitoring program in order to minimize duplication of effort and to take advantage of cost-savings through close coordination of on-going sampling programs.

All of the above collaboration, coordination, planning and implementation efforts provide the framework for having an effective process that directly benefits NPS aspects of TMDL implementation in the lower Gunnison Basin.

### 4.2 - Local Support

The Colorado Water Conservation Board (CWCB) has been a supporter of on-going selenium reduction activities in the Lower Gunnison Basin. The CWCB, through the Colorado Species Conservation Trust Fund (SCTF), has provided funding in support of on-the-ground selenium reduction projects and studies in both the Uncompahgre and North Fork sub-basins and has committed to providing \$50,000 of cash match to the proposed Phase 9 lateral piping project. A copy of the purchase order can be provided.

The STF will provide \$4,811 of in-kind services through coordination of the water-quality monitoring program for the Lower Gunnison Basin, utilization of volunteers for water-quality field sampling, assistance with education and outreach, providing a forum for regular public updates on the piping project, and technical assistance from STF experts. Copies of subcontractor invoices can be provided as evidence of support.

There is strong local support from the UVWUA Board of Directors and from shareholders serviced by the UVWUA because of the environmental, economic and delivery system improvement benefits associated with lateral piping projects as demonstrated by receipt of this proposal. The UVWUA will provide \$257,969 dollars of in-kind services to the project via a discounted labor and equipment construction rate for the piping project that is below normal and customary local private rates, as well as other in-kind services related to project management, accounting, education and outreach in the amount of \$10,156 (labor and equipment time sheets will be provided by financial manager). Match will also be provided via local piping distributors via a bulk pipe order discount in the amount of approximately \$189,890 (copy of invoice will be provided).

At this time, federal funding under the Basinwide Salinity Control Program, is unsecured. According to Reclamation, a new Funding Opportunity Announcement (FOA) for the Basinwide Salinity Program will be released on May 1, 2015 with a closing date of July 17, 2015. The UVWUA has been very successful in winning multiple salinity grant awards for piping irrigation laterals as evidenced by the 8 separate, phased piping projects funded by the Salinity Control Program (over 94 miles). If UVWUA projects can remain cost-effective, there is every reason to assume that future awards will continue. It is estimated that a federal contribution of approximately \$2,553,065 of Basinwide Salinity funds will be contributed to this project. Copies of Automatic Standard Applications for Payment (ASAP) receipts for Reclamation Salinity Control Projects can be provided.

### 4.3 - Coordination with Other Projects and Organizations

The entire Phase 9 lateral piping project coordinates with and directly addresses the goals of the Lower Gunnison Basin & Grand Valley SeWMP and the Gunnison Basin SMP. The proposal to pipe laterals will link to recommendations made under the Uncompahgre Project East Side System Optimization Study and



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will compliment on-going piping and lining projects occurring in the Uncompahgre Project Area as part of the Salinity Control Program. Finally, the modernization of the irrigation delivery system provides more reliable water flows that benefit on-farm irrigation water management efforts and provides pressurized delivery systems which allow for the conversion to more efficient on-farm irrigation technology that benefits the farmer, the water, and the soil.

### 4.4 - Similar Watershed Activities

There have been similar lateral piping projects occurring in the Uncompahgre Project Area over the past 15 years (Phases 1-8). The multiple lateral piping construction projects occurring in the Uncompahgre Project Area are part of a greater phased irrigation system modernization effort managed by a single entity – UVWUA – and are therefore not duplicative. Other lateral piping projects are occurring in other sub-basins of the lower Gunnison Basin watershed (e.g. North Fork) under the Salinity Control Program. These separate and on-going efforts are not duplicative, but are beneficial to each and every individual sub-basin with selenium impaired water bodies.

Lateral piping project are one component of a larger selenium control “toolbox” identified in the SeWMP and SMP, including but not limited to: 1) lining of larger canals and laterals, 2) combining larger canals and laterals, 3) applying Polyacrilamide to unlined ditches, 4) lining ponds, 5) avoiding new irrigation associated with new development in selenium problem areas, 6) on-farm soil health BMPs, 7) wise water use education and outreach, and 8) EQIP for on-farm conservation practices that benefit selenium reduction efforts.

