

February 2016

Sweetwater County Conservation District (SWCCD)
(District)

Bitter Creek Sampling and Analysis for TMDL Preparation, Watershed
Assessment and Water Quality Improvements

The project was conducted in cooperation with the State of Wyoming, Sweetwater County Commission, Wyoming Landscape Conservation Initiative, Bureau of Land Management, Wyoming Department of Environmental Quality, City of Rock Springs, Bitter Creek Watershed Advisory Committee and the United States Environmental Protection Agency, Region 8.

Project Number: 0N701-NPS2012A

Grant Number: C9008630-07, 12

1.0 Executive Summary

Project Title: Bitter Creek Sampling and Analysis for TMDL Preparation, Watershed Assessment and Water Quality Improvements

Project Start Date: April 5, 2012
Project Completion Date: December 31, 2015

Budget Summary

Budget Summary	
Total 319 or 205(j) Funds Awarded	\$72,000.00
Total 319 or 205(j) Funds Expended	\$67,876.40
Total Nonfederal Match Commitment	\$ 51,237.59
Total Nonfederal Match Expended	\$ 44,273.05
Total Project Budget	\$ 123,237.59
Total Project Expenditures	\$ 111,752.00

Summary of Accomplishments

The Sweetwater County Conservation District (SWCCD) and partners are working to address not only water quality but also water quantity and the general health of the 187,000-acre Bitter Creek watershed. It is the purpose and role of SWCCD to identify and prioritize local soil and water resource concerns, and connect the resource users to educational, technical, and financial assistance to implement conservation practices and technologies. To continue [water quality sampling and analysis](#) sponsored by the District is fundamental to the role of water resource issues that the District is aware of within the Bitter Creek and Killpecker Creek watersheds.

The District conducted water quality monitoring on Bitter and Killpecker Creeks from 2012-2015. SWCCD collected water quality data for Total Maximum Daily Load (TMDL) development and baseline reference and collaborated with WDEQ in this process. This included increasing the baseline data, especially flow data, which helped achieve a more realistic model for the TMDL development. The District provided education and outreach to increase public knowledge of water quality and nonpoint source pollution. SWCCD held monthly meetings and discussed water quality impairments within Bitter and Killpecker Creeks. The District annually discussed the status of the TMDL and collaborated with other agencies at the Bitter Creek Watershed Advisory Group (BKWAG) meeting. District staff administered the project and submitted all reporting during the course of the project. SWCCD Board and staff strived to create awareness of watershed conditions within the community, and believe it is crucial to developing and implementing mitigation plans which aim to reduce E. coli and chloride concentrations in the streams. SWCCD continues to maintain contacts with people and agencies within the watershed and solicit participation and support to aid the TMDL development process.

Section 2.0 Background

WDEQ scheduled development of TMDLs for the Bitter and Killpecker Creek impairments to begin in 2012. While a goodly amount of water quality data and instantaneous flow data have been collected to evaluate and confirm the impairments to date, the long length of the impairments and large size of the watershed relative to the number of monitoring sites established minimizes conclusions drawn from the dataset for some areas. Insights attained from the monitoring to date provide an opportunity to supplement the data and test conclusions with additional monitoring. For instance, examination of a potential reduction in *E. coli* concentrations observed in 2010 at several sites within Rock Springs, possibly resulting from BMP implementation could be accomplished. The monitoring proposed within the project is necessary to augment the monitoring done in the watershed to date, in order to assess any changes/improvements in water quality since previous monitoring was conducted and collect new data, so that WDEQ bases development of TMDL criteria on the most accurate watershed data. Additionally, collection of continuous flow data as proposed at selected sites (as coordinated with WDEQ) will allow insight into flow loading that is critical to accurately developing the TMDL. Moreover, as TMDLs are continually revisited (per WDEQ guidelines) and as future development and water quality changes may be observed within the watershed, a more robust 2003-2012 baseline water quality dataset will enhance the ability to make appropriate management decisions for the good of the water resource.

