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GOOSE CREEK WATERSHED LEVEL I STUDY
EXECUTIVE SUMMARY

Prepared for:

Wyoming Water Development Commission

Submitted by:

EnTech Inc.
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In association with

SWCA ENVIRONMENTAL CONSULTANTS
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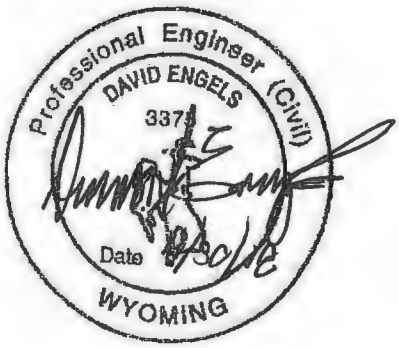
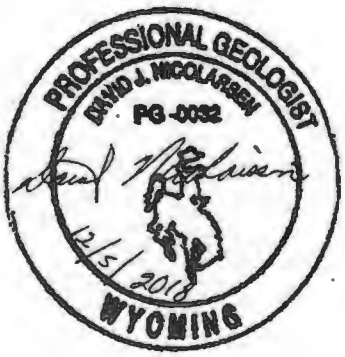
Civil • Water Resources • Environmental

November, 2018

GOOSE CREEK WATERSHED LEVEL I STUDY
EXECUTIVE SUMMARY





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1. INTRODUCTION AND OVERVIEW

1.1. Introduction

In 2015, the Sheridan County Conservation District (SCCD) of Sheridan County, Wyoming requested that the Wyoming Water Development Commission (WWDC) conduct a comprehensive study of the Goose Creek watershed in Sheridan and Johnson Counties. The SCCD made this request because it had received requests to sponsor such a study due to concerns with existing irrigation infrastructure and efficiency within this watershed area. A Level I study was previously required by the WWDC to become eligible for monies that the WWDC makes available for projects that can be used to improve such infrastructure and efficiency. While the SCCD, in working with the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS), has been successful in completing several irrigation structure projects within the Goose Creek watershed over the past few years, the SCCD believes that additional funding is necessary to address the numerous infrastructure deficiencies that currently exist.

In 2016, the Wyoming State Legislature appropriated funding for the Goose Creek Watershed Level I Study and, soon after, the WWDC entered into a contract with EnTech, Inc. Professional Engineers of Sheridan (EnTech) to provide the necessary services to prepare this watershed study. As the name implies, this Goose Creek Watershed Level I Study is a detailed evaluation and inventory of the water and land resources within the study area. Its principal purposes are to evaluate watershed function, assess upland, wetland and riparian conditions, develop geomorphic classifications, and identify resource concerns and water development opportunities within the watershed.

1.2. Project Overview

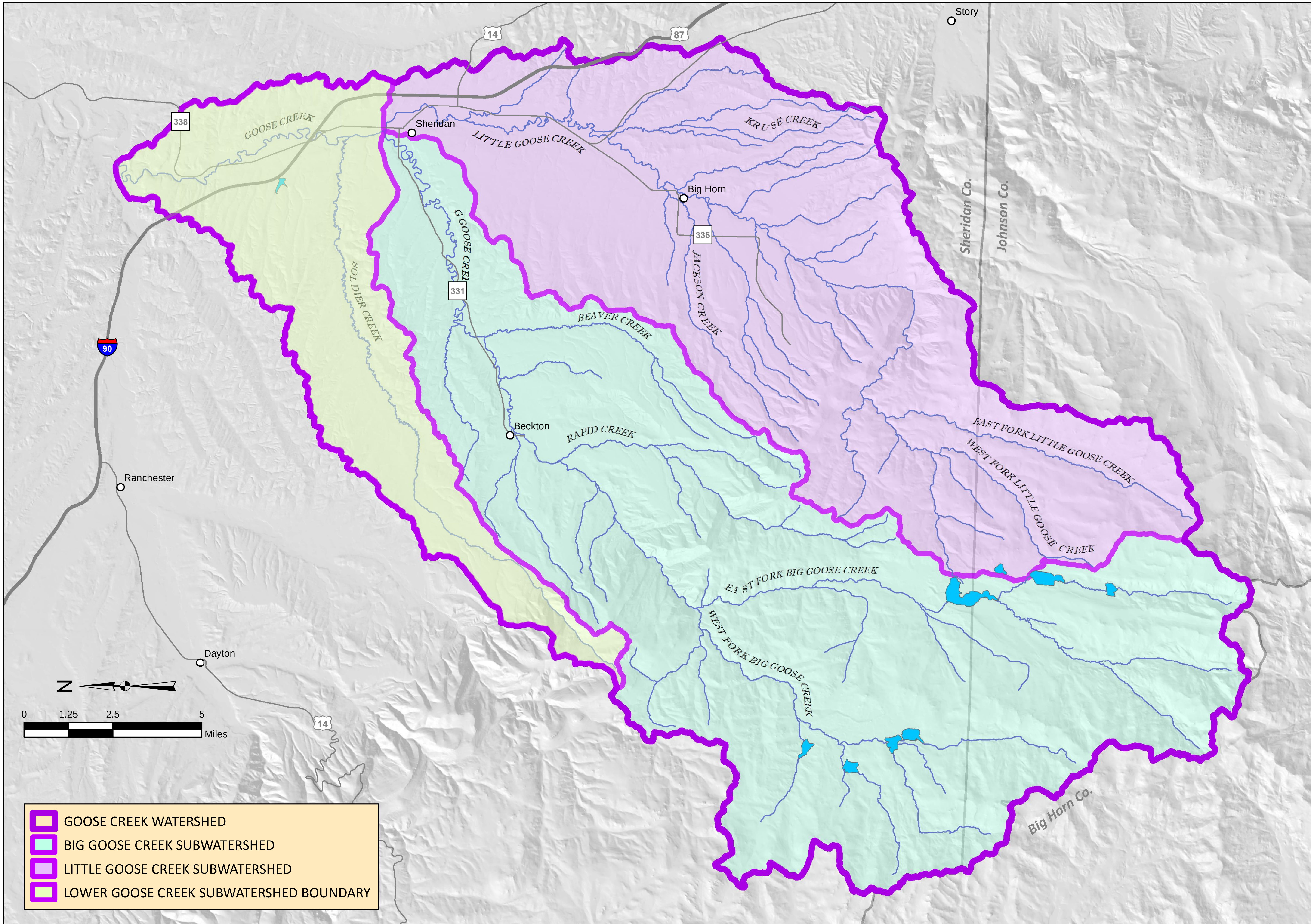
A watershed study provides a broad overview of an area defined by one stream that drains that entire area. In this case, that stream is Goose Creek, which is located in northern Wyoming and a major tributary of the Tongue River. This study describes in detail the characteristics of the Goose Creek watershed and provides information and recommendations on needed water-related improvements within this watershed.

The Level I study area is specifically defined as a subbasin of the Tongue River delineated in the United States Geological Survey (USGS) Hydrologic Unit Code as HUC10 – 1009010102, named as Big Goose Creek. Figure 1 shows the general location of the watershed within the State of Wyoming (State), and Figure 2 portrays the watershed itself. Henceforth throughout this Executive Summary, the Goose Creek Watershed Level I Study will also be referred to as "the Level I Study". The Goose Creek watershed will also be referred to as "the Watershed" and as "the Level I Study Area".

