

# Hydrology Field Survey

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for Golden Meadows Project  
Midas Gold, Inc.



**November 2012**

Prepared by:



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## Table of Contents

<b>SECTION 1: INTRODUCTION.....</b>	<b>1-1</b>
<b>SECTION 2: HYDROLOGY FIELD SURVEY METHODOLOGY.....</b>	<b>2-1</b>
<b>SECTION 3: HYDROLOGY FIELD SURVEY RESULTS .....</b>	<b>3-1</b>
3.1 Major Drainages in the Hydrology Field Survey Study Area.....	3-2
3.1.1 Meadow Creek Drainage .....	3-3
3.1.2 East Fork Meadow Creek Drainage (Blowout Creek).....	3-5
3.1.3 Rabbit Creek Drainage.....	3-7
3.1.4 Garnet Creek Drainage .....	3-9
3.1.5 Fiddle Creek Drainage .....	3-11
3.1.6 Midnight Creek Drainage .....	3-13
3.1.7 Hennessy Creek .....	3-15
3.1.8 West End Creek Drainage.....	3-17
3.1.9 Sugar Creek Drainage .....	3-19
3.1.10 East Fork of the South Fork Salmon River (EFSFSR) Drainage.....	3-21
<b>SECTION 4: CONCLUSIONS.....</b>	<b>4-1</b>
<b>SECTION 5: REFERENCES.....</b>	<b>5-1</b>

## List of Tables

Table 3-1. Summary of Hydrologic Site Types in Study Area.....	3-1
Table 3-2. Summary of Flow Rates in Study Area.....	3-2
Table 3-3. Characteristics of the Major Drainages in the Study Area .....	3-2
Table 3-4. Summary of Meadow Creek Hydrology Survey Site Data .....	3-4
Table 3-5. Summary of Blowout Creek Hydrology Field Survey Data .....	3-6
Table 3-6. Summary of Rabbit Creek Hydrology Field Survey Data.....	3-8
Table 3-7. Summary of Garnet Creek Hydrology Field Survey Data .....	3-10
Table 3-8. Summary of Fiddle Creek Hydrology Field Survey Data.....	3-12
Table 3-9. Summary of Midnight Creek Hydrology Field Survey Data .....	3-14
Table 3-10. Summary of Hennessy Creek Hydrology Field Survey Data.....	3-16
Table 3-11. Summary of West End Creek Hydrology Field Survey Data.....	3-18
Table 3-12. Summary of Sugar Creek Hydrology Field Survey Data.....	3-20
Table 3-13. Summary of EFSFSR Hydrology Field Survey Data.....	3-22

## List of Figures

Figure 1-1. Vicinity Map .....	1-3
Figure 1-2. Study Area.....	1-5
Figure 1-3. Hydrology Field Survey Site Map .....	1-6
Figure 3-1. Flows at Hydrologic Sites in Meadow Creek Drainage.....	3-4
Figure 3-2. Flows at Hydrologic Sites in Blowout Creek Drainage.....	3-6
Figure 3-3. Flows at Hydrologic Sites in Rabbit Creek Drainage .....	3-8
Figure 3-4. Flows at Hydrologic Sites in Garnet Creek Drainage.....	3-10
Figure 3-5. Flows at Hydrologic Sites in Fiddle Creek Drainage.....	3-12
Figure 3-6. Flows at Hydrologic Sites in Midnight Creek Drainage.....	3-14
Figure 3-7. Flows at Hydrologic Sites in Hennessy Creek Drainage .....	3-16
Figure 3-8. Flows at Hydrologic Sites in West End Creek Drainage .....	3-18
Figure 3-9. Flows at Hydrologic Sites in Sugar Creek Drainage .....	3-20
Figure 3-10. Flows at Hydrologic Sites in EFSFSR Drainage .....	3-22

## List of Appendices

Appendix A. Meadow Creek Drainage Hydrology Field Survey Summary Table
Appendix B. Blowout Creek Drainage Hydrology Field Survey Summary Table
Appendix C. Rabbit Creek Drainage Hydrology Field Survey Summary Table
Appendix D. Garnet Creek Drainage Hydrology Field Survey Summary Table
Appendix E. Fiddle Creek Drainage Hydrology Field Survey Summary Table
Appendix F. Midnight Creek Drainage Hydrology Field Survey Summary Table
Appendix G. Hennessy Creek Drainage Hydrology Field Survey Summary Table
Appendix H. West End Creek Drainage Hydrology Field Survey Summary Table
Appendix I. Sugar Creek Drainage Hydrology Field Survey Summary Table
Appendix J. EFSFSR Drainage Hydrology Field Survey Summary Table
Appendix K. Hydrology Field Survey Digital Camera Photo Logs and Photo CD

## Acronyms

Abbreviation/Acronym	Definition
amsl	above mean sea level
District	Stibnite-Yellow Pine Mining District
EFSFSR	East Fork of the South Fork of the Salmon River
gpm	gallons per minute
GPS	global positioning system
HDR	HDR Engineering, Inc.
HydroGeo	HydroGeo, Inc.
IDAPA	Idaho Administrative Procedure Act
IDL	Idaho Department of Lands
MGI	Midas Gold, Inc.
NFS	National Forest System
USFS	U.S. Forest Service
USGS	U.S. Geological Survey



## SECTION 1: INTRODUCTION

The following introduction was paraphrased, in part, from HDR Engineering, Inc. (HDR) (HDR, 2012). The Stibnite-Yellow Pine Mining District (District) in central Idaho is characterized by historic mining activities of deposits of gold, silver, tungsten, and antimony on private (patented claims) and federal (unpatented claims) lands. The District is in Valley County, Idaho, and is administered by the Krassel Ranger District of the Payette National Forest. A vicinity map showing the Golden Meadows Project location is shown on **Figure 1-1** and **Figure 1-2** shows the study area, which includes ten major drainages and encompasses an area approximately 33 square miles in size.

Mining in the District occurred periodically from the late 1800s through 1997. In 2007, Midas Gold, Inc. (MGI), a subsidiary of Midas Gold Corporation, began to acquire mining claims throughout the district from previous owners or by staking claims on its own behalf. With federal and state approval, MGI initiated mineral exploration activities in 2009 as part of the Golden Meadows Project to better define the mineral deposit potential for the area. This work included using the existing road network and constructing several temporary roads to access drill sites, build drill pads, drill on both National Forest System (NFS) and private land, and access disturbed areas for reclamation when exploration work ends in 2014.

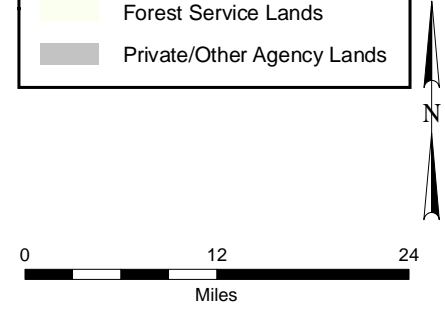
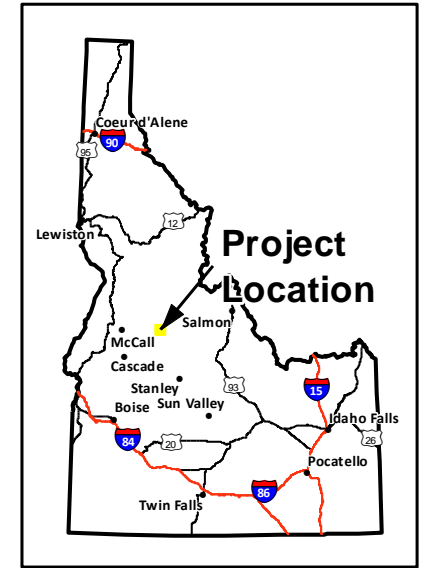
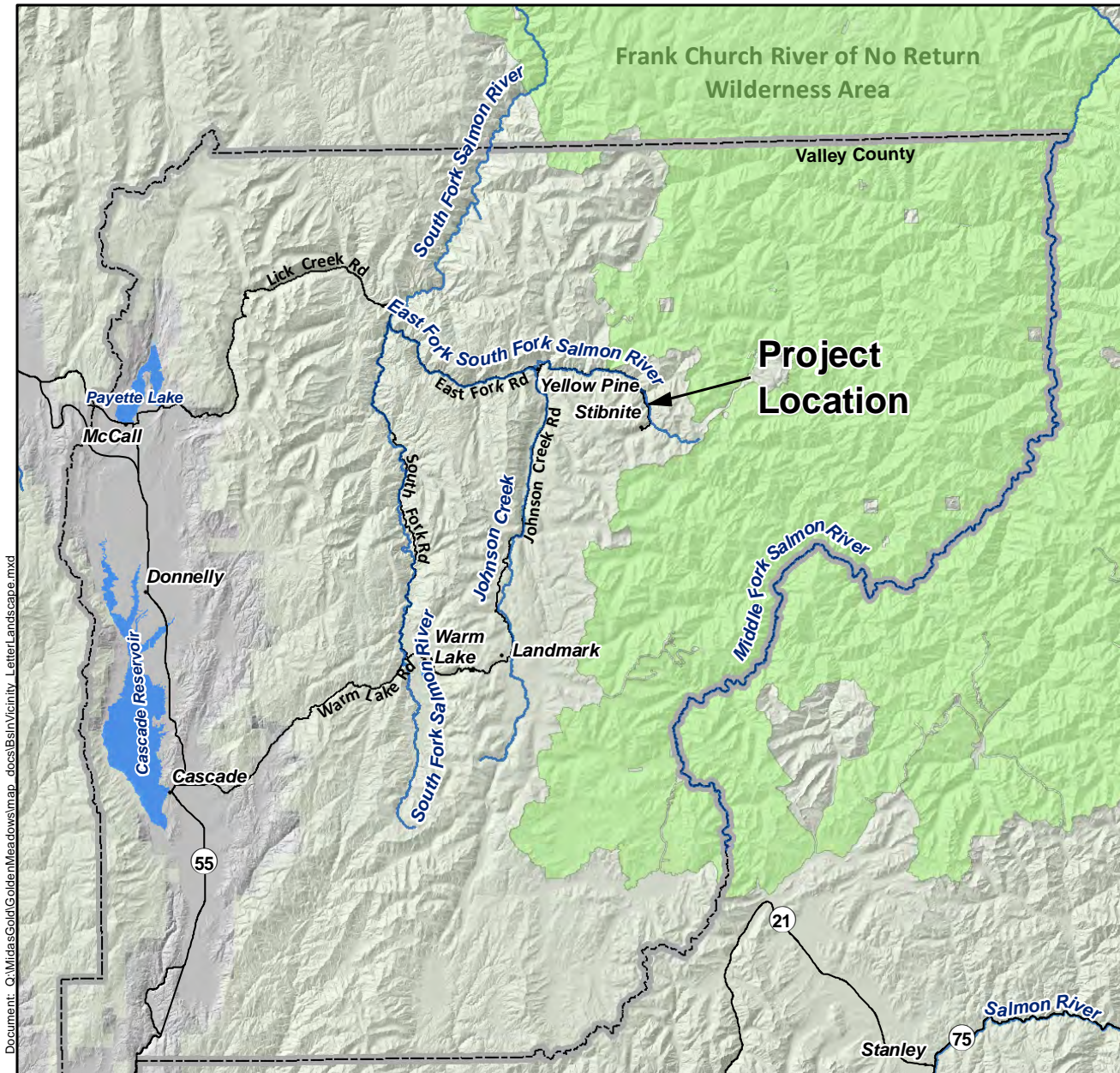
The U.S. Forest Service (USFS) has jurisdictional authority over surface disturbance associated with mining exploration activities on NFS land in the District. The Payette Lakes Supervisory Area of the Idaho Department of Lands (IDL) has jurisdictional authority over exploration and mining-related activities on private land within its administrative area (Idaho Administrative Procedure Act [IDAPA] 20.03.02).

HDR retained HydroGeo, Inc. (HydroGeo) to conduct the 2012 Golden Meadows Project *Hydrology Field Survey* to identify, map, and characterize the hydrologic features in the study area. The hydrology field survey protocols included mapping locations of hydrologic features (springs, seeps, ponds, and wetland areas that had not been previously mapped by the HDR survey crew), measuring flow volume and field water quality parameters for all springs and seeps in the study area, and recording flowing and non-flowing reaches of the intermittent streams in the study area. Wetland area sites were mapped during the survey, but wetland delineations were beyond HydroGeo's scope of work and were conducted by HDR personnel.

**Figure 1-3** shows the locations of the hydrologic sites. The data collected in the survey will be used for planning and permitting purposes.







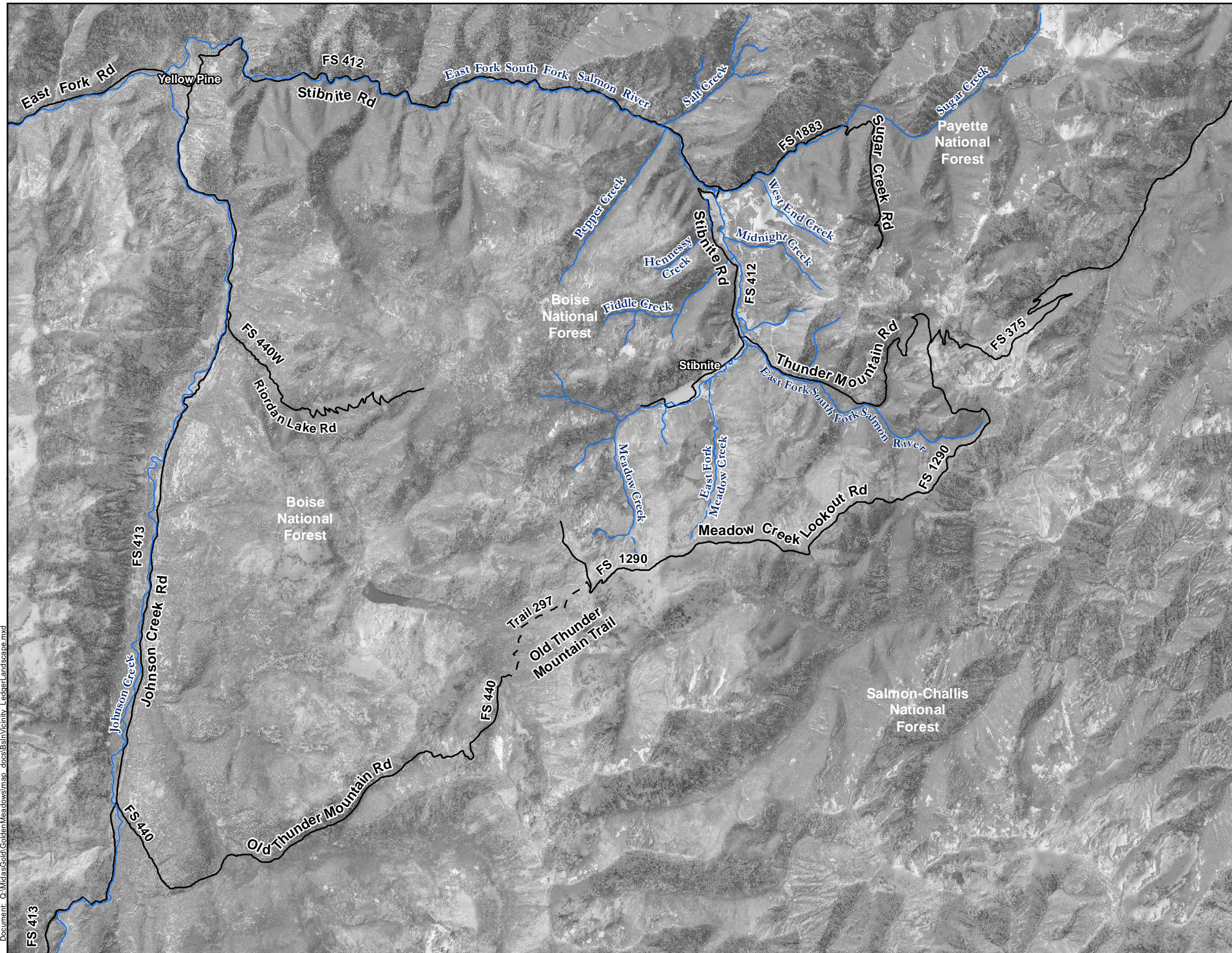
Imagery: 2011 NAIP, 1 meter resolution Source: NRCS/USDA Digital Gateway  
 Other Data Sources: State of Idaho Geospatial Gateway (INSIDE Idaho); Payette National Forest  
 Map Date: April, 2012

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**Figure 1-1**  
 Vicinity Map  
 Golden Meadows Project

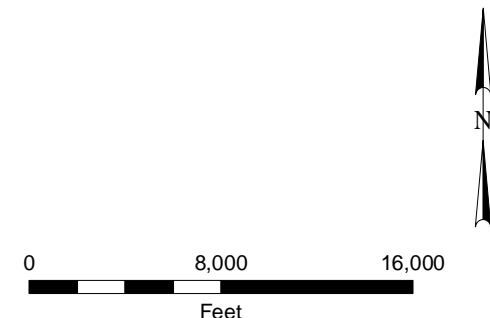


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**Legend**

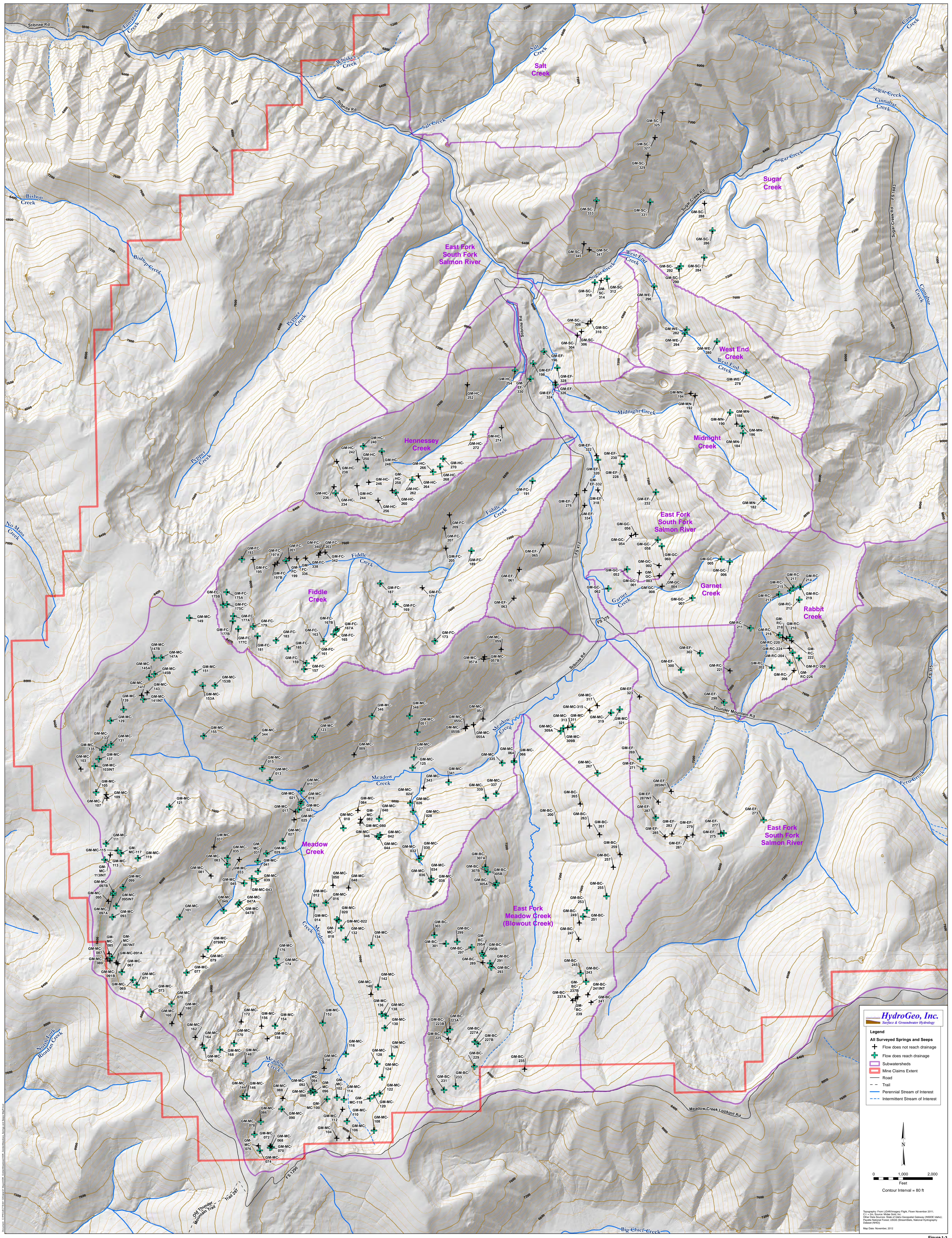
- Road
- - Trail
- Perennial Stream of Interest
- - Intermittent Stream of Interest



Imagery: 2011 NAIP, 1 meter resolution Source: NRCS/USDA Digital Gateway  
Other Data Sources: State of Idaho Geospatial Gateway (INSIDE Idaho);  
Payette National Forest; Boise National Forest; Salmon-Challis National Forest;  
Map Date: April, 2012

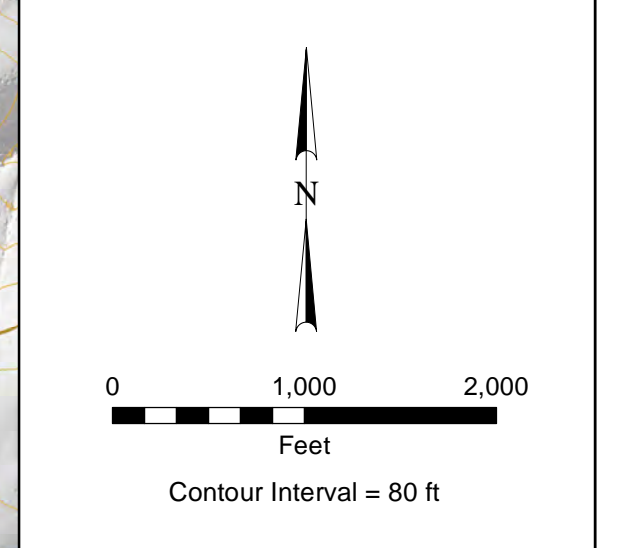
**Figure 1-2**  
Study Area  
Golden Meadows Project





**HydroGeo, Inc.**  
Surface & Groundwater Hydrology

- Legend**
- Flow does not reach drainage
  - Flow does reach drainage
  - Subwatersheds
  - Mine Claims Extent
  - Road
  - Trail
  - Perennial Stream of Interest
  - Intermittent Stream of Interest



Proprietary. From LDM/Imagery File, From November 2011.  
 C1 - 24, Escrow Map, Geo, Inc.  
 Open Data Source: From USGS (Digital) Gateway (DNGS) Inland  
 Dataset (DSE)  
 Map Date: November, 2012

Figure 1-3  
Hydrology Field Survey Site Map  
Golden Meadows Project



## SECTION 2: HYDROLOGY FIELD SURVEY METHODOLOGY

The hydrology field survey was conducted from July 12 to August 6, 2012. Late summer is an ideal time to conduct these types of surveys, because surface water flows and groundwater levels are low, making it is easier to identify perennial springs and seeps, not seasonal springs that are the result of runoff or snowmelt. For the purposes of this survey, a spring is defined as a clearly defined point where groundwater flows at the surface. A seep is defined as an area naturally inundated or saturated by groundwater that generally does not have a well-defined source.

Seepage originating from snowmelt, recent precipitation, ditches, creeks, irrigation or other human activities was not characterized or mapped.

The purpose of the hydrology field survey was to locate, map and characterize the hydrologic features (springs, seeps, ponds, wetland areas) in the study area. A secondary purpose of the hydrology field survey was to classify flows in drainages as flowing or non-flowing. Before beginning the field surveys, existing information, including aerial photographs, satellite imagery, vegetation mapping, and other available data, were used to map *potential* springs, seeps, ponds and wetland areas in the study area. HydroGeo personnel worked contemporaneously in the field with the HDR wetland delineators. To improve efficiency, HydroGeo surveyed drainages after the wetlands teams as much as possible to obtain pertinent access information on the locations of known spring and wetland areas.

For navigation, each hydrology survey team used an iPod Touch with a Magellan Toughcase (iPod) with iGIS version 5.1.3 (2012) software with U.S. Geological Service (USGS) topographic base maps. The locations of “known” (identified by the wetland team) spring, seep, pond and wetland area sites were downloaded on to the iPods. The iPod units and software enabled the teams to continually update and compile all data to provide an overview of the springs and seeps as they were surveyed. The site locations were also recorded with a hand-held Garmin Etrex global positioning system (GPS) instrument using UTM NAD83 (meter) units. The highest point of the actual source (emergence point) of the spring or seep was identified when possible and was used as the point for recording the GPS location. The source of the spring or seep was also noted as issuing from bedrock or colluvium (unconsolidated sediments) where obvious. The Garmin GPS also tracked the surveyor routes.

The hydrology field survey methodology consisted of two teams of two people each walking the survey area and identifying hydrologic sites (springs, seeps, ponds and/or wetland areas). As each hydrologic site was identified in the field, it was assigned a unique site ID and marked with a piece of flagging labeled with the site ID. The site ID included “GM” for Golden Meadows Project, two letters representing the name of the drainage area, and a three-digit number (for example GM-MC-015). One team generated even numbered sites and the other team generated odd numbered sites, so there are instances where the site numbers are not consecutive.

Sites with unique circumstances were designated with special letters. “INT” at the end of the site ID (for example, site number 079INT), indicated springs with flows that were intermittent. In this case, spring flow originated at site 079, then went underground and reappeared at site 079INT. These “INT” sites were not counted as “unique” sites in the summary tables. Sites with “A,” “B,” or “C” at the end of the site ID (for example site number 097A), designate spring or seep areas with multiple adjacent sources flowing into one channel or wetland area. Multiple

GPS points were taken (one at each lettered site); however, field water quality data were collected at only one of the lettered site locations.

If surveyors determined surface flow from the spring or seep site reached the main creek in the drainage, a “YES (Y)” was noted on the field sheet. If flows from the spring or seep sites did not reach the main creek in the drainage, the ephemeral drainage was denoted with a “NO (N).” Flows of springs or seeps which reached the main creek in each drainage basin during the survey period are designated by blue “+” (plus) symbols on Figure 1-3. Flows of springs or seeps in ephemeral drainages which did not reach the main creek in each drainage basin during the survey period are designated with black “+” (plus) symbols on Figure 1-3.

For most sites, spring flow was measured as close to the source of the spring as possible, using a graduated cup or bucket. The flow was measured by recording the time it took to fill a container of known volume. Three flow readings were taken, recorded, and then averaged. The calculated average flows were tabulated and are presented in the summary tables in this report. For very low flow sites, flows were diverted momentarily to allow more accurate measurement. If the flows in seep areas formed a channel below the seep field, measurements were taken at the highest possible location in the channel. In some instances, spring and seep flows were visually estimated.

The areal extent and flows of spring and seep complexes with multiple sources were estimated and recorded in the field. If ponds were directly associated with springs, pond size was also estimated in the field.

Field water quality parameters of pH (s.u.), electrical conductivity ( $\mu\text{S}/\text{cm}$ ), and temperature (degrees Celsius [ $^{\circ}\text{C}$ ]) were measured with a Hach multi-meter probe (temperature/conductivity/pH/dissolved oxygen) or an Oakton pH/CON 300 multi-meter probe (temperature/conductivity/pH) and recorded. The field water quality testing equipment was calibrated with buffered reference solutions in accordance with manufacturer instructions before use in the field on a daily basis.

Digital photographs of each site were taken to depict both detail and broad perspective views. The date, time, direction and other pertinent information were recorded in a photo log (Appendix K). Copies of the digital photo files are included in a CD in Appendix K.



## SECTION 3: HYDROLOGY FIELD SURVEY RESULTS

A total of 347 hydrologic sites were identified in 10 drainages in the study area during the hydrology field survey. The locations of the hydrologic sites are shown on Figure 1-3. The hydrologic sites were generally classified in the field as one of the following types: seep, seep with wetland, spring, spring with wetland, pond, pond with wetland; seep/pond/wetland complex, and re-emerging creek. The majority of sites were classified as seeps with wetlands or springs with wetlands (Table 3-1).

