

**Natrona
County
Conservation
District**

**North Platte River Watershed TMDL
Implementation Project – Segment 1
2012-2016**

**Section 319 Nonpoint Source Pollution Control
Program
Final Report**

Project Number: NPS2010E/2012E

**Prepared for the
Wyoming Department of Environmental Quality
Water Quality Division
Wyoming Nonpoint Source Program
Cheyenne, Wyoming**

February 29, 2016

Grant Number: C900863012 & C900863010

This Project was conducted in cooperation with local landowners and project participants, the City of Casper, Natrona County, Casper Alcova Irrigation District, Natrona County Weed & Pest, Wyoming Association of Conservation Districts, the Wyoming Department of Agriculture and the Wyoming Department of Environmental Quality – Water Quality Division, USDA-Natural Resources Conservation Service, USDA - Farm Service Agency, and the United States Environmental Protection Agency, Region 8.

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SECTION 1.0 EXECUTIVE SUMMARY

North Platte River Watershed TMDL Implementation Project - Segment 1

Grant #: **C900863012 & C900863010**

Start Date: **May 8, 2012**

Completion Date: **February 29, 2016**

Budget Summary	
Total 319 or 205(j) Funds Awarded	\$ 735,437.00
Total 319 or 205(j) Funds Expended	\$ 711,379.19
Total Nonfederal Match Commitment	\$ 649,450.00
Total Nonfederal Match Expended	\$ 613,899.56
Total Project Budget	\$ 1,384,887.00
Total Project Expenditures	\$ 1,325,278.75

Summary of Accomplishments

The purpose of the North Platte River Watershed Total Maximum Daily Load (TMDL) Implementation Project - Segment 1 managed by the Natrona County Conservation District (NCCD) was to restore the designated uses on the North Platte River and its tributaries by 2024 through implementing the recommended Best Management Practices (BMPs) from the North Platte River TMDL (2011). This was the first of three segments that began to address the eleven TMDLs and focused technical and financial resources on priority selenium areas within the watershed. Segment 1 built upon the past accomplishments in the Kendrick Watershed Project and initiated actions outlined in the North Platte River TMDL. The goals of this project were to increase landowner and agency collaboration in regards to the overall levels of selenium in our waterbodies, including local citizen leadership and guidance; implementation of BMPs in the Kendrick Watershed Project; continued water quality monitoring and analysis of selenium levels in the North Platte River Watershed to evaluate the effectiveness of the BMPs; and continued educational opportunities and materials to the landowners regarding selenium in the North Platte River Watershed. A project map can be found in Appendix A, showing the priority areas, Cody shale formation, impaired waterbodies, and the completed project locations.

During the course of this project, and in coordination with participating landowners and irrigators, the Natural Resources Conservation Service (NRCS), and the Casper Alcova Irrigation District (CAID), 17 BMPs were completed. A total of 726 acres were converted from flood to sprinkler irrigation, 29,569 feet of underground water conveyance was installed, replacing 35,519 feet of open ditch. These projects provided opportunities for partnership building between agencies, as well as landowners. The detailed BMP implementation projects can be found in Appendix B. Within Segment 1, partnerships were established with NCCD, CAID and NRCS that will allow for many future project collaboration opportunities. Natrona County Commissioners and the City of Casper have also partnered with NCCD to complete selenium reduction projects in the Kendrick Project area.

The Wyoming Water Development Commission (WWDC) completed a Level 1 Watershed Study in 2014 that evaluated and identified water development opportunities on irrigated lands, non-irrigated rangelands, wetlands, and streams. The study area covered approximately 2,323 square miles or 1,486,748 acres and encompassed the drainage area for the North Platte River from Pathfinder Reservoir downstream to east of Casper, Wyoming, where Cole and Muddy Creeks enter the North Platte River as shown in Figure 1.1 of the Executive Summary of the Final Report for the Middle North Platte Watershed Study Watershed Management Plan (Appendix C). The Level 1 Study generated over 70 potential projects within the watershed, including irrigation system conservation and rehabilitation, livestock/wildlife

upland watering opportunities, grazing management opportunities, and other watershed management opportunities. Through the Small Water Project Program (SWPP), NCCD implemented one livestock watering tank and pipeline project in 2015, with another two projects planned for implementation in 2016. Through the NRCS EQIP program, 11 livestock/wildlife watering projects were completed from 2012 to 2015.

With assistance from a Wyoming Department of Agriculture (WDA) Water Quality Grant, three informational newsletters were mailed to elected officials in Natrona County to educate them regarding the progress of the Segment 1 projects. In addition, three educational brochures were published, including Shelterbelts, Selenium Management, and Small Acreage Pasture Management (Appendix D). These brochures are distributed during landowner visits, through the USDA office, during educational events, and through the mail. All booklets have an emphasis on the health of the watershed.

Water quality monitoring continued throughout the project timeline. Monthly sampling and analysis was completed on 12-16 monitoring sites, depending upon the ice, receipt of landowner permissions or construction near the site restricting access. Annual water quality reports were compiled for 2012-2015 and are attached in Appendix E. The water quality data continues to support a trend in decreasing levels of total selenium in the North Platte River Watershed. The 2001 - 2014 monitoring data was integrated with validated 2015 data to plot graphs of mean annual selenium concentrations against time. The mean annual levels were analyzed at each monitoring station for significant trends with a 90% confidence level ($\alpha = 0.10$). These trend analyses indicate that statistically significant reductions in selenium levels are observed at the Poison Spring Creek (POSP), Poison Spider Creek (PSC1) and Johnson Reservoir Drain (JRD) monitoring stations [Apex, 2015]. There is a trend at Upper and Lower North Platte River (NPR1 and NPR2) showing a decrease in selenium loads, but this trend is not statistically significant. In July of 2014, three additional monitoring sites were added along the North Platte River to more effectively monitor changes in selenium concentration and load as tributaries enter the river through the project area (NPRRR, NPRPP, and NPRCR22). Since sampling at these three sites was only recently initiated, there is currently insufficient data to perform a statistical analysis.

Working closely with Wyoming Department of Environmental Quality (WDEQ), the NCCD would like to see the North Platte River delisted from the 303(d) list. Between 2001 and March of 2016, there have been only 3 exceedances of the current WDEQ/WQD/EPA selenium concentration standard of 0.005mg/L recorded from the North Platte River. They are as follows (upstream to downstream):

- NPR1 - No recorded exceedances in total selenium concentration, with 95 samples collected;
- NPRRR - No recorded exceedances, with 20 samples collected;
- NPRPP - One recorded exceedance (05-2015), with 21 samples collected;
- NPR2 - Two recorded exceedances (03-2004, 07-2010), with 93 samples collected;
- NPRCR22 - No recorded exceedances, with 21 samples collected.