## 5.0 – Project Evaluation and Data Management

### 5.1 - SAPP Development

A project specific Sampling and Analysis Project Plan (SAPP) and more refined load reduction targets will be developed by the UVWUA Subcontractor, Sonja Chavez de Baca of SC Environmental, who will be acting as the Project Director. Additional technical assistance will also be provided by the USGS. The SAPP template, available from the NPS Program, as well as recent SAPPs developed for other selenium NPS reduction projects (e.g. N. Fork Se Grant) can be used as a framework and revised for this project as necessary. Data will not be collected and sampling will not be started prior to the SAPP being approved by the NPS Program Coordinator.

### 5.2 – Monitoring Strategy

The UVWUA proposes to monitor the presence and absence of irrigation delivery system deep percolation and to characterize selenium concentrations in groundwater in order to estimate selenium loading before and after implementation of the project. Deep percolation has been identified as the major mechanisms by which selenium mobilization occurs (Wright and Butler, 1993). If deep percolation is eliminated in selenium rich soils, it then follows that selenium mobilization and loading from this source will be reduced.

Implementation of the monitoring program will be done through coordination and collaboration with the STF and their Lower Gunnison Basin Water Quality Monitoring Program. The STF monitoring program is carried out by their subcontractor/coordinator, SC Environmental, and various volunteers. Coordination with the STF and utilization of the same subcontractor ensures that the monitoring program has strong oversight and that costs can remain low. In addition, technical input is being provided by USGS associated with the monitoring program design, QA/QC, data review, and final summary report.



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The goal of the monitoring program will be to document changes in selenium concentration and load with the objective of moving toward the attainment of the in-stream 4.6 ppb chronic selenium water-quality standard. All appropriate methods of data collection and use that are compatible with CDPHE regulations, protocols and analysis tools will be addressed in the SAPP.

The monitoring program will include two years of both pre- and post-project deep percolation and water-quality monitoring in the immediate vicinity of the lateral piping project. The desired length of the monitoring program is based upon previous experience gained from the NPS funded 2009 lateral piping project where a strong need for pre-project baseline data and at least two years of post-project data collection is required to address a lag time in detecting seepage reduction and reduced selenium mobilization following lateral piping.

The groundwater monitoring program will involve placing 3-4 well points in strategic locations around the lateral piping project to monitor changes in deep percolation. Groundwater levels will be monitored at least 12 times per year. A reconnaissance of the area will also be done to locate potential seeps or wetlands down gradient of the lateral in order to further document changes in deep percolation following lateral construction.

### 5.3 – Data Management

Data collected by UVWUA will be uploaded to STORET and made publicly available utilizing the Colorado Data Sharing Network. Data will be managed by SC Environmental with oversight by USGS. Any data, results and analysis of this project will be summarized in a publicly available water-quality summary report written in cooperation with the STF and USGS.

### 5.4 - Models

Seepage rates for the laterals were determined in earlier studies done by Reclamation (Revised Uncompahgre Project Salt Loading Summary, 2006). The Hydro-salinity Model uses measured seepage rates and salinity concentrations to estimate salinity reduction. The second model for calculating selenium load reduction comes from the Montrose Arroyo report prepared by USGS (Butler, 2001) and documents a selenium to salinity loading relationship. Because of the huge variation in soil characteristics in the Uncompahgre Valley and the complexity of groundwater hydrology and selenium mobilization pathways, STF technical experts suggest using a range of potential selenium reduction associated with the piping project (e.g. 0.04 to 0.08 lbs/ton of salt removed). It is expected that selenium reduction targets will be further refined in the SAPP development phase (currently underway).

## 6.0 - Budget

6.1 - Budget Table – See Excel File.

## 7.0 - Public Involvement

### 7.1 - Process for Public Involvement

UVWUA will work closely with local entities to ensure stakeholder involvement in the project and to educate the public about local selenium water-quality issues and opportunities to address non-point source pollution. UVWUA will work with local media outlets to publish a newspaper article(s) highlighting local, state and federal collaboration in carrying out this selenium and salinity reduction project and the importance of addressing other non-ag sources of selenium loading so that selenium reduction gains are not negated by new sources.