Table 3-1. Summary of Hydrologic Site Types in Study Area

Hydrologic Site Type	Number of Sites
Seep	37
Seep with Wetland	153
Spring	33
Spring with Wetland	117
Pond	1
Pond with Wetland	2
Seep/Pond/Wetland Complex	3
Creek Re-emerging	1
<b>Total</b>	<b>347</b>

Due to the large number of sites and volume of data, the spring and seep sites are categorized by flow rate as follows:

- Flow greater than 20 gallons per minute (gpm)
- Flow between 5 and 19 gpm
- Flow less than 5 gpm
- Trickle
- No flow
- Not measured

The flow data for the hydrologic field survey spring and seep sites are summarized in Table 3-2. Part of the study protocols included determining if flows from the hydrologic sites identified in the field survey reached the main creek in its drainage. Sites with flows which reached the main creek in its drainage were indicated with a “YES (Y)” or “NO (N)” designation in the field. Flows from 226 hydrologic sites (65 percent of sites) reached the respective drainage. Based on the large number of spring and seep sites with flows reaching the main creek in the drainage and flow volumes increasing from upstream to downstream, the streams in the study area are considered to be “gaining.”

Table 3-2. Summary of Flow Rates in Study Area

Flow Rate (gallons per minute (gpm))	Number of Sites
20 gpm or more	33
5 to 19 gpm	110
Less than 5 gpm	182
Trickle	7
No Flow	11
Not Measured	4
<b>Total</b>	<b>347</b>

### 3.1 Major Drainages in the Hydrology Field Survey Study Area

The hydrology field survey study area within the mine claims extent boundary included the following ten drainages: Meadow Creek, East Fork Meadow Creek (also known as Blowout Creek), Rabbit Creek, Garnet Creek, Fiddle Creek, Midnight Creek, Hennessey Creek, West End Creek, Sugar Creek, and the East Fork of the South Fork Salmon River (EFSFSR). The characteristics of the drainages are summarized in Table 3-3 and detailed descriptions of the drainages are provided in the following sections.

Table 3-3. Characteristics of the Major Drainages in the Study Area

National Hydrography Dataset (NHD) Waterbody <sup>1</sup>	Stream Type	Drainage Area <sup>2</sup> (square miles)	Length <sup>2</sup> (miles)	Average Gradient (%)
Meadow Creek	Forested Perennial	7.71	4.78	6.2
East Fork Meadow Creek (Blowout Creek)	Forested Perennial	2.40	2.66	10.6
Rabbit Creek	Forested Perennial	0.64	1.19	24.0
Garnet Creek	Forested Perennial	0.50	1.24	23.8
Fiddle Creek	Forested Perennial	1.95	2.47	11.1
Midnight Creek	Forested Perennial	0.85	1.83	22.8
Hennessey Creek	Forested Perennial	0.74	1.16	24.5
West End Creek	Forested Perennial	0.60	1.55	27.3
Sugar Creek	Forested Perennial	17.36	7.14	6.2
East Fork of the South Fork Salmon River (EFSFSR) <sup>3</sup>	Forested Perennial	24.99	7.04	5.7

Source: Adapted from HDR (2012)

<sup>1</sup> USGS (2012); <http://www.nhd.usgs.gov>

<sup>2</sup> Estimated from GIS and USGS topographic maps

<sup>3</sup> Upstream of Sugar Creek (including tributaries listed above)

### 3.1.1 Meadow Creek Drainage

The Meadow Creek drainage encompasses an area of approximately 7.71 square miles (~4,934 acres) and consists of three forks; the main fork of Meadow Creek to the south, which originates at Meadow Creek Lake; a middle fork; and a west fork. The drainage ranges from approximately 6,800 to 8,800 feet above mean sea level (amsl) and has an overall average gradient of 6.2 percent (for the main drainage) (Table 3-3). All of Meadow Creek drainage lies within the study area (Figure 1-3). All three forks were flowing at the time of the survey.

A total of 166 unique sites with hydrologic features were identified in the Meadow Creek drainage during the hydrology field survey (Appendix A). The locations of the sites are illustrated on Figure 1-3. The Meadow Creek site type, flow data, and field water quality data are summarized in Table 3-4. Most of the sites were seeps with wetlands or springs with wetlands and had flows of less than 5 gpm. The average elevation of sites in this drainage was 7,634 feet amsl and site elevations ranged from 6,615 to 8,550 feet amsl. The majority of the springs emanate from colluvium.

Meadow Creek Lake occurs in the Meadow Creek drainage, but was not considered to be a “pond site” due to its large size; therefore, no GPS or water quality data were collected.

The field water quality data show the overall average temperature was 7.1 °C and temperatures ranged from 2.8 to 22.4 °C. The relatively high temperature of 22.4 °C was measured at a shallow pond at site number 125. The average pH was near neutral at 6.74 s.u. and pH values ranged from 5.80 to 7.89 s.u. The average electrical conductivity was 56 µS/cm and values ranged from 3 to 253 µS/cm.

The average flow rate was about 6 gpm and rates ranged from no flow to 30 gpm. The flow regime for the Meadow Creek drainage sites is graphically illustrated in Figure 3-1. Flows from 121 of the 166 hydrologic sites reached Meadow Creek, indicating it is a gaining stream. Spring and seep sites with flows reaching Meadow Creek are shown on Figure 1-3. A photo log with descriptions is presented in Appendix K along with a CD containing the photo files.

Table 3-4. Summary of Meadow Creek Hydrology Survey Site Data

Site Type	Seep	Seep w Wetland	Spring	Spring with Wetland	Pond	Pond with Wetland	Seep/ Pond/ Wetland Complex	Total
Number of Sites	21	68	24	51	1	1	0	166
Flow Rate	20 gpm or more	5 to 19 gpm	Less than 5 gpm	Trickle	No Flow	Not Measured	Flow Reached Meadow Creek	Flow Did Not Reach Meadow Creek
Number of Sites	15	45	96	5	2	3	121	45
	Elevation (ft amsl)	Temp. (°C)	pH (s.u.)	Electrical Conductivity (µS/cm)		Average Flow (gpm)		
Maximum	8,550	22.4	7.89	253		30		
Minimum	6,615	2.8	5.80	3		No flow		
Average	7,634	7.1	6.74	56		6		

ft amsl – feet above mean sea level  
 °C – degrees Centigrade  
 s.u. – specific units  
 µS/cm – microsiemen /centimeter

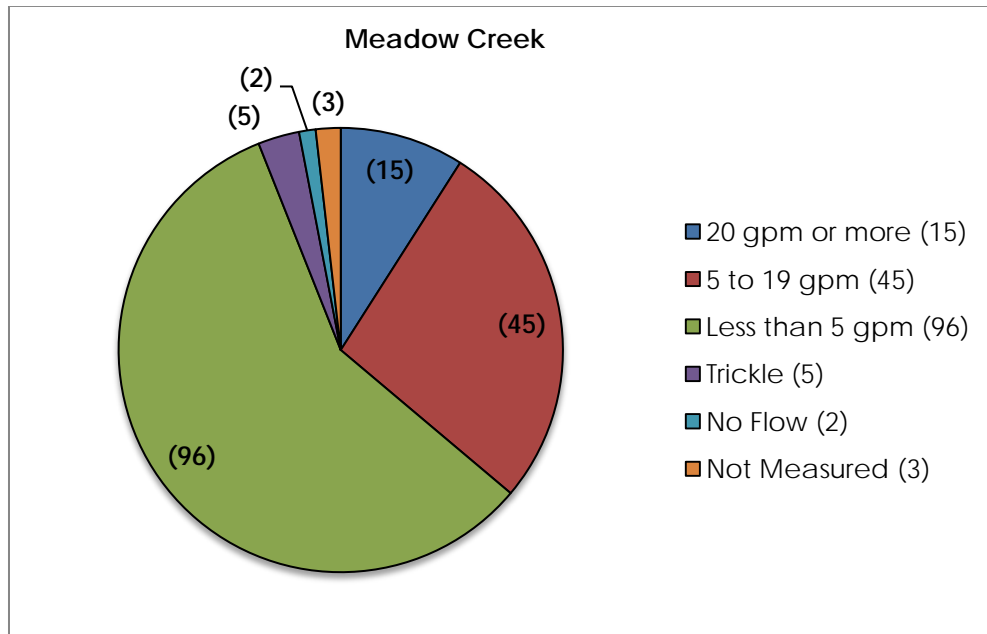


Figure 3-1. Flows at Hydrologic Sites in Meadow Creek Drainage

### 3.1.2 East Fork Meadow Creek Drainage (Blowout Creek)

The East Fork Meadow Creek (Blowout Creek) drainage encompasses an area of approximately 2.40 square miles (~1,536 acres). The drainage ranges from approximately 6,800 to 8,570 feet amsl and has an overall average gradient of 10.6 percent (Table 3-3). All of the Blowout Creek drainage lies within the study area (Figure 1-3). Blowout Creek was flowing at the time of the survey.

A total of 33 unique sites with hydrologic features were identified in the Blowout Creek drainage during the hydrology field survey (Appendix B). The locations of the sites are illustrated on Figure 1-3. The site elevations ranged from approximately 7,211 to 8,242 feet amsl and the average elevation was 7,766 feet amsl. The Blowout Creek site type, flow data, and field water quality data are summarized in Table 3-5. Nineteen sites were seeps with wetlands, 13 sites were springs with wetlands, and 1 site was a spring without a wetland. All spring and seep flows appear to emanate from colluvium.

The field water quality data show the average temperature for all Blowout Creek sites was 7.4 °C and temperatures ranged from 5.0 to 13.8 °C. The overall average electrical conductivity was 52 µS/cm and values ranged from 21 to 188 µS/cm. The average pH was near neutral at 6.64 s.u. and values ranged from 6.05 to 7.60 s.u. Due to a temporary multi-probe meter malfunction, no field pH or temperature values were recorded for site numbers 233, 237, and 239.

The average flow rate was about 8 gpm and flows ranged from no flow to 35 gpm. The flow regime for the Blowout Creek drainage sites is graphically illustrated in Figure 3-2. Flows from 20 of the 33 hydrologic sites reached Blowout Creek, indicating it is a gaining stream. Spring and seep sites with flows reaching Blowout Creek are shown on Figure 1-3. A photo log with descriptions is presented in Appendix K along with a CD containing the photo files.

Table 3-5. Summary of Blowout Creek Hydrology Field Survey Data

Site Type	Seep	Seep w Wetland	Spring	Spring with Wetland	Pond	Pond with Wetland	Seep/ Pond/ Wetland Complex	Total
Number of Sites	0	19	1	13	0	0	0	33
Flow Rate	20 gpm or more	5 to 19 gpm	Less than 5 gpm	Trickle	No Flow	Not Measured	Flow Reached Blowout Creek	Flow Did Not Reach Blowout Creek
Number of Sites	4	14	12	1	1	1	20	13
	Elevation (ft amsl)	Temp. (°C)	pH (s.u.)	Electrical Conductivity (µS/cm)		Average Flow (gpm)		
Maximum	8,242	13.8	7.60	188		35		
Minimum	7,211	5.0	6.05	21		No flow		
Average	7,766	7.4	6.64	52		8		

gpm – gallons per minute  
 ft amsl – feet above mean sea level  
 °C – degrees Centigrade  
 s.u. – specific units  
 µS/cm – microsiemen /centimeter

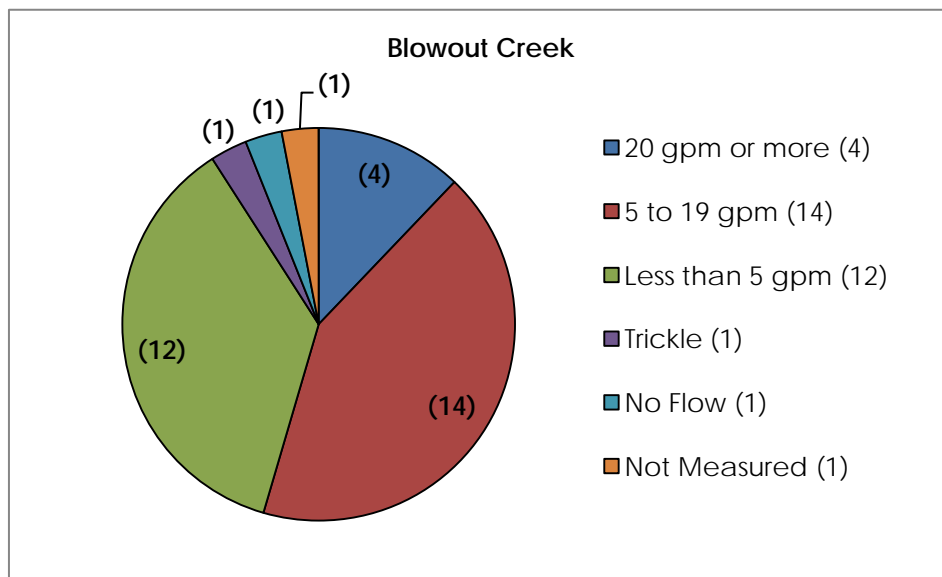


Figure 3-2. Flows at Hydrologic Sites in Blowout Creek Drainage

### 3.1.3 Rabbit Creek Drainage

Rabbit Creek drainage encompasses an area of approximately 0.64 square miles (~410 acres). The drainage ranges from about 6,800 to 8,870 feet amsl with an overall average gradient of 24.0 percent (Table 3-3). All of Rabbit Creek drainage lies within the study area and it is the easternmost drainage in the study area. Rabbit Creek was flowing at the time of the survey.

A total of 19 unique sites with hydrologic features were identified in the Rabbit Creek drainage during the hydrology field survey (Appendix C). The locations of the sites are illustrated on Figure 1-3. The site elevations ranged from approximately 7,308 to 8,070 feet amsl and the average site elevation was 7,725 feet amsl. The Rabbit Creek site type, flow data, and field water quality data are summarized in Table 3-6. Three sites were seeps, 9 sites were seeps with wetlands, and 7 sites were springs with wetlands. All spring and seep flows appear to emanate from colluvium.

The field water quality data show the Rabbit Creek average temperature was 8.1 °C and temperatures ranged from 5.8 to 13.4 °C. The overall average electrical conductivity was 94 µS/cm and values ranged from 11 to 189 µS/cm. The average pH was near neutral at 7.30 s.u. and values ranged from 6.13 to 8.31 s.u. Water quality data were not collected at site number 219 due to a temporary multi-probe meter malfunction.

The average flow rate was 7 gpm and rates ranged from 0.3 to 31.3 gpm. The flow regime for the Rabbit Creek hydrologic sites is graphically illustrated in Figure 3-3. Flows from 13 of the 19 hydrologic sites reached Rabbit Creek, indicating it is a gaining stream. Spring and seep sites with flows reaching Rabbit Creek are shown on Figure 1-3. A photo log with descriptions is presented in Appendix K along with a CD containing the photo files.

Table 3-6. Summary of Rabbit Creek Hydrology Field Survey Data

Site Type	Seep	Seep w Wetland	Spring	Spring with Wetland	Pond	Pond with Wetland	Seep/ Pond/ Wetland Complex	Total
Number of Sites	3	9	0	7	0	0	0	19
Flow Rate	20 gpm or more	5 to 19 gpm	Less than 5 gpm	Trickle	No Flow	Not Measured	Flow Reached Rabbit Creek	Flow Did Not Reach Rabbit Creek
Number of Sites	2	7	9	1	0	0	13	6
	Elevation (ft amsl)	Temp. (°C)	pH (s.u.)	Electrical Conductivity (µS/cm)		Average Flow (gpm)		
Maximum	8,070	13.4	8.31	189		31.3		
Minimum	7,308	5.8	6.13	11		0.3		
Average	7,725	8.1	7.30	94		6.7		

gpm – gallons per minute  
 ft amsl – feet above mean sea level  
 °C – degrees Centigrade  
 s.u. – specific units  
 µS/cm – microsiemen /centimeter

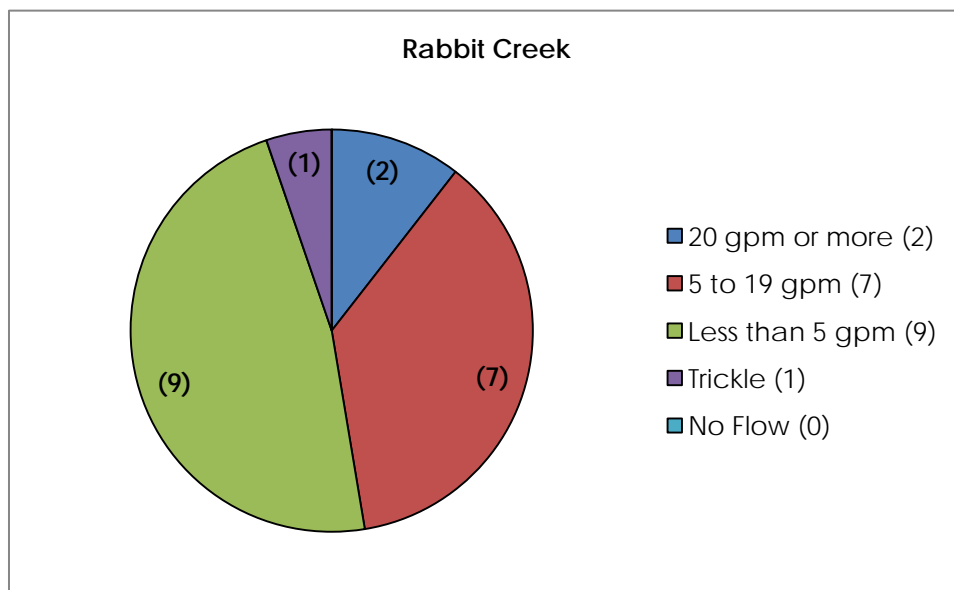


Figure 3-3. Flows at Hydrologic Sites in Rabbit Creek Drainage



### 3.1.4 Garnet Creek Drainage

The Garnet Creek drainage encompasses an area of approximately 0.50 square miles (~320 acres). The drainage ranges from about 6,400 to 8,935 feet amsl with an overall average gradient of 23.8 percent (Table 3-3). All of Garnet Creek lies within the study area and is behind the core shack/shop area. Garnet Creek was flowing during the time of the survey.

A total of 14 unique sites with hydrologic features were identified in the Garnet Creek drainage during the hydrology field survey (Appendix D). The locations of the sites are illustrated on Figure 1-3. The site elevations ranged from approximately 6,471 to 7,771 feet amsl and the average site elevation was 6,964 feet amsl. The Garnet Creek site type, flow data, and field water quality data are summarized in Table 3-7. Eight sites were springs with wetlands, 4 were seeps with wetlands, 1 site was a seep, and 1 site was a spring. The spring at site number 007 originated in the old mine workings from a bedrock/"fill" deposit. The springs and seeps at all other sites in this drainage emanated from colluvium.

The field water quality data show the overall average temperature was 8.8 °C and temperatures ranged from 6.0 to 15.5 °C. The average electrical conductivity was 113 and values ranged from 30 to 206 µS/cm. The average pH was near neutral at 7.17 s.u. and values ranged from 6.55 to 8.12 s.u.

The average flow rate was about 5 gpm and flows ranged from 0.2 to 15.5 gpm. The flow regime for the Garnet Creek drainage sites is graphically illustrated in Figure 3-4. Flows from seven (50 percent) of the 14 hydrologic sites reached Garnet Creek, indicating it is a gaining stream. Spring and seep sites with flows reaching Garnet Creek are shown on Figure 1-3. A photo log with descriptions is presented in Appendix K along with a CD containing the photo files.

Table 3-7. Summary of Garnet Creek Hydrology Field Survey Data

Site Type	Seep	Seep w Wetland	Spring	Spring with Wetland	Pond	Pond with Wetland	Seep/ Pond/ Wetland Complex	Total
Number of Sites	1	4	1	8	0	0	0	14
Flow Rate	20 gpm or more	5 to 19 gpm	Less than 5 gpm	Trickle	No Flow	Not Measured	Flow Reached Garnet Creek	Flow Did Not Reach Garnet Creek
Number of Sites	0	5	9	0	0	0	7	7
	Elevation (ft amsl)	Temp. (°C)	pH (s.u.)	Electrical Conductivity (µS/cm)		Average Flow (gpm)		
Maximum	7,771	15.5	8.12	206		15.5		
Minimum	6,471	6.0	6.55	30		0.2		
Average	6,964	8.8	7.17	113		4.6		

gpm – gallons per minute  
 ft amsl – feet above mean sea level  
 °C – degrees Centigrade  
 s.u. – specific units  
 µS/cm – microsiemen /centimeter

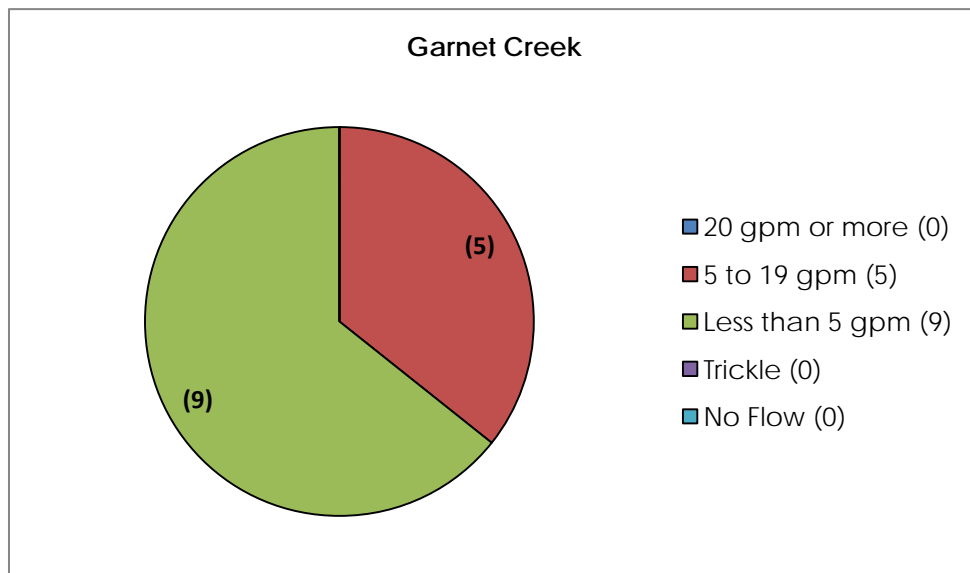


Figure 3-4. Flows at Hydrologic Sites in Garnet Creek Drainage

### 3.1.5 Fiddle Creek Drainage

The Fiddle Creek drainage encompasses an area of approximately 1.95 square miles (~1,248 acres). The drainage ranges from about 6,400 to 8,400 feet amsl and has an overall average gradient of 11.1 percent (Table 3-3). The entire Fiddle Creek drainage area lies within the study area and Fiddle Creek was flowing during the time of the survey.

A total of 31 unique sites with hydrologic features were identified in the Fiddle Creek drainage during the hydrology field survey (Appendix E). The locations of the sites are illustrated on Figure 1-3. The site elevations ranged from approximately 6,509 to 8,235 feet amsl and the average site elevation was 7,724 feet amsl. The Fiddle Creek site type, flow data, and field water quality data are summarized in Table 3-8. Most of the sites were seeps and springs with wetlands. All of the springs and seeps in this drainage emanated from colluvium.

The field water quality data show the overall average temperature was 7.5 °C and temperatures ranged from 3.0 to 15.4 °C. The average electrical conductivity was 34 and values ranged from 17 to 81  $\mu\text{S}/\text{cm}$ . The average pH was slightly below neutral at 6.41 s.u. and values ranged from 5.74 to 6.94 s.u.

The average flow rate was about 7 gpm and flows ranged from no flow to 20 gpm. The flow regime for the Fiddle Creek drainage sites is graphically illustrated in Figure 3-5. Flows from 19 of the 31 hydrologic sites reached Fiddle Creek, indicating it is a gaining stream. Spring and seep sites with flows reaching Fiddle Creek are shown on Figure 1-3. A photo log with descriptions is presented in Appendix K along with a CD containing the photo files.

Table 3-8. Summary of Fiddle Creek Hydrology Field Survey Data

Site Type	Seep	Seep w Wetland	Spring	Spring with Wetland	Pond	Pond with Wetland	Seep/ Pond/ Wetland Complex	Total
Number of Sites	3	10	2	16	0	0	0	31
Flow Rate	20 gpm or more	5 to 19 gpm	Less than 5 gpm	Trickle	No Flow	Not Measured	Flow Reached Fiddle Creek	Flow Did Not Reach Fiddle Creek
Number of Sites	2	14	12	0	3	0	19	12
	Elevation (ft amsl)	Temp. (°C)	pH (s.u.)	Electrical Conductivity (µS/cm)		Average Flow (gpm)		
Maximum	8,235	15.4	6.94	81		20		
Minimum	6,509	3.0	5.74	17		No flow		
Average	7,724	7.5	6.41	34		7		

gpm – gallons per minute  
 ft amsl – feet above mean sea level  
 °C – degrees Centigrade  
 s.u. – specific units  
 µS/cm – microsiemen /centimeter

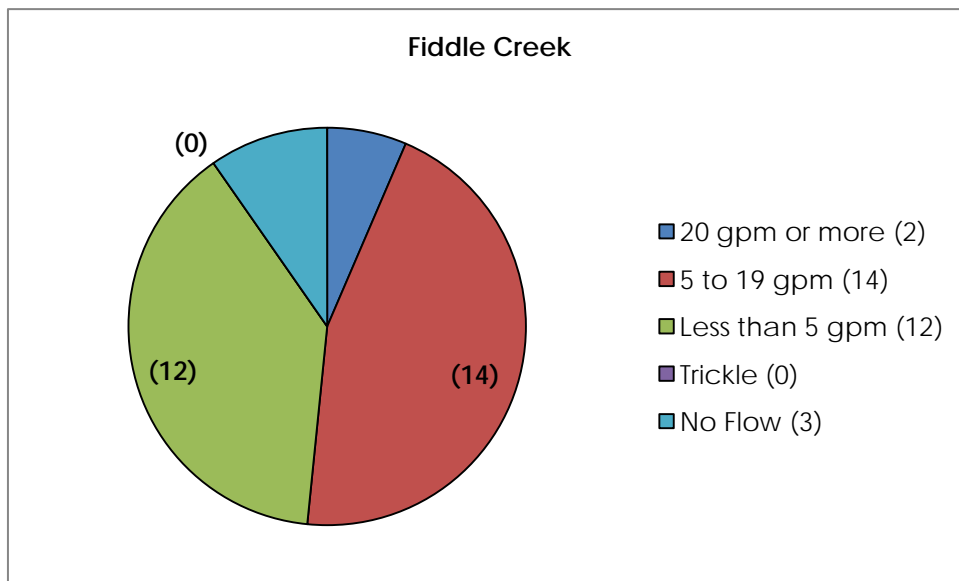


Figure 3-5. Flows at Hydrologic Sites in Fiddle Creek Drainage

### 3.1.6 Midnight Creek Drainage

The Midnight Creek drainage encompasses an area of approximately 0.85 square miles (~544 acres). The drainage ranges from approximately 6,400 to 8,935 feet amsl and has an overall average gradient of 22.8 percent (for the main drainage) (Table 3-3). All of Midnight Creek drainage lies within the study area (Figure 1-3). Midnight Creek was flowing at the time of the survey, but the surrounding hillsides were relatively dry. The Stibnite pit lies on the northern side of the drainage between Midnight Creek and West End Creek.

A total of seven unique sites with hydrologic features were identified in the Midnight Creek drainage during the hydrology field survey (Appendix F). The locations of the sites are illustrated on Figure 1-3. The site elevations ranged from approximately 7,231 to 8,088 feet amsl and the average site elevation was 7,712 feet amsl. The Midnight Creek site type, flow data, and field water quality data are summarized in Table 3-9. Five sites were seeps with wetlands, one was seep and one was spring with wetlands. All of the springs and seeps in this drainage emanated from colluvium.

The field water quality data show the overall average temperature was 9.0 °C and temperatures ranged from 5.3 to 13 °C. The average electrical conductivity was 169 and values ranged from 14 to 426 µS/cm. The average pH was near neutral at 7.47 s.u. and values ranged from 6.29 to 8.32 s.u.

The average flow rate was about 3 gpm and rates ranged from 0.2 gpm to 6.4 gpm. The flow regime for the Midnight Creek drainage sites is graphically illustrated in Figure 3-6. Flows from four of the seven hydrologic sites reached Midnight Creek, indicating it is a gaining stream. Spring and seep sites with flows reaching Midnight Creek are shown on Figure 1-3. A photo log with descriptions is presented in Appendix K along with a CD containing the photo files.