The WDEQ will review the data in more depth in the fall of 2016 to determine whether or not to proceed with efforts to de-list. The efforts to reduce selenium transportation in the high priority tributaries of the North Platte River have had a direct result in selenium reductions in the North Platte River.

The NCCD feels that the project was successful in meeting the goals and objectives of the Project Implementation Plan. Through this project, NCCD regained relationships with landowners, elected officials, and cooperating agencies that had been lost in previous years due to staff changes within NCCD. These partnerships will continue to provide opportunities to work together for the health of the watershed.

SECTION 2.0 BACKGROUND

The Wyoming Department of Environmental Quality (WDEQ) developed Total Maximum Daily Loads (TMDLs) for selenium impaired waterbodies in the North Platte River Watershed beginning in 2009. The deliverables for these TMDLs were to analyze data, characterize water quality problems, assess sources, allocate loads, calculate TMDLs, and define management measures for selenium in the watershed. Selenium is listed as a priority pollutant in Wyoming. The selenium TMDLs for the North Platte River Watershed were developed in accordance with Section 303(d) of the federal Clean Water Act and guidance developed by the U.S. Environmental Protection Agency (EPA). Development of the TMDLs was completed in September 2011 by a consultant for WDEQ and they are being reviewed prior to approval. The TMDLs require load reductions for the impaired waterbodies that range from 0% to 95% as shown in Table 2-1. Progress toward these selenium load reductions will be achieved through implementation of BMPs outlined in the North Platte River Watershed TMDL Implementation Plan as part of the Segment 1 project.

Table 2-1. Summary of Selenium TMDL Reductions on Impaired Waterbodies in the North Platte Watershed.

Flow Zone	High	Moist	Mid-Range	Dry	Low	All*
Waterbody Segment	TMDL Reduction Required					
Poison Spring Creek	38%	25%	52%	62%	71%	39%
Upstream Poison Spider Creek	0%	50%	58%	58%	0%	52%
Middle Poison Spider Creek	0%	0%	0%	0%	0%	0%
Downstream Poison Spider Creek	50%	64%	64%	56%	38%	60%
Oregon Trail Drain	0%	63%	84%	93%	89%	76%
Casper Creek	84%	55%	82%	62%	68%	74%
North Platte River	0%	0%	0%	7%	0%	2%
Thirty-Three Mile Reservoir	0%	63%	57%	5%	65%	52%
Rasmus Lee Lake						95%
Goose Lake						95%
Illco Pond						9%

* Total TMDL reductions are weighted averages of percent reductions based on percentages of total flow.

Selenium is an essential trace element to humans and animals; however, at higher concentrations, it can be toxic to humans, fish, livestock, shorebirds, and waterfowl. Sources of selenium in the North Platte Watershed are naturally occurring from soils and bedrock. Selenium is primarily derived from volcanic ash and tends to concentrate in marine shales. Plants grown in seleniferous soils can accumulate selenium and be harmful to animals when ingested. Certain plants require high selenium to thrive and are known as selenium indicators. These plants often indicate areas of high selenium and are not readily eaten by most animals except when other forage is scarce. Even though these indicator plants are not readily eaten, they contribute to selenium poisoning by making selenium in the soil available to neighboring, palatable selenium accumulating plants, including western wheatgrass, barley, wheat, and alfalfa.

Because of potential effects on fish, wildlife, and human health related to selenium, several studies were conducted in the 1990s by the U.S. Geological Survey (USGS), the U.S. Fish and Wildlife Service (USFWS), and the U.S. Bureau of Reclamation (USBR) in an area known as the Kendrick Project. High concentrations of selenium were found in plants, soils, water, sediment, and biota. Impaired reproduction and embryonic deformities in migratory aquatic birds breeding in the area are only a few of the adverse effects of increased selenium levels. Information collected from previous studies indicates that naturally occurring selenium dissolves from the soil during irrigation and is returned to the streams through excessive drainage water.

The high selenium concentrations documented as part of these studies ultimately resulted in placement of eleven waterbody segments within the Kendrick Project on Wyoming's 1998 and 2000 303d lists for non-support of cold-water fisheries, non-game fisheries, other aquatic life uses and/or wildlife due to exceedances of applicable numeric selenium criteria protective of aquatic life uses (Table 2-2). The Federal Clean Water Act requires TMDLs be developed for waters identified in Wyoming's 303(d) list as impaired by a pollutant.

Table 2-2. Impaired Waterbodies, Sources, and Impaired Use (WDEQ 2014 Integrated Report).

Waterbody	Segment	Name	Class	Location	Miles/Acres	Source	Impaired Use	Date Listed	TMDL Date
WYNP101800070 300_01	1	North Platte River	2AB	From the confluence with Muddy Creek upstream to the confluence with Poison Spider Creek.	36.8 mi.	Irrigated Crop Production, Natural Sources	Aquatic Life, Cold-Water Fish, Wildlife	1998	2009
WYNP101800070 302_01	2	Poison Spring Creek	3B	From Casper Canal downstream to the confluence with the North Platte River	8.2 mi.	Irrigated Crop Production, Natural Sources	Aquatic Life other than Fish	2000	2009
WYNP101800070 302_02	3	Rasmus Lee Lake	3B	Within the Kendrick Reclamation Project.	85.2 ac.	Irrigated Crop Production, Natural Sources	Aquatic Life other than Fish	2000	2009
WYNP101800070 302_03	4	Goose Lake	3B	Within the Kendrick Reclamation Project	30.1 ac.	Irrigated Crop Production, Natural Sources	Aquatic Life other than Fish	2000	2009
WYNP101800070 303_01	5	Oregon Trail Drain	3B	Within the Kendrick Reclamation Project	8.6 mi.	Irrigated Crop Production, Natural Sources	Aquatic Life other than Fish	2000	2009
WYNP101800070 406_01	6	Poison Spider Creek	2AB	From the confluence with the North Platte River to the confluence with Iron, Creek, within the Kendrick Reclamation Project.	1.3 mi.	Irrigated Crop Production, Natural Sources	Cold Water Game Fishery, Aquatic Life other than Fish	2000	2009
WYNP101800070 406_02	7	Poison Spider Creek	2C	From the confluence with Iron Creek to a point 5.8 miles upstream.	5.8 mi.	Irrigated Crop Production, Natural Sources	Non-Game Fishery, Aquatic Life other than Fish	2000	2009
WYNP101800070 406_03	8	Poison Spider Creek	3B	From the HUC 12 boundary (101800070406) to a point 6.0 miles downstream, within the Kendrick Reclamation Project.	6.0 mi.	Irrigated Crop Production, Natural Sources	Aquatic Life other than Fish	2000	2009
WYNP101800070 503_01	9	Illco Pond	3B	NE S13 T35N R81W within HUC 12 boundary (101800070503)	1.1 ac.	Irrigated Crop Production, Natural Sources	Aquatic Life other than Fish	2000	2009
WYNP101800070 504_01	10	Casper Creek	2AB	From the confluence with the North Platte River to a point 21.1 miles upstream, within the Kendrick Reclamation Project.	21.7 mi.	Irrigated Crop Production, Natural Sources	Cold Water Game Fishery, Aquatic Life other than Fish	2000	2009
WYNP101800070 703_01	11	Thirty-three Mile Reservoir	3B	Along South Fork Casper Creek, within Kendrick Reclamation Project.	30.2 ac.	Irrigated Crop Production, Natural Sources	Aquatic Life other than Fish	2000	2009