The total area encompassed by the Watershed is 415.4 square miles. For ease of identification and discussion within the Level I Study, the Watershed has been divided into three principal subwatersheds, all shown in Figure 2:

- Big Goose Creek Subwatershed, containing 203.4 square miles and encompassing the following HUC12 watersheds:
  - 100901010201;
  - 100901010202;
  - 100901010203;
  - 100901010204;
  - 100901010205;
- Little Goose Creek Subwatershed, containing 150.9 square miles and encompassing the following HUC12 watersheds:
  - 100901010206;
  - 100901010207;

EnTech Inc. Professional Engineers	SWCA Anderson Consulting Engineers, Inc. Civil • Water Resources • Environmental	***GOOSE CREEK WATERSHED LEVEL I STUDY***	***VICINITY MAP***	***FIG. 1***



LOCATION MAP

GOOSE CREEK WATERSHED
LEVEL I STUDY

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FIG. 2

    - 100901010208; and
- Lower Goose Creek Subwatershed, containing 61.1 square miles and encompassing the following HUC12 watershed;
    - 100901010209.

Within the Watershed is located one municipality: the City of Sheridan.

2. PURPOSE AND SCOPE

The primary purposes of this Level I Watershed Study are listed below:

- Develop a team approach among the SCCD, various landowners within the Watershed, and the WWDC to facilitate achievement of the groups' varied objectives.
- Foster public interest and participation in the Level I Study.
- Collect relevant available information on the Watershed.
- Describe and characterize the various attributes of the Watershed.
- Conduct a geomorphic investigation of the primary channels within the Watershed, and identify potential mitigation measures to improve impaired channel reaches.
- Identify needed water-related infrastructure within the Watershed by inventorying and characterizing existing facilities, with particular emphasis upon those facilities utilized for irrigation.
- Develop a watershed management plan which will provide recommendations on:
    - new facilities that will best utilize the water resources within the Watershed (particularly those that entail new water storage opportunities to augment water available for livestock and wildlife); and
    - improvements to existing water-related facilities.
- Include within the watershed management plan:
    - conceptual-level cost estimates associated with any recommended new facilities or improvements to existing ones;
    - an economic analysis based upon the cost estimates identified; and
    - information on the various means of public financing available for the recommended new facilities or improvements to existing ones.
- Assemble a Geographic Information System (GIS) that will utilize the considerable amount of spatial data, background mapping and orthographic imagery currently available, as well as new data created and developed as part of this Level I Study, to enable project stakeholders and other interested parties to easily access the GIS data.
- In conjunction with assembly of the GIS, create a Digital Library that allows for access to the information that has been inventoried and developed as part of the Level I Study.

3. WATERSHED DESCRIPTION AND INVENTORY

Considerable information is available concerning the land and water resources located within the Watershed. This information was used to describe and inventory the Watershed by assimilating, reviewing and compiling the data available in reports, studies, and both digital and hard copy databases. Key features targeted in the Watershed inventory included, but were not necessarily limited to, natural resources, land use, land ownership, zoning, climate, ecological sites, wetlands, wildlife, irrigation, hydrology, geology, soils, and vegetation.

Agencies from which information was obtained include the following:

- City of Sheridan, including
    - Planning Department;
    - Engineering Department; and
    - Public Utilities Division;
- Sheridan County, including:
    - Assessor's Office;
    - Information Technology Department;

    - Engineering Department; and
    - Emergency Management Division;
- Sheridan County Conservation District (SCCD);
- Johnson County, including:
    - Information Technology Department; and
    - Planning Department;
- Wyoming Water Development Commission (WWDC);
- Wyoming State Engineer's Office;
- Wyoming State Board of Control;
- Wyoming Department of Transportation;
- Wyoming Game & Fish Department;
- Wyoming Department of Environmental Quality;
- Wyoming State Geological Survey;
- Wyoming Geographic Information Science Center;
- Wyoming Oil and Gas Conservation Commission;
- Wyoming Office of State Lands and Investments;
- Wyoming State Loan and Investment Board;
- Wyoming State Historical Preservation Office through the Cultural Records Office;
- U.S. Department of Agriculture, including
    - Farm Service Agency;
    - Natural Resources Conservation Service; and
    - Forest Service (USFS), in particular the Bighorn National Forest;
- U.S. Environmental Protection Agency;
- U.S. Army Corps of Engineers;
- Veterans Affairs Medical Center in Sheridan;
- U.S. Department of the Interior, including;
    - U.S. Geological Survey;
    - Bureau of Land Management;
    - U.S. Bureau of Reclamation;
    - National Park Service; and
    - U.S. Fish and Wildlife Service;
- U.S. Department of Commerce, including:
    - National Weather Service.

Summarized information was provided via text, tables and figures, with references cited in the last section of the Level I Study that allows the reader to locate this information online.

While groundwater exists within the Watershed primarily in shallow, unconfined aquifers, it is not abundant. This fact is a major reason why irrigation and municipal water systems in the Watershed primarily use surface water. A few deep groundwater wells have been drilled into bedrock aquifers. Drilling to these deeper aquifers is possible, but has generally shown to not be cost-effective. Dips along the Big Horn Mountain front within the Watershed are generally between 30 and 40 degrees, creating long bands of outcrop parallel to this mountain range.

Streamflow characteristics within the Watershed exhibit a typical snowmelt-driven runoff pattern. The bulk of the annual runoff occurs between April and July. The late summer through fall months (August through October) see steep declines in streamflow as the streams return to baseflow conditions. Figure 3 portrays the mean monthly discharge hydrographs for Goose Creek.

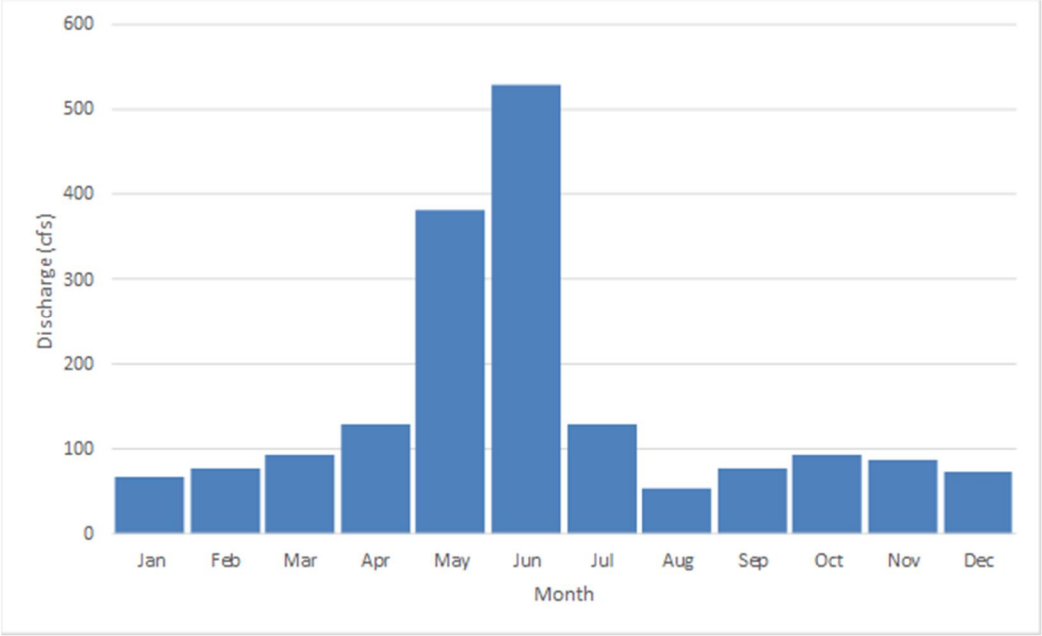

Figure 3 – Mean Monthly Discharge Hydrograph: USGS Stream Gage 006305700 on Goose Creek near Acme (1984-2010)

The most recent Powder/Tongue River Basin Model (RESPEC, 2018) was used to estimate the amount of flow which may be available for future development within the Watershed. Results of this availability analyses indicate that there is flow available for storage without incurring a shortage in downstream reaches as summarized in Table 1 for modeled stream reaches within the Watershed or downstream on the Tongue River. The total annual available flow for the entire Watershed is estimated in the model as over 136,000 A-F for a normal (6 out of 10 years) condition and over 85,000 A-F for a dry (2 out of 10 years) condition. The model results show that the large majority of available flows occur in May, June and July, as would be expected in this hydrologic setting and consistent with the pattern of gaged flows as previously described.