Table 3-9. Summary of Midnight Creek Hydrology Field Survey Data

Site Type	Seep	Seep w Wetland	Spring	Spring with Wetland	Pond	Pond with Wetland	Seep/ Pond/ Wetland Complex	Total
Number of Sites	1	5	0	1	0	0	0	7
Flow Rate	20 gpm or more	5 to 19 gpm	Less than 5 gpm	Trickle	No Flow	Not Measured	Flow Reached Midnight Creek	Flow Did Not Reach Midnight Creek
Number of Sites	0	1	6	0	0	0	4	3
	Elevation (ft amsl)	Temp. (°C)	pH (s.u.)	Electrical Conductivity (µS/cm)		Average Flow (gpm)		
Maximum	8,088	13.0	8.32	426		6.4		
Minimum	7,231	5.3	6.29	14		0.2		
Average	7,712	9.0	7.47	169		2.9		

gpm – gallons per minute  
 ft amsl – feet above mean sea level  
 °C – degrees Centigrade  
 s.u. – specific units  
 µS/cm – microsiemen /centimeter

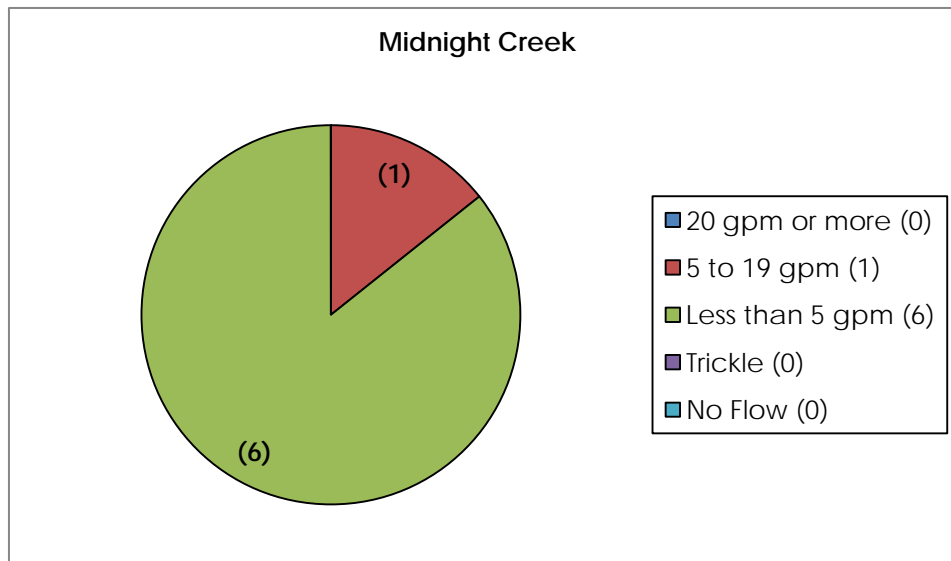


Figure 3-6. Flows at Hydrologic Sites in Midnight Creek Drainage

### 3.1.7 Hennessy Creek

The Hennessy Creek drainage encompasses an area of approximately 0.74 square miles (~474 acres). The drainage ranges from approximately 6,160 to 8,200 feet amsl and has an overall average gradient of 24.5 percent (Table 3-3). The entire Hennessy Creek drainage lies within the study area (Figure 1-3). Hennessy Creek was flowing at the time of the survey. Most of the seeps/springs occurred on the southern side of the drainage (facing north) and in the upper basin.

A total of 21 unique sites with hydrologic features were identified in the Hennessy Creek drainage during the hydrology field survey (Appendix G). The locations of the sites are illustrated on Figure 1-3. The site elevations ranged from approximately 6,354 to 8,058 feet amsl and the average site elevation was 7,607 feet amsl. The Hennessy Creek site type, flow data, and field water quality data are summarized in Table 3-10. Ten sites were springs with wetlands, eight sites were seeps with wetlands, two sites were springs, and one site was a spring/pond/wetland complex. The spring/pond/wetland complex site occurred in the upper area of the drainage at site number 238 and was about 3775 square feet in size. Four springs and/or seeps emanated from bedrock, all of the other sites emanated from colluvium.

The field water quality data show the overall average temperature was 6.5 °C and temperatures ranged from 3.7 to 14.5 °C. The average electrical conductivity was 40 µS/cm and values ranged from 18 to 132 µS/cm. The average pH was near neutral at 6.88 s.u. and values ranged from 6.51 to 7.48 s.u.

The average flow rate was about 7 gpm and flows ranged from 1.3 gpm to 20.4 gpm. The flow regime for the Hennessy Creek drainage sites is graphically illustrated in Figure 3-7. Flows from 11 of the 21 hydrologic sites reached Hennessy Creek, indicating it is a gaining stream. Spring and seep sites with flows reaching Hennessy Creek are shown on Figure 1-3. A photo log with descriptions is presented in Appendix K along with a CD containing the photo files.

Table 3-10. Summary of Hennessy Creek Hydrology Field Survey Data

Site Type	Seep	Seep w Wetland	Spring	Spring with Wetland	Pond	Pond with Wetland	Seep/ Pond/ Wetland Complex	Total
Number of Sites	0	8	2	10	0	0	1	21
Flow Rate	20 gpm or more	5 to 19 gpm	Less than 5 gpm	Trickle	No Flow	Not Measured	Flow Reached Hennessey Creek	Flow Did Not Reach Hennessey Creek
Number of Sites	2	8	11	0	0	0	11	10
	Elevation (ft amsl)	Temp. (°C)	pH (s.u.)	Electrical Conductivity (µmhos/cm)	Average Flow (gpm)			
Maximum	8,058	14.5	7.48	132	20.4			
Minimum	6,354	3.7	6.51	18	1.3			
Average	7,607	6.5	6.88	40	7.1			

gpm – gallons per minute  
 ft amsl – feet above mean sea level  
 °C – degrees Centigrade  
 s.u. – specific units  
 µS/cm – microsiemen /centimeter

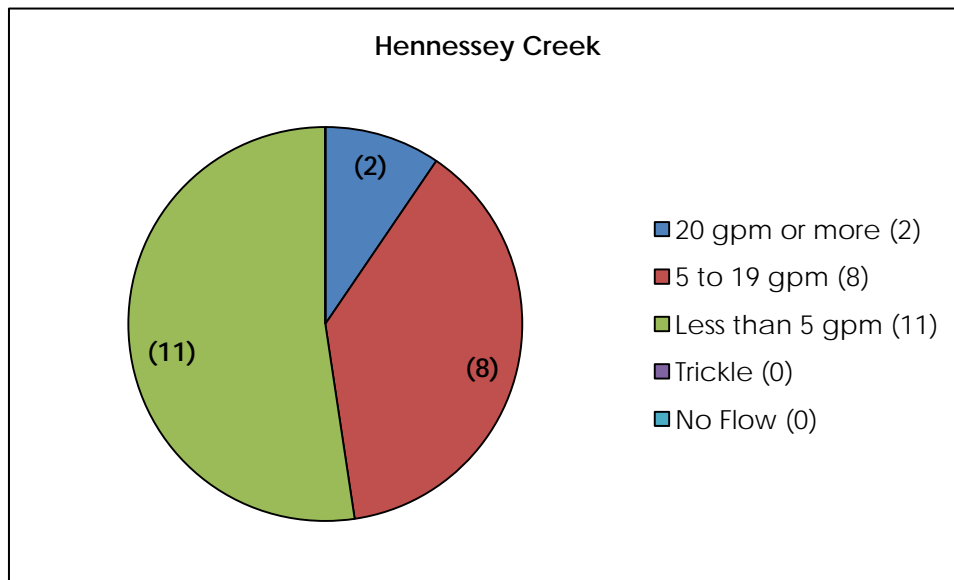


Figure 3-7. Flows at Hydrologic Sites in Hennessy Creek Drainage



### 3.1.8 West End Creek Drainage

The West End Creek drainage encompasses an area of approximately 0.60 square miles (~384 acres). The drainage ranges from approximately 6,000 to 8,640 feet amsl and has an overall average gradient of 27.3 percent (Table 3-3). This gradient does not take into account the upper and lower dumps that exist within the drainage. The upper and lower dumps are historic waste rock piles that completely cover sections of West End Creek. The dumps are a few hundred feet high and were put in West End Creek in the 1980s. The dumps divide West End Creek into three portions; above the upper dump, between the upper and lower dumps, and below the lower dump. All of West End Creek drainage lies within the study area (Figure 1-3). West End Creek was relatively dry, particularly the upper portion, where large bedrock cliffs exist on the southern side of the drainage. The northern side of the drainage was a large, mostly unvegetated talus slope.

A total of five unique sites with hydrologic features were identified in the West End Creek drainage during the hydrology field survey (Appendix H). The locations of the sites are illustrated on Figure 1-3. The site elevations ranged from approximately 6,378 to 7,594 feet amsl and the average site elevation was 7,002 feet amsl. The West End Creek site type, flow data, and field water quality data are summarized in Table 3-11. Two sites were seeps with wetlands, one site was a spring, one was a spring with wetland, and one was a re-emerging creek. Site 296 had the highest flow rate and the creek re-emerges from beneath the lower waste rock dump. With the exception of site number 296 which emerged from “waste rock,” all sites emanated from colluvium.

The field water quality data show the overall average temperature was 5.1 °C and temperatures ranged from 4.5 to 5.9 °C. The average electrical conductivity was 333 and values ranged from 275 to 418 µS/cm. The average pH was above neutral at 8.13 s.u. and values ranged from 7.83 to 8.31 s.u.

The average flow rate was about 41 gpm and flows ranged from 1.5 to 153.6 gpm. The flow regime for the West End Creek drainage sites is graphically illustrated in Figure 3-8. Flows from all five hydrologic sites reached West End Creek, indicating it is a gaining stream. Spring and seep sites with flows reaching West End Creek are shown on Figure 1-3. A photo log with descriptions is presented in Appendix K along with a CD containing the photo files.

Table 3-11. Summary of West End Creek Hydrology Field Survey Data

Site Type	Seep	Seep w Wetland	Spring	Spring with Wetland	Pond	Pond with Wetland	Re-emerging Creek	Total
Number of Sites	0	2	1	1	0	0	1	5
Flow Rate	20 gpm or more	5 to 19 gpm	Less than 5 gpm	Trickle	No Flow	Not Measured	Flow Reached West End Creek	Flow Did Not Reach West End Creek
Number of Sites	2	2	1	0	0	0	5	0
	Elevation (ft amsl)	Temp. (°C)	pH (s.u.)	Electrical Conductivity (µS/cm)	Average Flow (gpm)			
Maximum	7,594	5.9	8.31	418	153.6			
Minimum	6,378	4.5	7.83	275	1.5			
Average	7,002	5.1	8.13	333	40.8			

gpm – gallons per minute  
 ft amsl – feet above mean sea level  
 °C – degrees Centigrade  
 s.u. – specific units  
 µS/cm – microsiemen /centimeter

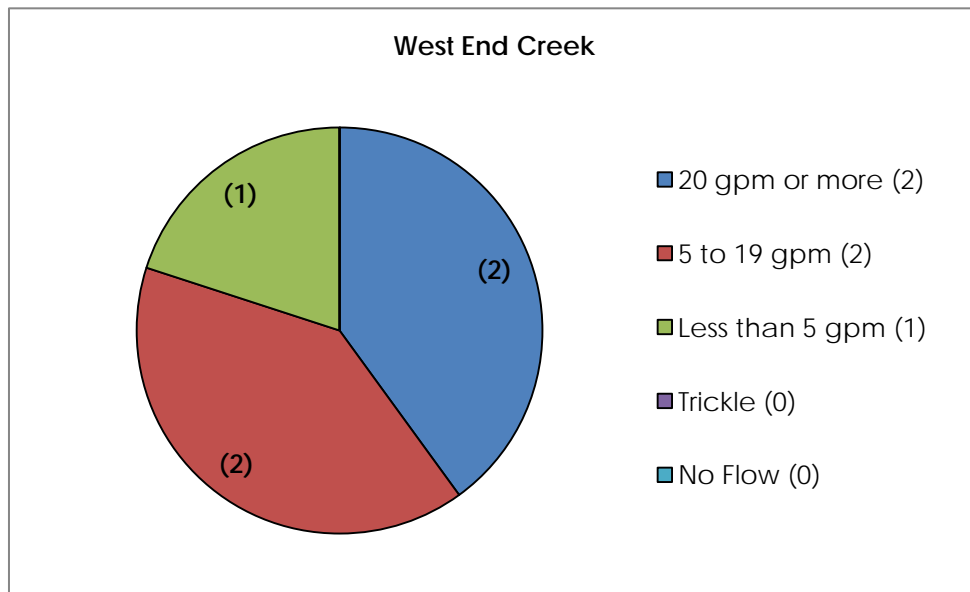


Figure 3-8. Flows at Hydrologic Sites in West End Creek Drainage

### 3.1.9 Sugar Creek Drainage

The Sugar Creek drainage encompasses an area of approximately 17.36 square miles (~11,110 acres). The drainage ranges from approximately 6,000 to 8,400 feet amsl and has an overall average gradient of about 6.2 percent (for the entire main drainage) (Table 3-3). Only a portion of the Sugar Creek drainage lies within the mine claims extent boundary. Note that Midnight Creek drains into Sugar Creek; however, this area is not included in the “Sugar Creek surveyed area.” Sugar Creek was flowing at the time of the survey.

A total of 19 unique sites with hydrologic features were identified in the Sugar Creek drainage during the hydrology field survey (Appendix I). The locations of the sites are illustrated on Figure 1-3. The site elevations ranged from approximately 6,095 to 7,478 feet amsl and the average site elevation was 6,620 feet amsl. The Sugar Creek site type, flow data, and field water quality data are summarized in Table 3-12. Eight sites were seeps, seven sites were seeps with wetlands, two sites were springs, and two sites were springs with wetlands. The majority of sites in this drainage emanated from colluvium, three sites emanated from colluvium/fill from the upper part of the Homestake hillside, and one site (number 290) had a possible bedrock source.

The field water quality data show the overall average temperature was 10.7 °C and temperatures ranged from 4.9 to 23.3 °C. The high temperature value was recorded at site 304, a seep with wetland site. The overall average electrical conductivity was 384 µS/cm and values ranged from 40 to 2,300 µS/cm. The 2,300 µS/cm value was recorded at site number 308 which is a seep coming out of the Old Homestake pit wall. Water from this site was a very dark red and orange color, had a slight sulfurous odor and a pH of 6.93 s.u. The overall average pH for sites in this drainage was near neutral at 7.69 s.u. and pH values ranged from 6.93 to 8.85 s.u.

The average flow rate was about 10 gpm and flows ranged from no flow to 73.5 gpm. The flow regime for the Sugar Creek drainage sites is graphically illustrated in Figure 3-9. Flows from eight of the 19 hydrologic sites reached Sugar Creek, indicating it is a gaining stream. Spring and seep sites with flows reaching Sugar Creek are shown on Figure 1-3. A photo log with descriptions is presented in Appendix K along with a CD containing the photo files.

Table 3-12. Summary of Sugar Creek Hydrology Field Survey Data

Site Type	Seep	Seep w Wetland	Spring	Spring with Wetland	Pond	Pond with Wetland	Seep/Pond/Wetland Complex	Total
Number of Sites	8	7	2	2	0	0	0	19
Flow Rate	20 gpm or more	5 to 19 gpm	Less than 5 gpm	Trickle	No Flow	Not Measured	Flow Reached Sugar Creek	Flow Did Not Reach Sugar Creek
Number of Sites	2	3	12	0	2	0	8	11
	Elevation (ft amsl)	Temp. (°C)	pH (s.u.)	Electrical Conductivity (µS/cm)		Average Flow (gpm)		
Maximum	7,478	23.3	8.85	2,300		73.5		
Minimum	6,095	4.9	6.93	40		No flow		
Average	6,620	10.7	7.69	384		10.1		

gpm – gallons per minute  
 ft amsl – feet above mean sea level  
 °C – degrees Centigrade  
 s.u. – specific units  
 µS/cm – microsiemen /centimeter

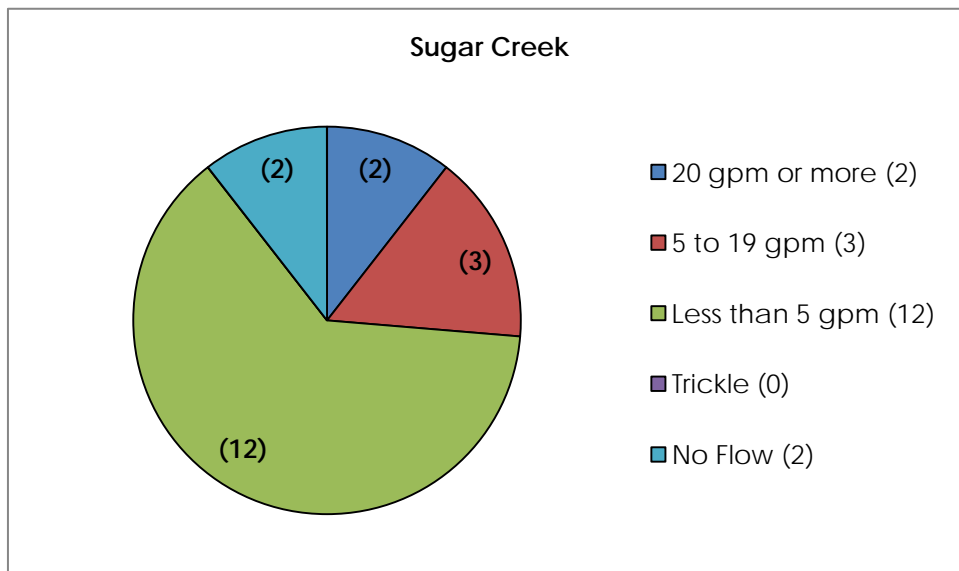


Figure 3-9. Flows at Hydrologic Sites in Sugar Creek Drainage

### 3.1.10 East Fork of the South Fork Salmon River (EFSFSR) Drainage

The total drainage area of the EFSFSR upstream of Sugar Creek encompasses approximately 24.99 square miles (~16,000 acres) and includes all tributaries, including Midnight Creek, Garnet Creek, Rabbit Creek, Blowout Creek, Meadow Creek, Fiddle Creek, and Hennessy Creek, along with the additional drainage area upstream of these stated creeks (i.e., all the way to the headwaters of the EFSFSR). The drainage ranges from approximately 6,000 to 8,900 feet amsl and has an overall average gradient 5.7 percent (for the entire main drainage) (Table 3-3). This discussion focuses on the surveyed part of the EFSFSR drainage, upstream of the confluence with Sugar Creek, excluding the other surveyed tributary and upstream only as far as the confluence with Rabbit Creek.

A total of 32 unique sites with hydrologic features were identified in the EFSFSR drainage during the hydrology field survey (Appendix J). The locations of the sites are illustrated on Figure 1-3. The site elevations ranged from approximately 6,075 to 7,992 feet amsl and the average site elevation was 6,995 feet amsl. The EFSFSR site type, flow data, and field water quality data are summarized in Table 3-13. Twenty-one of the sites were seeps with wetlands, eight sites were springs with wetlands, one site was a pond with wetland, and two sites were seep/pond/wetland complexes. The ponds at sites 198, 332, and 334 were approximately 150, 300, and 375 square feet in area, respectively. Three spring and seep sites emanated from colluvium/fill/waste rock, the others from colluvium.

The field water quality data show the overall average temperature was 8.0 °C and temperatures ranged from 4.7 to 17.6 °C. The overall average electrical conductivity was 135 µS/cm and values ranged from 27 to 431 µS/cm. The overall average pH was near neutral at 7.19 s.u. and values ranged from 6.61 to 8.20 s.u.

The average flow rate was about 11 gpm and flows ranged from no flow to 126.5 gpm. The flow regime for the EFSFSR drainage sites is graphically illustrated in Figure 3-10. Flows from 18 of the 32 hydrologic sites reached EFSFSR, indicating it is a gaining stream. Spring and seep sites with flows reaching EFSFSR are shown on Figure 1-3. A photo log with descriptions is presented in Appendix K along with a CD containing the photo files.

Table 3-13. Summary of EFSFSR Hydrology Field Survey Data

Site Type	Seep	Seep w Wetland	Spring	Spring with Wetland	Pond	Pond with Wetland	Seep/ Pond/ Wetland Complex	Total
Number of Sites	0	21	0	8	0	1	2	32
Flow Rate	20 gpm or more	5 to 19 gpm	Less than 5 gpm	Trickle	No Flow	Not Measured	Flow Reached EFSFSR	Flow Did Not Reach EFSFSR
Number of Sites	4	11	14	0	3	0	18	14
	Elevation (ft amsl)	Temp. (°C)	pH (s.u.)	Electrical Conductivity <sup>1</sup> (µS/cm)		Average Flow (gpm)		
Maximum	7,992	17.6	8.20	431		126.5		
Minimum	6,075	4.7	6.61	27		No flow		
Average	6,995	8.0	7.19	135		11.3		

gpm – gallons per minute  
 ft amsl – feet above mean sea level  
 °C – degrees Centigrade  
 s.u. – specific units  
 µS/cm – microsiemen /centimeter

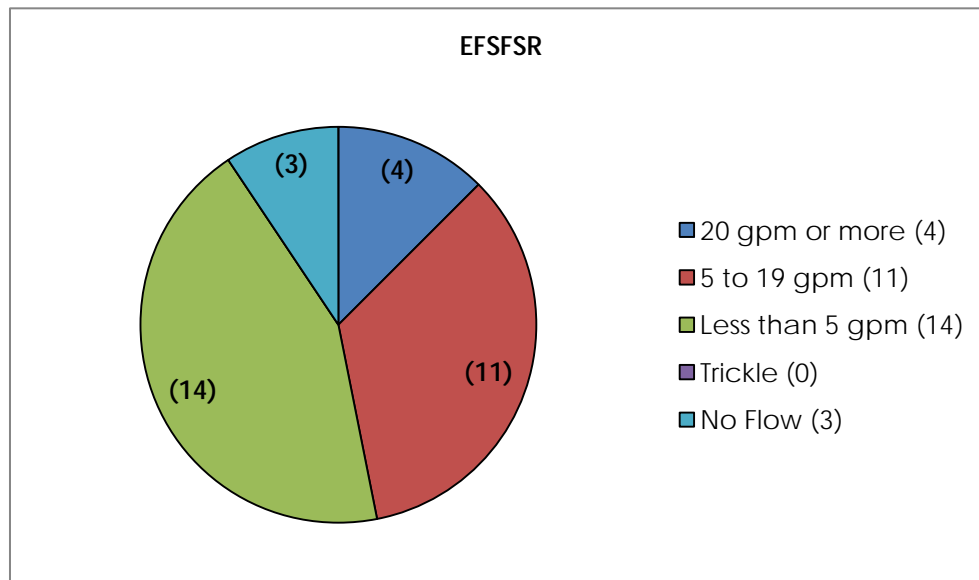


Figure 3-10. Flows at Hydrologic Sites in EFSFSR Drainage

## SECTION 4: CONCLUSIONS

The surveys were conducted from July 12 through August 6, 2012 in late summer, which is typically a period with low surface water flow and low groundwater levels; it is an optimal time for conducting spring and seep surveys. A total of 347 hydrologic sites were identified in 10 major drainages during the 2012 Golden Meadows Project *Hydrology Field Survey*. The survey identified 37 seeps; 153 seeps with wetlands; 33 springs; 117 springs with wetlands; 1 pond; 2 ponds with wetlands; 3 seep/pond/wetland complexes; and 1 re-emerging creek. With the exception of site number 235, which is located adjacent to the boundary, all hydrologic sites identified during the field survey were within the mine claims extent boundary. The highest concentration of spring and seep sites occurs in Meadow Creek, the upper reaches of Blowout Creek and Fiddle Creek, the southern hillsides of Hennessy and Rabbit creeks, and the lower half of Garnet Creek.

Due to the large number of sites and volume of data, the spring and seep sites were categorized by flow rate as follows:

- Flow greater than 20 gpm
- Flow between 5 and 19 gpm
- Flow less than 5 gpm
- Trickle
- No flow
- Not measured

Thirty-three sites had flows greater than 20 gpm, 110 had flows 5 to 19 gpm, 182 sites had flows less than 5 gpm, 7 sites had trickle flows, and 11 sites had no flow or standing water. Flows were not measured at four sites.

The survey also identified flows from 226 of the 347 hydrologic sites, which reached the main creek in the respective drainages. Based on the large number of spring and seep sites with flows reaching the main creek in study area drainages and flows increasing from upstream to downstream, streams in the study area are considered to be “gaining.”

The Golden Meadows study area is extensive and every effort was made to locate all springs, seeps and ponds; however, it should be noted that additional springs, seeps, ponds, and wetland areas may exist. Environmental conditions vary from year to year and seasonally. As a result, springs and seeps present in 2012 may or may not be present in future years. Conversely, some springs may be present in future years that were not visible or flowing in the summer of 2012. The data collected in the survey will be used for planning and permitting purposes.

## **SECTION 5: REFERENCES**

HDR, Inc., 2012. Data and miscellaneous GIS Geodatabase files, June 1, 2012.

iGIS, 2012. <http://www.geometryit.com>

U. S. Geological Service (USGS), 2012. <http://www.nhd.usgs.gov>





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## **Appendix A. Meadow Creek Drainage Hydrology Field Survey Summary Table**