Project partners included: Bitter and Killpecker Creek Watershed Advisory Group (BKWAG) Wyoming Department of Agriculture, Sweetwater County Board of County Commissioners, Wyoming Landscape Conservation Initiative, Mayor and City Council of Rock Springs, City Public Works and Parks Department, Local BLM and DEQ Offices and industry.

The project is significant as it helps to provide continue awareness and gives updated information on the watershed impairments to City and County personnel. The project promotes involvement as the TMDL process goes forward.

Numerous reports were developed and included in the attachment section 12.0

General Watershed Information:

The elevations within the project area range from 6,150 ft. AMSL at the downstream end of Bitter Creek to approximately 8,700 ft. AMSL in the upper reaches of the Bitter Creek watershed. The population estimate in the area included in this project is about 43,806 (Sweetwater County 2010 census). The climate is considered high arid desert with an average annual precipitation of 8.7” and an average annual temperature of 45° F with average extremes of 27° in the winter and 80° in the summer.

The surficial geography consists of gently rolling foothills, clay buttes, and vast areas of relatively flat desert land. Streams have associated alluvial deposits as flood plains and terraces. Most soils found in the watershed are underlain by soft bedrock of sedimentary origin; sandstone and shale are more susceptible and prone to wind erosion than water erosion. Loam and sandy loam soil textures without adequate vegetated cover or litter are highly susceptible to wind erosion. When above normal precipitation or intense storm events occur on the soil, there is water erosion associated with the steeper sloped soils. These soils are well to excessively drained, and range

from shallow to very deep. Bedrock may occur within 10 inches of the surface to deeper than 60 inches. Soil textures are sandy, coarse loamy and loamy. Permeability is moderate to rapid. Within the project area, private, municipal, state, and federal land are found with some of the lands within these watersheds as “checkerboard”, effectively dividing the land ownership between private interests, railroad, and BLM lands that are often leased for a variety of uses. The project area is predominately within the metropolitan development area of the City of Rock Springs, WY and the immediate outlying areas. Killpecker Creek (WYGR 14040105-066) and Bitter Creek (WYGR 14040105-023) are streams located in Sweetwater County.

Section 3.0 Goals and Outcomes

The project goals were to address fecal and chloride water quality impairments within the Bitter and Killpecker Creek watersheds through monitoring, public education and outreach, and by developing partnerships, and information sharing.

This was accomplished by collecting water quality data for TMDL development and baseline reference. The desired environmental outcomes for this project were **1)** additional water quality data that will help confirm and refine knowledge about the Bitter and Killpecker Creek impairments, **2)** additional water quality data to assist with upcoming TMDL development, **3)** additional water quality data that will serve as a baseline to help evaluate the effectiveness of future watershed restoration efforts, **4)** increased public knowledge of water quality and nonpoint source pollution due to public education and outreach activities, **5)** improved partnerships with local governments and agencies due to outreach efforts, and **6)** increased information-sharing about water quality monitoring sampling results and TMDL planning information with SWCCD, BKWAG, local industry, other interested entities, and the public. The project will continue to strive to create a sense of watershed stewardship and community pride in clean water--a social goal from previous grants.

Bacteria and chloride sampling were conducted in the Bitter and Killpecker Creek watersheds to review the impaired status of these two streams, as designated on the Wyoming Department of Environmental Quality (WDEQ) 303d List of Impaired Waters. This designation places the impaired water in line for development of a Total Maximum Daily Load (TMDL) calculation under WDEQ authority. Initial project sampling was conducted to verify the impairment findings. The specific purpose of subsequent sampling rounds has been adapted to meet changing monitoring goals over the course of the project. After being delayed during 2014 due to WDEQ workloads, TMDL development for the impairments is scheduled to begin in 2015.