Precipitation and irrigation of selenium rich soils can dissolve and mobilize selenium to surface and ground waters. Historical water quality data show the highest average selenium concentrations within the Kendrick Project are primarily because of irrigation waters and their proximity to shale-derived soils. Cretaceous Shales are a primary source of selenium, with Cody Shale having the highest selenium levels. Natural geomorphologic and hydrologic processes are occurring and potentially contribute to the natural background levels of selenium in the watershed. Selenium from these natural sources and processes are mainly influenced by irrigated lands with underlying Cody and other Cretaceous Formations; but may also be affected by seasonal patterns and anthropogenic activities which can increase selenium dissolution and mobilization. These selenium rich formations underlay approximately 51 percent or 696,678 acres of the watershed. Significant nonpoint sources of selenium in the watershed mostly originate from irrigation conveyances and irrigated lands within the Kendrick Project; however, selenium also comes from non-irrigated lands with erodible upland soils and eroding stream channels that are bare or sparsely vegetated.

The TMDL source allocation analysis showed a high correlation between selenium concentration and the area of Cody Shale, the length of irrigation canals within the area, and the length of streams within the area.

Remediation plan alternatives and BMP implementation to resolve selenium problems in the watershed began in the mid-1990s and continue today. Goals and objectives to address the selenium concerns were outlined in the Kendrick Watershed Plan, which was created in 2005 by the Natrona County Conservation District (NCCD) in partnership with the Kendrick Steering Committee, which was made up of area ranchers, farmers, local, state, and federal agencies. This planning effort assessed historical and current water quality data, identified improvement actions, and formulated recommendations which were presented to stakeholders to promote environmental stewardship within the watershed. As a result of these efforts, a substantial amount of water quality samples were collected and BMPs were installed in the watershed. Water sampling reports from 2010 and 2011 and the TMDL regression analysis between water quality data from 1988 to 1995 and data from 2001 to 2009 showed an improving trend in water quality, which is thought to be a direct result of the installation of these BMPs. This was made possible with project funding from local ranchers and farmers, NCCD, Natrona County, Casper-Alcova Irrigation District (CAID), City of Casper, WDEQ (through EPA Section 319 grants), Natural Resources Conservation Service (NRCS), U.S. Bureau of Reclamation (USBR), Wyoming Water Development Commission (WWDC), and the Wyoming Department of Agriculture (WDA).

The North Platte River is a priority watershed in the Wyoming Nonpoint Source Management Plan. This segment is consistent with that Plan since this project is a voluntary effort and would provide incentives to watershed stakeholders to improve the water quality of the North Platte River and its tributaries. Specifically, this project addresses the objectives of Goals I, II, and VI of the Nonpoint Source Management Plan and implements a project implementation plan that addresses EPA's Nine Key Elements, continues the State's Watershed Strategy, and builds upon past accomplishments of the NCCD's Kendrick Watershed Plan. This segment built on the previous efforts for adoption of BMPs by building on past public outreach efforts in the watershed that heightened stakeholder awareness of selenium problems.

Selenium is an issue to all landowners and water users within the watershed, whether urban or rural. The implementation of BMPs and subsequent trend of decreasing selenium concentrations in the North Platte River, are particularly of interest to public water users within the watershed. The NCCD has been working with the City of Casper in coordinating efforts regarding selenium reduction within the watershed. In 2015, the City of Casper has hired CH2M HILL Engineers, Inc. to complete the Sam H. Hobbs Wastewater Treatment Plant Preliminary Facilities Plan, which will include evaluating existing hydraulic and organic loadings, comparing current treatment plant design criteria, and developing 20 year projected hydraulic, organic, nutrient, and selenium loading capacity requirements based on current growth of Natrona County.

Every public water/sewer user would benefit from implementing projects on selenium nonpoint sources. The NCCD has presented information about this topic to local government officials since the inception of this project. Our newsletters and annual legislative breakfasts have been crucial to bringing all entities and agencies together in this effort. The City of Casper and Natrona County Commissioners have pledged to assist with the selenium reduction efforts with a financial contribution from each of \$50,000 annually for the next 4 years.

Project Map: See Appendix A.

SECTION 3.0 GOALS AND OUTCOMES

The overall project goal is to restore designated uses on the North Platte River and its tributaries by 2024 through implementing the recommended BMPs from the TMDL. The objectives of Segment 1 were to:

- Implement BMPs on irrigated lands to achieve selenium reductions as established in the TMDLs.
- Track BMP implementation progress toward achieving the goals of the TMDL.
- Increase BMP adoption by building on past public outreach efforts in the watershed.
- Monitor water quality and BMP effectiveness to document implementation progress.

The outcomes from the Project Implementation Plan are as follows:

Outcome 1: Administer the North Platte River Watershed Project Implementation Plan – Segment 1 in accordance with WDEQ and EPA requirements to accomplish project goals, targets, tasks, and milestones.

Task 1: Administration (*Efficient Project Administration, Contract Execution, and Report Submittal*)

The NCCD managed the project, tracked the budget expenditures, submitted quarterly reports and reimbursement requests, yearly reports, managed landowner contracts and project updates, kept records, filed MBE/WBE reports, and conferred with an accountant as necessary. Due to NCCD's yearly income being less than \$500,000, NCCD was not required to have yearly audits, and instead, an "Agreed Upon Procedures" (Appendix G) was conducted by Lenhart, Mason & Associates for FY2015 to ensure proper accounting and recordkeeping for the grant, as well as payroll. Water quality data was reviewed on a monthly basis, and the District Manager and/or a NCCD employee assisted with all monthly sampling events. Task deliverables consists of contract administration for 11 NCCD BMP projects, partnership with NRCS for 2 BMP projects and assistance with 4 additional EQIP BMP projects for a total of 17 completed BMP projects, project updates at 48 monthly board meetings, 1 Agreed Upon Procedures (to replace 3 audits), 16 quarterly progress reports, 15 reimbursement requests, 4 annual reports and 1 final report. All task outputs were met successfully.

Outcome 2: Reduced Selenium Loading from Irrigated and Non-Irrigated Lands by Implementing Recommended BMPs in the North Platte River Watershed TMDL.