## Nonpoint Source Project Implementation Plan

In order to minimize duplication of effort and maximize public awareness, the UVWUA will support and participate in on-going education and outreach efforts being conducted by other local entities. Local activities that UVWUA can take part in include for example, a Children's Natural Resource Festival sponsored by Shavano Conservation District (CD), irrigation water management seminars sponsored by Delta and Shavano CD's or CSU Extension, STF and SMP outreach to local land use planners and elected officials, collaborating in on-going research or studies being conducted by the STF, and the Uncompahgre Valley Soil Health Conference sponsored by the Delta County Economic Development.

Stakeholder participation will also be accomplished via updates at public meetings, newsletter articles, and STF webpage highlights. Project updates will be given at STF and SMP quarterly public meetings and annual UVWUA shareholder meetings. The UVWUA will publish an article(s) highlighting on-going efforts to address selenium and salinity in their annual newsletter to their 3,500 customers. The STF has agreed to highlight the Phase 9 lateral piping project on their website via a project photo album and summary. Finally, the UVWUA regularly hosts Uncompahgre Project field-trips/tours and can use these opportunity to educate the public about selenium and salinity water-quality issues.

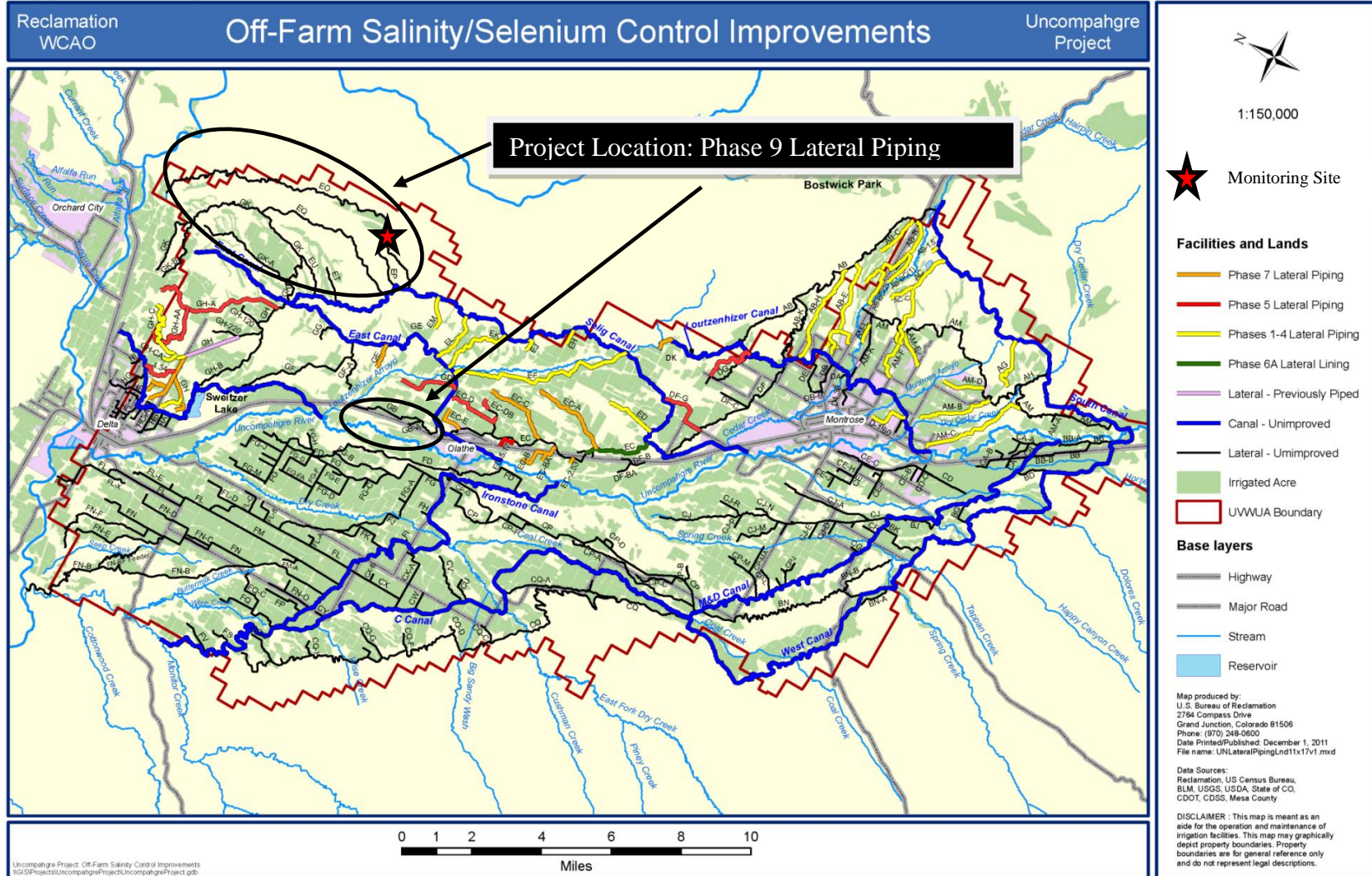
### Appendix Contents

- A) 2015 Budget Table – Appendix A: See Excel Workbook as separate attachment.
- B) Project Map – Appendix B
- C) Lead Project Sponsor and Cooperating Organizations – Appendix C
- D) Evaluation Table – Appendix D
- E) Application Signature Page – Appendix E