The Rosgen classification system is perhaps the most widely used today for classifying and evaluating stream systems from a geomorphological standpoint. This system evaluates stream sinuosity, slope, width/depth ratio and size of channel materials to designate which class best defines each studied stream. For this Level I Study, a Rosgen Level I evaluation was performed for the various streams within the Watershed. Four major stream types were found to exist within the Watershed: A-Type, B-Type, C-Type and F-Type. (The Rosgen Classification System contains a total of nine stream types.)

The Water Quality Division of the Wyoming Department of Environmental Quality (WDEQ) classifies surface waters in the state using a hierarchical system according to their designated uses. There are four major classes of surface water, with various subcategories within each class. Class 1 waters are managed for the highest water quality, with each subsequent class managed for a lower water quality, Class 4 waters being managed for the lowest quality. All of the streams located in the Watershed are classified by WDEQ as being Class 2 streams, and they are further classified as 2AB for being waters known to support cold-water game fish.

In 1998, the WDEQ, in conjunction with the Wyoming Water Resources Center, State of Wyoming Geological Survey, the University of Wyoming, and the Spatial Data Visualization Center, completed the Wyoming Ground Water Vulnerability Assessment Handbook. Contained within that handbook was statewide information on the vulnerability of groundwater. Several areas within the Watershed (typically within the lower reaches of the three subwatersheds) were determined to have a vulnerability rating of 5 (Most Vulnerable) on a scale of 1-5.

Table 1 - Available Flow in Acre-Feet for Goose Creek Watershed (Tongue River Spreadsheet Model, RESPEC, 2018)

Reach Number	Reach Name	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Wet Year Hydrologic Conditions														
Reach 6	Big Goose Creek above Rapid Creek	904	1,286	2,907	3,441	20,529	46,059	15,638	2,951	3,483	1,898	1,341	1,169	101,606
Reach 7	Rapid Creek	69	73	140	48	623	1,271	950	0	0	113	91	79	3,457
Reach 8	Big Goose Creek above Beaver Creek	1,124	1,461	3,103	3,483	21,123	47,246	16,489	2,953	3,660	2,400	1,725	1,471	106,238
Reach 9	Beaver Creek	93	60	52	73	492	715	186	89	80	238	186	142	2,407
Reach 10	Big Goose Creek above Little Goose Creek	1,400	1,633	3,209	3,561	21,649	48,030	16,767	3,237	4,048	3,126	2,286	1,896	110,842
Reach 11	Little Goose Creek	2,224	2,093	3,152	3,297	17,881	21,368	4,964	2,118	3,705	4,438	3,329	2,757	71,326
Reach 12	Goose Creek above Soldier Creek	3,952	3,983	6,542	7,735	41,796	70,136	20,934	4,960	6,376	5,948	5,002	4,266	181,629
Reach 13	Soldier Creek	980	690	596	535	1,360	1,604	490	436	579	1,021	928	822	10,043
Reach 14	Goose Creek below Soldier Creek	5,033	4,767	7,306	8,477	44,499	75,198	22,253	5,480	7,142	7,133	6,062	5,193	198,542
Reach 15	Goose Creek above Tongue River	5,033	5,011	9,233	10,550	51,668	78,502	24,930	6,146	8,136	7,133	6,182	5,193	217,717
Normal Year Hydrologic Conditions														
Reach 6	Big Goose Creek above Rapid Creek	1,635	1,718	2,316	2,493	13,582	20,113	3,309	0	0	1,801	2,111	1,792	50,870
Reach 7	Rapid Creek	69	59	60	0	0	870	0	0	0	0	96	81	1,234
Reach 8	Big Goose Creek above Beaver Creek	1,912	1,921	2,460	2,430	13,452	20,818	3,143	68	177	2,321	2,640	2,184	53,526
Reach 9	Beaver Creek	88	50	28	0	207	368	106	26	0	215	204	155	1,447
Reach 10	Big Goose Creek above Little Goose Creek	2,225	2,113	2,563	2,345	13,569	21,231	3,323	164	380	3,136	3,352	2,710	57,112
Reach 11	Little Goose Creek	4,735	4,308	4,283	1,399	8,255	7,903	989	1,215	1,775	6,366	6,320	5,436	52,985
Reach 12	Goose Creek above Soldier Creek	3,422	3,588	5,634	6,765	24,884	33,874	9,107	3,091	3,819	4,945	4,221	3,547	106,897
Reach 13	Soldier Creek	384	334	383	485	789	856	969	713	723	772	557	434	7,399
Reach 14	Goose Creek below Soldier Creek	4,729	5,627	6,080	8,953	24,129	38,842	8,919	4,325	6,185	6,974	6,107	5,341	126,211
Reach 15	Goose Creek above Tongue River	4,729	5,627	7,828	9,348	26,108	40,870	10,554	5,393	7,200	6,974	6,107	5,341	136,079
Dry Year Hydrologic Conditions														
Reach 6	Big Goose Creek above Rapid Creek	1,293	1,046	1,497	1,591	7,175	3,249	0	0	0	1,734	1,949	1,657	21,191
Reach 7	Rapid Creek	62	51	53	0	0	729	0	0	0	0	88	77	1,061
Reach 8	Big Goose Creek above Beaver Creek	1,471	1,176	1,599	1,494	7,020	3,895	14	0	0	2,121	2,350	1,935	23,073
Reach 9	Beaver Creek	49	22	16	0	320	232	74	0	0	184	173	109	1,180
Reach 10	Big Goose Creek above Little Goose Creek	1,679	1,295	1,668	1,367	7,315	4,309	222	69	121	2,846	2,972	2,334	26,195
Reach 11	Little Goose Creek	3,914	3,512	3,543	105	4,020	1,032	843	798	930	5,479	5,347	4,551	34,073
Reach 12	Goose Creek above Soldier Creek	2,460	2,466	4,029	4,330	12,204	9,213	2,041	1,205	2,265	4,021	3,303	2,733	50,269
Reach 13	Soldier Creek	282	253	312	768	810	756	600	345	581	639	438	331	6,114
Reach 14	Goose Creek below Soldier Creek	4,084	3,730	6,277	7,133	21,677	17,157	3,147	2,146	2,927	6,185	5,536	4,858	84,857
Reach 15	Goose Creek above Tongue River	4,084	3,730	6,277	7,133	21,677	17,157	3,147	2,146	3,182	6,185	5,536	4,858	85,112

By comparison, there are relatively few (11) discharge permits that have been issued by WDEQ in the Watershed. Of those eleven discharge permits, only one could be considered as being substantive: the discharge permit for the City of Sheridan's wastewater treatment plant.

Several streams within the Watershed have been listed in WDEQ's 2014 Integrated Report as needing Total Maximum Daily Load (TMDL) assessments, based upon noted impairments to those particular waterbodies. Table 2 lists those streams and identified impairments. Note that fecal coliform is a characteristic of each impaired stream.