Task 2: Best Management Practices (*Target 1 - Install lining and piping on open canals, laterals, and ditches, install water and stage-control structures and automation units, and implement irrigation scheduling to enhance water conservation and reduce contact, ponding and seepage on high seleniferous soils in the watershed.*)

In partnership with landowners, CAID, and NRCS, flood-furrow irrigation systems were converted to sprinklers and irrigations conveyances were converted from open dirt ditches to underground pipelines. There were 726 acres of conventionally flooded acres converted to sprinkler irrigation and 35,519 feet of open irrigation ditches were converted to 29,569 feet of pipeline. No automated water level control structures and equipment were installed. NCCD utilized participant, 319, and EQIP funding to accelerate BMP adoption. Plans and designs were prepared by either RESPEC or NRCS and certified by the planner. Original plans were for 50,000 linear feet of conveyances, 3,000 acres of flood to sprinkler conversions, and 4,000 acres of irrigation scheduling and automation. The original sprinkler acreage goals were estimates based upon our assumption that there were more large landowners that would have an interest in converting to sprinkler. However, the small to

medium acreage landowners expressed the most interest in transitioning to sprinklers during this segment. Subsequently, as the size of the participating irrigated fields decreased, the cost per acre to convert from flood to sprinklers increased resulting in less acres being converted with available funding. Also during Segment 1, the earthen ditch to pipeline projects focused on smaller (<12 inch diameter) pipeline projects which didn't have the per acre costs of the smaller sprinkler projects but the costs still increased depending on the number of field turnouts, diversion structures, and pumps that were serviced by the ditch. Because of the greater complexity of even the smaller ditch to pipe projects, more coordination with CAID was done in order to assure that water delivery was maintained as necessary and BMP installations were completed as required.

At the beginning of Segment 1, the NCCD adopted a cost-share docket that offered lower cost-share rates than NRCS' EQIP program, which more than likely affected irrigators with larger projects initially participating in the TMDL project. Moreover, since the TMDL was completed in 2011, irrigated lands mapping updates have been completed by the State Engineer's Office (SEO) as part of the Modified North Platte Decree and additional inventory data was obtained during the Level I Watershed Study. This mapping has indicated that there are approximately 60 flood-irrigated fields that cover 40 or more acres encompassing 6,000 acres within the watershed. More than 70 percent of these fields are located within the Oregon Trail Drain and the Casper Creek priority areas. The potential projects still exist and coordination with CAID and NRCS is ongoing to address water delivery infrastructure improvements that are necessary for implementing on-the-field ditch and flood project conversions.

The irrigation scheduling was included to provide irrigators an opportunity to improve efficiency on the existing sprinkler systems. However, during Segment 1 and the Level I Watershed Study, irrigators expressed more interest in converting additional earthen ditches to pipe and flood systems to sprinklers than improving efficiency of existing systems. Consequently, the NCCD re-prioritized their efforts to address those needs. Additionally, the NCCD coordinated with CAID to address earthen ditch to pipeline and automation needs on the Casper Canal and laterals. During Segment 1, CAID focused on operating their existing automation sites more effectively and completing ongoing pipeline infrastructure projects. Therefore, no automation sites were installed but potential sites have been identified and additional funding sources could possibly be pursued in Segment 2 depending on completion of ongoing projects.

The NCCD, NRCS, and CAID coordinated efforts in adapting to these changes resulting in a more collaborative approach for funding and implementing projects within the guidelines of the 319, EQIP, WWDC, and USBR programs. In 2014, NCCD partnered with NRCS on two projects, with NRCS sharing the cost of the sprinklers, and NCCD sharing the cost of the pipeline and all appurtenances with the landowners. In 2015, NRCS was able to fund all of the EQIP applications that they received, thus NCCD began focusing on the pipelines and projects with CAID. A BMP Implementation Project Spreadsheet with project pictures is found in Appendix B. Additional irrigation rehabilitation projects were completed by CAID within the watershed. Although these projects and costs were not included in this report because the funding assistance was provided by the WWDC and USBR programs, the projects have enabled the implementation of the projects completed during Segment 1.

The NCCD feels that BMP implementation was a success by increased collaboration between landowners, CAID, NRCS and NCCD, as well as the City of Casper and Natrona County.

Task 3: Resource Inventories, Alternative Identification, Management Plans, and Practice Implementation on Non-Irrigated Lands in Priority Selenium Areas of the Watershed. *(Target 2 - Complete Resource Inventories, Develop Management Plans, and Implement Practices to Improve Upland Areas and Stream Channel Stability to Reduce Selenium Loading through Reductions in Seleniferous Soil Exposure, Erosion, Mobilization, and Minimize Surface Disturbing Activities on 12,000 Acres in Priority Areas of High Seleniferous Geology and Soil within the Watershed)*

NCCD, in partnership with landowners, Natrona County Weed & Pest, and NRCS, assisted in completing inventories, assessments, planning and identifying priority areas for BMP implementation on erodible upland areas and stream channels with bare soil or sparse vegetation. The NRCS completed 11 EQIP rangeland projects during this time, with the guidance of the NCCD Board of Supervisors. These projects consisted of the installation of wells, pipelines and watering facilities to provide livestock and wildlife water for 53,507 acres, along with prescribed grazing plans.

A Level 1 Watershed Study was completed by the WWDC in February of 2014 for the Middle North Platte Watershed. The study provides a comprehensive evaluation and initial inventory of the water and land resources within the study area and provided a detailed Watershed Management Plan. The study area covered approximately 2,323 square miles or 1,486,748 acres and encompasses the drainage area for the North Platte River from Pathfinder Reservoir downstream to east of Casper, Wyoming, where Cole and Muddy Creeks enter the North Platte River as shown in Figure 1.1 of the Executive Summary of the Middle North Platte Watershed Study Watershed Management Plan – Topical Report RSI-2411 (Appendix C). Through the Level 1 Watershed Study, a total of 10 irrigation project opportunities were identified, and 59 upland wildlife/livestock water source projects opportunities were identified. NCCD implemented one livestock/wildlife well, pipeline and watering facility project during this time, providing water for 5641 acres. The targets set forth in Task 3 were accomplished with the partnerships between WWDC, NRCS and NCCD.

Outcome 3: Increase BMP Adoption on Irrigated and Non-Irrigated Lands by building on Past Public Outreach Efforts that Increased Awareness of Selenium Problems and Solutions in the North Platte River Watershed.