**Golden Meadows  
2012 Hydrology Field Survey  
Meadow Creek Data Summary**

Site Number	Site ID	Date / Time	Collected By	Photo(s) Pink Camera <sup>1</sup>	Photo(s) Blue Camera <sup>1</sup>	Feature Type	Deposit Type	GPS UTM Coordinates			Elev. (ft)	Temp. (°C)	pH (s.u.)	Elec. Cond. (µS/cm)	Average Flow (gpm)	Flow Measure Method	Color	Odor	Reach Meadow Creek (Y or N)	Spring Source Width (est.) (in)	Seep Source Width (est.) (ft)	Water Depth (in)	Seep Field Width (est.) (ft)	Seep Field Length (est.) (ft)	Wetland Width (est.) (ft)*	Wetland Length (est.) (ft)*	Pond Size (ft x ft)	Location	Comments
								Zone	Easting	Northing																			
009	GM-MC-009	7/12/12	GW	---	26 - 31	Seep w/Wetland	Bedrock	11N	629397	4972261	6,862				Trickle	Visual Estimate	clear	none	N	---	21	---	---	---	---	---	Meadow Creek Drainage	Seep at bedrock contact. Old seep site #260	
010	GM-MC-010	7/12/12	HO	7-9	---	Spring w/Wetland	Colluvium	11N	629288	4971504	7,003	6.1	7.89	253.0	2.9	Cup	clear	none	Y	3	---	---	---	6	10	---	Meadow Creek. South side of drainage, toward base, above large wetland.	Spring feeds large wetland area that runs all the way to the creek and creates an intermittent spring field.	
011	GM-MC-011	7/12/12	GW	---	35 - 38	Spring w/Wetland	Colluvium	11N	628854	4971888	6,857	7.7	7.45	68.7	25.0	Visual Estimate	clear	none	Y	---	---	---	---	---	---	---	West Fork of Meadow Creek Drainage	Spring located within large wetland, spring flows into west fork of meadow creek	
012	GM-MC-012	7/12/12	HO	10-13	---	Spring w/Wetland	Colluvium	11N	628946	4970721	6,977	6.7	7.37	104.7	1.8	Cup	clear	none	Y	2	---	---	---	20	>100	---	Meadow Creek. Dry on N side of MC from pt-010 until hit the wetland that -012 feeds.	Part of a larger spring network. Spring is intermittent varying seeps below.	
013	GM-MC-013	7/12/12	GW	---	39, 40	Seep w/Wetland	Colluvium	11N	628526	4971999	7,056	12.0	6.41	44.3	3.0	Cup	clear	none	Y	---	?	---	---	---	---	---	West Fork of Meadow Creek Drainage	Seep flowing out of brushy wetland adjacent to old jeep trail. Flows along jeep trail into West fork of Meadow Creek.	
014	GM-MC-014	7/12/12	HO	14-18	---	Spring w/Wetland	Colluvium	11N	628989	4970694	7,023	5.4	6.91	56.8	6.2	Cup	clear	none	Y	---	---	---	10	15	20	>100	---	Meadow Creek.	Spring feeds larger wetland /numerous seeps around/below it. 2 branches. 1 branch very difficult to measure but significantly smaller than other branch. Glacial Deposit.
015	GM-MC-015	7/12/12	GW	---	41 - 43	Seep	Colluvium	11N	628448	4972121	7,174	12.5	6.52	62.7	0.6	Cup	clear	none	Y	---	?	---	---	---	---	---	---	West Fork of Meadow Creek Drainage	One of many seeps in area. "does not seem to be seep, but rather unnamed stream disappearing and re-emerging in landslide area"
016	GM-MC-016	7/12/12	HO	19-21	---	Spring w/Wetland	Colluvium	11N	629105	4970729	7,189	6.0	7.02	36.2	8.0	Cup	clear	none	Y	5	---	---	---	30	>100	---	Meadow Creek. Uphill from GM-MC-014.	Spring feeds large wetland area that runs all the way to the creek and creates an intermittent spring field. Glacial deposit.	
017	GM-MC-017	7/13/12	GW	---	50, 51	Seep w/Wetland	Colluvium	11N	628793	4971670	6,826	11.1	6.80	126.2	1.5	Cup	clear	none	N	---	30	---	---	---	---	---	---	West Fork of Meadow Creek Drainage	Seep flows into wetland and disperses. Obj ID #276 MC Seep 3, ID# 87
018	GM-MC-018	7/12/12	HO	22-24	---	Spring w/Wetland	Colluvium	11N	629222	4970559	7,338	5.4	7.11	58.7	10.2	Cup	clear	none	Y	9	---	---	---	20	30	---	Meadow Creek. Approx 1/3 way to Meadow Creek Lake. Out the main limb of the MC drainage.	2 branches of the spring. Main branch measure flow, while smaller branch very difficult. Glacial/landslide formation.	
019	GM-MC-019	7/13/12	GW	---	44, 45	Seep w/Wetland	Colluvium	11N	628850	4971771	6,795	5.6	6.57	139.1	6.3	Cup	clear	none	Y	---	6	---	---	---	---	---	---	West Fork of Meadow Creek Drainage	Above old jeep trail, strong flow across jeep trail. Obj ID# 92
020	GM-MC-020	7/12/12	HO	25-27	---	Spring w/Wetland	Colluvium	11N	629239	4970547	7,367	6.0	7.22	73.2	5.3	Cup	clear	none	Y	6	---	---	---	12	---	---	---	Meadow Creek. Approx 150-200 feet from -MC-018.	Although only 150-200' from MC-018, these pts do not seem to be connected. No seep field between them or wetland species btwn them. Very marshy. Glacial/landslide deposit.
021	GM-MC-021	7/13/12	GW	---	46, 47	Seep	Colluvium	11N	628849	4971748	6,785	7.2	7.23	135.2	10.2	Cup	clear	none	Y	---	54	---	---	---	---	---	---	West Fork of Meadow Creek Drainage	Flow measurement taken below trail crossing, seep outlet Obj ID# 271, Seep field emanating right along roadside, dry above. Main spring at lower (eastern) edge of field.
022	GM-MC-022	7/12/12	HO	28-31	---	Spring w/Wetland	Colluvium	11N	629265	4970469	7,392	5.3	6.77	42.4	4.4	Cup	clear	none	Y	8	---	---	---	15	---	---	---	Meadow Creek-main drainage.	Spring part of a braided network (intermittent and hard to measure) flow other than in main branch. 15' strip of wetland that runs down drainage to join larger wetland at the bottom.
023	GM-MC-023	7/13/12	GW	---	48, 49	Seep	Colluvium	11N	628824	4971694	7,392	13.0	6.99	105.6	0.7	Cup	clear	none	Y	---	90	---	---	---	---	---	---	West Fork of Meadow Creek Drainage	Flow measured at trail crossing downstream, Seepfield emanating from side of road, dry above. Main spring at western edge of line.
024	GM-MC-024	7/13/12	HO	32-34	---	Spring	Bedrock	11N	629980	4971763	6,856	5.5	7.34	78.6	6.8	Cup	clear	none	Y	3	---	---	4	6	---	---	---	Meadow Creek. Up the steep drainage on south side across from Hanger Flats.	May be part of an intermittent spring. Towards the top of the ridge, very rocky/mossy slope. Possibly emanates from Bedrock.
025	GM-MC-025	7/13/12	GW	---	52, 53	Seep w/Wetland	Colluvium	11N	628777	4971589	6,826	10.4	6.38	54.8	1.5	Cup	clear	none	N	---	3	---	---	---	---	---	---	Meadow Creek Drainage	Seep with some wetland vegetation in drainage, drainage dry above
026	GM-MC-026	7/13/12	HO	35-37	---	Spring	Colluvium	11N	630010	4971675	7,008	5.1	6.98	62.8	1.1	Cup	clear	none	Y	2	---	---	6	10	---	---	---	Meadow Creek. Up the steep drainage on south side across from Hanger Flats.	6' x 10' mossy area surrounding spring but not a wetland. May be part of an intermittent spring but appears to be an independent drainage. Glacial deposit.
027	GM-MC-027	7/13/12	GW	---	54, 55	Seep w/Wetland	Colluvium	11N	628659	4971368	6,921	6.1	6.40	63.4	10.8	Cup	clear	none	Y	---	?	---	---	---	---	---	---	Meadow Creek Drainage	Previously named "start of hillside seep", Seep starting at break in slope, large wetland area with multiple seeps, marked main, westernmost seep. Hillside dry above.
028	GM-MC-028	7/13/12	HO	38-40	---	Spring	Colluvium	11N	630110	4971543	7,238	4.7	6.77	31.2	3.6	Cup	clear	none	Y	2	---	---	6	20	---	---	---	Meadow Creek. Up the steep drainage on south side across from Hanger Flats.	6' x 20' mossy area surrounding spring but not a wetland. Portion of water dives underground and comes out below. Feeds into larger wetland along main drainage.
029	GM-MC-029	7/13/12	GW	---	56 - 59	Seep	Colluvium	11N	628491	4971240	7,041	11.6	6.36	64.8	0.5	Cup	clear	none	Y	---	3	---	---	---	---	---	---	Meadow Creek Drainage	Seep field. Seep starting at break in slope, forming small pool, flow measured at pool outlet, flows into "Section 20 Fork" of Meadow Creek.
030	GM-MC-030	7/13/12	HO	41-43	---	Spring w/Wetland	Colluvium	11N	630089	4971213	7,586	6.2	7.02	133.1	2.5	Cup	clear	none	Y	6	---	---	---	6	12	---	---	Meadow Creek. Up the steep drainage on south side across from Hanger Flats.	Wetland surrounds spring. May have additional water above. Hike ~ 200' above and saw no additional flow.
031	GM-MC-031	7/13/12	GW	---	60, 61	Seep	Colluvium	11N	628401	4971158	7,065	7.8	6.55	62.6	2.0	Visual Estimate	clear	none	Y	---	?	---	---	---	---	---	---	Meadow Creek Drainage	Seep field. Multiple seeps at wetland boundary multiple sources with flow dispersed and under vegetation, logs and roots.
032	GM-MC-032	7/13/12	HO	44-46	---	Spring w/Wetland	Colluvium	11N	630072	4971180	7,586	4.1	7.13	92.1	4.6	Cup	clear	none	Y	5	---	---	---	15	20	---	---	Meadow Creek. Up the steep drainage on south side across from Hanger Flats heading toward the top of the drainage.	Wetland immediately around spring. Turns into a flowing channel 1' wide. On the GIS the pt appears "in" the main channel, however, is approx. 75' away.
033	GM-MC-033	7/13/12	GW	---	62, 63	Seep	Colluvium	11N	628211	4971179	7,194	6.8	6.58	35.8	No Flow	Visual Estimate	clear	none	N	---	?	---	---	---	---	---	---	Section 20 Fork of Meadow Creek Drainage	Obj ID #737. Multiple seeps at wetland boundary, additional seeps downstream, do not form single channel, but disperse underground, likely discharge to Section 20 Fork as groundwater.
034	GM-MC-034	7/13/12	HO	47-49	---	Spring w/Wetland	Colluvium	11N	630197	4970982	7,839	4.9	7.04	65.4	3.0	Cup	clear	none	Y	3	---	---	---	100	350	---	---	Meadow Creek. Up the steep drainage on south side across from Hanger Flats heading toward the top of the drainage.	Large wetland in the top of the drainage (fills the top portion of the drainage. May be even longer than 350'.
035	GM-MC-035	7/13/12	GW	---	70 - 72	Spring	Colluvium	11N	628088	4971194	7,325	5.4	6.44	45.1	2.0	Visual Estimate	clear	none	Y	180	---	---	---	---	---	---	---	Section 20 Fork of Meadow Creek Drainage	Flowing from slope adjacent to "Section 20 Fork of Meadow Creek", flow estimate where most branches converge.

**Golden Meadows  
2012 Hydrology Field Survey  
Meadow Creek Data Summary**

Site Number	Site ID	Date / Time	Collected By	Photo(s) Pink Camera <sup>1</sup>	Photo(s) Blue Camera <sup>1</sup>	Feature Type	Deposit Type	GPS UTM Coordinates			Elev. (ft)	Temp. (°C)	pH (s.u.)	Elec. Cond. (µS/cm)	Average Flow (gpm)	Flow Measure Method	Color	Odor	Reach Meadow Creek (Y or N)	Spring Source Width (est.) (in)	Seep Source Width (est.) (ft)	Water Depth (in)	Seep Field Width (est.) (ft)	Seep Field Length (est.) (ft)	Wetland Width (est.) (ft)*	Wetland Length (est.) (ft)*	Pond Size (ft x ft)	Location	Comments	
								Zone	Easting	Northing																				
036	GM-MC-036	7/13/12	HO	50-52	---	Spring w/Wetland	Colluvium	11N	630192		7.863	2.8	7.11	46.5	30.0	Visual Estimate	clear	none	Y	96	---	---	---	---	60	>350	---	Meadow Creek. Up the steep drainage on south side across from Hanger Flats at the top of the drainage.	Spring source braided. Total braids spans 8 ft. Feeds into large surrounding wetland that flows down the drainage (possibly >350' length).	
037	GM-MC-037	7/13/12	GW	---	73 - 75	Seep w/Wetland	Colluvium	11N	627948	4971308	7.599	10.7	6.67	40.8	Trickle	Visual Estimate	clear	none	N	---	6	---	---	---	---	---	---	---	Meadow Creek Drainage	Large Wetland. Seep with multiple sources across hillside forming large wetland source marked. Flow dispersed - trickle.
038	GM-MC-038	7/13/12	HO	53-55	---	Spring	Colluvium	11N	630193	4970947	7.865	5.5	7.61	134.4	23.1	Cup	clear	none	Y	96	---	---	---	---	---	---	---	---	Hillside spring across from Hanger Flats, between drainage to the W of Blowout Creek and the one E of the main MC drainage.	Large portion of flow goes under rocks. Measured only measurable portion. Spring is a wide network of above and underground braids.
039	GM-MC-039	7/14/12	GW	---	79, 80	Seep w/Wetland	Colluvium	11N	628385	4970953	7.242	5.5	6.67	57.4	0.5	Visual Estimate	clear	none	Y	---	3	0.5	---	---	---	---	---	---	Section 20 Fork of Meadow Creek Drainage	Seep field drains into main channel. Multiple seeps coming out all across hillside, marked and FWQ at highest point in seep field, visual est 0.5 gpm however additional seeps add significant flow, wet for 10 yds above then dry, this spring covers additional seeps from old survey #472 #727.
040	GM-MC-040	7/14/12	HO	56-58	---	Spring w/Wetland	Colluvium	11N	629657	4971601	7.100	5.0	7.59	162.7	3.3	Cup	clear	none	Y	3	---	---	---	---	30	>500	---	Meadow Creek. 2 drainages west of Blowout Creek.	Feeds into a large wetland that extends to the bottom of the slope.	
041	GM-MC-041	7/14/12	GW	---	76 - 78	Seep w/Wetland	Colluvium	11N	628404	4971055	7.109	4.5	6.79	58.0	3.0	Visual Estimate	clear	none	Y	---	21	---	---	---	---	---	---	---	Section 20 Fork of Meadow Creek Drainage	Area has multiple seeps converging and draining into main channel. Good flow very dispersed through wetland vegetation.
042	GM-MC-042	7/14/12	HO	59-61	---	Spring w/Wetland	Colluvium	11N	629667	4971433	7.301	4.4	7.32	170.6	13.6	Cup	clear	none	Y	72	---	---	---	---	15	30	---	Meadow Creek. 2 drainages west of Blowout Creek.	Branched spring network flowing into a large wetland. Feeds main drainage. 2 main branches that merge approximately 4ft after coming above ground.	
043	GM-MC-043	7/14/12	GW	---	81 - 83	Seep w/Wetland	Colluvium	11N	628341	4970983	7.188	5.0	6.92	40.9	2.0	Visual Estimate	clear	none	Y	---	9	1.5	---	---	---	---	---	---	Section 20 Fork of Meadow Creek Drainage	Seeps drain into main channel/wetland. Seep field feeding wetland, multiple channels, multiple sources, width of seep at upper most boundary 3 yds, but widens below, wet above for ~10 yds, then dry.
044	GM-MC-044	7/14/12	HO	62-65	---	Spring	Colluvium	11N	629652	4971414	7.306	4.5	7.80	170.5	3.2	Cup	clear	none	Y	1ft	---	---	---	---	---	---	---	---	Meadow Creek. 2 drainages west of Blowout Creek.	Spring located near GM-MC-042 but on different aspect. Flows out along rock/root path to main drainage. Rock/root path approximately 2' wide.
045	GM-MC-045	7/14/12	GW	---	84 - 86	Seep w/Wetland	Colluvium	11N	628262	4970932	7.278	6.5	6.78	74.5	1.0	Visual Estimate	clear	none	Y	---	9	---	---	---	---	---	---	---	Section 20 Fork of Meadow Creek Drainage	Seep field feeding wetland, multiple channels, multiple sources, width of seep at upper most boundary 3 yds, but widens below, wet above for ~10 yds, then dry.
046	GM-MC-046	7/14/12	HO	66-68	---	Spring	Bedrock	11N	629643	4971417	7.291	4.5	7.56	161.4	11.3	Cup	clear	none	Y	18	---	---	---	---	---	---	---	---	Meadow Creek. 2 drainages west of Blowout Creek.	Spring in same area as -042 and -044 but is main spring feeding drainage. Flows down rock channel and joins additional smaller springs to form main channel.
047	GM-MC-047	7/14/12	GW	---	87 - 89	Seep w/Wetland	Colluvium	11N	628211	4970732	7.492	10.0	6.24	80.1	Trickle	Visual Estimate	clear	none	Y	---	entire hillside	---	---	---	---	---	---	---	Meadow Creek Drainage	Large hillside seep field/wetland that converges into small stream, stream drains into main channel, stream drains into main drainage channel, sample taken at highest seep on hillside.
048	GM-MC-048	7/14/12	HO	69-72	---	Spring	Colluvium	11N	628051	4970650	7.523	8.4	7.08	36.4	2.8	Cup	clear	none	N	8	---	---	---	---	---	---	---	---	Main fork of Meadow Creek on the eastern hillside.	Spring starts on side of drainage under rocks and flows in 8" channel. Surrounded by moss and vegetation but would not characterize as "wetland".
049	GM-MC-049	7/14/12	GW	---	90 - 92	Spring w/Wetland	Colluvium	11N	628051	4970650	7.462	4.2	6.50	78.9	20.0	Visual Estimate	clear	none	Y	72	---	8	---	---	---	---	---	---	Meadow Creek Drainage	Large spring flowing 50 meters into main channel. Flowing out of pool on hillside, dry rocky hillside ~10 meters above.
050	GM-MC-050	7/14/12	HO	73-75	---	Spring	Colluvium	11N	629181	4970908	7.311	6.9	6.81	56.4	0.9	Cup	clear	none	N	3	---	---	---	---	---	---	---	---	Main fork of Meadow Creek on the eastern hillside.	Spring emanating from landslide slump. Additional adjacent seeps. Forms a small, 1' channel.
051	GM-MC-051	7/15/12	GW	---	93 - 95	Spring	Colluvium	11N	630052	4972497	6.986	9.6	7.55	45.0	10.0	Visual Estimate	clear	none	Y	252	---	1	---	---	---	---	---	---	North of Hangar Flats and Meadow Creek	Manmade drainage channel. Large spring from headcut in steep slope, flowing down in manmade channel, wetland with trickle of water flowing through it above headcut, stream in parallel drainage flowing at similar volume, starts much higher, will try to reach from top at later date.
053	GM-MC-053	7/15/12	GW	---	96 - 98	Seep w/Wetland	Colluvium	11N	630732	4972631	6.638	10.0	6.83	59.6	10.0	Visual Estimate	clear	none	N	1080	---	---	---	---	---	---	---	---	Meadow Creek Drainage	Hard to verify flow due to size of seep area and dense vegetation, possible seeps under rocks as well.
055	GM-MC-055	7/15/12	GW	---	99, 100	Seep w/Wetland	Colluvium	11N	630633	4972574	6.639	8.8	6.63	57.1	1.0	Visual Estimate	clear	none	N	---	9	---	---	---	---	---	---	---	Meadow Creek Drainage	Seep coming out of cut in hillside above ditch into tailings, flow dispersed across area ~3 meters wide.
057	GM-MC-057	7/15/12	GW	---	101 - 103	Spring w/Wetland	Colluvium	11N	630749	4973277	7.306	8.4	6.77	46.2	6.7	Cup	clear	none	N	360	---	---	---	---	---	---	---	---	Meadow Creek Drainage	Seep area has two main channels flowing through wetland then converging with additional channel from a seep further west. Spring coming out of high hillside below rock outcropping, flow measured in two main branches for total flow.
059	GM-MC-059	7/15/12	GW	---	104 - 106	Seep w/Wetland	Colluvium	11N	630920	4973349	7.279	9.9	7.04	48.2	1.0	Visual Estimate	clear	none	N	---	15	---	---	---	---	---	---	---	Meadow Creek Drainage	Water runs for short distance then goes back underground. Seep comes out of slump in hillside, flows in multiple channels through vegetation, no flow noticed at bottom of slope, flow disappears under ground > 50m below.
064	GM-MC-064	7/15/12	HO	iPOD9-iPOD11	---	Seep w/Wetland	Colluvium	11N	631054	4972186	6.696	9.2	6.72	106.0	5.0	Visual Estimate	clear	none	Y	---	---	---	100	120	100	120	---	---	Meadow Creek. Base of the hillside west of Blowout Creek.	Consists of 4 main "seep channels" flowing at a trickle. Entire field is a wetland and seeping to Meadow Creek.
066	GM-MC-066	7/15/12	HO	iPOD12-iPOD16	---	Seep w/Wetland	Colluvium	11N	631053	4972196	6.690	11.6	6.67	10.0	2.0	Cup	clear	none	Y	---	---	---	5	5	20	20	---	---	Meadow Creek. Hillside west of Blowout Creek.	Seep field consists of 2 main seep channels (10" wide each), which join approximately 35' downhill. This is the location where flow was taken.
067	GM-MC-067	7/16/12	GW	---	115 - 117	Spring w/Wetland	Colluvium	11N	626996	4970014	8.287	3.1	6.27	19.6	15.0	Visual Estimate	clear	none	Y	12	---	---	---	---	---	---	---	---	Middle Fork of Meadow Creek	High elevation spring between rock outcroppings.
068	GM-MC-068	7/16/12	HO	87-90	---	Spring w/Wetland	Colluvium	11N	628546	4968203	8.310	6.8	6.72	66.0	2.3	Cup	clear	none	Y	6	---	---	---	---	>500	>500	---	---	Basin in the top of main Meadow Creek drainage. South of Meadow Creek Lake. Adjacent to the southern most claims extent.	One seep among many (all form small channels). Wetland in seep field makes up whole lower sloped area in the basin.
069	GM-MC-069	7/16/12	GW	---	118 - 120	Seep w/Wetland	Colluvium	11N	627111	4969935	8.334	7.5	6.21	23.4	2.9	Visual Estimate	clear	none	Y	---	12	---	---	---	---	---	---	---	Middle Fork of Meadow Creek	Large area/wetland with multiple seeps, converging into channel 40 yards from highest starting seep. Large wet seep area about 4m across and 20m long before water collects in one spot, measurement at spot where larger amount of flow congregates.

Golden Meadows  
2012 Hydrology Field Survey  
Meadow Creek Data Summary

Site Number	Site ID	Date / Time	Collected By	Photo(s) Pink Camera <sup>1</sup>	Photo(s) Blue Camera <sup>1</sup>	Feature Type	Deposit Type	GPS UTM Coordinates			Elev. (ft)	Temp. (°C)	pH (s.u.)	Elec. Cond. (µS/cm)	Average Flow (gpm)	Flow Measure Method	Color	Odor	Reach Meadow Creek (Y or N)	Spring Source Width (est.) (in)	Seep Source Width (est.) (ft)	Water Depth (in)	Seep Field Width (est.) (ft)	Seep Field Length (est.) (ft)	Wetland Width (est.) (ft)*	Wetland Length (est.) (ft)*	Pond Size (ft x ft)	Location	Comments	
								Zone	Easting	Northing																				
070	GM-MC-070	7/16/12	HO	91-94	---	Spring w/Wetland	Colluvium	11N	628530	4968197	8,317	5.4	7.01	56.0	5.3	Cup	clear	none	Y	12	---	---	---	---	>500	>500	---	Basin in the top of main Meadow Creek drainage. South of Meadow Creek Lake. Adjacent to the southern most claims extent.	Flows into a rocky channel, then into seep field where numerous seeps exist. Wetland covers basically all lower slopes in basin.	
071	GM-MC-071	7/16/12	GW	---	121 - 123	Spring w/Wetland	Colluvium	11N	627149	4969881	8,371	4.7	6.30	20.0	15.0	Visual Estimate	clear	none	Y	720	---	---	---	---	---	---	---	---	Middle Fork of Meadow Creek	Snow melt runoff enters spring/seep field. Shallow bowl below steep slope with snowfields, spring fed by snowmelt, but may also exist yearround, has wetland veg, multiple channels before flowing together.
072	GM-MC-072	7/16/12	HO	95-98	---	Seep	Colluvium	11N	628530	4968216	8,313	6.7	6.52	58.9	2.0	Cup	clear	none	N	---	0.33	---	---	---	3	10	---	Basin in the top of main Meadow Creek drainage. South of Meadow Creek Lake.	Seep is surrounded by vegetation, but appears to be upland vegetation and not wetlands. Smaller wetland directly next to the channel.	
073	GM-MC-073	7/16/12	GW	---	126	Spring	Colluvium	11N	627294	4969810	8,421	5.9	6.00	17.2	30.0	Visual Estimate	clear	none	Y	---	---	---	---	---	---	---	---	Meadow Creek Drainage	Hillslope in small drainage have snowmelt runoff draining into spring flow, hard to determine flow and source of spring. Large shallow wetland area shown on topo maps, multiple inflows, snowmelt still feeding flow.	
074	GM-MC-074	7/16/12	HO	99-102	---	Seep w/Wetland	Colluvium	11N	628423	4968169	8,382	7.2	6.49	26.1	15.7	Cup	clear	none	Y	4	5	---	---	---	30	100	---	Basin in the top of main Meadow Creek drainage. South of Meadow Creek Lake.	2 main branches. Branch 1 is a seep and Branch 2 is a spring. Join approx. 20' from Branch 2 and 40' from Branch 1 source. Channel below the confluence is 1-1.5' wide.	
075	GM-MC-075	7/16/12	GW	---	127, 128	Spring	Bedrock	11N	627510	4969685	8,469	7.4	6.73	27.2	1.0	Visual Estimate	clear	none	Y	12	---	---	---	---	---	---	---	Middle Fork of Meadow Creek	Spring comes directly out of rocks, snowmelt runoff is seeping down the drainage and joining the springs. Spring at rock outcrop, almost at ridge.	
076	GM-MC-076	7/16/12	HO	103-105	---	Seep	Colluvium	11N	628409	4968214	8,371	4.3	6.54	24.0	1.9	Cup	clear	none	N	---	1	---	---	---	---	---	---	---	Basin in the top of main Meadow Creek drainage. South of Meadow Creek Lake.	Seep surrounded by vegetation, only a few wetland species. Mossy under and around small channel.
077	GM-MC-077	7/16/12	GW	---	129131132	Spring w/Wetland	Colluvium	11N	627666	4970007	8,064	3.3	7.04	86.3	3.0	Visual Estimate	clear	none	Y	36	---	---	---	---	---	---	---	Meadow Creek Drainage	Spring in drainage.	
078	GM-MC-078	7/17/12	HO	115-118	---	Spring w/Wetland	Bedrock	11N	628368	4968334	8,337	4.6	6.57	45.3	8.3	Cup	clear	none	Y	3	---	---	---	---	10	15	---	Basin in the top of main Meadow Creek drainage. South of Meadow Creek Lake.	Artesian spring. Bubbling straight up out of the ground. Cliffs surround the basin and this source is coming from Bedrock.	
079	GM-MC-079	7/16/12	GW	---	133-135	Spring	Colluvium	11N	627836	4970177	7,921	5.5	7.07	118.2	1.0	Visual Estimate	clear	none	N	---	---	---	---	---	---	---	---	---	Middle Fork of Meadow Creek	Spring emerges somewhere under large rock pile, runs down to bottom of slope out on flat ground for 3 meters and disappears, no wetland. All flow completely disappears within 2m on sandy flat surface below talus slope, large adjacent drainage completely dry. Flow reappears at 079INT.
080	GM-MC-080	7/16/12	HO	106-108	---	Seep w/Wetland	Colluvium	11N	629465	4971595	7,056	6.5	7.17	118.0	Trickle	Cup	clear	none	N	---	---	---	20	20	10	15	---	Hillside on the southeast side of Meadow Creek before confluence of different MC forks.	Seep field with multiple seeps. Cannot measure flow-seeping at a trickle.	
081	GM-MC-081	7/16/12	GW	---	136137	Seep w/Wetland	Colluvium	11N	627918	4971008	7,543	4.4	6.90	32.1	0.5	Visual Estimate	clear	none	N	---	3	---	---	---	---	---	---	---	Middle Fork of Meadow Creek	Seep is on top of rock face in between two main channels. Flow disappears after few yards reappears intermittently downstream.
082	GM-MC-082	7/16/12	HO	109-111	---	Seep	Colluvium	11N	629460	4971556	7,101	6.8	6.77	147.0	6.3	Cup	clear	none	N	---	---	---	6	10	---	---	---	Hillside on the southeast side of Meadow Creek before confluence of different MC forks.	Seep approximately 200 feet from -080 but on slightly different aspect. Seep field flows into vegetation/drainage but no wetland present.	
083	GM-MC-083	7/16/12	GW	---	138-139	Spring	Colluvium	11N	628088	4971126	7,348	9.1	6.49	60.5	1.0	Visual Estimate	clear	none	Y	6	---	---	---	---	---	---	---	Middle Fork of Meadow Creek	Spring out of rock outcropping.	
084	GM-MC-084	7/16/12	HO	112-114	---	Seep	Colluvium	11N	629437	4971686	6,887	8.4	6.84	131.0	0.5	Cup	clear	none	N	---	---	---	8	10	---	---	---	Hillside on the southeast side of Meadow Creek before confluence of different MC forks.	Seep field emanates into one small channel.	
085	GM-MC-085	7/17/12	GW	---	140-142	Spring w/Wetland	Colluvium	11N	626865	4970202	8,293	5.2	6.70	18.0	3.0	Visual Estimate	clear	none	N	12	---	---	---	---	---	---	---	---	Middle Fork of Meadow Creek	Spring splits into multiple channels. Spring in break in slope flows through wetland area, where it splits into multiple channels, WQ measurements taken with HydroLab Quanta probe.
086	GM-MC-086	7/17/12	HO	119-122	---	Seep w/Wetland	Bedrock	11N	628434	4968467	8,296	5.8	6.44	30.1	6.0	Cup	clear	none	Y	---	---	---	4	6	30	30	---	Basin in the top of main Meadow Creek drainage. South of Meadow Creek Lake. Heading around the cliffs south of the lake.	Numerous small seeps. Flow measured in main channel. Channel goes underground then reappears at GM-MC-090. Bedrock cliffs above and around source.	
087	GM-MC-087	7/17/12	GW	---	143144	Spring w/Wetland	Colluvium	11N	626846	4970148	8,338	4.1	6.82	19.0	2.0	Visual Estimate	clear	none	N	6	---	---	---	---	---	---	---	---	Middle Fork of Meadow Creek	Spring start on hillside slope, dry above, spring flow disappears after 20m, before popping back out at marked point GM-MC-087INT.
088	GM-MC-088	7/17/12	HO	123-126	---	Spring	Bedrock	11N	628661	4968705	8,000	7.8	5.98	27.3	0.8	Cup	clear	none	N	12	---	---	---	---	---	---	---	---	Basin in the top of main Meadow Creek drainage. South of Meadow Creek Lake. Heading around the cliffs south of the lake.	pH seemed low, so measured the 7.00 buffer solution and it read 7.07 so I assume the pH is correct. Spring flowing from under rock. Vegetation in drainage but not many wetland species.
089	GM-MC-089	7/17/12	GW	---	145-147	Spring	Colluvium	11N	626874	4970129	8,309	10.2	6.72	16.0	0.3	Visual Estimate	clear	none	N	3	---	---	---	---	---	---	---	---	Middle Fork of Meadow Creek	Spring appears in drainage channel and flows into wetland. Spring in hillside drainage, drainage continues dry above.
090	GM-MC-090	7/17/12	HO	127-130	---	Seep	Colluvium	11N	628649	4968597	8,111	5.5	6.29	45.0	1.3	Cup	clear	none	Y	---	0.6	---	---	---	2	5	---	Basin in the top of main Meadow Creek drainage. South of Meadow Creek Lake. 3rd small drainage south of Meadow Creek Lake.	Surrounded by lots of upland vegetation/not many wetland species. Created a small channel 6" wide.	
091	GM-MC-091	7/17/12	GW	---	148-150	Spring	Colluvium	11N	626937	4970109	8,238	5.9	6.54	12.0	0.3	Visual Estimate	clear	none	N	3	---	---	---	---	---	---	---	---	Middle Fork of Meadow Creek	Spring in large rocky creekbed, but flow very small, just below talus slope.