The TMDLs will be calculations of the maximum E. coli and chloride loads for the impairment reaches which still allow the State’s water quality standards to be met. The calculations are based on loading contributions from both point sources and nonpoint sources, and incorporate a margin of safety. The BKWAG studies have identified no point source contributions to the listed impairments. TMDLs will provide goals for implementation of management practices within the watershed.

1. How did you evaluate the success of your project in meeting its goal and outcomes?

The project goal was to collect water quality and quantity (flow) data within the Bitter and Killpecker Creek WDEQ listed impairments, to verify conclusions reached in previous sampling and studies, and to provide data to assist WDEQ development of TMDLs for the impairments. Additional goals included public education and outreach to generate awareness of, and input on, water quality issues and the TMDL process, and to develop partnerships and information sharing for the project.

Project monitoring was completed successfully, occurring at the number of sites, and in the manner proposed, within the project SAP. Water quality and flow data was collected which will be utilized in the WDEQ TMDL development process and enhances the existing data set. WDEQ has complimented the District on the robust nature of the data set compiled toward TMDL development.

During the project, partnerships were successfully developed and enhanced between the District, consultants, landowners, and WDEQ personnel. Information sharing between these groups was conducted openly and enhanced the overall understanding of the watershed conditions, monitoring, and monitoring results for all groups involved. Coordination between the District, EDE Consultants, and the WDEQ prevented duplication of effort and helped to simplify project work. During the project contacts with local government personnel were maintained which furthered awareness of water quality concerns to the community, and raised awareness for the need to implement BMPs where and when possible within the watershed.

2. Were there any unexpected or secondary benefits of the project?

Secondary benefits of the project include collection and compilation of site condition data and photographs as well as water quality data including field parameters and inorganic parameters in addition to the E.coli and Chloride data. This provides a detailed baseline data set over the project timeframe and provides a valuable reference for possible future studies evaluating geomorphologic changes or water quality/quantity conditions in the Bitter Creek watershed.

Section 4.0 Task Activities

Task #	Task Title	Task Description	Actual Deliverables
1	Project Administration	Administer the project, submit reimbursement requests, filing,	Provided timely reports and reimbursement requests to WDEQ.
2	Water Monitoring and Analysis	Conducted water quality sampling and monitoring on Bitter and Killpecker Creeks. Monitoring of flow data. Support TMDL development and evaluate future watershed restoration efforts	<p>Conducted 2012 Spring and Fall Sampling Conducted 2014 Spring and Fall Sampling Conducted 2015 Spring and Fall Sampling Provided water quality sampling reports from 2012 -2015.</p> <p>Added 2015 Fall Sampling by amendment – transferred funds from Admin and leftover monitoring money from previous years to the fall 2015 sampling round.</p>
3	Community Meetings	Conduct public meetings and update the community on the project	<p>Held public meetings every year of the project.</p> <p>Provided information to the Rock Springs City Council, The BKWAG, the Sweetwater County Board of Commissioners</p>
4	Recreation and Pet Waste/Urban Runoff Campaign	Develop and Implement information and education programs for RV Waste and storm drains	<p>Provided magnetic book markers for the SW County Home Show. (1,000 magnetic book markers) (clean water theme/storm drain theme handouts, along with current TMDL status and information)</p> <p>Provided 750 “Clean Water” hand sanitizers at the Home Show and Ranch Day for Kids.</p> <p>Attended the 2014 SW Resource Rendezvous Days at the SWC Events Complex- Keeping the Land Healthy – distributed hand sanitizer and bracelets. “Healthy Land Healthy Water – Everything is connected”</p> <p>Purchased 3- DOGIPOT pet stations and supplies for the new section of the Bitter Creek Dog Park in Rock Springs.</p> <p>RV camp waste disposal brochures were designed, printed and distributed at the local chambers, the National High School Rodeo Finals. (1,000 flyers)</p> <p>Pet Waste Flyers were designed, printed and inserted in the Rocket Miner Newspapers (7,500 flyers)</p> <p>“After the Storm” education flyers were designed, printed and inserted in the Rocket Miner newspapers, and website. (7,500 flyers)</p>