Task 4: Public Awareness and Outreach Activities *(Target 1 – Increase BMP adoption by Increasing Awareness, Knowledge of BMP Technical and Financial Assistance Opportunities among Residents Located on Irrigated and Non-Irrigated Lands in Priority Areas of High Seleniferous Geology and Soil within Watershed)*

NCCD held 48 board meetings before and during this project, as well as annual meetings with the Natrona County Commissioners, the City of Casper, and the Casper Public Utilities (12 meetings). An informational legislative breakfast was held each year (4 meetings) with all Natrona County elected officials invited to attend including federal, state, and local elected officials. During that time, officials are updated as to the progress of BMP implementation, as well as the latest trends in the water quality data. Numerous other, less formal meetings took place throughout the project with landowners, CAID, NRCS, and the Board of Public Utilities to discuss projects, selenium concentrations and potential future regulations regarding the North Platte River.

The original plan was to utilize mailings to landowners to inform them of the TMDL and the opportunities for BMPs through this segment. In 2014, the NCCD Board of Supervisors decided instead to develop printed materials to distribute during educational events, mail to landowners, and make available on our website. In partnership with Wyoming

Department of Agriculture (WDA), 319 Funds, and WDA Lab Funds, several educational booklets were published; “Selenium Management”, “Small Acreage Pasture Management”, and “Shelterbelts”, all with a focus on water quality. NCCD printed 1500 Selenium Management booklets that focus on Natrona County and the geology that underlies much of the county, primarily the Cody Shale which contributes to the selenium concentrations in our waterbodies. This booklet and the other two have been mailed or distributed to over 1,000 landowners in the county, and are available on our website, www.nccdwyoming.com. Our website has had 12,797 visitors between 2012 and 2015. In addition, three newsletters were written and mailed to over 50 elected officials within Natrona County in order to keep the officials familiar with the projects. These publications are found in Appendix D.

The educational goals of this project exceeded expectations due to the heightened interest from landowners, the participation of CAID in several projects, and the increased financial input awarded to NCCD by the City of Casper and Natrona County to assist with selenium mitigation projects throughout the watershed.

Outcome 4: Determine BMP Effectiveness and Selenium Load Reduction Achievement from Irrigated and Non-Irrigated BMPs by Monitoring Water Quality in the North Platte River Watershed.

Task 5: Evaluation and Monitoring (*Target 1 – Obtain Credible Data on at least 18 Sites in the Watershed to Monitor Selenium Reductions and BMP Effectiveness on Irrigated and Non-Irrigated Lands in Priority Areas of High Seleniferous Geology and Soil within the Watershed.*)

NCCD personnel assisted our consultants with each monthly sampling event to be more knowledgeable about the conditions of the watershed. NCCD followed the Sampling and Analysis Plan (SAP – Appendix F), and amended the SAP as needed throughout the project period. The SAP was amended in 2012 to fit with the goals of this grant, and due to costs of sampling, site locations were narrowed down to better analyze the BMPs in each priority area. In 2014, with guidance from WDEQ, three additional sites were added to the SAP that covered the length of the North Platte River as listed in the 303(d) List, making a total of five sampling locations on the North Platte River. Samples from collection sites were analyzed on a monthly basis for total recoverable selenium paired with instantaneous discharge measurements. In 2015, the Wyoming State Legislature passed a trespass law in regards to data collection.

NCCD followed these guidelines and received written permissions from landowners from each sampling sites. Some of these sites took longer to receive than others, and sampling on some sites was halted until the permission forms were received. All collected samples were sent to a certified laboratory for analysis. The data was reviewed on a monthly basis and analyzed annually to be incorporated into an annual report at the end of each calendar year (Appendix E). These reports and raw data were shared with WDEQ as received from the consultants.

Since monitoring sites were narrowed to fit the goals of this project, samples were obtained from 12-16 sites per month depending upon accessibility due to landowner permissions, construction, or weather conditions, instead of the original 18 sites. The total number of samples analyzed for total recoverable selenium (E200.8) was 649, instead of the predicted 900. Data was analyzed on a yearly basis, and water quality reports were completed for 2012, 2013, 2014, and 2015. The NCCD is confident about the quantity and quality of data obtained in this task.

The water quality data continues to support a trend in decreasing levels of total selenium in the North Platte River Watershed. The 2001 - 2014 monitoring data was integrated with validated 2015 data to plot graphs of mean annual selenium concentrations against time. The mean annual levels were analyzed at each monitoring station for significant trends with a 90% confidence level ($\alpha = 0.10$). These trend analyses indicate that statistically significant reductions in selenium levels are observed at the Poison Spring Creek (POSP), Poison Spider Creek (PSC1) and Johnson Reservoir Drain (JRD) monitoring stations [Apex, 2015]. There is a trend at Upper and Lower North Platte River (NPR1 and NPR2) showing a decrease in selenium loads, but this trend is not statistically significant. In July of 2014, three additional monitoring sites were added along the North Platte River to more effectively monitor changes in selenium concentration and load as tributaries enter the river through the project area (NPRRR, NPRPP, and NPRCR22). Since sampling at these three sites was only recently initiated, there is currently insufficient data to perform a statistical analysis.

SECTION 4.0 TASK ACTIVITIES

Task #	Task Title	Task Description	Projected Task Outputs	Actual Deliverables
1	Administration	Grant Management and Project Oversight, Timely Quarterly Reports and Payment Applications, Final Report, Accurate Budget Tracking, Audits	Contract Administration 3 Audits Payment Applications 12 Quarterly Reimbursements 12 Quarterly Progress Reports 1 Final Report	Consistent & Accurate Budget Tracking Project Management for 11 319 BMP Projects 1 Agreed Upon Procedures (no audit necessary) with Accountant for FY2015 Project Assistance for 6 EQIP Projects 16 Quarterly Reports 15 Reimbursement Requests 4 Yearly Reports 4 MBE/WBEs 48 Monthly Board Meeting Reports 1 Final Report
2	Irrigated Water Conveyance BMPs Flood-Furrow Irrigation BMPs	Install Irrigation BMPs on Open Canals, Laterals and Ditches, and Flood Irrigated Lands	Completed plans & Designs and certified BMP installations on 50,000 linear feet of conveyances 3,000 acres of flood to sprinkler conversions 4,000 acres of irrigation scheduling and automation* * See Pg. 8	Completed Plans & Designs and Installation Certification on: 11 319 Irrigation BMPs 6 EQIP Irrigation BMPs 726 Acres of Flood to Sprinkler Conversion 35,519 Feet of Open Dirt Ditches Converted to 29,569 Feet of Underground Pipeline
3	Range Management Plans, Non-Irrigated BMPs	Range Management Plans & BMPs on Non-Irrigated Lands, Inventories, and Non-Irrigated BMPs	Completed Rangeland & Stream Channel Inventories, Assessments, Management Plans, Contracts, and BMPs Implemented on 12,000 Acres Level I Watershed Study	11 EQIP Range Water Projects and Conservation Planning on 53,507 acres 1 SWPP Range Water Project supplying water for 5,641 acres Level 1 Watershed Study Completed April of 2014 3 Public Meetings for the Level 1 Watershed Study with 25 participants each (75 participants)
4	Public Awareness	Public Meetings, Direct Mail	Minimum of 1,000	48 Monthly Public Board