**Golden Meadows  
2012 Hydrology Field Survey  
Meadow Creek Data Summary**

Site Number	Site ID	Date / Time	Collected By	Photo(s) Pink Camera <sup>1</sup>	Photo(s) Blue Camera <sup>1</sup>	Feature Type	Deposit Type	GPS UTM Coordinates			Elev. (ft)	Temp. (°C)	pH (s.u.)	Elec. Cond. (µS/cm)	Average Flow (gpm)	Flow Measure Method	Color	Odor	Reach Meadow Creek (Y or N)	Spring Source Width (est.) (in)	Seep Source Width (est.) (ft)	Water Depth (in)	Seep Field Width (est.) (ft)	Seep Field Length (est.) (ft)	Wetland Width (est.) (ft)*	Wetland Length (est.) (ft)*	Pond Size (ft x ft)	Location	Comments
								Zone	Easting	Northing																			
092	GM-MC-092	7/17/12	HO	131-133	---	Seep	Colluvium	11N	628951	4968777	7,749	11.4	6.57	75.6	0.4	Cup	clear	none	Y	---	1	---	---	---	---	---	---	Main fork of Meadow Creek in the middle of the basin.	Lots of vegetation but no wetlands. Rock slide area.
093	GM-MC-093	7/17/12	GW	---	151-152	Pond w/Wetland	Colluvium	11N	626900	4970582	8,216	12.5	6.71	24.0	10.0	Visual Estimate	clear	none	Y	---	---	---	---	---	---	30 x 90	Middle Fork of Meadow Creek	Pond has multiple drainage points and channels. Pond in wetland depression, no visible inflow, outflow ~10 gpm visual estimate, area ~30x10m, includes vegetated area in standing water.	
094	GM-MC-094	7/17/12	HO	135-137	---	Seep	Colluvium	11N	628972	4968796	7,713	9.7	6.57	80.8	0.4	Cup	clear	none	Y	---	1.5	---	---	---	---	---	---	Main fork of Meadow Creek in the middle of the basin.	
095	GM-MC-095	7/17/12	GW	---	153-155	Spring w/Wetland	Colluvium	11N	626857	4970746	8,346	5.8	6.71	34.0	8.0	Visual Estimate	clear	none	N	6	---	---	---	---	---	---	---	Middle Fork of Meadow Creek	High elevation spring that flows above ground for 5 meters and then flows back underground until it reaches the meadow below. Spring on steep hillside, almost at top of ridge. Flow reappears at 095INT.
096	GM-MC-096	7/17/12	HO	138-140	---	Seep	Colluvium	11N	628988	4968769	7,753	6.1	6.81	65.3	1.1	Cup	clear	none	Y	---	2	---	---	---	---	---	---	Main fork of Meadow Creek in the middle of the basin.	In a rockslide channel. Flows into a drainage that joins other seeps and springs and flows into Meadow Creek.
098	GM-MC-098	7/17/12	HO	141-144	---	Seep	Colluvium	11N	628983	4968767	7,758	6.2	6.75	54.5	2.4	Cup	clear	none	Y	---	---	---	2	10	---	---	---	Main fork of Meadow Creek in the middle of the basin. On hillside above where the main MC drainage forks below the lake.	Large wetland in the bottom of the drainage. Small wetland surrounding seep field.
099	GM-MC-099	7/17/12	GW	---	159-161	Seep w/Wetland	Colluvium	11N	627007	4970891	8,290	4.4	6.72	32.0	1.0	Visual Estimate	clear	none	Y	---	---	---	---	---	---	---	---	Middle Fork of Meadow Creek	Area has 2 seeps converging 20 meters from origin and flowing down hillside. Seep with multiple flow sources and flow paths on steep hillside, total flow estimated ~1 gpm.
100	GM-MC-100	7/17/12	HO	145-148	---	Seep w/Wetland	Colluvium	11N	629120	4968700	7,730	5.2	6.70	54.2	19.9	Cup	clear	none	Y	---	---	---	40	70	30	80	---	Main fork of Meadow Creek in the middle of the basin. On hillside above where the main MC drainage forks below the lake.	Seep field with numerous seeps and channels. Source above main seep...can hear it underground but does not appear until the seep field. Wetland joins larger one in bottom of drainage.
101	GM-MC-101	7/17/12	GW	---	162-164	Seep w/Wetland	Colluvium	11N	627568	4970599	7,730	10.4	7.00	33.0	2.0	Visual Estimate	clear	none	Y	---	25	---	---	---	---	---	---	Middle Fork of Meadow Creek	Seep with wetland dispersed flow in multiple channels.
102	GM-MC-102	7/17/12	HO	149-151	---	Seep w/Wetland	Colluvium	11N	629222	4968717	7,670	8.4	6.49	59.4	1.3	Cup	clear	none	Y	---	1	---	---	---	5	200	---	Main fork of Meadow Creek in the middle of the basin. On hillside above where the main MC drainage forks below the lake.	Wetland approx. 2' on each side of the channel and flows into Meadow Creek. Channel approx. 1-2' wide.
103	GM-MC-103	7/18/12	GW	---	165 - 167	Seep w/Wetland	Colluvium	11N	626572	4972113	8,074	4.7	7.76	116.2	2.4	Cup	clear	none	N	---	3	---	---	---	---	---	---	North Fork of Meadow Creek	Seep at break in slope below ridge forming wetland, seep disappears after ~20 m, reappears at marked point GM-MC-103INT
104	GM-MC-104	7/18/12	HO	152-154	---	Seep w/Wetland	Colluvium	11N	629220	4968294	8,135	5.0	6.46	59.0	0.7	Cup	clear	none	N	---	1	---	---	---	5	20	---	Main fork of Meadow Creek. On the hillside to the southeast.	Seep flows for 20' then disappeared underground. Wetland extends 2.5' on both sides of the channel.
106	GM-MC-106	7/18/12	HO	155-158	---	Seep w/Wetland	Colluvium	11N	629347	4968296	8,059	4.7	6.65	35.0	0.9	Cup	clear	none	N	---	0.5	---	---	---	7	15	---	Main fork of Meadow Creek. On the hillside to the southeast.	Point appears close to GM-MC-104 but is on the other side of a small ridge.
107	GM-MC-107	7/18/12	GW	---	171 -173	Seep w/Wetland	Colluvium	11N	626834	4971850	8,033	6.8	6.50	58.1	1.0	Visual Estimate	clear	none	N	---	6	---	---	---	---	---	---	West Fork of Meadow Creek Drainage	Seep area with wetland flows above ground for 15 meters and returns below ground. Seep 3 yards wide, coming out of hillside, dry above.
108	GM-MC-108	7/18/12	HO	159-162	---	Seep w/Wetland	Colluvium	11N	629605	4968375	8,020	4.9	6.95	47.0	11.9	Cup	clear	none	Y	---	---	---	10	15	15	50	---	Main fork of Meadow Creek. On the eastern fork once the main fork splits.	5 main distinct seep channels. Flow measured where some of them converge.
109	GM-MC-109	7/18/12	GW	---	174 - 176	Seep w/Wetland	Colluvium	11N	626841	4971812	8,074	6.7	6.62	43.8	2.0	Visual Estimate	clear	none	N	---	3	---	---	---	---	---	---	West Fork of Meadow Creek Drainage	Seep in small depression on hillside, dry above and dry below, seep flows for ~20 m.
110	GM-MC-110	7/18/12	HO	163-165	---	Spring w/Wetland	Colluvium	11N	629325	4968471	7,880	5.8	6.55	24.0	9.5	Cup	clear	none	Y	8	---	---	---	---	10	40	---	Main fork of Meadow Creek. On the eastern fork once the main fork splits.	Part of an intermittent system. Source possibly GM-MC-106, located above but no visible water above.
111	GM-MC-111	7/18/12	GW	---	177 - 179	Seep w/Wetland	Colluvium	11N	626832	4971343	8,249	4.5	6.35	20.1	2.0	Visual Estimate	clear	none	Y	---	30	---	---	---	---	---	---	West Fork of Meadow Creek Drainage	Seep feeds large wetland area. Wetland has seeps coming out dispersed all along side, also large creek flowing in, possible water just reappearing from large stream.
112	GM-MC-112	7/18/12	HO	166-169	---	Seep	Colluvium	11N	629280	4968595	7,773	11.1	6.59	17.0	0.3	Cup	clear	none	N	---	---	---	8	1	---	---	---	Main fork of Meadow Creek. On the eastern fork once the main fork splits.	Intermittent seep. Flows for 20' before going underground, then comes back up (at GM-MC-114?) and joins main drainage.
113	GM-MC-113	7/18/12	GW	---	180 - 182	Seep w/Wetland	Colluvium	11N	626818	4971177	8,383	4.4	6.39	18.6	3.0	Visual Estimate	clear	none	Y	---	3	---	---	---	---	---	---	West Fork of Meadow Creek Drainage	Seep feeding into some large wetland (pretty far below), the stream formed by this seep diverges into several channels in and just above wetland below, more water flowing toward wetland than at source.
114	GM-MC-114	7/18/12	HO	170-172	---	Seep w/Wetland	Colluvium	11N	629293	4968696	7,680	8.7	6.14	9.0	0.3	Visual Estimate	clear	none	Y	---	0.5	---	---	---	15	30	---	Main fork of Meadow Creek. On the eastern fork once the main fork splits.	
115	GM-MC-115	7/18/12	GW	---	183 - 185	Spring w/Wetland	Colluvium	11N	626955	4971271	8,260	4.7	6.54	24.5	3.0	Visual Estimate	clear	none	Y	6	---	---	---	---	---	---	---	West Fork of Meadow Creek Drainage	conductivity cannot be measured, cable on probe broken. (NOTE: this is from fieldbook, but there is a recorded SC value on the fieldsheet).
116	GM-MC-116	7/18/12	HO	173-176	---	Seep w/Wetland	Colluvium	11N	629313	4969166	7,429	9.3	6.50	38.0	2.4	Cup	clear	none	Y	---	0.5	---	---	---	3	25	---	Main fork of Meadow Creek. Above the confluence of the split.	Part of an intermittent system. Begin hiking above to find the source.
117	GM-MC-117	7/18/12	GW	---	186 - 188	Spring	Colluvium	11N	626987	4971243	8,247	3.3	6.52	IM	5.0	Visual Estimate	clear	none	Y	12	---	---	---	---	---	---	---	West Fork of Meadow Creek Drainage	Spring out of bedrock.

Golden Meadows  
2012 Hydrology Field Survey  
Meadow Creek Data Summary

Site Number	Site ID	Date / Time	Collected By	Photo(s) Pink Camera <sup>1</sup>	Photo(s) Blue Camera <sup>1</sup>	Feature Type	Deposit Type	GPS UTM Coordinates			Elev. (ft)	Temp. (°C)	pH (s.u.)	Elec. Cond. (µS/cm)	Average Flow (gpm)	Flow Measure Method	Color	Odor	Reach Meadow Creek (Y or N)	Spring Source Width (est.) (in)	Seep Source Width (est.) (ft)	Water Depth (in)	Seep Field Width (est.) (ft)	Seep Field Length (est.) (ft)	Wetland Width (est.) (ft)*	Wetland Length (est.) (ft)*	Pond Size (ft x ft)	Location	Comments	
								Zone	Easting	Northing																				
118	GM-MC-118	7/18/12	HO	177-180		Seep	Colluvium	11N	629565	4968707	7,883	11.9	6.51	3.0	0.6	Cup	clear	none	Y	---	0.66	---	---	---	---	---	---	Main fork of Meadow Creek on the eastern hillside.	Seep turns into a decent size channel at the bottom of the slope (2' wide).	
119	GM-MC-119	7/18/12	GW		189 - 191	Spring	Colluvium	11N	627163	4971191	8,220	4.8	7.03	62.0	2.0	Visual Estimate	clear	none	Y	6	---	---	---	---	---	---	---	West Fork of Meadow Creek Drainage	WQ meter cable broke, stripped and re-spliced cable, seems to work fine.	
120	GM-MC-120	7/18/12	HO	181-184		Seep w/Wetland	Colluvium	11N	629605	4968742	7,906	7.8	6.88	52.0	2.8	Cup	clear	none	Y	---	2	---	---	---	15	20	---	Main fork of Meadow Creek on the eastern hillside.	Across hillslope from GM-MC-118.	
121	GM-MC-121	7/18/12	GW		192 - 194	Spring w/Wetland	Colluvium	11N	627488	4971724	7,777	3.7	6.18	31.9	3.0	Visual Estimate	clear	none	Y	36	---	---	---	---	---	---	---	West Fork of Meadow Creek Drainage	Below rock face.	
122	GM-MC-122	7/18/12	HO	185-188		Spring w/Wetland	Bedrock	11N	629663	4968757	7,967	5.6	6.81	31.0	16.4	Cup	clear	none	Y	18	---	---	---	---	5	>100	---	Main fork of Meadow Creek on the eastern hillside.	Be careful-cave above source and cougar tracks in the area.	
123	GM-MC-123	7/19/12	GW		195 - 197	Spring w/Wetland	Bedrock	11N	628992	4972450	7,601	6.6	7.20	34.9	25.0	Visual Estimate	clear	none	Y	---	---	---	---	---	---	---	---	North Slope of Hangar Flats, Meadow Creek Drainage	Spring out of bedrock in really steep terrain, GPS location close to source, WQ flow measured ~50 yards downstream, as source too steep to be closely accessed.	
124	GM-MC-124	7/18/12	HO	189-192		Seep w/Wetland	Colluvium	11N	629688	4968926	7,896	6.1	6.73	33.0	5.7	Cup	clear	none	Y	---	1.5	---	---	---	10	>100	---	Main fork of Meadow Creek on the eastern hillside.	Seep forms a 1' wide channel that flows down to Meadow Creek.	
125	GM-MC-125	7/19/12	GW		198	Pond	Colluvium	11N	630004	4972127	6,615	22.4	6.72	105.9	No Flow	Visual Estimate	clear	none	Y	---	---	30	---	---	---	---	90 x 120	West end of Hangar Flats, Meadow Creek Drainage	Pond at west end of Hangar Flats, size ~42m x 30m of open water surrounded by large wetland, in or outflow invisible through reeds.	
126	GM-MC-126	7/18/12	HO	193-197		Spring w/Wetland	Colluvium	11N	629791	4969145	7,950	5.3	7.26	76.0	15.3	Cup	clear	none	Y	12	---	---	---	---	7	>100	---	Main fork of Meadow Creek on the eastern hillside.	Main channel branches into 2 and flows into Meadow Creek.	
127	GM-MC-127	7/19/12	GW		199, 200	Seep w/Wetland	Colluvium	11N	630017	4972238	6,635	11.4	6.36	45.6	Trickle	Visual Estimate	brown	none	Y	---	0.5	---	---	---	---	---	---	Small slump just above Hangar Flats, Meadow Creek Drainage	Seep out of small slump at bottom of hillside adjacent to Hangar Flats, flow ~trickle at multiple places through wetland vegetation.	
128	GM-MC-128	7/18/12	HO	198-201		Seep w/Wetland	Colluvium	11N	629638	4969066	7,735	7.8	6.67	34.0	1.8	Cup	clear	none	Y	---	1	---	---	---	8	60	---	Main fork of Meadow Creek on the eastern hillside.	Large bedrock mass above.	
129	GM-MC-129	7/20/12	GW		201 - 203	Spring w/Wetland	Colluvium	11N	626879	4972615	7,919	3.5	6.08	20.2	20.0	Visual Estimate	clear	none	Y	12	---	---	---	---	---	---	---	West Fork of Meadow Creek Drainage	Large spring out of hillside surrounded by wetland, large channel about 10 yards north, but dry.	
130	GM-MC-130	7/18/12	HO	202-205		Spring w/Wetland	Colluvium	11N	629715	4969434	7,756	6.7	6.74	53.0	6.0	Cup	clear	none	Y	12	---	---	---	---	5	50	---	Main fork of Meadow Creek on the eastern hillside.	Bedrock hillside above.	
131	GM-MC-131	7/20/12	GW		204 - 206	Spring w/Wetland	Colluvium	11N	626883	4972367	7,852	5.1	6.12	34.9	15.0	Visual Estimate	clear	none	Y	12	---	---	---	---	---	---	---	West Fork of Meadow Creek Drainage	Spring at small headcut in slope.	
132	GM-MC-132	7/19/12	HO	206-208		Seep w/Wetland	Colluvium	11N	629311	4970350	7,439	6.5	6.98	47.6	12.0	Cup	clear	none	Y	---	---	---	10	---	15	50	---	Main fork of Meadow Creek on the eastern hillside.	Multiple seeps. Wetlands extend down drainage. Landslide slump. Source most likely above at GM-MC-134.	
133	GM-MC-133	7/20/12	GW		207 - 209	Spring w/Wetland	Bedrock	11N	626828	4972345	7,864	5.4	6.20	30.8	5.0	Visual Estimate	clear	none	Y	6	---	---	---	---	---	---	---	West Fork of Meadow Creek Drainage	Spring amidst bedrock outcropping, maybe shallow colluvium on top of bedrock.	
134	GM-MC-134	7/19/12	HO	209-212		Spring w/Wetland	Colluvium	11N	629577	4970291	7,851	6.9	7.18	26.3	1.8	Cup	clear	none	Y	6	---	---	---	---	4	>100	---	Main fork of Meadow Creek on the eastern hillside.		
135	GM-MC-135	7/20/12	GW		210 - 212	Seep w/Wetland	Colluvium	11N	626795	4972313	7,837	6.7	6.70	191.0	1.0	Visual Estimate	clear	none	Y	---	---	---	---	---	---	---	---	West Fork of Meadow Creek Drainage	Small seep coming out of small hillside deeply incised channel adjacent is dry.	
136	GM-MC-136	7/19/12	HO	213-217		Seep w/Wetland	Colluvium	11N	629683	4969579	7,694	8.1	6.90	34.0	2.0	Visual Estimate	clear	none	Y	---	---	---	10	15	15	20	---	Main fork of Meadow Creek on the eastern hillside.	Flows into a larger channel down below. Adjacent to a "blown out" drainage>	
137	GM-MC-137	7/20/12	GW		213 - 215	Spring w/Wetland	Colluvium	11N	626757	4972217	7,870	6.2	7.01	165.7	10.0	Visual Estimate	clear	none	Y	6	---	---	---	---	---	---	---	West Fork of Meadow Creek Drainage	Spring out of hillside, steep.	
138	GM-MC-138	7/19/12	HO	218-222		Spring	Colluvium	11N	629724	4969560	7,750	5.3	7.25	40.2	23.0	Cup	clear	none	Y	8	---	---	30	40	---	---	---	Main fork of Meadow Creek on the eastern hillside.	Spring and numerous seeps flowing into channel. Channel is "blown out". Rocks are very slimy where spring and seeps emit.	
139	GM-MC-139	7/20/12	GW		216 - 218	Spring w/Wetland	Colluvium	11N	627014	4972731	7,863	3.8	6.07	24.9	20.0	Visual Estimate	clear	none	Y	12	---	---	---	---	---	---	---	West Fork of Meadow Creek Drainage	Spring coming out of hillside slump.	
140	GM-MC-140	7/19/12	HO	223-227		Seep	Colluvium	11N	629572	4969781	7,583	9.8	7.09	38.4	1.1	Cup	clear	none	N	---	0.66	---	---	---	---	---	---	Main fork of Meadow Creek on the eastern hillside.	Vegetation below seep in channel, but not wetland species.	
141	GM-MC-141	7/20/12	GW		219 - 221	Seep w/Wetland	Colluvium	11N	627200	4972875	7,912	5.9	6.33	28.2	2.0	Visual Estimate	clear	none	N	---	1	---	---	---	---	---	---	West Fork of Meadow Creek Drainage	Seep coming out of slump in hillside, seep flows for ~20 m before disappearing, re-appears at GM-MC-141INT.	
142	GM-MC-142	7/19/12	HO	228-231		Spring w/Wetland	Colluvium	11N	629647	4969859	7,762	6.5	6.87	41.5	3.2	Cup	clear	none	Y	8	---	---	---	---	20	100	---	Main fork of Meadow Creek on the eastern hillside.	Walked 300-400' above and saw no additional water so assume this is the source.	
143	GM-MC-143	7/20/12	GW		222 - 224	Seep w/Wetland	Colluvium	11N	627257	4972903	7,924	5.3	5.95	29.4	0.5	Visual Estimate	clear	none	N	---	3	---	---	---	---	---	---	---	West Fork of Meadow Creek Drainage	coming out of slump in hillside, small flow, mostly underneath moss, spring intermittent, flow disappears after ~10 m.
144	GM-MC-144	7/20/12	HO	238-241, 246		Seep	Colluvium/Bedrock?	11N	628249	4968727	8,376	5.4	6.78	24.8	6.4	Cup	clear	none	Y	---	---	---	5	5	---	---	---	Above Meadow Creek Lake on the SW side. One of main sources of SW to the lake.	Feeds Meadow Creek Lake. Marshy around the seep field, but no wetland vegetation. Channel 1-1.5' wide.	
146	GM-MC-146	7/20/12	HO	242-245, 249		Seep	Colluvium	11N	628288	4968731	8,370	3.7	6.56	22.6	6.8	Cup	clear	none	Y	---	---	---	2	6	---	---	---	Above Meadow Creek Lake on the SW side. One of main sources of SW to the lake.	Seep channel 1-1.5' wide. Seep contributing to headwater channel that flows to the lake. Located approximately 200' from - 144 on more southern side of the basin. Ground mossy above source but no wetlands.	
148	GM-MC-148	7/20/12	HO	250-253		Seep w/Wetland	Colluvium	11N	628277	4969068	8,209	8.6	5.80	12.1	1.5	Cup	clear	none	Y	---	0.66, 0.66, 0.66	---	6	12	40	200	---	Above Meadow Creek Lake on the NW side.	Seep runs 200' to lake. 3 small seeps (8" wide each). Combined seep channel approximately 6" wide.	
149	GM-MC-149	7/20/12	GW		231 - 233	Spring w/Wetland	Colluvium	11N	627694	4973678	8,250	16.0	5.80	22.3	1.0	Visual Estimate	clear	none	Y	---	---	---	---	---	---	---	---	West Fork of Meadow Creek Drainage	This spring flows into large wetland (recognizable on topo map) there are multiple seeps coming up throughout the wetland, flow out of wetland > 50 gpm.	
150	GM-MC-150	7/20/12	HO	255-258		Seep w/Wetland	Colluvium	11N	629089	4969017	7,614	6.9	6.92	43.2	1.0	Cup	clear	none	N	---	---	---	10	20	20	30	---	Hillside below Meadow Creek Lake.	Seep feeds into larger wetland. Walked above source and found no additional water. Seep field has 3 main seeps.	
151	GM-MC-151	7/20/12	GW		234 - 236	Seep w/Wetland	Colluvium	11N	627750	4973117	8,146	13.9	6.10	25.5	15.0	Visual Estimate	clear	none	Y	---	90	---	---	---	---	---	---	West Fork of Meadow Creek Drainage	Large seep area, no visible inflow, multiple outflows (~10), combined outflow of all outflows very rough guess ~15 gpm.	



