

# EXHIBIT A

## Scope of Work

**WATER ACTIVITY NAME – Animas River Diversion Headgate Monitoring Study**

**GRANT RECIPIENT – Animas Consolidated Ditch Company**

**FUNDING SOURCE – Basin Account Water Supply Reserve Account**

## INTRODUCTION AND BACKGROUND

The Animas Consolidated Ditch Company owns and operates the Animas Consolidated Ditch, which serves the west side of the Animas River Valley between Baker's Bride and Durango. The ditch company has been in operations for over 100 years and has a diversion water right of 86 cfs which provides irrigation and other water uses to roughly 1,600 acres. The other ditch companies provide water for about 1,400 irrigated acres.

Most (98%) of the water diverted from the Animas River for beneficial use in the Animas Valley occurs between Baker's Bridge and Durango and occurs within the ½ mile section of the river that is the proposed study area. This area needs to be monitored for headcutting impacts due to the excessive large gravel extraction operations during the late 1900s that occurred in the 5 miles south of Bakers Bridge to Trimble Lane. The high removal rate greatly exceeded the replenishment rate of gravel by the river, so there are significant headcutting in the thalweg. These are known impacts but have yet to be quantified. This monitoring study will set the control points needed to quantify any changes in the river channel.

## OBJECTIVES

The project objectives are to install control points along a specific river stream section, delineate river cross sections, collect and analyze data. The data collection shall be made available for future studies to evaluate potential changes in the Animas River.

## TASKS

Provide a detailed description of each task using the following format.

### **TASK 1 – Site Assessment**

#### Description of Task

Prior to the site assessment, research studies and permits for any historic elevation data. The site visit attendees are a surveyor, engineering consultant(s), members of the Animas Consolidated Ditch Company and members of the Animas River Valley Ditch and Water Company (owns and operates the Reid Ditch). The group will first determine the area of interest for the study. Next the group will establish the permanent survey control points locations along the east and west banks of the Animas River for the purpose of initial channel mapping and the continued monitoring of the river channel. Discussions with surveyor on access, feasibility to the site and other constraints will determine the location of the remaining cross sections.

#### Method/Procedure

Common engineering and surveying principles and practices will be employed to determine the locations of the control points and cross sections. The control points will be established on the Colorado State Plane Grid system South Zone 503, NAD 1983, NAVD 1988.

# EXHIBIT A

## Deliverable

The major deliverables will be a site layout of cross section locations with latitude and longitude values for each control points' location.

## **TASK 2 – Surveying**

### Description of Task

The second task will be for the surveyor to start developing the cross sections for the river. The surveyor will survey field data collection of the existing Animas River channel topography and the preparation of channel cross sections above and below the headgates for the Animas Consolidated Ditch Company and the Reid Ditch.

### Method/Procedure

The surveyor will use common principles and practices to conduct the work.

## Deliverable

The major deliverables will be a generated map with the cross section locations, plan and profiles views of each cross section, and provide latitude and longitude values for each section.

## **TASK 3 – Research historic data**

### Description of Task

The third task will be for the engineer to conduct a research study to find, locate and collect all applicable existing data for the proposed project area. Having a historic record will generate a Animas River Valley wide understanding of the current and past conditions of the river.

### Method/Procedure

The engineer will use common principles and practices to conduct the work.

## Deliverable

The major deliverables will be a collection of data that is compiled in precise and concise manner to be reference in the future.

## **REPORTING AND FINAL DELIVERABLE**

### Reporting

The applicant shall provide the CWCB a progress report every 6 months, beginning from the date of the executed contract. The progress report shall describe the completion or partial completion of the tasks identified in the scope of work including a description of any major issues that have occurred and any corrective action taken to address these issues.

### Final Deliverable

At completion of the project, the applicant shall provide the CWCB a final report that summarizes the project and documents how the project was completed. This report may contain photographs, summaries of meetings and engineering reports/designs.

# EXHIBIT A

Animas Consolidated Ditch Company and partners  
Headgate Monitoring Study Budget

Attachment to Scope of Work

1/3/2013

Task	Description	Total Cost	WSRA Grant			Total WSRA Grant	Total Matching
			Technical	Construction	Other Direct Costs		
1	Site Assessment	\$3,200	\$2,000	\$0	\$0	\$2,000	\$1,200
2	Survey field data collection	\$13,140	\$10,500	\$0	\$0	\$10,500	\$2,640
3	Research historic data	\$2,160	\$2,000	\$0	\$0	\$2,000	\$160
	Subtotals	\$18,500	\$12,500	\$0	\$0	\$14,500	\$4,000
	Total						\$18,500

Labor Distribution		Technical							
		Principal Engineer		Associate Engineer I		Surveyor Field Work		Surveyor Professional Services	
		\$120	Subtotal	\$80	Subtotal	\$125	Subtotal	\$100	Subtotal
Task 1	Site Assessment	6	\$720	6	\$480	8	\$1,000	10	\$1,000
Task 2	Survey field data collection	0.5	\$80	1	\$80	76	\$9,500	35	\$3,500
Task 3	Research historic data	3.5	\$420	21.75	\$1,740	0	\$0	0	\$0
	Total		\$1,200	Total	\$2,300	Total	\$10,500	Total	\$4,500

Total

- \* The allocation of costs between each component may change depending upon the actual effort for each component.
- \* Billing rates will remain fixed or decreased.
- \* Contractors bld as one job not by individual tasks.

## TASK COMPLETION SCHEDULE

Tentative Task Completion Schedule	Completion Date
Task 1 - Site Assessment	31-Aug-13
Task 2 - Survey field data collection	31-Oct-13
Task 3 - Research historic data	31-Oct-13
Final Report	20-Nov-13



# EXHIBIT A Site Location Map



Harris Water Engineering, Inc.  
954 E. 2nd. Ave., Ste. #202  
Durango, CO 81301  
(970)-259-5322

Animas River Diversion Headgate  
Monitoring Study

WRSA Grant Application

Animas Valley, CO  
Courtesy La Plata County GIS  
Not to Scale  
Sec 25, T37N, R9E, NMPM



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## Map Sources:

Base Map - Durango East and Hermosa Quads, USGS  
 Rivers and Streams - CDOW  
 Roads - La Plata County GIS  
 ACD Alignment and Structures - San Juan Resource  
 Conservation & Development and USBR, June 2005  
 Irrigated Areas - BWC modified from CDSS

**Animas Consolidated  
 Ditch Headgate**

Coon Creek

Hermosa Creek

Animas River

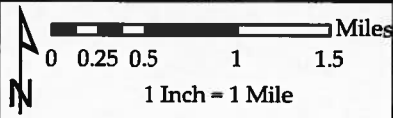
1 Mile to Durango, CO

## Map Legend

-  Ditch Headgate
-  Animas Consolidated Ditch
-  River/Stream
-  US Highway
-  County Road
-  Irrigated Area (=1,600 Acres)



555 RiverGate Lane, Suite B4-82  
 Durango, CO 81301  
 (970) 385-2340ph 385-2341fx  
[www.BikisWater.com](http://www.BikisWater.com)



Designed by: MJK  
 Checked by: EAB  
 Date: 12/31/2012  
 Scale: 1:63,360

**Animas Consolidated  
 Ditch Company  
 WSRA Grant Application**

**Exhibit  
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