5	Community and School Activities	Newsletter Website Information	Distributed 350 newsletters via hard copy to landowners and on the swccd.us website Ordered totes for the Spring 2016 Home Show at the events complex. "Clean Water Matter" will be printed on the totes and coloring books for kids.
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Section 5.0 BMP Implementation

Not Applicable

Section 6.0 Monitoring Results

The watershed segments monitored were primarily: 1) Killpecker Creek from the confluence with Bitter Creek in Rock Springs upstream to the Highway 191 crossing, and 2) Bitter Creek from approximately the downstream extent of the town of Rock Springs, upstream to the approximate upstream limits of the town of Point of Rocks. Killpecker Creek is listed as a Class 3B stream, the impaired reach flows primarily through urban development at the north edge of Rock Springs, and it is generally perennial in the impaired reach. Bitter Creek is a Class 2C stream, and primarily perennial in the impaired reach as it flows through Rock Springs and at Point of Rocks, but has been observed during the study to be ephemeral in a section of the impairment upstream of Rock Springs but downstream of Point of Rocks.

SWCCD conducted water quality monitoring at select sites on Bitter and Killpecker Creeks and reported the results of the monitoring conducted. Monitoring activities collected *E. coli*, chloride, and flow monitoring data at select project sites to confirm and refine information about impairments, advance and support TMDL development, and provide additional baseline data to help evaluate future watershed restoration efforts.

Section 6.0 Monitoring Results

- *If your project conducted water quality monitoring, this section should include a brief discussion of the monitoring strategy, the methods used, and a summary of the results. What were the monitoring objectives?*
- *Were these objectives met?*
- *Summarize the sampling and analysis methods used.*
- *Describe any models used to analyze the data.*
Provide a QA/QC report describing the quality and credibility of the data

Sampling for this project was conducted as a result of WDEQ 303d chloride and bacteria impairment listings on Bitter and Killpecker Creeks and pending TMDL development. The sampling purpose was to verify conclusions reached in previous sampling and studies and to collect surface water quality and quantity information to support WDEQ TMDL development.

The sampling design focused on sampling selected sites that could provide information to verify or refute prior conclusions and provide paired water quality/flow relationships.

Sampling was conducted according to protocols outlined in the WDEQ-WQD “Manual of Standard Operating Procedures for Sampler Collection and Analysis” and in accordance with the SOP presented in Appendix F of the project SAP.

Generally, sampling was conducted by collecting grab samples from the streams in sterile bottles placed on ice and transported to the project labs. Field parameters were taken in-situ. Flow measurements were taken using an impeller type velocity probe or cutthroat flume as dictated by site/flow conditions.

- Water quality grab samples were collected in a synoptic fashion at up to 23 sites, once each in May, June, and September. Streams were sampled upstream to downstream in a single 24 hour period to provide a snapshot of concentrations in specific stream reaches as selected with WDEQ input.
- Site stream flow velocity data was collected at each water quality sample site. Flow/depth ratings were updated or derived at all sites using survey data collected during site visits and computer flow/depth/slope modeling.

Paired flow-concentration data points (loading) were developed from the sampling results that will be used by WDEQ in defining the TMDLs. 39 paired chloride and 39 paired E. coli data points were attained for Bitter Creek and 27 paired chloride and 27 paired E. coli data points were collected within Killpecker Creek. These data increased the paired data points available for TMDL development in the watershed by 12% in Bitter Creek and 21% in Killpecker Creek for E. coli, and by 39% in Bitter Creek and 40% in Killpecker Creek for chloride.

Chloride samples from Killpecker Creek exhibited some of the highest chloride concentrations seen at those locations during the entire study since 2004. Killpecker Creek, while not listed as impaired for chloride, continues to function as a significant source of chloride to Bitter Creek. E. coli bacteria samples exceeding the standards continue to indicate potential source areas on Bitter Creek within Rock Springs City limits, on Killpecker Creek within Rock Springs City limits, and potentially on Bitter Creek in the general vicinity of the community of Point of Rocks. All of these areas that exhibit elevated levels of E. coli bacteria are within, and continue to confirm, the current bacteria impairments listed for Bitter and Killpecker Creeks.