**Golden Meadows  
2012 Hydrology Field Survey  
Meadow Creek Data Summary**

Site Number	Site ID	Date / Time	Collected By	Photo(s) Pink Camera <sup>1</sup>	Photo(s) Blue Camera <sup>1</sup>	Feature Type	Deposit Type	GPS UTM Coordinates			Elev. (ft)	Temp. (°C)	pH (s.u.)	Elec. Cond. (µS/cm)	Average Flow (gpm)	Flow Measure Method	Color	Odor	Reach Meadow Creek (Y or N)	Spring Source Width (est.) (in)	Seep Source Width (est.) (ft)	Water Depth (in)	Seep Field Width (est.) (ft)	Seep Field Length (est.) (ft)	Wetland Width (est.) (ft)*	Wetland Length (est.) (ft)*	Pond Size (ft x ft)	Location	Comments	
								Zone	Easting	Northing																				
152	GM-MC-152	7/20/12	HO	259-262	---	Spring w/Wetland	Colluvium	11N	629073	4969488	7,485	7.1	7.06	60.0	2.8	Cup	clear	none	Y	24	---	---	---	---	20	200	---	Hillside below Meadow Creek Lake.	Wetland flows down drainage.	
153	GM-MC-153	7/20/12	GW	---	237 - 239	Seep w/Wetland	Colluvium	11N	627833	4972979	8,071	6.3	5.87	28.9	2.0	Visual Estimate	clear	none	Y	---	30	---	---	---	---	---	---	---	West Fork of Meadow Creek Drainage	Seep 10 m wide, multiple outflows.
154	GM-MC-154	7/20/12	HO	263-266	---	Seep w/Wetland	Colluvium	11N	628581	4969459	7,915	9.1	7.05	41.3	1.9	Cup	clear	none	Y	---	---	---	6	75	20	150	---	Hillside below Meadow Creek Lake on the northern slope.	Forms a 1' wide gaining channel.	
155	GM-MC-155	7/20/12	GW	---	240 - 242	Spring w/Wetland	Colluvium	11N	627841	4972456	7,460	10.8	6.63	21.9	20.0	Visual Estimate	clear	none	Y	---	---	---	---	---	---	---	---	---	West Fork of Meadow Creek Drainage	Spring in slump area at break in slope.
156	GM-MC-156	7/20/12	HO	267-270	---	Seep w/Wetland	Colluvium/ Bedrock?	11N	628442	4969453	7,867	10.4	6.93	19.3	0.2	Cup	clear	none	N	---	---	---	10	30	10	30	---	Hillside below Meadow Creek Lake on the northern slope.	Dispersed wetland species throughout the seep field.	
158	GM-MC-158	7/20/12	HO	271-274	---	Seep w/Wetland	Colluvium	11N	628499	4969323	8,025	7.0	7.01	46.5	0.7	Cup	clear	none	N	---	---	---	20	50	10	200	---	Hillside below Meadow Creek Lake on the northern slope.		
160	GM-MC-160	7/21/12	HO	275-278	---	Spring	Colluvium	11N	627513	4969481	8,550	5.0	6.97	29.6	1.0	Cup	clear	none	N	4	---	---	---	---	---	---	---	---	Hillside below "Meadow Creek Lookout".	Spring channel 1' wide. Flows for 60' then dives back underground.
162	GM-MC-162	7/21/12	HO	279280	---	Seep w/Wetland	Colluvium	11N	627754	4969337	8,255	11.0	7.05	163.4	1.0	Visual Estimate	slight brown	none	N	---	---	---	40	40	40	40	---	Hillside below "Meadow Creek Lookout".	Adjacent to large boulders/rock outcropping.	
164	GM-MC-164	7/21/12	HO	281-284	---	Spring w/Wetland	Colluvium	11N	627827	4969260	8,257	5.3	6.77	23.0	1.0	Cup	clear	none	N	8	---	---	---	---	5	15	---	Hillside below "Meadow Creek Lookout".	Seep forms a 1' wide channel, flows for 50-60', then dives underground.	
166	GM-MC-166	7/21/12	HO	285-290	---	Seep	Colluvium	11N	627849	4969232	8,274	3.7	6.73	24.2	30.0	Visual Estimate	clear	none	Y	18	---	---	6	10	---	---	---	Hillside between Meadow Creek Lake and "Meadow Creek Lookout".	Spring and adjacent seep field. High flow channel.	
168	GM-MC-168	7/21/12	HO	291-294	---	Spring w/Wetland	Bedrock	11N	628010	4969213	8,159	4.3	6.72	24.7	11.2	Cup	clear	none	Y	6	---	---	---	---	5	30	---	Hillside between Meadow Creek Lake and "Meadow Creek Lookout".	Spring emanates from bedrock outcropping.	
170	GM-MC-170	7/21/12	HO	295-299	---	Spring w/Wetland	Bedrock	11N	628157	4969277	8,136	9.3	6.97	21.9	3.8	Cup	clear	none	Y	12	---	---	---	---	10	150	---	Hillside between Meadow Creek Lake and "Meadow Creek Lookout".	Spring emanating from underground-hard to see exact source. Forms a 1-2' wide channel that splits downstream then rejoins. Large (300' tall) bedrock outcroppings above.	
172	GM-MC-172	7/21/12	HO	300-302	---	Spring w/Wetland	Colluvium	11N	628231	4969497	7,849	6.4	7.13	43.2	1.9	Cup	clear	none	N	8	---	---	---	---	5	100	---	Lower portion of hillside below "Meadow Creek Lookout".	Rock/landslide slump.	
174	GM-MC-174	7/21/12	HO	303-306	---	Spring w/Wetland	Colluvium	11N	628603	4970085	7,421	5.6	6.78	50.6	5.7	Cup	clear	none	Y	8	---	---	3	3	5	20	---	Lower portion of hillside below "Meadow Creek Lookout".	Hillside above was dry. First water we found while hiking down. Boggy and marshy above seep source.	
176	GM-MC-176	7/21/12	HO	307-310	---	Seep w/Wetland	Colluvium	11N	628594	4970156	7,430	8.0	7.44	77.2	21.5	Cup	clear	none	Y	---	---	---	30	50	30	>100	---	Lower portion of hillside below "Meadow Creek Lookout".	Measured one seep channel. Estimated it was 1/3 flow of entire seep field.	
180	GM-MC-180	7/22/12	HO	iPOD17- iPOD19	---	Spring w/Wetland	Colluvium	11N	627600	4969572	8,376	11.5	6.68	17.1	1.7	Cup	clear	none	N	8	---	---	30	30	3	5	---	Hillside below "Meadow Creek Lookout".	Forms an 8" channel. Wetlands just around source. Large seep field/wet and mossy directly upstream.	
267	GM-MC-267	8/1/12	GW	---	386-388	Spring w/Wetland	Colluvium	11N	631917	4972071	7,610	6.0	6.36	26.9	5.0	Visual Estimate	clear	none	Y	---	---	---	---	---	---	---	---	South slope of Meadow Creek, east of Blowout Creek.	Spring on hillside, no wetland.	
309	GM-MC-309	8/4/12	GW	---	449-450	Seep w/Wetland	Colluvium	11N	631537	4972505	6,785	5.8	7.05	48.3	3.0	Visual Estimate	clear	none	Y	---	---	---	---	---	---	---	---	South slope of Meadow Creek, east of Blowout Creek.	South slope of Meadow Creek, east of Blowout Creek.	
311	GM-MC-311	8/4/12	GW	---	451-453	Seep w/Wetland	Colluvium	11N	631609	4972543	6,815	6.1	7.04	51.5	3.0	Visual Estimate	clear	none	N	---	---	---	---	---	---	---	---	South slope of Meadow Creek, east of Blowout Creek.	Two adjacent sources, each flowing at 1gpm. Total flow 3gpm. Flow disappears after 30 ft.	
313	GM-MC-313	8/4/12	GW	---	454-456	Seep w/Wetland	Colluvium	11N	631660	4972552	6,860	7.3	6.90	54.2	1.0	Visual Estimate	clear	none	Y	---	---	---	---	---	---	---	---	South slope of Meadow Creek, east of Blowout Creek.	Seep out of hillside near large flowing channel.	
315	GM-MC-315	8/4/12	GW	---	457-459	Seep w/Wetland	Colluvium	11N	631837	4972717	6,819	7.8	6.72	53.1	1.0	Visual Estimate	clear	none	N	---	---	---	---	---	---	---	---	South slope of Meadow Creek, east of Blowout Creek.	Flow disappears after 60ft.	
317	GM-MC-317	8/4/12	GW	---	460-462	Seep w/Wetland	Colluvium	11N	631915	4972770	6,829	6.3	6.32	48.4	3.0	Visual Estimate	clear	none	N	---	---	---	---	---	---	---	---	South slope of Meadow Creek, east of Blowout Creek.	Seep on hillside. Flows almost all the way down to wetland.	
319	GM-MC-319	8/4/12	GW	---	463-465	Seep w/Wetland	Colluvium	11N	632058	4972698	7,039	7.1	6.53	45.8	10.0	Visual Estimate	clear	none	Y	---	90	---	---	---	300	300	---	South slope of Meadow Creek, east of Blowout Creek.	Large seep area with wetland. Flow dispersed and in several channels.	
321	GM-MC-321	8/4/12	GW	---	466-468	Seep w/Wetland	Colluvium	11N	632147	4972731	7,053	12.4	6.24	32.1	10.0	Visual Estimate	clear	none	Y	---	240	---	---	---	---	---	---	South slope of Meadow Creek, east of Blowout Creek.	Seep area on semi-circle on hillside. Large seep area with multiple seeps.	
335	GM-MC-335	8/6/12	GW	---	487-489	Seep w/Wetland	Colluvium	11N	630932	4972177	6,658	6.5	7.49	134.6	3.0	Visual Estimate	clear	none	Y	---	---	---	---	---	---	---	3 x 3	South slope of Meadow Creek, west of Blowout Creek.	Seep just above engineered channel of Meadow Creek. Forms small wetland with several ponds.	
337	GM-MC-337	8/6/12	GW	---	490-492	Seep w/Wetland	Colluvium	11N	630869	4971859	6,966	9.3	6.81	55.8	5.0	Visual Estimate	clear	none	Y	---	---	---	---	---	---	---	---	South slope of Meadow Creek, west of Blowout Creek.	Seep in thicket of Alders. Flow in multiple channels.	
339	GM-MC-339	8/6/12	GW	---	493-495	Seep w/Wetland	Colluvium	11N	630761	4971817	7,041	6.2	6.55	36.7	20.0	Visual Estimate	clear	none	Y	---	---	---	---	---	---	---	---	South slope of Meadow Creek, west of Blowout Creek.	Wetland extends from MC-337 all the way across hillside to MC-339. Flow occurs in multiple seeps and springs and flows through multiple channels.	
341	GM-MC-341	8/6/12	GW	---	496-498	Seep w/Wetland	Colluvium	11N	630377	4971978	6,652	9.9	6.75	29.1	2.0	Visual Estimate	clear	none	Y	---	---	---	---	---	---	---	---	South slope of Meadow Creek, west of Blowout Creek.	Seep above engineered channel of Meadow Creek.	
343	GM-MC-343	8/6/12	GW	---	499-501	Seep w/Wetland	Colluvium	11N	630116	4971917	6,654	10.8	6.80	36.1	0.3	Visual Estimate	clear	none	N	---	small	---	---	---	---	---	---	South slope of Meadow Creek, west of Blowout Creek.		
344	GM-MC-344	9/13/12	GW	---	---	Spring		11N	---	---	---	---	---	---	n. m.				Y	---	---	---	---	---	---	---	---	West Fork of Meadow Creek Drainage	estimated location, unable to reach due to rock face	

**Golden Meadows  
2012 Hydrology Field Survey  
Meadow Creek Data Summary**

Site Number	Site ID	Date / Time	Collected By	Photo(s) Pink Camera <sup>1</sup>	Photo(s) Blue Camera <sup>1</sup>	Feature Type	Deposit Type	GPS UTM Coordinates			Elev. (ft)	Temp. (°C)	pH (s.u.)	Elec. Cond. (µS/cm)	Average Flow (gpm)	Flow Measure Method	Color	Odor	Reach Meadow Creek (Y or N)	Spring Source Width (est.) (in)	Seep Source Width (est.) (ft)	Water Depth (in)	Seep Field Width (est.) (ft)	Seep Field Length (est.) (ft)	Wetland Width (est.) (ft)*	Wetland Length (est.) (ft)*	Pond Size (ft x ft)	Location	Comments
								Zone	Easting	Northing																			
346	GM-MC-346	9/13/12	GW			Spring		11N						n.m.				Y	---								Meadow Creek Drainage	estimated location, unable to reach due to rock face	
348	GM-MC-348	9/13/12	GW			Spring		11N						n.m.				Y	---									Meadow Creek Drainage	estimated location, unable to reach due to rock face
097A & B	GM-MC-097A & B	7/17/12	GW	---	156-158	Spring w/Wetland	Colluvium	11N	626907	4970815	8.329	7.7	6.52	29.0	2.0	Visual Estimate	clear	none	Y	6	---	---	---	---	---	---		Middle Fork of Meadow Creek	Spring has 2 separate points where water flows out of the ground, they converge 20 meters downhill. 2 srpings on steep hillside combining ~20 m downstream from source, sample for WQ @ A, flow estimate A: 1 gpm, B: 1 gpm.
105A	GM-MC-105	7/18/12	GW	---	168 - 170	Spring w/Wetland	Colluvium	11N	626729	4971874	8.052	3.9	7.09	94.9	12.0	Visual Estimate	clear	none	Y	24	---	---	---	---	---	---		West Fork of Meadow Creek Drainage	2 main springs converge into channel. Spring feeding large wetland at break in slope, significant flow, GM-MC-105B: standing water in same wetland, no observable flow, wetland has small pond ~ 3m x 3m at bottom, outflow from wetland ~15 gpm.
145A & B	GM-MC-145A & B	7/20/12	GW	---	225 - 227	Seep w/Wetland	Colluvium	11N	627278	4973065	8.052	12.2	6.00	23.2	20.0	Visual Estimate	clear	none	Y	---	---	---	---	---	---	---		West Fork of Meadow Creek Drainage	Large seepfield on hillside slump extends from A - B, WQ + coord taken at point A, flow in multiple channels which split + combine, disappear + reappear throughout hillside wetland, combined flow >20 gpm.
147A & B	GM-MC-147A & B	7/20/12	GW	---	228 - 230	Seep w/Wetland	Colluvium	11N	627404	4973266	8.145	5.2	5.85	30.6	25.0	Visual Estimate	clear	none	Y	---	---	---	---	---	---	---		West Fork of Meadow Creek Drainage	Hillside has large wetlands with multiple seeps. Large field of seeps, extending from A --> B same as 145, seeps from multiple channels which disappear and re-appear throughout wetland on hillside.

n.m. - Not Measured  
<sup>1</sup> See Appendix K for details on photos



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## **Appendix B. Blowout Creek Drainage Hydrology Field Survey Summary Table**



**Golden Meadows  
2012 Hydrology Field Survey  
Blowout Creek Data Summary**

Site Number	Site ID	Date / Time	Collected By	Photo(s) Pink Camera <sup>1</sup>	Photo(s) Blue Camera <sup>1</sup>	Feature Type	Deposit Type	GPS UTM Coordinates			Elev. (ft)	Temp. (°C)	pH (s.u.)	Elec. Cond. (µS/cm)	Average Flow (gpm)	Flow Measure Method	Color	Odor	Reach Blowout Creek (Y or N)	Spring Source Width (est.) (in)	Seep Source Width (est.) (ft)	Water Depth (in)	Seep Field Width (est.) (ft)	Seep Field Length (est.) (ft)	Wetland Width (est.) (ft)*	Wetland Length (est.) (ft)*	Pond Size (ft x ft)	Location	Comments
								Zone	Easting	Northing																			
200	GM-BC-200	8/1/12	GW	---	none	Seep w/Wetland	Colluvium	11N	631492	4971554	7,211	---	---	n.m.	---	clear	none	Y	---	---	---	---	---	---	---	---	East slope of Blowout Creek drainage.	Dry above, multiple seeps across hillside. Wetland across and down hillside. (Same as site GM-BC-261INT)	
223	GM-BC-223A & B	7/31/12	GW	---	319-321	Spring w/Wetland	Colluvium	11N	630391	4969421	7,916	6.0	7.38	74.3	10.0	Visual Estimate	clear	none	Y	---	---	---	---	---	---	---	West slope of Blowout Creek.	Spring at bottom of talus slope below bedrock cliff. Flow increases downstream from additional location out of talus slope.	
225	GM-BC-225	7/31/12	GW	---	322-324	Seep w/Wetland	Colluvium	11N	630374	4969320	7,947	8.1	6.42	51.4	Trickle	Visual Estimate	clear	none	N	---	---	---	---	---	---	---	West slope of Blowout Creek.	Small seep flows for 30ft then disappears.	
227	GM-BC-227A & B	7/31/12	GW	---	326-328	Spring w/Wetland	Colluvium	11N	630646	4969294	7,857	7.0	6.83	104.9	10.0	Visual Estimate	clear	none	Y	---	---	---	---	---	---	---	Southwest slope of Blowout Creek.	Spring starting in middle of slump area, forms small trickle then larger flow.	
229	GM-BC-229	7/31/12	GW	---	329-331	Seep w/Wetland	Colluvium	11N	630643	4969037	7,989	11.8	6.74	42.4	3.0	Visual Estimate	clear	none	Y	---	---	---	30	90	---	---	Southwest slope of Blowout Creek.	Large wetland seep area. Saturated ground in middle of slump area, forms channel draining into main stem of Blowout Creek.	
231	GM-BC-231	7/31/12	GW	---	332-334	Seep w/Wetland	Colluvium	11N	630329	4968795	8,242	5.9	6.55	31.1	0.5	Visual Estimate	clear	none	Y	---	---	---	---	---	---	---	Blowout Creek.	Seep at break in slope. Seep with small flow, intermittent, flow disappears and reappears in slump area. Additional flow from wetlands. Source of main channel.	
233	GM-BC-233	7/31/12	GW	---	335-337	Seep w/Wetland	Colluvium	11N	630451	4968834	8,182	n.m.	n.m.	55.8	3.0	Visual Estimate	clear	none	Y	---	---	---	---	---	---	---	Blowout Creek.	Seep coming out of slump area, probably start of Blowout Creek. Blowout Creek splits in several channels in slump area to combine into channel with large flow downstream.	
235	GM-BC-235	7/31/12	GW	---	338-340	Spring w/Wetland	Colluvium	11N	631162	4969009	7,935	n.m.	6.74	44.7	3.0	Visual Estimate	clear	none	N	---	---	---	---	---	---	---	South slope of Blowout Creek drainage.	Spring flows for about 900ft, then completely dry deeply incised channel below.	
237	GM-BC-237A & B	7/31/12	GW	---	341-343	Seep w/Wetland	Colluvium	11N	631660	4969718	7,754	n.m.	n.m.	n.m.	No Flow	Visual Estimate	clear	none	N	---	---	---	---	---	---	---	South slope of Blowout Creek drainage.	Seep area, wet but no flow. Not enough water for Water Quality.	
239	GM-BC-239	7/31/12	GW	---	344-346	Spring w/Wetland	Colluvium	11N	631713	4969757	7,752	n.m.	n.m.	67.8	10.0	Visual Estimate	clear	none	N	---	---	---	---	---	---	---	South slope of Blowout Creek drainage.	Spring out of slump in hillside. Flows into 2 channels in different directions.	
241	GM-BC-241	7/31/12	GW	---	347-379	Spring w/Wetland	Colluvium	11N	631850	4969699	7,900	5.0	6.05	48.6	10.0	Visual Estimate	clear	none	N	---	---	---	---	---	---	---	South slope of Blowout Creek drainage.	Spring in middle of slump area. Spring flow disappears just for a few ft, then reappears to the side at 241INT.	
243	GM-BC-243	8/1/12	GW	---	350-352	Spring	Colluvium	11N	631798	4969916	7,674	6.0	6.69	75.1	10.0	Visual Estimate	clear	none	Y	---	---	---	---	---	---	---	East slope of Blowout Creek drainage.	Spring in deeply incised channel. Channel goes up to ridge but dry above. Spring merges with side slope flow 60ft below.	
245	GM-BC-245	8/1/12	GW	---	353-355	Seep w/Wetland	Colluvium	11N	631742	4970001	7,604	7.1	6.97	59.1	10.0	Visual Estimate	clear	none	Y	---	---	---	120	---	---	---	East slope of Blowout Creek drainage.	Large seep field, flow coming out of steep hillside at break in slope on top edge of slump mound.	
247	GM-BC-247	8/1/12	GW	---	356-358	Seep w/Wetland	Colluvium	11N	631722	4970353	7,720	5.6	6.79	42.4	20.0	Visual Estimate	clear	none	N	---	---	---	---	---	---	---	East slope of Blowout Creek drainage.	Spring coming out of big slump area.	
249	GM-BC-249	8/1/12	GW	---	359-361	Seep w/Wetland	Colluvium	11N	631728	4970522	7,687	9.1	6.40	53.7	0.5	Visual Estimate	clear	none	N	---	---	---	---	---	---	---	East slope of Blowout Creek drainage.	Small seep, adjacent to incised channel. Channel is dry. Seep disappears.	
251	GM-BC-251	8/1/12	GW	---	362-364	Seep w/Wetland	Colluvium	11N	631768	4970589	7,735	5.4	6.96	53.3	20.0	Visual Estimate	clear	none	Y	---	---	---	---	---	---	---	East slope of Blowout Creek drainage.	Spring on hillside in middle of slump (no large channel).	
253	GM-BC-253	8/1/12	GW	---	365-367	Spring w/Wetland	Colluvium	11N	631806	4970653	7,775	5.8	6.67	33.9	10.0	Visual Estimate	clear	none	Y	---	---	---	---	---	---	---	East slope of Blowout Creek drainage.	Spring in middle of slump, at bottom of old (15ft high) roadcut area.	
255	GM-BC-255	8/1/12	GW	---	368-370	Spring w/Wetland	Colluvium	11N	632010	4970799	7,968	7.4	6.90	46.4	30.0	Visual Estimate	clear	none	Y	---	---	---	---	---	---	---	East slope of Blowout Creek drainage.	Spring on hillside, large flow about 10ft below source.	
257	GM-BC-257	8/1/12	GW	---	371-373	Spring w/Wetland	Colluvium	11N	632080	4971098	7,935	5.8	6.40	26.4	2.0	Visual Estimate	clear	none	N	---	---	---	---	---	---	---	East slope of Blowout Creek drainage.	Small spring in middle of slump (almost on the ridge).	
259	GM-BC-259	8/1/12	GW	---	374-376	Spring w/Wetland	Colluvium	11N	632149	4971228	8,013	7.1	6.49	23.9	5.0	Visual Estimate	clear	none	N	---	---	---	---	---	120	---	East slope of Blowout Creek drainage.	Flow out of seep area forms numerous channels and disappears and reappears.	
261	GM-BC-261	8/1/12	GW	---	377-379	Seep w/Wetland	Colluvium	11N	631939	4971435	7,808	7.1	6.55	29.1	2.0	Visual Estimate	clear	none	N	---	---	---	---	---	---	---	East slope of Blowout Creek drainage.	Seep out of slump adjacent to drainage, forming wetlands.	
263	GM-BC-263	8/1/12	GW	---	380-382	Seep w/Wetland	Colluvium	11N	631834	4971525	7,734	7.9	6.42	27	1.0	Visual Estimate	clear	none	N	---	---	---	---	---	---	---	East slope of Blowout Creek drainage.	Flow 1gpm visible, possibly more flow seeping through wetland.	
265	GM-BC-265	8/1/12	GW	---	383-385	Seep w/Wetland	Colluvium	11N	631737	4971751	7,578	13.6	6.29	33.8	0.3	Visual Estimate	clear	none	N	---	---	---	---	---	3	10	East slope of Blowout Creek drainage.	Small seep in small wetland area. Small wet area 100ft above, without flow. Flow disappears after 10ft, but much larger wetland area below with flow reappearing.	
289	GM-BC-289	8/3/12	GW	---	419-421	Seep w/Wetland	Colluvium	11N	630731	4970109	7,589	6.7	6.55	60.6	2.0	Visual Estimate	clear	none	N	---	---	---	---	---	---	---	West slope of Blowout Creek.	Seep coming out of hillside slump, adjacent and 5m above drainage channel. Channel dry.	
291	GM-BC-291	8/3/12	GW	---	422-424	Seep w/Wetland	Colluvium	11N	630818	4970063	7,519	6.7	7.60	92.8	5.0	Visual Estimate	clear	none	Y	---	---	---	---	---	---	---	West slope of Blowout Creek.	Seep out of hillside feeding large wetland.	
293	GM-BC-293	8/3/12	GW	---	425-427	Spring w/Wetland	Colluvium	11N	630805	4970106	7,512	6.5	6.57	46.6	10.0	Visual Estimate	clear	none	Y	---	---	---	---	---	---	---	West slope of Blowout Creek.	Spring on hillside feeding large wetland below.	
295	GM-BC-295A & B	8/3/12	GW	---	428-430	Spring w/Wetland	Colluvium	11N	630722	4970208	7,512	6.9	6.68	40.4	15.0	Visual Estimate	clear	none	Y	---	---	---	---	---	---	---	West slope of Blowout Creek.	Two springs feeding larger wetland below. Flow measured at combined flow at break in slope.	
297	GM-BC-297	8/3/12	GW	---	431-433	Seep w/Wetland	Colluvium	11N	630615	4970271	7,616	6.7	6.26	20.8	2.0	Visual Estimate	clear	none	Y	---	---	---	---	---	---	---	West slope of Blowout Creek.	Flow increases to 10gpm approximately 150 downstream.	
299	GM-BC-299	8/3/12	GW	---	434-436	Spring w/Wetland	Colluvium	11N	630466	4970329	7,741	5.4	6.32	28.8	2.0	Visual Estimate	clear	none	Y	---	---	---	---	---	---	---	West slope of Blowout Creek.	Adjacent to large flowing channel in bowl in hillside.	
301	GM-BC-301	8/3/12	GW	---	437-439	Seep w/Wetland	Colluvium	11N	630348	4970307	7,824	7.0	6.12	23.4	5.0	Visual Estimate	clear	none	Y	---	---	---	---	---	---	---	West slope of Blowout Creek.	Seep field with several sources combining to form large flow going down channel. Flow in downstream channel 20 gpm.	
303	GM-BC-303	8/3/12	GW	---	440-442	Seep w/Wetland	Colluvium	11N	630230	4970396	7,918	9.2	6.20	27.3	10.0	Visual Estimate	clear	none	Y	---	---	---	---	---	---	---	West slope of Blowout Creek.	Large wetland with multiple seeps in bowl at break in slope.	
305	GM-BC-305A & B	8/3/12	GW	---	443-445	Spring w/Wetland	Colluvium	11N	630863	4970912	7,346	6.4	7.30	188.1	35.0	Visual Estimate	clear	none	Y	---	---	---	---	---	---	---	West slope of Blowout Creek.	Large spring in deeply incised channel. Large boulders in channel. Bedrock outcropping above but steep slumpy hillside on both sides.	
307	GM-BC-307A & B	8/3/12	GW	---	446-448	Seep w/Wetland	Colluvium	11N	630756	4971099	7,518	13.8	6.78	52.9	8.0	Visual Estimate	clear	none	Y	---	---	---	---	---	---	---	West slope of Blowout Creek.	Seep area with several sources in bowl at break in slope.	

n.m. - Not Measured  
<sup>1</sup> See Appendix K for details on photos



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## **Appendix C. Rabbit Creek Drainage Hydrology Field Survey Summary Table**





Golden Meadows  
2012 Hydrology Field Survey  
Rabbit Creek Data Summary

Site Number	Site ID	Date / Time	Collected By	Photo(s) Pink Camera <sup>1</sup>	Photo(s) Blue Camera <sup>1</sup>	Feature Type	Deposit Type	GPS UTM Coordinates			Elev. (ft)	Temp. (°C)	pH (s.u.)	Elec. Cond. (µS/cm)	Average Flow (gpm)	Flow Measure Method	Color	Odor	Reach Rabbit Creek (Y or N)	Spring Source Width (est.) (in)	Seep Source Width (est.) (ft)	Water Depth (in)	Seep Field Width (est.) (ft)	Seep Field Length (est.) (ft)	Wetland Width (est.) (ft)*	Wetland Length (est.) (ft)*	Pond Size (ft x ft)	Location	Comments
								Zone	Easting	Northing																			
226	GM-RC-226	7/31/12	HO	390-392	---	Seep w/Wetland	Colluvium	11N	633934	4973320	7,607	8.0	8.12	119.7	6.1	Bucket	clear	none	Y	---	1.5	---	20	20	20	20	---	Eastern side of Rabbit Creek.	Feeds into large wetland below. Landslide slump. On an elevation with a string of seeps.
224	GM-RC-224	7/31/12	HO	387-389	---	Seep w/Wetland	Colluvium	11N	633903	4973363	7,597	WQ assumed same as RC-220		1.5	Visual Estimate	clear	none	N	---	0.33	---	20	20	20	20	---	Eastern side of Rabbit Creek.	Comparable to the north and south seeps at RC-220; no WQ taken.	
222	GM-RC-222	7/31/12	HO	384-386	---	Seep w/Wetland	Colluvium	11N	633924	4973441	7,692	WQ assumed same as RC-220		1.5	Visual Estimate	clear	none	N	---	---	---	10	15	10	15	---	Eastern side of Rabbit Creek.	Seep field with wetland. Comparable to the north and south seeps on RC-220; no WQ taken.	
221	GM-RC-221	7/30/12	GW	---	316-318	Seep w/Wetland	Colluvium	11N	633287	4973130	7,370	9.6	7.26	169.2	1.0	Visual Estimate	clear	none	N	---	9	---	---	---	---	---	---	West slope of Rabbit Creek.	Muddy seep area. Seep just above man made waste rock pile. Waste pile 12ft across and 6ft high.
220	GM-RC-220	7/31/12	HO	372-378	---	Seep w/Wetland	Colluvium	11N	633872	4973467	7,683	---	8.30	165.5	1.5	Visual Estimate	clear	none	N	---	---	---	50	50	50	50	---	Eastern side of Rabbit Creek.	Multiple seeps occurring along hillside. Close to previous points RC-210 and RC-218. Therefore, no WQ taken just marked and pictures.
219	GM-RC-219	7/30/12	GW	---	none	Seep w/Wetland	Colluvium	11N	634014	4974000	8,049	n.m.	n.m.	n.m.	Trickle	Visual Estimate	clear	none	Y	---	---	---	---	---	---	---	---	North slope of Rabbit Creek.	Seep-headwater of Rabbit Creek. Rabbit Creek dry above.
218	GM-RC-218	7/31/12	HO	367-371	---	Seep	Colluvium	11N	633833	4973473	7,641	10.3	8.29	162.1	5.7	Bucket	clear	none	N	---	0.8	---	30	50	---	---	---	Eastern side of Rabbit Creek.	Disturbed slump (30' x 50') with dispersed wetland species but no large distinct wetland. 2 main seep channels 8"-1' wide. Form a joined channel 1.5-2' wide. Failure on saturated clay layer.
217	GM-RC-217	7/30/12	GW	---	313-315	Seep w/Wetland	Colluvium	11N	633944	4973988	8,001	6.2	6.38	13.0	31.3	Bucket	clear	none	Y	---	---	---	---	---	---	---	---	North slope of upper Rabbit Creek.	Large spring, major source for Rabbit Creek.
216	GM-RC-216	7/31/12	HO	364-366	---	Seep	Colluvium	11N	633798	4973499	7,641	8.9	8.15	188.6	6.2	Bucket	clear	none	Y	---	---	---	35	50	---	---	---	Eastern hillside of Rabbit Creek.	Dispersed wetland species on banks. Landslide slump/not reestablished yet. Failure surface on layer of clay under the top sediment. Forms 2- 1.5ft channels that combine 30' downstream.
215	GM-RC-215	7/30/12	GW	---	310-312	Seep w/Wetland	Colluvium	11N	633912	4973958	7,953	8.5	6.34	12.7	3.0	Visual Estimate	clear	none	Y	---	---	---	---	---	---	---	---	North slope of upper Rabbit Creek.	Seep approximately 50ft above Rabbit Creek.
214	GM-RC-214	7/31/12	HO	361-363	---	Seep	Colluvium	11N	634013	4973999	8,048	9.6	7.08	10.8	0.6	Cup	clear	none	Y	---	---	---	8	12	---	---	---	Headwaters of Rabbit Creek.	Channel extends further up but is dry. Appears to "top out" 150' up. Very small "wetland" but mainly just mossy bank.
213	GM-RC-213	7/30/12	GW	---	307-309	Spring w/Wetland	Colluvium	11N	633796	4973922	7,872	9.4	6.13	16.4	1.0	Visual Estimate	clear	none	Y	---	---	---	---	---	---	---	---	North slope of upper Rabbit Creek.	Spring 60ft above Rabbit Creek on steep slope.
212	GM-RC-212	7/31/12	HO	356-360	---	Spring w/Wetland	Colluvium	11N	634004	4973868	8,070	5.8	6.71	61.8	10.2	Bucket	clear	none	Y	4	---	---	---	---	25	100	---	Eastern hillside of Rabbit Creek.	Headed down from the saddle toward the creek.
211	GM-RC-211	7/30/12	GW	---	304-306	Spring w/Wetland	Colluvium	11N	633500	4973572	7,657	13.4	6.94	43.7	0.4	Cup	clear	none	Y	---	---	---	---	---	---	---	---	West slope hillside of Rabbit Creek.	Spring on steep hillside, dry above. Some wetland vegetation but no real wetland.
210	GM-RC-210	7/31/12	HO	379-383	---	Spring w/Wetland	Colluvium	11N	633908	4973480	7,743	6.7	8.31	168.6	29.8	Bucket	clear	none	Y	---	---	---	10	10	50	>100	---	Eastern hillside of Rabbit Creek.	Eminating from multiple "seeps" in hillside which appear to be fed by a high flow spring underground. Form a 1.5' wide channel. Wetland extends down to Rabbit Creek and combines with other wetlands. Landslide slump.
208	GM-RC-208	7/30/12	HO	352-355	---	Spring w/Wetland	Colluvium	11N	633999	4973263	7,714	6.4	6.80	113.7	6.0	Cup	clear	none	Y	6	---	---	---	---	30	100	---	Eastern hillside of Rabbit Creek.	Wetlands extend down drainage to bottom. Appears to be the top of the drainage, as it flattens out above.
206	GM-RC-206	7/30/12	HO	348-351	---	Spring w/Wetland	Colluvium	11N	633949	4973135	7,600	6.1	7.36	79.1	3.5	Cup	clear	none	N	6	---	---	---	---	25	100	---	Eastern hillside of Rabbit Creek.	Wetland extends down drainage and combines with a large marsh/wetland toward the bottom of the drainage.
204	GM-RC-204	7/30/12	HO	344-347	---	Spring w/Wetland	Colluvium	11N	633905	4973215	7,528	6.2	7.33	72.6	5.1	Cup	clear	none	Y	5	---	---	---	---	15	>200	---	Eastern hillside of Rabbit Creek.	Wetland extends down drainage and combines with a large marsh/wetland toward the bottom of the drainage.
202	GM-RC-202	7/30/12	HO	340-343	---	Seep w/Wetland	Colluvium	11N	633722	4973162	7,308	5.9	7.34	111.9	5.6	Cup	clear	none	Y	---	---	---	20	30	30	150	---	Eastern hillside of Rabbit Creek.	Additional source may be above. Wetlands extend down drainage to creek.