Table 2 - Stream Classification, Cause of Impairment, Year of Initial 303(d) Listing, and Year of TMDL Completion for the Various Waters in the Goose Creek Watershed

Water Body	Class	Impairment	Initial 303(d) Listing Year	Year TMDL Completed
Park Creek	2AB	Fecal Coliform	2000	2010
Rapid Creek	2AB	Fecal Coliform	2000	2010
Big Goose Creek	2AB	Fecal Coliform	1996	2010
Beaver Creek	2AB	Fecal Coliform	2000	2010
Sackett Creek	2AB	Fecal Coliform	2000	2010
Jackson Creek	2AB	Fecal Coliform	2000	2010
Little Goose Creek	2AB	Fecal Coliform, Habitat Alteration, Sediment	1996 (Fecal Coliform), 2006 (Habitat Alterations, Sediment)	2010
McCormick Creek	2AB	Fecal Coliform	2004	2010
Kruse Creek	2AB	Fecal Coliform	2000	2010
Goose Creek	2AB	Fecal Coliform, Habitat Alterations, Sediment	2000 (Fecal Coliform), 2006 (Habitat Alterations, Sediment)	2010
Soldier Creek	2AB	Fecal Coliform	2000	2010

As a result of these stream impairments, the SCCD has been vigilant in developing a watershed plan for mitigation. Implementation of projects by the SCCD to improve stream water quality has begun, which include septic system improvements, establishment of animal feeding operations, riparian buffer development streambank stabilization, reservoir development and changes in grazing management.

Water quality data provided by the WDEQ and SCCD was used to evaluate the suitability of surface water within the Watershed for agricultural use, primarily irrigation and livestock watering. The agencies-supplied data for each of the three subwatersheds (Big Goose Creek, Little Goose Creek and Lower Goose Creek) was compared to maximum recommended levels for irrigation and animal watering, as provided by WDEQ and two previous studies. The results of this comparison indicated that the water discharging from the Watershed appears to be generally suitable for these agricultural-related purposes.

There are three community water systems located within the Watershed:

1. the system owned jointly by the City of Sheridan and the Sheridan Area Water Supply Joint Powers Board, and operated by the City;
2. the system owned by the Downer Neighborhood I&S District (which is operated by and receives its treated water from the City); and
3. the Veterans Affairs Medical Center.

There are also two small non-community water systems:

1. the Big Horn Mountain KOA Campground (serving approximately 150 persons), and
2. the Bighorn National Forest Burgess Ranger Station (serving approximately 20 persons).

As a major part of the Watershed Description and Inventory task, irrigation water systems located within the Watershed were mapped and described. The following methodology was utilized in selecting the irrigation systems to be investigated for this inventory effort involved with this Level I Study:

1. Information was obtained from the Board of Control for all diversions that this state agency monitors within the Watershed.
2. Letters and accompanying survey forms were sent to representatives utilizing these various diversions. For all respondents to these letters, their systems were included in the inventory. If there was no response to the letters, follow-up inquiries were made by phone for all diversions of 5 cfs or greater to determine interest in the inventory program. While most representatives of ditches with diversions greater than 5 cfs willingly participated in the inventory program, some did not.

Inventories of irrigation facilities for those who agreed to participate were then conducted according to the following general procedures:

- Ditch representatives and some associated irrigators were interviewed. The ditch representatives provided valuable insight into the ditch condition, issues, and management.
- Field inventories were performed of the system's hydraulic structures and their current conditions, including:
  - diversion facilities,
  - measurement devices,
  - wasteways,
  - representative portions of conveyance systems (e.g., lined and unlined ditches, pipes, etc.),
  - siphons, and
  - representative turnouts.
- The field inventories included specific observations of areas of seepage loss, erosion and degradation, and vegetation encroachment.
- The field inventories were documented with various photographs and, where applicable, measurements.
- Locations of appropriate facilities were determined using equipment that enabled incorporation of those locations into the GIS network developed as part of this Level I Study.

This information was then incorporated into the Level I Study's GIS database.

Using the methodology described above, irrigation systems were inventoried by evaluating and mapping each system. They are listed in Table 3. The irrigation systems and their respective PODs are also depicted in Figures 4 and 5.

Table 3 – Irrigation Systems Inventoried in Level I Study

BIG GOOSE CREEK SUBWATERSHED	LITTLE GOOSE CREEK SUBWATERSHED	LOWER GOOSE CK. SUBWATERSHED
Snively Ditch	Peralta Ditch	Grinnell Ditch
Big Goose and Beaver Ditch [1] [2]	Last Chance Ditch	Soldier Creek Ditch
PK Ditch	Colorado Colony Ditch[4]	
Alliance Ditch	Muskrat Ditch	
Alliance Lateral Ditch[3]	East Side Ditch	
Rocky Ditch	Negro John Ditch	
No. 9 Ditch	Gerdel Ditch	
Daisy Ditch	Metz Ditch[5]	
Wild Rose System[3]	Burn Cleuch Ditch	
Flume Ditch	Paradise Park South Ditches[5]	
	Reed Ditch	
	Meade Coffeen Ditch[6]	
	Piney Cruse Creek Ditch[6]	

[1] also conveys water into Little Goose Creek Subwatershed

[2] first diversion is out of East Fork of Big Goose Creek in BNF into Rapid Creek, with second diversion out of Rapid Creek then used by ditch's irrigators

[3] point of diversion From Big Goose Creek same as Alliance Ditch, POD shown in table for Alliance Lateral Ditch is from Alliance Ditch

IRRIGATION SYSTEMS INVENTORIED IN BIG GOOSE CREEK AND LOWER GOOSE CREEK SUBWATERSHEDS

GOOSE CREEK WATERSHED LEVEL I STUDY

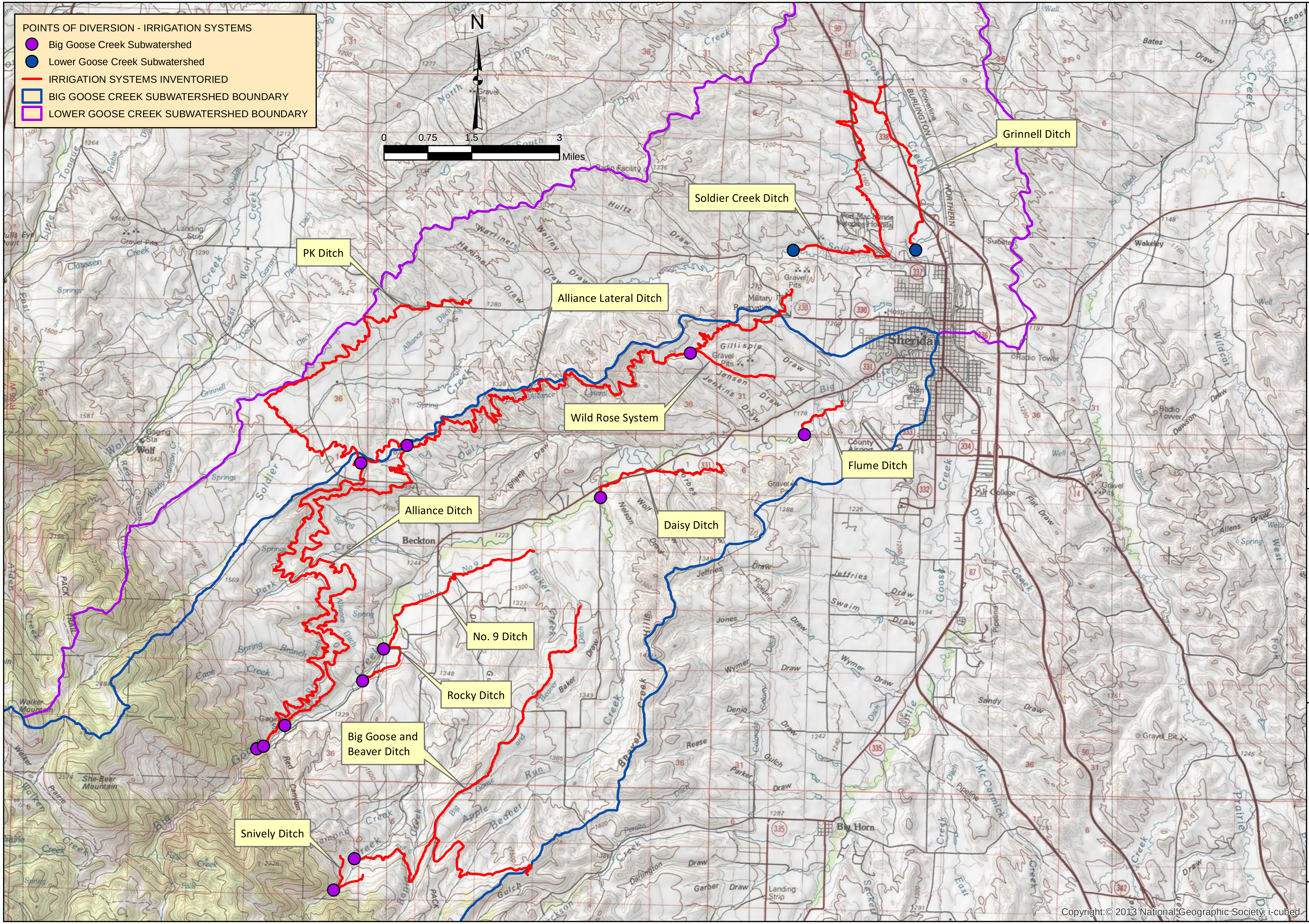

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FIG. 4

Piney Cruse Creek Ditch (Transbasin Diversion from Piney Creek)