	<p>& Outreach Activities</p>	<p>Flyers, Website Updates, Educational Materials, Educational Meetings</p>	<p>irrigators, residents, and website visitors informed of the TMDL and this segment's BMP opportunities resulting in increased awareness, cost-share application and implemented BMPs</p>	<p>Meetings 4 City Council Meeting Presentations 4 Natrona County Commissioners' Meeting Presentations 4 Casper Board of Public Utilities' Meeting Presentations 4 Annual Elected Officials' Breakfasts & Updates 4 Annual Home Shows - Booth for Public Education – speak to approximately 2,000 people each year (6,000 people) 3 Informational Newsletters mailed to 50 Recipients per mailing (150 Recipients)</p> <p>Published: 1000 Pasture Management Booklets 1000 Shelterbelt Booklets 1500 Selenium Management Booklets To Date, at least 1000 Booklets distributed by mail and through all educational events, and available on NCCD Website</p> <p>Educational Website Updated Regularly 12,797 Website Visits between 2012 & 2015</p>
<p>5</p>	<p>Evaluation & Monitoring</p>	<p>Water Quality Sampling & Analysis, Annual Water Quality Reports</p>	<p>Monitoring data from at least 18 sampling sites Monitoring will occur in 2012, 2013, and 2014 Minimum of 900 total recoverable selenium (E200.8) water quality samples and paired instantaneous discharge measurements</p>	<p>42 Monthly Water Quality Sampling Events on 12-16 Sites Depending Upon Weather & Landowner Permissions from 06/2012 thru 12/2015 649 Total Recoverable Selenium Water Quality Samples with Paired Instantaneous Discharge Measurements</p>
<p>5</p>	<p>Evaluation &</p>	<p>Water Quality Sampling &</p>	<p>Data will be analyzed,</p>	<p>4 Annual Water Quality Reports –</p>

(cont)	Monitoring (cont)	Analysis, Annual Water Quality Reports (cont)	reviewed, and interpreted to adapt implementation priorities and strategies and evaluate project effectiveness	Data Review & Analysis to Evaluate Project Effectiveness Updated Sampling Analysis Plan Approved by WDEQ in 2012, 2014 and 2015
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SECTION 5.0 BMP IMPLEMENTATION

During the course of this project, and in coordination with Natural Resources Conservation Service (NRCS) and Casper Alcoa Irrigation District (CAID), 17 BMPs were completed. A total of 726 acres were converted from flood to sprinkler irrigation, 29,569 feet of underground water conveyance was installed, replacing 35,519 feet of open ditch. These projects provided opportunities for partnership building between agencies, as well as landowners. See Appendix B for Segment 1 Accomplishments with BMP implementation and project pictures. With Segment 1, partnerships were established with NCCD, CAID and NRCS that will allow for many future project collaboration opportunities. Natrona County Commissioners and the City of Casper have also partnered with NCCD to complete selenium mitigation projects in the Kendrick Project area.

Since 2010, 4 BMP projects have been completed in the Poison Spider Creek Drainage, upstream from the Poison Spider Creek Tuffy (PSCT) and Poison Spider Creek Lower (PSC2) monitoring sites. This drainage continues to show a trend of decreasing concentrations of selenium. In the same time frame, 9 BMP projects were implemented upstream from Johnson Reservoir Drain (JRD), and the landowners in this area are very pro-active in the efforts to reduce the selenium levels. A linear regression analysis of the available data yielded a statistically significant ($p=.016$) downward trend at JRD. While these BMPs are potentially not the only contributors to the selenium reduction, it is reasonable to correlate the downward trends in the selenium levels to the BMPs that are implemented in these drainages.

The Oregon Trail Drain (OTD10 and OTD) has exceeded the selenium levels set by WDEQ/WQD/EPA consistently. While there have been 10 BMP projects implemented in this drainage area, outside influences have impacted the water quality considerably. During 2014 and 2015, a new highway project was constructed through the heart of the Oregon Trail Drain, with a tremendous amount of impact to the drainage, the soils and the Cody shale. This area is also being developed extensively, with the addition of subdivisions in what once was farmland. This topic is being discussed with Natrona County Planning in order to look at potential planning changes to future subdivisions, with selenium mitigation in mind.

SECTION 6.0 MONITORING RESULTS

The NCCD's Sampling and Analysis Plan (SAP – Appendix F) was approved by Wyoming Department of Environmental Quality in June of 2012, has been updated periodically as needed, and continues to be the guidance document by which NCCD and our consultants achieve the monitoring goals. In June of 2012, monitoring frequency was increased to monthly and flow measurement was incorporated at all locations. At this point, there were 15 sampling sites. This monitoring program continued through 2013. In July of 2014, three (3) monitoring sites were added along the North Platte River to more effectively monitor changes in selenium concentration and load as tributaries enter the river through the project area. Some sampling sites were removed, leaving 15 sampling sites through the end of the grant period. A Selenium Monitoring Map is included in Appendix A.

Sampling Methodology

In 2015, Apex (subcontractor for water quality sampling), along with a NCCD staff, collected water samples and measured field parameters (pH, temperature, Dissolved Oxygen (DO), electrical conductivity (EC)) and flow at the designated monitoring points where flow was observed. Water samples were collected following standard surface water quality sampling protocols as single “grab” samples and transported to an Environmental Protection Agency (EPA) certified water quality testing laboratory for total recoverable selenium concentration analysis. Lab analysis results and Chain of Custody forms are included in the annual water quality reports (Appendix E).

Flow rates were calculated by direct flow velocity measurement at regular intervals in the stream channel using a standard in-stream portable meter. Historically, a Global Water flow probe (FP111) was used to collect data, but a Marsh-McBirney Flow-Mate was utilized to measure flow beginning in November 2012. Sampling performed in November 2013 used a Watermark USGS 6205 Mini to collect flow measurements as the Marsh-McBirney Flow-Mate flow meter was suspected of malfunctioning. Starting in July 2014, a Hach FH950 flow meter was utilized to measure stream flow. With this method, flow velocity and depth are measured at regular intervals of length, typically 0.5 - 1 ft., along a stream channel transect. The total volume of water that moves through the cross-section is calculated per unit time in cubic feet per second (cfs) to give an estimated flow rate. The margin of error for these estimations is typically $\pm 10\%$ of the estimated flow. The SAP incorporated flow measurement at all monitoring locations beginning in June 2012. Previous to 2012, flow had only been measured at six (6) monitoring sites (PSC2, SFCC2, JRD, SMD, CACR2, and OTD).