n.m. - Not Measured  
<sup>1</sup> See Appendix K for details on photos



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## **Appendix D. Garnet Creek Drainage Hydrology Field Survey Summary Table**



Golden Meadows  
2012 Hydrology Field Survey  
Garnet Creek Data Summary

Site Number	Site ID	Date / Time	Collected By	Photo(s) Pink Camera <sup>1</sup>	Photo(s) Blue Camera <sup>1</sup>	Feature Type	Deposit Type	GPS UTM Coordinates			Elev. (ft)	Temp. (°C)	pH (s.u.)	Elec. Cond. (µS/cm)	Average Flow (gpm)	Flow Measure Method	Color	Odor	Reach Garnet Creek (Y or N)	Spring Source Width (est.) (in)	Seep Source Width (est.) (ft)	Water Depth (in)	Seep Field Width (est.) (ft)	Seep Field Length (est.) (ft)	Wetland Width (est.) (ft)*	Wetland Length (est.) (ft)*	Pond Size (ft x ft)	Location	Comments
								Zone	Easting	Northing																			
001	GM-GC-001	7/11/12	GW/HO	---	1-3	Spring w/Wetland	Colluvium	11N	632349	4974146	6,634	10.2	6.95	90.2	1.1	Cup	clear	none	N	4	---	---	---	---	10 acres	---	Garnet Creek. North of Garnet Creek, behind core shack, 1/3 way up the slope.	Part of a much larger wetland (approx. 10 acres).	
002	GM-GC-002	7/11/12	GW/HO	---	4,5	Spring w/Wetland	Colluvium	11N	632553	4974218	6,978	8.0	7.24	99.4	2.8	Cup	clear	none	N	4	---	---	---	---	10 acres	---	Garnet Creek. North of Garnet Creek, behind core shack, 1/3 way up the slope.	Part of a much larger wetland (approx. 10 acres).	
003	GM-GC-003	7/11/12	GW/HO	---	6,7	Spring w/Wetland	Colluvium	11N	632555	4974114	6,904	10.8	6.77	48.4	0.2	Cup	clear	none	N	4	---	---	---	---	10 acres	---	Garnet Creek. North of Garnet Creek, behind core shack, 1/3 way up the slope.	Landslide slump.	
004	GM-GC-004	7/11/12	GW/HO	---	8-11	Seep	Colluvium	11N	632697	4974135	7,128	15.5	6.96	87.1	0.4	Cup	ly sheen	none	N	---	---	---	8	10	10	12	---	Garnet Creek.	Seeps out of old road cut. Small wetland directly around spring. Oily sheen on spring runoff.
005	GM-GC-005	7/11/12	GW/HO	---	12,13	Seep w/Wetland	Colluvium	11N	633197	4974288	7,607	6.0	6.55	19.5	3.6	Cup	clear	none	Y	---	3	---	---	---	15	20	---	Garnet Creek. Just downstream from GC headwaters.	Landslide slump. Flows 60ft before entering Garnet Creek.
006	GM-GC-006	7/11/12	GW/HO	---	14-18	Seep w/Wetland	Colluvium	11N	633285	4974260	7,771	7.2	8.12	21.7	7.1	Cup	clear	none	Y	---	---	---	10	12	25	25	---	Garnet Creek. Headwaters of Garnet Creek.	Large seep with 2 main branches. Flow measured at both branches and combined.
007	GM-GC-007	7/11/12	GW/HO	---	19-21	Spring w/Wetland	Bedrock/Fill	11N	632898	4973886	7,207	7.5	7.34	26.6	1.4	Cup	slightly cloudy	slight sulfur	Y	12	---	---	---	---	---	---	---	Adjacent to the old "Garnet Pit".	Hillside spring on south side of Garnet Pit and flows into GC.
008	GM-GC-008	7/11/12	GW/HO	---	22,23	Spring w/Wetland	Colluvium	11N	632584	4974006	6,852	9.1	7.87	206.0	1.5	Cup	clear	none	N	2	---	---	---	---	12	15	---	Garnet Creek. Seep coming out of old road grade on North side of GC.	Flow and WQ taken slightly downhill from flagging point.
052	GM-GC-052	7/15/12	HO	76-78	---	Seep w/Wetland	Colluvium	11N	632224	4974181	6,560	9.4	7.20	119.1	15.5	Cup	clear	slight sulfur/marsh	Y	---	0.5 and 0.5	---	10	15	30	40	---	Garnet Creek. NE side.	2 main seeps, come together to form a 1-1.5' channel and a large wetland. Wetland extends along almost the entire bottom of the drainage. Flow measured directly after seep channels join.
054	GM-GC-054	7/15/12	HO	79-81	---	Seep w/Wetland	Colluvium	11N	632268	4974531	6,645	7.6	n.m.	195.5	10.0	Visual Estimate	clear	none	N	---	---	---	40	15	50	>200	---	Garnet Creek. NE side.	Large seep field 40' wide, seeping at approximately 2ft/sec. Wetland covers the seep field and extends down to the drainage. pH probe malfunctioning.
056	GM-GC-056	7/15/12	HO	82-84	---	Spring w/Wetland	Colluvium	11N	632311	4974540	6,705	7.1	n.m.	145.3	4.3	Cup	clear	none	N	24	---	---	---	---	20	50	---	Garnet Creek. NE side.	Spring emanates from hillside covered in rocks-hard to tell the exact size because covered. pH probe malfunctioning.
058	GM-GC-058	7/15/12	HO	85, iPOD1, iPOD2	---	Spring w/Wetland	Colluvium	11N	632541	4974487	6,957	7.2	n.m.	149.6	1.6	Cup	clear	none	Y	2	---	---	---	---	15	20	---	Garnet Creek. NE side.	Landslide/rock deposit. pH probe malfunctioning.
060	GM-GC-060	7/15/12	HO	iPOD3- iPOD5	---	Spring w/Wetland	Colluvium	11N	632580	4974422	7,071	n.m.	n.m.	191.8	7.3	Cup	clear	none	Y	6	---	---	---	---	40	>150	---	Garnet Creek. NE side.	Spring emanates from sidewall in drainage. Wetland extends down drainage. pH and temperature probes malfunctioning.
062	GM-GC-062	7/15/12	HO	iPOD6- iPOD8	---	Spring	Colluvium	11N	632029	4973983	6,471	8.8	6.71	187.0	7.2	Cup	clear	none	Y	12	---	---	---	---	---	---	---	Below the core shack.	Flows into drainage then into culvert which goes beneath the road from the core shack to the Stibnite Camp. Green algae growing on banks.

n.m. - Not Measured  
<sup>1</sup> See Appendix K for details on photos



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## **Appendix E. Fiddle Creek Drainage Hydrology Field Survey Summary Table**





Golden Meadows  
2012 Hydrology Field Survey  
Fiddle Creek Data Summary

Site Number	Site ID	Date / Time	Collected By	Photo(s) Pink Camera <sup>1</sup>	Photo(s) Blue Camera <sup>1</sup>	Feature Type	Deposit Type	GPS UTM Coordinates			Elev. (ft)	Temp. (°C)	pH (s.u.)	Elec. Cond. (µS/cm)	Average Flow (gpm)	Flow Measure Method	Color	Odor	Reach Fiddle Creek (Y or N)	Spring Source Width (est.) (in)	Seep Source Width (est.) (ft)	Water Depth (in)	Seep Field Width (est.) (ft)	Seep Field Length (est.) (ft)	Wetland Width (est.) (ft)*	Wetland Length (est.) (ft)*	Pond Size (ft x ft)	Location	Comments
								Zone	Easting	Northing																			
157	GM-FC-157	7/21/12	GW	---	243 - 245	Spring w/Wetland	Colluvium	11N	628883	4973147	8,200	3.4	6.08	19.6	5.0	Visual Estimate	clear	none	Y	6	---	---	---	---	---	---	---	Fiddle Creek south slope drainage	Flow increases to 15-20 gpm 50 meters downstream from source. Spring coming out of large boulders next to bedrock outcropping.
159	GM-FC-159	7/21/12	GW	---	246-248	Seep w/Wetland	Colluvium	11N	628906	4973209	8,133	5.4	6.50	18.8	20.0	Visual Estimate	clear	none	Y	---	---	---	---	---	---	---	---	South slope of Fiddle Creek drainage.	Seep with 3 distinct origins, coming out of small talus slope and adjacent hillside slump (9ft apart). Combined flow for all 3 sources (measured 60ft downstream). Flow splits up into separate channels again.
161	GM-FC-161	7/21/12	GW	---	249-251	Spring w/Wetland	Colluvium	11N	628984	4973264	8,124	4.8	6.35	22.4	15.0	Visual Estimate	clear	none	Y	---	---	---	---	---	---	---	---	South slope of Fiddle Creek drainage.	Seep coming out of bottom of talus slope, adjacent to bedrock outcropping.
163	GM-FC-163	7/21/12	GW	---	252-254	Spring	Colluvium	11N	629085	4973436	7,935	9.6	6.46	18.7	0.3	Visual Estimate	clear	none	Y	---	---	---	---	---	---	---	---	South slope of Fiddle Creek drainage.	Spring coming out of bottom of talus slope, adjacent to bedrock outcropping.
165	GM-FC-165	7/21/12	GW	---	255-257	Spring w/Wetland	Colluvium	11N	629186	4973509	7,951	6.3	6.36	18.5	2.0	Visual Estimate	clear	none	Y	---	---	---	---	---	---	---	---	South slope of Fiddle Creek drainage.	Spring coming out of bottom of talus slope, adjacent to rock outcropping. Flows for 3ft, goes underground for 10ft, then reappears.
167A & B	GM-FC-167A & B	7/21/12	GW	---	258-260	Spring w/Wetland	Colluvium	11N	629220	4973559	7,919	3.2	5.74	17.6	20.0	Visual Estimate	clear	none	Y	---	---	---	---	---	---	---	---	South slope of Fiddle Creek drainage.	Spring has 2 sources (A and B), coming out of hillside at break in slope. WQ taken at A.
169	GM-FC-169	7/21/12	GW	---	261-263	Spring w/Wetland	Colluvium	11N	629826	4973822	7,467	6.3	6.42	28.4	15.0	Visual Estimate	clear	none	Y	---	---	---	---	---	---	---	---	South slope of Fiddle Creek drainage.	Spring in incised creekbed, dry above but was flowing above 2 weeks ago.
171	GM-FC-171	7/21/12	GW	---	264-266	Spring w/Wetland	Colluvium	11N	630103	4973990	7,280	6.2	6.37	25.8	2.0	Visual Estimate	clear	none	N	---	---	---	---	---	---	---	---	South slope of Fiddle Creek drainage.	Spring upwelling at flat area at break in slope, forming two 3ft x 3ft puddles.
173	GM-FC-173	7/21/12	GW	---	267-269	Spring w/Wetland	Colluvium	11N	630233	4973437	7,826	7.4	6.80	23.1	5.0	Visual Estimate	clear	none	Y	---	---	---	---	---	---	---	---	South slope of Fiddle Creek drainage.	Spring starts high up in drainage-gaining lots of flow downstream.
175A - C	GM-FC-175A - C	7/22/12	GW	---	171-173 from other blue camera	Spring w/Wetland	Colluvium	11N	628044	4973813	8,235	3.8	6.36	32.6	10.0	Visual Estimate	clear	none	Y	---	---	---	---	---	---	---	---	Fiddle Creek.	Spring coming out of steep hillside forming wetland at break in slope below. Additional seeps and springs coming out, extending from FC-175A to FC-175B.
177AC	GM-FC-177A-C	7/22/12	GW	---	none	Spring w/Wetland	Colluvium	11N	628144	4973646	8,164	3.6	6.13	35.9	15.0	Visual Estimate	clear	none	Y	---	---	---	---	---	---	---	---	Fiddle Creek.	Additional seeps coming out of wetlands area. Wetland extends from FC-177A to FC-177B.
179	GM-FC-179	7/22/12	GW	---	none	Seep w/Wetland	Colluvium	11N	628355	4973589	8,065	6.7	6.30	29.3	3.0	Visual Estimate	clear	none	Y	---	---	---	---	---	---	---	---	Fiddle Creek.	Spring on steep hillside just below bedrock outcropping.
181	GM-FC-181	7/22/12	GW	---	none	Spring w/Wetland	Colluvium	11N	628400	4973490	8,137	5.2	6.24	34.5	5.0	Visual Estimate	clear	none	Y	---	---	---	---	---	---	---	---	Fiddle Creek.	Spring at break in slope, large boulders, bedrock outcropping above.
183	GM-FC-183	7/22/12	GW	---	none	Spring w/Wetland	Colluvium	11N	628590	4973445	8,116	3.0	n.m.	31.3	3.0	Visual Estimate	clear	none	Y	---	---	---	---	---	---	---	---	Fiddle Creek.	Spring at break in slope, below steep slope with bedrock outcropping.
185	GM-FC-185	7/22/12	GW	---	none	Seep w/Wetland	Colluvium	11N	628712	4973360	8,190	9.8	n.m.	28.0	2.0	Visual Estimate	clear	none	Y	---	---	---	---	---	---	---	---	Fiddle Creek.	Seep in flat area below ridge. pH probe broken.
187	GM-FC-187	7/22/12	GW	---	none	Seep w/Wetland	Colluvium	11N	629669	4974036	7,342	9.0	n.m.	31.3	1.0	Visual Estimate	clear	none	Y	---	---	---	---	---	---	---	---	Fiddle Creek.	Seep in slump area, adjacent to bedrock outcropping. pH probe broken.
189	GM-FC-189	7/22/12	GW	---	none	Seep w/Wetland	Colluvium	11N	630613	4974374	7,067	5.6	n.m.	37.3	2.0	Visual Estimate	clear	none	Y	---	---	---	---	---	---	---	---	Fiddle Creek.	Seep at break in slope, forming a puddle 6ft x 6ft. pH probe broken.
191	GM-FC-191	7/22/12	GW	---	301-303	Seep w/Wetland	Colluvium	11N	631244	4975097	6,509	15.4	n.m.	77.6	0.5	Visual Estimate	clear	none	Y	---	---	---	---	---	---	---	---	Fiddle Creek.	Seep at break in slope on small terrace above Fiddle Creek. pH probe broken.
193	GM-FC-193	7/23/12	GW	---	274-276	Spring w/Wetland	Colluvium	11N	628237	4974284	8,085	8.1	6.45	44.0	10.0	Visual Estimate	clear	none	Y	---	---	---	---	---	---	---	---	Fiddle Creek.	Seep out of talus slope at bottom of bedrock cliff.
195	GM-FC-195	7/23/12	GW	---	277-279	Seep w/Wetland	Colluvium	11N	628354	4974282	8,021	15.3	5.75	31.0	1.0	Visual Estimate	clear	none	N	---	---	---	---	---	---	---	---	Fiddle Creek.	Wetland at break in slope with small seep in center. Flow out of wetland disappears after 6ft.
197A & B	GM-FC-197A & B	7/23/12	GW	---	280-282	Seep w/Wetland	Colluvium	11N	628578	4974229	7,785	11.5	6.57	17.0	5.0	Visual Estimate	clear	none	N	---	---	---	---	---	---	---	---	Fiddle Creek.	Seep on steep hillside (dry at break in slope above) with adjacent seep with trickle.
199	GM-FC-199	7/23/12	GW	---	283-285	Seep w/Wetland	Colluvium	11N	628692	4974272	7,721	10.0	6.82	41.0	3.0	Visual Estimate	clear	none	Y	---	---	---	---	---	---	---	---	Fiddle Creek.	Seep in center of steep slope, 150ft below rock outcropping.
201	GM-FC-201	7/23/12	GW	---	286-288	Spring w/Wetland	Colluvium	11N	628728	4974293	7,705	7.3	6.94	57.0	3.0	Visual Estimate	clear	none	N	---	---	---	---	---	---	---	---	North slope of Fiddle Creek.	On steep hillside.
203	GM-FC-203	7/23/12	GW	---	289-291	Spring w/Wetland	Colluvium	11N	629047	4974343		10.8	6.82	27.0	10.0	Visual Estimate	clear	none	N	---	---	---	---	---	---	---	---	North slope of Fiddle Creek.	Spring out of small boulder field below steep slope. Flow dissipates into smaller channels through wetland.
205	GM-FC-205	7/23/12	GW	---	292-294	Spring w/Wetland	Colluvium	11N	630348	4974399	7,108	7.8	6.53	68.0	8.0	Visual Estimate	clear	none	N	---	---	---	---	---	---	---	---	North slope of Fiddle Creek.	
207	GM-FC-207	7/23/12	GW	---	295-297	Spring w/Wetland	Colluvium	11N	630334	4974608	7,182	7.8	6.83	81.0	10.0	Visual Estimate	clear	none	N	---	---	---	---	---	---	---	---	North slope of Fiddle Creek.	Spring on steep hillside.
209	GM-FC-209	7/23/12	GW	---	298-300	Seep w/Wetland	Colluvium	11N	630384	4974745	7,208	8.7	6.30	34.0	5.0	Visual Estimate	clear	none	N	---	---	---	---	---	---	---	---	North slope of Fiddle Creek.	Seep 150ft below rock outcropping. Flow is in several small channels.
336	GM-FC-336	7/23/12	GW	---	none	Seep	Colluvium	11N	628805	4974289	7,643	---	---	---	No Flow	Visual Estimate	clear	none	N	---	---	---	---	---	---	---	---	North slope of Fiddle Creek.	Wet/damp spot along hillside, no flow, little water.
338	GM-FC-338	7/23/12	GW	---	none	Seep	Colluvium	11N	628896	4974296	7,584	---	---	---	No Flow	Visual Estimate	clear	none	N	---	---	---	---	---	---	---	---	North slope of Fiddle Creek.	Wet/damp spot along hillside, no flow, little water.
340	GM-FC-340	7/23/12	GW	---	none	Seep	Colluvium	11N	629031	4974327	7,515	---	---	---	No Flow	Visual Estimate	clear	none	N	---	---	---	---	---	---	---	---	North slope of Fiddle Creek.	Wet/damp spot along hillside, no flow, little water.
342	GM-FC-342	7/23/12	GW	---	none	Spring	Colluvium	11N	629098	4974358	7,518	---	---	---	5.0	Visual Estimate	clear	none	N	---	---	---	---	---	---	---	---	North slope of Fiddle Creek.	Spring out of same boulder field adjacent to 203.

<sup>1</sup> See Appendix K for details on photos



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## **Appendix F. Midnight Creek Drainage Hydrology Field Survey Summary Table**



Golden Meadows  
2012 Hydrology Field Survey  
Midnight Creek Data Summary

Site Number	Site ID	Date / Time	Collected By	Photo(s) Pink Camera <sup>1</sup>	Photo(s) Blue Camera <sup>1</sup>	Feature Type	Deposit Type	GPS UTM Coordinates			Elev. (ft)	Temp. (°C)	pH (s.u.)	Elec. Cond. (µS/cm)	Average Flow (gpm)	Flow Measure Method	Color	Odor	Reach Midnight Creek (Y or N)	Spring Source Width (est.) (in)	Seep Source Width (est.) (ft)	Water Depth (in)	Seep Field Width (est.) (ft)	Seep Field Length (est.) (ft)	Wetland Width (est.) (ft)*	Wetland Length (est.) (ft)*	Pond Size (ft x ft)	Location	Comments
								Zone	Easting	Northing																			
182	GM-MN-182	7/22/12	HO	iPOD20-iPOD22	---	Spring w/Wetland	Colluvium	11N	633634	4974913	8,088	7.8	6.29	14.0	6.4	Cup	clear	none	Y	18	---	---	---	---	5	10	---	Top of Midnight Creek drainage.	Hiked to the top of the drainage-no additional water above. Small wetland around source, becomes larger further down the drainage. Landslide slump.
184	GM-MN-184	7/22/12	HO	iPOD23-iPOD27	---	Seep w/Wetland	Colluvium	11N	633423	4975591	7,880	7.8 , 6.9	7.6 , 7.63	81.9 , 110.1	4.2	Cup	clear	none	Y	---	1	---	10	20	5	20	---	Midnight Creek. Hillside to the est.	Two separate seep branches, 20' apart. Each 6" wide and join downstream. Flow taken only at Branch 2. Branch 1 is about 1/2 the flow of Branch 2. Below a large talus slope.
190	GM-MN-190	7/23/12	HO	319-321	---	Seep w/Wetland	Colluvium	11N	633289	4975804	7,758	8.8	7.66	86.3	4.0	Cup	clear	none	Y	---	---	---	15	30	2 to 15	100	---	Midnight Creek. Hillside to the est.	Forms a 1-2' channel. Mossy around but main channel has a rock bottom. Flow measured below seep field in combined flow.
186	GM-MN-186	7/23/12	HO	311-313	---	Seep w/Wetland	Colluvium	11N	633409	4975665	7,910	5.3	7.61	116.1	3.0	Cup	clear	none	Y	---	1 - 1.5	---	---	---	5	50	---	Midnight Creek. Hillside to the est.	Below large talus slope.
194	GM-MN-194	7/23/12	HO	325-327	---	Seep w/Wetland	Colluvium	11N	632882	4976000	7,231	12.2	8.32	426.0	2.0	Visual Estimate	clear	none	N	---	---	---	10	10	10	10	---	Midnight Creek. Hillside to the est.	Consists of 2-10' x 10' seep fields; one above and one below.
188	GM-MN-188	7/23/12	HO	314-317	---	Seep w/Wetland	Colluvium	11N	633357	4975682	7,852	6.6	6.72	92.4	0.8	Cup	clear	none	N	---	1	---	12	30	6	60	---	Midnight Creek. Hillside to the est.	Forms a 8" wide channel. Below large talus slope. Black tubing runs up along the drainage and goes underneath the talus pile.
192	GM-MN-192	7/23/12	HO	322-324	---	Seep	Colluvium	11N	632926	4975977	7,263	13.0	8.22	278.0	0.2	Cup	clear	none	N	---	---	---	10	10	---	---	---	Midnight Creek. Hillside to the est.	Forms a 6" wide channel. Very mossy but no wetland.

n.m. - Not Measured

<sup>1</sup> See Appendix K for details on photos



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## **Appendix G. Hennessy Creek Drainage Hydrology Field Survey Summary Table**





Golden Meadows  
2012 Hydrology Field Survey  
Hennessy Creek Data Summary

Site Number	Site ID	Date / Time	Collected By	Photo(s) Pink Camera <sup>1</sup>	Photo(s) Blue Camera <sup>1</sup>	Feature Type	Deposit Type	GPS UTM Coordinates			Elev. (ft)	Temp. (°C)	pH (s.u.)	Elec. Cond. (µS/cm)	Average Flow (gpm)	Flow Measure Method	Color	Odor	Reach Hennessy Creek (Y or N)	Spring Source Width (est.) (in)	Seep Source Width (est.) (ft)	Water Depth (in)	Seep Field Width (est.) (ft)	Seep Field Length (est.) (ft)	Wetland Width (est.) (ft)*	Wetland Length (est.) (ft)*	Pond Size (ft x ft)	Location	Comments
								Zone	Easting	Northing																			
234	GM-HC-234	8/1/12	HO	404-408	---	Seep w/Wetland	Bedrock	11N	629207	4974969	8,058	6.7	6.71	21.0	4.2	Cup	clear	none	Y	---	0.66	---	---	---	30	>100	---	Hennessy Creek. On top in the main bowl. Forms an 8" channel. Joins larger wetlands approximately 100' down drainage.	
236	GM-HC-236	8/1/12	HO	409-411	---	Seep w/Wetland	Bedrock	11N	629191	4975034	8,052	4.8	6.84	18.3	2.2	Cup	clear	none	N	---	0.5	---	3	6	15	30	---	Hennessy Creek. On top in the main bowl. Seep field in bedrock outcropping, surrounded on 300° by bedrock. Forms 1.5' wide channel.	
238	GM-HC-238	8/1/12	HO	412-416	---	Seep, Pond, Wetland	Bedrock	11N	629219	4975297	7,985	5.5	6.62	20.8	1.3	Cup	clear	none	N	4	---	30	---	10	10	25 x 15	Hennessy Creek. On top in the main bowl. Seep-like spring appears to be feeding a standing water pond. In a bedrock enclave (surrounded on 300° by bedrock). Forms a 1-2' channel.		
240	GM-HC-240	8/1/12	HO	417-420	---	Spring w/Wetland	Bedrock	11N	629493	4975454	7,892	6.4	6.57	35.4	16.8	Cup	clear	none	Y	12	---	---	---	60	>100	---	Hennessy Creek. North side in top of the main bowl. Spring feeds large wetland downstream. Forms 1.5-2' wide channel. Layer of colluvium on top but originating from bedrock base.		
242	GM-HC-242	8/1/12	HO	421-423	---	Seep w/Wetland	Colluvium	11N	629436	4975313	7,870	10.4	6.81	29.8	20.0	Visual Estimate	clear	none	N	---	---	---	200	100	200	>100	---	Hennessy Creek. Middle of top of the main bowl. Dispersed flow, no flow measured. Most likely originating from above and going under bedrock outcropping.	
244	GM-HC-244	8/1/12	HO	424-426	---	Spring w/Wetland	Colluvium	11N	629428	4975047	7,878	6.1	6.66	20.5	2.3	Cup	clear	none	N	8	---	---	---	30	60	---	Hennessy Creek. South side of the main bowl. Glaciated deposit. Feeds large wetland and joins with the main wetland (extending across the entire basin).		
246	GM-HC-246	8/1/12	HO	427-430	---	Spring w/Wetland	Colluvium	11N	629549	4975080	7,775	9.6	6.76	18.1	1.4	Cup	clear	none	N	3	---	---	---	30	30	---	Hennessy Creek. South side of the main bowl. Feeds into larger wetland which joins an even larger wetland. Forms an 8" channel. Glaciated deposit.		
248	GM-HC-248	8/1/12	HO	435-438	---	Spring w/Wetland	Colluvium	11N	629685	4975402	7,729	7.5	7.16	61.0	14.8	Cup	clear	none	Y	8	---	---	---	20	20	---	Hennessy Creek. North side in top of the main bowl. Joins what appears to be a major tributary to the creek.		
250	GM-HC-250	8/1/12	HO	431-434	---	Seep w/Wetland	Colluvium	11N	629520	4975230	7,795	14.5	7.30	31.3	6.0	Cup	clear	none	Y	---	5	---	---	20	30	---	Hennessy Creek. Middle of the main bowl. 2 main seeps (1.5ft wide each). Join to form an intermittent channel 1' wide. Feeds into lg wetland (extends most of the basin) and eventually joins another large wetland below.		
252	GM-HC-252	8/1/12	HO	439-442	---	Spring w/Wetland	Colluvium	11N	630570	4976089	7,174	5.6	7.26	84.9	4.6	Cup	clear	none	N	4	---	---	---	10	50	---	Hennessy Creek-eastern side of the northern slope, heading down drainage. Intermittent spring-dives underground 20' down slope.		
254	GM-HC-254	8/1/12	HO	443-445	---	Spring w/Wetland	Colluvium	11N	631064	4976239	6,354	6.7	7.48	131.5	1.5	Cup	clear	none	Y	3	---	---	---	20	20	---	Bottom of Hennessy Creek. Very eastern side the northern slope below the old road grade. Small seep with lots of elderberry on downslope of old road grade. Wetland may extend further.		
256	GM-HC-256	8/2/12	HO	446-448	---	Seep w/Wetland	Colluvium	11N	629646	4974895	7,919	8.2	6.51	21.3	1.3	Cup	clear	none	N	---	---	---	10	20	50	100	---	Hennessy Creek towards top of ridge. (Western end of southern hillside).	
258	GM-HC-258	8/2/12	HO	449-451	---	Seep w/Wetland	Colluvium	11N	629792	4974994	7,796	6.3	6.53	23.7	4.6	Cup	clear	none	N	---	1.25	---	---	10	10	---	Hennessy Creek. Southern hillside toward the top of the basin. Seep emits from a circular "enclave". Appears to be part of a large network of seeps/wetlands up high. More "scummy" than previous ones.		
260	GM-HC-260	8/2/12	HO	452-455	---	Seep w/Wetland	Colluvium	11N	629828	4974977	7,796	4.2	6.53	23.6	5.9	Cup	clear	none	Y	---	---	---	25	25	40	50	---	Hennessy Creek. Southern hillside toward the top of the basin. Hillside hollow. Forms 1-1.5' wide channel.	
262	GM-HC-262	8/2/12	HO	456-459	---	Spring	Colluvium	11N	630001	4975109	7,645	3.7	6.91	36.1	20.4	Bucket	clear	none	Y	10	---	---	---	---	---	---	---	Hennessy Creek. Southern hillside toward the top of the basin. Heading downstream. No surrounding wetland, but feeds a large wetland below. Wetland species just on banks.	
264	GM-HC-264	8/2/12	HO	460-463	---	Seep w/Wetland	Colluvium	11N	630062	4975147	7,602	4.5	6.94	37.4	1.4	Cup	clear	none	N	---	---	---	3	6	10	30	---	Hennessy Creek. Southern hillside toward the top of the basin. Hillside slump (10' x 30').	
266	GM-HC-266	8/2/12	HO	464-469	---	Spring w/Wetland	Colluvium	11N	630217	4975188	7,562	4.7	6.83	28.8	9.9	Bucket	clear	none	Y	5	---	---	---	8	50	---	Hennessy Creek. Southern hillside toward the top of the basin. Heading east along the hillside/twd toward the top of the ridge. 2 springs (1 east/1 west) approximately 10' from each other and join 25' downstream. Flows downslope to join additional large wetland on "bench" below. Forms a relatively high flow channel 8" wide.		
268	GM-HC-268	8/2/12	HO	470-473	---	Spring w/Wetland	Colluvium	11N	630288	4975245	7,493	4.4	6.81	27.2	7.4	Cup	clear	none	Y	5	---	---	---	8	>100	---	Hennessy Creek. Southern hillside toward the top of the ridge, heading east. Wetland joins larger wetland on "bench" below. Forms a small intermittent channel 8" - 1' wide.		
270	GM-HC-270	8/2/12	HO	474-477	---	Spring	Colluvium	11N	630320	4975327	7,395	5.4	7.00	31.7	3.3	Cup	clear	none	Y	4	---	---	---	---	---	---	---	Hennessy Creek. Southern hillside heading east and about to hit the nose of the ridge. No wetland around source but feeds a large wetland below.	
272	GM-HC-272	8/2/12	HO	478-481	---	Spring w/Wetland	Colluvium	11N	630630	4975578	7,103	4.9	6.96	39.7	11.3	Bucket	clear	none	Y	8	---	---	---	10	>100	---	Hennessy Creek. Southern hillside heading east almost to the ridge "nose". Wetland joins larger wetland on "bench" below.		
274	GM-HC-274	8/2/12	HO	482-484	---	Spring w/Wetland	Colluvium	11N	630923	4975647	6,864	6.2	7.36	91.9	7.8	Cup	clear	none	N	6	---	---	---	5	30	---	Hillside between Hennessy and Fiddle Creeks. North side of hillside. Located at the top of a wetland which extends down to possibly bottom of hillside. Forms a small intermittent channel 8" wide.		