Burn Cleuch Ditch

Meade-Coffeen Ditch (Transbasin Diversion from Piney Creek)

Reed Ditch

East Side Ditch

Metz Ditch

Last Chance Ditch

Paradise Pk. South Ditches

Muskrat Ditch

Gerdel Ditch

Negro John Ditch

Colo. Colony Ditch

Peralta Ditch

N

0 0.5 1 2 Miles

POINTS OF DIVERSIONS - IRRIGATION SYSTEMS

IRRIGATION SYSTEMS INVENTORIED

LITTLE GOOSE CREEK SUBWATERSHED BOUNDARY

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IRRIGATION SYSTEMS INVENTORIED IN LITTLE GOOSE CREEK SUBWATERSHED

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FIG. 5

[4] ditch representatives elected to not participate in Level I Study evaluations, but nonetheless listed due to its importance in the Watershed
[5] point of diversion out of Colorado Colony Ditch
[6] water source is Piney Creek drainage, tributary to Powder River, through Tunnel Hill

There are eight reservoirs located within the Watershed with capacities exceeding 500 acre-feet. Of the eight reservoirs, six reservoirs are located within the Big Goose Creek Subwatershed, although all eight store water principally initiating in the Big Goose drainage. Due to the fact that some of these reservoirs have post-1950 storage right filing dates, the possibility exists that increased monitoring on the part of the State of Montana to fill the pre-1950 Tongue River Reservoir (a +/- 79,000 acre-feet reservoir located just north of the state line) may limit the time that the Wyoming post-1950 storage rights can be utilized. This increased monitoring appears to have been brought on as a result of the Montana v. Wyoming lawsuit filed by Montana in 2007 (and ultimately decided upon by the U.S. Supreme Court in 2018) over water use under the Yellowstone River Compact.

4. WATERSHED MANAGEMENT AND REHABILITATION PLAN

In conjunction with the development of the Level I Study's GIS, inventories that were conducted provided a baseline illustrating and assessing existing conditions within the Watershed. This baseline led to the development of a Watershed Management and Rehabilitation Plan. This plan included a listing and description of recommended projects that were segregated into the following categories:

- Irrigation System Infrastructure Rehabilitation and Improvements Projects (ISI).
- Surface Water Storage Opportunities (SWSO).
- Upland Water Development Opportunities (UWDO).
- Fisheries Mitigation (FM).

In order to provide additional information on the relative importance of the various projects proposed with the Watershed Management and Rehabilitation Plan, a matrix was prepared which summarizes the opportunities and challenges affecting the projects identified as part of the plan. This matrix (which is shown as Table 4) not only identifies the various projects and their associated costs, it also assists the reader in identifying interrelationships among the various proposed projects. It also facilitates screening and prioritization of the various projects to guide in the ultimate selection and implementation of the various projects being proposed.

The matrix is formatted utilizing a 1 to 3 ranking criteria for each project, with 1 being the highest ranking and 3 being the lowest ranking. The matrix includes a column entitled SWPP Priority and WWDC Account (I or II) which provides information on funding availability from the WWDC's Small Water Projects Program (SWPP). This column shows two numbers for each project:

1. The project priority number for SWPP funding, according to the WWDC's project priority listings; and
2. Roman numeral I or II, indicating whether or not the project could be funded out of the SWPP's Account I (New Development) or Account II (Rehabilitation).

Project priorities for the SWPP's Account I and Account II as identified in the matrix are as follows (from highest to lowest priority);

Account I (New Development) Project Priories:

1. Source Water Development;
2. Storage;
3. Pipelines, conveyance facilities, solar platforms and windmills;
4. Irrigation;
5. Environmental; and
6. Recreational.

Account II (Rehabilitation) Project Priories:

1. Diversion structures and spring developments;
2. Storage;
3. Pipelines, conveyance facilities, solar platforms and windmills;