Flow rates at the five (5) North Platte River sites (NPR1, NPRRR, NPRPP, NPR2, and NPRCR22) are estimated from real-time online Bureau of Reclamation hydrometric data for Gray Reef Reservoir http://www.usbr.gov/gp-bin/hydromet_archives.pl?grar. Flow data is noted on the field data sheets included in the annual water quality reports (Appendix E). A field assurance and quality control (QA/QC) review was conducted by Ginger Paige, of the University of Wyoming, in 2014. A field check is also scheduled for May of 2016.

Data Analysis

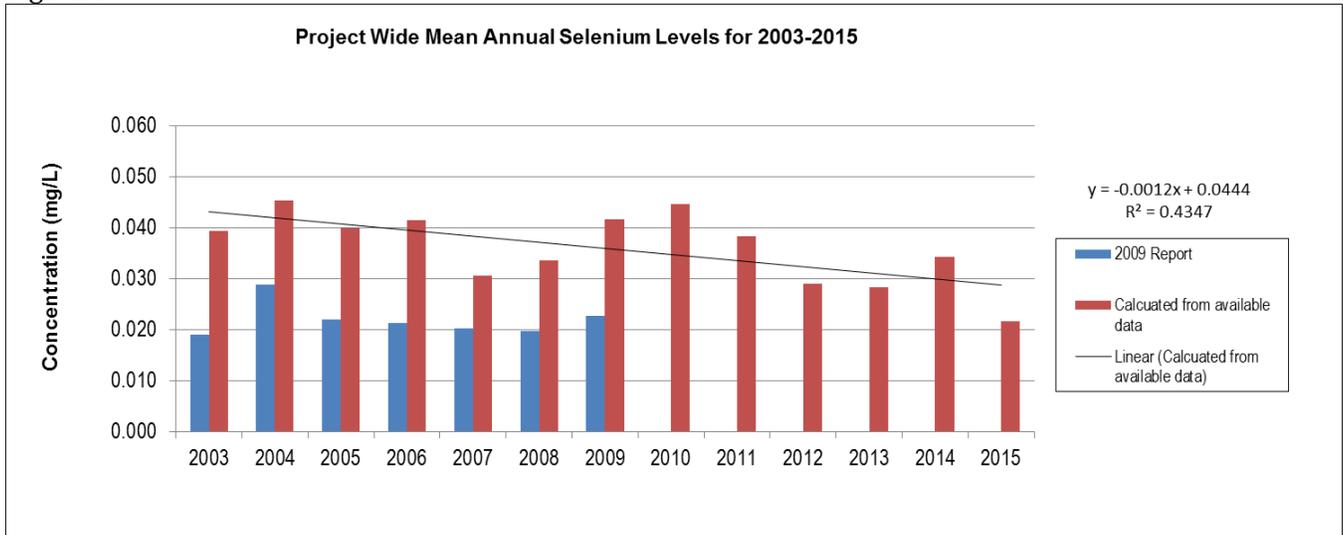
Apex staff conducted QA/QC on the water quality and flow data obtained each year to certify the validity of the results.

Apex continued the accumulative approach of adding each years' data to the original 2001-2011 dataset. Apex conducted trend analyses for each water quality monitoring station using the Regression Function within the Excel Data Analysis Add-in Program. Apex analyzed mean annual levels for significant trends with 90% confidence level. The 90% significance level has been evaluated and accepted by the U.S. Geological Survey (USGS) in surface water quality and flow analyses (Clark and Mason, 2007). Each annual report presents selenium load in pounds per month, the measured flow of each site, and the selenium concentrations for each of the monitoring sites by month.

Project Wide Averages

Project wide averages are plotted in Figure 6-1 below: 1) as they were reported in the 2009 Report to NCCD (AET, 2009) and 2) as they were recalculated by Apex in 2015 from the available data for all sites monitored every year in the period 2003-2015.

Figure 6-1.



The downward trend shown for the recalculated annual mean selenium levels is statistically significant (p=0.0005) based on a linear regression analysis. This indicated that the significant project wide decrease in annual mean selenium levels during the 2001 – 2014 has continued into 2015. Apex did caution the NCCD that the dataset for the period from 2001-2009 is incomplete and lacked a clear organizational structure.

Existing data trends show some Se load reduction at the following individual sites: South Fork Casper Creek (SFCC10), Johnson Reservoir Drain (JRD), the Upper North Platte River (NPR1), North Platte River Robertson Road (NPRRR), and the Lower North Platte River (NPR2). However, these trends should be viewed with caution as they are based on limited data. Additional data collection during Segment 2 will provide more insight as to the accuracy of these trends and whether any conclusions can be drawn with respect to linkages with implemented BMPs.

The water quality data continues to support a trend in decreasing levels of total selenium in the North Platte River Watershed. The 2001 - 2014 monitoring data was integrated with validated 2015 data to plot graphs of mean annual selenium concentrations against time. The mean annual levels were analyzed at each monitoring station for significant trends with a 90% confidence level ($\alpha = 0.10$). These trend analyses indicate that statistically significant reductions in selenium levels are observed at the Poison Spring Creek (POSP), Poison Spider Creek (PSC1) and Johnson Reservoir Drain (JRD) monitoring stations [Apex, 2015]. There is a trend at Upper and Lower North Platte River (NPR1 and NPR2) showing a decrease in selenium loads, but this trend is not statistically significant. In July of 2014, three additional monitoring sites were added along the North Platte River to more effectively monitor changes in selenium concentration and load as tributaries enter the river through the project area (NPRRR, NPRPP, and NPRCR22). Since sampling at these three sites was only recently initiated, there is currently insufficient data to perform a statistical analysis.

Water quality monitoring was completed on a monthly basis at twelve to sixteen sampling sites as shown in Table 6-1:

Table 6-1. Water Quality Monitoring Sites.

Sample Site Name	Site ID Code	UTM_E_83	UTM_N_83	Lat_NAD83	Lon_NAD83	Elevation
Lower Casper Creek	CACR2	388609	4744669	42.846488	-106.363222	5123
Johnson Reservoir Drain	JRD	381923	4755190	42.940199	-106.447233	5263
Upper North Platte River	NPR1	374757	4736629	42.771967	-106.530903	5183
North Platte River Robertson Road	NPRRR	384352	4740836	42.811349	-106.414517	5146
North Platte River - Platte Parkway	NPRPP	389776	4744452	42.844703	-106.348901	5123
Lower North Platte River	NPR2	400996	4745840	42.858735	-106.211869	5080
North Platte River County Road 22	NPRCR22	419843	4744718	42.850842	-105.981047	5007
Oregon Trail Drain	OTD	384278	4742665	42.827806	-106.415803	5149
Poison Spring Creek	POSP	370875	4729248	42.704878	-106.576652	5238
Middle Poison Spider Creek	PSC1	362730	4742666	42.824250	-106.679331	5504
Lower Poison Spider Creek	PSC2	375027	4734055	42.775850	-106.527694	5183
Upper Poison Spider Creek	PSC3	352881	4743582	42.830665	-106.799998	5702
Poison Spider Creek @ Tuffy Rd	PSCT	372970	4739258	42.795342	-106.553333	5261
South Fork Casper Creek @ 33 Mile Road	SFCC10	378215	4758792	42.972048	-106.493447	5321
Six Mile Drain	SMD	382925	4750291	42.896251	-106.433934	5223
Upper Oregon Trail Drain	OTD10	381498	4743966	42.839090	-106.450073	5238