### Nonpoint Source Project Implementation Plan

#### Appendix B (Map 1) - NPS Project Location

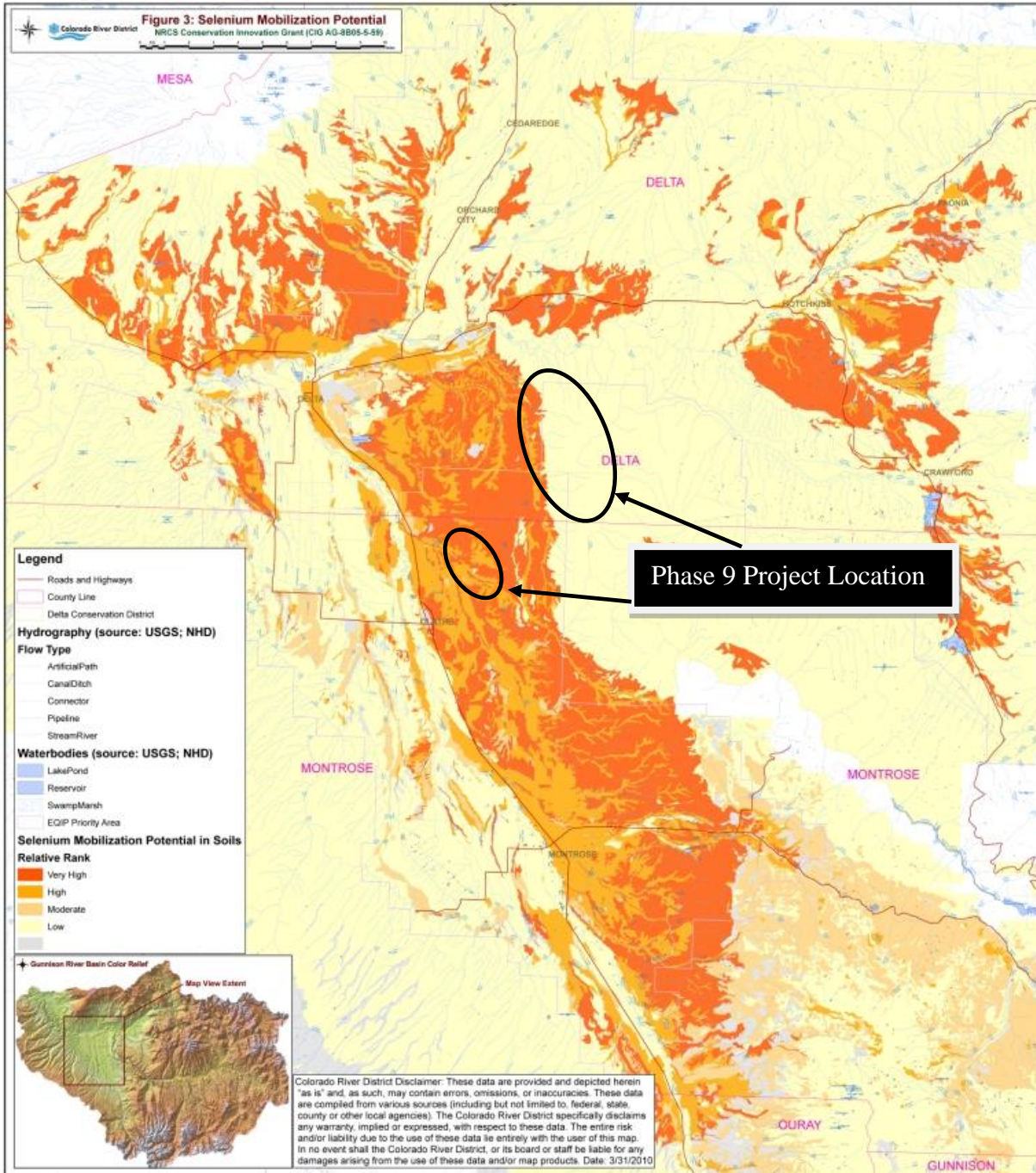






# Nonpoint Source Project Implementation Plan

## Appendix B (Map 2) - Se Soil Mobilization Potential and Project Location.





## Nonpoint Source Project Implementation Plan

### Appendix C - Lead Project Sponsor and Cooperating Organizations

<b>Lead Sponsor</b>			
Agency Name	Uncompahgre Valley Water Users Association		
Agency Address	601 N. Park Avenue		
Role/contribution	Project Sponsor & Contractor		
Contact Person	Steve Fletcher, Manager	Telephone	970-249-3813
E-mail address	<a href="mailto:sfletcher@montrose.net">sfletcher@montrose.net</a>		

<b>Cooperators</b>			
Agency Name	Gunnison Basin & Grand Valley Selenium Task Forces		
Agency Address	114 Sandpiper Trail, Gunnison, CO 81230		
Role/contribution	Project Collaboration		
Contact Person	Sonja Chavez de Baca	Telephone	970-641-8927
E-mail address	<a href="mailto:gbstf@roadrunner.com">gbstf@roadrunner.com</a>		

<b>Cooperators</b>			
Agency Name	US Bureau of Reclamation		
Agency Address	2764 Compass Dr., Suite 106, Grand Junction, CO 81506		
Role/contribution	Project Collaboration		
Contact Person	John Sottolare (Salinity Coordinator)	Telephone	970-248-0640
E-mail address	<a href="mailto:jsottolare@usbr.gov">jsottolare@usbr.gov</a>		

<b>Cooperators</b>			
Agency Name	Colorado Water Conservation Board		
Agency Address	1313 Sherman Street, Rm 721, Denver, CO 80203		
Role/contribution	Project Collaborator		
Contact Person	Steve Miller	Telephone	303-866-3441 Ext.3228
E-mail address	<a href="mailto:steve.miller@state.co.us">steve.miller@state.co.us</a>		

<b>Cooperators</b>			
Agency Name	Colorado River Water Conservation District		
Agency Address	P.O. Box 1120, Glenwood Springs, CO 81601		
Role/contribution	Project Partner		
Contact Person	David A. Kanzer	Telephone	970-945-8522 Ext. 224
E-mail address	<a href="mailto:dkanzer@crwcd.org">dkanzer@crwcd.org</a>		