TABLE 4 - PROJECT MATRIX

ID	NAME	PROJECT COST	PRACTICAL IMPLEMENTATION?	RELATIVE COST	ECONOMIC FEASIBILITY AND ABILITY TO FUND	NET HYDROLOGIC EFFECTS	INCREASED WATER USE EFFICIENCY	REDUCTION OF EROSION AND/OR WATER QUALITY DEGRADATION	SUSTAINABILITY	IMPACTS TO WATER RIGHTS AND EXISTING COMPACTS	EASE OF PERMITTING	PUBLIC ACCEPTABILITY	POTENTIAL FATAL FLAWS?	SWPP PRIORITY AND WWDC ACCOUNT (I OR II)	OVERALL RANKED PRIORITY
Irrigation System Infrastructure - Big Goose Creek Subwatershed															
ISI-BG-AL-01	Alliance Ditch Slide Area Repair	$40,131	Yes	Low	Yes	No negative effects	Yes	Yes	Yes	None	Likely to be little problem	Yes	None	3(II)	2
ISI-BG-ALL-01	Alliance Lateral Ditch Wasteway Gate Removal	$4,914	Yes	Low	Yes	No negative effects	Yes	N/A	Yes	None	Likely to be little problem	Yes	None	4(II)	2
ISI-BG-ALL-02	Alliance Lateral Ditch Culvert Replacement 1	$57,184	Yes	Low	Yes	No negative effects	Yes	Yes	Yes	None	Likely to be little problem	Yes	None	3(II)	2
ISI-BG-ALL-03	Alliance Lateral Ditch Culvert Installaton 1	$17,176	Yes	Low	Yes	No negative effects	Yes	Yes	Yes	None	Likely to be little problem	Yes	None	3(II)	2
ISI-BG-ALL-04	Alliance Lateral Ditch Culvert Installation 2	$18,029	Yes	Low	Yes	No negative effects	Yes	Yes	Yes	None	Likely to be little problem	Yes	None	3(II)	2
ISI-BG-ALL-05	Alliance Lateral Ditch Trash Rack 1	$10,374	Yes	Low	Yes	No negative effects	Yes	N/A	Yes	None	Likely to be little problem	Yes	None	4(II)	2
ISI-BG-ALL-06	Alliance Lateral Ditch Trash Rack 2	$3,822	Yes	Low	Yes	No negative effects	Yes	N/A	Yes	None	Likely to be little problem	Yes	None	4(II)	2
ISI-BG-ALL-07	Alliance Lateral Ditch Culvert Installation 3	$193,156	Yes	Medium	Possibly	No negative effects	Yes	Yes	Yes	None	Likely to be little problem	Yes	None	3(II)	2
ISI-BG-ALL-08	Alliance Lateral Ditch Culvert Replacement 2	$4,304	Yes	Low	Yes	No negative effects	Yes	Yes	Yes	None	Likely to be little problem	Yes	None	3(II)	2
ISI-BG-ALL-09	Alliance Lateral Ditch Erosion Control Structure 1	$14,514	Yes	Low	Yes	No negative effects	Yes	Yes	Yes	None	Likely to be little problem	Yes	None	4(II)	2
ISI-BG-ALL-10	Alliance Lateral Ditch Culvert Installation 4	$17,367	Yes	Low	Yes	No negative effects	Yes	Yes	Yes	None	Likely to be little problem	Yes	None	3(II)	2
ISI-BG-ALL-11	Alliance Lateral Ditch Culvert Replacement 3	$19,728	Yes	Low	Yes	No negative effects	Yes	Yes	Yes	None	Likely to be little problem	Yes	None	3(II)	2
ISI-BG-ALL-12	Alliance Lateral Ditch Culvert Installation 5	$25,448	Yes	Low	Yes	No negative effects	Yes	Yes	Yes	None	Likely to be little problem	Yes	None	3(II)	2
ISI-BG-ALL-13	Alliance Lateral Ditch Erosion Control Structure 2	$6,938	Yes	Low	Yes	No negative effects	Yes	Yes	Yes	None	Likely to be little problem	Yes	None	4(II)	2
ISI-BG-ALL-14	Alliance Lateral Ditch Culvert Replacement 4	$18,718	Yes	Low	Yes	No negative effects	Yes	Yes	Yes	None	Likely to be little problem	Yes	None	3(II)	2
ISI-BG-ALL-15	Alliance Lateral Ditch Culvert Installation 5	$24,588	Yes	Low	Yes	No negative effects	Yes	Yes	Yes	None	Likely to be little problem	Yes	None	3(II)	2
ISI-BG-ALL-16	Alliance Lateral Ditch Erosion Control Structure 3	$9,600	Yes	Low	Yes	No negative effects	Yes	Yes	Yes	None	Likely to be little problem	Yes	None	4(II)	2
ISI-BG-ALL-17	Alliance Lateral Ditch Culvert Installation 6	$1,479,954	Yes	High	Possibly	No negative effects	Yes	Yes	Yes	None	Likely to be little problem	Yes	Directional drilling is a proven technology, but possible risk in drilling at that depth.	3(II)	1
ISI-BG-ALL-18	Alliance Lateral Ditch Culvert Installation 7	$11,470	Yes	Low	Yes	No negative effects	Yes	Yes	Yes	None	Likely to be little problem	Yes	None	3(II)	2
ISI-BG-ALL-19	Alliance Lateral Ditch Turnout 1	$29,184	Yes	Low	Yes	No negative effects	Yes	Yes	Yes	None	Likely to be little problem	Yes	None	4(II)	2
ISI-BG-ALL-20	Alliance Lateral Ditch Turnout 2	$39,818	Yes	Low	Yes	No negative effects	Yes	Yes	Yes	None	Likely to be little problem	Yes	None	4(II)	2
ISI-BG-BGB-01	Big Goose Beaver Ditch Culvert Installation	$186,876	Yes	Medium	Yes	No negative effects	Yes	Yes	Yes	None	Likely to be little problem	Yes	None	3(II)	2
ISI-BG-BGB-02	Big Goose Beaver Energy Dissipation Structures	$34,371	Yes	Low	Yes	No negative effects	Yes	Yes	Yes	None	Likely to be little problem	Yes	None	4(II)	2
ISI-BG-DA-01	Daisy Ditch Wasteway Installation	$132,638	Yes	Low	Possibly	No negative effects	Yes	Yes	Yes	None	Likely to be little problem	Yes	None	4(II)	2
ISI-BG-DA-02	Daisy Ditch Headgate Replacement	$14,196	Yes	Low	Yes	No negative effects	Yes	Yes	Yes	None	Likely to be little problem	Yes	None	1(II)	2
ISI-BG-FL-01	Flume Ditch Wasteway Gate Replacement	$5,106	Yes	Low	Yes	No negative effects	Yes	Yes	Yes	None	Likely to be little problem	Yes	None	4(II)	2
ISI-BG-FL-02	Flume Ditch Seepage	$217,189	Yes	Medium	Possibly	No negative effects	Yes	Yes	Yes	None	Likely to be little problem	Yes	None	4(II)	2
ISI-BG-FL-03	Flume Ditch Culverts	$2,198	Yes	Low	Yes	No negative effects	Yes	Yes	Yes	None	Likely to be little problem	Yes	None	3(II)	2
ISI-BG-PK-01	PK Ditch Culvert Replacement	$72,253	Yes	Low	Yes	No negative effects	Yes	Yes	Yes	None	Likely to be little problem	Yes	None	3(II)	2
ISI-BG-RO-01	Rocky Ditch Seepage Rehabilitation	$12,285	Yes	Low	Yes	No negative effects	Yes	Yes	Yes	None	Likely to be little problem	Yes	None	4(II)	2
ISI-BG-RO-02	Rocky Ditch Headgate Replacement	$12,422	Yes	Low	Yes	No negative effects	Yes	Yes	Yes	None	Likely to be little problem	Yes	None	1(II)	2
ISI-BG-SN-01	Snively Ditch Flume Replacement	$29,894	Yes	Low	Yes	No negative effects	Yes	N/A	Yes	None	Likely to be little problem	Yes	None	3(II)	2
ISI-BG-SN-02	Snively Ditch Culvert Installation	$21,649	Yes	Low	Yes	No negative effects	Yes	N/A	Yes	None	Likely to be little problem	Yes	None	3(II)	2
ISI-BG-WR-01	Wild Rose Meter Replacement	$2,321	Yes	Low	Yes	No negative effects	Yes	N/A	Yes	None	Likely to be little problem	Yes	None	4(II)	2
ISI-BG-WR-02	Wild Rose Dam Improvements	$150,778	Yes	Medium	Yes	No negative effects	Yes	N/A	Yes	None	Likely to be little problem	Yes	None	2(II)	2
ISI-BG-WR-03	Wild Rose Headgate Improvements	$52,280	Yes	Low	Yes	No negative effects	Yes	Yes	Yes	None	Likely to be little problem	Yes	None	1(II)	1