SECTION 7.0 PARTNERS

Many partnerships with both landowners and agencies were established or re-established through this Segment 1 project. While the topic of selenium in our watershed has been presented to local government officials since the inception of this project, our newsletters and annual legislative breakfasts have been critical to bringing all entities and agencies together in this effort to minimize selenium movement. The City of Casper and Natrona County Commissioners have both promised to assist with the selenium mitigation efforts with a financial contribution of \$50,000 each year for four years from both entities. Natrona County’s contribution could vary a bit each year, as these funds come from the 1% sales tax.

NCCD acknowledges and appreciates the support of the following conservation partners:

- The **City of Casper**, who provided local leadership.
- The **Casper Public Utilities Board**, who provided local leadership.
- The **Natrona County Commissioners**, who provided local leadership.
- The **Natrona County Weed and Pest**, who supplied conservation recommendations.
- The **Wyoming Association of Conservation Districts**, who offered continuous leadership and knowledge to NCCD staff.
- The **University of Wyoming Extension Service**, who provided outreach assistance.

- The **USDA National Resource Conservation Service**, who gave countless hours of program assistance, technical support, and partnership on projects.
- The **Casper Alcova Irrigation District**, for partnering on projects.
- The **USDA Farm Service Agency**, who bestowed landowner information and agency cooperation.
- The **Wyoming Department of Agriculture**, who made available guidance and program assistance, as well as water quality grants as match for the water quality sampling.
- The **Wyoming Department of Environmental Quality**, who provided grant and project leadership and supervision, as well as financial support.
- The **Wyoming Game and Fish**, who made available wildlife technical assistance.
- The **Environmental Protection Agency-Region 8**, who endowed overall grant and project support.

SECTION 8.0 INFORMATION AND EDUCATION

NCCD held 48 board meetings before and during this project, as well as annual meetings with the Natrona County Commissioners, the City of Casper, and the Casper Public Utilities (12 meetings). An informational legislative breakfast was held each year (4 meetings) with all Natrona County elected officials invited to attend including federal, state, and local elected officials. During that time, officials are updated as to the progress of BMP implementation, as well as the latest trends in the water quality data. Numerous other, less formal meetings took place throughout the project with landowners, CAID, NRCS, and the Board of Public Utilities to discuss projects, selenium concentrations and potential future regulations regarding the North Platte River.

The original plan was to utilize mailings to landowners to inform them of the TMDL and the opportunities for BMPs through this segment. In 2014, the NCCD Board of Supervisors decided instead to develop printed materials to distribute during educational events, mail to landowners, and make available on our website. In partnership with Wyoming Department of Agriculture (WDA), 319 Funds, and WDA Lab Funds, several educational booklets were published; “Selenium Management”, “Small Acreage Pasture Management”, and “Shelterbelts”, all with a focus on water quality. NCCD printed 1500 Selenium Management booklets that focus on Natrona County and the geology that underlies much of the county, primarily the Cody Shale which contributes to the selenium concentrations in our waterbodies. This booklet and the other two have been mailed or distributed to over 1,000 landowners in the county, and are available on our website, www.nccdwyoming.com. Our website has had 12,797 visitors between 2012 and 2015. In addition, three newsletters were written and mailed to over 50 elected officials within Natrona County in order to keep the officials familiar with the projects. These publications are found in Appendix D.

The educational goals of this project exceeded expectations due to the heightened interest from landowners, the participation of CAID in several projects, and the increased financial input awarded to NCCD by the City of Casper and Natrona County to assist with selenium mitigation projects throughout the watershed.

SECTION 9.0 COMPLICATIONS

With the ability to hire a professional consultant on this project, NCCD feels that this project commenced without many complications. The consultant was critical in leading the project development, as well as engineering designs when assistance from NRCS was limited. Whenever possible, NCCD utilized the expertise of NRCS staff to assist with project development, regulatory assistance, and project designs. When this was unavailable due to complications at a federal level or just lack of staffing, NCCD was able to depend upon a professional consultant to get the job done.

Due to the reliance on the consulting firm for several projects that NRCS could not assist with, consulting expenses were higher than projected, but with each segment, these expenses should decrease with greater grant management skills, landowner relationships, and agency partnerships that were developed throughout Segment 1.

SECTION 10.0 RECOMMENDATIONS

The North Platte River Watershed Project – Segment 2, has already commenced, with plans for a Segment 3 in the future. With the District Manager of NCCD remaining the same throughout the period of the grant, much was learned regarding managing a grant. Proper bookkeeping is critical and organization of records. The lessons learned from Segment 1 will certainly assist with the organization, project management, recordkeeping and tracking of any future grants. Ms. Jennifer Zygmunt and Mr. Eric Hargett, of WDEQ Water Quality Division, assisted with anything necessary and the Access Program allowed for simple, accurate and timely report filing.

SECTION 11.0 FINANCIAL SUMMARY

Task #	Task Title	319 or 205(j) Funds Expended	Nonfederal Match Expended	Total NPS Expenditures	Other Federal Funds Expended
1	Administration	\$ 71,650.54*	\$ 20,321.38	\$ 91,971.92	
2	BMP Implementation	\$ 566,518.89	\$ 288,711.71	\$ 855,230.60	\$ 454,072.42
3	Resource Inventories	\$	\$ 238,929.82	\$ 238,929.82	
4	Public Information	\$ 5,450.06*	\$ 22,569.56	\$ 28,019.62	
5	Evaluation & Monitoring	\$ 67,759.71	\$ 43,367.09	\$ 111,126.80	
	TOTALS	\$ 711,379.19	\$ 613,899.56	\$1,325,278.76	\$ 454,072.42

- Per the Access Database, Administration Costs were \$341.75 higher and Public Information Costs were \$341.75 lower. A recording discrepancy in QuickBooks.

SECTION 12.0 ATTACHMENTS

APPENDIX A: Project Maps

APPENDIX B: BMP Implementation Project Spreadsheet

APPENDIX C: Executive Summary of the Middle North Platte Watershed Study Watershed Management Plan

APPENDIX D: Educational Materials

APPENDIX E: Annual Water Quality Monitoring Reports 2012, 2013, 2014, & 2015

APPENDIX F: Sampling and Analysis Plan, Quality Assurance Project Plan

APPENDIX G: Agreed Upon Procedures

APPENDIX H: References Cited