The monitoring objectives were to collect synoptic water quality and quantity (flow) data within the Bitter and Killpecker Creek WDEQ listed impairments, to verify conclusions reached in previous sampling and studies, and to provide data to assist WDEQ development of TMDLs for the impairments. These objectives were met as detailed in the preceding discussion.

Sampling and analysis methods for the project were as described in the project SAP. Analysis of E. coli samples were conducted by Wyoming Analytical Laboratories, Inc. in Rock Springs. Analysis of chloride/inorganic water quality samples were conducted by Wyoming Department of Agriculture Analytical Services in Laramie.

The water quality data results were entered into an Excel spreadsheet containing all the data collected for the SWCCD Bitter Creek watershed project since 2004. Tables and graphs of the data were prepared in Excel which allow comparison with the historic data set. All data was transferred to WDEQ for their use in TMDL development. EDE Consultants prepared a project report detailing the 2012 monitoring and providing assessment of the data collected.

Project QA/QC was conducted as described in the project SAP to ensure the integrity of the data collected during the monitoring project. Sampling procedures QA/QC was conducted to assure proper sampling protocol was followed as well as instrument calibration procedures during sampling collection and transport. QA/QC review of the lab data reports was conducted to verify that lab procedures including sample identification, analysis dates, holding times, reporting limits, duplicates, and blanks met criteria. Review of the lab reports and data sets indicate that applicable QA/QC parameters were met and that the data is credible data.

BK Project Reports can be found online, along with graphs, charts and pictures on our website at - <http://www.swccd.us/bitter-creek-watershed.php>

SWCCD had great success with the implementation of their information/education activities. The District received kudos (by email) from the Wyoming Association of Conservation Districts and Wyoming Fair Board for their pet waste campaign and dog poo flyer during the National High School Rodeo Finals in Rock Springs. (summer 2015)

Section 7.0 Partners

Partners	Contributions
State of Wyoming Wyoming Department of Agriculture	Grant Match Money
Sweetwater County Board of County Commissioners	Grant Match Money Letter of Support
Wyoming Landscape Conservation Initiative	Letter of Support
Bureau of Land Management	Project Support/BKWAG Meeting Support Technical Expertise
Wyoming Department of Environmental Quality	Project Lead and Support Technical Expertise
City of Rock Springs	Project Support /BKWAG Meeting Support
City of Rocks Springs Parks and Recreation Department	Pet Waste Support
Bitter Creek Watershed Advisory Committee (BKWAG)	Project Support Technical Expertise
Larry Folks, Landowner, Salt Wells Ranch	Project Support
The UPS Store	Printing
Rocket Miner Newspaper	Articles regarding the Bitter Creek and project
Bottom Line Marketing	Marketing supplies

Environmental Design Engineering (consultant)	Water Quality Sampling Data & Analysis reporting and interpretation BKWAG meeting support Project Work/General Project support Technical & TMDL Support
Inberg Miller Engineers (IME)	Project Support
Western Archeological Services (WAS)	Archeological Report

Sweetwater County Board of County Commissioners along with the Wyoming Landscape Conservation Initiative (WLCI) provided letters of support for the project. SWCCD received match money from Sweetwater County during the duration of the project. Wyoming Department of Agriculture (WDA) provided a match for this grant through their state funding biennium for water quality funding. SWCCD deemed the partnerships a success and there were no funding shortfalls during the project. Sweetwater County, WLCI, and WDA will continue to work together in the future and are currently working on another project on Bitter Creek.