TABLE 4 - PROJECT MATRIX

ID	NAME	PROJECT COST	PRACTICAL IMPLEMENTATION?	RELATIVE COST	ECONOMIC FEASIBILITY AND ABILITY TO FUND	NET HYDROLOGIC EFFECTS	INCREASED WATER USE EFFICIENCY	REDUCTION OF EROSION AND/OR WATER QUALITY DEGRADATION	SUSTAINABILITY	IMPACTS TO WATER RIGHTS AND EXISTING COMPACTS	EASE OF PERMITTING	PUBLIC ACCEPTABILITY	POTENTIAL FATAL FLAWS?	SWPP PRIORITY AND WWDC ACCOUNT (I OR II)	OVERALL RANKED PRIORITY
Irrigation System Infrastructure - Little Goose Creek Subwatershed and Lower Goose Creek Subwatershed															
ISI-LG-BU-01	Burn-Cleuch Ditch Measuring Flume	$12,695	Yes	Low	Yes	No negative effects	Yes	Yes	Yes	None	Likely to be little problem	Yes	None	4(I)	2
ISI-LG-BU-02	Burn-Cleuch Ditch UW Center Pivot Electrification	$79,853	Yes	Low	Possibly	No negative effects	Yes	Yes	Yes	None	Likely to be little problem	Yes	None	4(I)	2
ISI-LG-BU-03	Burn-Cleuch Ditch SC Control System	$20,475	Yes	Low	Yes	No negative effects	Yes	Yes	Yes	None	Likely to be little problem	Yes	None	4(I)	2
ISI-LG-ES-01	East Side Ditch Diversion Rehabilitation	$6,655	Yes	Low	Yes	No negative effects	Yes	Yes	Yes	None	Likely to be little problem	Yes	None	4(II)	2
ISI-LGES-02	East Side Ditch Wasteway	$26,263	Yes	Low	Yes	No negative effects	Yes	Yes	Yes	None	Likely to be little problem	Yes	None	4(II)	2
ISI-LG-ES-03	East Side Ditch Improvements	$27,255	Yes	Low	Yes	No negative effects	Yes	Yes	Yes	None	Likely to be little problem	Yes	None	4(II)	2
ISI-LG-ES-04	East Side Ditch Culvert Installation 1	$6,460	Yes	Low	Yes	No negative effects	Yes	Yes	Yes	None	Likely to be little problem	Yes	None	3(II)	2
ISI-LG-ES-05	East Side Ditch Sackett Creek Wasteway	$10,511	Yes	Low	Yes	No negative effects	Yes	Yes	Yes	None	Likely to be little problem	Yes	None	4(II)	2
ISI-LG-ES-06	East Side Ditch Culvert Installation 2	$14,558	Yes	Low	Yes	No negative effects	Yes	Yes	Yes	None	Likely to be little problem	Yes	None	3(II)	2
ISI-LG-ES-07	East Side Ditch Culvert Installation 3	$94,411	Yes	Low	Yes	No negative effects	Yes	Yes	Yes	None	Likely to be little problem	Yes	None	3(II)	2
ISI-LG-ES-08	East Side Ditch Garber Measuring Device	$4,413	Yes	Low	Yes	No negative effects	Yes	Yes	Yes	None	Likely to be little problem	Yes	None	4(I)	2
ISI-LG-ES-09	East Side Ditch Concrete Ditch Replacement	$189,189	Yes	Medium	Possibly	No negative effects	Yes	Yes	Yes	None	Likely to be little problem	Yes	None	4(II)	2
ISI-LG-ES-10	East Side Ditch Siphon	$50,743	Yes	Low	Yes	No negative effects	Yes	Yes	Yes	None	Likely to be little problem	Yes	None	3(II)	2
ISI-LG-ES-11	East Side Ditch Maverick Lane Pipeline Installation	$24,165	Yes	Low	Yes	No negative effects	Yes	Yes	Yes	None	Likely to be little problem	Yes	None	3(I)	2
ISI-LG-GE-01	Gerdel Ditch Seepage Rehabilitation	$21,417	Yes	Low	Yes	No negative effects	Yes	Yes	Yes	None	Likely to be little problem	Yes	None	3(II)	2
ISI-LG-LC-01	Last Chance Ditch Flume Replacement at East Fork Davis Creek	$18,537	Yes	Low	Yes	No negative effects	Yes	Yes	Yes	None	Likely to be little problem	Yes	None	4(II)	2
ISI-LG-LC-02	Last Chance Ditch Culvert Installation 1	$49,072	Yes	Low	Yes	No negative effects	Yes	Yes	Yes	None	Likely to be little problem	Yes	None	3(II)	2
ISI-LG-LC-03	Last Chance Ditch Culvert Installation 2	$33,720	Yes	Low	Yes	No negative effects	Yes	Yes	Yes	None	Likely to be little problem	Yes	None	3(II)	2
ISI-LG-MC-01	Kruse Creek Sideroll Irrigation Sytem	$67,800	Yes	Low	Yes	No negative effects	Yes	Yes	Yes	None	Likely to be little problem	Yes	None	4(I)	2
ISI-LG-ME-01	Metz Ditch Pipeline Installation	$1,077,079	Yes	High	Possibly	No negative effects	Yes	Yes	Yes	None	Likely to be little problem	Yes	None	3(II)	2
ISI-LG-MU-01	Muskrat Ditch Turnout	$10,511	Yes	Low	Yes	No negative effects	Yes	Yes	Yes	None	Likely to be little problem	Yes	None	4(II)	2
ISI-LG-MU-02	Muskrat Ditch Turnout Replacement	$29,894	Yes	Low	Yes	No negative effects	Yes	Yes	Yes	None	Likely to be little problem	Yes	None	4(II)	2
ISI-LG-NE-01	Negro John Diversion Dam	$53,485	Yes	Low	Yes	No negative effects	Yes	Yes	Yes	None	Likely to be little problem	Yes	None	1(II)	2
ISI-LG-PE-01	Peralta Ditch Headgate Rehabilitation	$22,523	Yes	Low	Yes	No negative effects	Yes	Yes	Yes	None	Likely to be little problem	Yes	None	1(II)	2
ISI-LG-PE-02	Peralta Ditch Measuring Flume	$17,513	Yes	Low	Yes	No negative effects	Yes	Yes	Yes	None	Likely to be little problem	Yes	None	4(II)	2
ISI-LG-PE-03	Peralta Ditch Dow Ranch Turnout Rehabilitation	$15,794	Yes	Low	Yes	No negative effects	Yes	Yes	Yes	None	Likely to be little problem	Yes	None	4(II)	2
ISI-LG-PE-04	Peralta Ditch Breach Restoration	$26,448	Yes	Low	Yes	No negative effects	Yes	Yes	Yes	None	Likely to be little problem	Yes	None	4(II)	2
ISI-LG-PE-05	Peralta Ditch Turnout Installation	$26,448	Yes	Low	Yes	No negative effects	Yes	Yes	Yes	None	Likely to be little problem	Yes	None	4(II)	2
ISI-LG-PP-01	South Paradise Park Pipeline	$277,619	Yes	Medium	Possibly	No negative effects	Yes	Yes	Yes	None	Likely to be little problem	Yes	None	3(II)	2
ISI-LG-RE-01	Reed Ditch Headgate Replacement	$5,597	Yes	Low	Yes	No negative effects	Yes	Yes	Yes	None	Likely to be little problem	Yes	None	1(II)	2
ISI-LG-RE-02	Reed Ditch Measuring Device	$2,048	Yes	Low	Yes	No negative effects	Yes	Yes	Yes	None	Likely to be little problem	Yes	None	4(I)	2
ISI-LG-RE-03	Reed Ditch Knecht Drainage	$6,689	Yes	Low	Yes	No negative effects	Yes	Yes	Yes	None	Likely to be little problem	Yes	None	4(II)	2
ISI-LG-RE-04	Reed Ditch Flume Structure Replacement	$47,871	Yes	Low	Yes	No negative effects	Yes	Yes	Yes	None	Likely to be little problem	Yes	None	4(II)	2
ISI-LoG-GR-1	Grinnell Ditch Turnout Replacement	$20,639	Yes	Low	Yes	No negative effects	Yes	Yes	Yes	None	Likely to be little problem	Yes	None	4(II)	2
ISI-LoG-SC-01	Soldier Creek Ditch VAMC Turnout Replacement	$14,640	Yes	Low	Yes	No negative effects	Yes	Yes	Yes	None	Likely to be little problem	Yes	None	4(II)	2
	TOTAL ALL INFRASTRUCTURE SYSTEM IMPROVEMENTS PROJECTS	**$5,292,840**													