n.m. - Not Measured  
<sup>1</sup> See Appendix K for details on photos



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## **Appendix H. West End Creek Drainage Hydrology Field Survey Summary Table**



Golden Meadows  
2012 Hydrology Field Survey  
West End Creek Data Summary

Site Number	Site ID	Date / Time	Collected By	Photo(s) Pink Camera <sup>1</sup>	Photo(s) Blue Camera <sup>1</sup>	Feature Type	Deposit Type	GPS UTM Coordinates			Elev. (ft)	Temp. (°C)	pH (s.u.)	Elec. Cond. (µS/cm)	Average Flow (gpm)	Flow Measure Method	Color	Odor	Reach West End Creek (Y or N)	Spring Source Width (est.) (in)	Seep Source Width (est.) (ft)	Water Depth (in)	Seep Field Width (est.) (ft)	Seep Field Length (est.) (ft)	Wetland Width (est.) (ft)*	Wetland Length (est.) (ft)*	Pond Size (ft x ft)	Location	Comments	
								Zone	Easting	Northing																				
278	GM-WE-278	8/3/12	HO	493-496	---	Spring	Colluvium	11N	633456	4976218	7.594	4.5	7.83	275.0	24.7	Bucket	clear	none	Y	18	---	---	---	---	---	---	---	---	West End Creek, top of where drainage begins. Came down from the northern slope.	Forms a 1-2' channel. Surrounded by vegetation but no wetland species. Bedrock outcropping above (between here and Midnight Ck).
280	GM-WE-280	8/3/12	HO	499-503	---	Spring w/Wetland	Colluvium	11N	633153	4976538	7.339	5.3	8.20	323.0	14.3	Bucket	clear	none	Y	4	---	---	---	---	15	30	---	West End Creek above the 1st waste rock dump. On the northern hillside.	Small wetland mainly consisting of willows. Forms an 8"-1' channel. Creek is currently beneath the waste rock dump. Spring develops relatively high flow channel that dives under the dump.	
282	GM-WE-282	8/3/12	HO	506-511	---	Seep w/Wetland	Colluvium	11N	632840	4976661	6.878	4.9	8.20	297.0	10.0	Visual Estimate	clear	none	Y	---	0.5	---	6	6	15	30	---	West End Creek. On northern hillside directly below the 1st rock waste dump.	Previously marked by wetlands surveyors. 25' downslope seep turns into major seep field (20' x 30') supplying approximately 40% of the flow in West End Creek. Forms a braided seep channel network.	
294	GM-WE-294	8/4/12	HO	538-541	---	Seep w/Wetland	Colluvium	11N	632821	4976621	6.821	5.0	8.11	353.0	1.5	Cup	clear	none	Y	---	2	---	---	---	5	>100	---	Western hillside of West End Creek. West hillside broken into 3 sections. Located in the middle section.	Forms a 4" channel. Flowing into top of creek where creek emerges from beneath the upper dump.	
296	GM-WE-296	8/4/12	HO	542-545	---	Creek re-emerging	Colluvium	11N	632504	4977109	6.378	5.9	8.31	418.0	153.6	Bucket	clear	none	Y	2	---	---	---	---	---	---	---	---	West End Creek. Location where creek emerges from underneath the lower dump.	Only a portion is emerging but can hear remainder of creek flowing under the rocks on the channel bottom.

n.m. - Not Measured

<sup>1</sup> See Appendix K for details on photos



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## **Appendix I. Sugar Creek Drainage Hydrology Field Survey Summary Table**





Golden Meadows  
2012 Hydrology Field Survey  
Sugar Creek Data Survey

Site Number	Site ID	Date / Time	Time	Collected By	Photo(s) Pink Camera <sup>1</sup>	Photo(s) Blue Camera <sup>1</sup>	Feature Type	Deposit Type	GPS UTM Coordinates			Elev. (ft)	Temp. (°C)	pH (s.u.)	Elec. Cond. (µS/cm)	Average Flow (gpm)	Flow Measure Method	Color	Odor	Reach Sugar Creek (Y or N)	Spring Source Width (est.) (in)	Seep Source Width (est.) (ft)	Water Depth (in)	Seep Field Width (est.) (ft)	Seep Field Length (est.) (ft)	Wetland Width (est.) (ft)*	Wetland Length (est.) (ft)*	Pond Size (ft x ft)	Location	Comments
									Zone	Easting	Northing																			
284	GM-SC-284	8/3/12	13:30	HO	513-519	---	Spring	Colluvium	11N	633021	4977408	6,680	4.9	8.85	100.3	47.6	Bucket	clear	none	Y	48	---	---	---	---	---	---	---	Hillside east of Sugar Creek. Hillside around the "nose" from West End Creek.	Consists of 2 main springs. 1st spring (to the N) consists of 3 x 4" sources spanning 4' total across. 2nd spring (to the S) has 2 main sources each 4" wide. Feeds wetlands below. Springs 30'-40' apart.
286	GM-SC-286	8/3/12	14:30	HO	520-526	---	Seep	Colluvium	11N	633106	4977687	6,552	6.3	7.89	119.0	9.3	Cup	clear	none	Y	4	---	---	50	75	---	---	---	Hillside to the east of Sugar Creek.	Large seep field at upper start of flow. 2 main seeps each channel 4". Very thick vegetation/wet and mossy with some wetland shrubs.
288	GM-SC-288	8/3/12	15:20	HO	527-529	---	Seep	Colluvium	11N	633022	4977968	6,192	10.8	8.33	227.0	0.4	Cup	clear	none	N	---	8	---	---	---	---	---	---	Seep along old Jeep Road Grade on the hillside east of Sugar Creek.	Different aspect than -286. More on the "nose" instead of the drainage.
290	GM-SC-290	8/3/12	16:20	HO	531-533	---	Spring w/Wetland	Colluvium/Bedrock?	11N	632758	4977293	6,592	6.5	8.28	310.0	73.5	Bucket	clear	none	Y	---	---	---	30	50	40	60	---	Hillside east of Sugar Creek.	Forms a high flow channel 6"-1' wide. Moss mat cover but emittance over the rocks underneath the moss. Area largely outcropped (not immediately adjacent to the source but above and around). Ma emit from bedrock.
292	GM-SC-292	8/3/12	16:30	HO	534-537	---	Seep	Colluvium	11N	632777	4977318	6,582	5.9	8.12	275.0	12.0	Cup	clear	none	Y	---	---	---	20	30	---	---	---	Hillside east of Sugar Creek.	Very diffuse seep field.
304	GM-SC-304	8/5/12	12:50	HO	561-564	---	Seep w/Wetland	Colluvium/Fill	11N	631708	4976604	6,509	23.3	7.01	78.6	0.3	Visual Estimate	clear	none	N	---	---	---	5	5	5	10	---	Above Sugar Creek, on the upper part of the Homestake hillside.	Flows into a small, standing water area. Most likely runs downhill during peak runoff. Hillside made of "fill".
306	GM-SC-306	8/5/12	13:10	HO	565-568	---	Seep w/Wetland	Colluvium	11N	631750	4976641	6,498	18.4	7.55	40.1	0.1	Cup	clear	none	N	---	---	---	15	40	10	40	---	Above Sugar Creek, on the upper part of the Homestake hillside.	Forms a 3-4" channel. Wetlands run down seep channel (10' wide) and spreads out when hits the "bench" to 30' x 20'.
308	GM-SC-308	8/5/12	13:45	HO	569-573	---	Seep	Colluvium/Fill	11N	631818	4976719	6,457	16.6	6.93	2300.0	0.4	Cup	clear	none	N	---	3	---	---	---	---	---	---	Above Sugar Creek, on the upper part of the Homestake hillside.	Seep coming out of the old Homestake Pit Wall. Iron smell and water is very dark red and orange.
310	GM-SC-310	8/5/12	14:00	HO	574-576	---	Seep	Colluvium/Fill	11N	631843	4976749	6,453				0.4	Visual Estimate	clear	none	N	---	0.5	---	---	---	---	---	---	Above Sugar Creek, on the upper part of the Homestake hillside.	Seep coming out of the old Homestake Pit Wall. Iron smell and water is very dark red and orange. Seep very dispersed and hard to measure.
312	GM-SC-312	8/5/12	15:00	HO	577-580	---	Spring	Colluvium	11N	632014	4977189	6,146	6.4	7.59	316.0	13.4	Bucket	clear	none	Y	12	---	---	---	---	---	---	---	Above Sugar Creek, on the lower portion of the Homestake hillside.	Coming up from beneath a rock. Forms a 1.5' wide channel.
314	GM-SC-314	8/5/12	15:30	HO	581-584	---	Seep	Colluvium	11N	631955	4977171	6,109	9.1	7.20	1362.0	0.6	Cup	clear	none	N	12	---	---	---	---	---	---	---	Above Sugar Creek, on the lower portion of the Homestake hillside.	Forms a small 4" channel. Essentially only a trickle off a log.
316	GM-SC-316	8/5/12	15:50	HO	585-588	---	Spring w/Wetland	Colluvium	11N	631889	4977149	6,095	7.3	7.59	190.3	4.6	Cup	clear	none	Y	8	---	---	---	---	20	20	---	Above Sugar Creek, on the lower portion of the Homestake hillside.	Forms a 1-1.5' wide channel.
325	GM-SC-325	8/5/12	9:45	GW	---	472-474	Seep w/Wetland	Colluvium	11N	632590	4978905	7,478	11.6	7.34	58.3	0.3	Visual Estimate	clear	none	N	---	---	---	---	---	---	---	---	North slope of Sugar Creek.	Small seep coming out of small wetland in drainage. Seep flows for 10ft below the wetland before disappearing.
327	GM-SC-327	8/5/12	10:40	GW	---	475-477	Seep w/Wetland	Colluvium	11N	632511	4978648	7,391	11.0	7.08	64.7	3.0	Visual Estimate	clear	none	N	---	---	---	---	---	---	---	---	North slope of Sugar Creek.	Seep in middle of Alder thicket on side slope of drainage.
329	GM-SC-329	8/5/12	11:00	GW	---	478-480	Seep w/Wetland	Colluvium	11N	632439	4978465	7,220	10.3	7.25	98.4	3.0	Visual Estimate	clear	none	N	---	---	---	---	---	50	50	---	North slope of Sugar Creek.	Dispersed throughout wetland area.
331	GM-SC-331	8/5/12	12:15	GW	---	481-483	Seep w/Wetland	Colluvium	11N	632462	4977983	6,625	9.7	8.15	314.0	2.0	Visual Estimate	clear	none	Y	---	---	---	---	---	---	---	---	North slope of Sugar Creek.	Seep in drainage with small wetland.
333	GM-SC-333	8/5/12	14:00	GW	---	484-486	Seep w/Wetland	Colluvium	11N	631907	4977998	6,954	13.0	7.92	294.0	1.0	Visual Estimate	clear	none	Y	---	---	---	---	---	---	---	---	North slope of Sugar Creek.	Seep in drainage with wetland.
345	GM-SC-345	8/5/12	12:15	GW	---	---	Seep	Colluvium	11N	631777	4977549					No Flow			N									North slope of Sugar Creek.	small wet area, no flow	
347	GM-SC-347	8/5/12	14:00	GW	---	---	Seep	Colluvium	11N	631830	4977487					No Flow			N									North slope of Sugar Creek.	small wet area, no flow	

n.m. - Not Measured  
<sup>1</sup> See Appendix K for details on photos



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## **Appendix J. EFSFSR Drainage Hydrology Field Survey Summary Table**



**Golden Meadows  
2012 Hydrology Field Survey  
East Fork of the South Fork Salmon River (EFSFSR) Data Summary**

Site Number	Site ID	Date / Time	Collected By	Photo(s) Pink Camera <sup>1</sup>	Photo(s) Blue Camera <sup>1</sup>	Feature Type	Deposit Type	GPS UTM Coordinates			Elev. (ft)	Temp. (°C)	pH (s.u.)	Elec. Cond. (µS/cm)	Average Flow (gpm)	Flow Measure Method	Color	Odor	Reach EFSFSR (Y or N)	Spring Source Width (est.) (in)	Seep Source Width (est.) (ft)	Water Depth (in)	Seep Field Width (est.) (ft)	Seep Field Length (est.) (ft)	Wetland Width (est.) (ft)*	Wetland Length (est.) (ft)*	Pond Size (ft x ft)	Location	Comments
								Zone	Easting	Northing																			
061	GM-EF-061	7/15/12	GW	---	107 - 109	Seep w/Wetland	Colluvium	11N	631107	4974178	7,168	4.7	6.67	40.5	30.0	Visual Estim	clear	none	N	---	75	---	---	---	---	---	---	West of camp, East Fork	Large area with multiple springs converging into channel. Large spring emanating along multiple points in small bowl on steep hillside.
063	GM-EF-063	7/15/12	GW	---	110 - 112	Spring w/Wetland	Colluvium	11N	631051	4973882	7,376	5.7	7.03	29.5	5.7	Cup	clear	none	N	72	---	---	---	---	---	---	East Fork	Spring flowing from small depression in hillside.	
065	GM-EF-065	7/15/12	GW	---	113, 114	Seep w/Wetland	Colluvium	11N	631353	4974434	6,882	7.8	6.94	77.0	1.7	Cup	clear	none	N	---	9	---	---	---	---	---	East Fork	Seep area - 1-2 m wide.	
196	GM-EF-196	7/24/12	HO	328-333	---	Seep w/Wetland	Colluvium	11N	631362	4976435	6,075	7.6	6.95	320.0	2.0	Visual Estimate	clear	none	Y	---	1.5	---	---	---	30	150	---	Reclaimed bench adjacent to EFSFSR.	Spring flowing into swampy wetland.
198	GM-EF-198	7/24/12	HO	334-336	---	Seep, Pond, Wetland	Colluvium	11N	631251	4976312	6,152	8.8	6.72	86.9	2.0	Visual Estimate	clear	none	Y	---	---	15	---	---	10	40	10 x 15	Bench above the Glory Hole on the western side.	Seep flows down to Glory Pit for about 200' long channel with wetlands at the bottom. Small pond on top (1.5' deep) (10'x20' pond).
228	GM-EF-228	7/31/12	HO	393-396	---	Seep w/Wetland	Colluvium	11N	632167	4975272	6,814	7.2	8.18	212.0	3.1	Cup	clear	none	Y	---	---	---	10	40	15	60	---	Midnight Creek haul road. South of Midnight Creek drainage.	Wetland extends down road.
230	GM-EF-230	7/31/12	HO	397-399	---	Spring w/Wetland	Colluvium	11N	632199	4975349	6,903	5.7	8.04	269.0	28.4	Bucket	clear	none	Y	5	---	---	---	---	10	100	---	Midnight Creek haul road. South of Midnight Creek drainage.	Wetland runs to haul road.
232	GM-EF-232	7/31/12	HO	400-402	---	Seep w/Wetland	Colluvium	11N	632521	4974980	7,257	5.9	7.99	277.0	11.9	Bucket	clear	none	Y	---	---	---	5	10	20	100	---	Midnight Creek haul road. South of Midnight Creek drainage. Between Garnet and Midnight Creeks.	Wetland extends almost to haul road. Landslide slump.
269	GM-EF-269	8/1/12	GW	---	389-391	Seep w/Wetland	Colluvium	11N	632358	4972219	7,524	17.6	6.80	37.4	1.0	Visual Estimate	clear	none	Y	---	---	---	---	---	---	---	---	West slope of EFSFSR, south of Meadow Creek.	Seep coming out of wetland at break in slope. No flow into wetland.
271	GM-EF-271	8/1/12	GW	---	392-394	Spring w/Wetland	Colluvium	11N	632390	4972116	7,687	6.3	6.62	26.7	20.0	Visual Estimate	clear	none	Y	---	---	---	30	---	---	---	---	West slope of EFSFSR, south of Meadow Creek.	Forms two channels below seep/wetland and combine after 100ft.
273	GM-EF-273	8/2/12	GW	---	395-397	Spring w/Wetland	Colluvium	11N	633635	4971588	7,554	5.4	6.81	47.3	5.0	Visual Estimate	clear	none	Y	---	---	---	---	---	---	---	---	West slope of EFSFSR, south of Meadow Creek.	Spring in drainage.
275	GM-EF-275	8/2/12	GW	---	398-400	Spring w/Wetland	Colluvium	11N	633222	4971451	7,761	5.4	6.88	54.0	10.0	Visual Estim	clear	none	Y	---	---	---	---	---	---	---	---	West slope of EFSFSR, south of Meadow Creek.	Wetland below.
276	GM-EF-276	8/2/12	HO	485-487	---	Seep w/Wetland	Colluvium	11N	631701	4974953	6,433	9.5	7.21	75.1	0.2	Cup	clear	none	N	---	---	---	3	4	15	20	---	Along county road between YellowPine and Stibnite. Found while walking back to the shop from Hennessy Creek.	Forms a 3" channel.
277	GM-EF-277	8/2/12	GW	---	401-403	Seep w/Wetland	Colluvium	11N	633194	4971445	7,759	5.8	6.88	43.7	10.0	Visual Estim	clear	none	Y	---	100	---	---	---	---	---	---	West slope of EFSFSR, south of Meadow Creek.	Seep with flowing water from several sources along hillside.
279	GM-EF-279	8/2/12	GW	---	404-406	Seep w/Wetland	Colluvium	11N	632902	4971431	7,923	6.5	6.93	53.4	5.0	Visual Estimate	clear	none	N	---	---	---	---	---	---	---	---	West slope of EFSFSR, south of Meadow Creek.	Large seep area with multiple sources at break in slope. Bedrock outcropping just above.
281	GM-EF-281	8/2/12	GW	---	407-409	Seep w/Wetland	Colluvium	11N	632842	4971415	7,965	12.3	6.70	39.7	7.0	Visual Estimate	clear	none	N	---	---	---	---	---	---	---	---	West slope of EFSFSR, south of Meadow Creek.	Seep area with two main sources, 15ft apart.
283	GM-EF-283	8/2/12	GW	---	410-412	Seep w/Wetland	Colluvium	11N	632686	4971442	7,976	8.5	6.70	34.6	3.0	Visual Estimate	clear	none	N	---	---	---	---	---	---	---	---	West slope of EFSFSR, south of Meadow Creek.	Seep in slump area, large wetland below. Multiple sources.
285	GM-EF-285	8/2/12	GW	---	413-415	Seep w/Wetland	Colluvium	11N	632616	4971413	7,992	10.6	6.65	36.0	5.0	Visual Estimate	clear	none	N	---	---	---	---	---	---	---	---	West slope of EFSFSR, south of Meadow Creek.	Large seep area with multiple sources and multiple flow paths.
287	GM-EF-287	8/2/12	GW	---	416-418	Spring w/Wetland	Colluvium	11N	632520	4971611	7,858	6.1	6.67	33.1	2.0	Visual Estimate	clear	none	Y	---	---	---	---	---	---	---	---	West slope of EFSFSR, south of Meadow Creek.	Spring with large wetland and additional seep sources. Flow disappears for short while after wetland at 287, then reappears in drainage channel at 278INT.
298	GM-EF-298	8/4/12	HO	546-550	---	Seep w/Wetland	Colluvium	11N	633228	4972802	6,921	8.0	7.74	254.0	14.4	Cup	clear	none	Y	---	1	---	30	30	30	100	---	Hillside between Garnet and Rabbit Creeks.	2 main seep sources 4" wide each. Wetlands on seep field and extend to bottom of drainage.
300	GM-EF-300	8/4/12	HO	551-554	---	Seep w/Wetland	Colluvium	11N	632782	4973140	7,013	9.4	7.27	131.7	4.9	Cup	clear	none	Y	---	---	---	25	75	30	>100	---	Hillside between Garnet and Rabbit Creeks.	Seep field has one main emergence source and forms a 5" channel. Wetlands extend down drainage.
302	GM-EF-302	8/4/12	HO	555-558	---	Spring w/Wetland	Colluvium	11N	632979	4973312	7,358	7.4	6.99	95.6	7.0	Cup	clear	none	Y	3	---	---	---	---	10' - 30'	>100	---	Hillside between Garnet and Rabbit Creeks.	Wetlands extend to bottom of the drainage.
318	GM-EF-318	8/6/12	HO	595-597	---	Seep w/Wetland	Colluvium	11N	631919	4975002	6,374				No Flow	---	clear	none	N	---	---	---	50	100	50	100	---	Along old Jeep trail along the EFSFSR between Garnet and Midnight drainages.	Wetland/mossy area. Possibly significant flow during wet season.
320	GM-EF-320	8/6/12	HO	598-601	---	Seep w/Wetland	Colluvium	11N	631920	4975314	6,400	10.9	7.84	270.0	2.9	Cup	clear	none	Y	---	---	---	15	40	25	50	---	Hillside between Garnet and Midnight Creeks. Flows into the EFSFSR.	
322	GM-EF-322	8/6/12	HO	602-605	---	Seep w/Wetland	Colluvium	11N	631907	4975355	6,388	10.4	7.84	264.0	1.9	Cup	clear	none	N	---	---	---	6	30	10	15	---	Hillside to the east of the EFSFSR.	Hillside slump along old Jeep Road. Approximately 200' N of GM-EF-320.
323	GM-EF-323	8/4/12	GW	---	469-471	Seep w/Wetland	Colluvium	11N	632352	4972860		7.2	6.61	63.6	1.0	Visual Estimate	clear	none	N	---	10	---	---	---	---	---	---	West slope of EFSFSR between Meadow Creek and Rabbit Creek..	Flow hidden by vegetation.

Golden Meadows  
2012 Hydrology Field Survey  
East Fork of the South Fork Salmon River (EFSFSR) Data Summary

Site Number	Site ID	Date / Time	Collected By	Photo(s) Pink Camera <sup>1</sup>	Photo(s) Blue Camera <sup>1</sup>	Feature Type	Deposit Type	GPS UTM Coordinates			Elev. (ft)	Temp. (°C)	pH (s.u.)	Elec. Cond. (µS/cm)	Average Flow (gpm)	Flow Measure Method	Color	Odor	Reach EFSFSR (Y or N)	Spring Source Width (est.) (in)	Seep Source Width (est.) (ft)	Water Depth (in)	Seep Field Width (est.) (ft)	Seep Field Length (est.) (ft)	Wetland Width (est.) (ft)*	Wetland Length (est.) (ft)*	Pond Size (ft x ft)	Location	Comments
								Zone	Easting	Northing																			
324	GM-EF-324	8/6/12	HO	616-619	---	Spring w/Wetland	Colluvium/Fill/Waste Rock	11N	631482	4976094	6,152	6.4	7.94	246.0	126.5	Bucket	clear	none	Y	12	---	---	---	---	60	60	---	Hillside east of the EFSFSR. Above the Glory Hole. Springs coming out of the SE Bradley dumps.	2 distinct spring sources (6" wide each). Combine 40' after they emit from the hillside and form a 6"-1' channel.
326	GM-EF-326	8/6/12	HO	620-623	---	Seep w/Wetland	Colluvium/Fill/Waste Rock	11N	631478	4976116	6,148	WQ assumed same as EF-324		0.3	Visual Estimate	clear	none	N	---	---	---	20	20	30	150	---	Hillside east of the EFSFSR. Above the Glory Hole. Springs coming out of the SE Bradley dumps.	Approximately 150' from GM-EF-324.	
328	GM-EF-328	8/6/12	HO	624-627	---	Seep w/Wetland	Colluvium/Fill/Waste Rock	11N	631501	4976266	6,130	6.2	7.42	431.0	14.0	Cup	clear	none	Y	---	---	---	50	100	50	150	---	Hillside east of the EFSFSR. Above the Glory Hole. Springs coming out of the SE Bradley dumps.	Dispersed flow. Wetlands cover seep field and continue down to the Glory Hole.
330	GM-EF-330	8/6/12	HO	628-631	---	Seep w/Wetland	Colluvium	11N	631225	4976153	6,145	11.3	8.20	220.0	1.6	Cup	clear	none	Y	---	0.5	---	---	---	30	50	---	Western hillside above bench/wall.	Seep source from 3 points (each pt 2" wide). Wetlands on bench and extends up drainage to upper bench. Emitting from old pit
332	GM-EF-332	8/6/12	HO	636-638	---	Seep, Pond, Wetland	Colluvium	11N	631784	4974996	6,376	No WQ or flow-standing water		No Flow	---	clear	none	N	---	1	24	---	---	2	10	15 x 20	Along the west side of EFSFSR along the old road grade.	Channel approximately 1' wide when flowing. Pond currently just standing water. Wetland surrounds pond by 1ft and extends up seep channel.	
334	GM-EF-334	8/6/12	HO	639-640	---	Pond w/Wetland	Colluvium	11N	631784	4974843	6,384	No WQ or flow-standing water		No Flow	---	clear	none	N	---	---	12	25	200	25	200	15 x 25	Along the west side of EFSFSR along the old road grade.	No apparent hillside flow-seeping from underneath. Currently standing water, 1'-3' deep.	

<sup>1</sup> See Appendix K for details on photos

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## **Appendix K. Hydrology Field Survey Digital Camera Photo Logs and Photo CD**