## Nonpoint Source Project Implementation Plan

### Appendix D - Section 5.2 Evaluation Table

<b>Environmental Goal:</b> Improve water quality in the Uncompahgre and Gunnison Rivers by reducing selenium concentration and load by piping irrigation laterals.			
<b>Programmatic Goal:</b> Complete project evaluation, outreach and administration.			
	<b>Responsible Party</b>	<b>Products or Outcomes</b>	<b>Measures of Success</b>
<b>PHASE 9: CONSTRUCTION &amp; POST-PROJECT MONITORING</b>			
<b>Objective 1:</b> Implement a post-project monitoring program to determine the effectiveness of piping irrigation laterals at reducing or eliminating deep percolation and selenium load to local streams in the Uncompahgre Project Area and Lower Gunnison River Basin.			
<b>Task 1:</b> Develop SAPP (Completed under contract for pre-project activities)	Sub/Project Director (PD), STF, USGS	1) SAPP 2) Load reduction target	1) SAPP implementation w/minimal modifications 2) Load reduction target accepted by all parties
<b>Task 2:</b> Collect 2 years of post-project monitoring data	Sub/PD, STF	1) Post-project data set	1) Successful collection of data outlined in SAPP
<b>Task 3:</b> Upload data to DSN and prepare final water-quality summary report	Sub/PD, STF	1) Documentation of data trends 2) Data storage tool (DSN)	1) WQ summary report 2) Trend toward standard attainment of 4.6 ppb 3) Data uploaded to DSN prior to end of contract
<b>Objective 2:</b> Complete design and engineering for Phase 9 laterals.			
<b>Task 4:</b> Design and engineer lateral construction	Reclamation & UVWUA	1) Engineering plans and specification	1) Approved engineering plans and specs
<b>Objective 3:</b> Obtain project clearances including cultural resources and NEPA, and conduct habitat replacement (HR) and right-of-way (ROW) documentation.			
<b>Task 5:</b> Conduct cultural resources survey and environmental assessment	Reclamation, UVWUA, Sub/PD	1) Cultural resources survey submitted to SHPO 2) Environmental assessment	1) SHPO approval 2) Approved FONSI/CEC
<b>Task 6:</b> Develop HR plan and implement	UVWUA, Sub/PD	1) HR plan 2) HR constructed	1) Approved HR plan 2) HR complete and approved



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<b>Task 7:</b> Document lateral alignment and ROW	Reclamation & UVWUA	Document lateral alignment and ROW	1) ROW submitted to local government(s)
<b>Objective 4:</b> Pipe 11.3 miles of the Phase 9 laterals for selenium (and salinity) reduction benefits, clean construction site and install any necessary fencing.			
<b>Task 8:</b> 11.3 miles piped	UVWUA	1) 11.3 miles of open laterals in closed pipe	1) All pipe installed according to plans and specs with minimal modifications
<b>Objective 5:</b> Increase stakeholder awareness and encourage public involvement in addressing selenium water-quality issues in the basin.			
<b>Task 9:</b> Develop public outreach and education program focused on Se	UVWUA, Sub/PD, STF and SMP Work Group	<ol style="list-style-type: none"> <li>1) One newspaper article</li> <li>2) Two public presentations</li> <li>3) Two annual newsletter updates</li> <li>4) Two supported public outreach events</li> <li>5) Two meetings w/local elected officials</li> <li>6) One web-page</li> </ol>	<ol style="list-style-type: none"> <li>1) Copy of newspaper article</li> <li>2) Documentation of two public presentations</li> <li>3) Copies of annual newsletters</li> <li>4) Documentation of meetings with planners or elected officials</li> <li>5) Link to website w/project highlight</li> </ol>
<b>Objective 6:</b> Carry out regular grant administration activities as required under the NPS Program to ensure successful project outcome.			
<b>Task 10:</b> Administer project kick-off mtg and communication; prepare semi-annual and final reports; track expenditures, in-kind, cash match, and federal contributions	UVWUA, Sub/PD, and STF	<ol style="list-style-type: none"> <li>1) Documentation of project kick-off</li> <li>2) Eight semi-annual prepared &amp; submitted</li> <li>4) Expenditures, match and federal contributions documented</li> <li>5) Final report</li> </ol>	<ol style="list-style-type: none"> <li>1) Project start-up and other deadlines met</li> <li>2) Semi-annual reports &amp; reimbursement requests approved with minimal modifications</li> <li>3) Final report approved</li> </ol>

### Appendix E – Applicant Proposal Signature Page



## Nonpoint Source Project Implementation Plan



Colorado  
Department  
of Public Health  
and Environment

### Nonpoint Source Program Application Implementation Project Proposal and PIP

By signing and submitting the attached application, the authorized official agrees that the information provided in this application is, to the best of the applicant's knowledge and based on reasonable inquiry, true, accurate and complete.

Print Name and Title of Authorized Official: Steve L. Fletcher, Manager

Signature of Authorized Official: [Handwritten Signature] Date 12/30/14