TABLE 4 - PROJECT MATRIX

ID	NAME	PROJECT COST	PRACTICAL IMPLEMENTATION?	RELATIVE COST	ECONOMIC FEASIBILITY AND ABILITY TO FUND	NET HYDROLOGIC EFFECTS	INCREASED WATER USE EFFICIENCY	REDUCTION OF EROSION AND/OR WATER QUALITY DEGRADATION	SUSTAINABILITY	IMPACTS TO WATER RIGHTS AND EXISTING COMPACTS	EASE OF PERMITTING	PUBLIC ACCEPTABILITY	POTENTIAL FATAL FLAWS?	SWPP PRIORITY AND WWDC ACCOUNT (I OR II)	OVERALL RANKED PRIORITY
Surface Water Storage Opportunities															
SWSO-01	PK/Alliance Stockwater Dam Enlargement	$240,657	Yes	Medium	Yes		Yes	N/A	Yes	None	Likely to be little problem	Yes	None	2(I)	2
SWSO-02	Gillispie Dam and Reservoir	$22,731,424	Yes	High	Possibly		Yes	N/A	Yes	Possibly	May have permitting issues due to decreased non-irrigation flows in Big Goose Creek	May have permitting issues due to decreased non-irrigation flows in Big Goose Creek	None known at this time	2(I)	2
SWSO-03	Lake DeSmet Reservoir Transbasin Diversion - Municipal Water Source	$62,901,320	Yes	High	Unlikely		Yes	N/A	Yes	Possibly	Possible permitting issues	Drawdown of Lake DeSmet Reservoir may be an issue	None known at this time	3(I)	2
SWSO-04	Lake DeSmet Reservoir Transbasin Diversion - Irrigation Water Source	$59,939,910	Yes	High	Unlikely		Yes	N/A	Yes	Possibly	Possible permitting issues	Drawdown of Lake DeSmet Reservoir may be an issue	None known at this time	3(I)	2
SWSO-05	Lake DeSmet Reservoir Transbasin Diversion - Watershed Supplemental Supply Source	$35,209,747	Yes	High	Unlikely		Yes	N/A	Yes	Possibly	Possible permitting issues	Drawdown of Lake DeSmet Reservoir may be an issue	None known at this time	3(I)	2
Upland Water Development Opportunities															
UWDO-01	Walker Prairie Spring Development	$8,690	Yes	Low	Yes	No negative effects	Yes	N/A	Yes	None	Likely to be little problem	Yes	None	1(I)	1
UWDO-02	Buffalo Jump Spring Development	$9,190	Yes	Low	Yes	No negative effects	Yes	N/A	Yes	None	Likely to be little problem	Yes	None	1(I)	1
UWDO-03	Beaver Creek Hills Upland Water Development	$74,529	Yes	Low	Yes	No negative effects	Yes	N/A	Yes	None	Likely to be little problem	Yes	None	1(I)	1
UWDO-04	Tepee Upland Water Development	$55,508	Yes	Low	Yes	No negative effects	Yes	N/A	Yes	None	Likely to be little problem	Yes	None	1(I)	1
UWDO-05	Poverty Flat Upland Water Development	$45,271	Yes	Low	Yes	No negative effects	Yes	N/A	Yes	None	Likely to be little problem	Yes	None	1(I)	1
UWDO-06	East Fork Little Goose Creek Upland Water Development	$32,894	Yes	Low	Yes	No negative effects	Yes	N/A	Yes	None	Likely to be little problem	Yes	None	1(I)	1
UWDO-07	Flume Ditch Solar Collector Stockwater Pumping Systems	$23,274	Yes	Low	Yes	No negative effects	Yes	N/A	Yes	None	Likely to be little problem	Yes	None	3(I)	1
UWDO-08	Flume Ditch Spring Development	$17,905	Yes	Low	Yes	No negative effects	Yes	N/A	Yes	None	Likely to be little problem	Yes	None	1(I)	1
UWDO-09	Clark Upland Water Development	$8,559	Yes	Low	Yes	No negative effects	Yes	N/A	Yes	None	Likely to be little problem	Yes	None	1(I)	1
	TOTAL UPLAND WATER DEVELOPMENT OPPORTUNITIES PROJECTS	**$275,820**													
Fisheries Mitigation															
FM-BG-CS-01	City of Sheridan Intake Diversion Dam Fish Ladder	$297,520	Yes	Medium	Likely to need several funding sources	No negative effects	N/A	N/A	Yes	None	Likely to be little problem	Yes	None	1,5(I)	2
FM-BG-N9-01	No. 9 Ditch Diversion Dam Replacement	$177,195	Yes	Medium	Likely to need several funding sources	No negative effects	Yes	N/A	Yes	None	Likely to be little problem	Yes	None	1,5(II)	2
FM-LG-RE-01	Reed Ditch Diversion Dam Rehabilitation	$36,498	Yes	Low	Likely to need several funding sources	No negative effects	Yes	N/A	Yes	None	Likely to be little problem	Yes	None	1,5(II)	2
FM-LG-ES-01	East Side Ditch Diversion Dam Replacement	$235,928	Yes	Medium	Likely to need several funding sources	No negative effects	Yes	N/A	Yes	None	Likely to be little problem	Yes	None	1,5(II)	2
FM-LG-BU-01	Burn-Cleuch Ditch Diversion Dam	$339,835	Yes	Medium	Likely to need several funding sources	No negative effects	Yes	N/A	Yes	None	Likely to be little problem	Yes	None	1,5(II)	2
	TOTAL FISHERIES MITIGATION PROJECTS	**$1,086,976**													

4. Irrigation other than the above;
5. Environmental; and
6. Recreational.

5. PERMITS

Information was provided on the various permits that will be required in order to implement the projects recommended in the Watershed Management and Rehabilitation Plan. The number and complexity of required permits will vary depending upon the projects' complexities and ownership of the land upon which the proposed projects are located (i.e., federal, state or private land). Some state and/or federal permits will be required even if a prospective project is to be situated on private lands. Projects associated with federal lands or federal funding are subject to the requirements of the National Environmental Policy Act (NEPA), which often extend the amount of time and financial resources needed to secure permitting.

6. FUNDING OPPORTUNITIES

Descriptions were provided of the various funding opportunities that are available to potential project sponsors to finance the projects identified in the Watershed and Management Plan. There are many local, state and federal agencies that administer programs that fund projects that have been identified. The agencies from which grants and loans are typically requested for funding such improvement projects are listed below, segregated into the three categories identified above.

1. Local Funding Sources
   - SCCD
   - Sheridan County Weed and Pest Control District
2. State Funding Sources
   - WWDC
   - Wyoming Department of Environmental Quality
   - Wyoming Game and Fish Department
   - Wyoming Office of State Lands and Investments
   - Wyoming Department of Agriculture's Water Quality Grant Program
   - Wyoming Wildlife and Natural Resource Trust
3. Federal Funding Sources
   - National Resources Conservation Service
   - Environmental Protection Agency
   - Bureau of Land Management
   - Farm Service Agency
   - Fish and Wildlife Service
   - U.S. Army Corps of Engineers
   - Rural Development
   - U.S. Forest Service
   - U.S. Bureau of Reclamation

Non-profit organizations such as Ducks Unlimited and the National Fish and Wildlife Foundation also offer funding opportunities for eligible projects as defined by their respective organizations.

7. CONCLUSIONS AND RECOMMENDATIONS

The results of this Level I Study are summarized below and represent an important opportunity for the State and the local community (through the SCCD) to thoughtfully plan for the future of the Watershed and its water resources.

1. Upon conducting an inventory of irrigation system infrastructure within the Watershed, it is evident that a significant number of improvements to the irrigation system

infrastructure are necessary. The Level I Study outlined specific improvements and associated costs to implement 71 projects which address many of these needed improvements.

2. Solicitation of possible projects to implement upland water development opportunities has led to nine possible projects being identified in the Level I Study. This relatively small number of possible projects appears to indicate that the agricultural community is generally satisfied with the current state of furnishing water to livestock in the upland areas located throughout the Watershed.

3. The Level I Study has identified five projects that would provide continued water diversions while simultaneously benefitting fisheries by allowing for their required periodic migrations. Several of these fisheries migration projects will also improve these facilities' ability to divert streamflows.

4. The existing water supplies within the Watershed have been generally sufficient to satisfy the existing demands associated with all of the water users, with mountain reservoirs filling with springtime runoff and that water being used to augment flows in the mid-and-late summer. However, due to an expected increase in the population residing within the Watershed, there is a perceived need for additional water supplies for municipal purposes. Additionally, increased monitoring of the Tongue River drainage by the State of Montana and resulting impacts upon post-1950 storage water rights may affect Watershed water supplies for Wyoming water users.