Section 8.0 Information and Education

SWCCD targeted participants by distributing their RV camp waste disposal brochures during the National High School Rodeo (NHSF) Final and at two local Chamber of Commerce's. The brochure helped to identify where the camp waste disposal sites were at in the county. The District believed this was a helpful brochure for the many trailers and campers that were parked here in the area during the NHSR in July 2015.

SWCCD partnered with the Bureau of Land Management and Wyoming Game & Fish Department for the 2014 SW Resource Rendezvous Days at the SWC Events Complex. Over 1,000 students came through during this two day event. The District's theme focused on "Keeping the Land Healthy" and the TMDL "Why start the process?" Another focus topic included: "Healthy Land Healthy Water – Everything is Connected" SWCCD distributed hand sanitizer and bracelets at the event. Many questions were asked by the students and SWCCD was delighted by the interest from the students on why it is important to help keep our water and soil healthy. The responsibility from future generations is paramount to continued education.

SWCCD participated in the 2015 Home Show in April. The District had copies of the 2014 Watershed Project Summary Report. (1.15.15) (EDE) for distribution. The District carried over many of the same themes regarding healthy water and TMDL status and information into the Home Show. The District engaged public participation during the event and answered many consumer questions relating to many aspects of natural resources.

SWCCD purchased doggie pots and supplies for the newer section of the Rock Springs Bitter Creek Dog Park. This was done in cooperation with the Rock Springs Parks & Recreation Department. A recent article was done in the Rocket Miner newspaper. (11.6.15) "Officials hope stations encourage public to clean up after animals". As a result, two pet waste stations opened along the greenbelt on Dewar Drive and at the Bitter Creek Bark Park, due to grant funds provided by the WDEQ.

Section 9.0 Complications

The delay in TMDL development changed the timeframe during which SWCCD provided TMDL management and support work. Initially it was assumed that SWCCD support would be conducted concurrently with the TMDL development in the fall of 2013, now this work is anticipated to parallel the TMDL development in the spring and summer of 2014. The details of the nature and extent of that work will be determined by WDEQ following direction during the 2014 annual SWCCD Bitter and Killpecker Creek Watershed Assessment Group (BKWAG) Meeting and the WDEQ TMDL development kick off meeting.

Second delay for the TMDL. With the government shut down, all TMDL projects have been delayed including the Bitter Creek Project. The official start of the TMDL will be in March or April of 2014. This will be an official public/kickoff meeting.

The District did have a BKWAG/TMDL steering committee meeting in April of 2014 and again in 2015. As a result of WDEQ staff leaving the TMDL program the project was behind schedule.

A Technical Advisory Committee was formed during the April 2015 BKWAG Meeting. On May 20, 2015, a WDEQ TAC Public Meeting was held at the Sweetwater County Health Building. It was decided at that time the TAC would have a conference call on the second Tuesday of every month. The calls have been sporadic due to the departure of the TMDL program coordinator. Although there have been staffing issues within the Department, the TMDL program is moving forward albeit slowly. A new coordinator has been moved into the TMDL program and is currently on task with finishing the TMDL within a timely schedule.

SWCCD understands the TMDL timeline maybe affected somewhat.

Amendment number One, dated June 27, 2012 to the Cooperative Agreement extended the agreement through December 31, 2015 and modified the total project cost. The original federal funding was \$27,400.00 with an expiration date of September 30, 2012. The total project cost was not to exceed \$123,238.00. WDEQ in-house (older) money became available for the first phase of the project. These funds were used for this project in order to allow SWCCD to pay their consultant. The first amendment increased the federal funding amount by \$55,560 to bring the total federal funding to \$72,000.

In August 2015, Amendment Number Two to the Cooperative Agreement was approved to change the scope of work to add fall 2015 monitoring to Task 2, which transferred \$2,312.80 from Task 1 to Task 2. Administration costs reduced from \$7,143.60 to \$4,830.80 and increased the monitoring budget from \$64,856.40 to \$67,169.20. There was leftover money in task two that was put into fall 2015 monitoring. SWCCD had reduced administrative costs and requested to add some of those funds into task #2 water quality monitoring.

Section 10.0 Recommendations

The grant could not have been made possible if the commitment was not there from all the various partners who worked together to make a successful project.

SWCCD learned to be flexible with other agencies' scheduled needs. At this time we have not identified the future of sampling.

The 2013 BKWAG steering committee recommended to continue monitoring the legacy sites on Bitter Creek to once every two years or a three year basis. This will continue to allow a cursory review of water quality status within the watershed and provide a general awareness of water quality trends over time. This level of monitoring would allow for possible identification of otherwise unsuspected water quality issues within the watershed, while not requiring a significant effort or expenditure. Coordination between WDEQ and SWCCD should be maintained for sampling programs within Bitter and Killpecker Creeks to allow collection of the greatest amount of, and most useful, data for the betterment of the watershed.

The SWCCD provides a means of organized representation for various public, private, recreational, agricultural and industrial users of the Bitter and Killpecker Creek watersheds. The ongoing involvement of the SWCCD in the sampling and data analysis process allows the stakeholders they represent to have a voice in the determination of TMDL's and be part of the final outcome of the TMDL that are being developed.

Every 5 years, the TMDL will be reviewed by the State of Wyoming. Though it is not mandatory for the Conservation District to conduct future sampling, the information gathered from continued sampling and analysis to supplement sampling conducted by the State may contribute to resolving these water quality resource issues at the earliest possible opportunity and prevent encumbering the growth and prosperity of the County and the City.

Section 11.0 Financial Summary

Provide a financial summary of the project by completing a table in the following format.

Task #	Task Title	319 or 205(j) Funds Expended	Nonfederal Match Expended	Total NPS Expenditures	Other Federal Funds Expended
1	Project Administration	\$3,909.05	\$0.00	\$3,909.05	\$0.00
2	Water Monitoring & Analysis	\$63,389.46	\$34,940.35	\$98,329.75	\$0.00
3	Community Meeting	\$0.00	\$4,866.36	\$4,866.36	\$0.00
4	Recreation, Pet Waste & Urban Runoff Campaign	\$180.70	\$1,338.00	\$1,518.70	\$0.00
5	Community & School Activities	\$0.00	\$3,128.34	\$3,128.34	\$0.00
	TOTALS	\$67,479.21	\$44,273.05	\$111,752.20	\$0.00

Section 12.0 Attachments

Bitter and Killpecker 2012 Bacteria & Chloride Spring Sampling Results Summary Report

Prepared by: EDE Consultants

2013 Bitter and Killpecker Creek Watershed Project Summary Report Study

Prepared By: EDE Consultant

2014 Bitter Creek and Killpecker Creek
Watershed Project Summary Report

Prepared By: EDE Consultants

- Sampling & Analysis Plan Bitter & Killpecker Creek Watershed Study Supplemental Sampling - 2011-2013
- Bitter & Killpecker Creeks Watershed 2012 Bacteria and Chloride Spring Samplings Results Summary Report – August 24, 2012
- 2013 Bitter Creek and Killpecker Creek Watershed Project Summary Report - February 3, 2014
- Sampling & Analysis Plan Bitter & Killpecker Creek Watershed Study – Fiscal Year 2013-2014 August 12, 2014
- 2014 Bitter Creek & Killpecker Creek Watershed Project Summary Report – January 15, 2015
- *2015 Bitter Creek & Killpecker Creek Summary Report – March 2016
- Bitter Creek Watershed Advisory Group (BKWAG) Meeting minutes - April 2014 & April 2015
- Bacteria Sampling within Rock Springs prepared by EDE- April 14, 2014
- Resource Rendezvous Workshop Materials
- Home and Garden Show
- Newsletters
- Newspaper article -Pet waste campaign
- RV Waste Campaign Brochure
- After the Storm flyer

*EDE is currently in the process of completing the 2015 Sampling Report. The Report will be submitted to WDEQ upon completion.